Town of Paradise Valley

6401 E Lincoln Dr
Paradise Valley, AZ 85253

Meeting Notice and Agenda

Town Council

Thursday, June 22, 2017 | **4:00 PM** | **Council Chambers**

1. CALL TO ORDER / ROLL CALL

Notice is hereby given that members of the Town Council will attend either in person or by telephone conference call, pursuant to A.R.S. §38-431(4).

2. STUDY SESSION ITEMS

The Study Session is open to the public however the following items are scheduled for discussion only. The Town Council will be briefed by staff and other Town representatives. There will be no votes and no final action taken on discussion items. The Council may give direction to staff and request that items be scheduled for consideration and final action at a later date. The order of discussion items and the estimated time scheduled to hear each item are subject to change.

17-237 **Discussion of the Indian Bend Road Traffic Calming Measure Associated with Five Star/Ritz Carlton Development**
45 Minutes

Recommendation: Provide feedback and direction regarding the traffic calming measure approved by the City of Scottsdale on Indian Bend Road between Scottsdale Road and the Town limits.

Staff Contact: Kevin Burke, 480-348-3690

17-236 **Discussion of Councilmember Paul Dembow's Nomination for the Arizona Municipal Risk Retention Pool (AMRRP)**
15 Minutes

Recommendation: Discuss Councilmember Dembow's nomination for the Arizona Municipal Risk Retention Pool.

Staff Contact: Kevin Burke, 480-348-3690

17-240 **Discussion of Statement of Direction for Hillside Code Updates (Article XXII of the Town Zoning Ordinance)**
60 Minutes

Staff Contact: George Burton, 480-348-3525

3. EXECUTIVE SESSION

17-233 **The Town Council may go into executive session at one or more times during the meeting as needed to confer with the Town Attorney for legal advice regarding any of the agenda items listed on the agenda as authorized by A.R.S. §38-431.03(A)(3).**

17-238 **The Town Council may go into executive session to confer with the Town Attorney for legal advice regarding zoning and other standards applicable to group homes, assisted living homes, and sober living homes as authorized by A.R.S. §38-431.03(A)(3) and pending or potential litigation regarding same as authorized by A.R.S. §38-431.03(A)(4).**

4. BREAK

5. RECONVENE FOR REGULAR MEETING 6:00 PM

6. ROLL CALL

7. PLEDGE OF ALLEGIANCE*

8. PRESENTATIONS*

9. CALL TO THE PUBLIC

Citizens may address the Council on any matter not on the agenda. In conformance with Open Meeting Laws, Council may not discuss or take action on this matter at this Council meeting, but may respond to criticism, ask that staff review a matter raised, or ask that it be placed on a future agenda. Those making comments shall limit their remarks to three (3) minutes. Please fill out a Speaker Request form prior to addressing the Council.

10. CONSENT AGENDA

All items on the Consent Agenda are considered by the Town Council to be routine and will be enacted by a single motion. There will be no separate discussion of these items. If a member of the Council or public desires discussion on any item it will be removed from the Consent Agenda and considered separately. Please fill out a Speaker Request form prior to the start of the meeting and indicate which item you would like to address.

11. PUBLIC HEARINGS

The Town Council may hear public comments and take action on any of these items. Citizens may address the Council regarding any or all of these items. Those making comments are limited to three (3) minutes. Speakers may not yield their time to others. Please fill out a Speaker Request form prior to the start of the meeting and indicate which item you would like to address.

12. ACTION ITEMS

The Town Council May Take Action on This Item. Citizens may address the Council regarding any or all of these items. Those making comments are limited to three (3) minutes. Speakers may not yield their time to others. Please fill out a Speaker Request form prior to the start of the meeting and indicate which item you would like to address.

17-231 **Consideration of Paradise Valley Bicycle & Pedestrian Master Plan Statement of Direction**

Recommendation: Approve the Statement of Direction (SOD) for the Paradise Valley Bicycle & Pedestrian Master Plan

Staff Contact: Paul Michaud, 480-348-3574

17-235 **Approval of Councilmember Paul Dembow's Nomination for the Arizona Municipal Risk Retention Pool (AMRRP)**

Recommendation: Approve Councilmember Dembow's nomination for the Arizona Municipal Risk Retention Pool.

Staff Contact: Kevin Burke, 480-348-3690

17-243 **Adoption of Statement of Direction for Hillside Code Updates (Article XXII of the Town Zoning Ordinance)**

Recommendation: Consider the Statement of Direction for Hillside Code Updates (Article XXII of the Town Zoning Ordinance) as Discussed in Study Session.

Staff Contact: George Burton, 480-348-3525

13. FUTURE AGENDA ITEMS

The Town Council May Take Action on This Item. The Mayor or Town Manager will present the long range meeting agenda schedule and announce major topics for the following meeting. Any member of the Council may move to have the Town Manager add a new agenda item to a future agenda. Upon concurrence of three more Members, which may include the Mayor, the item shall be added to the list of future agenda items and scheduled by the Town Manager as a future agenda item within 60 days.

17-234 **Consideration of Requests for Future Agenda Items**

Recommendation: Review the current list of pending agenda topics.

Staff Contact: Kevin Burke, 480-348-3690

14. MAYOR / COUNCIL / MANAGER COMMENTS

The Mayor, Council or Town Manager may provide a summary of current events. In conformance with Open Meeting Laws, Council may not have discussion or take action at this Council meeting on any matter discussed during the summary.

15. ADJOURN

AGENDA IS SUBJECT TO CHANGE

**Notice is hereby given that pursuant to A.R.S. §1-602.A.9, subject to certain specified statutory exceptions, parents have a right to consent before the State or any of its political subdivisions make a video or audio recording of a minor child. Meetings of the Town Council are audio and/or video recorded, and, as a result, proceedings in which children are present may be subject to such recording. Parents in order to exercise their rights may either file written consent with the Town Clerk to such recording, or take personal action to ensure that their child or children are not present when a recording may be made. If a child is present at the time a recording is made, the Town will assume that the rights afforded parents pursuant to A.R.S. §1-602.A.9 have been waived.*

The Town of Paradise Valley endeavors to make all public meetings accessible to persons with disabilities. With 72 hours advance notice, special assistance can also be provided for disabled persons at public meetings. Please call 480-948-7411 (voice) or 480-483-1811 (TDD) to request accommodation to participate in the Town Council meeting.

Town of Paradise Valley

6401 E Lincoln Dr
Paradise Valley, AZ 85253

Action Report

File #: 17-237

TO: **Mayor Collins and Town Council Members**

FROM: **Kevin Burke, Town Manager**

DATE: **June 22, 2017**

DEPARTMENT: Town Manager

AGENDA TITLE:
Discussion of the Indian Bend Road Traffic Calming Measure Associated with Five Star/Ritz Carlton Development.

Council Goals or Other Policies / Statutory Requirements:
Infrastructure - For efficient and effective execution, review and seek improvements for the planning, timing and coordination of infrastructure maintenance and enhancement.

RECOMMENDATION:
Provide feedback and direction regarding the traffic calming measure approved by the City of Scottsdale on Indian Bend Road between Scottsdale Road and the Town limits.

SUMMARY STATEMENT:

Timeline of Decision Points
As a refresher to this topic that was part of the January 2016 Development Agreement (D.A.) between the Town of Paradise Valley and Five Star Development concerning what is generally known as the Ritz Carlton parcel, below is a timeline of decision points:

- Five Star and Town of Paradise Valley (TPV) TPV agreed that Palmeraie (the commercial element of the project split between Paradise Valley and Scottsdale) traffic should be prioritized to enter the development at 6750 N. Scottsdale Road. This is the current signalized intersection that enables movement into and out of the Spectrum. It was projected at time of the D.A. that such entrance would require a double left turn lane.

- City of Scottsdale (COS) did not approve this. They prioritized the Palmeraie traffic to enter at Indian Bend.

- Because COS prioritized Palmeraie traffic to Indian Bend, the "Ritz Carlton Resort Master Traffic Impact Analysis (TIA)" dated November 2015 called for traffic calming on Indian Bend

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(Executive Summary page 4, first bullet and Future Rodway Improvements page 29-31).

- As a side note, the left turn lane at 6750 Scottsdale Road was approved as a single lane permissible, non-protected left turn movement. If stacking to make such movement exceeds the left turn lane capacity and creates cars waiting in the through northbound lanes on Scottsdale Road, COS will restripe the left turn lane to allow a double left and change the signal to a protected left turn movement. None of this changes the requirement for traffic calming on Indian Bend.

- Per the D.A. (2.3.5.9), Five Star, TPV and COS met to discuss these traffic impacts and possible traffic calming solutions on Indian Bend. In the early summer of 2016, a traffic calming measure called "the Swoop" was identified as the best solution by all parties. This mirrors the street improvement on Chaparral immediately west of Scottsdale Road and represented a similar transition between a commercial use and a residential use. [See attachement Labeled Indian Bend Traffic Calming Illustration]

- The Swoop would be constructed on Indian Bend in the COS by Five Star. Therefore, the COS had to approve it as part of their TIA.

- COS asked the TPV Town Manager if the Town had a preference. The Manager checked in with councilmembers. The majority of Councilmembers informally expressed support. One member asked for more information. Specifically, the concern/theory was that Indian Bend is used by many drivers to avoid the Lincoln and Scottsdale intersection. If the traffic calming was too effective, these drivers might choose to drive on Cheney or Hummingbird Road and redirect an undue impact onto those streets.

- The Town Manager requested traffic diversion information from Five Star and its traffic engineer CivTech starting in June 2016. It was received in June 2017. [see attachment labeled IBR ADT Comparison_final]

- Prior to receipt of that traffic study, Interim Town Engineer Woody Scoutten reviewed the TIA for Palmeraie submitted to COS. The intersection of the Swoop and the residential portion of Indian Bend showed a Level of Service (LOS) E during weekday PM peak and a LOS F during Saturday travel. This means those choosing to cut through Indian Bend eastbound would have a very difficult time actually making a left turn to reach the Scottsdale Road intersection during these time periods. Thus making it very effective in calming traffic on Indian Bend in TPV, but also raising concerns of greater redirection of that traffic.

- On March 21, 2017, the COS approved the Palmeraie rezoning that included the swoop design.

Summary of Additional Traffic Diversion Information

- CivTech June 2, 2017 report predicts future traffic on Indian Bend will be reduced by 1,670 vehicles or 26% with the Swoop. The report suggests the majority of vehicles will be diverted to the Scottsdale Road and Lincoln Drive intersection. Further, as a result of the swoop, 60

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more cars per day are expected to use Hummingbird and 100 more cars per day will use Cheney. Cheney would remain within its current LOS A capacity and Hummingbird would remain within its current LOS B capacity.

- EPS (the firm for which Interim Town Engineer Woody Scouten works), reviewed the CivTech traffic study and made the following additional notes:

  - It is somewhat difficult to say how many will divert as it is going to depend on how hard it will be to access the Indian Bend / Scottsdale Road intersection, which may not be a problem for a while until all of the commercial actually develops. Looking back at the original report, it looks as if today, and projected to continue in the future, the majority of traffic on Indian Bend Road west of Scottsdale (cut-thru or otherwise) are going east and west through the intersection. This is likely due to the fact that Indian Bend provides the nearest interchange at the Loop 101 and there aren't many good alternatives.

  - If that is the case, then it is hard to imagine traffic diverting much to the north or the south as they would need to back track to continue east on Indian Bend Road. Again, if it becomes extremely onerous to access the intersection then they may have incentive to divert. The one thing that is concerning, however, is that according to the original report eastbound traffic trying to get from Indian Bend onto the "swoop" is expected to experience a level-of-service "E" in the PM peak and "F" in the Saturday peak with full buildout. This may create a greater incentive.

  - In other words, drivers using Indian Bend Road are trying to get to and from the Loop 101 and that many of them will not be dissuaded from continuing to use Indian Bend because there aren't many alternative routes. So, it's hard to predict how much through traffic will be diverted because of the east-west congestion caused by the swoop.

- Town Engineer Paul Mood further inquired about the basis for the diversion rate used in the calculation. CivTech provided information indicating that traffic calming usually has a greater impact on speeds rather than volumes of traffic. CivTech will be available to explain the findings during the study session.

- The final note is the CivTech report suggests that TPV monitor traffic on Hummingbird and Cheney and install traffic calming measures if undesirable levels of cut through traffic divert to these residential streets. This was certainly concerning as this is what is the Town is trying to avoid.

<u>Recommendation</u>

As noted above, this traffic calming measure actually occurs in the City of Scottsdale and has been approved. This does not mean alternative solutions are prohibited, but they would require concurrence by the COS. The proposed traffic calming accomplishes the goal of the D.A. which was to apply traffic calming facilities to Indian Bend if Palmeraie traffic was directed onto Indian Bend. The concern regarding diversion of cut through traffic appears to be minimal as analyzed by CivTech and confirmed by the Town's contracted engineer. For these reasons, staff recommends Town

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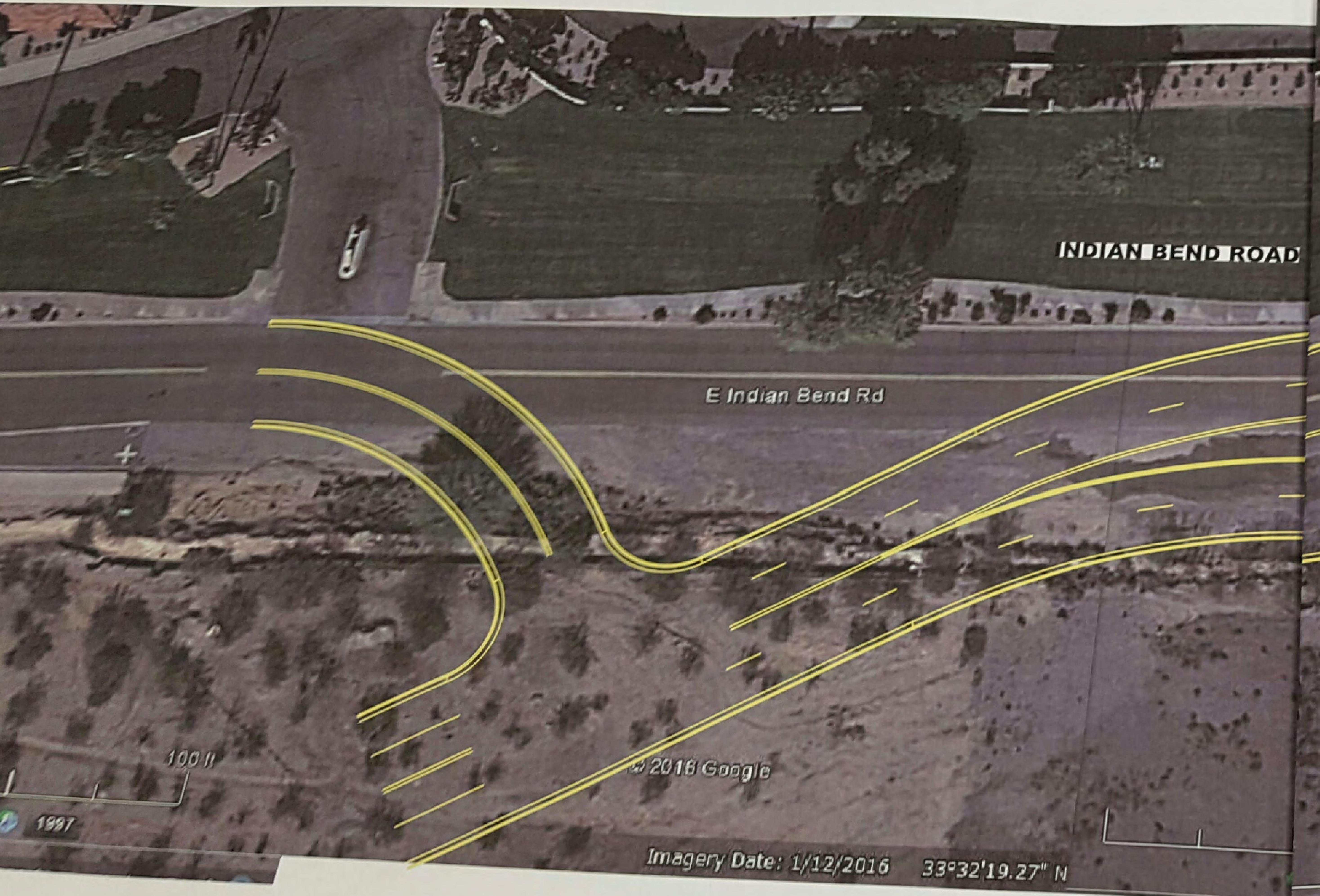
Council direct staff to ensure the traffic calming measure is constructed as approved in the City of Scottsdale.

BUDGETARY IMPACT:
None - all costs are borne by Five Star.

ATTACHMENT(S):
Ritz Carlton Resort Master Traffic Impact Analysis
Indian Bend Traffic Calming Illustration
CivTech's IBR ADT Comparisons_final

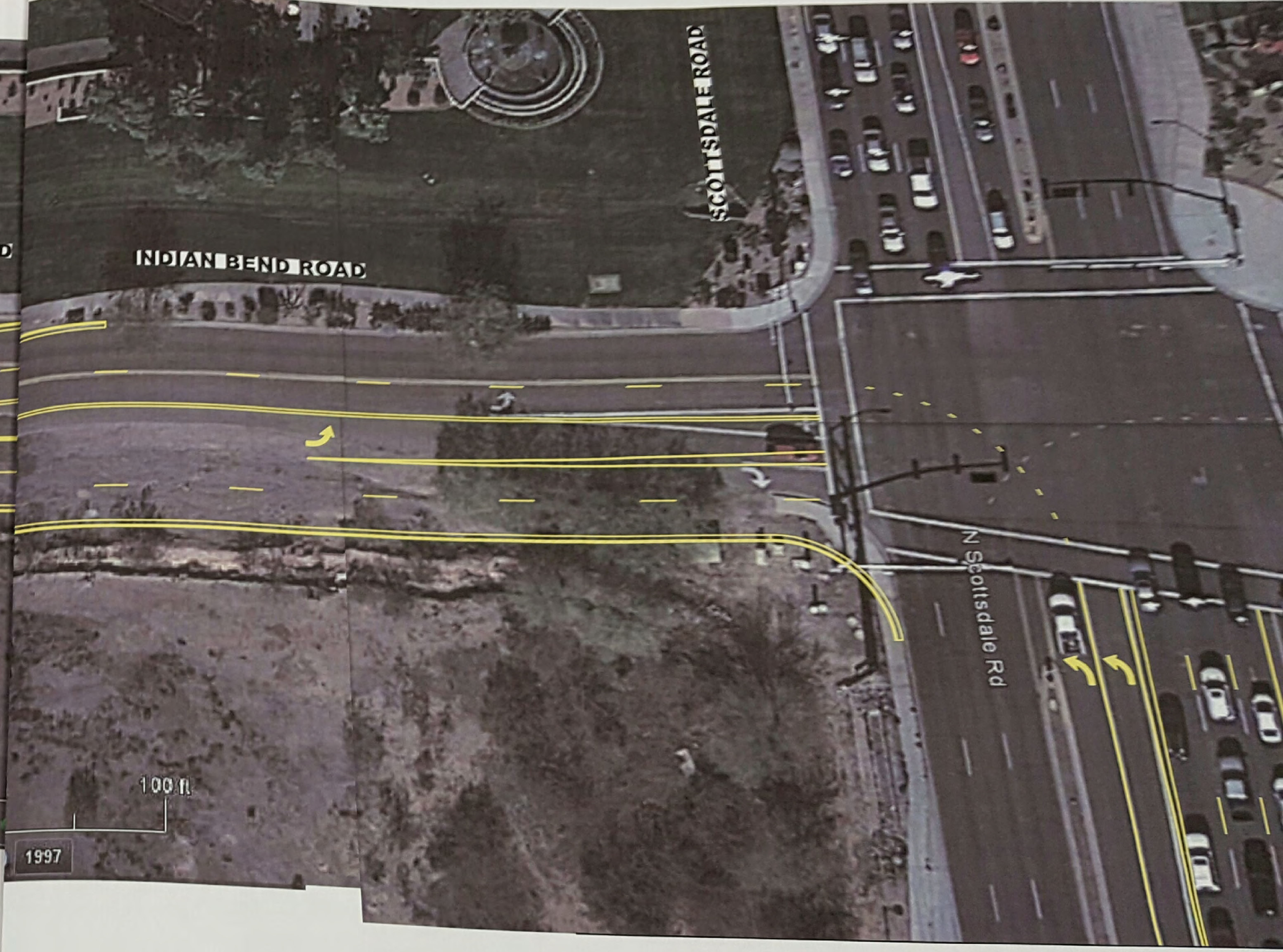


PROPOSED STREET MODIFICATION

SCALE: 1"=40'

SCALE: 1"=40'

0' 20' 40' 80'



FOR SCOTTSDAL

SEE FIG-(

PROPOSED STREET MODIFICATIO

SCALE: 1"=40'

CivTech

35879
DAWN D.
CARTIER
Registered Professional Engineer (Civil)
CERTIFICATE NO.
Date Signed 6.2.17
ARIZONA, U.S.A.
Expires 3-31-2019

June 2, 2017

Chris Klecka, PLC
Five Star Development
6720 N. Scottsdale Road, Suite 130
Scottsdale, AZ 85253

RE: Indian Bend Road Traffic Statement – ADT Comparison with Traffic Calming Design

Dear Mr. Klecka:

CivTech has been retained to evaluate the effect of the planned traffic calming redesign of Indian Bend Road west of Scottsdale Road. At the request of the Town of Paradise Valley, the developer of the Palmeraie development and related Ritz Carlton development consulted with the Town, City of Scottsdale and CivTech for traffic calming options. The planned "swoop" concept was selected to move forward in design plans. The swoop design brings all westbound traffic on Indian Bend Road from Scottsdale Road to enter the Palmeraie/Ritz Carlton development unless making a turn to stay on Indian Bend Road. All traffic on Indian Bend Road eastbound will be required to stop at the "tee" intersection with the swoop and turn left to continue on Indian Bend Road.

The swoop redesign of Indian Bend Road will still allow 2-way traffic but will require westbound vehicles to turn right (yielding to pedestrians) and eastbound vehicles to turn left (stop controlled). Thus, westbound vehicles will not be required to stop unless pedestrians are present, while eastbound vehicles are required to stop and will be delayed by vehicles entering/exiting the Palmeraie development. As such, vehicles traveling eastbound through will be more affected by the redesign than westbound vehicles.

The Town of Paradise Valley indicated that some vehicles currently using Indian Bend Road are cut-through traffic that use Mockingbird Lane and Invergordon Road to bypass congested portions of Scottsdale Road. The redesign of Indian Bend Road has the potential to influence cut-through traffic to use Cheney Drive or Hummingbird Lane instead of Indian Bend Road. It is also possible that some cut-through traffic will discontinue using Town streets altogether due to traffic calming on Indian Bend Road and the residential nature of both Cheney Drive and Hummingbird Lane. Trips to/from Ritz Carlton and Palmeraie have access to the roundabout west of the planned swoop. These development related trips are not expected to use Cheney Drive or Hummingbird Lane as a cut-through route. Most eastbound traffic, which is the direction most delayed by the swoop design, traveling towards Loop 101 is expected to occur in the morning hours. Fortunately, the delay of eastbound vehicles at the stop sign is less in the morning than in the evening as Palmeraie's retail components will generate less conflicting traffic in the morning.

Traffic volume counts were observed over a 24-hour period on Thursday, May 11, 2017, on Indian Bend Road east of Mockingbird Lane and on Cheney Drive east of Mockingbird Lane. Traffic volumes were estimated on Hummingbird Lane due to ongoing construction. At the observed locations, 3,190 daily vehicles were recorded on Indian Bend Road and 2,635 daily vehicles were recorded on Cheney Drive. It may be noted that the Cheney Drive traffic count volume may be larger than typical due to the construction on Hummingbird Lane. The typical daily volume on Hummingbird Lane is estimated to be 50 percent of the traffic observed on Cheney Drive which calculates to approximately 1,320 vehicles. Based on observations of the area roads the week of May 22, the estimated count is assumed to be very conservative. The Town did not request Mockingbird Lane to have traffic counted, though it is considered within this study using the 5,000 average daily traffic (ADT) indicated within the *Ritz Carlton Traffic Impact Analysis*. The observed and estimated existing traffic volumes are depicted in **Exhibit A**.

The traffic calming is expected to reduce Palmeraie trips to/from Lincoln Drive via Indian Bend Road and Mockingbird Lane by approximately 1,510 daily trips. These trips are expected to instead travel south to Lincoln Drive via Scottsdale Road (1,130 daily trips) or through internal connections to Quail Run Lane (380 daily trips).

This evaluation considers 320 of the trips on Indian Bend Road (approximately 10 percent) to be cut-through type trips. It is anticipated that up to half (160) of the cut-through trips, predominantly westbound, may divert through Cheney Drive or Hummingbird Lane. Cheney Drive, which is signalized at Scottsdale Road and is classified by the Town as a collector roadway, is expected to facilitate 100 daily cut-through trips (traffic increase of up to 4 percent). Hummingbird Lane, which is classified as a local roadway, is expected to facilitate a lesser amount – 60 daily cut-through trips (traffic increase of up to 4 percent). The future total ADT, with the addition of trips to/from Ritz Carlton and Palmeraie, are depicted on **Exhibit B** within the **Attachments** for projected conditions with and without the swoop.

Paradise Valley evaluates roadway segment levels-of-service based on roadway classification, number of lanes, ADT and volume thresholds within Table 4 within *Traffic Impact Analysis (TIA) Criteria and Traffic Impact Statement (TIS) Criteria*, dated May 2015. A portion of the table is copied below as **Table 1**.

Table 1: Roadway Segment Volume Thresholds for LOS by Classification

Roadway (Urban Area)	# of Travel Lanes	LOS A	LOS B	LOS C	LOS D	LOS E
Minor Arterial	2	11,280	13,160	15,040	16,920	18,800
	3	12,960	15,120	17,280	19,440	21,600
	4	21,540	25,130	28,720	32,310	35,900
	5	22,080	25,760	29,440	33,120	36,800
Major Collector	2	5,100	5,950	6,800	7,650	8,500
	3	8,520	9,940	11,360	12,780	14,200
	4	10,560	12,320	14,080	15,840	17,600
Minor Collector	2	3,360	3,920	4,480	5,040	5,600
Local Street	2	1,200	1,400	1,600	1,800	2,000

Source: *Traffic Impact Analysis (TIA) Criteria and Traffic Impact Statement (TIS) Criteria, Paradise Valley,* Table 4

The projected ADT and LOS for each roadway considered is summarized in **Table 2**.

Table 2: Roadway Segment LOS Summary

	Roadway	Location Reference	Classification	# of Travel Lanes	Projected ADT	Projected LOS
Without Traffic Calming/Swoop	Cheney Drive	East of Mockingbird Lane	Collector (Minor)[(1)]	2	2,640	A
	Hummingbird Lane	East of Mockingbird Lane	Local	2	1,320[(3)]	B
	Indian Bend Road	East of Mockingbird Lane	Collector (Major)[(1)]	3[(2)]	6,360	A
	Indian Bend Road	West of Scottsdale Road	Collector (Major)[(1)]	4[(2)]	11,370	B
	Mockingbird Lane	North of Indian Bend Road	Minor Arterial	2	5,900	A
With Traffic Calming/Swoop	Cheney Drive	East of Mockingbird Lane	Collector (Minor)[(1)]	2	2,740	A
	Hummingbird Lane	East of Mockingbird Lane	Local	2	1,380[(3)]	B
	Indian Bend Road	East of Mockingbird Lane	Collector (Major)[(1)]	3[(2)]	4,690	A
	Indian Bend Road	West of Scottsdale Road	Collector (Major)[(1)]	4[(2)]	11,730	B
	Mockingbird Lane	North of Indian Bend Road	Minor Arterial	2	5,740	A

(1) "Minor" or "Major" designation is not indicated within the Town's classification map. This study presumes Cheney Drive is a Minor Collector and Indian Bend Road is a Major Collector.
(2) The Ritz Carlton and Palmeraie developments will construct half-street improvements.
(3) Count could not be conducted due to road construction, volume was estimated using Cheney Drive as a reference.

Cheney Road is anticipated to operate at LOS A with or without traffic calming on Indian Bend Road. The potential traffic volume increase is not enough to affect the projected ADT. The segment would need 720 added vehicles (instead of 100) for the segment to be evaluated at LOS B and 1,840 added vehicles for the segment to be evaluated at LOS D. This would require an unlikely scenario that more than half of all vehicles using Indian Bend Road would divert to Cheney Drive.

Hummingbird Lane is anticipated to operate at LOS B with or without traffic calming on Indian Bend Road. The potential traffic volume increase is not enough to affect the projected ADT. The segment would need 80 added vehicles (instead of 60) for the segment to be evaluated at LOS C and 280 added vehicles for the segment to be evaluated at LOS D.

It is expected that the Town of Paradise Valley will wish to monitor traffic volumes before and after reconstruction of Indian Bend Road. CivTech accordingly recommends conducting future traffic counts after construction on Hummingbird Lane finishes and before the Ritz Carlton Resort or other portions of the overall development opens. This will provide a baseline for traffic comparison without unusual traffic conditions due to construction work.

Should traffic volumes increase to more than desired and traffic calming on Hummingbird lane or Cheney Drive is desired, it is recommended that the Town considers options that enhance the roadway character such as landscaped chicanes or chockers.

CONCLUSIONS

- At the request of the Town of Paradise Valley, the developer of the Palmeraie development and related Ritz Carlton development consulted with the Town, City of Scottsdale and CivTech for traffic calming options. The planned “swoop” concept was selected to move forward in design plans.
  - The swoop redesign of Indian Bend Road will still allow 2-way traffic but will require westbound vehicles to turn right (yielding to pedestrians) and eastbound vehicles to turn left (stop controlled). The eastbound movement towards Loop 101 is heaviest in the morning. Fortunately, Palmeraie’s retail components will generate less conflicting traffic in the morning than it will in the evening.
- The redesign of Indian Bend Road has the potential to influence cut-through traffic to use Cheney Drive or Hummingbird Lane instead of Indian Bend Road. It is also possible that some cut-through traffic will discontinue using Town streets altogether due to traffic calming on Indian Bend Road and the residential nature of both Cheney Drive and Hummingbird Lane.
- The traffic calming is expected to reduce Palmeraie trips to/from Lincoln Drive via Indian Bend Road and Mockingbird Lane by approximately 1,510 daily trips. These trips are expected to instead travel south to Lincoln Drive via Scottsdale Road (1,130 daily trips) or through internal connections to Quail Run Lane (380 daily trips).
- This evaluation considers 320 of the trips on Indian Bend Road (approximately 10 percent) to be cut-through type trips. It is anticipated that up to half (160) of the cut-through trips, predominantly westbound, may divert through Cheney Drive or Hummingbird Lane.
  - Cheney Drive, which is signalized at Scottsdale Road and is classified by the Town as a collector roadway, is expected to facilitate 100 daily cut-through trips (traffic increase of up to 4 percent).
  - Hummingbird Lane, which is classified as a local roadway, is expected to facilitate a lesser amount – 60 daily cut-through trips (traffic increase of up to 4 percent).
- Cheney Road is anticipated to operate at LOS A with or without traffic calming on Indian Bend Road. The potential traffic volume increase is not enough to affect the projected ADT.
  - The segment would need 720 added vehicles (instead of 100) for the segment to be evaluated at LOS B and 1,840 added vehicles for the segment to be evaluated at LOS D. This would require an unlikely scenario that more than half of all vehicles using Indian Bend Road would divert to Cheney Drive.
- Hummingbird Lane is anticipated to operate at LOS B with or without traffic calming on Indian Bend Road. The potential traffic volume increase is not enough to affect the projected ADT.
  - The segment would need 80 added vehicles (instead of 60) for the segment to be evaluated at LOS C and 280 added vehicles for the segment to be evaluated at LOS D.

- It is expected that the Town of Paradise Valley will wish to monitor traffic volumes before and after reconstruction of Indian Bend Road. CivTech accordingly recommends conducting future traffic counts after construction on Hummingbird Lane finishes and before the Ritz Carlton Resort or other portions of the overall development opens. This will provide a baseline for traffic comparison without unusual traffic conditions due to construction work.

- Should traffic volumes increase to more than desired and traffic calming on Hummingbird lane or Cheney Drive is desired, it is recommended that the Town considers options that enhance the roadway character such as landscaped chicanes or landscaped chokers.

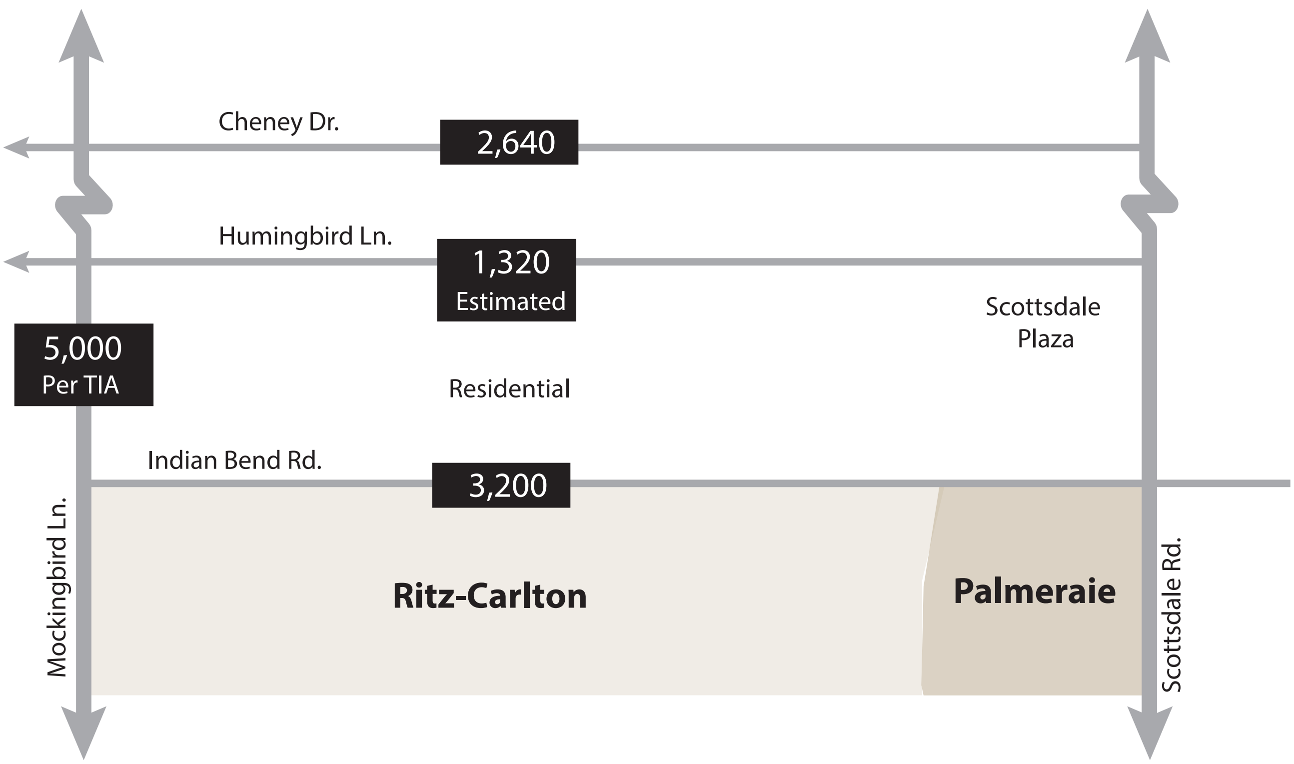
Should there be any questions please contact me at 480-659-4250.

Sincerely,

CivTech

Dawn Cartier, P.E., PTOE
President

<u>Attachments:</u>
Exhibit A: Existing ADT
Exhibit B: Projected ADT
Traffic Counts



Source: CivTech, Inc. 2017

Exhibit A: Existing Average Daily Traffic

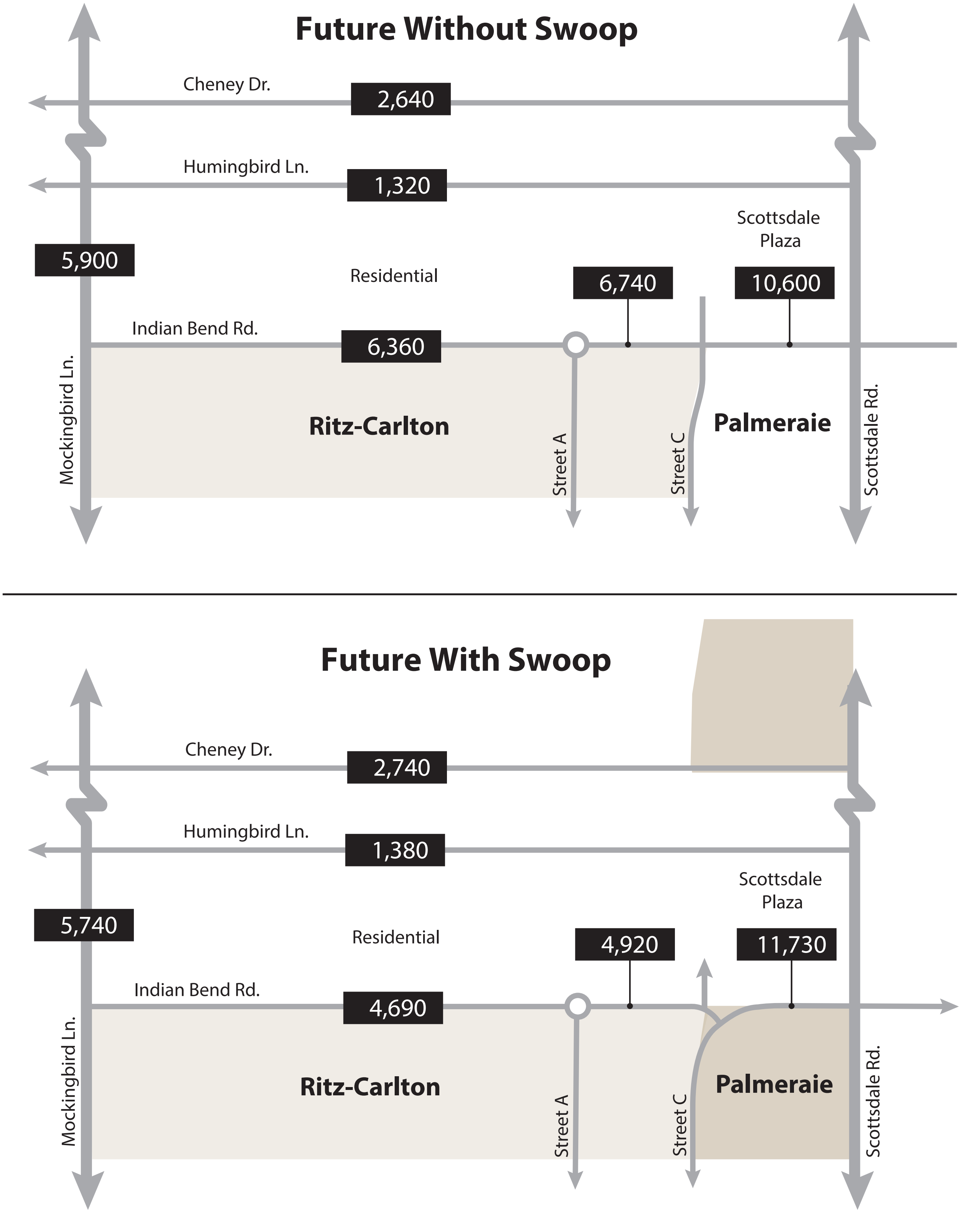


Exhibit B: Projected Average Daily Traffic

Source: CivTech, Inc. 2017

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Thursday, May 11, 2017 City: Scottsdale Project #: 17-1215-001

Location: Cheney Dr. btwn. Scottsdale Rd. & Mockingbird Ln.

AM Period	NB		SB		EB		WB			PM Period	NB		SB		EB		WB		
00:00					0		0			12:00					21		21		
00:15					0		1			12:15					18		25		
00:30					0		0			12:30					35		27		
00:45					0	0	1	2	2	12:45					17	91	28	101	192
01:00					0		0			13:00					36		16		
01:15					0		0			13:15					33		26		
01:30					2		0			13:30					19		32		
01:45					0	2	0	0	2	13:45					25	113	29	103	216
02:00					0		0			14:00					24		22		
02:15					0		0			14:15					23		22		
02:30					0		0			14:30					32		25		
02:45					0	0	0	0		14:45					23	102	36	105	207
03:00					0		0			15:00					16		26		
03:15					0		0			15:15					22		26		
03:30					1		1			15:30					24		29		
03:45					0	1	1	2	3	15:45					21	83	21	102	185
04:00					0		0			16:00					28		23		
04:15					1		0			16:15					25		20		
04:30					1		3			16:30					29		20		
04:45					4	6	4	7	13	16:45					24	106	20	83	189
05:00					1		1			17:00					28		26		
05:15					1		2			17:15					22		22		
05:30					2		6			17:30					20		31		
05:45					6	10	5	14	24	17:45					29	99	27	106	205
06:00					7		5			18:00					27		20		
06:15					11		8			18:15					21		17		
06:30					15		9			18:30					17		13		
06:45					19	52	10	32	84	18:45					6	71	16	66	137
07:00					12		25			19:00					15		16		
07:15					23		17			19:15					15		9		
07:30					17		24			19:30					12		13		
07:45					17	69	37	103	172	19:45					14	56	9	47	103
08:00					19		22			20:00					10		11		
08:15					30		38			20:15					18		8		
08:30					24		32			20:30					10		11		
08:45					22	95	23	115	210	20:45					6	44	6	36	80
09:00					21		26			21:00					13		10		
09:15					15		27			21:15					8		4		
09:30					25		33			21:30					4		5		
09:45					22	83	24	110	193	21:45					5	30	3	22	52
10:00					18		19			22:00					0		3		
10:15					19		20			22:15					4		1		
10:30					19		35			22:30					2		3		
10:45					19	75	23	97	172	22:45					0	6	1	8	14
11:00					16		18			23:00					0		1		
11:15					21		25			23:15					1		0		
11:30					15		20			23:30					2		0		
11:45					19	71	38	101	172	23:45					2	5	2	3	8
Total Vol.						464		583	**1047**							806		782	**1588**

GPS Coordinates: 33.545930, -111.933325

Daily Totals

NB	SB	EB	WB	Combined
		1270	1365	**2635**

	AM			PM		
Split %	44.3%	55.7%	**39.7%**	50.8%	49.2%	**60.3%**
Peak Hour	08:15	07:45	**07:45**	12:30	14:45	**12:30**
Volume	97	129	**219**	121	117	**218**
P.H.F.	0.81	0.85	**0.81**	0.84	0.81	**0.88**

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Thursday, May 11, 2017 City: Scottsdale Project #: 17-1215-003

Location: Indian Bend Rd. btwn. Scottsdale Rd. & Mockingbird Ln.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			3		1			12:00			19		30		
00:15			0		2			12:15			23		28		
00:30			1		0			12:30			15		41		
00:45			0	4	0	3	7	12:45			33	90	32	131	221
01:00			1		1			13:00			28		37		
01:15			0		0			13:15			29		25		
01:30			0		0			13:30			21		31		
01:45			1	2	1	2	4	13:45			20	98	23	116	214
02:00			1		1			14:00			27		21		
02:15			0		0			14:15			31		24		
02:30			1		0			14:30			31		39		
02:45			0	2	0	1	3	14:45			31	120	36	120	240
03:00			0		0			15:00			19		31		
03:15			0		0			15:15			32		31		
03:30			0		0			15:30			24		40		
03:45			0	0	0	0		15:45			35	110	37	139	249
04:00			0		0			16:00			25		30		
04:15			0		1			16:15			23		26		
04:30			1		0			16:30			33		32		
04:45			2	3	1	2	5	16:45			26	107	23	111	218
05:00			2		1			17:00			34		43		
05:15			1		2			17:15			52		40		
05:30			10		3			17:30			42		25		
05:45			9	22	9	15	37	17:45			37	165	29	137	302
06:00			8		8			18:00			26		43		
06:15			7		6			18:15			19		21		
06:30			8		15			18:30			22		29		
06:45			17	40	22	51	91	18:45			16	83	19	112	195
07:00			18		31			19:00			11		21		
07:15			29		22			19:15			10		25		
07:30			36		35			19:30			17		20		
07:45			37	120	22	110	230	19:45			5	43	18	84	127
08:00			30		34			20:00			9		18		
08:15			37		33			20:15			9		16		
08:30			31		32			20:30			4		10		
08:45			31	129	23	122	251	20:45			6	28	9	53	81
09:00			24		21			21:00			3		14		
09:15			26		23			21:15			6		13		
09:30			23		18			21:30			7		9		
09:45			30	103	31	93	196	21:45			8	24	10	46	70
10:00			17		23			22:00			7		9		
10:15			27		24			22:15			3		7		
10:30			31		30			22:30			5		2		
10:45			26	101	28	105	206	22:45			1	16	0	18	34
11:00			21		19			23:00			0		3		
11:15			23		20			23:15			1		4		
11:30			21		29			23:30			0		2		
11:45			32	97	32	100	197	23:45			0	1	2	11	12
Total Vol.				623		604	**1227**					885		1078	**1963**

GPS Coordinates: 33.538606, -111.932359

Daily Totals

NB	SB	EB	WB	Combined
		1508	1682	**3190**

	AM			PM		
Split %	50.8%	49.2%	**38.5%**	45.1%	54.9%	**61.5%**
Peak Hour	07:30	11:45	**07:30**	17:00	15:00	**17:00**
Volume	140	131	**264**	165	139	**302**
P.H.F.	0.95	0.80	**0.93**	0.79	0.87	**0.82**

Ritz Carlton Resort

Master Traffic Impact Analysis

Section 10, Township 2 North,
Range 4 East
Paradise Valley, AZ

November 2015
Project No. 15-360

Prepared For:
Five Star Development
6720 North Scottsdale Road
Suite 130
Scottsdale, Arizona 85253

For Submittal to:
Town of Paradise Valley

Prepared By:

CivTech

10605 North Hayden Road
Suite 140
Scottsdale, Arizona 85260
480-659-4250

RITZ CARLTON RESORT
MASTER TRAFFIC IMPACT ANALYSIS

Section 10, Township 2 North, Range 4 East
Paradise Valley, AZ

Prepared for:

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6720 North Scottsdale Road
Suite 130
Scottsdale, Arizona 85253

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CivTech, Inc.
10605 North Hayden Road
Suite 140
Scottsdale, Arizona 85260
(480) 659-4250

Registered Professional Engineer (Civil)
CERTIFICATE NO.
35879
DAWN D.
CARTIER
Date Signed Nov 4, 2015
ARIZONA, U.S.A.
expires 03.31.2016

November 2015

CivTech Project No: 15-360

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EXECUTIVE SUMMARY

This report documents a traffic impact analysis performed for a mixed use development consisting of a resort, residential and commercial land uses. The proposed Ritz Carlton Resort is located on +105.9 acres north of Lincoln Drive, south of Indian Bend Road, east of Mockingbird Lane and west of Scottsdale Road. The related Palmeraie development within the City of Scottsdale limits is located on +17 acres on the southwest corner of Scottsdale Road and Indian Bend Road and will compliment Parcel E of the proposed site.

CivTech Inc. has been retained by Five Star Development to perform the traffic impact analysis for the proposed Ritz Carlton Resort. The site was previously prepared and approved for a mixed use plan in 2007. This report represents the second submittal which addresses comments made on the previous submittal. The Towns comments and comment responses are provided in **Appendix A**.

The development is proposed with a 200 room resort hotel and 120 villas including a spa, lodge, meeting facilities, gardens, outdoor function space, and retail. The residential component of the plan consists of approximately 114 lots/units of low density single family residential and 100 units/lots of attached residences. The commercial component of the site is planned to consist of approximately 107,000 square feet of retail/restaurant use, 44,000 square feet of office and 230 attached residential dwelling units. The site is planned to provide four (4) access points along Indian Bend Road, three (3) along Scottsdale Road (in which one (1) of the three (3) access points will be a signalized shared driveway with the Spectrum development), and one (1) access point along Lincoln Drive aligning with the Quail Run intersection.

The purpose of this study is to address traffic and transportation impacts of the proposed development on the surrounding streets and intersections. This traffic impact analysis was prepared based on criteria set forth during a scoping meeting with staff from the Town of Paradise Valley utilizing the original TIA, the Traffic Impact and Mitigation Measure guidelines from the City of Scottsdale and public input received during the planning effort in 2007, and comments received on the previous submittals. The specific objectives of the study are:

1. To evaluate lane requirements on all existing roadways and at all existing intersections within the study area.
2. To determine future level of service for all proposed major intersections within the study area and recommend any capacity related improvements.
3. To determine necessary lane configurations at all major intersections within the proposed development to provide acceptable future levels of service.
4. To evaluate the need for future traffic control changes within the proposed development.
5. To evaluate the need for auxiliary lanes at stop and signal controlled intersections.
6. To evaluate the need for deceleration lanes at each site access.

7. To assess any safety concerns on the existing roadways and provide options to ensure they are not intensified with an increase in traffic.

The following recommendations have been documented in this study:

General

- This study evaluates four (4) horizon years, opening year (2018), opening plus five (2023), opening plus ten (2028) and opening plus fifteen (2033). The future study horizon years were analyzed to ensure that future off-site impacts were constructed with the current plan.

- Per the collision data reviewed there are no major mitigation measures currently warranted within the vicinity of the site. It should be noted that the intersections of **Tatum Boulevard & Lincoln Drive** and **Scottsdale Road & Indian Bend Road** recorded a high number of rear-end crashes relative to crash type. Due to this occurrence, it is recommended that these intersections be further evaluated by the Town.

- The future lane configurations and traffic controls are depicted in **Figure 29** and **Figure 30**.

- The developer proposes signalizing the intersection of Quail Run Road and Lincoln Drive. The intersection is anticipated to exceed the peak hour signal warrant criteria in the 2018 opening year.

- Projected ADT are presented in **Table 19**. All major roadways within the study area are anticipated to have traffic volumes below the maximum roadway capacity thresholds upon full buildout of the proposed site. The background, site and available volume capacity on several roadway segments are depicted on **Figure 32**.

- An intersection site distance analysis was performed to set guidelines for establishing line of sight for the proposed development at major internal intersections. Using the guidelines set forth by A Policy on Geometric Design of Highways and Streets, **Table 21** was generated for each intersection created by a new site access point.

Roadway Improvements

- The developer will construct half-street improvements to Indian Bend Road from Scottsdale Road to approximately 600 feet to the west. This improvement will provide a two-way left-turn lane (TWLTL) on Indian Bend Road along the improved length. The remainder of Indian Bend Road is currently constructed at its ultimate condition.

- It is likely that the City of Scottsdale will require the addition of a second westbound through lane along Indian Bend Road. This determination will be made by the City of Scottsdale during their review of the Palmeraie TIMA.

- The developer will improve the intersection of Scottsdale Road and 6750 North. The west leg after improvements will consist of two (2) dedicated left-turn lanes, a dedicated right-turn lane and two (2) ingress lanes. The median within the south leg of the intersection will be modified and the northbound lanes restriped to provide two dedicated left-turn lanes and three (3) through lanes. An alternative improvement condition is proposed should the City of Scottsdale not allow dual northbound left turn lanes. Final geometry and mitigation is subject to approval by the City of Scottsdale. Improvements at this intersection could require the relocation of overhead improvements and other utilities.

- The developer proposes to signalize the intersection of Quail Run Road and Lincoln Drive, which will serve as the main entrance to the proposed Ritz Carlton Resort, by opening year 2018. Based on the signal warrant section within this report *2010 MUTCD* signal warrant criteria is met at the main Ritz Carlton entrance by opening year 2018. Signalization at this intersection will require removal of the nearest median (west of the intersection) and also require the developer to construct new medians.

- The developer has agreed to construct a westbound right-turn lane at the intersection of Lincoln Drive and Mockingbird Lane by opening year 2018. The installment of the westbound right-turn lane will improve the traffic characteristics of this intersection. This may require the relocation of the traffic signal and red light cameral on the affected corner.

- If right-of-way is available, the developer should construct a southbound right-turn lane at the intersection of Lincoln Drive and Mockingbird Lane. The installment of the southbound right-turn lane will improve the delay for southbound vehicles with the likely growth in traffic along Lincoln Drive. This will require relocation of the traffic signal on the affected corner.

- As part of planned regional improvements, the Town of Paradise Valley plans to install a raised median on Mockingbird Lane between Lincoln Drive and Northern Avenue between the financial years of 2018 and 2029. This improvement is not anticipated to cause major changes to current traffic patterns.

- The intersection of Mockingbird Lane and Indian Bend Road was evaluated as a one-way stop controlled intersection which continues to meet acceptable levels of service during the study horizon. Input from neighbors indicates a concern for increased delay at this intersection and a possible need to keep traffic flowing in all directions. Optional intersection treatments should be considered in the future.

- The traffic circle located at Intersection A should be evaluated for alternate pavement treatment. The existing pavers are difficult for a bicycle to negotiate.

- Indian Bend Road may require traffic calming elements to be installed between the traffic circle (Intersection A) and Mockingbird Lane if traffic from Palmeraie is prioritized to use Indian Bend Road. The determination to prioritize Indian Bend could be made by the City of Scottsdale during their review of the Palmeraie TIMA. Options for traffic calming that can be applied in areas with high pedestrian and bicycle volumes have been discussed within the TIA. Traffic calming options are discussed within the main body of this TIA.

Trip Generation

- Phase 1 (opening 2018) of the development is anticipated to generate 3,794 daily trips, of which 384 trips are during the AM peak hour and 353 trips are during the PM peak hour.

- Phase 2 (Buildout horizon year 2023) of the development is anticipated to generate a total of 14,710 daily trips, of which 729 trips are during the AM peak hour and 1,303 trips are during the PM peak hour. It was calculated that approximately 20% of total trips are expected to remain internal to the site. Considering the 20% internal capture reduction, 11,768 new daily trips are anticipated with 583 AM peak hour trips and 1,042 PM peak hour trips.

Intersection Capacity Analysis

- The results of the existing analysis summarized in **Table 4** indicate that all study intersections should operate at overall acceptable level of service (LOS D or better) with the exception of Scottsdale Road/Joshua Tree Road. The signalized intersections of Scottsdale Road/Indian Bend Road, Scottsdale Road/Joshua Tree Road, Scottsdale Road/6750 North, Tatum Boulevard/Lincoln Drive, Mockingbird Lane/Lincoln Drive, Scottsdale Road/Lincoln Drive, Scottsdale Road/McDonald Drive operate at acceptable LOS overall but have one or more movements that experience elevated delay during AM and/or PM peak hour.
    - The southbound left and westbound shared movements at the intersection of ***Scottsdale Road and Joshua Tree Road*** experience elevated delays during the peak hours. Elevated movement delays at stop controlled intersections with major roadways is not uncommon.

- The results of the future analyses summarized in **Table 15** indicate that all study intersections within the Town of Paradise Valley operate acceptably except for the intersection of Tatum Boulevard/Lincoln Drive. Within the City of Scottsdale, most study intersections along Scottsdale Road are anticipated to experience elevated delays in one or more movements during the AM and/or PM peak hour. These intersections are discussed along with recommended mitigation strategies below. Final mitigation and operating conditions of intersections within the jurisdiction of the City of Scottsdale will be subject to approval by the City of Scottsdale.

- The signalized intersection of site ***Tatum Boulevard and Lincoln Drive*** continues to experience elevated delays in some of its individual movements. Due to the general high traffic volumes using the intersection, right-of-way (ROW) acquisition would be required to mitigate the delay by installing additional through lanes. Lengthening the westbound right-turn lane is recommended if right-of-way can be acquired.

- All other study intersections within the Town of Paradise Valley are anticipated to operate acceptably. It may be noted that a couple movements at the intersections of Mockingbird Lane/Lincoln Drive and Quail Run Road/Lincoln Drive are anticipated to experience elevated delays during the peak hours; however, elevated delays for a few individual movements at are not uncommon at signalized intersections of major roadways. A southbound right-turn lane at the intersection of ***Mockingbird Lane and Lincoln Drive*** is recommended to reduce southbound delays if right of way can be acquired.

- Without mitigation, the signalized intersection of site ***Scottsdale Road and Indian Bend Road*** continues to experience elevated delays in some of its individual movements. Mitigation could include signal timing adjustments and reconfiguring the eastbound approach to provide two left turn lanes, one through lane and a shared through-right turn lane. The reconfiguration will not require additional pavement width at the intersection and may be completed with the half-street improvements on Indian Bend Road. After the recommended mitigation, the intersection is anticipated to operate at acceptable LOS.

- The improved condition of the intersection of ***Scottsdale Road and 6750 North*** is anticipated to operate acceptably overall. The improvements include constructing the north half of 6750 North, restriping the approach, modifying the Scottsdale Road median and striping to provide a second northbound left turn lane, add a northbound left-turn protected phase with an eastbound right-turn overlap, and appropriate signal phase timing adjustments. While the intersection improvements allow the intersection to operate acceptably overall, the eastbound left turn movement is anticipated to continue to operate with elevated delays during the peak hours. Final mitigation at this intersection will be determined by the City of Scottsdale.

  - The peak hour analyses of the alternative access conditions (only a single northbound left turn lane on Scottsdale Road approaching 6750 North) indicate that both the intersection of Scottsdale Road and Indian Bend Road and the intersection of Scottsdale Road and 6750 North are anticipated to operate with fairly similar LOS compared to the LOS anticipated with the proposed conditions.

- o The two way stop controlled intersection of site ***Scottsdale Road and Joshua Tree Road*** continues to experience elevated delays. Poor LOS is not uncommon for stop controlled movements to major roadways. It should be noted that Synchro software does not allow HCM analysis left turn movements with 2-stages so actual delay may be better than analyzed. No mitigation is recommended.

- o Without mitigation, the intersection of site ***Scottsdale Road and Lincoln Drive*** continues to experience elevated delays in some of its individual movements. It is recommended to adjust the signal timing and add right-turn overlap periods, where applicable. The mitigation will improve the delay such that the intersection may operate acceptably, although some individual movements are still anticipated to operate with elevated delays during the peak hours. Any phasing adjustments, including the additional of a right-turn overlap phase, will require the approval of the City of Scottsdale.

- o The intersection of site ***Scottsdale Road and McDonald Drive*** continues to experience elevated delays in some of its individual movements. Due to the general high traffic volumes using the intersection, ROW acquisition would be required to mitigate the delays; however, this is not recommended as part of this study.

- The peak hour analyses of the alternative access conditions (only a single northbound left turn lane on Scottsdale Road approaching 6750 North) indicate that both the intersection of Scottsdale Road and Indian Bend Road and the intersection of Scottsdale Road and 6750 North are anticipated to operate with fairly similar LOS compared to the LOS anticipated with the proposed conditions. Final mitigation and operating conditions of intersections within the jurisdiction of the City of Scottsdale will be subject to approval by the City of Scottsdale.

- All intersections considered during the event scenario are anticipated to operate acceptably.

Queue Storage Lengths

- Turn lane storage recommendations for the 2033 horizon year are summarized in **Table 20**. The new turn lanes at the intersection of Quail Run Road and Lincoln Drive are recommended to be striped with 150-feet of storage each. The proposed northbound dual left-turn lanes at the intersection of Scottsdale Road and 6750 North are able to be constructed with approximately 115-feet of storage each, which is more storage than the Synchro analysis predicts. The southbound right-turn lane at the intersection is will need to be increased when the intersection is completed; 150 feet of storage is recommended.

- o The westbound left-turn lane at the intersection of Mockingbird Lane and Lincoln Drive is projected to require additional storage due to residential traffic volumes. It is recommended that the turn lane be extended to provide 350-feet of storage which will require the removal of a center median. The new south- and westbound right-turn lanes at the intersection are recommended to provide 175 feet and 150 feet of storage, respectively.

- o Should only a single northbound left turn lane be provided at the intersection of Scottsdale Road and 6750 North, Synchro's 95th percentile queue projection for the turn lane is 132 feet; in the same scenario, the projected 95th percentile queue for the northbound left turn lane on Scottsdale Road approaching Indian Bend Road is 309 feet. This intersection, in addition to the westbound left-turn queue, will be analyzed further as part of the update to the Palmeraie TIA as requested by the City of Scottsdale with the updated Palmeraie site plan. Final mitigation at these intersections will be determined by the City of Scottsdale.

INTRODUCTION

The Ritz Carlton development, located in the northeast quadrant of Section 10, Township 2 North, Range 4 East, is a proposed mixed use resort development. The site contains approximately 105.9 acres of undeveloped land bordered by Indian Bend Road on the north, Lincoln Drive on the south, Mockingbird Lane on the west and Scottsdale Road on the east.

A location map of the study area is provided in **Figure 1**.

The site is proposed with four entry points from Indian Bend Road, three entry points from Scottsdale Road (one is a shared, signalized driveway with the Spectrum development), and one entry point Lincoln Drive aligning with the Quail Run intersection.

This study analyzes the traffic impact due to the Ritz Carlton on the surrounding street network and meets the study requirements of the Town of Paradise Valley and the City of Scottsdale. The Ritz Carlton will generate more than 1,000 trips in the peak hour. Therefore, the study area is defined as site access drives and all signalized intersections and/or major unsignalized street intersections within ½-mile. Coordination with the Town of Paradise Valley Engineering staff indicated a desire to broaden the study area. The study area was broadened to cover major intersections in each direction of travel including Northern Avenue/Mockingbird Lane, Invergordon Road/Lincoln Drive, Mockingbird Lane/McDonald Drive, and Scottsdale Road/McDonald Drive.

This traffic impact study analyzes the intersections for levels of service at the site entrances and other key intersections within the study area. The intersections are analyzed for the AM and PM peak hours during the existing, 2018 opening year, 2023 build-out year, and 2028 and 2033 horizon years to determine the recommended intersection lane configuration, intersection stop control, turn lane storage requirements, and roadway typical sections for the development.

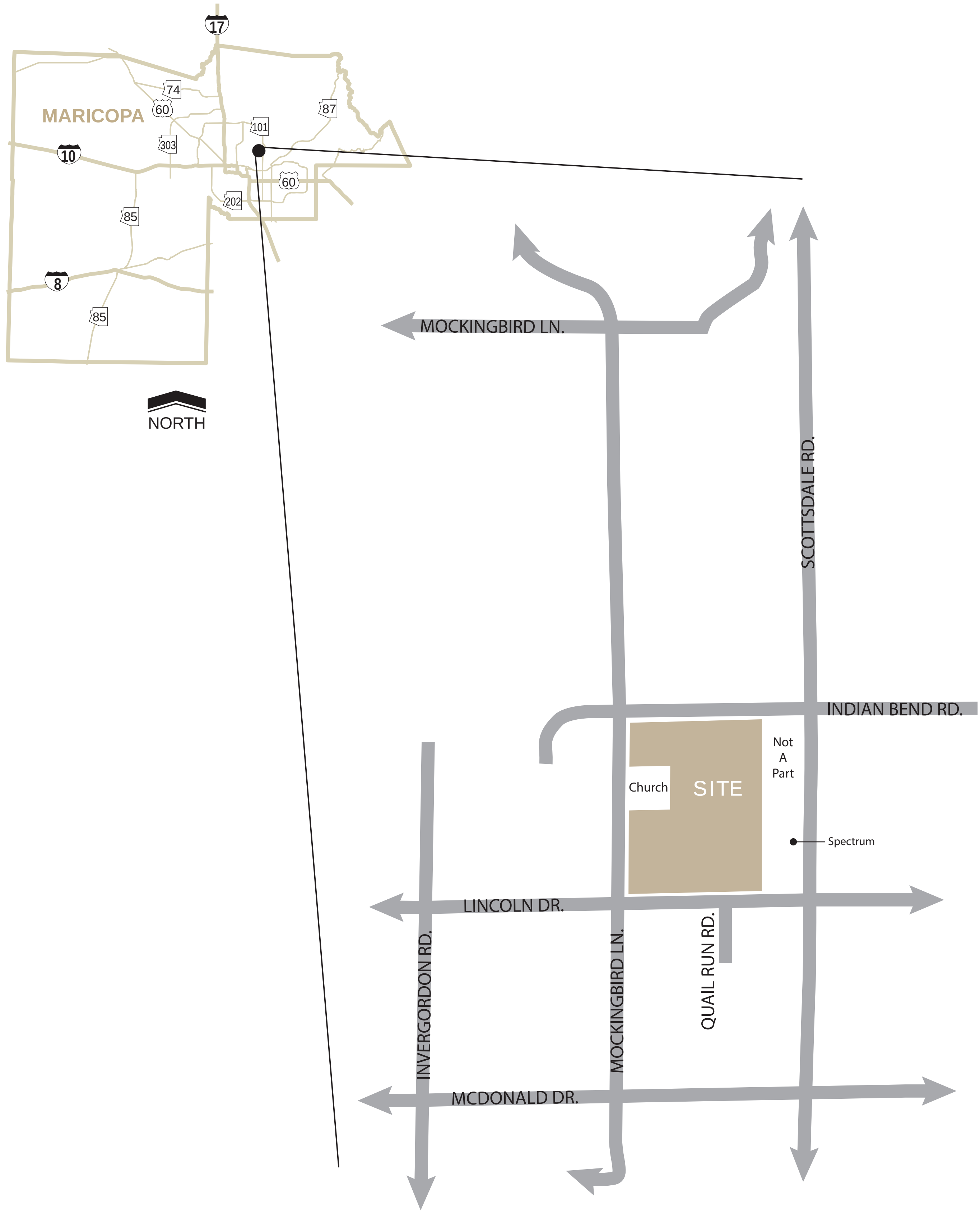


Figure 1: Vicinity Map

EXISTING CONDITIONS

SURROUNDING LAND USE

The Ritz Carlton site is currently undeveloped land located in the Town of Paradise Valley. Scottsdale Road serves as the primary boundary between the City of Scottsdale and the Town of Paradise Valley. However, the boundary jogs at Indian Bend Road and aligns with 71st Street (approximately). Land west of 71st Street between Indian Bend Road and Lincoln Drive is located within the Town of Paradise Valley.

The Spectrum Office development is located on one of the exception parcels within the development boundaries. It consists of a campus of office buildings with underground parking. A signalized driveway providing access to Scottsdale Road was provided with cross access granted to the development of the Ritz Carlton development. A half street configuration, acting as a site driveway, is currently provided for the Spectrum Office Complex use.

The Lincoln Center is a multi-tenant single-story office complex located on one of the exception parcels within the development boundaries. Access is provided from two driveways, one along Scottsdale Rod and the other along Lincoln Drive.

Saint Barnabus of the Desert is an existing church located on approximately 10 acres of land (one of the noted exceptions) within the boundaries listed for the Ritz Carlton. Saint Barnabus currently provides two driveways for access to Mockingbird Lane.

The Scottsdale Plaza Resort is located directly north of Indian Bend Road and is access via one driveway to Scottsdale Road, one driveway to Indian Bend Road and one driveway to Hummingbird Road. The access along Indian Bend Road is located east of the traffic circle and west of the Scottsdale Road intersection.

Existing residential homes surround the site. Residential dwellings are located to the south and southwest (west of the existing commercial). Homes are also found east of Scottsdale Road (east of the existing commercial) and residential homes line the street west of Mockingbird Lane and north of Indian Bend Road.

The McCormick-Stillman Railroad Park located east of Scottsdale Road on the southeast corner of Indian Bend Road and Scottsdale Road serves as a regional park for the City of Scottsdale.

McCormick Ranch Golf Club located to the northeast provides a resort hotel and golf course for public use. The Paradise Valley Country Club to the west and the Phoenician Golf Club to the southwest provide additional golf opportunities for the resort users and residential owners.

The Borgata, Scottsdale Fashion Square and other local retail establishments, located to the south, provide shopping and dining venues to local residents and visitors.

EXISTING ROADWAY NETWORK

The existing roadway network within the study area includes Scottsdale Road, Lincoln Drive, Mockingbird Lane, Invergordon Road, McDonald Drive, Indian Bend Road, Northern Avenue, and Quail Run.

Scottsdale Road is a north-south roadway located in the City of Scottsdale. Within the study area, Scottsdale Road is classified as a major arterial - suburban and has a posted speed limit along Scottsdale Road of 45 miles per hour (mph). Scottsdale Road provides access to the Carefree Highway (SR 74), the Pima Freeway (Loop 101), and the Red Mountain Freeway (Loop 202). Beginning in the north, Tom Darlington Drive becomes Scottsdale Road upon crossing Carefree Highway. North of Carefree Highway, the alignment is North Tom Darlington Drive; south of Carefree Highway it becomes Scottsdale Road. Scottsdale Road continues south, eventually becoming Rural Road, south of Red Mountain Freeway. North of the Loop 202 it remains Scottsdale Road, while south of the Loop 202 it becomes Rural Road.

Lincoln Drive is an east-west roadway. West of the 71st Street alignment, it is located in the Town of Paradise Valley, is classified as a urban major arterial and has a posted speed limit of 40 mph. East of the 71st Street alignment, it is within the City of Scottsdale, is classified as a minor collector - suburban and has a posted speed limit of 35 mph. Beginning in the east at Cattletrack Road, Lincoln Drive continues west, providing access to the Piestewa Peak Highway (SR 51). After crossing the SR 51, the alignment becomes Glendale Avenue where it continues to the west providing access to I-17. To the east of the SR 51, it remains as Lincoln Drive, but upon crossing the SR 51 it becomes East Glendale Avenue.

Mockingbird Lane is a predominantly north-south minor arterial roadway located in the Town of Paradise Valley. Beginning in the north, 68th Street becomes North Mockingbird Lane where it continues south, ultimately becoming Monte Vista Drive. North of McDonald Drive, it remains as North Mockingbird Lane. South of East Mockingbird Lane, it becomes Monte Vista Drive. North of East Mockingbird Lane, it is 68th Street; south of East Mockingbird Lane, it is North Mockingbird Lane. North Mockingbird Lane runs north-south, while East Mockingbird Lane runs east-west.

Invergordon Road is a north-south roadway located in the Town of Paradise Valley. It is classified as a minor arterial north of Northern Avenue and south of Lincoln Drive and is classified as a local roadway between Northern Avenue and Lincoln Drive. Invergordon Road begins in the north, providing access to various side streets as it continues south. Ultimately, it comes to an end when it becomes 64th Street. Invergordon Road does not provide regional access to major highways/ freeways. Invergordon Road, south of Lincoln Drive has a posted speed limit of 35 mph.

McDonald Drive is an east-west roadway. West of the 71st Street alignment, it is located in the Town of Paradise Valley, is classified as a minor arterial and has a posted speed limit of 35 mph. East of the 71st Street alignment, it is within the City of Scottsdale, is classified as a suburban minor arterial and has a posted speed limit of 40 mph. Beginning in the east at the Pima Freeway (Loop 101), McDonald Drive continues west terminating at Tatum Boulevard. McDonald Drive provides regional access to the Pima Freeway (Loop 101) and is a major travel route to and from the Phoenix Sky Harbor International Airport when used to access the 44th Street alignment.

Indian Bend Road is an east-west roadway. West of Scottsdale Road, it is located in the Town of Paradise Valley, is classified as a collector and has a posted speed limit of 25 mph. East of Scottsdale Road, Indian Bend Road is within the City of Scottsdale and is classified as a suburban minor arterial. The posted speed limit along Indian Bend Road, east of Scottsdale Road, is 40 mph. Beginning in the east at Pima Freeway (Loop 101), Indian Bend Road continues west until terminating at Mockingbird Lane. Indian Bend Road provides regional access to the Pima Freeway. Indian Bend Road contains a traffic circle within the study area. This was originally placed on behalf of the land owners prior to the planning of the Ritz Carlton development.

Northern Avenue is an east-west roadway located in the Town of Paradise Valley. It is classified as a local roadway except for the portion that is named East Mockingbird Lane, which is classified as a minor arterial. Beginning in the east, Golf Drive becomes Northern Avenue. Continuing west, Northern Avenue then becomes East Mockingbird Lane, just west of North Mockingbird Lane. East Mockingbird Lane continues west where it then becomes East Northern Avenue again, west of Invergordon Road. East Northern Avenue ultimately terminates when it becomes North Foothill Drive. Northern Avenue does not provide access to any major highways/ freeways from its location with the Town of Paradise Valley.

Quail Run Road is a north-south residential roadway located in the Town of Paradise Valley. The observed speed limit is 25 mph since it is a residential street. Quail Run Road begins at Lincoln Drive and ends within the existing subdivision. It does not provide access to any major highways/freeways. There is no posted speed limit along Quail Run Road but given its residential nature, a speed of 25 mph should be observed.

6750 North is an east-west driveway located in the City of Scottsdale. It is located on Scottsdale Road approximately ¼-mile south of the Scottsdale Road and Lincoln Drive intersection. This access currently operates as a driveway for Spectrum. The existing configuration of the driveway provides for the half street on the south side (Spectrum property).

EXISTING INTERSECTION CONFIGURATION

The intersection of **Mockingbird Lane/68th Street and Northern Avenue/Mockingbird Lane** is operating under 4-way stop controlled conditions. The northbound approach consists of one dedicated left turn lane and a shared through-right turn lane. The southbound, eastbound, and westbound approaches each consist of a shared left-through-right turn lane. The intersection of Mockingbird Lane and Northern Avenue is located just south of the Camelback Golf Course driveway.

The intersection of **Mockingbird Lane and Indian Bend Road** is operating as a tee intersection under stop controlled conditions. The northbound approach consists of a shared through-right turn lane. The southbound approach consists of one dedicated left turn lane and one through lane. The eastbound approach is an unpaved, gated, emergency access for the adjacent parcel. The westbound approach consists of one dedicated left turn lane and one dedicated right turn lane with stop control. Mockingbird Lane functions as the major roadway, while Indian Bend Road functions as the minor roadway.

The intersection of **Scottsdale Plaza Resort Driveway and Indian Bend Road** is operating as a tee intersection under stop controlled conditions. All approaches consist of a single general purpose lane. Indian Bend Road functions as the major roadway, while the Scottsdale Plaza Resort Driveway functions as the minor roadway.

The intersection of **Scottsdale Road and Indian Bend Road** is operating under signalized conditions. The north- and southbound left-turn movements operate with permitted and lagging protective phasing. The east- and westbound approaches are split phase lagging and leading, respectively. The northbound approach consists of one dedicated left turn lane, three through lanes, and one dedicated right turn lane. The southbound approach consists of one dedicated left turn lane, two through lanes, and one shared through-right turn lane. The eastbound approach consists of one dedicated left turn lane and a shared through-right turn lane. The westbound approach consists of two dedicated left turn lanes, one through lane, and one shared through-right turn lane.

The intersection of **Scottsdale Road and Joshua Tree Lane** is operating as a tee intersection under stop controlled conditions. The northbound approach consists of two through lanes and a shared through-right turn lane. The southbound approach consists of a dedicated left turn lane and three through lanes. The westbound approach consists of a single general purpose lane. The intersection provides a center vehicle refuge space for left turning vehicles from Joshua Tree Lane. Scottsdale Road functions as the major roadway, while the Joshua Tree Lane functions as the minor roadway.

The intersection of **Scottsdale Road and 6750 North** is operating as a tee intersection under signalized conditions. The Spectrum Access is located on Scottsdale Road between Lincoln Drive and McDonald Drive at ¼ mile spacing. All left turn movements operate with permitted phasing. The northbound approach consists of one dedicated left turn lane and three through lanes. The southbound approach consists of three through lanes and one dedicated right turn lane. The eastbound approach consists of one dedicated left turn lane and one dedicated right turn lane. There is currently no westbound approach.

The intersection of **Tatum Boulevard and Lincoln Drive** is operating under signalized conditions. The left turn movement approaching eastbound operates with protected leading phasing. All other left turn movements operate with leading protected and permitted phasing. The northbound, southbound and westbound approaches consist of a dedicated left turn lane two through lanes and a dedicated right turn lane. The east bound approach consists of two dedicated left turn lanes, one through lane and a shared through-right turn lane.

The intersection of **Invergordon Road and Lincoln Drive** is operating under signalized conditions. All left-turn movements operate with permitted phasing. The northbound approach consists of one dedicated left turn lane and a shared through-right turn lane. The southbound approach is not striped and is assumed to provide a shared left-through-right turn lane. The eastbound and westbound approaches consist of one dedicated left turn lane, one through lane, and a shared through-right turn lane.

The intersection of **Mockingbird Lane and Lincoln Drive** is operating under signalized conditions. The northbound and southbound left-turn movements operate with permitted phasing only while the eastbound and westbound left-turn movements operate with permitted and lagging protective phasing. The northbound and southbound approaches consist of one dedicated left turn lane and a shared through-right turn lane. The eastbound and westbound approaches consist of one dedicated left turn lane, one through lane, and a shared through-right turn lane.

The intersection of **Quail Run Road and Lincoln Drive** is operating as a tee intersection under stop controlled conditions. The northbound approach consists of one shared left-right turn lane with stop control. There is currently no southbound approach. The eastbound approach consists of one through lane and a shared through-right turn lane. The westbound approach consists of one dedicated left turn lane and two through lanes. Lincoln Drive functions as the major roadway, while Quail Run functions as the minor roadway. Quail Run Road provides residential access only south of Lincoln Drive.

The intersection of **Scottsdale Road and Lincoln Drive** is operating under signalized conditions. The northbound and southbound left-turn movements operate with lagging protective phasing. The east- and westbound approaches are split phase lagging and leading, respectively. The south- and eastbound right-turn movements have an additional protected phase during the eastbound approach and northbound left-turn protected phases, respectively. The northbound approach consists of one dedicated left turn lane, three through lanes, and a right turn lane. The southbound approach consists of two dedicated left turn lanes, three through lanes, and a right turn lane. The eastbound approach consists of one dedicated left turn lane, one through lane, and one shared through-right turn lane. The westbound approach consists of two dedicated left turn lanes, two through lanes, and one dedicated right turn lane.

The intersection of **Mockingbird Lane and McDonald Drive** is operating under all-way stop controlled conditions. The northbound approach consists of a shared left-through-right turn lane. The southbound approach consists of one dedicated left turn lane and one dedicated right turn lane. The eastbound and westbound approaches consist of one dedicated left turn lane and a shared through-right turn lane.

The intersection of **Scottsdale Road and McDonald Drive** is operating under signalized conditions. The northbound and southbound left-turn movements operate with lagging protective phasing. The eastbound and westbound left-turn movements operate with permissive and lagging protective phasing. The eastbound right-turn movement has an additional protected phase during the northbound left-turn protected phase. The northbound approach consists of two dedicated left turn lanes, two through lanes, and a shared through-right turn lane. The southbound approach consists of one dedicated left turn lane, three through lanes, and a right turn lane. The eastbound approach consists of one dedicated left turn lane; one shared left turn-through lane, and one right turn lane. The westbound approach consists of two dedicated left turn lanes, two through lanes, and one dedicated right turn lane.

The existing intersection traffic controls are summarized in **Table 1**.

Table 1 – Existing Intersection Traffic Controls

ID	Intersection	Traffic Controls
1	Northern Ave & Mockingbird Ln.	4-way stop
2	Mockingbird Ln. & Indian Bend Rd.	1-way stop (WB)
3	Scottsdale Plaza Resort & Indian Bend Rd.	1-way stop (SB)
4	Scottsdale Rd. & Indian Bend Rd.	Signalized
5	Scottsdale Rd. & Joshua Tree Ln.	1-way stop (WB)
6	Scottsdale Rd. & 6750 North	Signalized
7	Tatum Blvd. & Lincoln Dr.	Signalized
8	Invergordan Rd. & Lincoln Dr.	Signalized
9	Mockingbird Ln. & Lincoln Dr.	Signalized
10	Quail Run & Lincoln Dr.	1-way stop (NB)
11	Scottsdale Rd. & Lincoln Dr.	Signalized
12	Mockingbird Ln. & McDonald Dr.	4-way stop
13	Scottsdale Rd. & McDonald Dr.	Signalized

The existing lane configurations and intersection traffic controls are depicted in **Figure 2**.

EXISTING TRAFFIC VOLUMES

Peak hour turning movement counts were conducted at the study intersections during April of 2015. Peak hour volumes counted for use in this traffic impact analysis are depicted in **Figure 3**.

Average daily traffic (ADT) segment counts were obtained from the City of Scottsdale website and the Arizona Department of Transportation's (ADOT) traffic data management system. Town of Paradise Valley does not publish ADT data. One additional 24-hour segment count was conducted on Lincoln Drive, west of Quail Run Road. The data obtained is provided in **Appendix B** and is presented in **Table 2**.

Table 2 – 24-Hour Segment Traffic Volumes

Roadway	Reference	Volume
Scottsdale Rd.	North of Indian Bend Road	39,100
Scottsdale Rd.	Between Indian Bend Rd. & Lincoln Dr.	43,500
Scottsdale Rd.	Between Lincoln Dr. & McDonald Dr.	43,200
Scottsdale Rd.	South of McDonald Dr.	40,700
Mockingbird Ln.	Between Indian Bend Rd. & Lincoln Dr.	5,999
Indian Bend Rd.	East of Scottsdale Rd.	16,300
Lincoln Dr.	East of Tatum Blvd.	22,483
Lincoln Dr.	West of Quail Run Rd.	13,870
McDonald Drive	East of Scottsdale Rd.	18,700

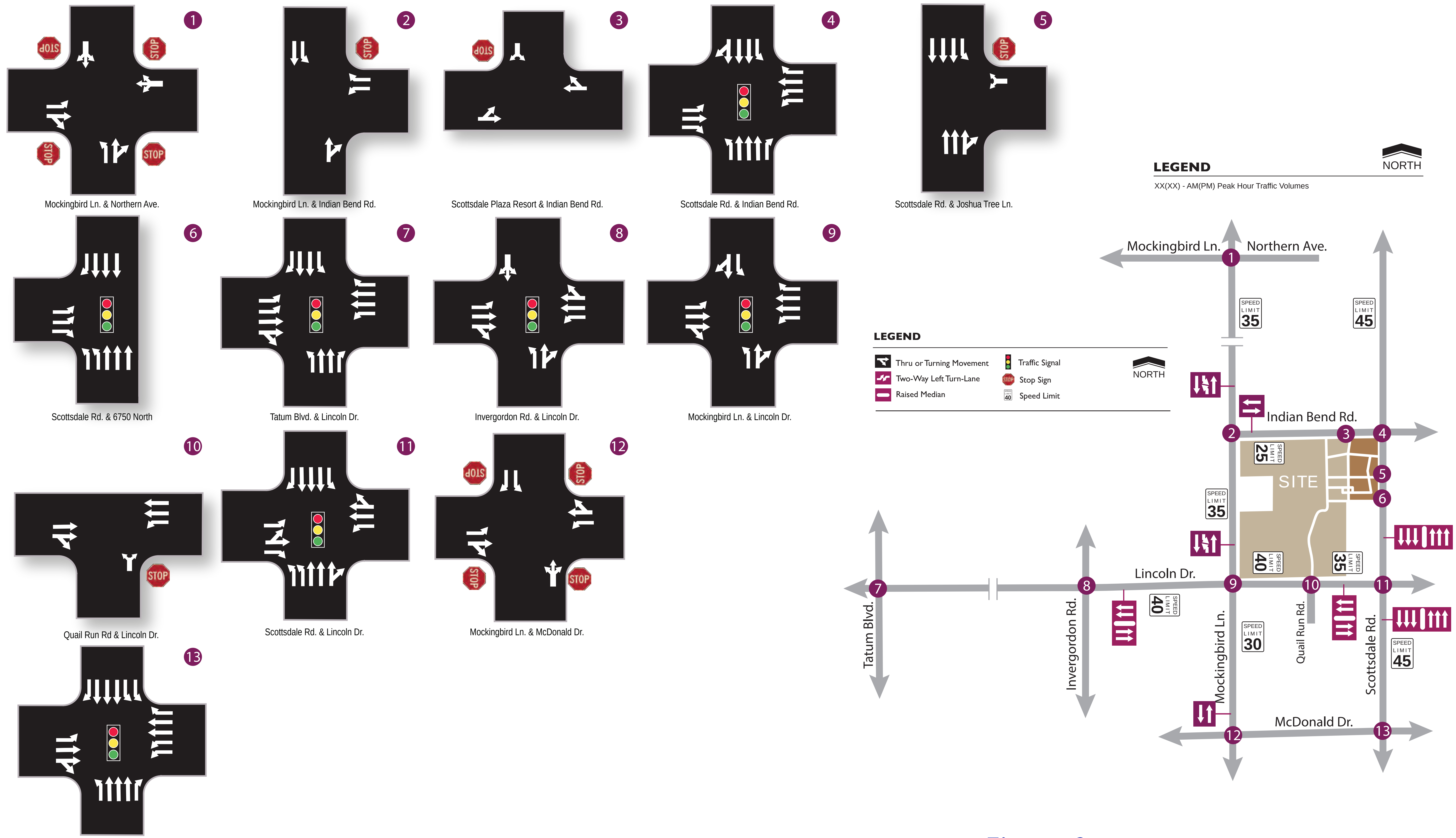


Figure 2: Existing Lane Configurations and Traffic Controls

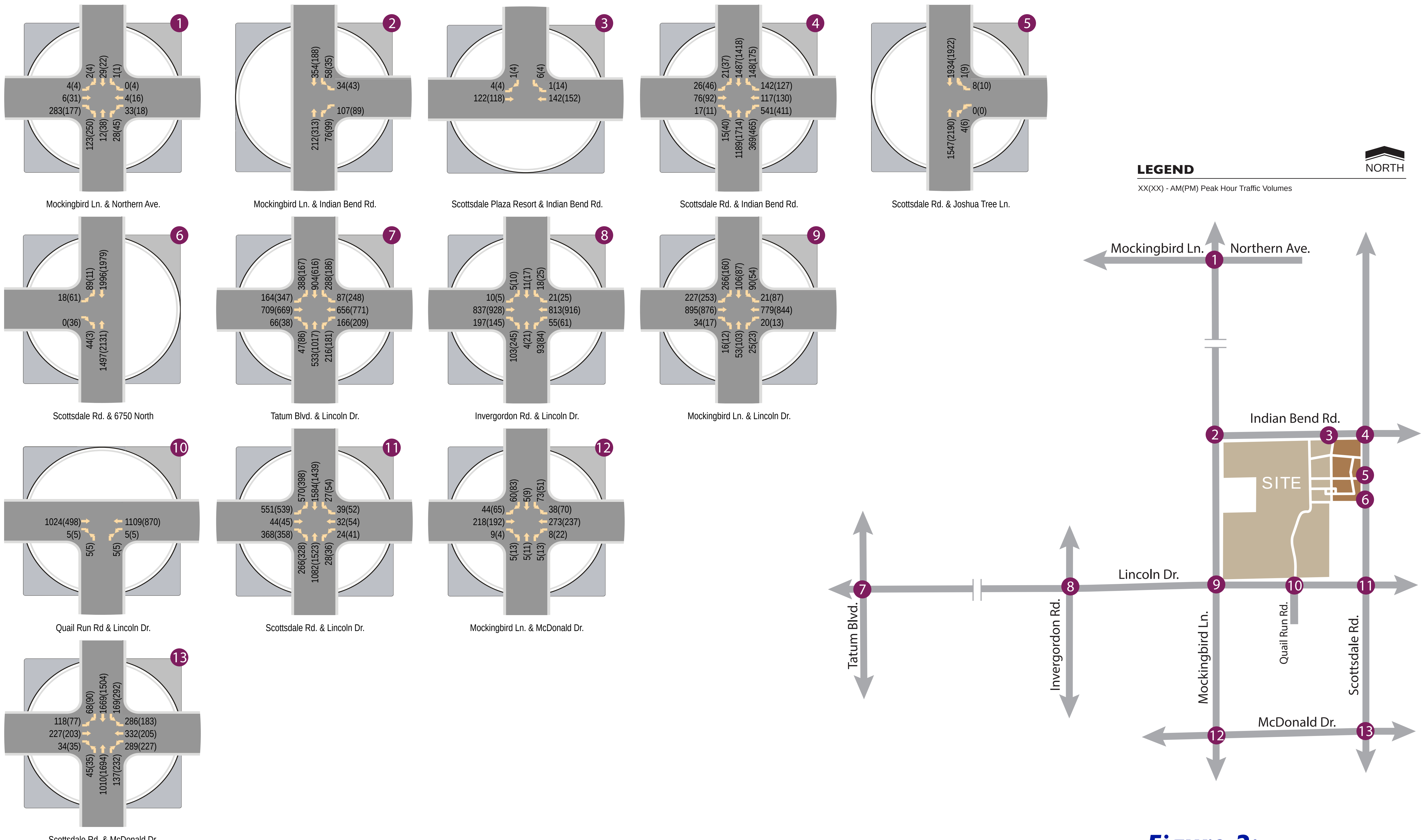


Figure 3: Existing Traffic Volumes

EXISTING CAPACITY ANALYSIS

Peak hour capacity analyses have been conducted for the study intersections based on existing lane configurations, stop control and traffic volumes. All intersections have been analyzed using the methodologies presented in the *Highway Capacity Manual (HCM), Special Report 209,* updated 2010. All signalized and unsignalized intersections have been analyzed as such using the methodologies presented in the *Highway Capacity Manual, Special Report 209,* Updated 2010, and using Synchro 9 software under the HCM 2010 methodologies.

The concept of level-of-service (LOS) uses qualitative measures that characterize operational conditions within the traffic stream. The individual levels-of-service are described by factors that include speed, travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations A through F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions. **Table 3** lists the level of service criteria for signalized and unsignalized intersections.

Table 3 – Level-of-Service Criteria for Controlled Intersections

Level-of-Service	Unsignalized Control Delay (sec/veh)	Signalized Control Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	> 50	> 80

Source: Exhibit 18-4 and Exhibit 19-1, Highway Capacity Manual 2010

Results of the existing level-of-service analyses are shown in **Table 4** for both peak hours. The analyses utilized signal timing provided by the Town of Paradise Valley and the City of Scottsdale. The traffic analysis worksheets for the existing conditions have been included within **Appendix B**. Analysis of segment ADT is provided in a later section.

Table 4 – Existing Peak Hour Levels of Service

ID	Intersection	Control	Approach/ Movement	AM Peak Hour	PM Peak Hour
1	Mockingbird Ln. & Northern Ave.	4-way Stop	NB left	B	B
			NB thru/right	A	A
			SB shared	A	A
			EB left	A	A
			EB thru/right	B	B
			WB shared	A	A
			Overall	**A**	**B**
2	Mockingbird Ln. & Indian Bend Rd.	1-way stop (WB)	SB Left	A	A
			WB Left	C	B
			WB Right	A	B
3	Scottsdale Plaza Resort Driveway & Indian Bend Rd.	1-way stop (SB)	SB shared	A	A
			EB shared	A	A
4	Scottsdale Rd. & Indian Bend Rd.	Signalized	NB left	D	D
			NB thru	D	D
			NB right	C	C
			SB left	D	D
			SB thru	C	C
			SB right	D	C
			EB left	E	E
			EB thru	E	E
			EB right	D	D
			WB left	E	E
			WB thru	D	D
			WB right	B	B
			Overall	**D**	**D**
5	Scottsdale Rd. & Joshua Tree Rd.	1-way stop (WB)	SB left	D	F
			WB shared	D	F
6	Scottsdale Rd. & 6750 North	Signalized	NB	A	A
			SB	A	A
			EB	E	E
			Overall	**A**	**A**
7	Tatum Blvd. & Lincoln Dr.	Signalized	NB left	C	C
			NB thru	D	D
			NB right	D	C
			SB left	C	C
			SB thru	C	C
			SB right	C	C
			EB left	E	F
			EB thru	E	E
			EB right	E	E
			WB left	D	D
			WB thru	D	D
			WB right	D	D
			Overall	**D**	**D**

Table 4 – Existing Peak Hour Levels of Service (Continued)

ID	Intersection	Control	Approach/ Movement	AM Peak Hour	PM Peak Hour
8	Invergordan Rd. & Lincoln Dr.	Signalized	NB left	C	C
			NB thru/right	C	C
			SB shared	C	C
			EB left	A	B
			EB thru	A	A
			EB right	A	A
			WB left	B	B
			WB thru	A	A
			WB right	A	A
			Overall	**A**	**B**
9	Mockingbird Ln. & Lincoln Dr.	Signalized	NB left	E	E
			NB thru/right	D	E
			SB left	D	D
			SB thru/right	D	D
			EB left	D	C
			EB thru	B	A
			EB right	B	A
			WB left	D	D
			WB thru	D	D
			WB right	D	E
			Overall	**C**	**C**
10	Quail Run & Lincoln Dr.	1-way Stop (NB)	NB shared	C	B
			WB left	B	A
11	Scottsdale Rd. & Lincoln Dr.	Signalized	NB left	C	C
			NB thru	A	A
			NB right	A	B
			SB left	D	D
			SB thru	B	C
			SB right	B	B
			EB left/thru	F	F
			EB right	D	D
			WB left	E	E
			WB thru	E	E
			WB right	E	E
			Overall	**C**	**C**
12	Mockingbird Ln. & McDonald Dr.	4-way Stop	NB Shared	A	A
			SB Left	B	B
			SB Right	A	A
			EB Left	A	A
			EB Shared	B	B
			WB Left	A	A
			WB Shared	B	B
			Overall	**B**	**B**

Table 4 – Existing Peak Hour Levels of Service (Continued)

ID	Intersection	Control	Approach/ Movement	AM Peak Hour	PM Peak Hour
13	Scottsdale Rd. & McDonald Dr.	Signalized	NB left	D	D
			NB thru	C	D
			NB right	C	C
			SB left	C	D
			SB thru	D	C
			SB right	B	B
			EB left	D	D
			EB thru	E	E
			EB right	E	E
			WB left	F	F
			WB thru	D	E
			WB right	C	C
			Overall	**D**	**D**

The results of the existing analysis summarized in **Table 4** indicate that all study intersections should operate at overall acceptable level of service (LOS D or better) with the exception of Scottsdale Road/Joshua Tree Road. The signalized intersections of Scottsdale Road/Indian Bend Road, Scottsdale Road/Joshua Tree Road, Scottsdale Road/6750 North, Tatum Boulevard/Lincoln Drive, Mockingbird Lane/Lincoln Drive, Scottsdale Road/Lincoln Drive, Scottsdale Road/McDonald Drive operate at acceptable LOS overall but have one or more movements that experience elevated delays during AM and/or PM peak hour.

The southbound left and westbound shared movements at the intersection of ***Scottsdale Road and Joshua Tree Road*** experience elevated delays during the peak hours. Elevated delays at stop controlled movements at intersections with major roadways is not uncommon.

CRASH EXPERIENCE

The following crash analysis was developed from historical data obtained by CivTech from ADOT. The crash data and collision diagrams can be found in **Appendix D**. The crash history data covered the latest full three year periods available, 2012 through 2014.[1] For this project, CivTech has done its best in attempting to glean the most relevant crashes from the more than 100,000 crashes that occur each year; however, the results cannot be considered “official” since they were not received from an official source.

CivTech identified a three-year total of 90 crashes without any fatalities at the study intersections. There were 29 in 2012, 30 in 2013, and 31 in 2014.

Section Crashes. Since there were just a small number of crashes along the Mockingbird Lane frontage of the proposed development, and the Lincoln Drive frontage of the proposed development, the resulting section crash analysis is provided in **Table 5** and **Table 6**, respectively.

Table 5 – Section Crashes: Mockingbird Lane, Lincoln Drive to Indian Bend Road

STATISTIC	2012	2013	2014	TOTAL
Crash Severity				
Injury Crashes (# Injuries)	0	1(1)	0	1(1)
Non-Injury, Property Damage Only	1	0	0	1
TOTAL	1	1	0	2
Crash Type				
Angle	1	1	0	2
TOTAL	1	1	0	2
Crashes involving bicycles/pedestrians	0	0	0	0

A review of the results summarized in **Table 5** reveals that the small number of crashes that occurred on Mockingbird Lane between Lincoln Drive and Indian Bend Road does not warrant further detailed analysis (contributing factors, etc.) or any mitigation measures that could be provided with the proposed development.

[1] ADOT is charged by statute with the responsibility of tracking all incidents involving motor vehicles occurring, reported, and investigated in the State. ADOT has devolved the responsibility of responding to requests for crash data to local agencies. In this case, CivTech requested crash data from the Town which it could not provide in time for this analysis.

Table 6 – Section Crashes: Lincoln Drive, Mockingbird Lane to 70th Street

STATISTIC	2012	2013	2014	TOTAL
Crash Severity				
Injury Crashes (# Injuries)	0	2(2)	1(1)	3(3)
Non-Injury, Property Damage Only	3	1	4	8
TOTAL	3	3	5	11
Crash Type				
Angle	0	1	0	1
Left Turn	0	0	2	2
Rear End	2	0	0	2
Sideswipe (same direction)	1	1	1	3
Sideswipe (opposite direction)	0	0	1	1
Other/Unknown	0	1	1	2
TOTAL	3	3	5	11
Crashes involving bicycles/pedestrians	0	0	0	0

A review of the results summarized in **Table 6** reveals that the small number of crashes that occurred on Lincoln Drive between Mockingbird Lane and 70th Street does not warrant further detailed analysis (contributing factors, etc.) or any mitigation measures that could be provided with the proposed development.

Intersection Crashes. There were crashes at or related to five (5) of the seven (7) study intersections that are signalized or otherwise considered key to the analysis. At one of these seven (Scottsdale Road at 6750 North), no crashes were recorded. The remaining study intersection along Scottsdale Road at Joshua Tree Lane recorded one (1) PDO (Property Damage Only) incident in its 3-year analysis, which does not warrant further evaluation. For this exercise, CivTech selected from the crash data base only those crashes for which the indicated study area was intersection or intersection-related.

Scottsdale Road at Lincoln Drive -- The first intersection to be considered is that of Scottsdale Road at Lincoln Drive, the crashes of which are summarized in **Table 7**. This is a major intersection with a traffic signal. Less than one-fourth of the crashes (6 of 26) resulted in bodily injury; 20 of the 26 crashes occurred during daytime, while the other 6 occurred during nighttime (with lighting).

Table 7 – Intersection Crashes: Scottsdale Road at Lincoln Drive

STATISTIC	2012	2013	2014	TOTAL
Crash Severity				
Injury Crashes (# Injuries)	1(1)	2(2)	3(4)	6(7)
Non-Injury, Property Damage Only	6	5	9	20
TOTAL	7	7	12	26
Crash Type				
Single Vehicle	0	1	0	1
Angle	1	1	2	4
Left Turn	1	1	0	2
Sideswipe (same direction)	0	0	1	1
Rear End	5	4	8	17
Other/Unknown	0	0	1	1
TOTAL	7	7	12	26
Crashes involving bicycles/pedestrians	0	0	0	0

A review of the results summarized in **Table 7** reveals that the small number and the several types of crashes that occurred on Scottsdale Road at Lincoln Drive does not warrant further detailed analysis (contributing factors, etc.) or any mitigation measures that could be provided with the proposed development.

A review of the crash data reveals that more than half (17 of 26) of the crashes were rear-end collisions, which may occur whenever there is a slowing or stopping of traffic, such as for a red light. Rear-end collisions tend to increase when a traffic signal is used to treat the types of collisions that are more severe, such as angle or left turn collisions, and are generally considered untreatable as they are often the result of inattention or some other factor contributed by the driver of the following vehicle.

Tatum Boulevard at Lincoln Drive – The next study intersection to be considered is Tatum Boulevard at Lincoln Drive. The crash analysis for this intersection is provided in **Table 8**. This is a major intersection with a traffic signal. About one-third of the crashes (8 of 26) resulted in bodily injury. 16 of the 26 incidents occurred during daytime, while the remaining 8 occurred during nighttime (with lighting).

Table 8 – Intersection Crashes: Tatum Boulevard at Lincoln Drive

STATISTIC	2012	2013	2014	TOTAL
Crash Severity				
Injury Crashes (# Injuries)	1(1)	4(7)	3(4)	8(12)
Non-Injury, Property Damage Only	5	4	9	18
TOTAL	6	8	12	26
Crash Type				
Angle	0	3	2	5
Rear End	6	5	8	19
Sideswipe (same direction)	0	0	1	1
Other/Unknown	0	0	1	1
TOTAL	6	8	12	26
Crashes involving bicycles/pedestrians	0	0	0	0

A review of the results summarized in **Table 8** reveals that most of the recorded incidents occurred as non-injury.

A review of the crash data reveals that about three-fourths of the crashes (19 of 26) were rear-end collisions, which may occur whenever there is a slowing or stopping of traffic, such as for a red light. Rear-end collisions tend to increase when a traffic signal is used to treat the types of collisions that are more severe, such as angle or left turn collisions, and are generally considered untreatable as they are often the result of inattention or some other factor contributed by the driver of the following vehicle. However, due to the large factor of rear-end collisions, it is recommended that further evaluation is needed by the Town of Paradise Valley.

The largest majority of crashes reported occurred in clear weather on dry roads throughout the year with no concentrations of collisions on any particular day of the week or in any single month or season.

Scottsdale Road at Indian Bend Road -- The crashes recorded at the signalized intersection of Scottsdale Road and Indian Bend Road are summarized in **Table 9**. Fewer than thirty percent (6 of 21) of the crashes resulted in injury. Most of the collisions occurred during daylight in clear weather on dry roads. Only a couple incidents occurred at dusk or in the dark, or raining with wet conditions.

Table 9 – Intersection Crashes: Scottsdale Road at Indian Bend Road

STATISTIC	2012	2013	2014	TOTAL
Crash Severity				
Injury Crashes (# Injuries)	2(2)	4(6)	0	6(8)
Non-Injury, Property Damage Only	8	5	2	15
TOTAL	10	9	2	21
Crash Type				
Single Vehicle	1	0	0	1
Angle	0	1	0	1
Rear End	8	7	2	17
Sideswipe (same direction)	1	0	0	1
Other/Unknown	0	1	0	1
TOTAL	10	9	2	21
Crashes involving bicycles/pedestrians	0	0	0	0

A review of the crash data reveals that more than eighty percent of the crashes (17 of 21) were rear-end collisions. As previously stated, due to the large factor of rear-end collisions, it is recommended that further evaluation is needed by the Town of Paradise Valley.

The largest majority of crashes reported occurred in clear weather on dry roads throughout the year with no concentrations of collisions on any particular day of the week or in any single month or season. Only one incident was recorded for raining conditions and two incidents reported wet surface.

Mockingbird Lane at Lincoln Drive – **Table 10** summarizes the crashes recorded at the intersection of Mockingbird Lane and Lincoln Drive. At this signalized intersection, none of the recorded incidents (0 of 2) resulted in injury. Both of these incidents occurred in daytime, with clear weather and dry surface.

Table 10 – Intersection Crashes: Mockingbird Lane at Lincoln Drive

STATISTIC	2012	2013	2014	TOTAL
Crash Severity				
Injury Crashes (# Injuries)	0	0	0	0
Non-Injury, Property Damage Only	1	1	0	2
TOTAL	1	1	0	2
Crash Type				
Rear End	1	0	0	1
Other/Unknown	0	1	0	1
TOTAL	1	1	0	2
Crashes involving bicycles/pedestrians	0	0	0	0

A review of the small amount of crash data shows only one rear-end collision, with the other incident unknown. Due to the small amount of incidents, this intersection does not warrant further analysis.

Mockingbird Lane at Indian Bend Road. The crashes recorded at Mockingbird Lane and Indian Bend road are summarized as reported in **Table 11**. This intersection is stop controlled in the westbound approach. The one recorded incident back in 2012 resulted in injury. This incident occurred in dry conditions, during clear weather in the daytime.

Table 11 – Intersection Crashes: Mockingbird Lane at Indian Bend Road

STATISTIC	2012	2013	2014	TOTAL
Crash Severity				
Injury Crashes (# Injuries)	1(1)	0	0	1(1)
Non-Injury, Property Damage Only	0	0	0	0
TOTAL	1	0	0	1
Crash Type				
Rear End	1	0	0	1
TOTAL	1	0	0	1
Crashes involving bicycles/pedestrians	0	0	0	0

A review of the incident reported shows that this incident was from a rear-end collision. Since only one incident has been reported for this intersection since 2012, it is not recommended to be evaluated for further analysis.

Conclusion. Per the above discussion, it can be concluded that there are no major mitigation measures currently warranted within the vicinity of the site. It should be noted that the intersections of **Tatum Boulevard & Lincoln Drive** and **Scottsdale Road & Indian Bend Road** recorded a high number of rear-end crashes relative to crash type. Due to this occurrence, it is recommended that these intersections be further evaluated by the Town.

FUTURE ROADWAY IMPROVEMENTS

PROJECT SPECIFIC IMPROVEMENTS

The developer is expected to complete half-street improvements to Indian Bend Road from Scottsdale Road to approximately 600 feet to the west. This will provide a two-way left-turn lane on Indian Bend Road along the improved length. The remainder of Indian Bend Road is at its ultimate condition.

It is likely that the City of Scottsdale will require the addition of a second westbound through lane along Indian Bend Road. This determination will be made by the City of Scottsdale during their future review of the Palmeraie TIMA.

The developer will improve the intersection of Scottsdale Road and 6750 North. The west leg after improvements will consist of two dedicated left turn lanes, a dedicated right turn lane and two ingress lanes. The median within the south leg of the intersection will be modified and the northbound lanes restriped to provide two dedicated left turn lanes and three through lanes. An alternative improvement condition is proposed should the City of Scottsdale not allow dual northbound left turn lanes. Final geometry and mitigation is subject to approval by the City of Scottsdale. Improvements at this intersection could require the relocation of overhead improvements and other utilities.

The developer proposes to signalize the intersection of Quail Run Road and Lincoln Drive which will serve as the main entrance to the proposed Ritz Carlton Resort by opening year 2018. A signal warrant analysis is provided at a later section in the report. This will require removal of the nearest median (west of the intersection). The developer also currently plans to construct new medians.

The developer has agreed to construct a westbound right turn lane and a southbound right turn lane on Lincoln Drive approaching Mockingbird Lane. The turn lanes will separate approaching right turning traffic from through traffic on the same approach and improve the traffic characteristics of the intersection. This may require the relocation of the traffic signal and red light camera on the affected corners.

The traffic circle located at the intersection of Access A and Indian Bend Road should be evaluated for alternative pavement treatment. The existing pavers are difficult for a bicycle to negotiate.

Indian Bend Road may require traffic calming elements to be installed between the traffic circle (Intersection A) and Mockingbird Lane if traffic from Palmeraie is prioritized to use Indian Bend Road. The determination to prioritize Indian Bend Road could be made by the City of Scottsdale during their review of the future Palmeraie TIMA. Potential traffic calming options are discussed below.

Speed humps - A vertical "hump" across the roadway that causes the driver to slow due to driver discomfort. This treatment is arguably the most cost effective treatment as they generally have a low cost to initially place and maintain and are fairly effective at decreasing vehicular speeds below the speed limit within its vicinity.


SPEED HUMP

Radar Speed Sign – typically accompanied by a speed limit sign, a radar speed sign reminds drivers with illuminated visual feedback boards. These signs are effective at reminding drivers of speed limits and reduces occurrences of speeding vehicles provided driver observance.

Chicane – A chicane is a relatively quick horizontal swerve in the road that causes the driver to slow due to driver discomfort and to keep the vehicle within the travel lane. If the roadway is already constructed, a chicane may require additional right-of-way or decreasing lane widths. Locations available for chicanes generally depend on curbing and access needs. On-street parking is restricted on and approaching chicanes. Chicanes with center medians are prefered as drivers cannot drive through the opposing travel lane to maintain a higher speed. Chicanes with center median and landscaping may provide a nieghborhood element, but are considerably more expensive to install than the previous options discussed.


CHICANE

Choker – a choker is a short section that provides a considerably smaller roadway width than the rest of the roadway. Chokers cause drivers to slow due to perceived discomfort with the vehicle's tires in closer proximity to the outside curb and opposing traffic. A choker can restrict the roadway to allow only one lane preventing simultaneous two-way traffic. Consideration must also be given to driveway access and parking. Costs of chokers depend on their length and quality/maintenance of landscaping installed. The Town of Paradise Valley has already applied this concept on Mockingbird lane immediately south of McDonald Drive.

A treatment specific to the intersection of 69th Place and Indian Bend Road may be employed rather than or in addition to treatment(s) to roadway segments. If the intersection is reconfigured to an all-way stop condition or a roundabout, vehicles traveling on Indian Bend Road will be required to slow or stop. An all-way stop is relatively inexpensive to install, but requires justification which may be explored further. A roundabout, when properly designed, can improve neighborhood traffic conditions and add neighborhood character, but is more expensive than all of the previous options and will not prevent or deter traffic from using Indian Bend Road.

REGIONAL IMPROVEMENTS

Construction along Scottsdale Road, north of the Ritz Carlton development was completed in early 2007 as part of a City of Scottsdale improvement project. Eastbound Indian Bend Road was widened at the intersection with Scottsdale Road to provide dual westbound left turn lanes. The Town of Paradise Valley plans to install a median on Mockingbird Lane between Lincoln Drive and Northern Avenue sometime within the financial years 2018 and 2029. This improvement is not anticipated to cause major changes to current traffic patterns. There are no other known projects planned within the opening years of the Ritz Carlton development which will redirect current traffic patterns on the surrounding area streets.

The intersection of Mockingbird Lane and Indian Bend Road was evaluated as a one-way stop controlled intersection which continues to meet acceptable levels of service during the study horizon. Input from neighbors indicates a concern for increased delay at this intersection and a possible need to keep traffic flowing in all directions. Optional intersection treatments should be considered in the future.

PROPOSED DEVELOPMENT

SITE LOCATION

The Ritz Carlton located in the northeast quadrant of Section 10, of Township 2 North, Range 4 East is a proposed resort, residential and commercial planned development. The site contains approximately ±105.9 acres of undeveloped land bordered by Indian Bend Road on the north, Lincoln Drive on the south, Mockingbird Lane on the west and Scottsdale Road on the east. Four existing developments located within the above mentioned boundaries, accounting for approximately 30-acres of land, are exceptions from this development. These exceptions are made up of an existing church located on a ±10-acre parcel east of Mockingbird Lane with the Spectrum Office development located along Scottsdale Road, the Alliance Residential development location along Lincoln Drive and the Lincoln Center Office Development located at the northwest corner of Scottsdale Road and Lincoln Drive accounting for the other ±20-acres.

The related Palmeraie development within the City of Scottsdale is located on ±17 acres on the southwest corner of Scottsdale Road and Indian Bend Road and will compliment Parcel E of the site.

LAND USE AND INTENSITY

This development consists of mixed uses which include resort, residential, office and a shopping center. **Table 12** illustrates the land uses and intensity of the proposed development.

Table 12 – Land Use and Intensity/Density

Parcel	Land Use	Size (acres)	Area Coverage	Dwellings / Floor Area
A	Resort Hotel	±18.0	29.8%	200 Keys
A1	Resort Villas	±9.5	38.2%	120 Units
B	Single-Family Residential	±33.5	25.6%	89 DU's
C	Single-Family Residential	±25.8	24.5%	55 DU's
D	Attached Residential	±8.0	38.7%	100 DU's
E	Attached Residential Grocery Store Office Retail Restaurant	±11.0	40.2%	200 DU's 9,519 SF 43,599 SF ±113,882 SF 27,700 SF

DU = Dwelling Unit

SITE PLAN AND ACCESS

The layout of the site is illustrated in **Figure 5**. The development is proposed with a 200 room resort hotel and 120 villas including a spa, lodge, meeting facilities, gardens, outdoor function space, and retail. The residential component of the plan consists of approximately 114 lots/units of low density single family residential and 100 units/lots of attached residences. The commercial component of the site is planned to consist of approximately 107,000 square feet of retail/restaurant use, 44,000 square feet of office and 230 attached residential dwelling units. The site is proposed with four entry points from Indian Bend Road, three entry points from Scottsdale Road (one is a shared, signalized driveway with the Spectrum development at 6750 North), and one entry point Lincoln Drive aligning with the Quail Run intersection.

Roadways internal to the commercial area provide access to all parcels but are designed to discourage cut-through traffic as they are somewhat circuitous, often provide on street parking and will likely have considerable pedestrian crossing traffic. Vehicles are anticipated to prefer to use accesses closest to respective parking areas. The hotel plans for easy pedestrian access to/from the commercial corner.

TRIP GENERATION

The average daily traffic (ADT), AM peak hour and PM peak hour volumes have been estimated by trip rates given in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition.* The applicable trip rates from ITE's *Trip Generation Manual* were used to calculate the total trips for the site. **Table 13** shows the trip generation established for this development. Detailed trip generation calculations have been included in the **Appendix E**.

The Ritz Carlton has several land uses that if considered as stand-alone projects would generate traffic volumes that would require evaluation. However, the Resort Hotel land use accounts for these uses as part of the development. Therefore, the trips generated from the resort portion of the development are determined by the number of units and are inclusive of the spa, retail, meeting space, and club house uses.

Figure 4: Site Plan

Trip Reductions for Internal Trips

According to data presented in the ITE Trip Generation Manual, trips attracted to commercial and/or retail land uses are often shared. This means that a single trip (vehicle) to the proposed development may visit other generators within the site during the same visit, a phenomenon known as "interaction" or "internal capture." This is especially true for sites with multiple tenants and/or land uses. This has the effect of reducing the off-site trip generating potential of the proposed site. Based on the proposed resort and residential land uses it was determined internal capture rates would not be apply by Phase I opening year (2018). Preliminary calculations per ITE methodology indicated a full build internal capture rate greater than 20% percent by study horizon year (2023). For study purposes and to remain conservative, a maximum internal capture rate of 20% percent was applied to the total daily and both the AM and PM peak hour trips. Detailed internal capture calculations have been included within **Appendix E**

Trip Reductions for Pass-By Trips

Based on published ITE data, it could be estimated that a portion of the traffic entering and exiting the development proposed for this site would be "new" traffic added to the adjacent roadway system and that the balance of the traffic would come from that which is already "passing by" the site. This TIA does not apply pass-by reductions within the peak hour analyses to be conservative.

Trips were generated for both the opening year and build-out of the development. **Table 6** displays the resulting trip generation results.

Table 13 – Trip Generation

Phase	Parcel	Land Use	ITE	Size	Units	Daily	AM Peak Hour			PM Peak Hour		
						Total	In	Out	Total	In	Out	Total
1	A	Resort Hotel	330	200	Rooms	1,000	87	34	121	36	48	84
1	A1	Resort Hotel	330	120	Rooms	600	64	25	89	22	29	51
1	B	Homes	210	89	DU	944	18	55	73	60	35	95
1	C	Homes	210	55	DU	606	12	37	49	39	23	62
2	D	Attached Homes	230	100	DU	644	9	43	52	41	20	61
2	E	Attached Homes	230	200	DU	1,176	15	75	90	72	35	107
2	E	Retail	820	85,000	SF	6,112	88	54	142	258	280	538
2	E	Grocery Store	850	10,000	SF	2,062	21	13	34	76	73	149
2	E	Restaurant	931	12,000	SF	1,080	8	2	10	60	30	90
2	E	Office	710	44,000	SF	486	61	8	69	11	55	66
Total Phase 1 Trips			*Totals*			3,794	190	194	384	198	155	353
Total Buildout Trips			*Totals*			14,710	383	346	729	675	628	1,303
			Internal Capture			*(2,942)*	*(77)*	*(69)*	*(146)*	*(135)*	*(126)*	*(261)*
			Net Trips			11,768	306	277	583	540	502	1,042

Phase 1 (opening 2018) of the development is anticipated to generate 3,794 daily trips, of which 384 trips are during the AM peak hour and 353 trips are during the PM peak hour.

Phase 2 (Buildout horizon year 2023) of the development is anticipated to generate 14,710 daily trips, of which 729 trips are during the AM peak hour and 1,303 trips are during the PM peak hour. Some trips are expected to remain internal to the site and some external trips will already be using the roadways adjacent to the site. Considering these reductions, 11,768 new daily trips are anticipated with 583 AM peak hour trips and 1,042 PM peak hour trips.

TRIP DISTRIBUTION

The Ritz Carlton development consists of multiple land uses. Trips were distributed based on the type of land use. For hotel related trips, most are anticipated to travel to/from Sky Harbor Airport with the remainder to nearby areas in downtown Scottsdale. For residential trips, employment opportunity within a 10-mile radius of the site, projected by Maricopa Association of Government (MAG) socioeconomic data, was considered. For retail, restaurant and commercial trips, the projected population within a 5-mile radius was considered. For office trips, the projected employment within a 5-mile radius was considered. These distributions of socioeconomic data were used as a base for the distributions applied to the trips generated by the site. They were adjusted according to major roadways and likely travel routes such as Lincoln Drive, Scottsdale Road and Loop 101.

The trip distribution applied to site generated traffic is summarized in **Table 14** and depicted in **Figure 5**, **Figure 6**, **Figure 7** and **Figure 8**.

Table 14 – Trip Distribution Percentages by Land Use

Roadway	To/From	Trip Distribution			
		Hotel	**Residential**	**Retail**	**Office**
Tatum Boulevard	North	0%	2%	5%	3%
Tatum Boulevard	South	75%	11%	7%	10%
Scottsdale Road	North	5%	11%	21%	19%
Scottsdale Road	South	5%	20%	24%	24%
Mockingbird Lane	West	0%	2%	5%	2%
Indian Bend Road	East	5%	29%	16%	20%
Lincoln Drive	West	0%	0%	2%	0%
Lincoln Drive	East	10%	15%	7%	12%
McDonald Drive	East	0%	10%	8%	8%
McDonald Drive	West	0%	0%	5%	2%
Total		**100%**	**100%**	**100%**	**100%**

The percentages presented in **Table 14** were applied to the trips generated to determine the site traffic at the intersections within the study area. **Figure 9** and **Figure 10** present the opening year site traffic (2018) for the Ritz Carlton. **Figure 11** and **Figure 12** present the build-out site generated traffic (2023, 2028 and 2033).

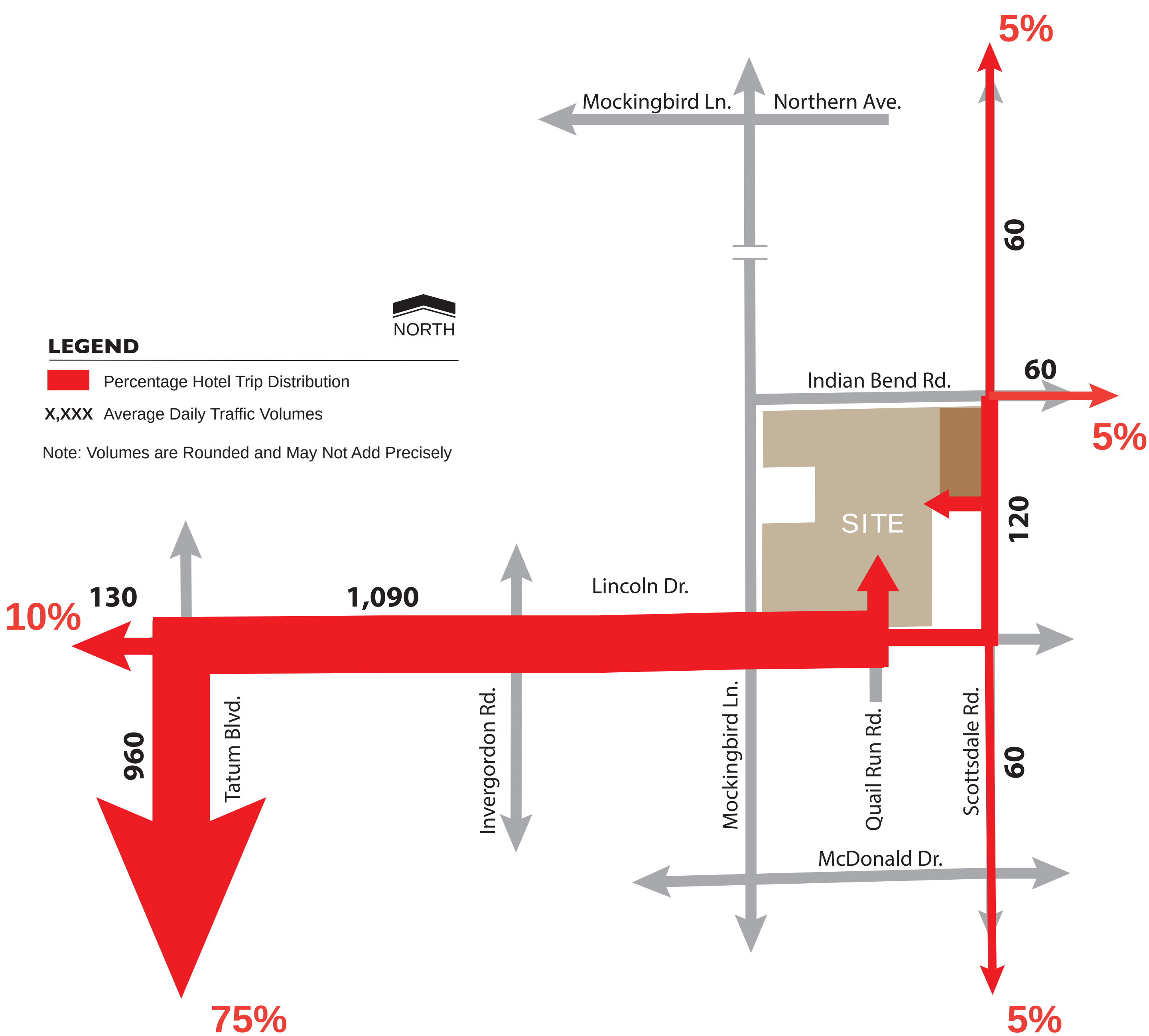


Figure 5: Hotel Distribution

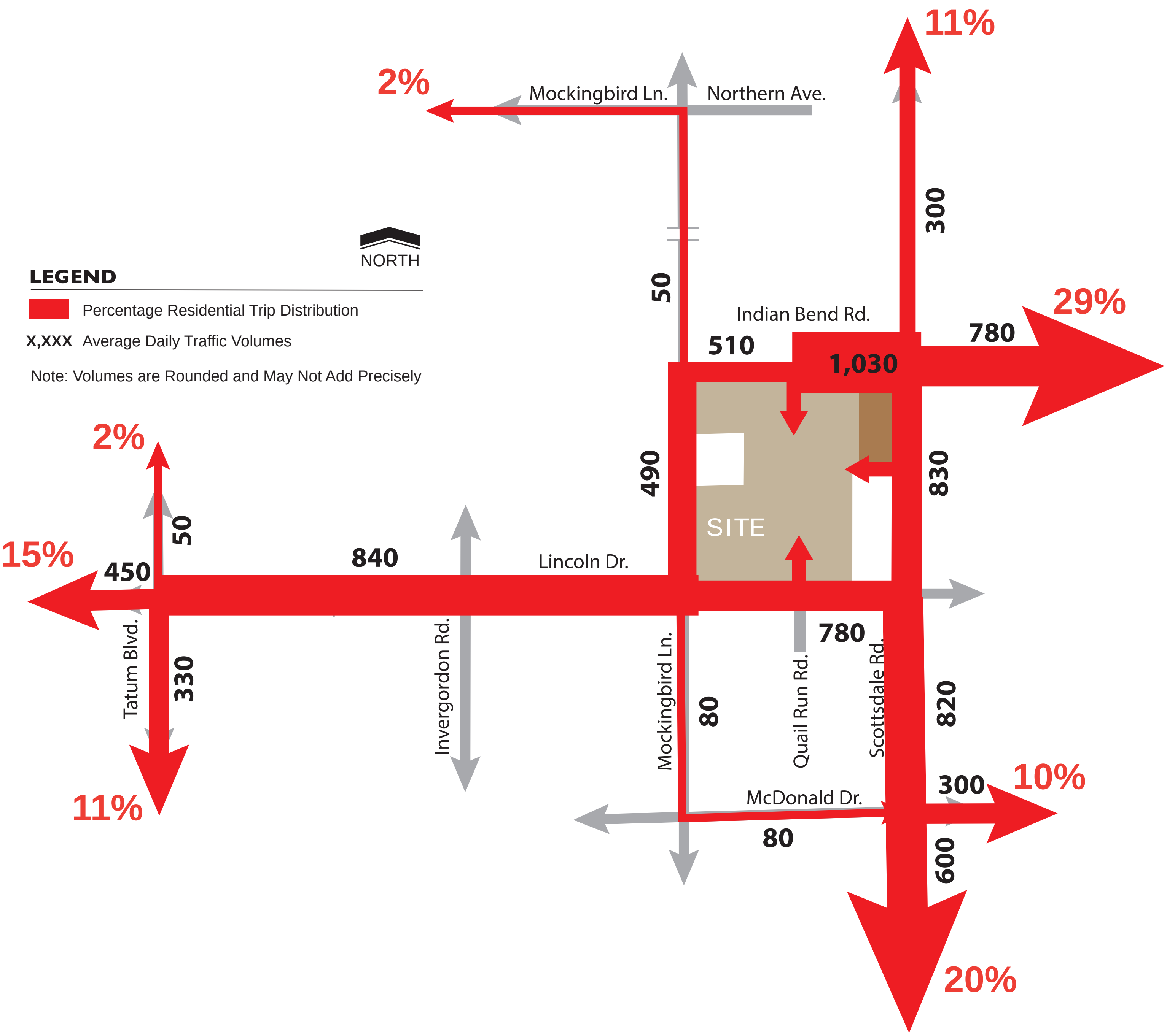


Figure 6: Residential Distribution

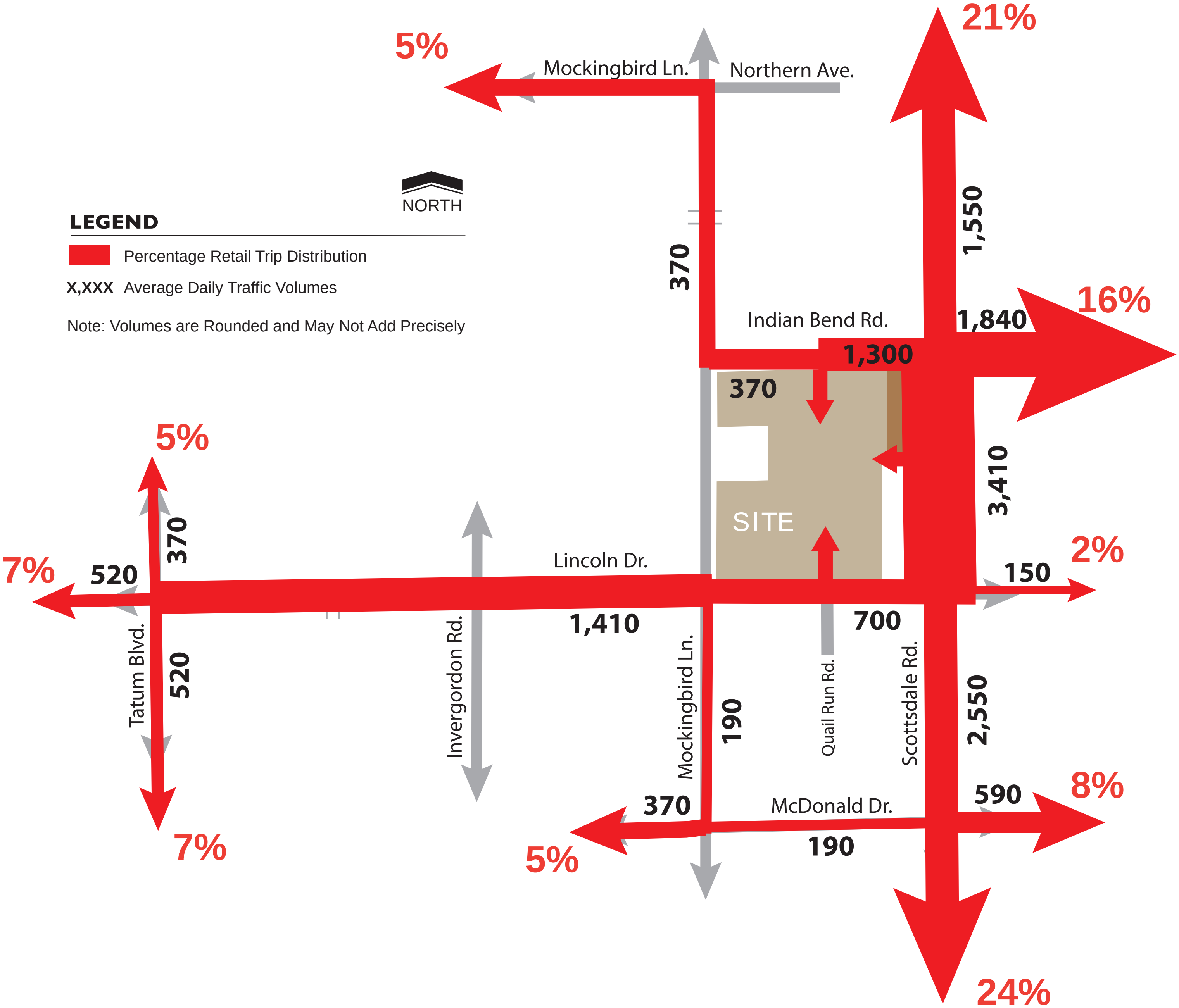


Figure 7: Retail Distribution

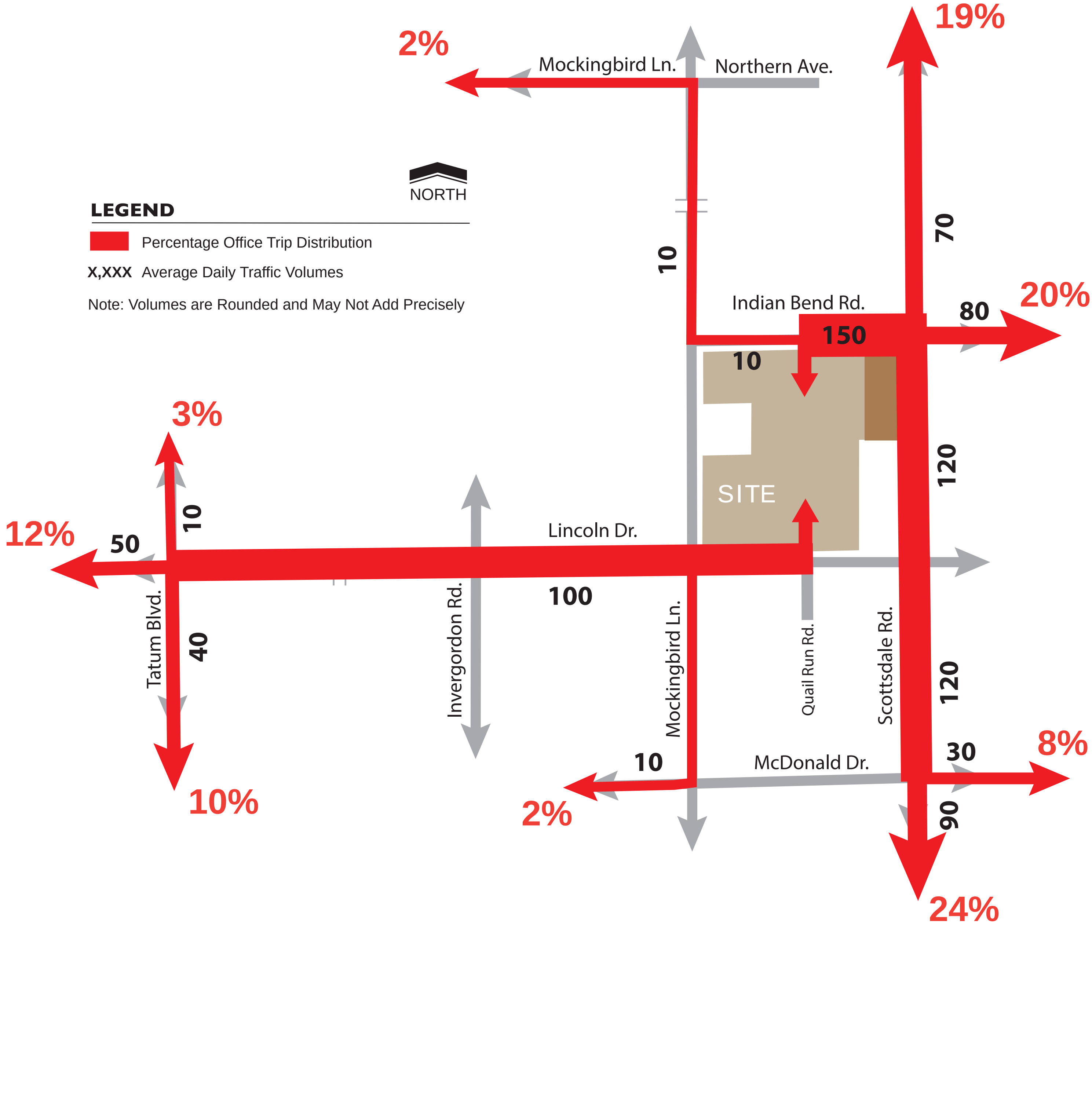


Figure 8: Office Distribution

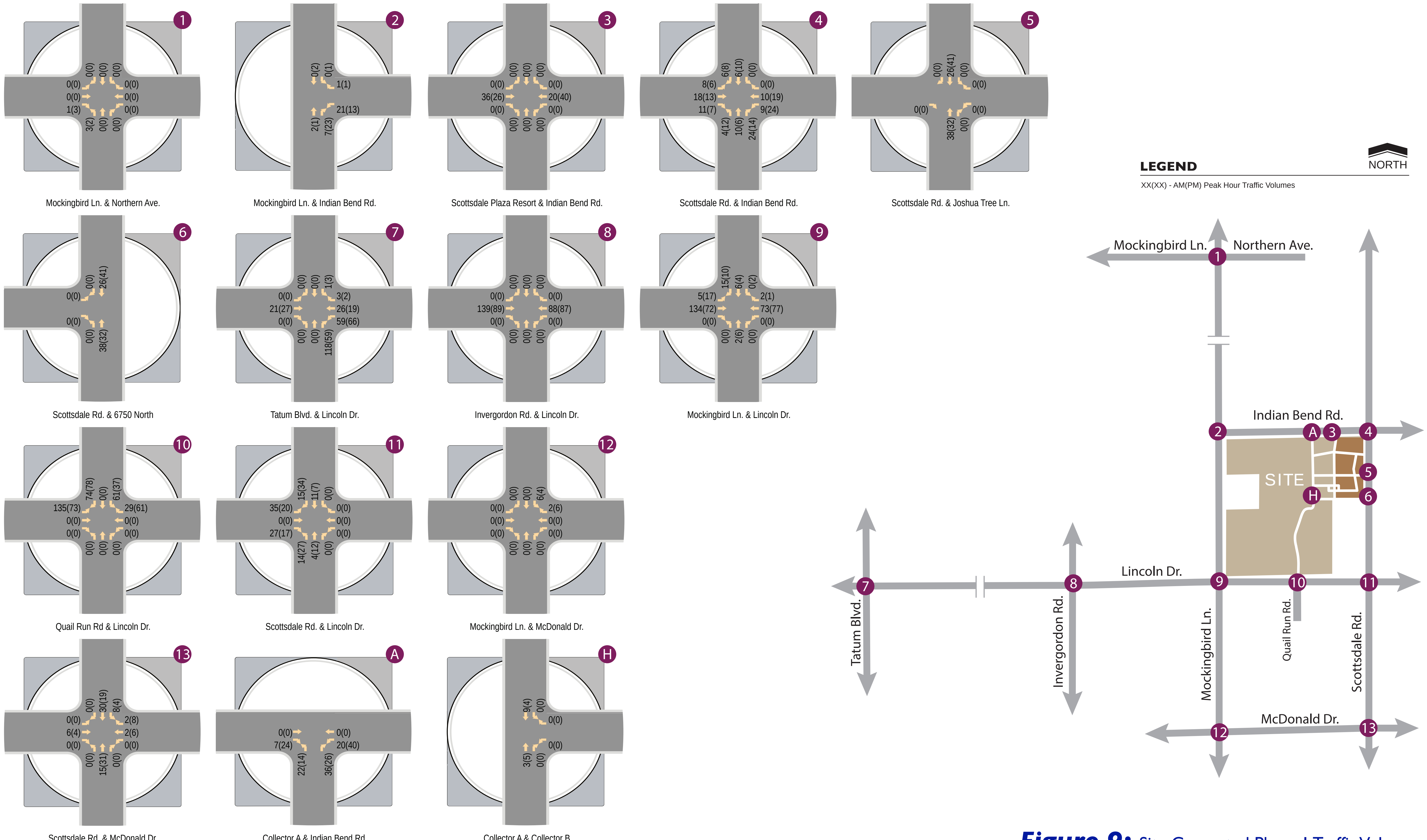


Figure 9: Site Generated Phase I Traffic Volumes A

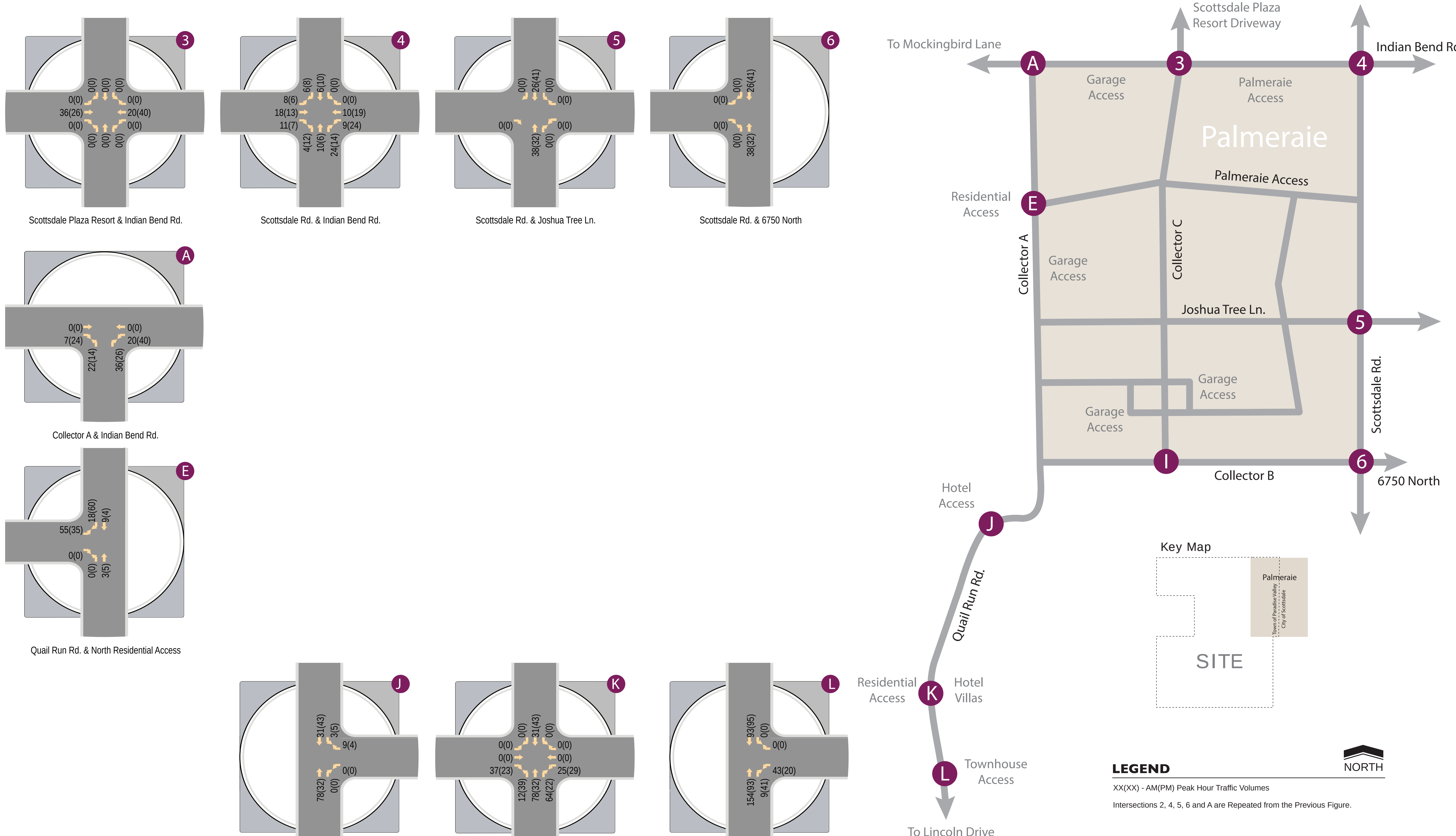
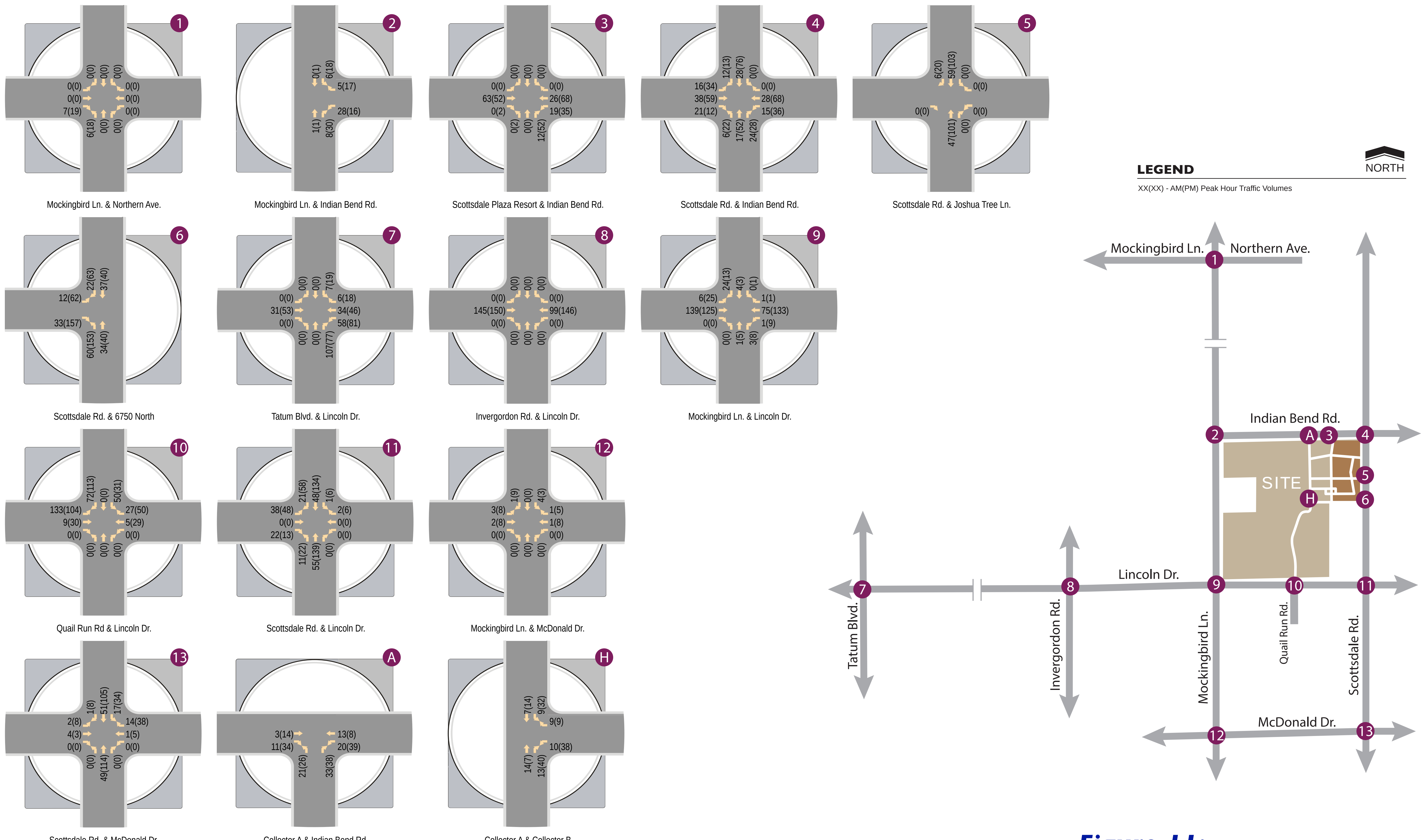


Figure 10: Site Generated Phase I Traffic Volumes B



LEGEND

NORTH

XX(XX) - AM(PM) Peak Hour Traffic Volumes

Figure 11: Site Buildout Traffic Volumes A

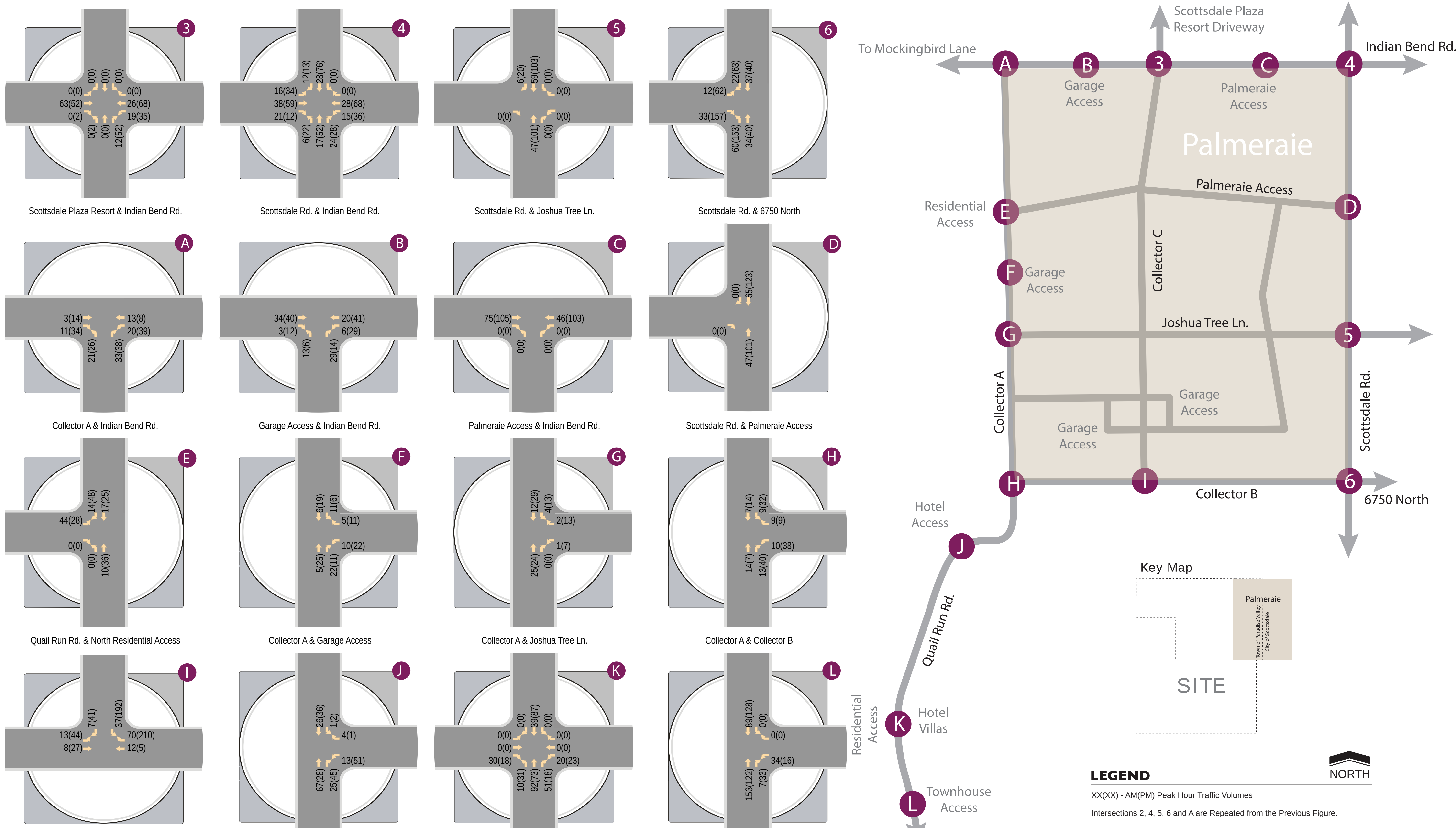


Figure 12: Site Buildout Traffic Volumes B

FUTURE BACKGROUND TRAFFIC

Background traffic is often projected by applying a growth factor to existing traffic. To determine an appropriate growth factor, daily traffic volumes within the vicinity of the site, published by the Town of Paradise Valley and the City of Scottsdale, were reviewed. For purposes of this study, a 0.5 percent annual growth rate was applied to traffic volumes on major roadways. This growth rate equates to growth factors of 1.015, 1.041, 1.067 and 1.094 for the study years 2018, 2023, 2028 and 2033, respectively. Background growth calculations are included within **Appendix G**.

The adjacent Palmeraie development will also add traffic to the study roadways. Palmeraie is located on the southwest corner of Scottsdale Road and Indian Bend Road. Palmeraie is a planned retail development consisting of approximately 300,000 SF of retail and restaurant land uses, a 175 room hotel and 235 resort hotel condominium units. Access to Palmeraie will be provided at the driveways on Indian Bend Road and Scottsdale Road previously discussed. The developer of Ritz-Carlton is also the owner of the proposed Palmeraie development and is anticipated to develop Palmeraie concurrently with Parcel E of the site. The site generated traffic by Palmeraie, as projected within the TIMA, is considered as background traffic within this study. As the access points have changed, the trips were redistributed according to the trip distributions presented that were applied to the site.

The nearby Mountain Shadows Resort redevelopment will also add traffic to the study roadways. Mountain Shadows Resort is located on the southern corners of 56th Street and Lincoln Drive. The redevelopment will construct new hotel facilities. The site generated traffic by Mountain Shadows Resort, as projected within the TIA, is considered as background traffic within this study.

Selected excerpts of the *Palmeraie Traffic Impact and Mitigation Analysis*, *Mountain Shadows Traffic impact Analysis* and traffic volume depictions are included within **Appendix G**. Any traffic volumes generated by any other developments are assumed to be accounted for within the growth factors applied to the existing traffic counts.

The background traffic for the study years are projected by applying the applicable growth factor to the existing traffic volumes and then adding the traffic generated by Palmeraie and Mountain Shadows Resort. Projected background traffic for 2018 is depicted in **Figure 13** and **Figure 14**. Projected background traffic for 2023 is depicted in **Figure 15** and **Figure 16**. Projected background traffic for 2028 is depicted in **Figure 17** and **Figure 18**. Projected background traffic for 2033 is depicted in **Figure 19** and **Figure 20**.

TOTAL TRAFFIC

Total traffic was determined by adding the site generated traffic to the background traffic for each study year. Projected total traffic for 2018 is depicted in **Figure 21** and **Figure 22**. Projected total traffic for 2023 is depicted in **Figure 23** and **Figure 24**. Projected background total for 2028 is depicted in **Figure 25** and **Figure 26**. Projected background total for 2033 is depicted in **Figure 27** and **Figure 28**.

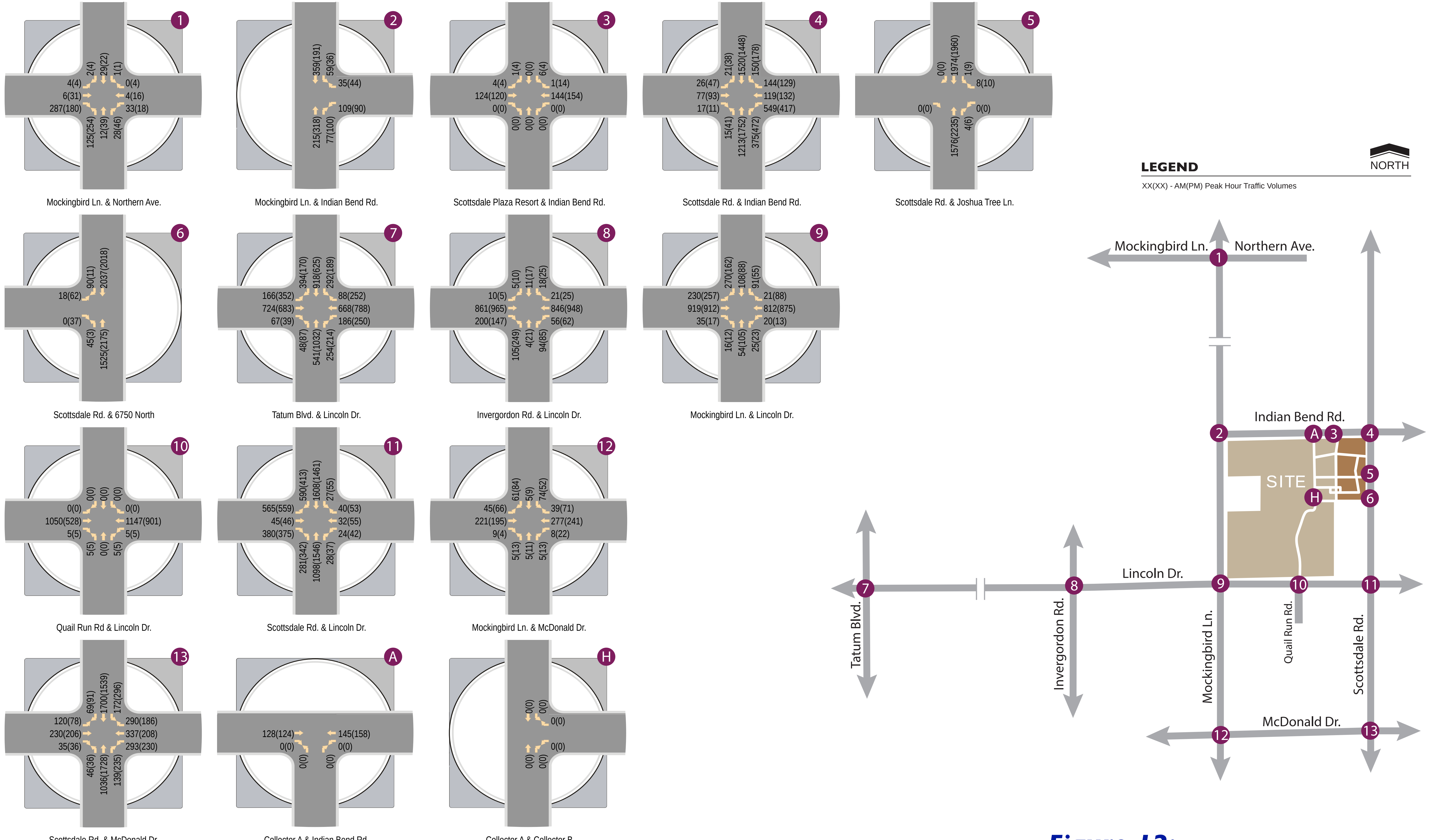


Figure 13: 2018 Background Traffic Volumes A

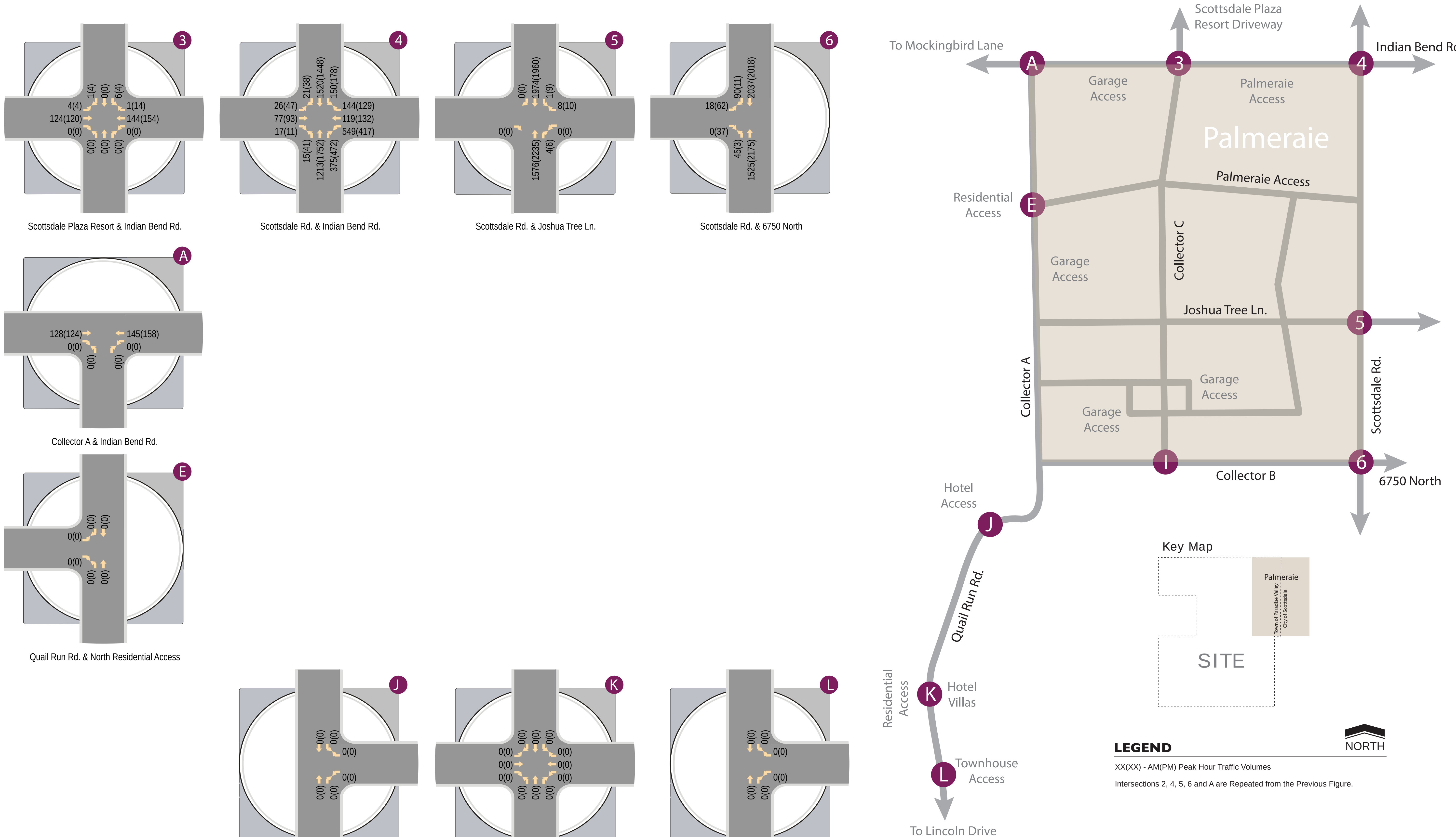


Figure 14: 2018 Background Traffic Volumes B

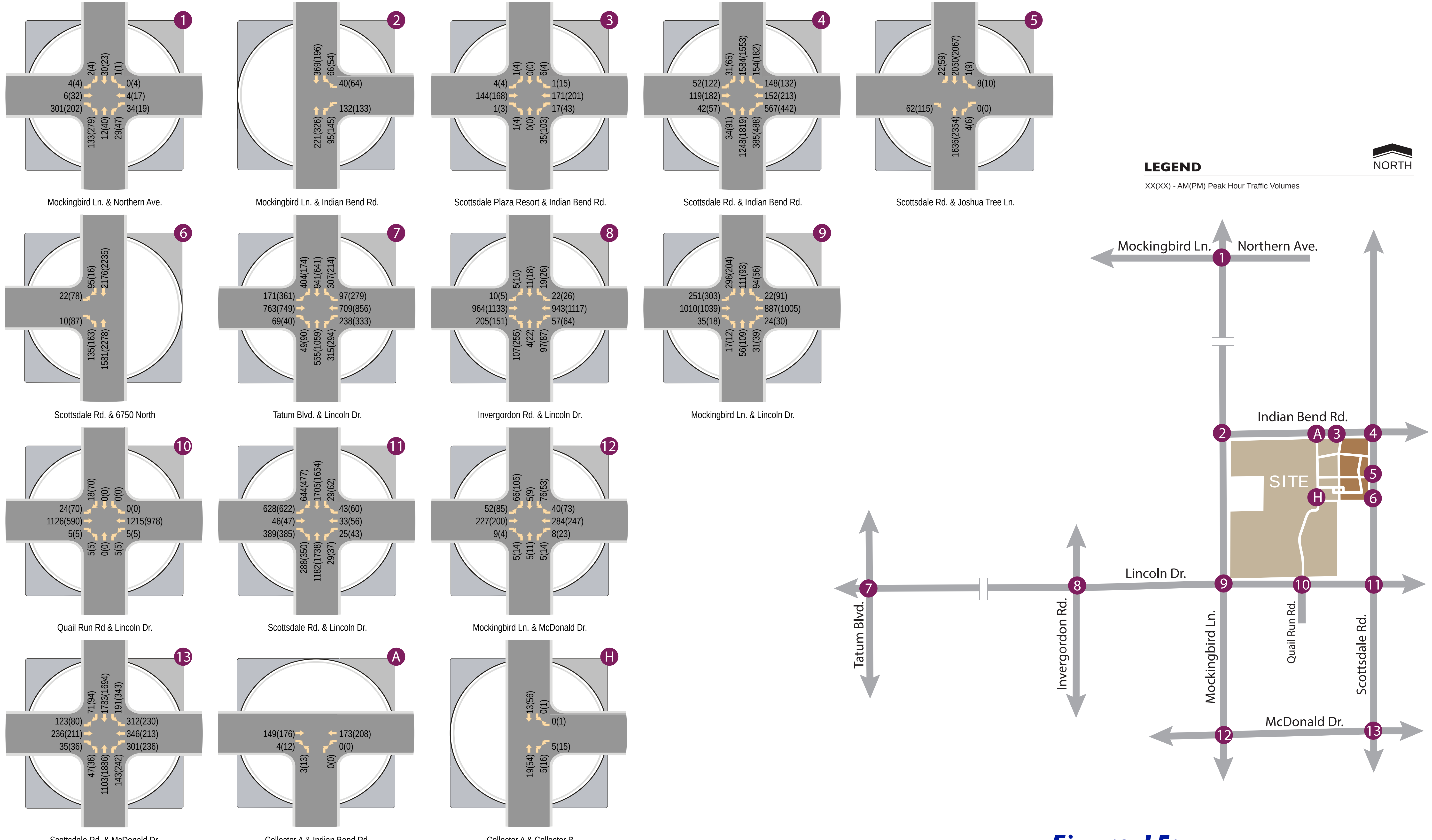


Figure 15: 2023 Background Traffic Volumes A

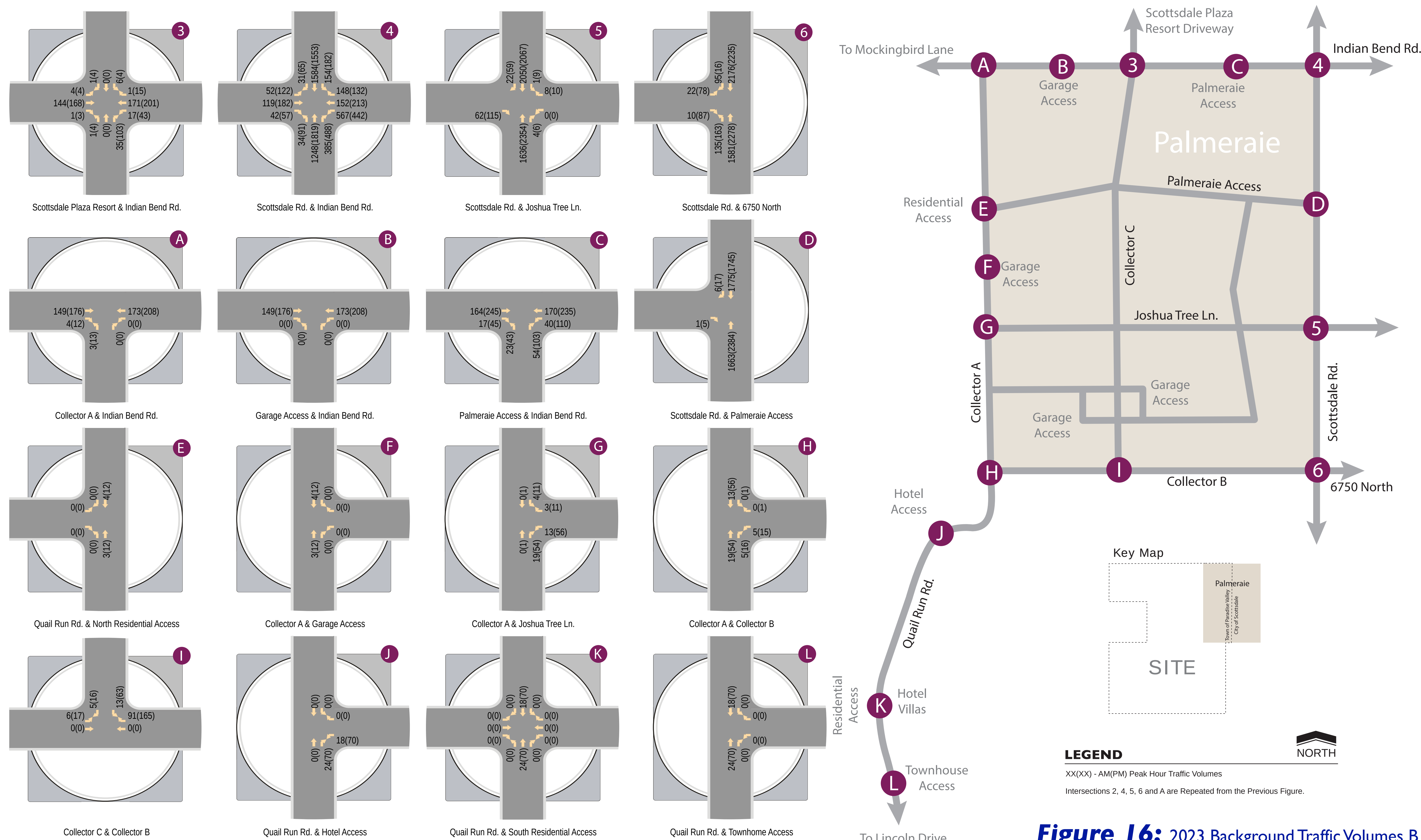


Figure 16: 2023 Background Traffic Volumes B

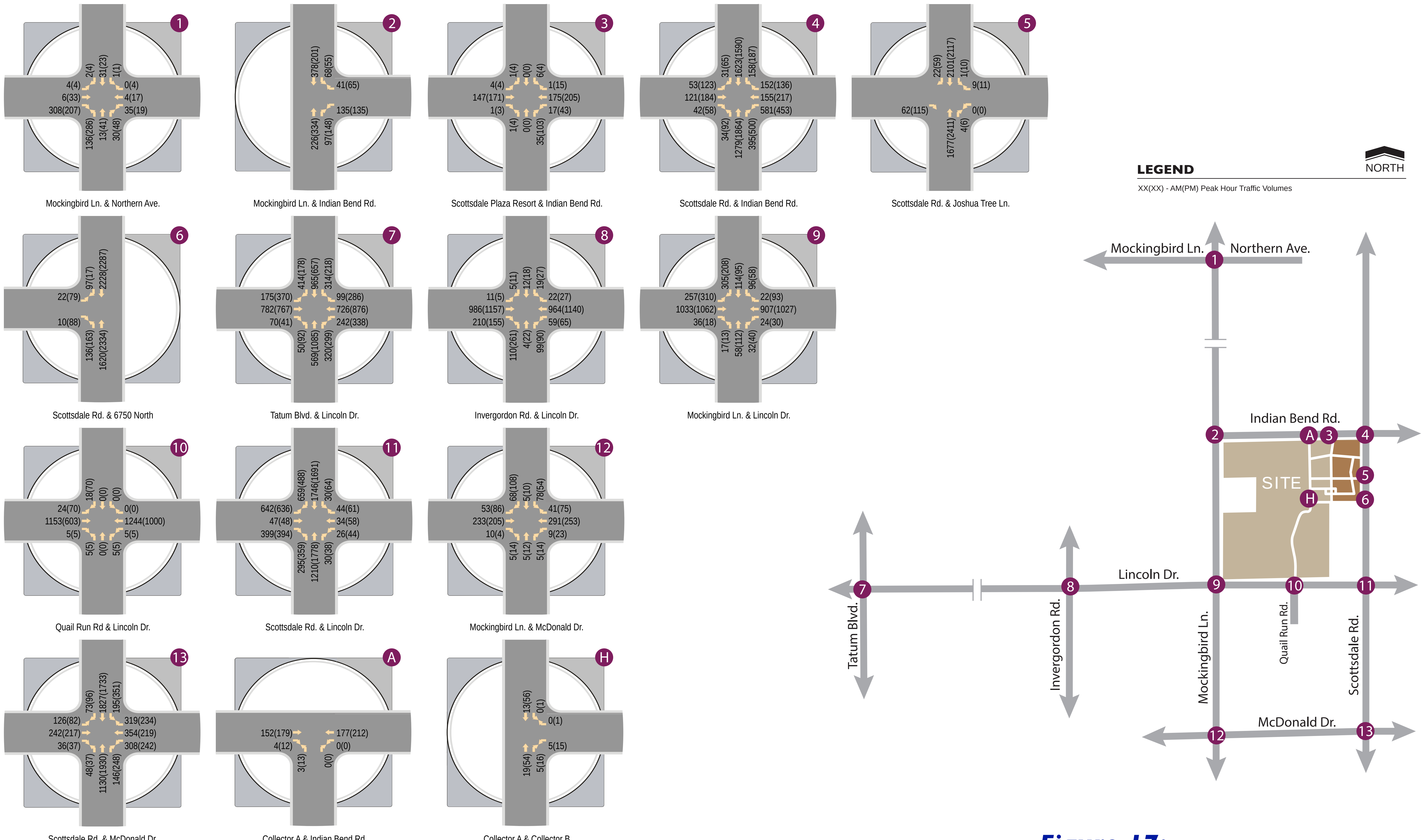


Figure 17: 2028 Background Traffic Volumes A

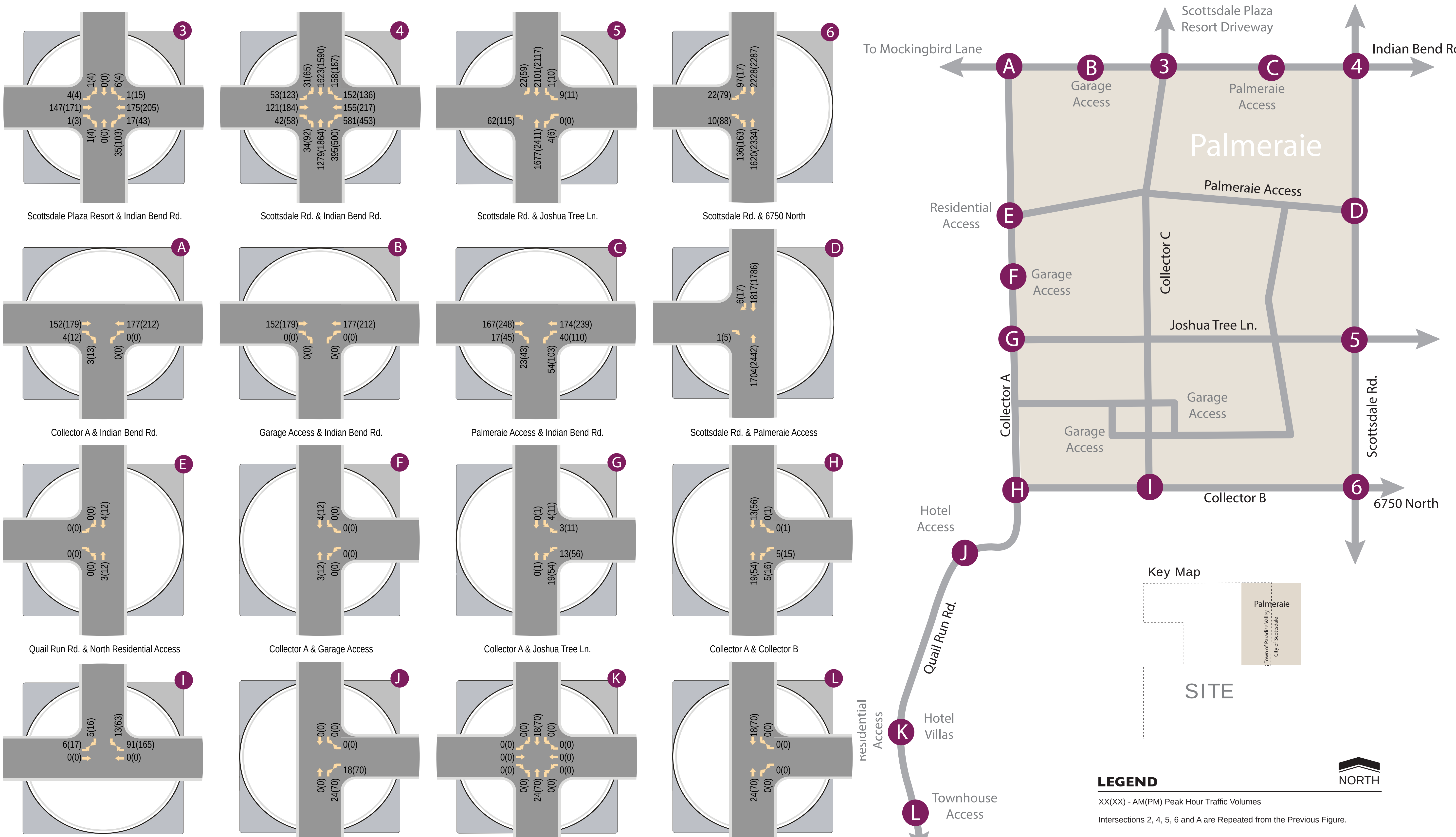


Figure 18: 2028 Background Traffic Volumes B

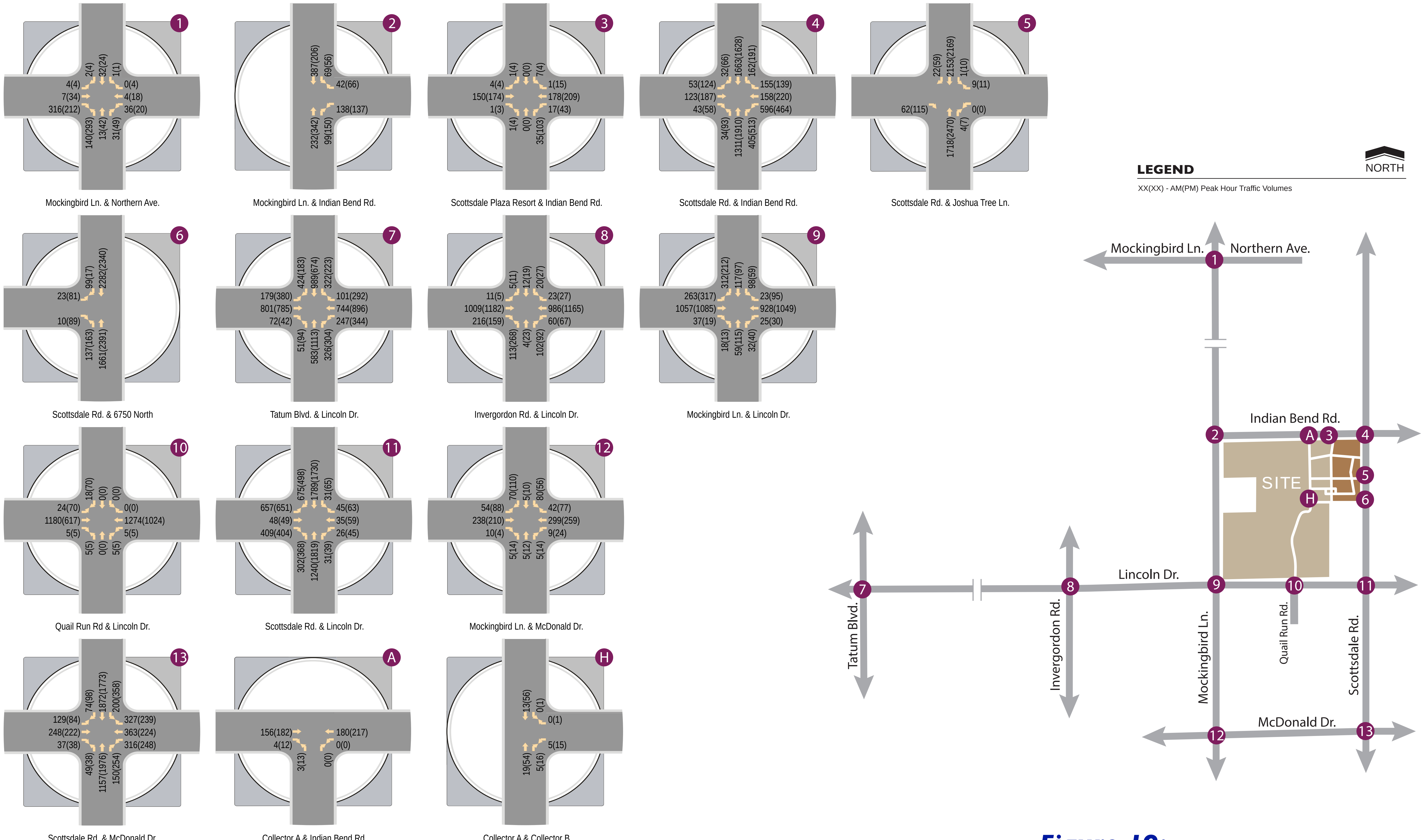


Figure 19: 2033 Background Traffic Volumes A

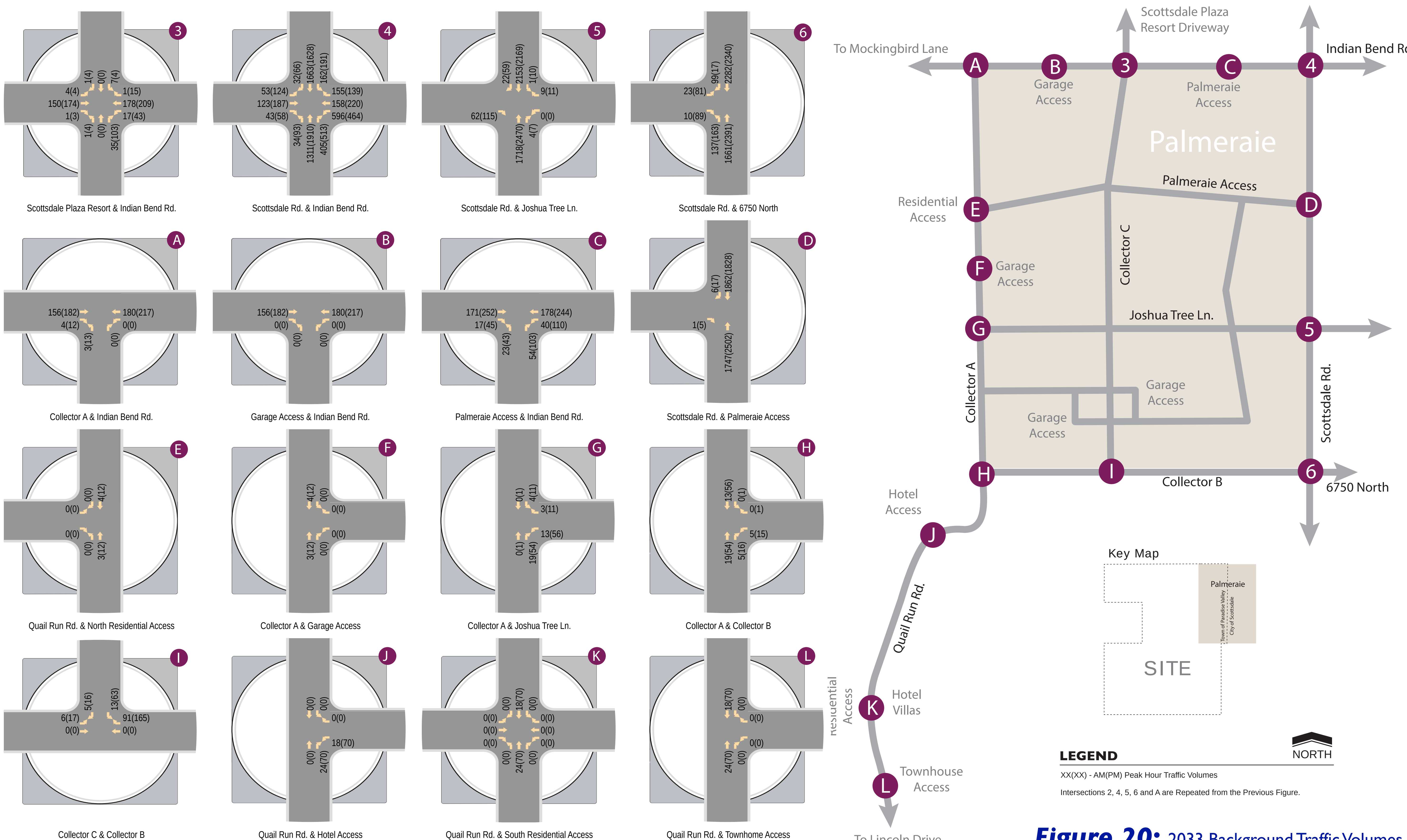


Figure 20: 2033 Background Traffic Volumes B

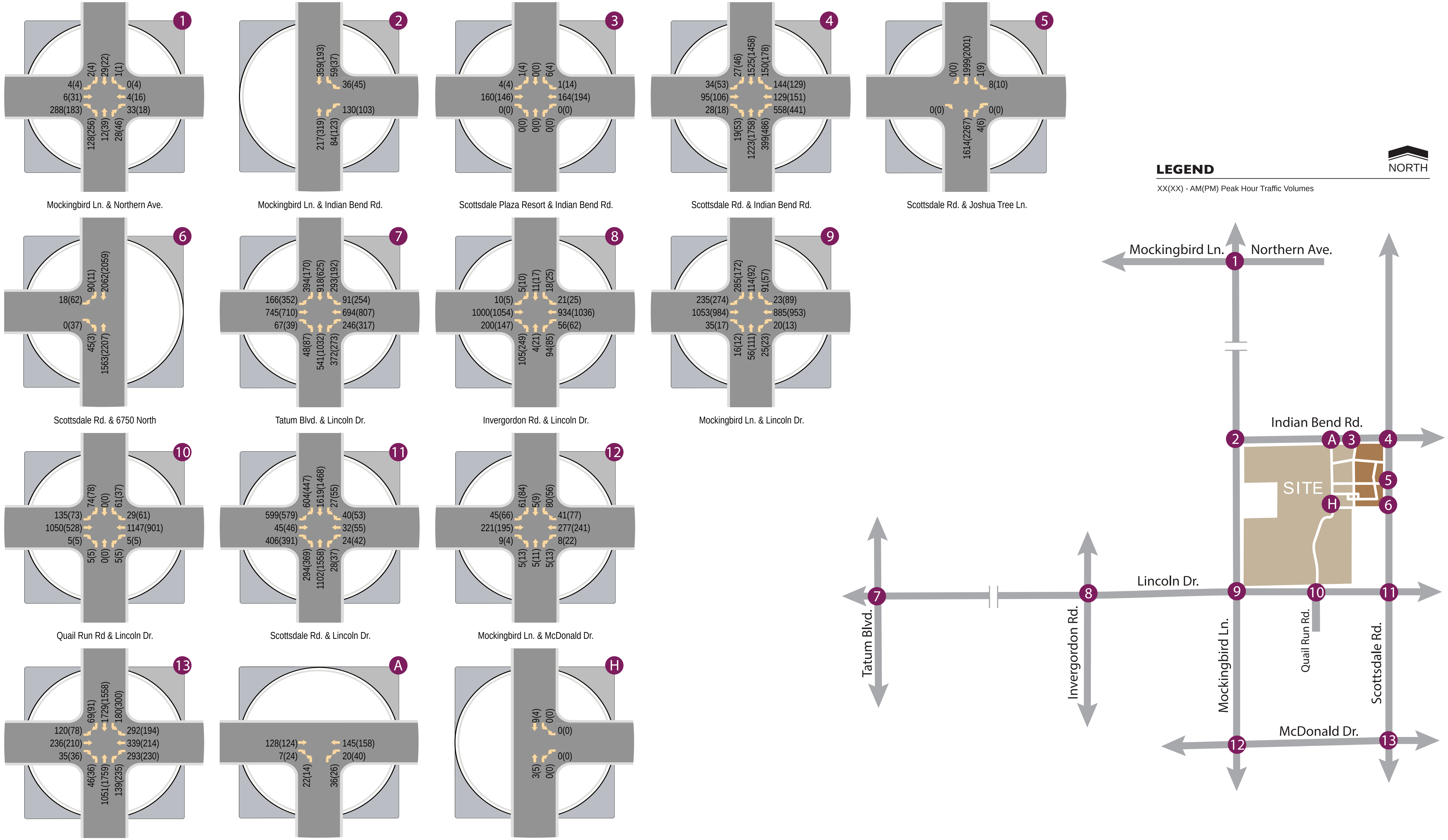


Figure 21: 2018 Total Traffic Volumes A

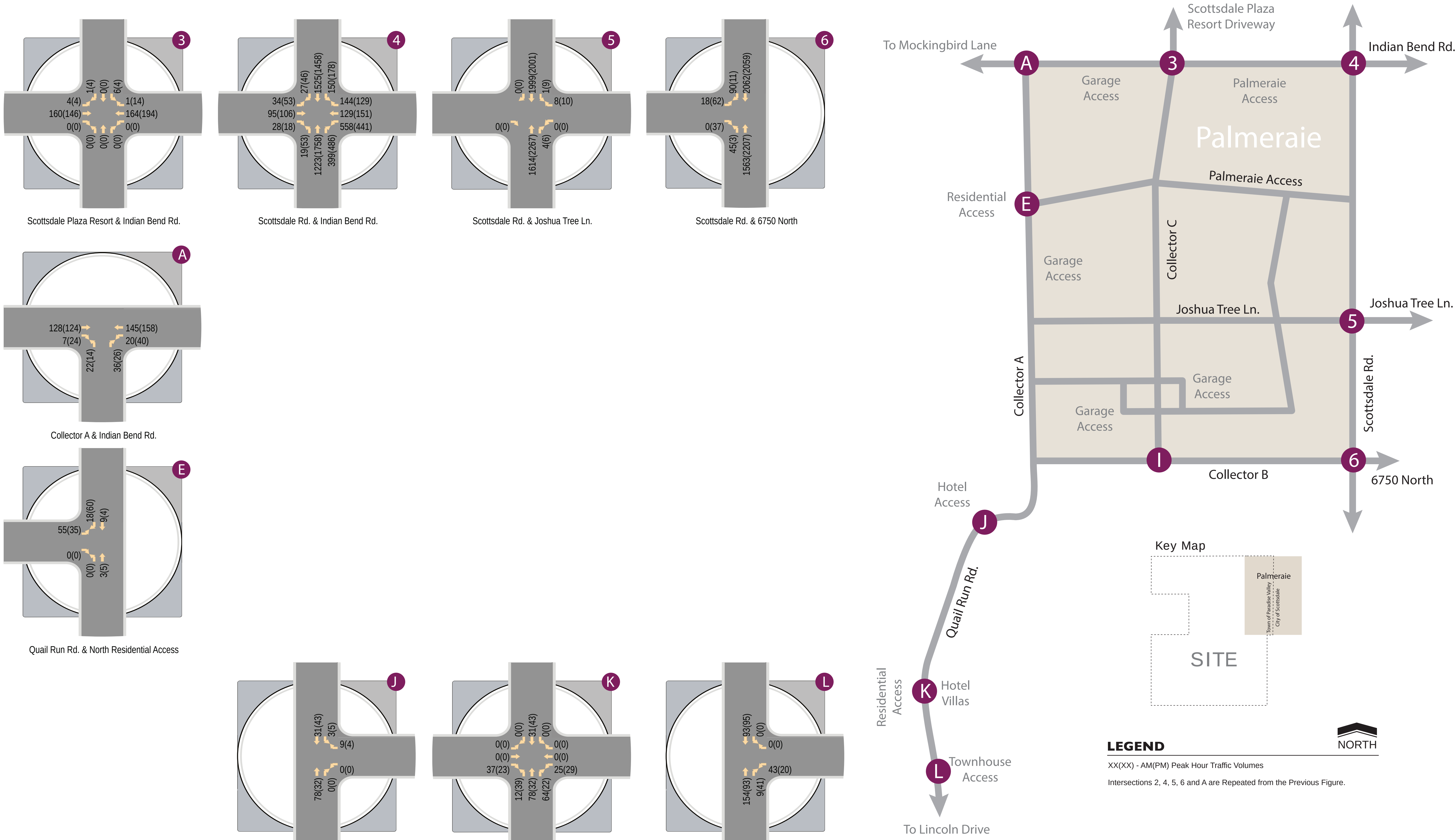


Figure 22: 2018 Total Traffic Volumes B

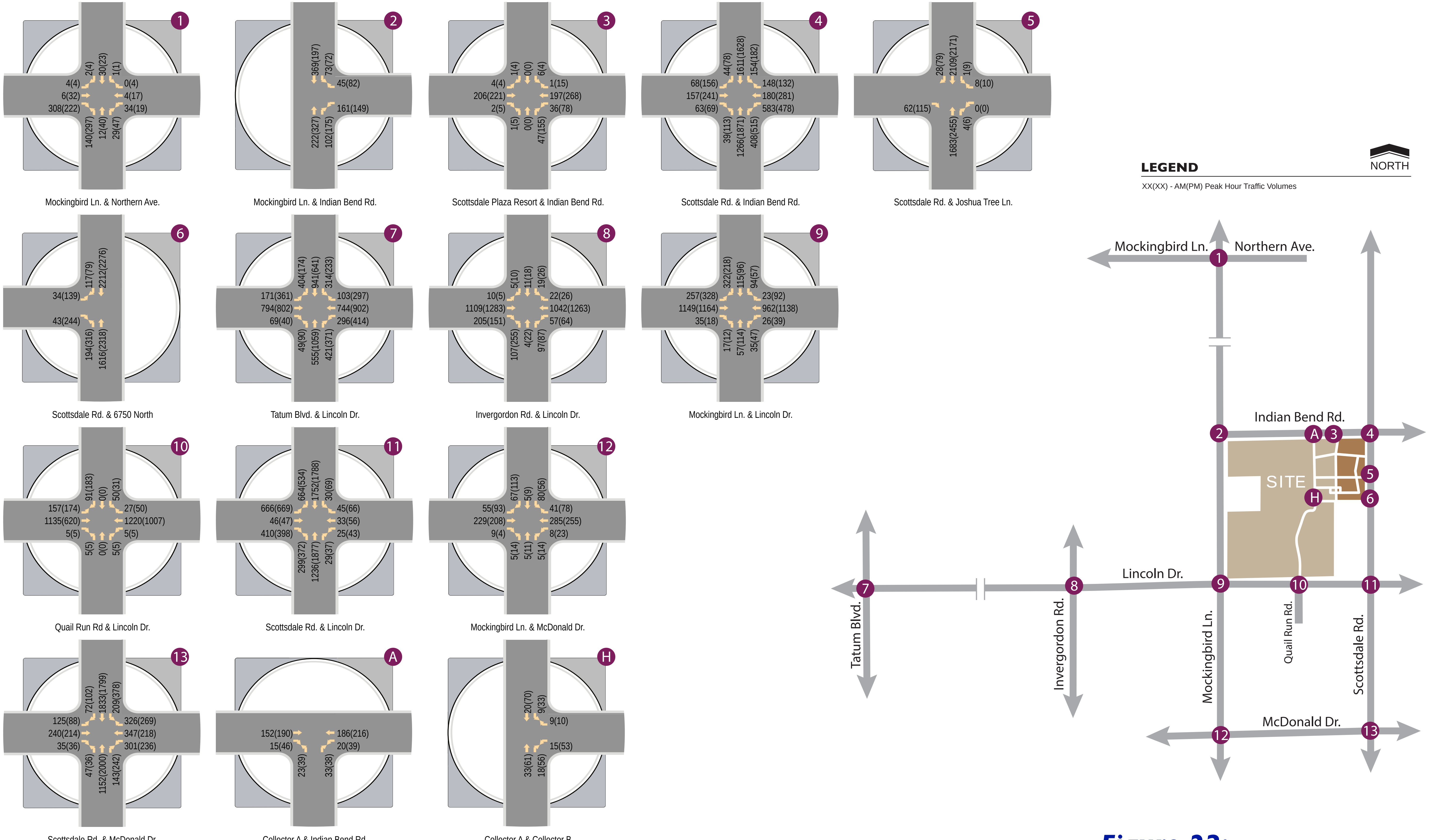


Figure 23: 2023 Total Traffic Volumes A

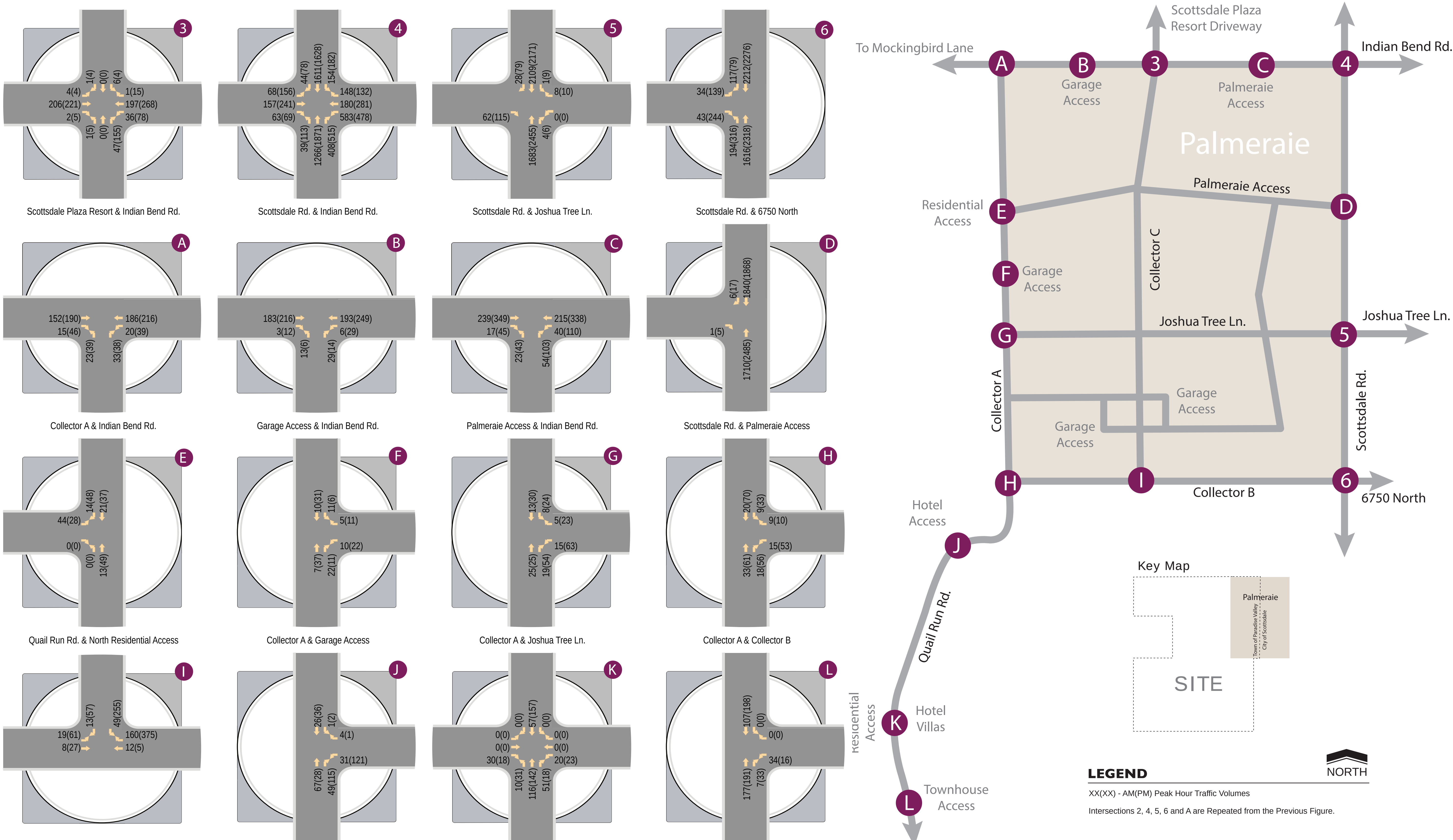


Figure 24: 2023 Total Traffic Volumes B

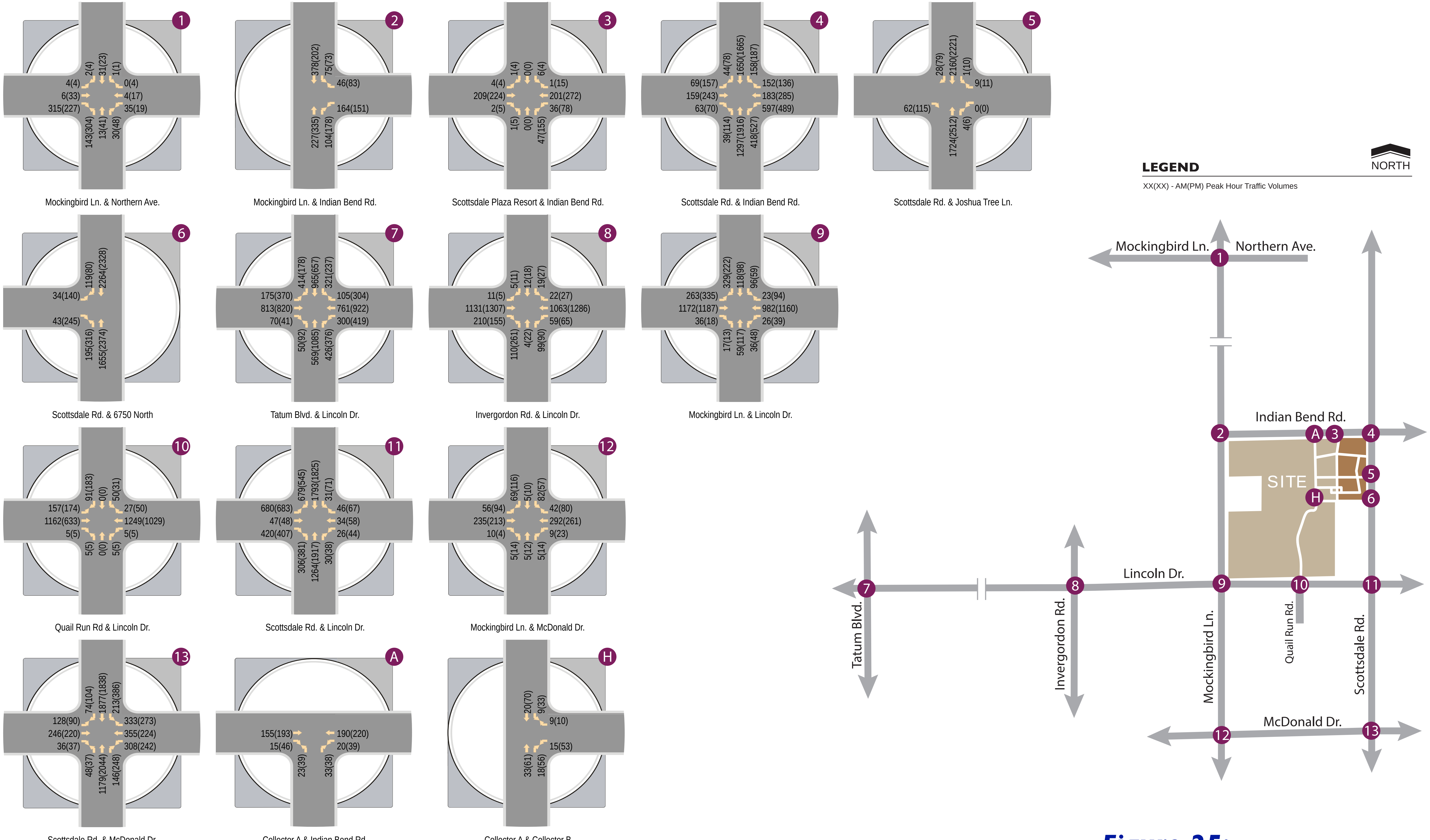


Figure 25: 2028 Total Traffic Volumes A

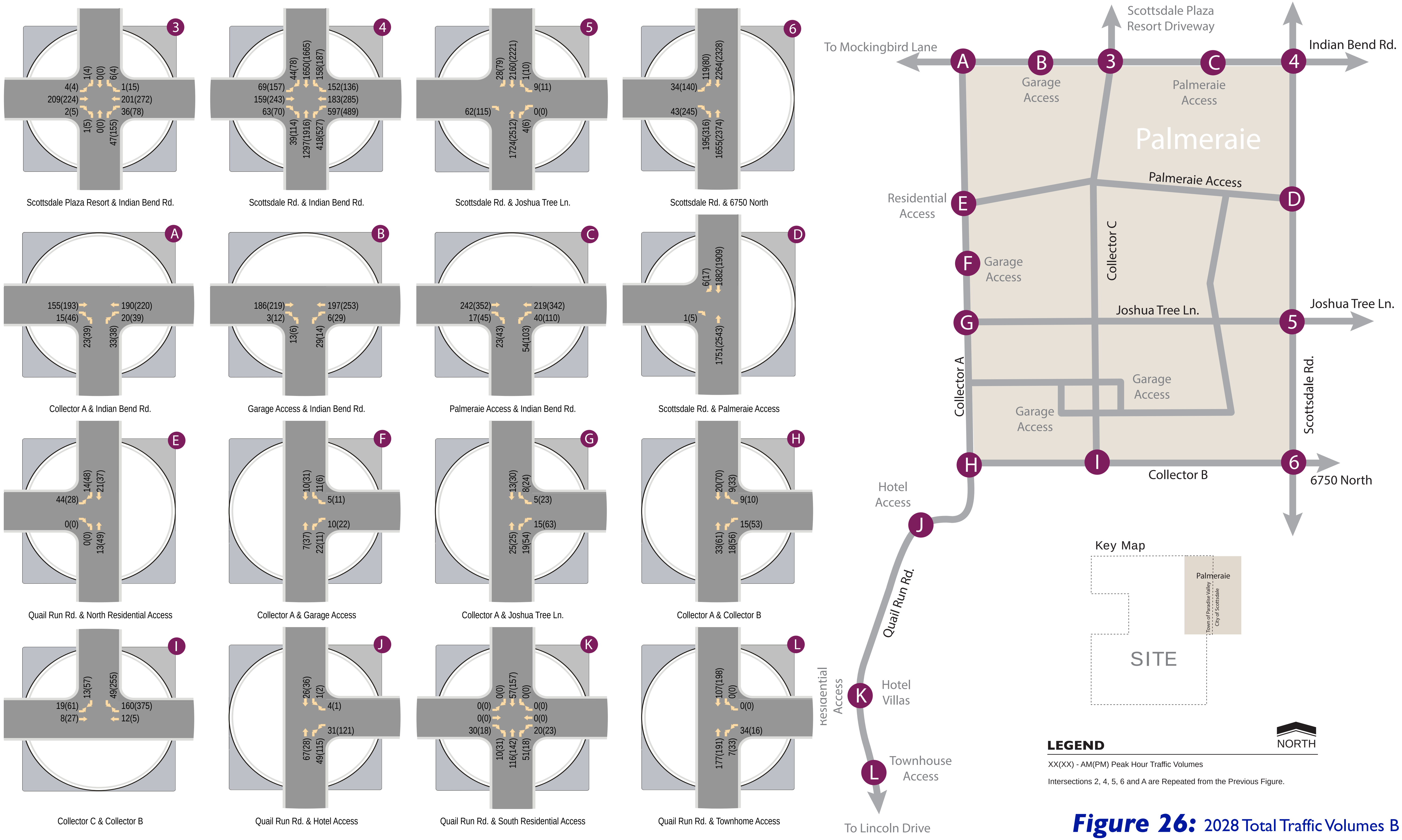


Figure 26: 2028 Total Traffic Volumes B

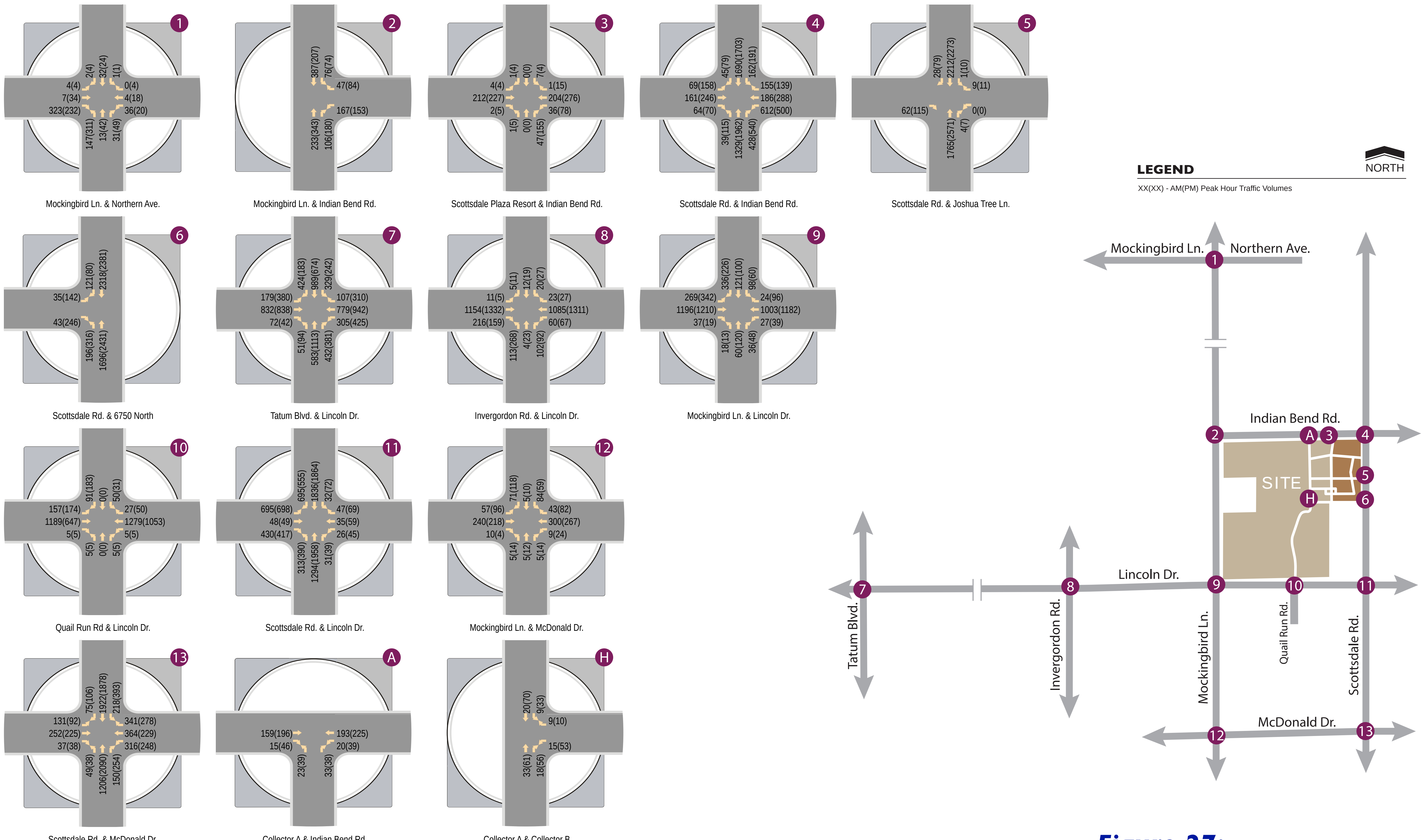


Figure 27: 2033 Total Traffic Volumes A

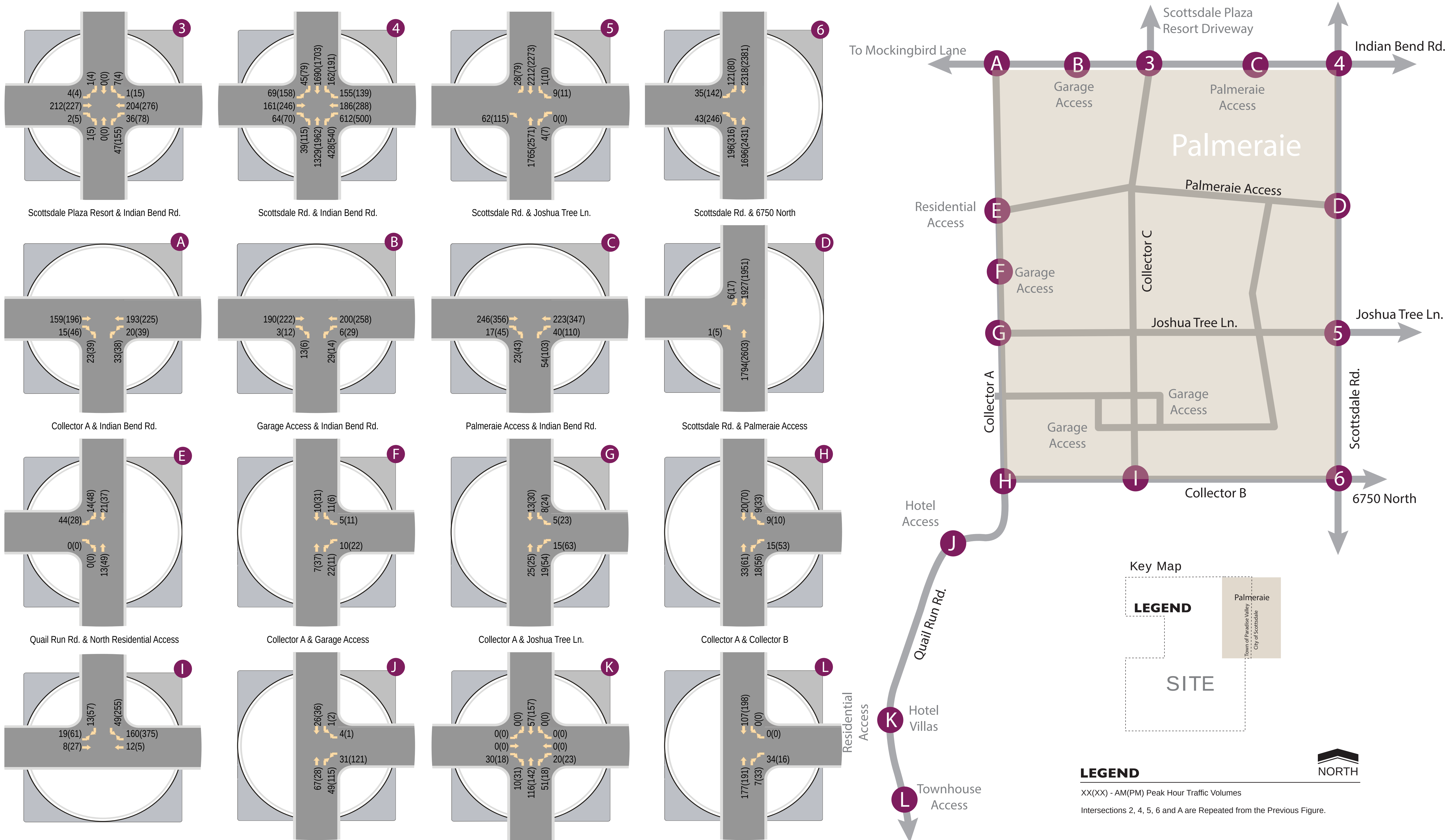


Figure 28: 2033 Total Traffic Volumes B

INTERSECTION CAPACITY ANALYSIS

Peak hour capacity analyses have been conducted for the study intersections and all site access points for the 2018, 2023, 2028 and 2033 horizon years. All unsignalized intersections have been analyzed as such using the methodologies previously discussed. Results of the analyses performed are shown in **Table 15**. Analysis reports for the 2018, 2023, 2028 and 2033 study years are included in **Appendix H**, **Appendix I**, **Appendix J** and **Appendix K**, respectively.

Table 15 – Future Peak Hour Levels of Service

ID	Intersection	Traffic Control	Approach/ Movement	AM(PM) Peak Hour LOS			
				2018	2023	2028	2033
1	Mockingbird Ln. & Northern Ave.	4-way stop	NB left	B(B)	B(C)	B(C)	B(C)
			NB thru/right	A(A)	A(A)	A(A)	A(A)
			SB shared	A(A)	A(A)	A(A)	A(A)
			EB left	A(A)	A(A)	A(A)	A(A)
			EB thru/right	B(B)	B(B)	B(B)	B(B)
			WB shared	A(A)	A(A)	A(A)	A(A)
			Overall	**A(B)**	**B(B)**	**B(B)**	**B(B)**
2	Mockingbird Ln. & Indian Bend Rd.	1-way stop (WB)	SB left	A(A)	A(A)	A(A)	A(A)
			WB left	C(B)	C(C)	C(C)	C(C)
			WB right	B(B)	B(B)	B(B)	B(B)
3	Scottsdale Plaza Resort Driveway & Indian Bend Rd.	2-way stop (NB/SB)	NB shard	-(-)	A(B)	A(B)	A(B)
			SB shared	B(B)	B(C)	B(C)	B(C)
			EB left	A(A)	A(A)	A(A)	A(A)
			WB left	-(-)	A(A)	A(A)	A(A)
4	Scottsdale Rd. & Indian Bend Rd.	(1)Signalized	NB left	D(D)	D(D)	D(D)	D(D)
			NB thru	C(D)	C(D)	C(D)	C(D)
			NB right	B(B)	B(B)	B(B)	B(B)
			SB left	D(D)	D(E)	D(E)	D(E)
			SB thru	D(C)	D(C)	D(C)	D(D)
			SB right	D(D)	B(A)	D(A)	B(A)
			EB left	E(E)	E(E)	E(F)	E(F)
			EB thru	E(E)	F(F)	F(F)	F(F)
			EB right	D(D)	D(D)	D(D)	D(D)
			WB left	E(E)	E(E)	E(E)	E(E)
			WB thru	D(D)	D(F)	D(F)	D(F)
			WB right	B(B)	B(B)	B(B)	B(B)
			Overall	**D(D)**	**D(D)**	**D(E)**	**D(E)**
5	Scottsdale Rd. & Joshua Tree Rd.	(1)2-way stop (EB/WB)	SB left	D(F)	D(F)	D(F)	D(F)
			EB right	-(-)	E(F)	E(F)	E(F)
			WB shared	C(D)	C(E)	F(F)	F(E)

(1) Final mitigation and operation conditions will be determined by the City of Scottsdale.

Table 15 – Future Peak Hour Levels of Service (Continued…..)

ID	Intersection	Traffic Control	Approach/ Movement	AM(PM) Peak Hour LOS 2018	2023	2028	2033
6	Scottsdale Rd. & 6750 North	Signalized (1)(2)	NB left	C(C)	C(D)	C(D)	C(D)
			NB thru	A(A)	A(A)	A(A)	A(A)
			SB thru	C(C)	C(D)	D(D)	D(D)
			SB right	B(B)	B(B)	B(B)	B(B)
			EB left	E(E)	E(E)	E(E)	E(E)
			EB right	-(C)	C(C)	C(C)	C(C)
			Overall	**B(B)**	**C(C)**	**C(C)**	**C(C)**
7	Tatum Blvd. & Lincoln Dr.	Signalized	NB left	C(C)	C(C)	C(C)	C(C)
			NB thru	D(D)	D(D)	D(D)	D(E)
			NB right	E(C)	E(D)	F(D)	F(D)
			SB left	C(D)	D(E)	D(E)	D(E)
			SB thru	C(C)	C(C)	C(C)	D(C)
			SB right	D(C)	D(C)	D(C)	D(C)
			EB left	E(D)	E(D)	E(D)	E(D)
			EB thru	E(E)	F(F)	F(F)	F(F)
			EB right	E(E)	F(F)	F(F)	F(F)
			WB left	F(F)	F(F)	F(F)	F(F)
			WB thru	D(F)	D(F)	D(F)	D(F)
			WB right	C(D)	C(E)	C(E)	C(E)
			Overall	**D(E)**	**E(F)**	**E(F)**	**E(F)**
8	Invergordan Rd. & Lincoln Dr.	Signalized	NB left	C(C)	C(C)	C(C)	C(C)
			NB thru/left	C(C)	C(C)	C(C)	C(C)
			SB shared	C(C)	C(C)	C(C)	C(C)
			EB left	A(B)	A(B)	A(B)	A(B)
			EB thru	A(B)	A(B)	A(B)	A(B)
			EB right	A(B)	A(B)	A(B)	A(B)
			WB left	B(B)	B(C)	B(C)	B(C)
			WB thru	A(B)	A(B)	A(B)	A(B)
			WB right	A(B)	A(B)	A(B)	A(B)
			Overall	**A(B)**	**A(B)**	**A(B)**	**A(B)**
9	Mockingbird Ln. & Lincoln Dr.	Signalized	NB left	D(D)	D(D)	D(D)	D(D)
			NB thru/right	D(E)	D(E)	D(E)	D(E)
			SB left	D(D)	D(D)	D(D)	D(D)
			SB thru	D(D)	D(D)	D(D)	D(E)
			SB right	E(D)	E(E)	D(E)	E(E)
			EB left	C(C)	D(D)	D(D)	D(D)
			EB thru	B(A)	B(A)	B(A)	B(A)
			EB right	B(A)	B(A)	B(A)	B(A)
			WB left	C(D)	C(D)	C(D)	C(D)
			WB thru	C(D)	C(D)	C(D)	C(D)
			WB right	C(B)	C(B)	C(B)	C(B)
			Overall	**C(C)**	**C(C)**	**C(C)**	**C(C)**

(1) Final mitigation and operation conditions will be determined by the City of Scottsdale.
(2) An Alternative analysis for this intersection is presented in **Table 17** for a single northbound left turn lane option.

Table 15 – Future Peak Hour Levels of Service (Continued…..)

ID	Intersection	Traffic Control	Approach/ Movement	AM(PM) Peak Hour LOS 2018	2023	2028	2033
10	Quail Run & Lincoln Dr.	Signalized	NB shared	E(E)	E(D)	E(D)	E(D)
			SB left/thru	E(E)	E(D)	E(D)	E(D)
			SB right	E(E)	E(E)	E(E)	E(E)
			EB left	A(A)	A(A)	A(A)	A(A)
			EB thru	A(A)	A(A)	A(A)	A(A)
			EB right	A(A)	A(A)	A(A)	A(A)
			WB left	A(A)	A(A)	A(A)	A(A)
			WB thru	A(A)	A(B)	A(B)	A(B)
			WB right	A(A)	A(A)	A(A)	A(A)
			Overall	**A(A)**	**A(B)**	**A(B)**	**A(B)**
11	Scottsdale Rd. & Lincoln Dr.	(1)Signalized	NB left	C(C)	E(C)	E(C)	E(C)
			NB thru	A(A)	A(B)	A(B)	A(B)
			NB right	A(B)	A(B)	A(B)	A(C)
			SB left	D(D)	E(D)	E(D)	E(D)
			SB thru	C(D)	C(F)	C(F)	C(F)
			SB right	D(D)	C(D)	C(D)	C(D)
			EB left/thru	F(F)	F(F)	F(F)	F(F)
			EB right	E(D)	F(E)	F(E)	F(E)
			WB left	E(E)	E(E)	E(E)	E(E)
			WB thru	E(E)	E(E)	E(E)	E(E)
			WB right	E(E)	E(E)	E(E)	E(E)
			Overall	**D(D)**	**F(E)**	**F(E)**	**F(E)**
12	Mockingbird Ln. & McDonald Dr.	4-way stop	NB shared	A(A)	A(B)	A(B)	A(B)
			SB left	B(B)	B(B)	B(B)	B(B)
			SB right	A(A)	A(B)	A(B)	A(B)
			EB left	A(A)	A(B)	A(B)	A(B)
			EB shared	B(B)	B(B)	B(B)	B(B)
			WB left	A(A)	A(A)	A(A)	A(A)
			WB shared	B(B)	B(B)	B(C)	B(C)
			Overall	**B(B)**	**B(B)**	**B(B)**	**B(B)**
13	Scottsdale Rd. & McDonald Dr.	(1)Signalized	NB left	D(D)	D(D)	D(D)	D(D)
			NB thru	C(D)	C(F)	C(F)	C(F)
			NB right	C(C)	C(C)	C(C)	C(C)
			SB left	C(D)	C(D)	C(D)	C(D)
			SB thru	D(D)	F(D)	F(D)	F(F)
			SB right	B(C)	B(C)	B(C)	B(C)
			EB left	D(D)	E(D)	E(D)	E(D)
			EB thru	E(E)	E(E)	E(E)	E(E)
			EB right	E(E)	E(E)	E(E)	E(E)
			WB left	F(F)	F(F)	F(F)	F(F)
			WB thru	D(D)	D(D)	D(D)	D(D)
			WB right	C(C)	C(C)	C(C)	C(D)
			Overall	**D(D)**	**D(E)**	**E(E)**	**E(E)**
A	Collector A & Indian Bend Rd.	Roundabout	NB shared	A(A)	A(A)	A(A)	A(A)
			EB shared	A(A)	A(A)	A(A)	A(A)
			WB shared	A(A)	A(A)	A(A)	A(A)
			Overall	**A(A)**	**A(A)**	**A(A)**	**A(A)**

(1) Final mitigation and operation conditions will be determined by the City of Scottsdale.

Table 15 – Future Peak Hour Levels of Service (Continued…..)

ID	Intersection	Traffic Control	Approach/ Movement	AM(PM) Peak Hour LOS			
				2018	2023	2028	2033
B	Garage Access & Indian Bend Rd.	1-way stop (SB)	NB shared WB left	-(-) -(-)	B(B) A(A)	B(B) A(A)	B(B) A(A)
C	Palmeraie Access & Indian Bend Rd.	1-way stop (SB)	NB shared WB left	-(-) -(-)	B(C) A(A)	B(C) A(A)	B(C) A(A)
D	Scottsdale Rd. & Palmeraie Access	(1)1-way stop (WB)	EB Right	-(-)	C(C)	C(C)	C(C)
E	Collector A & North Residential Access	1-way stop (EB)	NB shared EB shared	A(A) A(A)	A(A) A(A)	A(A) A(A)	A(A) A(A)
F	Collector A & Garage Access	1-way stop (WB)	SB shared WB shared	-(-) -(-)	A(A) A(A)	A(A) A(A)	A(A) A(A)
G	Collector A & Joshua Tree Ln.	1-way stop (WB)	SB shared WB shared	-(-) -(-)	A(A) A(A)	A(A) A(A)	A(A) A(A)
H	Collector A & Collector B	1-way stop (WB)	SB shared WB shared	-(-) -(-)	A(A) A(B)	A(A) A(B)	A(A) A(B)
I	Collector C & Collector B	1-way stop (SB)	SB shared WB shared	-(-) -(-)	A(C) A(A)	A(C) A(A)	A(C) A(A)
J	Hotel Access & Quail Run Rd.	1-way stop (WB)	SB shared WB shared	A(A) A(A)	A(A) A(B)	A(A) A(B)	A(A) A(B)
K	North Residential Access & Quail Run Rd.	Roundabout	NB EB WB	A(A) A(A) A(A)	A(A) A(A) A(A)	A(A) A(A) A(A)	A(A) A(A) A(A)
			Overall	**A(A)**	**A(A)**	**A(A)**	**A(A)**
L	Townhome Access & Quail Run Rd.	1-way stop (WB)	SB shared WB shared	A(A) B(A)	A(A) B(B)	A(A) B(B)	A(A) B(B)

(1) Final mitigation and operation conditions will be determined by the City of Scottsdale.

The results of the future analyses summarized in **Table 15** indicates that all study intersections within the Town of Paradise Valley operate acceptably except for the intersection of Tatum Boulevard/Lincoln Drive. Within the City of Scottsdale, most study intersections along Scottsdale Road are anticipated to experience elevated delays in one or more movements during the AM and/or PM peak hour. These intersections are discussed along with recommended mitigation strategies below. Final mitigation and operating conditions of intersections within the jurisdiction of the City of Scottsdale will be subject to approval by the City of Scottsdale.

The signalized intersection of site ***Tatum Boulevard and Lincoln Drive*** continues to experience elevated delays in some of its individual movements. Due to the general high traffic volumes using the intersection, right-of-way (ROW) acquisition would be required to mitigate the delay by installing additional through lanes. Lengthening the westbound right-turn lane is recommended if right-of-way can be acquired.

All other study intersections within the Town of Paradise Valley are anticipated to operate acceptably. It may be noted that a couple movements at the intersections of Mockingbird Lane/Lincoln Drive and Quail Run Road/Lincoln Drive are anticipated to experience elevated delays during the peak hours; however, elevated delays for a few individual movements at are not uncommon at signalized intersections of major roadways. A southbound right-turn lane at the intersection of ***Mockingbird Lane and Lincoln Drive*** is recommended to reduce southbound delays if right of way can be acquired.

Without mitigation, the signalized intersection of ***Scottsdale Road and Indian Bend Road*** continues to experience elevated delays in some of its individual movements. Mitigation could include signal timing adjustments and reconfiguring the eastbound approach to provide two left turn lanes, one through lane and a shared through-right turn lane. The reconfiguration will not require additional pavement width at the intersection and may be completed with the half-street improvements on Indian Bend Road. After the recommended mitigation, the intersection is anticipated to operate at acceptable LOS.

The improved condition of the intersection of ***Scottsdale Road and 6750 North*** is anticipated to operate acceptably overall. The improvements include constructing the north half of 6750 North, restriping the approach, modifying the Scottsdale Road median and striping to provide a second northbound left turn lane, add a northbound left-turn protected phase with an eastbound right-turn overlap, and appropriate signal phase timing adjustments. While the intersection improvements allow the intersection to operate acceptably overall, the eastbound left turn movement is anticipated to continue to operate with elevated delays during the peak hours. Final mitigation at this intersection will be determined by the City of Scottsdale.

The two-way stop controlled intersection of site ***Scottsdale Road and Joshua Tree Road*** continues to experience elevated delays. Poor LOS is not uncommon for stop controlled movements to major roadways. It should be noted that Synchro software does not allow HCM analysis left turn movements with more than one stage at four-legged intersections so actual delay may be better than analyzed. No mitigation is recommended.

Without mitigation, the intersection of site ***Scottsdale Road and Lincoln Drive*** continues to experience elevated delays in some of its individual movements. It is recommended to adjust the signal timing and add right-turn overlap periods, where applicable. The mitigation will improve the delay such that the intersection may operate acceptably, although some individual movements are still anticipated to operate with elevated delays during the peak hours.

The intersection of site ***Scottsdale Road and McDonald Drive*** continues to experience elevated delays in some of its individual movements. Due to the general high traffic volumes using the intersection, ROW acquisition would be required to mitigate the delays; however, this is not recommended as part of this study.

The mitigated intersection LOS for study intersections that have been adjusted with the recommended mitigation is summarized in **Table 16**. These mitigated conditions represent recommendations based on LOS. Factors such as signal progression and pedestrians should also be a consideration before final improvement strategies are determined by the applicable jurisdiction. The future lane configurations and traffic controls are depicted in **Figure 29** and **Figure 30**. The analysis reports for the 2033 mitigated conditions are included within **Appendix L**.

Table 16 – Future Peak Hour Levels of Service Mitigated

ID	Intersection	Traffic Control	Approach/ Movement	AM(PM) Peak Hour LOS	
				2033 w/o Mitigation	2033 w/Mitigation
4	Scottsdale Rd. & Indian Bend Rd.	Signalized	NB left	D(D)	D(D)
			NB thru	C(D)	A(C)
			NB right	B(B)	A(A)
			SB left	D(E)	D(E)
			SB thru	D(D)	D(D)
			SB right	D(D)	B(C)
			EB left	E(F)	E(D)
			EB thru	F(F)	E(E)
			EB right	D(D)	E(E)
			WB left	E(E)	E(E)
			WB thru	D(F)	C(E)
			WB right	B(B)	B(C)
			Overall	**D(E)**	**C(D)**
11	Scottsdale Rd. & Lincoln Dr.	Signalized	NB left	E(C)	D(E)
			NB thru	A(B)	B(B)
			NB right	A(C)	B(C)
			SB left	E(D)	D(E)
			SB thru	C(F)	E(E)
			SB right	C(D)	F(D)
			EB left/thru	F(F)	E(E)
			EB right	F(E)	D(D)
			WB left	E(E)	E(E)
			WB thru	E(E)	E(F)
			WB right	E(E)	E(F)
			Overall	**F(E)**	**D(D)**

An analysis was also performed for an alternative condition in which only a single northbound left-turn lane is provided at the intersection of Scottsdale Road and 6750 North. Should the City of Scottsdale not allow the second left-turn lane, the movement capacity would be decreased (comparatively), causing increased delay and queuing. For purposes of this study, one-third of the projected left-turn volume is no longer anticipated to turn here, but instead continue northbound on Scottsdale Road until turning left onto Indian Bend Road (65 vehicles during the AM peak hour and 106 vehicles during the PM peak hour). The intersections of Scottsdale Road and 6750 and Scottsdale Road and Indian Bend Road were analyzed using the methodologies previously explained, under the alternative conditions. **Table 17** presents the resulting LOS at the intersections. LOS worksheets are included in **Appendix M**. Final mitigation and operating conditions of intersections within the jurisdiction of the City of Scottsdale will be subject to approval by the City of Scottsdale.

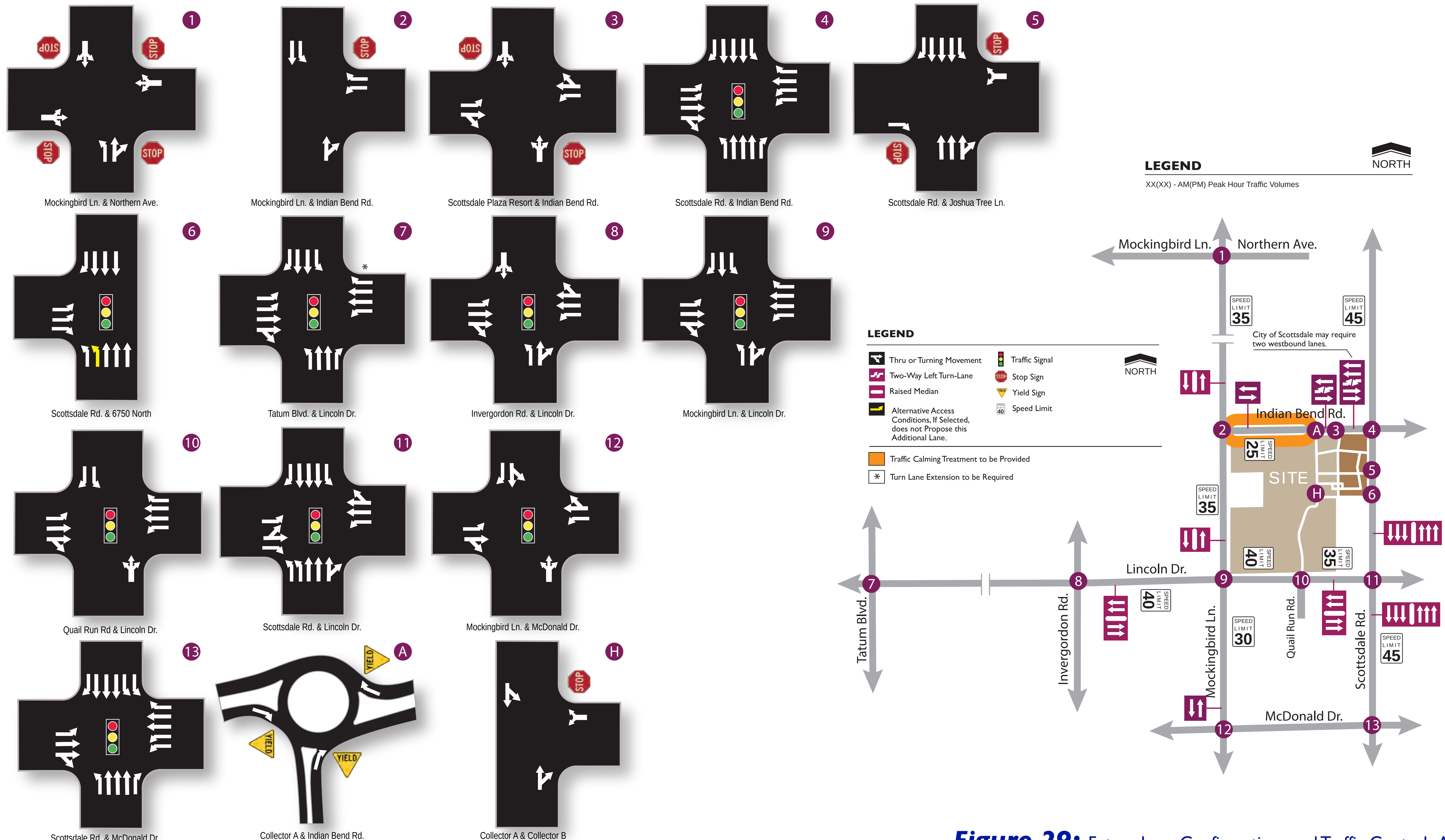


Figure 29: Future Lane Configurations and Traffic Controls A

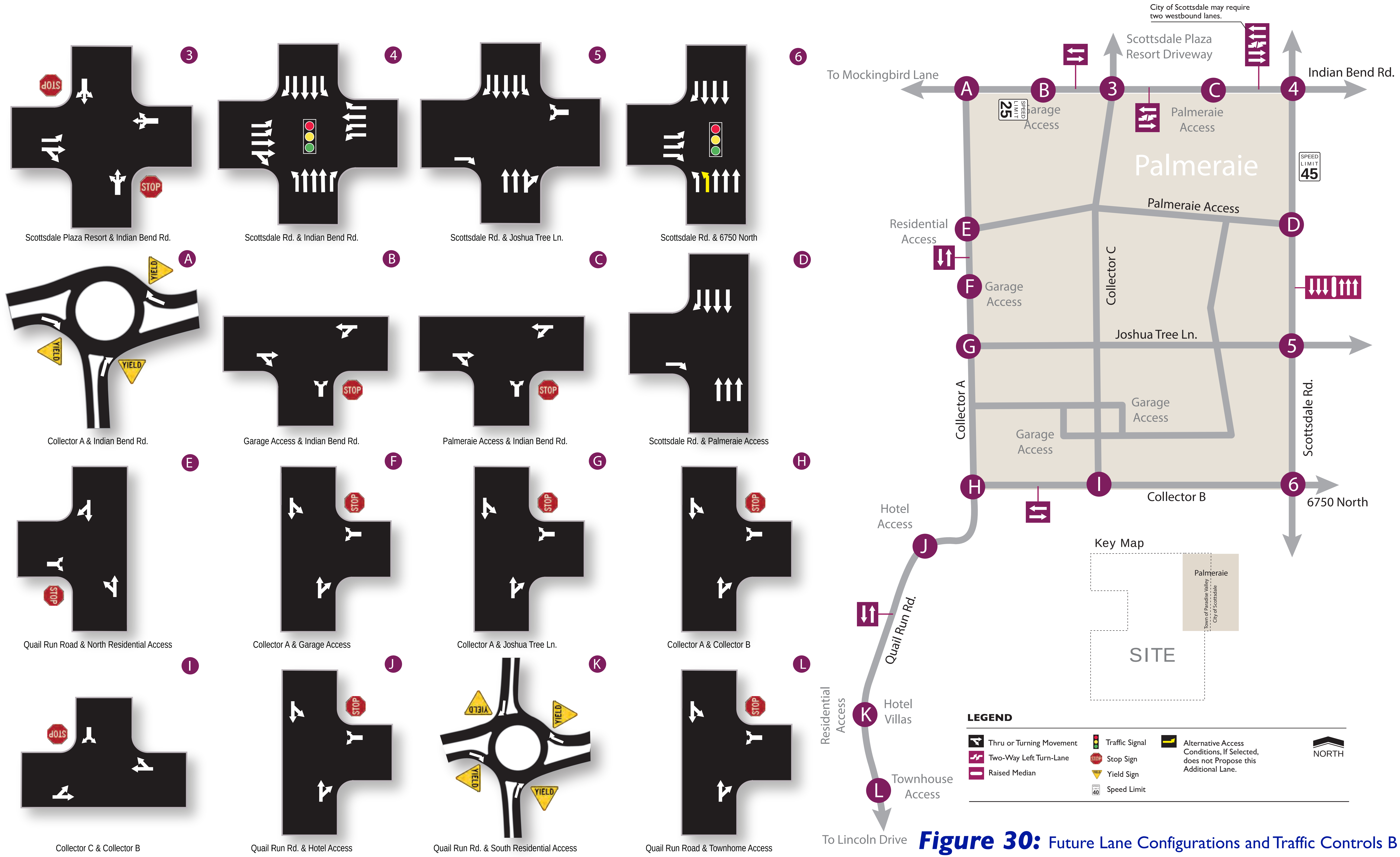


Figure 30: Future Lane Configurations and Traffic Controls B

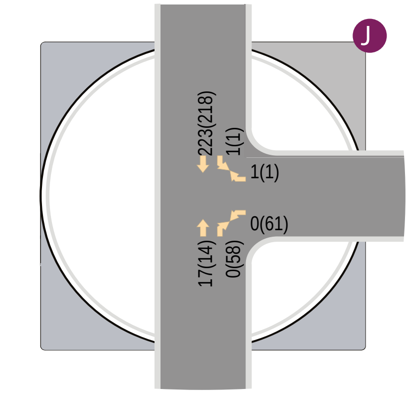
Table 17 – Alternative Peak Hour Levels of Service

ID	Intersection	Traffic Control	Approach/ Movement	AM(PM) Peak Hour LOS	
				2033 Proposed	2033 Alternative
4	Scottsdale Rd. & Indian Bend Rd.	Signalized	NB left	D(D)	D(D)
			NB thru	A(C)	A(C)
			NB right	A(A)	A(A)
			SB left	D(E)	D(E)
			SB thru	D(D)	D(D)
			SB right	B(C)	B(C)
			EB left	E(D)	E(D)
			EB thru	E(E)	E(E)
			EB right	E(E)	E(E)
			WB left	E(E)	E(E)
			WB thru	C(E)	C(E)
			WB right	B(C)	B(C)
			Overall	**C(D)**	**C(D)**
6	Scottsdale Rd. & 6750 North	Signalized	NB left	C(D)	C(D)
			NB thru	A(A)	A(A)
			SB thru	D(D)	B(C)
			SB right	B(B)	A(B)
			EB left	E(E)	E(E)
			EB right	C(C)	C(D)
			Overall	**C(C)**	**B(C)**

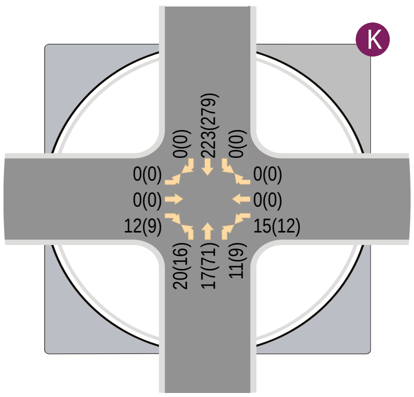
The peak hour analyses of the alternative access conditions (only a northbound left turn lane on Scottsdale Road approaching 6750 North) indicate that both the intersection of Scottsdale Road and Indian Bend Road and the intersection of Scottsdale Road and 6750 North are anticipated to operate with fairly similar LOS compared to the LOS anticipated with the proposed conditions. Final mitigation and operating conditions of intersections within the jurisdiction of the City of Scottsdale will be subject to approval by the City of Scottsdale.

An analysis was also performed for some of the intersections considering traffic during an event condition. From a separate parking study of the site, it was determined that 200 vehicles could participate in an event. These 200 vehicles (considering the exit condition) were distributed from the hotel according to the retail distribution discussed previously. The event exit condition will typically occur at night, not during the PM peak hour. For non-event traffic during the event exiting peak hour, PM peak hour traffic volumes were scaled down by 50 percent. This reduction was chosen because the 24-hour count on Lincoln Drive indicated that traffic volumes at 8:00 PM or later were less than 50 percent of the recorded peak hour traffic.

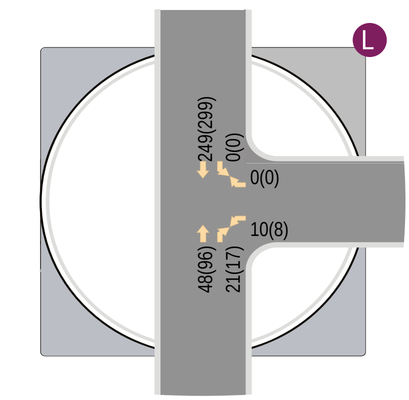
Projected total event peak hour volumes at selected intersections are depicted in **Figure 31**. These intersections were analyzed using the methodologies described previously. **Table 18** presents the resulting LOS at the intersections. LOS worksheets are included in **Appendix N**.



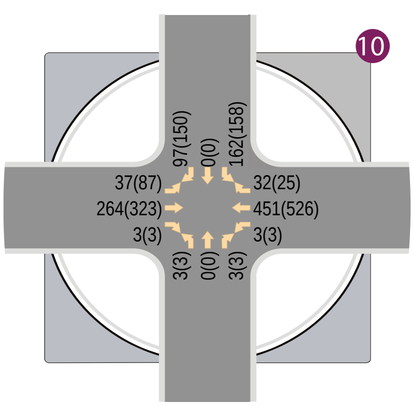
Quail Run Rd. & Hotel Access



Quail Run Rd. & South Residential Access



Quail Run Rd. & Townhome Access



Quail Run Rd & Lincoln Dr.

NORTH

LEGEND

XX(XX) - 2018(2033) - Peak Hour Volumes at Event End

Figure 31: Total Traffic at Event End

Table 18 – Event Peak Hour Levels of Service

ID	Intersection	Traffic Control	Approach/ Movement	Event LOS 2018	Event LOS 2033
10	Quail Run & Lincoln Dr.	Signalized	NB shared	D	D
			SB left/thru	E	E
			SB right	D	D
			EB left	A	A
			EB thru	A	A
			EB right	A	A
			WB left	A	A
			WB thru	A	B
			WB right	A	A
			Overall	**B**	**B**
J	Hotel Access & Quail Run Rd.	1-way stop (WB)	SB shared	A	A
			WB shared	A	A
K	North Residential Access & Quail Run Rd.	Roundabout	NB	A	A
			EB	A	A
			WB	A	A
			Overall	**A**	**A**
L	Townhome Access & Quail Run Rd.	1-way stop (WB)	SB shared	A	A
			WB shared	B	B

All intersections considered during the event scenario are anticipated to operate acceptably.

SIGNAL WARRANT ANALYSIS

The development proposes signalizing the intersection of Quail Run Road and Lincoln Drive, which is proposed as the main Ritz Carlton Resort site access by Phase 1 opening horizon year 2018. The projected 2018 traffic volumes at this intersection were compared to the peak hour signal warrant criteria, warrant 3, presented within the *2010 Manual on Uniform Traffic Control Devices (MUTCD), Section 4C.04.* The volumetric criteria to satisfy the warrant is based on the volumes entering the intersection on the major road (Lincoln Drive) and the larger approach of the minor street (Site Driveway at Quail Run Road). The traffic volumes presented in **Figure 21** indicates that the Lincoln Drive volume is sufficient such that the minor street approach volume need only surpass the lower threshold volume of 100 vehicles. As the 2018 AM peak hour volume of the southbound approach is 135 vehicles the intersection exceeds the threshold and therefore meets the peak hour signal warrant. Furthermore, the main Ritz Carlton driveway is anticipated to generate 247 vehicles during an event peak hour scenario. While other signal warrants may be met as well, meeting the peak hour warrant sufficiently justifies the installation of the signal proposed by the developer for purposes of this study.

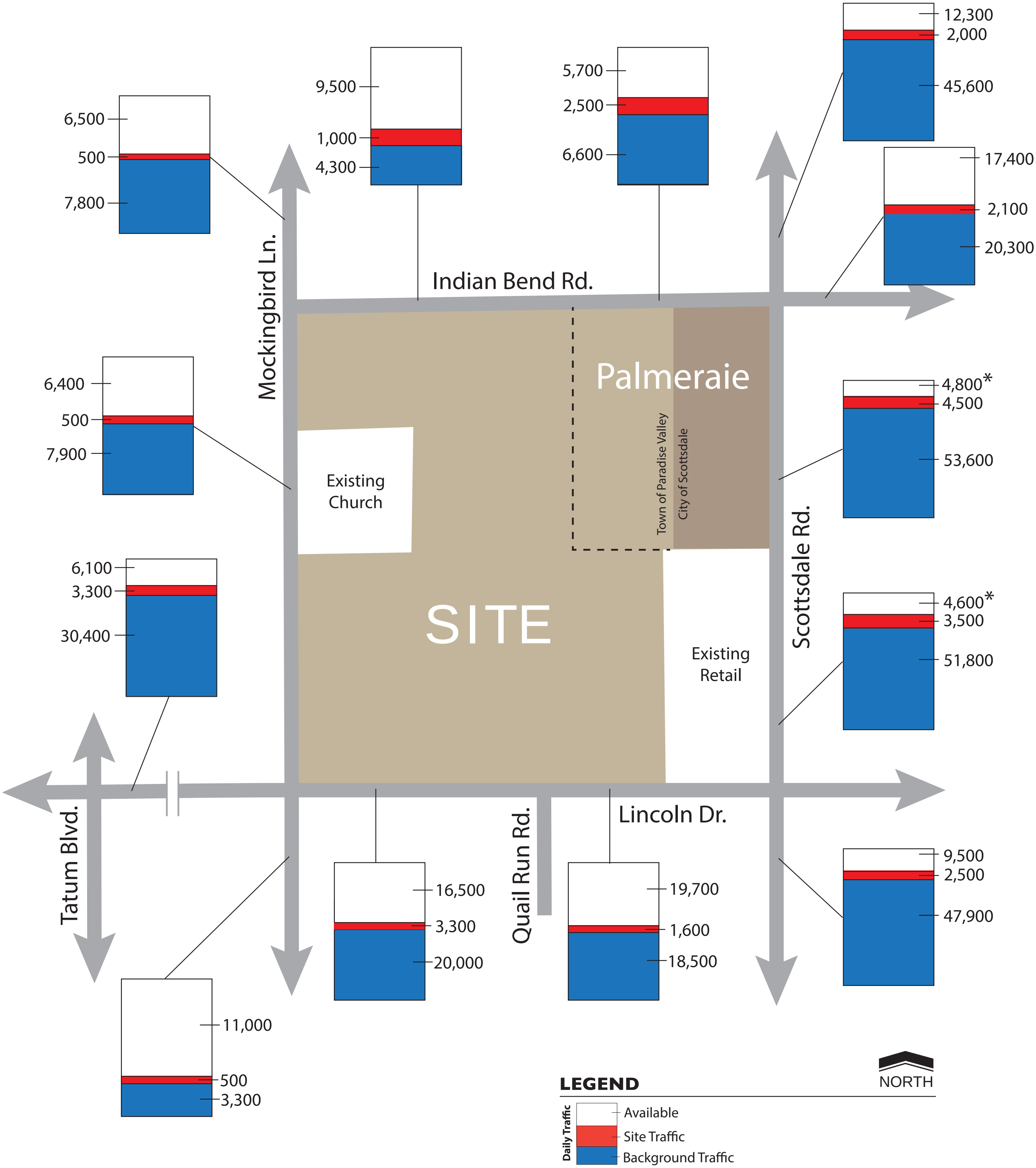
SEGMENT CAPACITY ANALYSIS

The site daily trips is added to the projected background ADT to produce total future ADT of the roadway segments. Projected ADT are presented in **Table 19**. Calculations are presented along with the ADT capacity according to Florida's Department of Transportation (FDOT). It should be noted that FDOT's LOS thresholds are more conservative than Paradise Valley's volume thresholds. For example, Paradise Valley thresholds consider Lincoln Drive's capacity to be 40,900 whereas FDOT's threshold is 39,800 (FDOT is known to be proactive in publishing traffic/transportation studies and data). All major roadways within the study area are anticipated to have traffic volumes below the maximum roadway capacity thresholds upon full buildout of the proposed site. The background, site and available volume capacity on several roadway segments are depicted on **Figure 32**. ADT calculations are included within **Appendix O**

Table 19 – 24-Hour Segment Traffic Volumes

Roadway	Reference	Site ADT		Total ADT				Capacity
		2018	2023+	2018	2023	2028	2033	
Scottsdale Rd.	North of Indian Bend Road	300	2,000	42,500	45,500	56,500	47,600	59,900
Scottsdale Rd.	Between Indian Bend Rd. & Lincoln Dr.	700	4,500	50,800	55,800	56,900	58,100	62,900(1)
Scottsdale Rd.	Between Lincoln Dr. & McDonald Dr.	600	3,500	48,900	53,000	54,100	55,300	59,900
Scottsdale Rd.	South of McDonald Dr.	500	2,500	45,100	48,300	49,300	50,400	59,900
Mockingbird Ln.	Between Indian Bend Rd. & Lincoln Dr.	400	500	7,700	8,000	8,200	8,400	14,800
Indian Bend Rd.	East of Scottsdale Rd.	700	2,100	19,600	21,600	22,000	22,400	39,800
Lincoln Dr.	East of Tatum Blvd.	2,000	3,300	30,200	32,500	33,100	33,700	39,800
Lincoln Dr.	West of Quail Run Rd.	2,000	3,300	20,500	22,600	22,900	23,300	39,800
McDonald Drive	East of Scottsdale Rd.	200	900	20,300	21,500	22,000	22,500	39,800

(1) FDOT applies a 5% increase for having right-turn lanes.



* Higher Capacity when Right-Turn Lanes are Considered.

Figure 32: Used and Available Roadway Capacity

QUEUING ANALYSIS

RIGHT TURN LANES

Paradise Valley lists the following criteria for consideration of a right turn lane. Three of the four criteria must be met to warrant a right turn lane.

- Adjacent street has at least 5,000 vpd.
- The posted speed limit is 35 mph or greater.
- At least 1,000 vehicles per day will use the driveway.
- At least 90 vehicles are expected to make right turns into the driveway.

Based on these criteria, a right turn lane is warranted at the intersection of Quail Run Road and Lincoln Drive approaching westbound, which the Developer proposes. The developer will also construct a westbound approaching right turn lane on Lincoln Drive approaching Mockingbird Lane, which also meets the above criteria.

Table 20 presents the right-turn queue lengths recommended by the volumes anticipated in the 2033 horizon year. Additional storage length calculations should be completed prior to traffic signal installation or a change in intersection stop control that are not considered within this study.

LEFT TURN STORAGE ANALYSIS

All accesses where a left-turn movement into the site is allowed has a left-turn lane or two-way left-turn lane provided, with the exception of the roundabout access on Indian Bend Road.

TURN LANE STORAGE LENGTHS

A queuing analysis for left turns was performed for all intersection turn lanes under stop or signal control within the study area, according the 2033 Synchro analyses which provides projected 95th percentile queue lengths. The resulting turn lane storage recommendations for the 2033 horizon year are summarized in **Table 20**. Synchro queuing reports are included within **Appendix L**.

Table 20 – 2038 Turn Lane Lengths

ID	Intersection	Control	Movement	AM(PM) LOS		
				Existing[1]	Synchro	Recommended
4	Scottsdale Rd. & Indian Bend Rd.	Signalized	NB left	235’	111’	[3]235’
			SB left	205’	248’	250’
			EB left	95’	[2]101’	[2]100’
			WB left	[2]260’	[2]373’	[4]260’
			NB right	210’	95’	[5]210’
			SB right	-	20’	[5]150’
			WB right	265’	99’	[3]265’
6	Scottsdale Rd. & 6750 North	Signalized	NB left	95’	[2]96’	[6]115’
			EB left	55’	[2]92’	[2][3]150’
			SB right	100’	58’	[5][7]150’
			EB right	55’	264’	275’
9	Mockingbird Ln. & Lincoln Dr.	Signalized	NB left	80’	41’	[3]80’
			SB left	135’	116’	[3]135’
			EB left	150’	368’	[5][8]350’
			WB left	95’	63’	[3]95’
			SB right	-	167’	175’
10	Quail Run Rd. & Lincoln Dr.	Signalized	EB left	-	113’	[5]150’
			WB left	TWLTL[9]	7’	[5]150’
			WB right	-	12’	[5]150’

(1) Striped length from stop bar, measured using aerial photographs, rounded to the nearest 5-feet.
(2) Dual turn lanes. Measurements and calculations are for the length of each turn lane.
(3) Existing queue storage provides sufficient space for future volumes.
(4) Turn lane cannot be extended due to prior turn lane.
(5) Maximum queue length is set at 350’ for signalized intersections and 75’ minimum storage length for unsignalized intersections. A minimum of 150’ is recommended for new turn lanes.
(6) Approximately 115’ of dual queue storage may be constructed if the existing 110-foot gap is reduced to 90 feet during modification of the median and striping.
(7) Existing storage length will be reduced with completion of the intersection, recommend extending the storage length to 150 feet.
(8) Extension of turn lane will require removal of a center median.
(9) Existing or proposed two-way left turn lane.

The new turn lanes at the intersection of Quail Run Road and Lincoln Drive are recommended to be striped with 150-feet of storage each. The proposed northbound dual left-turn lanes at the intersection of Scottsdale Road and 6750 North are able to be constructed with approximately 115-feet of storage each, which is more storage than the Synchro analysis predicts. The southbound right-turn lane at the intersection is will need to be increased when the intersection is completed; 150 feet of storage is recommended.

The westbound left-turn lane at the intersection of Mockingbird Lane and Lincoln Drive is projected to require additional storage due to residential traffic volumes. It is recommended that the turn lane be extended to provide 350-feet of storage which will require the removal of a center median. The new south- and westbound right-turn lanes at the intersection are recommended to provide 175 feet and 150 feet of storage, respectively.

Should only a single northbound left turn lane be provided at the intersection of Scottsdale Road and 6750 North, Synchro's 95th percentile queue projection for the turn lane is 132 feet; in the same scenario, the projected 95th percentile queue for the northbound left turn lane on Scottsdale Road approaching Indian Bend Road is 309 feet. This intersection, in addition to the westbound left-turn queue, will be analyzed further as part of the update to the Palmeraie TIA as requested by the City of Scottsdale with the updated Palmeraie site plan. Final mitigation at these intersections will be determined by the City of Scottsdale.

SITE DISTANCE ANALYSIS

There must be sufficient unobstructed sight distance along both approaches of an intersection and across their included corners to allow operators of vehicles to see each other in time to prevent a collision. The sight triangle is the area encompassed by the line of sight from a stopped vehicle on the minor roadway to the approaching vehicle on the major roadway.

An intersection site distance analysis was performed to set guidelines for establishing line of sight for the proposed development at major internal intersections. Using the guidelines set forth by *A Policy on Geometric Design of Highways and Streets*, **Table 21** was generated for each intersection created by a new site access point.

A major component of calculating sight distance is vehicle travel speed. For this analysis, the following speeds were assumed for each roadway based on their functional classification.

- Scottsdale Road 50 mph Principal Arterial
- Lincoln Drive 45 mph Major Arterial
- Indian Bend Road 35 mph Minor Collector

Table 21 – Intersection Sight Distance Analysis

Site Access	Required Sight Dist. Left (ft)	Required Sight Dist. Right (ft)	Existing Sight Dist. Left (ft)	Existing Sight Dist. Right (ft)
At Lincoln Drive	505	570	1000+	1000+
At Indian Bend Drive	395	445	1000+	1000+
At Scottsdale Road	560	635	1000+	1000+

There are no existing obstructions to sight distance within the project intersections or along the included corners of the existing intersections. Adequate sight distance must be provided at the intersections to allow safe left and right turning movements from the development. Recommended distances for these movements can be found in the table above.

Sight distance is largely based on the design speed of the roadway. When the posted speed limit is reduced, the required sight distance will also be reduced as a result. Sight distance calculations are included within **Appendix P**.

CONCLUSIONS AND RECOMMENDATIONS

The following recommendations have been documented in this study:

General

- This study evaluates four (4) horizon years, opening year (2018), opening plus five (2023), opening plus ten (2028) and opening plus fifteen (2033). The future study horizon years were analyzed to ensure that future off-site impacts were constructed with the current plan.
- Per the collision data reviewed there are no major mitigation measures currently warranted within the vicinity of the site. It should be noted that the intersections of **Tatum Boulevard & Lincoln Drive** and **Scottsdale Road & Indian Bend Road** recorded a high number of rear-end crashes relative to crash type. Due to this occurrence, it is recommended that these intersections be further evaluated by the Town.
- The future lane configurations and traffic controls are depicted in **Figure 29** and **Figure 30**.
- The developer proposes signalizing the intersection of Quail Run Road and Lincoln Drive. The intersection is anticipated to exceed the peak hour signal warrant criteria in the 2018 opening year.
- Projected ADT are presented in **Table 19**. All major roadways within the study area are anticipated to have traffic volumes below the maximum roadway capacity thresholds upon full buildout of the proposed site. The background, site and available volume capacity on several roadway segments are depicted on **Figure 32**.
- An intersection site distance analysis was performed to set guidelines for establishing line of sight for the proposed development at major internal intersections. Using the guidelines set forth by A Policy on Geometric Design of Highways and Streets, **Table 21** was generated for each intersection created by a new site access point.

Roadway Improvements

- The developer will construct half-street improvements to Indian Bend Road from Scottsdale Road to approximately 600 feet to the west. This improvement will provide a two-way left-turn lane (TWLTL) on Indian Bend Road along the improved length. The remainder of Indian Bend Road is currently constructed at its ultimate condition.
- It is likely that the City of Scottsdale will require the addition of a second westbound through lane along Indian Bend Road. This determination will be made by the City of Scottsdale during their review of the Palmeraie TIMA.

- The developer will improve the intersection of Scottsdale Road and 6750 North. The west leg after improvements will consist of two (2) dedicated left-turn lanes, a dedicated right-turn lane and two (2) ingress lanes. The median within the south leg of the intersection will be modified and the northbound lanes restriped to provide two dedicated left-turn lanes and three (3) through lanes. An alternative improvement condition is proposed should the City of Scottsdale not allow dual northbound left turn lanes. Final geometry and mitigation is subject to approval by the City of Scottsdale. Improvements at this intersection could require the relocation of overhead improvements and other utilities.

- The developer proposes to signalize the intersection of Quail Run Road and Lincoln Drive, which will serve as the main entrance to the proposed Ritz Carlton Resort, by opening year 2018. Based on the signal warrant section within this report *2010 MUTCD* signal warrant criteria is met at the main Ritz Carlton entrance by opening year 2018. Signalization at this intersection will require removal of the nearest median (west of the intersection) and also require the developer to construct new medians.

- The developer has agreed to construct a westbound right-turn lane at the intersection of Lincoln Drive and Mockingbird Lane by opening year 2018. The installment of the westbound right-turn lane will improve the traffic characteristics of this intersection. This may require the relocation of the traffic signal and red light cameral on the affected corner.

- If right-of-way is available, the developer should construct a southbound right-turn lane at the intersection of Lincoln Drive and Mockingbird Lane. The installment of the southbound right-turn lane will improve the delay for southbound vehicles with the likely growth in traffic along Lincoln Drive. This will require relocation of the traffic signal on the affected corner.

- As part of planned regional improvements, the Town of Paradise Valley plans to install a raised median on Mockingbird Lane between Lincoln Drive and Northern Avenue between the financial years of 2018 and 2029. This improvement is not anticipated to cause major changes to current traffic patterns.

- The intersection of Mockingbird Lane and Indian Bend Road was evaluated as a one-way stop controlled intersection which continues to meet acceptable levels of service during the study horizon. Input from neighbors indicates a concern for increased delay at this intersection and a possible need to keep traffic flowing in all directions. Optional intersection treatments should be considered in the future.

- The traffic circle located at Intersection A should be evaluated for alternate pavement treatment. The existing pavers are difficult for a bicycle to negotiate.

- Indian Bend Road may require traffic calming elements to be installed between the traffic circle (Intersection A) and Mockingbird Lane if traffic from Palmeraie is prioritized to use Indian Bend Road. The determination to prioritize Indian Bend could be made by the City of Scottsdale during their review of the Palmeraie TIMA. Options for traffic calming that can be applied in areas with high pedestrian and bicycle volumes have been discussed within the TIA. Traffic calming options are discussed within the main body of this TIA.

Trip Generation

- Phase 1 (opening 2018) of the development is anticipated to generate 3,794 daily trips, of which 384 trips are during the AM peak hour and 353 trips are during the PM peak hour.

- Phase 2 (Buildout horizon year 2023) of the development is anticipated to generate a total of 14,710 daily trips, of which 729 trips are during the AM peak hour and 1,303 trips are during the PM peak hour. It was calculated that approximately 20% of total trips are expected to remain internal to the site. Considering the 20% internal capture reduction, 11,768 new daily trips are anticipated with 583 AM peak hour trips and 1,042 PM peak hour trips.

Intersection Capacity Analysis

- The results of the existing analysis summarized in **Table 4** indicate that all study intersections should operate at overall acceptable level of service (LOS D or better) with the exception of Scottsdale Road/Joshua Tree Road. The signalized intersections of Scottsdale Road/Indian Bend Road, Scottsdale Road/Joshua Tree Road, Scottsdale Road/6750 North, Tatum Boulevard/Lincoln Drive, Mockingbird Lane/Lincoln Drive, Scottsdale Road/Lincoln Drive, Scottsdale Road/McDonald Drive operate at acceptable LOS overall but have one or more movements that experience elevated delay during AM and/or PM peak hour.
    - The southbound left and westbound shared movements at the intersection of ***Scottsdale Road and Joshua Tree Road*** experience elevated delays during the peak hours. Elevated movement delays at stop controlled intersections with major roadways is not uncommon.

- The results of the future analyses summarized in **Table 15** indicate that all study intersections within the Town of Paradise Valley operate acceptably except for the intersection of Tatum Boulevard/Lincoln Drive. Within the City of Scottsdale, most study intersections along Scottsdale Road are anticipated to experience elevated delays in one or more movements during the AM and/or PM peak hour. These intersections are discussed along with recommended mitigation strategies below. Final mitigation and operating conditions of intersections within the jurisdiction of the City of Scottsdale will be subject to approval by the City of Scottsdale.

- The signalized intersection of site ***Tatum Boulevard and Lincoln Drive*** continues to experience elevated delays in some of its individual movements. Due to the general high traffic volumes using the intersection, right-of-way (ROW) acquisition would be required to mitigate the delay by installing additional through lanes. Lengthening the westbound right-turn lane is recommended if right-of-way can be acquired.

- All other study intersections within the Town of Paradise Valley are anticipated to operate acceptably. It may be noted that a couple movements at the intersections of Mockingbird Lane/Lincoln Drive and Quail Run Road/Lincoln Drive are anticipated to experience elevated delays during the peak hours; however, elevated delays for a few individual movements at are not uncommon at signalized intersections of major roadways. A southbound right-turn lane at the intersection of ***Mockingbird Lane and Lincoln Drive*** is recommended to reduce southbound delays if right of way can be acquired.

- Without mitigation, the signalized intersection of site ***Scottsdale Road and Indian Bend Road*** continues to experience elevated delays in some of its individual movements. Mitigation could include signal timing adjustments and reconfiguring the eastbound approach to provide two left turn lanes, one through lane and a shared through-right turn lane. The reconfiguration will not require additional pavement width at the intersection and may be completed with the half-street improvements on Indian Bend Road. After the recommended mitigation, the intersection is anticipated to operate at acceptable LOS.

- The improved condition of the intersection of ***Scottsdale Road and 6750 North*** is anticipated to operate acceptably overall. The improvements include constructing the north half of 6750 North, restriping the approach, modifying the Scottsdale Road median and striping to provide a second northbound left turn lane, add a northbound left-turn protected phase with an eastbound right-turn overlap, and appropriate signal phase timing adjustments. While the intersection improvements allow the intersection to operate acceptably overall, the eastbound left turn movement is anticipated to continue to operate with elevated delays during the peak hours. Final mitigation at this intersection will be determined by the City of Scottsdale.

  - The peak hour analyses of the alternative access conditions (only a single northbound left turn lane on Scottsdale Road approaching 6750 North) indicate that both the intersection of Scottsdale Road and Indian Bend Road and the intersection of Scottsdale Road and 6750 North are anticipated to operate with fairly similar LOS compared to the LOS anticipated with the proposed conditions.

- o The two way stop controlled intersection of site ***Scottsdale Road and Joshua Tree Road*** continues to experience elevated delays. Poor LOS is not uncommon for stop controlled movements to major roadways. It should be noted that Synchro software does not allow HCM analysis left turn movements with 2-stages so actual delay may be better than analyzed. No mitigation is recommended.

- o Without mitigation, the intersection of site ***Scottsdale Road and Lincoln Drive*** continues to experience elevated delays in some of its individual movements. It is recommended to adjust the signal timing and add right-turn overlap periods, where applicable. The mitigation will improve the delay such that the intersection may operate acceptably, although some individual movements are still anticipated to operate with elevated delays during the peak hours. Any phasing adjustments, including the additional of a right-turn overlap phase, will require the approval of the City of Scottsdale.

- o The intersection of site ***Scottsdale Road and McDonald Drive*** continues to experience elevated delays in some of its individual movements. Due to the general high traffic volumes using the intersection, ROW acquisition would be required to mitigate the delays; however, this is not recommended as part of this study.

- The peak hour analyses of the alternative access conditions (only a single northbound left turn lane on Scottsdale Road approaching 6750 North) indicate that both the intersection of Scottsdale Road and Indian Bend Road and the intersection of Scottsdale Road and 6750 North are anticipated to operate with fairly similar LOS compared to the LOS anticipated with the proposed conditions. Final mitigation and operating conditions of intersections within the jurisdiction of the City of Scottsdale will be subject to approval by the City of Scottsdale.

- All intersections considered during the event scenario are anticipated to operate acceptably.

<u>Queue Storage Lengths</u>

- Turn lane storage recommendations for the 2033 horizon year are summarized in **Table 20**. The new turn lanes at the intersection of Quail Run Road and Lincoln Drive are recommended to be striped with 150-feet of storage each. The proposed northbound dual left-turn lanes at the intersection of Scottsdale Road and 6750 North are able to be constructed with approximately 115-feet of storage each, which is more storage than the Synchro analysis predicts. The southbound right-turn lane at the intersection is will need to be increased when the intersection is completed; 150 feet of storage is recommended.

- The westbound left-turn lane at the intersection of Mockingbird Lane and Lincoln Drive is projected to require additional storage due to residential traffic volumes. It is recommended that the turn lane be extended to provide 350-feet of storage which will require the removal of a center median. The new south- and westbound right-turn lanes at the intersection are recommended to provide 175 feet and 150 feet of storage, respectively.

- Should only a single northbound left turn lane be provided at the intersection of Scottsdale Road and 6750 North, Synchro's 95th percentile queue projection for the turn lane is 132 feet; in the same scenario, the projected 95th percentile queue for the northbound left turn lane on Scottsdale Road approaching Indian Bend Road is 309 feet. This intersection, in addition to the westbound left-turn queue, will be analyzed further as part of the update to the Palmeraie TIA as requested by the City of Scottsdale with the updated Palmeraie site plan. Final mitigation at these intersections will be determined by the City of Scottsdale.

LIST OF REFERENCES

A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials, Washington, D.C., 2011.

Design and Safety of Pedestrian Facilities, Institute of Transportation Engineers, Washington, D.C., March 1998.

Highway Capacity Manual. Transportation Research Board, National Research Council, Washington, D.C., 2010.

Manual of Uniform Traffic Control Devices. U.S. Department of Transportation, Federal Highways Administration, Washington, D.C., 2009.

Mountain Shadows Traffic Impact Analysis (TIA), CivTech, Scottsdale, AZ, June 2007

Trip Generation 9th Edition, Institute of Transportation Engineers, Washington, D.C, 2012.

NPTS Urban Travel Patterns Report, Federal Highway Administration, McLean VA, December 1994.

Ritz Carlton Traffic Impact Analysis (TIA), CivTech, Scottsdale, AZ, November 2007

Palmeraie Traffic Impact and Mitigation Analysis (TIMA), CivTech Inc., Scottsdale, AZ, April 2009.

TECHNICAL APPENDIX

APPENDIX A

REVIEW COMMENTS

LEE ENGINEERING

ARIZONA
TEXAS
NEW MEXICO
OKLAHOMA

Registered Professional Engineer (Civil)
CERTIFICATE NO.
38915
PAUL A.
GUZEK
Date Signed 9/15/15
ARIZONA, U.S.A.
EXPIRES 3-31-18

September 15, 2015

Mr. James Shano, P.E., C.M.P.
Public Works Director/Town Engineer
Assistant to the Town Manager for Strategic Planning
Town of Paradise Valley
6401 East Lincoln Drive
Paradise Valley, Arizona 85253-4328

RE: Lee Engineering Review of the Ritz Carlton Resort Traffic Impact Analysis (TIA) by CivTech dated August, 2015 – 2nd submittal

Dear Mr. Shano:

I have reviewed the 2nd submittal to the Ritz Carlton Resort TIA report to determine whether the information presented in it meets the Town of Paradise Valley's guidelines set forth for this project, the Town Council Statement of Direction, and first review comments. In addition, I reviewed any engineering analysis and improvement details that were provided based on Town, City of Scottsdale, or MAG Standard Details.

The 2nd submittal report for the Ritz Carlton site has not be evaluated in great detail, but has been reviewed to a sufficient level to analyze site access conditions and impacts to the Town roadways. The accompanying Ritz Carlton Property Parking Analysis has not been reviewed. The following comments are presented based on my review of the traffic impact report:

General Comments

1. The report has addressed all of the original TIA comments in a satisfactory manner.
2. Throughout the report LOS E or F operation is identified as having "delay". A more appropriate term would be "elevated delay", and are locations where mitigation alternatives should be evaluated to permit acceptable traffic operations. It is noted, however, that many movements along the Scottsdale Road corridor intersections operate with elevated delay during the AM and PM peak hours, even without the added traffic impact of the proposed Ritz Carlton.

Technical Review Comments

1. The total traffic volumes indicated for the "2023 total traffic volume conditions" do not appear to be presented appropriately. The report indicates the total traffic (Figure 23) should be the sum of site traffic (Figure 11) plus background traffic (Figure 15). For example, Intersection #6 in the PM peak hour, the inbound northbound left-turn volume should equal 316 vehicles (153 plus 163) but is shown as 156 vehicles. Traffic volumes for other movements/intersections also appear not to be added properly. It does appear, however, the volumes utilized in the capacity analysis conducted for the 2023 total traffic condition has utilized appropriate turn volumes.
2. The 2023 capacity analysis shows Intersection #6 (Scottsdale Road and 6750 North) to be analyzed in an improved state with dual northbound left-turn lanes (existing condition is a single northbound

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left-turn lane) operating with permissive-only left-turn phasing. This is not an operational condition that is typically utilized due to safety concerns, although it is found at a few select locations throughout the Valley. This phasing should be confirmed with the City of Scottsdale to determine if it would be allowed. Even under this scenario, the northbound left-turn movement into the site shows LOS F operation (PM peak hour). The report identifies LOS mitigation for this movement to include permissive plus protected left-turn phasing, which may or may not be permitted by the City of Scottsdale.

3. Mitigation at the intersection of Scottsdale Road and 6750 North identifies converting the single northbound left-turn lane to dual turn lanes and to maximize the left turn storage length (total dual lane storage about 220 feet, currently about 100 feet). As indicated, this will increase storage capacity but will not accommodate the projected storage needed. Under this scenario, vehicles waiting to turn left into the site could extend into the northbound through travel lane creating a safety issue. Analysis should identify the maximum number of vehicles that could be accommodated at this location then re-assign the remaining vehicles to other travel paths to access the site (northbound left-turn movement at Lincoln Drive or Indian Bend Road) to determine potential LOS and storage lane impacts at these locations due to the increased volumes. Secondary impacts may be realized through this re-assignment, such as the extension of the southbound right-turn lane storage area into the site at Quail Run Road or extension of the northbound left-turn lane at Indian Bend Road.
4. Mitigation as stated in the report at the Scottsdale Road / 6750 North intersection will require traffic signal and likely overhead utility improvements. The City of Scottsdale should be consulted for the operational conditions to be permitted at this location.
5. The report states all Paradise Valley study intersections, except for the Tatum Boulevard and Lincoln Drive intersection, are anticipated to operate acceptably in the future. This appears to be a true statement, although some individual movements, such as the southbound approach to Lincoln Drive from Mockingbird Lane, will operate at LOS E/F in the AM and/or PM peak hours, as indicated in the report. To improve the poor operating side street movements, intersection widening would be required which may or may not be feasible or appropriate.
6. Mitigation at the intersection of Scottsdale Road and Lincoln Drive is offered via modification of the green splits to favor the higher volume movements. This may or may not be appropriate mitigation, depending upon impact to vehicle queue length conditions and pedestrian considerations.
7. Any half-street improvements to the eastbound Indian Bend Road approach to Scottsdale Road should include the mitigation identified in the report (Figure 29) as well as considering any secondary improvement for increasing the northbound left-turn storage or capacity, if required, based on additional analysis at the Scottsdale Road/6750 North intersection.
8. Mitigation at the intersection of Mockingbird Lane and Lincoln Drive to install a westbound right-turn lane also appears to require relocation of red light camera equipment and traffic signal equipment that is located at the northeast corner of intersection.
9. The report indicated the site driveway on Lincoln Drive at the Quail Run Road alignment will meet MUTCD traffic signal installation warrants and operate at acceptable service levels. Typically, quarter-mile traffic signals are not favorable to traffic progression. To best accommodate through traffic along Lincoln Drive, the Town should strive to minimize the green time provided to the side street movements and minimize any protected eastbound to northbound left-turn phasing.
10. Table 19 of the report incorrectly identifies the intersection as STOP-controlled and a 150-foot eastbound left-turn lane appropriate (Synchro queue length results were not an output result provided in the appendix). Based on 2033 PM peak hour traffic volumes of 174 vehicles and a 130-second cycle length, a 200-foot turn bay would be more reasonable.

Conclusions

The TIA has identified a number of issues that the Ritz Carlton site is expected to generate, which any development fronting Scottsdale Road would create. The Town should consult with the City of Scottsdale regarding the signal operation/phasing of the Scottsdale/6750 North intersection to best accommodate site traffic demand. Depending upon the signal operation permitted, additional mitigation may be needed at adjacent intersection locations along Scottsdale Road to accommodate increased turn movement volumes. Mitigation identified by the TIA along Indian Bend Road appears to be appropriate to maximize the eastbound approach cross-section to Scottsdale Road. Improvements at the site driveway onto Lincoln Drive appear to be appropriate.

Closure

If a further discussion of these comments/conclusions is needed, I can be reached at (602) 955-7206 or by e-mail at pguzek@lee-eng.com.

Respectfully submitted,

Paul Guzek

Paul Guzek, PE, PTOE

Lee Engineering, LLC

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
General Comments					
1.	Paul Guzak-Lee Engineering	General	n/a	The report has addressed all of the original TIA comments in a satisfactory manner.	This comment provides informational to the Town/developer with no indication of a required change in the TIA. A response is not required.
2.	Paul Guzak-Lee Engineering	General	1	Throughout the report LOS E or F operation is identified as having “delay”. A more appropriate term would be “elevated delay”, and are locations where mitigation alternatives should be evaluated to permit acceptable traffic operations. It is noted, however, that many movements along the Scottsdale Road corridor intersections operate with elevated delay during the AM and PM peak hours, even without the added traffic impact of the proposed Ritz Carlton.	Applicable instances of having "delay" changed to having "elevated delay"
Technical Review Comments					
1.	Paul Guzak-Lee Engineering	Figure 23 (p. 53)	1	The total traffic volumes indicated for the “2023 total traffic volume conditions” do not appear to be presented appropriately. The report indicates the total traffic (Figure 23) should be the sum of site traffic (Figure 11) plus background traffic (Figure 15). For example, Intersection #6 in the PM peak hour, the inbound northbound left-turn volume should equal 316 vehicles (153 plus 163) but is shown as 156 vehicles. Traffic volumes for other movements/intersections also appear not to be added properly. It does appear, however, the volumes utilized in the capacity analysis conducted for the 2023 total traffic condition has utilized appropriate turn volumes.	The figures printed and collated within the physical report are not the correct, updated figures. The figures within the electronic version were correct (which was included within the submittal on a CD). The most recent figures are now included.

Reviewed Date: 8/16/2015
CivTech Received Date: 8/17/2015
CivTech Entered Date: 8/19/2015
CivTech Response Date: 9/15/2015

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
2.	Paul Guzak-Lee Engineering	pp. 59, 63 & 66-67	1	The 2023 capacity analysis shows Intersection #6 (Scottsdale Road and 6750 North) to be analyzed in an improved state with dual northbound left-turn lanes (existing condition is a single northbound left-turn lane) operating with permissive-only left-turn phasing. This is not an operational condition that is typically utilized due to safety concerns, although it is found at a few select locations throughout the Valley. This phasing should be confirmed with the City of Scottsdale to determine if it would be allowed. Even under this scenario, the northbound left-turn movement into the site shows LOS F operation (PM peak hour). The report identifies LOS mitigation for this movement to include permissive plus protected left-turn phasing, which may or may not be permitted by the City of Scottsdale.	The recommendation is based on similar phasing situations, such as at the intersection of Scottsdale Road & McDowell Road (one of the study intersections) which has permitted and protective left turn phasing for the EB (single) & WB (dual) left turn movements. Synchro predicts that the delay and queue length will be greater with only protected phasing; however, CivTech agrees that the City of Scottsdale will determine signal configuration and phasing. The previously analyzed condition evaluates the turn lane to operate at 56 seconds of delay per average vehicle, or LOS E. The phase split was previously assigned by synchro's automatic formulas without adjustment by the analyst, resulting in a 12 second phase (including 4 seconds of yellow and all-red intervals). The analysis now considers a split of 20 seconds. The study now also includes an alternative analysis should the city of Scottsdale not allow the 2nd northbound left-turn lane.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
3.	Paul Guzak-Lee Engineering	p. 72	1	Mitigation at the intersection of Scottsdale Road and 6750 North identifies converting the single northbound left-turn lane to dual turn lanes and to maximize the left turn storage length (total dual lane storage about 220 feet, currently about 100 feet). As indicated, this will increase storage capacity but will not accommodate the projected storage needed. Under this scenario, vehicles waiting to turn left into the site could extend into the northbound through travel lane creating a safety issue. Analysis should identify the maximum number of vehicles that could be accommodated at this location then re-assign the remaining vehicles to other travel paths to access the site (northbound left-turn movement at Lincoln Drive or Indian Bend Road) to determine potential LOS and storage lane impacts at these locations due to the increased volumes. Secondary impacts may be realized through this re-assignment, such as the extension of the southbound right-turn lane storage area into the site at Quail Run Road or extension of the northbound left-turn lane at Indian Bend Road.	Similar to the response to the prior comment, this queue reported previously considered a phase duration of 12 seconds, including 4 seconds of yellow and all-red intervals. The analysis now considers a split of 20 seconds resulting in a shorter 95th percentile queue. The study now also includes an alternative analysis should the city of Scottsdale not allow the 2nd northbound left-turn lane. This alternative is provided to give a range of mitigation that could occur on-set since the City of Scottsdale will provide guidance in the future with the submission of the Palmeraie TIA.
4.	Paul Guzak-Lee Engineering	General	1	Mitigation as stated in the report at the Scottsdale Road/6750 North intersection will require a traffic signal and likely overhead utility improvements. The City of Scottsdale should be consulted for the operational conditions to be permitted at this location.	Likely utility improvements are mentioned in the TIA. An alternative evaluation has been provided to satisfy a possible scenario where more cars divert to Indian Bend Road.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
5.	Paul Guzak-Lee Engineering	General	n/a	The report states all Paradise Valley study intersections, except for the Tatum Boulevard and Lincoln Drive intersection, are anticipated to operate acceptably in the future. This appears to be a true statement, although some individual movements, such as the southbound approach to Lincoln Drive from Mockingbird Lane, will operate at LOS E/F in the AM and/or PM peak hours, as indicated in the report. To improve the poor operating side street movements, intersection widening would be required which may or may not be feasible or appropriate.	It may be noted that the intersection of Tatum Boulevard and Lincoln Drive is anticipated to operate at LOS E or F during the peak hours even without the proposed site. Also a recommendation to lengthen the eastbound right-turn lane on Lincoln Drive to Tatum Boulevard would require additional right-of-way (ROW). This recommendation should be considered if additional ROW is acquired and is now included as a recommendation in the TIA. A Southbound right-turn lane at the intersection of Mockingbird/Lincoln should also be considered if ROW is available. This has also been added to the TIA.
6.	Paul Guzak-Lee Engineering	pp. 63 & 66	n/a	Mitigation at the intersection of Scottsdale Road and Lincoln Drive is offered via modification of the green splits to favor the higher volume movements. This may or may not be appropriate mitigation, depending upon impact to vehicle queue length conditions and pedestrian considerations.	This intersection will be reviewed again by the City of Scottsdale with the Palmeraie TIMA and mitigation will need to be determined by both the Town of Paradise Valley and the City of Scottsdale. A statement has been added to the TIA.
7.	Paul Guzak-Lee Engineering	Figure 29 (p. 58)	1	Any half-street improvements to the eastbound Indian Bend Road approach to Scottsdale Road should include the mitigation identified in the report (Figure 29) as well as considering any secondary improvement for increasing the northbound left-turn storage or capacity, if required, based on additional analysis at the Scottsdale Road/6750 North intersection.	Agree: The eastbound approach should provide dual left-turn lanes, one (1) through lane and a shared through/right-turn lane. A second westbound through lane may be required if dual northbound turn lanes are required by the City of Scottsdale. Mitigation improvements at the intersection of Indian Bend/Scottsdale Road should meet City of Scottsdale design standards which will be determined during the review of the Palmeraie TIA.

Reviewed Date: 8/16/2015
CivTech Received Date: 8/17/2015
CivTech Entered Date: 8/19/2015
CivTech Response Date: 9/15/2015

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
8.	Paul Guzak-Lee Engineering	General	n/a	Mitigation at the intersection of Mockingbird Lane and Lincoln Drive to install a westbound right-turn lane also appears to require relocation of red light camera equipment and traffic signal equipment that is located at the northeast corner of intersection.	We agree. The need for this improvement is stated in the improvement summary.
9.	Paul Guzak-Lee Engineering	General	n/a	The report indicated the site driveway on Lincoln Drive at the Quail Run Road alignment will meet MUTCD traffic signal installation warrants and operate at acceptable service levels. Typically, quarter-mile traffic signals are not favorable to traffic progression. To best accommodate through traffic along Lincoln Drive, the Town should strive to minimize the green time provided to the side street movements and minimize any protected eastbound to northbound left-turn phasing.	Agree - comment regarding progression and the need to retime signals has been added to the Recommendation and Conclusions
10.	Paul Guzak-Lee Engineering	Table 19 (p. 72)	1	Table 19 of the report incorrectly identifies the intersection as STOP-controlled and a 150-foot eastbound left-turn lane appropriate (Synchro queue length results were not an output result provided in the appendix). Based on 2033 PM peak hour traffic volumes of 174 vehicles and a 130-second cycle length, a 200-foot turn bay would be more reasonable.	The cell indicating "1-way stop (NB)" control, which is existing, has been corrected to "Signal" control, which is proposed. The queue recommendations of 150' is greater than the 95th percentile queue reported by Synchro. A reference to Appendix L (previously Appendix N) is now included within the report.
Conclusions					

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
	Paul Guzak-Lee Engineering	General	n/a	The TIA has identified a number of issues that the Ritz Carlton site is expected to generate, which any development fronting Scottsdale Road would create. The Town should consult with the City of Scottsdale regarding the signal operation/phasing of the Scottsdale/6750 North intersection to best accommodate site traffic demand. Depending upon the signal operation permitted, additional mitigation may be needed at adjacent intersection locations along Scottsdale Road to accommodate increased turn movement volumes. Mitigation identified by the TIA along Indian Bend Road appears to be appropriate to maximize the eastbound approach cross-section to Scottsdale Road. Improvements at the site driveway onto Lincoln Drive appear to be appropriate.	A meeting was held with the City of Scottsdale which results in an alternative scenario now presented in the TIA. The final mitigation along Scottsdale Road will be determined by the City of Scottsdale.

REPORT REVIEW

REPORT TITLE: Ritz Carlton Resort

REPORT DATE: August 2015

PREPARED BY: CivTech

CASE #: N/A Paradise Valley

REVIEWED BY: John Bartlett & Phillip Kercher

REVIEW DATE: September 2015

COMMENTS:

1. Include a discussion of the site's current zoning and proposed zoning (if needed).
2. Page 10 – The 6750 North driveway (Collector B) was constructed to provide access to the Spectrum office building and the adjacent parcel to the north. It was not anticipated that it would continue to the west into Paradise Valley.
3. Include a trip generation comparison to a development plan that would be allowed under the current zoning or to an approved site plan.
4. The distribution for hotel trips appears to be too heavily weighted to Tatum Boulevard to the west in comparison to the use of Loop 101 and Scottsdale Road (75% of hotel traffic using Tatum Boulevard).
5. Access to the residential parcel B should be oriented to Indian Bend Road rather than using Collector B through the commercial portion of the site to/from Scottsdale Road.
6. Please submit a conceptual layout for Indian Bend Road improvements adjacent to the site with a transition to the Paradise Valley cross section west of the site. The intersection configuration shows two eastbound through lanes approaching Scottsdale Road but does not show two westbound lanes. Dual northbound left-turns may be needed at the Scottsdale Road and Indian Bend Road intersection; therefore, two westbound receiving lanes along Indian Bend Road should be provided.
7. A southbound right-turn lane should be provided at the intersection of Scottsdale Road and Indian Bend Road.
8. The daily traffic volume capacities used in Figure 32 and Table 18 are significantly higher that the City of Scottsdale uses. Scottsdale Road, a major arterial, has a daily capacity of 48,000 vehicles, not 59,900. McDonald Drive and Indian Bend Road, both minor arterials, have a daily capacity of 34,000 vehicles, not 39,800.

9. There is a lack of storage length available for the anticipated westbound left-turn traffic volume on Indian Bend Road at Scottsdale Road, yet no mitigation is recommended.
10. Table 19 – The storage requirement from Synchro for the northbound left turn at the intersection of Scottsdale Road and Collector B is shown as dual left-turn lanes with a storage length of 284 feet per lane. The study recommends providing dual left-turn lanes with 120 feet of storage. There is only 95 feet of single lane left-turn storage available with the existing median configuration. This situation is not acceptable. Some access management/reconfiguration must be provided to reduce the left turn demand at this quarter-mile intersection.
11. Do not support the modification to provide dual left-turns in the northbound direction at the Collector B intersection on Scottsdale Road by removal of the existing median. The northbound left-turn movements should be encouraged to access the development via Indian Bend Road and Lincoln Drive where dual left-turn lanes exist or could be restriped within the existing roadway improvements.
12. Do not support the location of Access D as shown on the figures or the circular configuration that would result in two connections to Scottsdale Road. The projected volumes at this location do not show a significant benefit for this access to be allowed. The spacing does not meet minimum driveway spacing required by City of Scottsdale policy.
13. Do not support the location of Access C due to the proximity to the Scottsdale Road and Indian Bend Road signalized intersection. Full access should not be provided 300 feet from a major intersection. This traffic should use Collector C to access Indian Bend Road.
14. Volume Figures – Intersection E is shown as a "T" intersection with the side street extending to the west and turning movements to match; however, the site plan and roadway network on each volume figure shows a connection to the east labeled "Palmeraie Access."
15. Volume Figures – Intersection G is shown as a "T" intersection with the side street extending to the west and turning movements to match; however, the site plan shows a connection into residential Parcel B to the west.
16. 1st Submittal Comment Responses – Comment 9 – Identifies that signal timing at Scottsdale Road intersections was based on a 120 second cycle length and coordinated. Contact Steve Ramsey at the City of Scottsdale to acquire current timing plans for the study area intersections within Scottsdale to accurately report before and after operations, storage lengths, etc., at these locations.
17. The recommendations for signal timing adjustments to provide additional time to east-west movements at intersections along Scottsdale Road may not be feasible given the desire to maintain traffic progression along Scottsdale Road.
18. Please describe in the study if any access restrictions are intended to be installed on the internal driveways. For example, will the commercial parcels be able to utilize Quail Run Road to access Lincoln Drive? Will the resort parcel be able to utilize Collector B to access Scottsdale Road?
19. Right-turn overlap phasing should not be assumed at the signalized intersections along Scottsdale Road without approval from City of Scottsdale Traffic Engineering.

20. A site plan that shows the relation of the of the proposed site driveway locations to the existing streets/driveways along Scottsdale Road, Indian Bend Road, and Lincoln Drive should be provided.

General Comments:

1. The City of Scottsdale has not approved the site plan for Palmeraie portion of the development.
2. The City of Scottsdale Transportation Department has not approved any of the proposed improvements to streets and intersections within the city of Scottsdale.
3. The City of Scottsdale Transportation Department has not approved any of the proposed site access locations along City of Scottsdale street frontages.
4. We will be encouraging strong pedestrian connections between the resort and residential portions of the overall development to the retail parcels and to the adjacent signalized intersections on Scottsdale Road to encourage bike and pedestrian travel, especially to the adjacent McCormick-Stillman Railroad Park.

Ritz Carlton - City of Scottsdale Review Comments   CivTech, Inc.   Review Comments & Responses

1st Review of 2nd Submittal

City of Scottsdale

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
1.	John Bartlett & Phillip Kercher	General	3	Include a discussion of the sites' current zoning and proposed zoning (if needed).	Zoning identified in the SUP.
2.	John Bartlett & Phillip Kercher	Page 10	1	The 6750 North driveway (Collector B) was constructed to provide access to the Spectrum office building and the adjacent parcel to the north. It was not anticipated that it would continue to the west into Paradise Valley.	Sentence removed from the study.
3.	John Bartlett & Phillip Kercher	General	3	Include a trip generation comparison to a development plan that would be allowed under the current zoning or to an approved site plan.	Future Palmeraie Study will provide comparison for Scottsdale portion. Trip Generation provided was based on amount shown in the SUP.
4.	John Bartlett & Phillip Kercher	General	3	The distribution for hotel trips appears to be too heavily weighted to Tatum Boulevard to the west in comparison to the use of Loop 101 and Scottsdale Road (75% of hotel traffic using Tatum Boulevard).	The main entrance to the resort is to/from Lincoln Drive which provides a shorter path to the airport. Since the reports is based on AM and PM peak hour trips, and not mid day trips, the distribution was weighted for arrival and departure trips.
5.	John Bartlett & Phillip Kercher	General	3	Access to the residential parcel B should be oriented to Indian Bend Road rather than using collector B through the commercial portion of the site to/from Scottsdale Road.	An access to Indian Bend Road will not be provided however the site plan has been updated to move the internal access along the Quail Run alignment closer to Indian Bend Road.
6.	John Bartlett & Phillip Kercher	General	3	Please submit a conceptual layout for Indian Bend Road improvements adjacent to the site with a transition to the Paradise Valley cross section west of the site. The intersection configuration shows two eastbound through lanes approaching Scottsdale Road but does not show two westbound lanes. Dual northbound left-turns may be needed at the Scottsdale Road and Indian Bend Road intersection; therefore, two westbound receiving lanes along Indian Bend Road should be provided.	A conceptual layout will be provided to the Town for review prior to the City Council approval hearing. The analysis provided within the report for the alternaive access condition does not indicate a need for dual left turn lanes at this location. This intersection will be further analyzed in the future Palmeraie TIS update.
7.	John Bartlett & Phillip Kercher	General	1	A southbound right-turn lane should be provided at the intersection of Scottsdale Road and Indian Bend Road.	The report text and Figure 29 have been updated to include SB the right-turn lane.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
8.	John Bartlett & Phillip Kercher	Figure 32 and Table 18	1	The daily traffic volume capacities used in Figure 32 and Table 18 are significantly higher that the City of Scottsdale uses. Scottsdale Road, a major arterial, has a daily capacity of 48,000 vehicles, not 59,900. McDonald Drive and Indian Bend Road, both minor arterials, have a daily capacity of 34,000 vehicles, not 39,800.	The daily traffic considers all left and right turning traffic in addition to the through traffic on this segment of roadway. While the City of Scottsdale thresholds are utilized, they typically consider the average through volumes in the area. The average roadway volumes comply with the City's threshold. To provide a conservative view of likely conditions for Town residents, the minor turning volumes were considered which necessitated a methodology for level of service which provides capacity allowances in these areas. The Florida DOT method considers variables for these movements and was thus utilized for this effort.
9.	John Bartlett & Phillip Kercher	Queue Storage	1	There is a lack of storage length available for the anticipated westbound left-turn traffic volume on Indian Bend Road at Scottsdale Road, yet no mitigation is recommended.	The TIA has been updated to discuss available northbound to westbound left turn capacity as well as discussing the existing condition and likely future condition with the westbound to southbound left turn movement.
10.	John Bartlett & Phillip Kercher	Table 19	1	The storage requirement from Synchro for the northbound left turn at the intersection of Scottsdale Road and Collector B is shown as dual left-turn lanes with a storage length of 284 feet per lane. The study recommends providing dual left-turn lanes with 120 feet of storage. There is only 95 feet of single lane left-turn storage available with the existing median configuration. This situation is not acceptable. Some access management/reconfiguration must be provided to reduce the left-turn demand at this quarter-mile intersection.	The phasing configuration for the intersection was not analyzed correctly in the 2033 horzon year. This has been corrected, along with a slightly longer green time appropriation. These changes reduced the projected queue length and delay to a constructible level. In addition, the TIA considers an alternative analysis for traffic turning northbound onto Indian Bend Road.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
11.	John Bartlett & Phillip Kercher	General	1	Do not support the modification to provide dual left-turns in the northbound directional the Collector B intersection on Scottsdale Road by removal of the existing median. The northbound left-turn movements should be encouraged to access the development via Indian Bend Road and Lincoln Drive where dual left-turn lanes exist or could be restriped within the existing roadway improvements.	Complete removal of the median is not recommended by the development. The TIA now also considers an alternative analysis for traffic turning northbound onto Indian Bend Road should that be the preferred improvement by the City of Scottsdale. The intersection improvements necessary within the City of Scottsdale will be evaluated again with the Palmeraie TIA.
12.	John Bartlett & Phillip Kercher	General	1	Do not support the location of Access D as shown on the figures or the circular configuration that would result in two connections to Scottsdale Road. The projected volumes at this location do not show a significant benefit for this access to be allowed. The spacing does not meet minimum driveway spacing required by City of Scottsdale Policy.	The final driveway configuration and spacing will be determined by the City of Scottsdale during the Palmeraie site planning process. We anticipate the volume of right turning vehicles remaining consistent with that shown in the report. Therefore other traffic recommendations in the TIA should continue to operate acceptably with the reconfiguration of the driveways.
13.	John Bartlett & Phillip Kercher	General	1	Do not support the location of Access C due to the proximity to the Scottsdale Road and Indian Bend Road signalized intersection. Full access should not be provided 300 feet from the major intersection. This traffic should use Collector C to access Indian Bend Road.	The final driveway configuration and spacing will be determined by the City of Scottsdale during the Palmeraie site planning process. We anticipate the volume of turning vehicles remaining consistent with that shown in the report. Therefore other traffic recommendations in the TIA should continue to operate acceptably with the reconfiguration of the driveways.
14.	John Bartlett & Phillip Kercher	Volume Figures	1	Intersection E is shown as a "T" intersection with the side street extended to the west and turning movements to match; however, the site plan and roadway network on each volume figure shows a connection to the east labeled "Palmeraie Access."	The site plan has been updated and no longer supports the same connections as previously reviewed.
15.	John Bartlett & Phillip Kercher	Volume Figures	1	Intersection G is shown as a "T" intersection with the side street extended to the west and turning movements to match, however, the site plan shows a connection into residential Parcel B to the west.	The site plan has been updated and no longer supports the same connections as previously reviewed.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
16.	John Bartlett & Phillip Kercher	1st Submittal Comment Responses, Comment 9	1	Identifies that signal timing at Scottsdale Road intersections was based on a 120 second cycle length and coordinated. Contact Steve Ramsey at the City of Scottsdale to acquire current timing plans for the study area intersections within Scottsdale to accurately report before and after operations, storage lengths, etc., at these locations.	Signal timing cards were obtained from Steve Ramsey prior to the first review of the TIA. The timing cards indicate that the intersection is currently operating with a 120 second cycle length which was utilized for the analysis.
17.	John Bartlett & Phillip Kercher	General	1	The recommendations for signal timing adjustments to provide additional time to east-west movements at intersections along Scottsdale Road may not be feasible given the desire to maintain traffic progression along Scottsdale Road.	The report recommends that timing be evaluated when the signal is placed at Quail Run. It is understood that this timing may prioritize Scottsdale Road which could increase delays to Lincoln Drive.
18.	John Bartlett & Phillip Kercher	General	1	Please describe in the study if any access restrictions are intended to be installed on the internal driveways. For example, will the commercial parcels be able to utilize Quail Run Road to access Lincoln Drive? Will the resort parcel be able to utilize Collector B to access Scottsdale Road?	No access restrictions have been planned internal to the development. Through connections have been provided from all parcels. However, the design of the internal street network is circuitous to limit those using the roadway network as a cut through route. It is likely that a majority of the Palmeraie patrons will use the arterial street system in order to avoid the circuitous nature of the Ritz Carlton roadway network.
19.	John Bartlett & Phillip Kercher	General	1	Right-turn overlap phasing should not be assumed at the signalized intersections along Scottsdale Road without approval from City of Scottsdale Traffic Engineering.	The analysis provides, in one or mare case, a right turn overlap as a mitigation option for improved LOS. This improvement would require the support of the City prior to installation and can be reviewed with the Palmeraie TIA.
20.	John Bartlett & Phillip Kercher	General	1	A site plan that shows the relation of the proposed site driveway locations to the existing streets/driveway along Scottsdale Road, Indian Bend Road, and Lincoln Drive should be provided.	An updated site plan for Palmeraie will be provided during the site planning process. The site plan shown in the Ritz Carlton TIA is conceptual and will be further refined through the City review process.
21.	John Bartlett & Phillip Kercher	General	1	The City of Scottsdale has not approved the site plan for Palmeraie portion of the development.	Understood.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
22.	John Bartlett & Phillip Kercher	General	1	The City of Scottsdale Transportation Department has not approved any of the proposed improvements to streets and intersections within the City of Scottsdale.	Understood. The Palmeraie TIA will be updated during the site plan submittal process for the Palmeraie.
23.	John Bartlett & Phillip Kercher	General	1	The City of Scottsdale Transportation Department has not approved any of the site access locations along City of Scottsdale street frontages.	Understood. The Palmeraie TIA will be updated during the site plan submittal process for the Palmeraie.
24.	John Bartlett & Phillip Kercher	General	1	We will be encouraging strong pedestrian connections between the resort and residential portions of the overall development to the retail parcels and to the adjacent signalized intersections on Scottsdale Road to encourage bike and pedestrian travel, especially to the adjacent McCormick-Stillman Railroad Park.	Agree that a strong pedestrian element should be provided.

LEE ENGINEERING

ARIZONA
TEXAS
NEW MEXICO
OKLAHOMA

Registered Professional Engineer (Civil)
CERTIFICATE NO.
38915
PAUL A.
GUZEK
Date Signed 6-30-15
ARIZONA, U.S.A.
EXPIRES 3-31-18

June 30, 2015

Mr. James Shano, P.E., C.M.P.
Public Works Director/Town Engineer
Assistant to the Town Manager for Strategic Planning
Town of Paradise Valley
6401 East Lincoln Drive
Paradise Valley, Arizona 85253-4328

RE: Lee Engineering Review of the Ritz Carlton Resort Traffic Impact Analysis by CivTech dated May, 2015 – 1st submittal

Dear Mr. Shano:

I have reviewed the first submittal to the Ritz Carlton Resort report to determine whether the information presented in it meets the Town's guidelines set forth for this project, the Town Council Statement of Direction and review any engineering analysis and improvement details based on Town, City of Scottsdale, or MAG Standard Details. The following comments are presented based on my review of the traffic impact report:

General Comments

1. The report has estimated a total of 15,000 daily and 1,151 PM peak hour trips will be generated by the proposed development. Per Town TIA requirements, these values would place this TIA into a Category 3 analysis reviewing an opening year, 5-, 10-, and 15-year horizon periods. The report has analyzed an opening year, 5-year and 15-year conditions.
2. Typos, pages 22, 27, Figure 4 which improperly identifies Indian Bend Rd, and all figures have misspelled "Church".

Technical Review Comments

1. Page 12, the lane configuration at the intersection of Scottsdale and Indian Bend Road is displayed incorrectly in Figure 2, but analyzed with the correct configuration.
2. Page 13, the text refers to traffic controls being depicted on Figure 3, it should read Figure 2.
3. Page 13, the text refers to traffic volumes being depicted on Figure 4, it should read Figure 3.
4. Page 13, text states segment counts are presented in Table 2. Table 2 does not show these volumes.
5. Page 13, the report text indicate 24-hour volumes were collected from the City of Scottsdale and Town of Paradise Valley websites. No 24-hour volume data has been presented in the report.
6. The traffic volumes presented for the intersection of Lincoln Drive and Quail Run may not be appropriate as the count data presented in the appendix for this location shows reporting errors as some 15-minue periods indicate zero volume.
7. Intersection analysis has been conducted using Traffix software Version 8 per methodologies of the 2000 Highway Capacity Manual (HCM). Results may not be compatible to the more recent HCM 2010 methodologies that have been the standard since 2011.

8. The intersection capacity analysis results summary, shown in Table 3, depict approach and overall LOS results, but does not indicate individual movement LOS. In some cases, individual movements may be operating at LOS E or F which is unacceptable and may require mitigation or improvement considerations.
9. Actual timing data at the analyzed signalized intersections have not been used, instead timing input assumptions have been made. The results will show a comparison of Before/After conditions, but will not provide an indication of how the intersections are actually operating. The results provided in the report likely identify operations that are better than actual field conditions. The results also do not provide a split and phasing diagram making analysis difficult to review, as it appears that the phasing used for the analysis may not be reflective of actual field operation (possible yellow-trap phasing, minimal green time) as certain signalized locations.
10. Page 17, the report indicated no regional improvements are planned within the area. The Town of Paradise Valley indicates a project to install medians on Mockingbird Lane from Lincoln to Northern (FY 2018-29), Lincoln/Invergordon intersection realignment, and Town-wide traffic signal upgrades.
11. Page 18, Figure number identified incorrectly.
12. TIA guidelines state that a roadway segment analysis shall be conducted for the daily and peak hour conditions (Data Collection, Item C). This has not been conducted within the report.
13. TIA guidelines state that a crash analysis shall be conducted for the intersections and roadways within the study area for the latest 36-month period. (Data Collection, Item D). This has not been conducted within the report.
14. Page 20, Trip Generation. The trip estimates for the AM peak of the Resort Hotel hour may be overestimated by as much as 50% (approximately 100 trips). In the overall picture, this may or may not be significant.
15. The internal capture rate for the AM and PM peak hours have not been presented in the Appendix, only the daily. The daily internal capture rate appears to have been calculated properly.
16. The application of the pass-by trips were not properly applied. The pass-by component included the internally captured trips, which underestimates the amount of "new" trips (by about 80 trips). The 80 trips have been considered within the pass-by trip component. In the overall picture, this may or may not be significant.
17. Page 22, Table 6. The 2020 percentage to/from the west should be 28% not 18% as indicated.
18. Table 6 indicates different North percentage than shown in Figure 5, explain.
19. Figures 7 & 8. In the PM peak hour, the In/Out volumes appear to be slightly lower than identified in Table 5.
20. It appears all peak hour traffic volumes presented for the background and total volume figure sheets are correct.
21. The intersection capacity analysis is conducted inappropriately, similar to existing conditions, regarding signal settings and phasing. The analysis has also optimized each intersection individually and does not take into account any progression that may be in-place for Scottsdale Road or other locations.
22. Page 35. No ADT's have been supplied or analyzed, the lane configurations are based on the capacity analysis output.
23. Figure 15. The results indicate a traffic signal is recommended for the intersection of Lincoln and Quail Run. Based on traffic volumes this location will not meet MUTCD warrants for a traffic signal. Please explain/justify recommendation. If a traffic signal is warranted, how will the signal function in regards to timing, phasing, and coordination along the existing Lincoln Drive corridor?
24. The Town's TIA guidelines provide Deceleration Lane Criteria for right turn lanes. The use of AASHTO guidelines to determine the need for right turn lanes on adjacent streets may not be applicable.

25. Page 38, Table 8. Recommended storage lengths for right and left turn lanes at many locations may not be possible as they will impact the existing turn lane design of other locations. These locations should be noted.
26. The recommended storage length listed for the northbound left turn movement into the site at Intersection 2 is 350 feet, however, Table 8 indicates 475 feet is required by AASHTO. In either case, only 95 feet of storage exists at this location. Modification of this turn lane would impact the existing turn bay immediately to the south for vehicles entering in a residential development on the east side of Scottsdale Road. With this location identified as the main access into the Ritz Carlton Development, how does the developer intend to accommodate the projected 444 PM peak hour vehicles turning left at this location without vehicles queuing into the northbound through travel lanes?
27. Page 38, Table 8. Intersection 10 identifies a 1-way STOP condition, whereas the intersection would be minor-street stop control for both the northbound and southbound approached (2-way). Figure 15 recommends the intersection to be signal controlled. The analysis for this intersection requires revision.
28. The report does not address Lincoln Drive modifications and impacts needed to accommodate site access at the Quail Run alignment.
29. Page 40, Recommendations. The City of Scottsdale has revised their Functional Classification System, however Scottsdale is classified as a Major Arterial - Suburban. The Town of Paradise Valley identifies Lincoln Road as an Urban Major Arterial.
30. Page 41, Recommendations. The report identifies that there will be "event" traffic associated with the resort. This traffic has not been estimated in the trip generation analysis. If the site is to host events on a recurring basis, this volume should be added to trip generation estimate and evaluated.
31. As outlined in the Statement of Direction from the Town, the report has not appropriately addressed what impacts the site's Lincoln Avenue access will have (loss of landscape median island to accommodate left turn movements, needed relocation of electrical switching cabinet to accommodate a right turn deceleration lane, impacts a potential traffic signal may have to traffic flow along Lincoln Avenue).
32. As outlined in the Statement of Direction from the Town, the report has not conducted traffic analysis along Lincoln Drive from Scottsdale Road to Tatum Boulevard.
33. As outlined in the Statement of Direction from the Town, the report has not addressed on-site vehicle circulation.
34. It is anticipated that the recommendations will change based on the above comments and revisions to the report.

Conclusions

There are some serious traffic related issues the TIA has not addressed or has identified as being acceptable. The most major of these items is how the developer will accommodate the projected 444 PM peak hour vehicles turning left into the site at Intersection 2 (Comment #26), the intersection capacity analyses that have used assumed timings and not actual timing and coordination data along Scottsdale Road (Comment #9 and #21), the traffic control at the site's proposed access onto Lincoln Drive (Comment #23, #28 and #30). In addition, the report has not appropriately address the Town's concerns identified in the Statement of Direction pertaining to impacts the site access will have to Lincoln Drive, a traffic analysis of Lincoln Drive from Scottsdale to Tatum, and on-site vehicle circulation (Comments #31, #32, and #33).

Closure

If a further discussion of these comments/conclusions is needed, I can be reached at (602) 955-7206 or by e-mail at pguzek@lee-eng.com.

Respectfully submitted,

Paul Guzek, PE, PTOE

Lee Engineering, LLC

Ritz Carlton **CivTech, Inc.** **Review Comments & Responses**
1st Submittal

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
1.	Paul Guzak-Lee Engineering	General Comments	1	The report has estimated a total of 15,000 daily and 1,151 PM Peak hour trips will be generated by the proposed development. Per Town TIA requirements, these values would place this TIA into a Category 3 analysis reviewing an opening year, 5-, 10-, and 15-year horizon periods. The report has analyzed an opening year, 5-year and 15-year conditions.	The report has been updated to include existing, opening year, opening+5, opening+10 and opening+15 study horizon years, per the Town's TIA requirements.
2.	Paul Guzak-Lee Engineering	General Comments	1	Typos pages 22, 27, Figure 4 which improperly identifies Indian Bend Road, and all figures have misspelled "church"	Report text and Figures have all been spell checked and updated with the correct spelling and identifications.
1.	Paul Guzak-Lee Engineering	Page 12	1	The lane configuration at the intersection of Scottsdale and Indian Bend Road is displayed incorrectly in Figure 2, but analyzed with the correct configuration.	Figure 2 has been updated to match text within the report.
2.	Paul Guzak-Lee Engineering	Page 13	1	The text refers to traffic controls being depicted on Figure 3, it should read Figure 2.	Text has been revised to reference Figure 2.
3.	Paul Guzak-Lee Engineering	Page 13	1	The text refers to traffic volumes being depicted on Figure 4, it should read Figure 3.	Text has been revised to reference Figure 3.
4.	Paul Guzak-Lee Engineering	Page 13	1	Text states segment counts are presented in Table 2. Table 2 does not show these volumes.	Table 2 revised to include existing segment ADT volumes.

Reviewed Date: 6/20/2015
CivTech Received Date: 8/4/2015
CivTech Entered Date: 8/7/2015
CivTech Response Date: 8/7/2015

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
5.	Paul Guzak-Lee Engineering	Page 13	1	The report text indicate 24-hour volumes were collected from the City of Scottsdale and Town of Paradise Valley Websites. No 24 hour volume data has been reported in the report.	24-hour count data used/referenced within Table 2 has been included in Appendix B.
6.	Paul Guzak-Lee Engineering		2	The traffic volumes presented for the intersection of Lincoln Drive and Quail Run may not be appropriate as the count data presented in the appendix for this location shows reporting errors as some 15-minute periods indicate zero volume.	All Intersection Capacity Analyses have been revised using Synchro 9 under the HCM 2010 methodologies which do not report any errors.
7.	Paul Guzak-Lee Engineering		2	Intersection analysis has been conducted using Traffix software Version 8 per methodologies of the 2000 Highway Capacity Manual (HCM). Results may not be compatible to the more recent HCM 2010 methodologies that have been the standard since 2011	All Intersection Capacity Analyses have been updated with Synchro 9 which uses the HCM 2010 methodologies.
8.	Paul Guzak-Lee Engineering		1	The intersection capacity analysis results summary, shown in Table 3, depict approach and overall LOS results, but does not indicate individual movement LOS. In some cases, individual movements may be operating at LOS E or F which is unacceptable and may require mitigation or improvement considerations.	All Levels of service Tables have been updated to include individual movement LOS for unsignalized intersections and approach/overall LOS at signalized intersections. Should an individual movement at any of the signalized intersections be less than acceptable, it has been mentioned within the text of the report along with any appropriate mitigation that can be implemented. Levels of service by movement for all intersections can be found within the Appendix, under Capacity Analysis.

Reviewed Date: 6/20/2015
CivTech Received Date: 8/4/2015
CivTech Entered Date: 8/7/2015
CivTech Response Date: 8/7/2015

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
9.	Paul Guzak-Lee Engineering		2	Actual timing data at the analyzed signalized intersections have not been used, instead timing input assumptions have been made. The results will show a comparison of Before/After conditions, but will not provide an indication of how the intersections are actually operating. The results provided in the report likely identify operations that are better than actual field conditions. The results also do not provide a split and phasing diagram making analysis difficult to review, as it appears that the phasing used for the analysis may not be reflective of actual field operation (possible yellow-trap phasing, minimal green time) as certain signalized locations.	Intersection Capacity Analysis for each study horizon year has been updated in Synchro 9 and includes recent signal timing received from the Town of PV at all signals along Lincoln Drive within the Towns limits. Signal timing along Scottsdale Road was assumed at 120-second Cycle lengths and coordinated. Signal Phasing diagrams have been included within the Appendix for each study horizon year.
10.	Paul Guzak-Lee Engineering	Page 17	1	the report indicated no regional improvements are planned within this area. The town of Paradise Valley indicates a project to install medians on Mockingbird Lane from Lincoln to Northern (FY 2018-29) Lincoln/Invergordon intersection realignment, and Town-wide traffic signal upgrades.	The report has been updated to include the regional improvement along Mockingbird Lane. We understand that the traffic signal upgrades were recently implemented.
11.	Paul Guzak-Lee Engineering	Page 18	1	Figure number identified incorrectly	Figure numbers have all been updated within the text of the report.

Reviewed Date: 6/20/2015
CivTech Received Date: 8/4/2015
CivTech Entered Date: 8/7/2015
CivTech Response Date: 8/7/2015

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
12.	Paul Guzak-Lee Engineering		1	TIA guidelines state that a roadway segment analysis shall be conducted for the daily and peak our conditions (Data Collection, item C) This has not been conducted within the report.	A segment analysis section has been added within the report and can be found before the queue storage section of the report.
13.	Paul Guzak-Lee Engineering		1	TIA guidelines state that a crash analysis shall be conducted for the intersections and roadways within the study area for the latest 36-month period. (Data Collection, item D). This has not been conducted within the report.	A crash analysis section has been added within the report and can be found within the Existing Conditions write up of the report.
14.	Paul Guzak-Lee Engineering	Page 20	1	Trip Generation. The trip estimates for the AM peak of the Resort Hotel hour may be overestimated by as much as 50% (approximately 100 trips). In the overall picture, this may or may not be significant.	Trip Generation has been revised.
15.	Paul Guzak-Lee Engineering	Page 29	3	The internal capture rate for the AM and PM Peak hours have not been presented in the Appendix, only the daily. The daily internal capture rate appears to have been calculated properly.	Text has been modified. The internal capture worksheet for daily conditions is now included in the appendix. From the calculation, a universal 20% internal capture rate which was calculated for the overall Daily was also applied to the peak (AM/PM) hours as well.
16.	Paul Guzak-Lee Engineering		2	The application of the pass-by trips were not properly applied. The pass-by component included the internally captured trips, which underestimates the amount of "new" trips (by about 80 trips). The 80 trips have been considered within the pass-by trip component. In the overall picture, this may or may not be significant.	To remain conservative Pass-By trips were removed within the report/text and within the analysis.

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Item No.	Reviewer	Location	Code	Review Comment	Response
17.	Paul Guzak-Lee Engineering	Page 22, Table 6	1	The 2020 percentage to/from the west should be 28% not 18% as indicated.	Table 6, has been revised.
18.	Paul Guzak-Lee Engineering	Table 6	1	Indicates different North percentage than shown in figure 5, explain.	Table 6, has been revised to match Figure 5. This was a typo, therefore no further explanation required.
19.	Paul Guzak-Lee Engineering	Figures 7 and 8	1	In the PM peak hour, the In/Out volumes appear to be slightly lower than identified in Table 5.	Trip Generation has been revised and site plan updated. All volumes on Figures 7 and 8 have been verified with Table 5 and updated within the analysis. The traffic distribution software rounds trips when the distribution does not result in a whole number. This small difference is due to rounding.
20.	Paul Guzak-Lee Engineering		3	It appears all peak hour traffic volumes presented for the background and total volume figure sheets are correct.	No comment required.
21.	Paul Guzak-Lee Engineering		2	The intersection capacity analysis is conducted inappropriately, similar to existing conditions, regarding signal settings and phasing. The analysis has also optimized each intersection individually and does not take into account any progression that may be in-place for Scottsdale Road or other locations.	All Intersection Capacity Analyses have been updated with Synchro 9 which uses the HCM 2010 methodologies. Each signalized intersection along the Lincoln Drive and Scottsdale Road corridor have signal offsets optimized using the intersection of Scottsdale Rd. & Lincoln Dr. as the master signal.
22.	Paul Guzak-Lee Engineering	Page 35	1	No ADT's have been supplied or analyzed, the lane configurations are based on the capacity analysis output.	Please refer to comment responses 4 and 5.

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
23.	Paul Guzak-Lee Engineering	Figure 15	1	The results indicate a traffic signal is recommended for the intersection of Lincoln and Quail Run. Based on traffic volumes this location will not meet MUTCD warrants for a traffic signal. Please explain/justify recommendation. If a traffic signal is warranted, how will the signal function in regards to timing, phasing, and coordination along the existing Lincoln Drive corridor?	The updated analysis using the new site plan results in meeting the MUTCD peak hour signal warrant. It is recommended, as analyzed, to have a cycle length of 130 seconds to match the cycle length of the signal at Mockingbird/Lincon for optimal signal progression. Protected & permitted phasing is recommended for the westbound left turn movement.
24.	Paul Guzak-Lee Engineering		1	The Towns TIA guidelines provide Deceleration Lane Criteria for right-turn lanes. The use of AASHTO guidelines to determine the need for right-turn lanes on adjacent streets may not be applicable.	Deceleration lane criteria for right-turn lanes has been updated per the Town's TIA guidelines. Synchro reported queue lengths are now used instead of AASHTO methodology.
25.	Paul Guzak-Lee Engineering	Page 38, Table 8	1	Recommended storage lengths for right and left turn lanes at many locations may not be possible as they will impact the existing turn lane design for other locations. These locations should be noted.	Table 8 has been revised and foot noted.

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Item No.	Reviewer	Location	Code	Review Comment	Response
26.	Paul Guzak-Lee Engineering		1	The recommended storage length listed for the northbound left turn movement into the site intersection 2 is 350 feet, however, Table 8 indicates 475 feet is required by AASHTO. In either case, only 95 feet of storage exists at this location. Modification of this turn lane would impact the existing turn bay immediately to the south for vehicles entering in a residential development on the east side of Scottsdale Road. With this location identified as the main access into the Ritz Carlton Development, how does the developer intend to accommodate the projected 444 PM Peak Hour vehicles turning left at this location without vehicles queuing into the northbound through travel lanes?	All calculated/recommended queue storage lengths within Table 8 have been updated per the Synchro 9 analysis which accounts for signal timing/offsets. Intersection 2 is being proposed with dual left-turn lanes to help accommodate the queue. All queue lengths have been revised to make sure they are not recommending longer queues then what can feasibly be constructed within the ROW.
27.	Paul Guzak-Lee Engineering	Page 38, Table 8	1	Intersection 10 identifies a 1-way stop condition, whereas the intersection would be minor- street stop control for both the Northbound and Southbound approached (2-way). Figure 15 recommends the intersection to be signal controlled. The analysis for this intersection requires revision.	Analysis has been revised.
28.	Paul Guzak-Lee Engineering		1	The report does not address Lincoln Drive modifications and impacts needed to accommodate site access at the Quail Run alignment.	The TIA now discusses this .

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Item No.	Reviewer	Location	Code	Review Comment	Response
29.	Paul Guzak-Lee Engineering	Page 40, Recommendations	1	The City of Scottsdale has revised their Functional Classification System, however Scottsdale is classified as a Major Arterial-Suburban. The Town of Paradise Valley identifies Lincoln Road as an Urban Major Arterial.	Text has been updated to include both the City of Scottsdale and Town of Paradise Valley classifications for Lincoln Drive and Scottsdale Road.
30.	Paul Guzak-Lee Engineering	Page 41 recommendations	1	The report identifies that there will be "event" traffic associated with the resort. This traffic has not been estimated in the trip generation analysis. If the site is to host events on a recurring basis, this volume should be added to trip generation estimate and evaluated.	An Event Section/Analysis has been added within the report and can be found directly after the 2033 intersection capacity analysis within the report. Detailed analysis worksheets can be found within Appendix L.
31.	Paul Guzak-Lee Engineering		1	As outlined in the Statement of Direction from the Town, the report has not appropriately addressed what impacts the site's Lincoln Avenue access will have (loss of landscape median island to accommodate a right turn deceleration lane, impacts a potential traffic signal may have to traffic flow along Lincoln Avenue)	TIA now discusses these topics.
32.	Paul Guzak-Lee Engineering		1	As outlined in the Statement of Direction from the Town, the report has not conducted traffic analysis along Lincoln Drive from Scottsdale Road to Tatum Blvd.	Analysis at the intersection of Lincoln Dr. and Tatum Blvd. has ben added per the Statement of Direction from the Town.

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Item No.	Reviewer	Location	Code	Review Comment	Response
33.	Paul Guzak-Lee Engineering		1	As outlined in the Statement of Direction from the Town, the report has not addressed on-site vehicle circulation	Circulation discussion has been included within the site access section of the report. Also several internal intersections of concern have been included within the analysis/text of this report.
34.	Paul Guzak-Lee Engineering		1	It is anticipated that the recommendations will change based on the above comments and revisions to the report.	The report has been revised as described in these responses.
35.	Paul Guzak-Lee Engineering	Conclusions	1	There are some serious traffic related issues the TIA has not addressed or has identified as being acceptable. The most major of these items is how the developer will accommodate the projected 444 PM peak hour vehicles turning left into the site at intersection 2 (comment #26), the intersection capacity analyses that have used assumed timings and not actual timing and coordination data along Scottsdale Road (Comment #9 and 21), the traffic control at the sites proposed access onto Lincoln Drive (comments #23,#28 and #30) In addition, the report has not appropriately address the Towns concern identified in the Statement of Direction pertaining to impacts the site access will have to Lincoln Drive, a traffic analysis of Lincoln Drive from Scottsdale to Tatum, and on-site vehicle circulation (Comments #31, #32 and #33)	The report has been revised as described in these responses.

APPENDIX B

TRAFFIC COUNTS

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1114-001

TMC SUMMARY OF Northern Ave. & Mockingbird Ln.

Northern Ave. (north approach)

APPROACH LANES		0	1	0
TOTAL		6	51	2
PM		4	22	1
MD				
AM		2	29	1

N

Mockingbird Ln. (west approach)

APPROACH LANES	TOTAL	AM	MD	PM
0	8	4		4
1	37	6		31
0	460	283		177

CONTROL

4 Way Stop

Mockingbird Ln. (east approach)

AM	MD	PM	TOTAL	APPROACH LANES
0		4	4	0
4		16	20	1
33		18	51	0

Northern Ave. (south approach)

PM	250	38	45	
MD				
AM	123	12	28	
TOTAL	373	50	73	
APPROACH LANES	1	1	0	

LOCATION #: 15-1114-001

TURNING MOVEMENT COUNT

Northern Ave. & Mockingbird Ln.
(Intersection Name)

TUESDAY — Day
04/14/2015 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 745 AM

NOON PEAK HOUR

PM PEAK HOUR 415 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1114-002

TMC SUMMARY OF Mockingbird Ln. & Indian Bend Rd.

Mockingbird Ln.

Indian Bend Rd.

N

Mockingbird Ln. (north leg)

APPROACH LANES

APPROACH LANES	0	1	1
TOTAL	0	542	93
PM	0	188	35
MD			
AM	0	354	58

Indian Bend Rd. (east leg)

AM	MD	PM	TOTAL	APPROACH LANES
34		43	77	1
0		0	0	0
107		89	196	1

Indian Bend Rd. (west leg)

APPROACH LANES	TOTAL	AM	MD	PM
0	0	0		0
0	0	0		0
0	0	0		0

CONTROL

1 Way Stop

WB

Mockingbird Ln. (south leg)

PM	0	313	99
MD			
AM	0	212	76
TOTAL	0	525	175
APPROACH LANES	0	1	0

LOCATION #: 15-1114-002

TURNING MOVEMENT COUNT

Mockingbird Ln. & Indian Bend Rd.
(Intersection Name)

TUESDAY	04/14/2015
Day	Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR	745 AM
NOON PEAK HOUR	
PM PEAK HOUR	445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1114-003

TMC SUMMARY OF Mockingbird Ln. & Lincoln Dr.

Mockingbird Ln.

Lincoln Dr.

Lincoln Dr.

N

Southbound (Mockingbird Ln., north approach)

APPROACH LANES		0	1	1
TOTAL		426	193	144
PM		160	87	54
MD				
AM		266	106	90

Eastbound (Lincoln Dr., west approach)

APPROACH LANES	TOTAL	AM	MD	PM
1	480	227		253
2	1771	895		876
0	51	34		17

CONTROL

Signalized

Westbound (Lincoln Dr., east approach)

AM	MD	PM	TOTAL	APPROACH LANES
21		87	108	0
779		844	1623	2
20		13	33	1

Northbound (Mockingbird Ln., south approach)

PM	12	103	23	
MD				
AM	16	53	25	
TOTAL	28	156	48	
APPROACH LANES	1	1	0	

Mockingbird Ln.

LOCATION #: 15-1114-003

TURNING MOVEMENT COUNT

Mockingbird Ln. & Lincoln Dr.
(Intersection Name)

Day	Date
TUESDAY	04/14/2015

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 730 AM

NOON PEAK HOUR

PM PEAK HOUR 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1114-004

TMC SUMMARY OF Mockingbird Ln. & McDonald Dr.

Mockingbird Ln. (north leg)

APPROACH LANES

Approach lanes		1	0	1
TOTAL		143	14	124
PM		83	9	51
MD				
AM		60	5	73

N

McDonald Dr. (west leg)

APPROACH LANES

Approach lanes	TOTAL	AM	MD	PM
1	109	44		65
1	410	218		192
0	13	9		4

CONTROL

4 Way Stop

McDonald Dr. (east leg)

AM	MD	PM	TOTAL	Approach lanes
38		70	108	0
273		237	510	1
8		22	30	1

APPROACH LANES

Mockingbird Ln. (south leg)

PM	13	11	13	
MD				
AM	5	5	5	
TOTAL	18	16	18	
Approach lanes	0	1	0	

APPROACH LANES

LOCATION #: 15-1114-004

TURNING MOVEMENT COUNT

Mockingbird Ln. & McDonald Dr.
(Intersection Name)

Day	Date
TUESDAY	04/14/2015

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR	800 AM
NOON PEAK HOUR	
PM PEAK HOUR	500 PM

Intersection Turning Movement
Prepared by:

Field Data Services of Arizona, Inc.
520.316.6745

Project #: 15-1114-005

TMC SUMMARY OF Invergordon Rd. & Lincoln Dr.

N

CONTROL

Signalized

Invergordon Rd. (north leg) — APPROACH LANES

APPROACH LANES		0	1	0
TOTAL		11	31	68
PM		6	14	32
MD				
AM		5	17	36

Lincoln Dr. (west leg) — APPROACH LANES

APPROACH LANES	TOTAL	AM	MD	PM
1	33	18		15
2	1929	996		933
0	367	222		145

Lincoln Dr. (east leg) — APPROACH LANES

AM	MD	PM	TOTAL	APPROACH LANES
22		13	35	0
943		896	1839	2
94		62	156	1

Invergordon Rd. (south leg) — APPROACH LANES

PM	248	8	101	
MD				
AM	138	12	139	
TOTAL	386	20	240	
APPROACH LANES	1	1	1	

LOCATION #: 15-1114-005

TURNING MOVEMENT COUNT

Invergordon Rd. & Lincoln Dr.
(Intersection Name)

TUESDAY	04/14/2015
Day	Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR	730 AM
NOON PEAK HOUR	
PM PEAK HOUR	415 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1114-006

TMC SUMMARY OF Scottsdale Rd. & Indian Bend Rd.

N

Scottsdale Rd. (North Approach – Southbound)

APPROACH LANES

	0	3	1
TOTAL	58	2905	323
PM	37	1418	175
MD			
AM	21	1487	148

Indian Bend Rd. (West Approach – Eastbound)

APPROACH LANES	TOTAL	AM	MD	PM
1	72	26		46
0	168	76		92
1	28	17		11

CONTROL

Signalized

Indian Bend Rd. (East Approach – Westbound)

AM	MD	PM	TOTAL	APPROACH LANES
142		127	269	1
117		130	247	1
541		411	952	2

Scottsdale Rd. (South Approach – Northbound)

PM	35	1714	465
MD			
AM	12	1189	369
TOTAL	47	2903	834
	1	3	1

APPROACH LANES

LOCATION #: 15-1114-006

TURNING MOVEMENT COUNT

Scottsdale Rd. & Indian Bend Rd.
(Intersection Name)

TUESDAY	04/14/2015
Day	Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR	730 AM
NOON PEAK HOUR	
PM PEAK HOUR	445 PM

Intersection Turning Movement
Prepared by:

Field Data Services of Arizona, Inc.
520.316.6745

Project #: 15-1114-007

TMC SUMMARY OF Scottsdale Rd. & Lincoln Dr.

Scottsdale Rd. (north leg)

Lincoln Dr. (west leg) — Lincoln Dr. (east leg)

N

Southbound approach (Scottsdale Rd., north leg)

APPROACH LANES

APPROACH LANES	1	3	1
TOTAL	968	3023	81
PM	398	1439	54
MD			
AM	570	1584	27

Eastbound approach (Lincoln Dr., west leg)

APPROACH LANES	TOTAL	AM	MD	PM
2	1090	551		539
1	89	44		45
1	726	368		358

CONTROL

Signalized

Westbound approach (Lincoln Dr., east leg)

AM	MD	PM	TOTAL	APPROACH LANES
39		52	91	0
32		54	86	2
24		41	65	1

Northbound approach (Scottsdale Rd., south leg)

PM	328	1523	36	
MD				
AM	266	1082	28	
TOTAL	594	2605	64	
APPROACH LANES	2	3	0	

APPROACH LANES

Scottsdale Rd.

LOCATION #: 15-1114-007

TURNING MOVEMENT COUNT

Scottsdale Rd. & Lincoln Dr.
(Intersection Name)

Day	Date
TUESDAY	04/14/2015

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR	730 AM
NOON PEAK HOUR	
PM PEAK HOUR	445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1114-008

TMC SUMMARY OF Scottsdale Rd. & McDonald Dr.

Scottsdale Rd.

McDonald Dr.

McDonald Dr.

N

Southbound (north leg) – APPROACH LANES

APPROACH LANES	1	3	2
TOTAL	158	3173	461
PM	90	1504	292
MD			
AM	68	1669	169

Eastbound (west leg) – APPROACH LANES

APPROACH LANES	TOTAL	AM	MD	PM
1	195	118		77
2	430	227		203
0	69	34		35

CONTROL
Signalized

Westbound (east leg) – APPROACH LANES

AM	MD	PM	TOTAL	APPROACH LANES
286		183	469	1
332		205	537	2
289		227	516	2

Northbound (south leg) – APPROACH LANES

PM	35	1694	232
MD			
AM	45	1010	137
TOTAL	80	2704	369
APPROACH LANES	1	3	1

Scottsdale Rd.

LOCATION #: 15-1114-008

TURNING MOVEMENT COUNT

Scottsdale Rd. & McDonald Dr.
(Intersection Name)

TUESDAY — Day
04/14/2015 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 745 AM

NOON PEAK HOUR

PM PEAK HOUR 445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1145-004

TMC SUMMARY OF Cottonwood Resort Dwy. & Indian Bend Rd.

Cottonwood Resort Dwy. (north leg, southbound approach)

APPROACH LANES	0	1	0
TOTAL	5	0	10
PM	4	0	4
MD			
AM	1	0	6

Indian Bend Rd. (west leg, eastbound approach)

APPROACH LANES	TOTAL	AM	MD	PM
0	8	4		4
1	240	122		118
0	0	0		0

CONTROL

1-Way Stop

SB

Indian Bend Rd. (east leg, westbound approach)

AM	MD	PM	TOTAL	APPROACH LANES
1		14	15	0
142		152	294	1
0		0	0	0

Cottonwood Resort Dw (south leg, northbound approach)

PM	0	0	0
MD			
AM	0	0	0
TOTAL	0	0	0
APPROACH LANES	0	0	0

LOCATION #: 15-1145-004

TURNING MOVEMENT COUNT

Cottonwood Resort Dwy. & Indian Bend Rd.
(Intersection Name)

TUESDAY — Day

05/05/15 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 745 AM

NOON PEAK HOUR

PM PEAK HOUR 500 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1145-005

TMC SUMMARY OF Scottsdale Rd. & Sands North Residental Dwy

Scottsdale Rd. (north leg) — APPROACH LANES

Lanes		0	3	1
TOTAL		0	3848	10
PM		0	1917	9
MD				
AM		0	1931	1

Sands North Residental Dwy (west leg) — APPROACH LANES

Lanes	TOTAL	AM	MD	PM
0	0	0		0
0	0	0		0
0	0	0		0

CONTROL
1-Way Stop
WB

Sands North Residental Dwy (east leg) — APPROACH LANES

AM	MD	PM	TOTAL	Lanes
5		5	10	0
0		0	0	1
3		5	8	0

N

Scottsdale Rd. (south leg) — APPROACH LANES

PM	0	2190	6	
MD				
AM	0	1547	4	
TOTAL	0	3737	10	
Lanes	0	3	0	

LOCATION #: 15-1145-005

TURNING MOVEMENT COUNT

Scottsdale Rd. & Sands North Residental Dwy
(Intersection Name)

TUESDAY	05/05/15
Day	Date

COUNT PERIODS			
AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR	730 AM
NOON PEAK HOUR	
PM PEAK HOUR	445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1145-006

TMC SUMMARY OF Scottsdale Rd. & 6750 North

Scottsdale Rd. (north leg)

APPROACH LANES

APPROACH LANES	1	3	0
TOTAL	100	3975	0
PM	11	1979	0
MD			
AM	89	1996	0

N

6750 North (west leg)

APPROACH LANES

APPROACH LANES	TOTAL	AM	MD	PM
1	79	18		61
0	0	0		0
1	36	0		36

CONTROL

Signal

6750 North (east leg)

AM	MD	PM	TOTAL	APPROACH LANES
0		0	0	0
0		0	0	0
0		0	0	0

Scottsdale Rd. (south leg)

PM	3	2131	0
MD			
AM	44	1497	0
TOTAL	47	3628	0
APPROACH LANES	1	3	0

LOCATION #: 15-1145-006

TURNING MOVEMENT COUNT

Scottsdale Rd. & 6750 North
(Intersection Name)

TUESDAY
Day

05/05/15
Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 730 AM

NOON PEAK HOUR

PM PEAK HOUR 445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1182-001

TMC SUMMARY OF Invergordon Rd. & Lincoln Dr.

Invergordon Rd. (north leg) — APPROACH LANES

	Left	Thru	Right
APPROACH LANES	0	1	0
TOTAL	15	28	43
PM	10	17	25
MD			
AM	5	11	18

Lincoln Dr. (west leg) — APPROACH LANES

APPROACH LANES	TOTAL	AM	MD	PM
1	15	10		5
2	1765	837		928
0	342	197		145

CONTROL

Signalized

Lincoln Dr. (east leg) — APPROACH LANES

AM	MD	PM	TOTAL	APPROACH LANES
21		25	46	0
813		916	1729	2
55		61	116	1

Invergordon Rd. (south leg) — APPROACH LANES

	Left	Thru	Right
PM	245	21	84
MD			
AM	103	4	93
TOTAL	348	25	177
APPROACH LANES	1	1	1

N

LOCATION #: 15-1182-001

TURNING MOVEMENT COUNT

Invergordon Rd. & Lincoln Dr.
(Intersection Name)

Day	Date
THURSDAY	06/18/2015

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 730 AM

NOON PEAK HOUR:

PM PEAK HOUR: 445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1182-002

TMC SUMMARY OF Tatum Blvd. & Lincoln Dr.

N

Tatum Blvd.

Lincoln Dr.

North approach (Tatum Blvd.)

APPROACH LANES

	1	2	1
TOTAL	555	1520	474
PM	167	616	186
MD			
AM	388	904	288

West approach (Lincoln Dr.)

APPROACH LANES

Lanes	TOTAL	AM	MD	PM
2	511	164		347
2	1378	709		669
0	104	66		38

CONTROL

Signalized

East approach (Lincoln Dr.)

AM	MD	PM	TOTAL	Lanes
87		248	335	1
656		771	1427	2
166		209	375	1

APPROACH LANES

South approach (Tatum Blvd.)

PM	86	1017	181	
MD				
AM	47	533	216	
TOTAL	133	1550	397	
	1	2	1	

APPROACH LANES

LOCATION #: 15-1182-002

TURNING MOVEMENT COUNT

Tatum Blvd. & Lincoln Dr.
(Intersection Name)

THURSDAY	06/18/2015
Day	Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR	715 AM
NOON PEAK HOUR	
PM PEAK HOUR	430 PM

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Friday, June 26, 2015 - Sunday, June 28, 2015 **City:** Paradise Valley **Project#** 15-1189-001

Location : Lincoln Dr. west of Quail Run Rd.

2-DAY AVERAGE

AM Period	NB		SB		EB		WB			PM Period	NB		SB		EB		WB		
00:00	0		0		21		28			12:00	0		0		132		130		
00:15	0		0		14		20			12:15	0		0		127		132		
00:30	0		0		17		17			12:30	0		0		124		133		
00:45	0	0	0	0	10	61	17	81	142	12:45	0	0	0	0	127	509	142	535	1044
01:00	0		0		12		13			13:00	0		0		123		128		
01:15	0		0		12		19			13:15	0		0		125		158		
01:30	0		0		8		17			13:30	0		0		122		135		
01:45	0	0	0	0	8	39	12	59	98	13:45	0	0	0	0	129	498	136	556	1054
02:00	0		0		8		14			14:00	0		0		131		144		
02:15	0		0		11		13			14:15	0		0		126		151		
02:30	0		0		7		9			14:30	0		0		121		146		
02:45	0	0	0	0	4	30	6	42	71	14:45	0	0	0	0	118	495	145	585	1080
03:00	0		0		8		7			15:00	0		0		120		144		
03:15	0		0		13		5			15:15	0		0		129		152		
03:30	0		0		8		7			15:30	0		0		131		161		
03:45	0	0	0	0	7	35	10	28	63	15:45	0	0	0	0	127	506	154	611	1117
04:00	0		0		10		7			16:00	0		0		135		167		
04:15	0		0		15		7			16:15	0		0		123		148		
04:30	0		0		20		10			16:30	0		0		123		148		
04:45	0	0	0	0	14	58	11	35	93	16:45	0	0	0	0	108	488	182	645	1132
05:00	0		0		27		19			17:00	0		0		109		149		
05:15	0		0		35		26			17:15	0		0		108		140		
05:30	0		0		39		17			17:30	0		0		127		142		
05:45	0	0	0	0	32	132	25	85	217	17:45	0	0	0	0	121	465	144	574	1039
06:00	0		0		39		28			18:00	0		0		131		118		
06:15	0		0		57		38			18:15	0		0		113		103		
06:30	0		0		59		43			18:30	0		0		93		95		
06:45	0	0	0	0	56	210	46	154	364	18:45	0	0	0	0	86	423	96	411	833
07:00	0		0		57		46			19:00	0		0		69		73		
07:15	0		0		68		46			19:15	0		0		80		61		
07:30	0		0		68		51			19:30	0		0		84		82		
07:45	0	0	0	0	82	275	58	200	475	19:45	0	0	0	0	89	321	93	308	629
08:00	0		0		83		54			20:00	0		0		74		88		
08:15	0		0		81		73			20:15	0		0		56		66		
08:30	0		0		90		76			20:30	0		0		66		67		
08:45	0	0	0	0	79	332	79	281	613	20:45	0	0	0	0	74	269	79	299	568
09:00	0		0		72		74			21:00	0		0		68		83		
09:15	0		0		93		74			21:15	0		0		67		76		
09:30	0		0		86		88			21:30	0		0		57		65		
09:45	0	0	0	0	83	333	101	336	669	21:45	0	0	0	0	58	249	69	292	541
10:00	0		0		91		92			22:00	0		0		57		59		
10:15	0		0		81		93			22:15	0		0		50		47		
10:30	0		0		76		111			22:30	0		0		48		37		
10:45	0	0	0	0	73	320	85	381	701	22:45	0	0	0	0	42	196	47	190	385
11:00	0		0		72		103			23:00	0		0		27		48		
11:15	0		0		78		93			23:15	0		0		33		30		
11:30	0		0		80		92			23:30	0		0		23		29		
11:45	0	0	0	0	83	312	109	396	708	23:45	0	0	0	0	25	107	26	133	240
Total Vol.						2135		2076	**4211**							4524		5136	**9660**

GPS Coordinates: 0

Daily Totals

NB	SB			Combined
		6659	7212	**13870**

	AM			PM		
Split %	50.7%	49.3%	**30.4%**	46.8%	53.2%	**69.6%**
Peak Hour	11:45	11:45	**11:45**	15:15	16:00	**15:15**
Volume	465	503	**968**	521	645	**1155**
P.H.F.	0.88	0.95	**0.92**	0.97	0.89	**0.96**

Signal Timing Change

Intersection: 6 **Lincoln Drive and Tatum Boulevard** Date: 6/9/2015

Timing by: Michael Baker Approved by:

Implementation Date: Time:

Problem:

Solution: Town-Wide Signal timing project

Changes Made From:

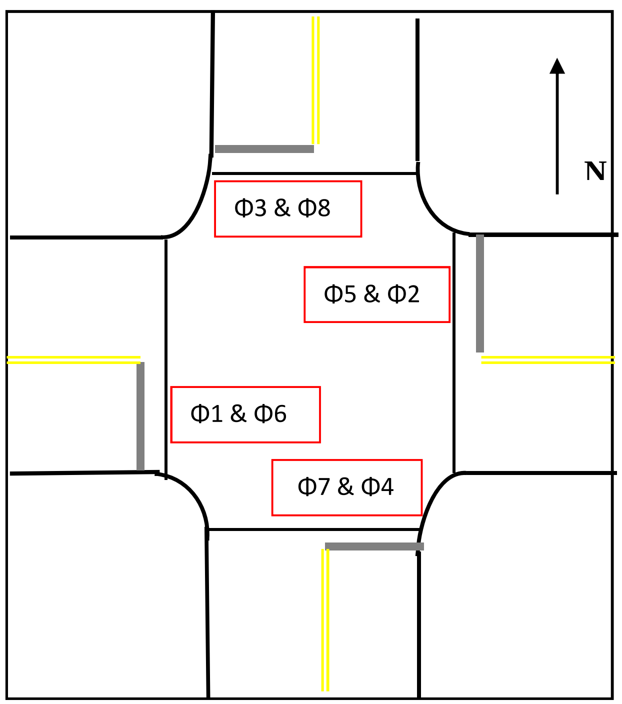
- [X] Controller
- [ ] Other:

Verified Changes In:

- [ ] Synchro
- [ ] Main Timing Sheet

Is this a temporary change?

- [ ] Yes, Date to Review for Removal?
- [X] No



Pattern # 1

Cycle Length: 130 **Offset:** 47 **Coord Phases:** Φ4 & Φ8

1)	17	**2)**	44	**3)**	32	**4)**	37
5)	19	**6)**	42	**7)**	8	**8)**	61

Notes: Max Recall on 2&6

Pattern # 2

Cycle Length: 130 **Offset:** 13 **Coord Phases:** Φ4 & Φ8

1)	21	**2)**	38	**3)**	30	**4)**	41
5)	18	**6)**	41	**7)**	8	**8)**	63

Notes: Max Recall on 2&6

Pattern # 3

Cycle Length: 130 **Offset:** 10 **Coord Phases:** Φ4 & Φ8

1)	21	**2)**	35	**3)**	20	**4)**	54
5)	17	**6)**	39	**7)**	9	**8)**	65

Notes: Max Recall on 2&6

Time of Day

STEP	PGM	TIME	PATTERN
1	1	6:00	1
2	1	9:00	2
3	1	14:00	3
4	1	18:00	2
5			
6			
7			
8			
9			
10			

Controller Configuration:

Ring 1	1		2		3		4	
Ring 2	5		6		7		8	
Barriers				^				^

Controller Timing Data:

Lincoln Drive and Tatum Boulevard

	1	2	3	4	5	6	7	8
Phases in use	x	x	x	x	x	x	x	x
Minimum Green	4	15	4	15	4	15	4	15
Walk		5		5		5		5
Ped Clear		23		24		23		24
Veh. Ext.	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Max 1	40	60	50	70	30	60	20	80
Max 2	40	60	50	70	30	60	20	80
Yellow Time	4	4.5	3	4.5	4	4.5	3	4.5
Red Clear	1	2.5	1	2.5	1	2.5	1	2.5

Signal Timing Change

Intersection: 16 **Lincoln Drive and Invergordon Road** Date: 6/9/2015

Timing by: Michael Baker Approved by:

Implementation Date: Time:

Problem:

Solution: Town-Wide Signal timing project

Changes Made From:

[X] Controller
[ ] Other:

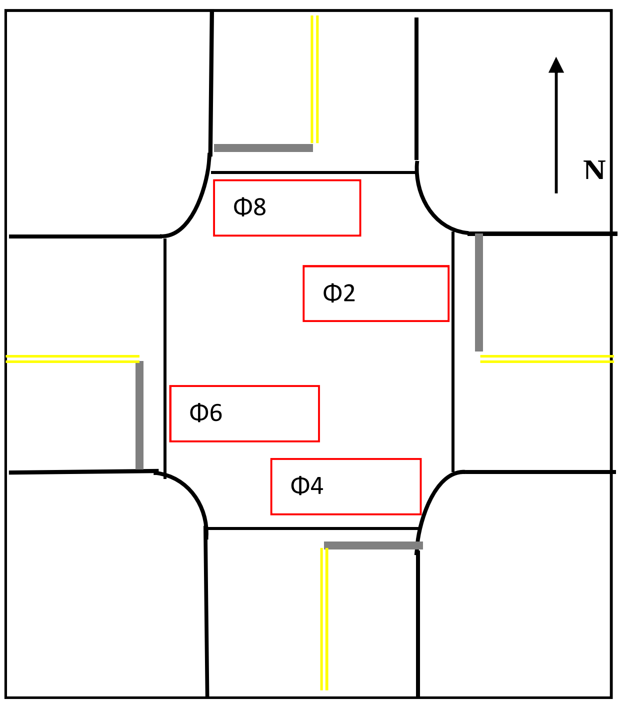
Verified Changes In:

[ ] Synchro
[ ] Main Timing Sheet

Is this a temporary change?

[ ] Yes,
[X] No

Date to Review for Removal?



Pattern # 1

Cycle Length: 65 **Offset:** 59 **Coord Phases:** Φ2 & Φ6

1)	0	**2)**	34	**3)**	0	**4)**	31
5)	0	**6)**	34	**7)**	0	**8)**	31

Notes:

Pattern # 2

Cycle Length: 65 **Offset:** 52 **Coord Phases:** Φ2 & Φ6

1)	0	**2)**	34	**3)**	0	**4)**	31
5)	0	**6)**	34	**7)**	0	**8)**	31

Notes:

Pattern # 3

Cycle Length: 65 **Offset:** 54 **Coord Phases:** Φ2 & Φ6

1)	0	**2)**	34	**3)**	0	**4)**	31
5)	0	**6)**	34	**7)**	0	**8)**	31

Notes:

Time of Day

STEP	PGM	TIME	PATTERN
1	1	6:00	1
2	1	9:00	2
3	1	14:00	3
4	1	18:00	2
5			
6			
7			
8			
9			
10			

Controller Configuration:

Ring 1			2				4	
Ring 2			6				8	
Barriers				^				^

Controller Timing Data:

	1	2	3	4	5	6	7	8
Phases in use		x		x		x		x
Minimum Green		15		10		15		10
Walk		7		7		7		
Ped Clear		11		17		11		
Veh. Ext.		3		3		3		3
Max 1		50		50		50		50
Max 2		50		50		50		50
Yellow Time		4.5		4		4.5		4
Red Clear		1.5		3		1.5		3

Signal Timing Change

Intersection: 19 **Lincoln Drive and Mockingbird Lane** Date: 6/9/2015

Timing by: Michael Baker Approved by: ____

Implementation Date: ____ Time: ____

Problem: ____

Solution: Town-Wide Signal timing project

Changes Made From:

- [X] Controller
- [ ] Other: ____

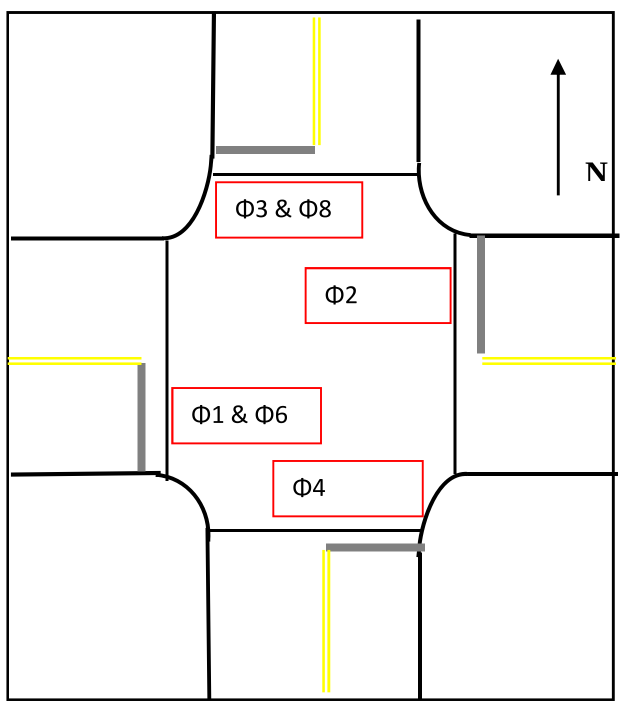
Verified Changes In:

- [ ] Synchro
- [ ] Main Timing Sheet

Is this a temporary change?

- [ ] Yes,
- [X] No

Date to Review for Removal? ____



Pattern # 1

Cycle Length: 130 **Offset:** 128 **Coord Phases:** Φ2 & Φ6

1)	27	**2)**	50	**3)**	9	**4)**	44
5)	0	**6)**	77	**7)**	0	**8)**	53

Notes:

Pattern # 2

Cycle Length: 130 **Offset:** 15 **Coord Phases:** Φ2 & Φ6

1)	26	**2)**	56	**3)**	10	**4)**	38
5)	0	**6)**	82	**7)**	0	**8)**	48

Notes:

Pattern # 3

Cycle Length: 130 **Offset:** 16 **Coord Phases:** Φ2 & Φ6

1)	31	**2)**	57	**3)**	8	**4)**	34
5)	0	**6)**	88	**7)**	0	**8)**	42

Notes:

Time of Day

STEP	PGM	TIME	PATTERN
1	1	6:00	1
2	1	9:00	2
3	1	14:00	3
4	1	18:00	2
5			
6			
7			
8			
9			
10			

Controller Configuration:

Ring 1	**1**		**2**		**3**		**4**	
Ring 2			**6**				**8**	
Barriers				**^**				**^**

Controller Timing Data:

	1	2	3	4	5	6	7	8
Phases in use	x	x	x	x		x		x
Minimum Green	4	15	4	7		15		7
Walk		7		7		7		7
Ped Clear		14		20		14		20
Veh. Ext.	3	3	3	3		3		3
Max 1	50	80	20	60		110		70
Max 2	50	80	20	60		110		70
Yellow Time	3	4.5	3	4		4.5		4
Red Clear	1	1.5	1	2.5		1.5		2.5

SCOTTSDALE RD. & INDI BASIC TIMING

RECOMMENDED CLEARANCES

	N/S	E/W	LEFT TURN STANDARD
F.D.W.	16	31	
YELLOW	4.4	4.2	3.0
ALL-RED	1.6	2.8	1.0

DATE DESIGNED: 3/15/2010

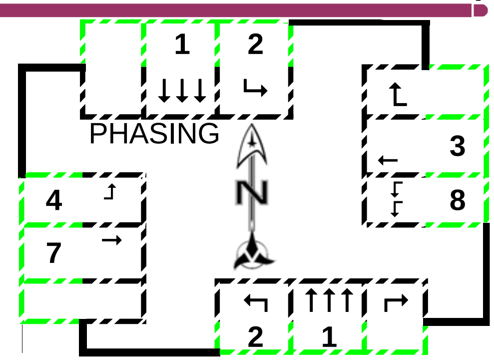
SYSTEM #	SECTION #
82	722

COMMUNICATIONS MM-1-5-1 I.P. ADDRESS 172.17. 10.82

TIMING #1 TIMING #2 TIMING #3 TIMING #4
CLEARANCE SEQUENCE PATTERNS HISTORY

MM-2-1
TIMING PLAN #1

PHASE	1	2	3	4			7	8	9	10	11	12	13	14	15	16
MOVEMENT	NST	NSL	WBT	EBL			EBT	WBL								
NOTES		perm/PROT		PROT				PROT								
GREENS																
MIN GRN	20	4	6	4			6	4								
BK MGRN																
CS MGRN																
DLY GRN																
PEDESTRIAN																
WALK	7		7				7									
WALK2																
WLK MAX																
PED CLR/FDW	16		31				31									
PD CLR2																
PC MAX																
PED CO																
MAXIMUMS																
VEH EXT	0	1	2	1			1	1.5								
VH EXT2																
MAX 1	60	20	35	20			20	35								
MAX 2	70	30	40	35			40	40								
MAX 3																
DYM MAX																
DYM STP																
YELLOW	4.4	3	4.2	3			4.2	3								
REDS																
RED CLR	1.6	1	2.8	1			2.8	1								
RED MAX																
RED RVT	2		2				2									
VOL DENSITY																
ACT B4																
SEC/ACT																
MAX INT																
TIME B4																
CARS WT																
STPTDUC																
TTREDUC																
MIN GAP																
MM-2-8 RECALLS																
LOCK DET																
VEH RECALL																
PED RECALL	X															
MAX RECALL																
SOFT RECALL																
NO REST																
ADD INIT CAL																



1	2	3	4	5	6	7	8
58	18	31	18	64	22	15	34
65	30	35	38	71	34	35	38

SPLIT PLAN MAXIMUMS

NOTES

Use Sequence #3 to Lead phs 4 & 7 and Lag phs 3 & 8

ONLY VALID WHEN STAMPED

SCOTTSDALE RD. & INDI COORDINATOR

CITY OF SCOTTSDALE

N

CLEARANCES

	PH1	2	3	4	5	6	7	8
FDW	16	0	31	0	0	0	31	0
YELLOW	4.4	3.0	4.2	3.0	0.0	0.0	4.2	3.0
ALL RED	1.6	1.0	2.8	1.0	0.0	0.0	2.8	1.0

SYSTEM # 82

SECTION # 722

MORNING | EVENING | N/S EX | MID-DAY | MIDNIGHT | E/W EX

CLEARANCE | BASIC TIME | SEQUENCE | HISTORY

MM-3-3 MORNING SPLIT PATTERNS

TIMING PLAN # 1

SEQUENCE # 3

ACTION PLAN #

SEQUENCE				
R1	1 ↕	2	4	3 ←
R2			7 →	8

MOVEMENTS	NST	NSL	WBT	EBL			EBT	WBL

E/W		N/S
	WALK & GREEN	
	FDW & GREEN	
	GREEN w/o WALK	
	LEFT	

PLAN # 1

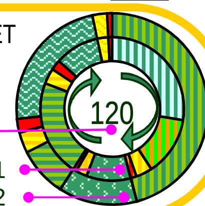
DATE EFFECTIVE 10/10/2012

OPERATIVE TIMES 0630-0900

	RING 1				RING 2				TARGET
PHASE	1	2	3	4	5	6	7	8	
SPLIT	55	16	33	16	55	16	17	32	120
COORD	X								ACTUAL CYCLE
RECALLS (V, P, Mx)	P								
GREEN	49	12	26	12	55	16	10	28	

RING 1

RING 2



PLAN # 2

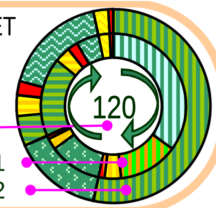
DATE EFFECTIVE 10/10/2012

OPERATIVE TIMES

	RING 1				RING 2				TARGET
PHASE	1	2	3	4	5	6	7	8	
SPLIT	64	18	28	10	64	18	13	25	120
COORD	X								ACTUAL CYCLE
RECALLS (V, P, Mx)	P								
GREEN	58	14	21	6	64	18	6	21	

RING 1

RING 2



PLAN # 3

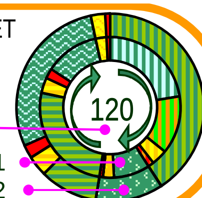
DATE EFFECTIVE 10/10/2012

OPERATIVE TIMES

	RING 1				RING 2				TARGET
PHASE	1	2	3	4	5	6	7	8	
SPLIT	49	14	38	19	49	14	19	38	120
COORD	X								ACTUAL CYCLE
RECALLS (V, P, Mx)	P								
GREEN	43	10	31	15	49	14	12	34	

RING 1

RING 2



MM-3-2

AVAILABLE COORDINATOR PATTERN #s

1 1
1 2
1 3
1 4
1 5
1 6
2 1
2 2
2 3
2 4
2 5
2 6
3 1
3 2
3 3
3 4
3 5
3 6

PROGRESSION VALUES

DIR CODE	COORD DIR	B.O.G. OFFSET
1	NB	115
2	SB	30
3	NS	30
4	EB	15
5	WB	15
6	EW	15

HYPERLINKS TO MORNING TIME-SPACE DIAGRAMS

1

2

3

4

5

6

SCOTTSDALE RD. & INDIA COORDINATOR

CLEARANCES

	PH1	2	3	4	5	6	7	8
FDW	16	0	31	0	0	0	31	0
YELLOW	4.4	3.0	4.2	3.0	0.0	0.0	4.2	3.0
ALL RED	1.6	1.0	2.8	1.0	0.0	0.0	2.8	1.0

SYSTEM # 82

SECTION # 722

MORNING | EVENING | N/S EX | MID-DAY | MIDNIGHT | E/W EX

CLEARANCE | BASIC TIME | SEQUENCE | HISTORY

MM-3-3 EVENING SPLIT PATTERNS

TIMING PLAN 1	SEQUENCE				
SEQUENCE 3	R1	1 ↕	2	4	3 ←
ACTION PLAN	R2			7 →	8

MOVEMENTS: NST NSL WBT EBL EBT WBL

E/W		N/S
	WALK & GREEN	
	FDW & GREEN	
	GREEN w/o WALK	
	LEFT	

MM-3-2

AVAILABLE COORDINATOR PATTERN #s

7 1, 7 2, 7 3, 7 4, 7 5, 7 6, 8 1, 8 2, 8 3, 8 4, 8 5, 8 6, 9 1, 9 2, 9 3, 9 4, 9 5, 9 6

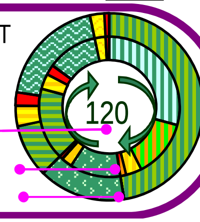
PLAN # 7

DATE EFFECTIVE 11/21/2006

OPERATIVE TIMES 1530-1830

PHASE	1	2	3	4	5	6	7	8	TARGET
	RING 1				RING 2				
SPLIT	57	18	27	18	57	18	18	27	120
COORD	X								ACTUAL
RECALLS (V, P, Mx)	P								CYCLE
GREEN	51	14	20	14	57	18	11	23	

RING 1
RING 2



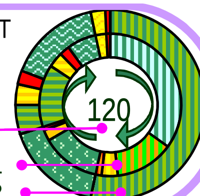
PLAN # 8

DATE EFFECTIVE

OPERATIVE TIMES

PHASE	1	2	3	4	5	6	7	8	TARGET
	RING 1				RING 2				
SPLIT	64	20	24	12	64	20	13	23	120
COORD	X								ACTUAL
RECALLS (V, P, Mx)	P								CYCLE
GREEN	58	16	17	8	64	20	6	19	

RING 1
RING 2



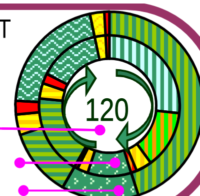
PLAN # 9

DATE EFFECTIVE

OPERATIVE TIMES

PHASE	1	2	3	4	5	6	7	8	TARGET
	RING 1				RING 2				
SPLIT	54	16	29	21	54	16	21	29	120
COORD	X								ACTUAL
RECALLS (V, P, Mx)	P								CYCLE
GREEN	48	12	22	17	54	16	14	25	

RING 1
RING 2



PROGRESSION VALUES

DIR CODE	COORD DIR	B.O.G. OFFSET
1	NB	115
2	SB	30
3	NS	30
4	EB	45
5	WB	45
6	EW	45

HYPERLINKS TO EVENING TIME-SPACE DIAGRAMS

1
2
3
4
5
6

SCOTTSDALE RD. & SP BASIC TIMING

CITY OF SCOTTSDALE

RECOMMENDED CLEARANCES

	N/S	E/W	LEFT TURN STANDARD
F.D.W.	6	22	
YELLOW	4.9	3.2	3.0
ALL-RED	1.1	3.8	1.0

DATE DESIGNED: 11/17/2010

SYSTEM #	SECTION #
209	722

COMMUNICATIONS: MM-1-5-1 I.P. ADDRESS: 172.17. 12.09

TIMING #1 | TIMING #2 | TIMING #3 | TIMING #4
CLEARANCE | SEQUENCE | PATTERNS | HISTORY

MM-2-1 TIMING PLAN #1

PHASE	1		3						9	10	11	12	13	14	15	16
MOVEMENT	NST		EWT													
NOTES																
MIN GRN	10		5													
BK MGRN																
CS MGRN																
DLY GRN																
WALK	20		8													
WALK2																
WLK MAX																
PED CLR/FDW	10		22													
PD CLR2																
PC MAX																
PED CO																
VEH EXT			2													
VH EXT2																
MAX 1	95		30													
MAX 2	100		45													
MAX 3																
DYM MAX																
DYM STP																
YELLOW	4.9		2.8													
RED CLR	1.1		3.2													
RED MAX																
RED RVT	2		2													
ACT B4																
SEC/ACT																
MAX INT																
TIME B4																
CARS WT																
STPTDUC																
TTREDUC																
MIN GAP																
LOCK DET																
VEH RECALL																
PED RECALL	X															
MAX RECALL																
SOFT RECALL																
NO REST																
ADD INIT CAL																

GREENS

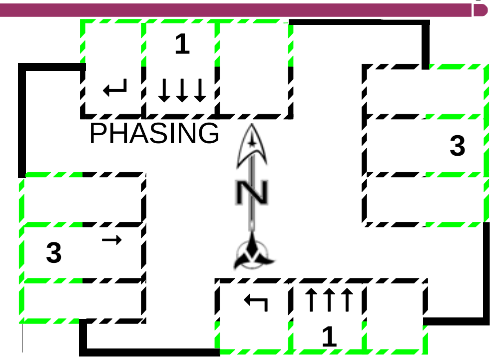
PEDESTRIAN

MAXIMUMS

REDS

VOL DENSITY

MM-2-8 RECALLS



1	2	3	4	5	6	7	8
94	0	26	0	0	0	0	0
99	0	41	0	0	0	0	0

SPLIT PLAN MAXIMUMS

NOTES

ONLY VALID WHEN STAMPED

SCOTTSDALE RD. & SPI COORDINATOR

CLEARANCES

	PH1	2	3	4	5	6	7	8
FDW	10	0	22	0	0	0	0	0
YELLOW	4.9	0.0	2.8	0.0	0.0	0.0	0.0	0.0
ALL RED	1.1	0.0	3.2	0.0	0.0	0.0	0.0	0.0

SYSTEM # 209

SECTION # 722

MORNING | EVENING | N/S EX | MID-DAY | MIDNIGHT | E/W EX | CLEARANCE | BASIC TIME | SEQUENCE | HISTORY

MM-3-3 MORNING SPLIT PATTERNS

TIMING PLAN # 1

SEQUENCE # 1

ACTION PLAN #

SEQUENCE

R1 1 ↕ | 3 ↔

R2

MOVEMENTS NST EWT

E/W N/S: WALK & GREEN; FDW & GREEN; GREEN w/o WALK; LEFT

PLAN # 1
DATE EFFECTIVE 11/20/2006

OPERATIVE TIMES 0630-0900

	RING 1				RING 2				TARGET
PHASE	1	2	3	4	5	6	7	8	
SPLIT	95		25						120
COORD	X								ACTUAL
RECALLS (V, P, Mx)	P								CYCLE
GREEN	89	0	19	0	0	0	0	0	

120 RING 1 RING 2

PLAN # 2
DATE EFFECTIVE 3/30/2009

OPERATIVE TIMES

	RING 1				RING 2				TARGET
PHASE	1	2	3	4	5	6	7	8	
SPLIT	100		20						120
COORD	X								ACTUAL
RECALLS (V, P, Mx)	P								CYCLE
GREEN	94	0	14	0	0	0	0	0	

120 RING 1 RING 2

PLAN # 3
DATE EFFECTIVE 3/30/2009

OPERATIVE TIMES

	RING 1				RING 2				TARGET
PHASE	1	2	3	4	5	6	7	8	
SPLIT	88		32						120
COORD	X								ACTUAL
RECALLS (V, P, Mx)	P								CYCLE
GREEN	82	0	26	0	0	0	0	0	

120 RING 1 RING 2

MM-3-2

AVAILABLE COORDINATOR PATTERN #s

1 1, 1 2, 1 3, 1 4, 1 5, 1 6, 2 1, 2 2, 2 3, 2 4, 2 5, 2 6, 3 1, 3 2, 3 3, 3 4, 3 5, 3 6

PROGRESSION VALUES

DIR CODE	COORD DIR	B.O.G. OFFSET
1	NB	100
2	SB	75
3	NS	65
4	EB	25
5	WB	25
6	EW	25

HYPERLINKS TO MORNING TIME-SPACE DIAGRAMS

1 2 3 4 5 6

SCOTTSDALE RD. & SPI COORDINATOR

CLEARANCES

	PH1	2	3	4	5	6	7	8
FDW	10	0	22	0	0	0	0	0
YELLOW	4.9	0.0	2.8	0.0	0.0	0.0	0.0	0.0
ALL RED	1.1	0.0	3.2	0.0	0.0	0.0	0.0	0.0

SYSTEM # 209

SECTION # 722

MORNING | EVENING | N/S EX | MID-DAY | MIDNIGHT | E/W EX | CLEARANCE | BASIC TIME | SEQUENCE | HISTORY

MM-3-3 EVENING SPLIT PATTERNS

TIMING PLAN 1
SEQUENCE 1
ACTION PLAN

SEQUENCE
R1: 1 ↕ | | 3 ↔ |
R2:

MOVEMENTS NST EWT

E/W N/S: WALK & GREEN; FDW & GREEN; GREEN w/o WALK; LEFT

MM-3-2

AVAILABLE COORDINATOR PATTERN #s

7 1, 7 2, 7 3, 7 4, 7 5, 7 6, 8 1, 8 2, 8 3, 8 4, 8 5, 8 6, 9 1, 9 2, 9 3, 9 4, 9 5, 9 6

PROGRESSION VALUES

DIR CODE	COORD DIR	B.O.G. OFFSET
1	NB	100
2	SB	75
3	NS	65
4	EB	30
5	WB	30
6	EW	30

HYPERLINKS TO EVENING TIME-SPACE DIAGRAMS

1, 2, 3, 4, 5, 6

PLAN # 7
DATE EFFECTIVE 1/0/1900
OPERATIVE TIMES 1530-1830

PHASE	1	2	3	4	5	6	7	8	TARGET
SPLIT	96		24						120
COORD	X								ACTUAL CYCLE
RECALLS (V, P, Mx)	P								
GREEN	90	0	18	0	0	0	0	0	

RING 1 (phases 1–4), RING 2 (phases 5–8). RING 1, RING 2. Cycle 120

PLAN # 8
DATE EFFECTIVE
OPERATIVE TIMES

PHASE	1	2	3	4	5	6	7	8	TARGET
SPLIT	100		20						120
COORD	X								ACTUAL CYCLE
RECALLS (V, P, Mx)	P								
GREEN	94	0	14	0	0	0	0	0	

RING 1, RING 2. Cycle 120

PLAN # 9
DATE EFFECTIVE
OPERATIVE TIMES

PHASE	1	2	3	4	5	6	7	8	TARGET
SPLIT	88		32						120
COORD	X								ACTUAL CYCLE
RECALLS (V, P, Mx)	P								
GREEN	82	0	26	0	0	0	0	0	

RING 1, RING 2. Cycle 120

SCOTTSDALE RD. & LINC BASIC TIMING

CITY OF SCOTTSDALE

RECOMMENDED CLEARANCES

	N/S	E/W	LEFT TURN STANDARD
F.D.W.	15	26	
YELLOW	4.5	4	3.0
ALL-RED	1.5	3	1.0

DATE DESIGNED: 4/20/2010

SYSTEM #	SECTION #
80	722

COMMUNICATIONS MM-1-5-1 I.P. ADDRESS 172.17. 10.80

TIMING #1 TIMING #2 TIMING #3 TIMING #4
CLEARANCE SEQUENCE PATTERNS HISTORY

MM-2-1 TIMING PLAN #1

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MOVEMENT	NBT	SBL	WBT		SBT	NBL	EBT									
NOTES			Th&Lt				Th&Lt									
MIN GRN	20	5	5		20	5	8									
BK MGRN																
CS MGRN																
DLY GRN																
WALK	7		7		7		7									
WALK2																
WLK MAX																
PED CLR/FDW	15		26		15		26									
PD CLR2																
PC MAX																
PED CO																
VEH EXT	0	1	2		0	1	2									
VH EXT2																
MAX 1	65	15	20		60	20	30									
MAX 2	70	35	30		65	35	40									
MAX 3																
DYM MAX																
DYM STP																
YELLOW	4.5	3	4		4.5	3	4									
RED CLR	1.5	1	3		1.5	1	3									
RED MAX																
RED RVT	2		2		2		2									
ACT B4																
SEC/ACT																
MAX INT																
TIME B4																
CARS WT																
STPTDUC																
TTREDUC																
MIN GAP																
LOCK DET																
VEH RECALL																
PED RECALL	X				X											
MAX RECALL																
SOFT RECALL																
NO REST																
ADD INIT CAL																

GREENS

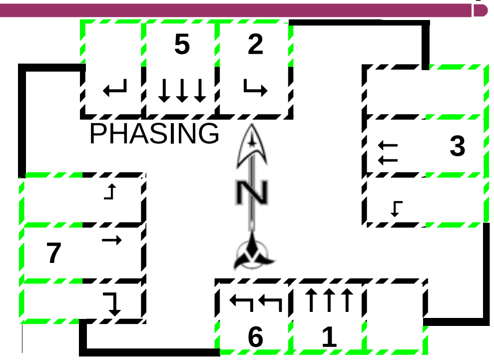
PEDESTRIAN

MAXIMUMS

REDS

VOL DENSITY

MM-2-8 RECALLS



1	2	3	4	5	6	7	8
62	12	20	33	57	21	26	27
70	35	27	46	64	35	39	34

SPLIT PLAN MAXIMUMS

NOTES

PHASES 3 & 7 ARE EXCLUSIVE

ONLY VALID WHEN STAMPED

SCOTTSDALE RD. & LINC COORDINATOR

CLEARANCES

	PH1	2	3	4	5	6	7	8
FDW	15	0	26	0	15	0	26	0
YELLOW	4.5	3.0	4.0	0.0	4.5	3.0	4.0	0.0
ALL RED	1.5	1.0	3.0	0.0	1.5	1.0	3.0	0.0

SYSTEM # **80**

SECTION # **722**

MORNING | EVENING | N/S EX | MID-DAY | MIDNIGHT | E/W EX

CLEARANCE | BASIC TIME | SEQUENCE | HISTORY

MM-3-3
MORNING SPLIT PATTERNS

TIMING PLAN # **1**
SEQUENCE # **9**
ACTION PLAN #

SEQUENCE

R1	1 ↑	2 ↵	3 ←	
R2	5 ↓	6 ↰		7 →

MOVEMENTS	NBT	SBL	WBT		SBT	NBL	EBT	

E/W | N/S
WALK & GREEN
FDW & GREEN
GREEN w/o WALK
LEFT

MM-3-2
AVAILABLE COORDINATOR PATTERN #s

1 1, 1 2, 1 3, 1 4, 1 5, 1 6, 2 1, 2 2, 2 3, 2 4, 2 5, 2 6, 3 1, 3 2, 3 3, 3 4, 3 5, 3 6

PROGRESSION VALUES

DIR CODE	COORD DIR	B.O.G. OFFSET
1	NB	75
2	SB	90
3	NS	90
4	EB	105
5	WB	105
6	EW	105

HYPERLINKS TO MORNING TIME-SPACE DIAGRAMS

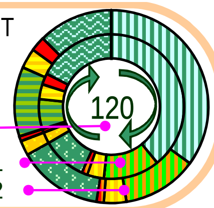
1, 2, 3, 4, 5, 6

PLAN # 1
DATE EFFECTIVE 4/20/2010
OPERATIVE TIMES 0630-0900

	RING 1				RING 2				TARGET
PHASE	1	2	3	4	5	6	7	8	
SPLIT	61	14	19	26	56	19	28	17	120
COORD	X				X				ACTUAL
RECALLS (V, P, Mx)	P				P				CYCLE
GREEN	55	10	12	26	50	15	21	17	

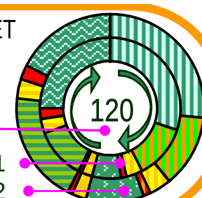
PLAN # 2
DATE EFFECTIVE 4/20/2010
OPERATIVE TIMES

	RING 1				RING 2				TARGET
PHASE	1	2	3	4	5	6	7	8	
SPLIT	68	16	15	21	63	21	21	15	120
COORD	X				X				ACTUAL
RECALLS (V, P, Mx)	P				P				CYCLE
GREEN	62	12	8	21	57	17	14	15	



PLAN # 3
DATE EFFECTIVE 4/20/2010
OPERATIVE TIMES

	RING 1				RING 2				TARGET
PHASE	1	2	3	4	5	6	7	8	
SPLIT	57	12	21	30	53	16	30	21	120
COORD	X				X				ACTUAL
RECALLS (V, P, Mx)	P				P				CYCLE
GREEN	51	8	14	30	47	12	23	21	



SCOTTSDALE RD. & LINC COORDINATOR

CITY OF SCOTTSDALE

CLEARANCES

	PH1	2	3	4	5	6	7	8
FDW	15	0	26	0	15	0	26	0
YELLOW	4.5	3.0	4.0	0.0	4.5	3.0	4.0	0.0
ALL RED	1.5	1.0	3.0	0.0	1.5	1.0	3.0	0.0

SYSTEM # 80

SECTION # 722

MORNING | EVENING | N/S EX | MID-DAY | MIDNIGHT | E/W EX | CLEARANCE | BASIC TIME | SEQUENCE | HISTORY

MM-3-3 EVENING SPLIT PATTERNS

TIMING PLAN 1

SEQUENCE 9

ACTION PLAN

SEQUENCE

R1	1 ↑	2 ↰	3 ←	
R2	5 ↓	6 ↰		7 →

MOVEMENTS	NBT	SBL	WBT		SBT	NBL	EBT	

E/W		N/S
	WALK & GREEN	
	FDW & GREEN	
	GREEN w/o WALK	
	LEFT	

MM-3-2

AVAILABLE COORDINATOR PATTERN #s

PROGRESSION VALUES

HYPERLINKS TO EVENING TIME-SPACE DIAGRAMS

PLAN # 7

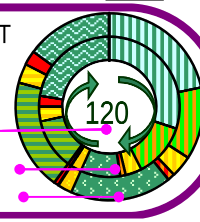
DATE EFFECTIVE 4/20/2010

OPERATIVE TIMES 1530-1830

PHASE	1	2	3	4	5	6	7	8	TARGET
	RING 1				RING 2				
SPLIT	57	15	21	27	47	25	30	18	120
COORD	X				X				ACTUAL
RECALLS (V, P, Mx)	P				P				CYCLE
GREEN	51	11	14	27	41	21	23	18	

RING 1

RING 2



PLAN # 8

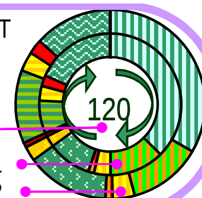
DATE EFFECTIVE 4/20/2010

OPERATIVE TIMES

PHASE	1	2	3	4	5	6	7	8	TARGET
	RING 1				RING 2				
SPLIT	66	16	16	22	61	21	22	16	120
COORD	X				X				ACTUAL
RECALLS (V, P, Mx)	P				P				CYCLE
GREEN	60	12	9	22	55	17	15	16	

RING 1

RING 2



PLAN # 9

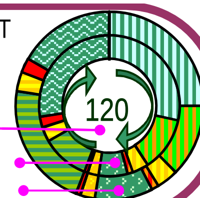
DATE EFFECTIVE 4/20/2010

OPERATIVE TIMES

PHASE	1	2	3	4	5	6	7	8	TARGET
	RING 1				RING 2				
SPLIT	55	12	20	33	51	16	33	20	120
COORD	X				X				ACTUAL
RECALLS (V, P, Mx)	P				P				CYCLE
GREEN	49	8	13	33	45	12	26	20	

RING 1

RING 2



AVAILABLE COORDINATOR PATTERN #s
7 1
7 2
7 3
7 4
7 5
7 6
8 1
8 2
8 3
8 4
8 5
8 6
9 1
9 2
9 3
9 4
9 5
9 6

DIR CODE	COORD DIR	B.O.G. OFFSET	
1	NB	75	1
2	SB	90	2
3	NS	90	3
4	EB	3	4
5	WB	3	5
6	EW	3	6

SCOTTSDALE RD. & McD BASIC TIMING

RECOMMENDED CLEARANCES

	N/S	E/W	LEFT TURN STANDARD
F.D.W.	16	24	
YELLOW	4.5	4.3	3.0
ALL-RED	1.5	2.7	1.0

DATE DESIGNED: 3/15/2010

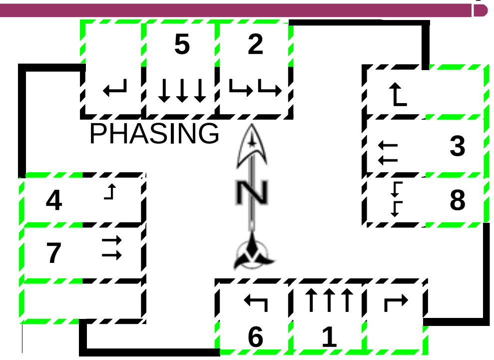
SYSTEM #	SECTION #
73	721

COMMUNICATIONS MM-1-5-1 I.P. ADDRESS 172.17. 10.73

TIMING #1 TIMING #2 TIMING #3 TIMING #4
CLEARANCE SEQUENCE PATTERNS HISTORY

MM-2-1 TIMING PLAN #1

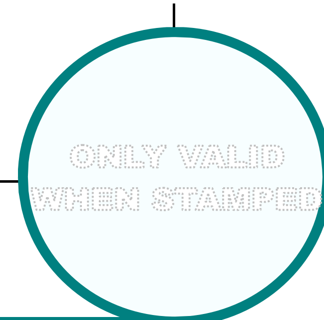
	PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	MOVEMENT	NBT	SBL	WBT	EBL	SBT	NBL	EBT	WBL								
	NOTES																
GREENS	MIN GRN	20	10	8	6	20	10	8	6								
	BK MGRN																
	CS MGRN																
	DLY GRN																
PEDESTRIAN	WALK	9		6		9		6									
	WALK2																
	WLK MAX																
	PED CLR/FDW	16		24		16		24									
	PD CLR2																
	PC MAX																
	PED CO																
MAXIMUMS	VEH EXT	0	1	2	1	0	1	2	1								
	VH EXT2																
	MAX 1	55	20	40	20	55	20	40	20								
	MAX 2	65	35	45	30	65	35	45	30								
	MAX 3																
	DYM MAX																
	DYM STP																
	YELLOW	4.5	3	4.3	3	4.5	3	4.3	3								
REDS	RED CLR	1.5	1	2.7	1	1.5	1	2.7	1								
	RED MAX																
	RED RVT	2		2		2		2									
VOL DENSITY	ACT B4																
	SEC/ACT																
	MAX INT																
	TIME B4																
	CARS WT																
	STPTDUC																
	TTREDUC																
	MIN GAP																
MM-2-8 RECALLS	LOCK DET																
	VEH RECALL																
	PED RECALL																
	MAX RECALL	x				x											
	SOFT RECALL																
	NO REST																
	ADD INIT CAL																



1	2	3	4	5	6	7	8
52	20	29	17	52	20	29	17
64	35	44	39	64	35	44	39

SPLIT PLAN MAXIMUMS

NOTES



SCOTTSDALE RD. & McDO COORDINATOR

CLEARANCES

	PH1	2	3	4	5	6	7	8
FDW	16	0	24	0	16	0	24	0
YELLOW	4.5	3.0	4.3	3.0	4.5	3.0	4.3	3.0
ALL RED	1.5	1.0	2.7	1.0	1.5	1.0	2.7	1.0

SYSTEM # 73

SECTION # 721

MORNING | EVENING | N/S EX | MID-DAY | MIDNIGHT | E/W EX

CLEARANCE | BASIC TIME | SEQUENCE | HISTORY

MM-3-3 MORNING SPLIT PATTERNS

TIMING PLAN # 1

SEQUENCE # 1

ACTION PLAN #

SEQUENCE

R1	1 ↑	2 ↵	3 ←	4 ↰
R2	5 ↓	6 ↵	7 →	8 ↱

MOVEMENTS	NBT	SBL	WBT	EBL	SBT	NBL	EBT	WBL

E/W | N/S

WALK & GREEN

FDW & GREEN

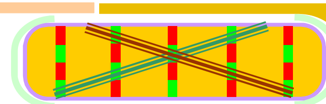
GREEN w/o WALK

LEFT

MM-3-2

AVAILABLE COORDINATOR PATTERN #s

11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 31, 32, 33, 34, 35, 36



PROGRESSION VALUES

DIR CODE	COORD DIR	B.O.G. OFFSET
1	NB	35
2	SB	25
3	NS	30
4	EB	25
5	WB	25
6	EW	25

HYPERLINKS TO MORNING TIME-SPACE DIAGRAMS

1 2 3 4 5 6

PLAN # 1

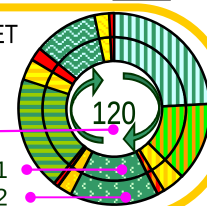
DATE EFFECTIVE 1/0/1900

OPERATIVE TIMES 0630-0900

	RING 1				RING 2				TARGET
PHASE	1	2	3	4	5	6	7	8	
SPLIT	51	22	30	17	51	22	30	17	120
COORD	X				X				ACTUAL
RECALLS (V, P, Mx)	P				P				CYCLE
GREEN	45	18	23	13	45	18	23	13	

RING 1

RING 2



PLAN # 2

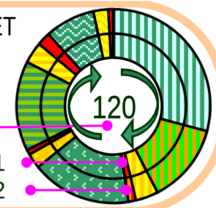
DATE EFFECTIVE 3/30/2009

OPERATIVE TIMES

	RING 1				RING 2				TARGET
PHASE	1	2	3	4	5	6	7	8	
SPLIT	57	24	25	14	57	24	25	14	120
COORD	X				X				ACTUAL
RECALLS (V, P, Mx)	P				P				CYCLE
GREEN	51	20	18	10	51	20	18	10	

RING 1

RING 2



PLAN # 3

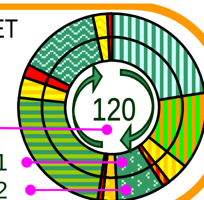
DATE EFFECTIVE 3/30/2009

OPERATIVE TIMES

	RING 1				RING 2				TARGET
PHASE	1	2	3	4	5	6	7	8	
SPLIT	49	14	36	21	49	14	36	21	120
COORD	X				X				ACTUAL
RECALLS (V, P, Mx)	P				P				CYCLE
GREEN	43	10	29	17	43	10	29	17	

RING 1

RING 2



SCOTTSDALE RD. & McDO COORDINATOR

CITY OF SCOTTSDALE

CLEARANCES

	PH1	2	3	4	5	6	7	8
FDW	16	0	24	0	16	0	24	0
YELLOW	4.5	3.0	4.3	3.0	4.5	3.0	4.3	3.0
ALL RED	1.5	1.0	2.7	1.0	1.5	1.0	2.7	1.0

SYSTEM # 73

SECTION # 721

MORNING | EVENING | N/S EX | MID-DAY | MIDNIGHT | E/W EX

CLEARANCE | BASIC TIME | SEQUENCE | HISTORY

MM-3-3 EVENING SPLIT PATTERNS

TIMING PLAN 1

SEQUENCE 1

ACTION PLAN

SEQUENCE

R1	1 ↑	2 ↳	3 ←	4 ↰
R2	5 ↓	6 ↵	7 →	8 ↱

MOVEMENTS	NBT	SBL	WBT	EBL	SBT	NBL	EBT	WBL

E/W | N/S
WALK & GREEN
FDW & GREEN
GREEN w/o WALK
LEFT

MM-3-2

AVAILABLE COORDINATOR PATTERN #s

PROGRESSION VALUES

HYPERLINKS TO EVENING TIME-SPACE DIAGRAMS

PLAN # 7
DATE EFFECTIVE 1/0/1900
OPERATIVE TIMES 1530-1830

PHASE	1	2	3	4	5	6	7	8	TARGET
	RING 1				RING 2				
SPLIT	54	19	31	16	54	19	31	16	120
COORD	X				X				ACTUAL
RECALLS (V, P, Mx)	P				P				CYCLE
GREEN	48	15	24	12	48	15	24	12	RING 1 / RING 2

120

PLAN # 8
DATE EFFECTIVE
OPERATIVE TIMES

PHASE	1	2	3	4	5	6	7	8	TARGET
	RING 1				RING 2				
SPLIT	58	22	26	14	58	22	26	14	120
COORD	X				X				ACTUAL
RECALLS (V, P, Mx)	P				P				CYCLE
GREEN	52	18	19	10	52	18	19	10	RING 1 / RING 2

120

PLAN # 9
DATE EFFECTIVE
OPERATIVE TIMES

PHASE	1	2	3	4	5	6	7	8	TARGET
	RING 1				RING 2				
SPLIT	49	14	36	21	49	14	36	21	120
COORD	X				X				ACTUAL
RECALLS (V, P, Mx)	P				P				CYCLE
GREEN	43	10	29	17	43	10	29	17	RING 1 / RING 2

120

Available coordinator patterns: 7 1, 7 2, 7 3, 7 4, 7 5, 7 6, 8 1, 8 2, 8 3, 8 4, 8 5, 8 6, 9 1, 9 2, 9 3, 9 4, 9 5, 9 6

DIR CODE	COORD DIR	B.O.G. OFFSET	
1	NB	35	1
2	SB	25	2
3	NS	30	3
4	EB	35	4
5	WB	35	5
6	EW	35	6

APPENDIX C

COLLISION DATA

2012

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	3	7	7	0
Severity				
Fatal	0	0	0	0
Injury	0	0	0	0
PDO	3			
Total	3			

	PDO	INJ	FAT	TOTAL
Units	7	0	0	7

LightCondition	Code	No.
DAYLIGHT	1	3
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	0
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		3

Weather	Code	No.
CLEAR	1	3
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		3

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	0
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	1
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	0
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	2
UNKNOWN	99	0
Check Total		3

Weekday	Code	No.
Sunday	1	0
Monday	2	0
Tuesday	3	0
Wednesday	4	1
Thursday	5	1
Friday	6	0
Saturday	7	1
Check Total		3

Circumstances	
Intersection Related?	0
Hit & Run?	1

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	3
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	0
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		3

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	0
LEFT_TURN	3	0
REAR_END	4	2
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	1
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		3

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	3
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		3

Month	Code	No.
January	1	0
February	2	0
March	3	0
April	4	0
May	5	1
June	6	0
July	7	0
August	8	0
September	9	2
October	10	0
November	11	0
December	12	0
Total		3

(Unit) SurfaceCondition	Code	No.
DRY	1	7
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		7

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LTCN	WECN	JCT REL	TRF CWY	HECD	MC
2649811	Lincoln Dr			M	400	Mockingbird Ln	719	719	120512	14:42	7	2	1	1	99	1	1	1	0	0	1	1	W	W	1	8	2	0	1	1	1	1	12	1	0	0	255	1			0			0			N	1	1	0	5	16	6
2653925	Lincoln Dr			P	457	70th St	719	719	120912	08:03	4	2	1	1	1	1	1	1	0	0	1	1	E	E	2	1	2	0	1	1	1	1	16	1	0	0	255	1			0			0			N	1	1	0	3	16	4
2653944	Lincoln Dr			M	540	70th St	719	719	120920	08:48	5	3	1	1	1	1	1	1	99	99	1	1	E	E	1	1	3	0	1	1	1	1	1	1	0	0	255	1			0			0			Y	1	1	0	5	16	4
													1		1		1		99		1		E		1				1		1		16		0																		

CRASH STATISTICS 2013

Lincoln Drive, Mockingbird Lane to 70th Street

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	3	6	8	0
Severity				
Fatal	0	0	0	0
Injury	2	2	2	0
PDO	1			
Total	3			

	PDO	INJ	FAT	TOTAL
Units	2	4	0	6

LightCondition	Code	No.
DAYLIGHT	1	3
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	0
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		3

Weather	Code	No.
CLEAR	1	2
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	1
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		3

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	1
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	1
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	0
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	1
UNKNOWN	99	0
Check Total		3

Weekday	Code	No.
Sunday	1	0
Monday	2	0
Tuesday	3	0
Wednesday	4	1
Thursday	5	0
Friday	6	2
Saturday	7	0
Check Total		3

Circumstances

Intersection Related?	2
Hit & Run?	0

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	1
INTERSECTION_NON_INTERCHANGE	1	1
INTERSECTION_RELATED_NON_INTERCHANGE	2	0
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	1
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		3

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	1
LEFT_TURN	3	0
REAR_END	4	0
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	1
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	1
Check Total		3

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	3
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		3

Month	Code	No.
January	1	0
February	2	0
March	3	0
April	4	0
May	5	1
June	6	0
July	7	0
August	8	0
September	9	1
October	10	0
November	11	1
December	12	0
Total		3

(Unit) SurfaceCondition	Code	No.
DRY	1	4
WET	2	2
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		6

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LT CN	WE CN	JCT REL	TRF CWY	HE CD	MC
2728952	Lincoln Dr			P	0	Mockingbird Ln	719	719	130517	10:48	6	2	1	1	1	1	1	1	-1	0	1	1	S	E	4	1	3	0	4	1	1	1	-1	6	0	0	255		1		1	1	0	0			N	1	1	11	3	16	99
																													1		2		103		0																		
2766102	Lincoln Dr			P	0	Mockingbird Ln	719	719	130918	16:23	4	2	1	1	1	1	1	1	0	0	1	1	E	S	1	1	3	0	1	4	3	1	1	-1	0	0	255		1		1	1	0	0			N	1	1	1	2	16	2
																													1		1		6		0																		
2783432	Lincoln Dr			M	500	70th St	719	719	131122	13:41	6	2	2	2	99	99	1	1	0	0	1	1	E	E	8	1	2	0	1	1	1	1	1	12	0	0	255	1			0			0			N	1	4	0	5	16	6

CRASH STATISTICS

2014

Lincoln Drive, Mockingbird Lane to 70th Street

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	5	11	13	0
Severity				
Fatal	0	0	0	0
Injury	1	1	1	0
PDO	4			
Total	5			

	PDO	INJ	FAT	TOTAL
Units	8	3	0	11

LightCondition	Code	No.
DAYLIGHT	1	4
DAWN	2	0
DUSK	3	1
DARK_LIGHTED	4	0
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		5

Weather	Code	No.
CLEAR	1	5
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		5

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	1
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	0
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	1
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	2
UNKNOWN	99	1
Check Total		5

Weekday	Code	No.
Sunday	1	1
Monday	2	2
Tuesday	3	0
Wednesday	4	0
Thursday	5	0
Friday	6	2
Saturday	7	0
Check Total		5

Circumstances

Intersection Related?	4
Hit & Run?	0

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	4
INTERSECTION_RELATED_NON_INTERCHANGE	2	0
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	1
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		5

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	0
LEFT_TURN	3	2
REAR_END	4	0
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	1
SIDESWIPE_OPPOSITE_DIRECTION	7	1
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	1
UNKNOWN	99	0
Check Total		5

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	5
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		5

Month	Code	No.
January	1	0
February	2	0
March	3	2
April	4	0
May	5	0
June	6	1
July	7	0
August	8	0
September	9	2
October	10	0
November	11	0
December	12	0
Total		5

(Unit) SurfaceCondition	Code	No.
DRY	1	11
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		11

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2
2825395	Lincoln Dr			P	700	Mockingbird Ln	719	719	140331	08:52	2	2	1	1	1	1	1	1	0	0	1	1	W	NW	1	6
2825474	Lincoln Dr			P	0	Mockingbird Ln	719	719	140307	07:56	6	3	1	1	##	##	1	1	99	0	1	1	E	S	4	3
													1		##		1		0		1		W		1	
2852145	Lincoln Dr			P	0	Mockingbird Ln	719	719	140620	18:31	6	2	1	1	1	1	1	1	-1	-1	1	1	W	S	1	1
2877308	Lincoln Dr			P	0	Mockingbird Ln	719	719	140921	19:16	1	2	1	1	1	1	1	1	0	0	1	1	S	W	4	1
2877309	Lincoln Dr			P	0	Mockingbird Ln	719	719	140922	11:42	2	2	1	1	1	1	1	1	0	0	1	1	NE	W	4	1

INCIDNT	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LT CN	WE CN	JCT REL	TRF CWY	HE CD	MC
2825395	2	0	1	1	1	1	16	1	0	0	255	1			0			0			N	1	1	5	4	16	6
2825474	3	0	1	1	1	2	1	4	0	0	255		1		1	1	0	0			N	1	1	1	5	16	7
			1		1		1		0																		
2852145	2	0	1	1	1	1	2	2	0	0	255	1			0			0			N	1	1	1	99	16	97
2877308	2	0	1	1	1	1	1	5	0	0	255	1			0			0			N	3	1	1	5	16	3
2877309	4	0	4	1	1	1	-1	103	0	0	255	1			0			0			N	1	1	1	2	16	3
			1	4	1	1	1	-1	0	0	255																

2012

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	1	2	2	0
Severity				
Fatal	0	0	0	0
Injury	1	1	1	0
PDO	0			
Total	1			

	PDO	INJ	FAT	TOTAL
Units	0	2	0	2

LightCondition	Code	No.
DAYLIGHT	1	1
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	0
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		1

Weather	Code	No.
CLEAR	1	1
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		1

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	0
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	1
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	0
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	0
UNKNOWN	99	0
Check Total		1

Weekday	Code	No.
Sunday	1	0
Monday	2	0
Tuesday	3	0
Wednesday	4	0
Thursday	5	0
Friday	6	1
Saturday	7	0
Check Total		1

Circumstances	
Intersection Related?	1
Hit & Run?	0

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	1
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		1

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	0
LEFT_TURN	3	0
REAR_END	4	1
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		1

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE ~~TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	1
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		1

Month	Code	No.
January	1	0
February	2	0
March	3	0
April	4	0
May	5	0
June	6	0
July	7	0
August	8	0
September	9	1
October	10	0
November	11	0
December	12	0
Total		1

(Unit) SurfaceCondition	Code	No.
DRY	1	2
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		2

PLACE HOLDER (clear fill before printing)

LOCATION								DATE & TIME				UNITS															PERSON												SEVERITY									GENERAL						
			OFF-	D	DIS-	INTERSECT		OFCR			D	TO-	SRFCND		ALGMT		GRADE		DFCTS		TYPE		TRDR		UACT		TTL	TTL	TYP		INJR		VIOLTN		PHSCND		NON	INCIDENTS			INJURIES			FATALITIES			H	LT	WE	JCT	TRF	HE	M
INCIDNT	ON STREET	MP	SET	R	TANCE	STREET	NCIC	NCIC	YYMMDD	HH:MM	W	TAL	U1	U2	1	2	1	2	U1	U2	U1	U2	1	2	U1	U2	MOT	NON	1	2	1	2	D1	D2	D1	D2	LOC	PDO	INJ	FAT	TTL	MOT	NON	TTL	MOT	NON	R	CN	CN	REL	CWY	CD	C
2653946	Mockingbird Ln			M	30	Indian Bend Rd	719	719	120921	15:37	6	2	1	1	1	1	1	1	0	0	1	1	N	N	1	2	2	0	1	1	2	1	1	4	0	0	255		1		1	1	0	0			N	1	1	2	3	16	4

CRASH STATISTICS

2012

Mockingbird Lane at Lincoln Drive

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	1	2	2	0
Severity				
Fatal	0	0	0	0
Injury	0	0	0	0
PDO	1			
Total	1			

	PDO	INJ	FAT	TOTAL
Units	2	0	0	2

Circumstances

Intersection Related?	1
Hit & Run?	0

LightCondition	Code	No.
DAYLIGHT	1	1
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	0
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		1

Weather	Code	No.
CLEAR	1	1
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		1

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	0
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	1
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	0
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	0
UNKNOWN	99	0
Check Total		1

Weekday	Code	No.
Sunday	1	0
Monday	2	0
Tuesday	3	1
Wednesday	4	0
Thursday	5	0
Friday	6	0
Saturday	7	0
Check Total		1

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	1
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		1

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	0
LEFT_TURN	3	0
REAR_END	4	1
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		1

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	1
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		1

Month	Code	No.
January	1	0
February	2	0
March	3	0
April	4	0
May	5	0
June	6	0
July	7	0
August	8	0
September	9	0
October	10	1
November	11	0
December	12	0
Total		1

(Unit) SurfaceCondition	Code	No.
DRY	1	2
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		2

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2
	<---------------------- LOCATION ----------------------					-->		<-DATE & TIME->			<---- UNITS															---->
2677277	Lincoln Dr			P	0	Mockingbird Ln	719	719	121016	15:27	3	2	1	1	1	1	1	1	0	0	1	1	E	E	3	1

INCIDNT	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LTCN	WECN	JCTREL	TRFCWY	HECD	MC
	<---- PERSON										---->	<---- SEVERITY								---->	<---- GENERAL						---->
2677277	2	0	1	1	1	1	16	1	0	0	255	1			0			0			N	1	1	2	3	16	4

CRASH STATISTICS 2013

Mockingbird Lane at Lincoln Drive

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	1	2	3	0
Severity				
Fatal	0	0	0	0
Injury	0	0	0	0
PDO	1			
Total	1			

	PDO	INJ	FAT	TOTAL
Units	2	0	0	2

LightCondition	Code	No.
DAYLIGHT	1	1
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	0
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		1

Weather	Code	No.
CLEAR	1	1
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		1

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	0
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	0
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	0
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	0
UNKNOWN	99	1
Check Total		1

Weekday	Code	No.
Sunday	1	0
Monday	2	0
Tuesday	3	0
Wednesday	4	0
Thursday	5	1
Friday	6	0
Saturday	7	0
Check Total		1

Circumstances	
Intersection Related?	1
Hit & Run?	1

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	1
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		1

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	0
LEFT_TURN	3	0
REAR_END	4	0
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	1
UNKNOWN	99	0
Check Total		1

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	1
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		1

Month	Code	No.
January	1	0
February	2	0
March	3	0
April	4	0
May	5	0
June	6	0
July	7	0
August	8	0
September	9	1
October	10	0
November	11	0
December	12	0
Total		1

(Unit) SurfaceCondition	Code	No.
DRY	1	2
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		2

PLACE HOLDER (clear fill before printing)

LOCATION								DATE & TIME				UNITS															PERSON											SEVERITY									GENERAL						
INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOL D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LT CN	WE CN	JCT REL	TRF CWY	HE CD	MC
2766120	Lincoln Dr			P	0	Mockingbird Ln	719	719	130926	14:30	5	2	1	1	##	##	1	1	99	0	1	1	W	E	10	3	3	0	4	1	1	99	-1	97	0	0	255	1			0			0			Y	1	1	2	99	16	97
																													1		1		1		0																		

CRASH STATISTICS *Involvement*

2012

Mockingbird Lane, Lincoln Drove to Indian Bend Road

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	1	2	2	0
Severity				
Fatal	0	0	0	0
Injury	0	0	0	0
PDO	1			
Total	1			

	PDO	INJ	FAT	TOTAL
Units	2	0	0	2

Circumstances	
Intersection Related?	0
Hit & Run?	0

LightCondition	Code	No.
DAYLIGHT	1	0
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	0
DARK_NOT_LIGHTED	5	1
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		1

Weather	Code	No.
CLEAR	1	0
CLOUDY	2	1
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		1

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	1
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	0
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	0
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	0
UNKNOWN	99	0
Check Total		1

Weekday	Code	No.
Sunday	1	0
Monday	2	0
Tuesday	3	0
Wednesday	4	0
Thursday	5	1
Friday	6	0
Saturday	7	0
Check Total		1

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	0
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	1
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		1

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	1
LEFT_TURN	3	0
REAR_END	4	0
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		1

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~—TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	1
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		1

Month	Code	No.
January	1	0
February	2	0
March	3	0
April	4	0
May	5	0
June	6	0
July	7	0
August	8	1
September	9	0
October	10	0
November	11	0
December	12	0
Total		1

(Unit) SurfaceCondition	Code	No.
DRY	1	2
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		2

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LT CN	WE CN	JCT REL	TRF CWY	HE CD	MC
2647424	Mockingbird Ln			M	460	Indian Bend Rd	719	719	120823	20:55	5	2	1	1	1	1	1	1	0	0	1	1	N	W	1	4	2	0	1	1	1	1	103	1	0	0	255	1			0			0			N	5	2	7	2	16	2

CRASH STATISTICS *Involvement* **Mockingbird Lane, Lincoln Drive to Indian Bend Road**

2013

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	1	2	2	0
Severity				
Fatal	0	0	0	0
Injury	1	1	1	0
PDO	0			
Total	1			

	PDO	INJ	FAT	TOTAL
Units	0	2	0	2

LightCondition	Code	No.
DAYLIGHT	1	1
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	0
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		1

Weather	Code	No.
CLEAR	1	1
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		1

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	1
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	0
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	0
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	0
UNKNOWN	99	0
Check Total		1

Weekday	Code	No.
Sunday	1	1
Monday	2	0
Tuesday	3	0
Wednesday	4	0
Thursday	5	0
Friday	6	0
Saturday	7	0
Check Total		1

Circumstances	
Intersection Related?	1
Hit & Run?	1

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	1
INTERSECTION_RELATED_NON_INTERCHANGE	2	0
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		1

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	1
LEFT_TURN	3	0
REAR_END	4	0
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		1

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE ~~TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	1
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		1

Month	Code	No.
January	1	0
February	2	0
March	3	0
April	4	0
May	5	0
June	6	0
July	7	0
August	8	0
September	9	1
October	10	0
November	11	0
December	12	0
Total		1

(Unit) SurfaceCondition	Code	No.
DRY	1	2
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		2

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW
2766113	Mockingbird Ln			P	0	Indian Bend Rd	719	719	130929	14:02	1

INCIDNT	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC
2766113	2	1	1	1	1	1	1	0	99	1	1	S	W	4	1	2	0	1	1	99	3	5	1	0	0	255

INCIDNT	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LT CN	WE CN	JCT REL	TRF CWY	HE CD	MC
2766113		1		1	1	0	0			Y	1	1	1	2	16	2

CRASH STATISTICS

2012

Scottsdale Road at Indian Bend Road

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	10	20	26	0
Severity				
Fatal	0	0	0	0
Injury	2	2	2	0
PDO	8			
Total	10			

	PDO	INJ	FAT	TOTAL
Units	16	4	0	20

LightCondition	Code	No.
DAYLIGHT	1	9
DAWN	2	0
DUSK	3	1
DARK_LIGHTED	4	0
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		10

Weather	Code	No.
CLEAR	1	10
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		10

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	1
TWO_WAY_NOT_DIVIDED	2	0
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	0
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	1
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	8
UNKNOWN	99	0
Check Total		10

Weekday	Code	No.
Sunday	1	1
Monday	2	0
Tuesday	3	1
Wednesday	4	3
Thursday	5	0
Friday	6	3
Saturday	7	2
Check Total		10

Circumstances

Intersection Related?	10
Hit & Run?	1

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	10
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		10

CollisionManner	Code	No.
SINGLE_VEHICLE	1	1
ANGLE (front to side)(other than left turn)	2	0
LEFT_TURN	3	0
REAR_END	4	8
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	1
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		10

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE ~~TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	9
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	1
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		10

Month	Code	No.
January	1	1
February	2	0
March	3	2
April	4	3
May	5	1
June	6	1
July	7	0
August	8	0
September	9	0
October	10	1
November	11	1
December	12	0
Total		10

(Unit) SurfaceCondition	Code	No.
DRY	1	20
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		20

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LT CN	WE CN	JCT REL	TRF CWY	HE CD	MC
2618389	Scottsdale Rd			M	70	Indian Bend Rd	725	725	120313	17:42	3	2	1	1	1	1	1	1	0	0	1	1	N	N	1	2	2	0	1	1	3	1	1	16	0	0	255		1		1	1	0	0			Y	1	1	2	5	16	4
2618461	Scottsdale Rd			P	30	Indian Bend Rd	719	725	120302	16:09	6	2	1	1	1	1	1	1	0	0	1	1	S	S	3	1	2	0	1	1	1	1	1	16	0	0	255	1			0			0			N	1	1	2	5	16	4
2621462	Scottsdale Rd			P	35	Indian Bend Rd	719	725	120404	17:20	4	2	1	1	1	1	1	1	0	0	1	1	S	S	3	1	2	0	1		1		1		0			1			0			0			N	1	1	2	5	16	4
2621483	Indian Bend Rd			P	25	Scottsdale Rd	725	725	120407	18:25	7	2	1	1	1	1	1	1	0	-1	1	1	W	W	3	4	2	0	1		1		2		0			1			0			0			N	3	1	2	4	16	4
2621486	Scottsdale Rd			M	25	Indian Bend Rd	719	725	120407	17:30	7	2	1	1	1	1	1	1	0	0	1	1	N	N	3	1	4	0	1		1		2		0			1			0			0			N	1	1	2	5	16	4
2633146	Scottsdale Rd			M	250	Scottsdale Rd	725	725	120125	14:37	4	2	1	1	2	2	1	1	0	0	1	1	NE	NE	1	3	3	0	1	4	1	1	1	-1	0	0	255	1			0			0			N	1	1	2	5	16	4
2636324	Scottsdale Rd			M	200	Indian Bend Rd	725	725	120617	11:40	1	2	1	1	1	1	1	1	99	99	1	1	N	N	1	8	3	0	1	4	1	2	12	-1	0	0	255		1		1	1	0	0			N	1	1	2	5	16	6
2649830	Indian Bend Rd			M	1056	Scottsdale Rd	719	719	120511	07:42	6	1	1		2		1		0		1		W		9		1	0	1		1		13		0			1			0			0			N	1	1	2	1	33	1
2689337	Scottsdale Rd			P	1320	Indian Bend Rd	725	725	121024	16:03	4	2	1	1	1	1	1	1	0	0	1	1	N	N	2	8	3	0	1	4	1	1	16	-1	0	0	255	1			0			0			N	1	1	2	5	16	4
2692928	Scottsdale Rd			P	1320	Indian Bend Rd	725	725	121102	16:03	6	3	1	1	1	1	1	1	0	0	1	1	S	S	3	2	4	0	1	1	1	1	1	2	0	0	255	1			0			0			N	1	1	2	5	16	4
													1		1		1		0		1		S		3				1	4	1	1	2	-1	0	0	255																

CRASH STATISTICS **2013**

Scottsdale Road at Indian Bend Road

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	9	23	26	1
Severity				
Fatal	0	0	0	0
Injury	4	6	5	1
PDO	5			
Total	9			

	PDO	INJ	FAT	TOTAL
Units	11	12	0	23

LightCondition	Code	No.
DAYLIGHT	1	8
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	1
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		9

Weather	Code	No.
CLEAR	1	7
CLOUDY	2	1
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	1
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		9

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	0
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	0
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	3
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	6
UNKNOWN	99	0
Check Total		9

Weekday	Code	No.
Sunday	1	0
Monday	2	0
Tuesday	3	1
Wednesday	4	3
Thursday	5	1
Friday	6	4
Saturday	7	0
Check Total		9

Circumstances	
Intersection Related?	9
Hit & Run?	0

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	9
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		9

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	1
LEFT_TURN	3	0
REAR_END	4	7
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	1
UNKNOWN	99	0
Check Total		9

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	8
PEDESTRIAN	17	1
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		9

Month	Code	No.
January	1	2
February	2	1
March	3	0
April	4	1
May	5	1
June	6	0
July	7	2
August	8	0
September	9	0
October	10	0
November	11	2
December	12	0
Total		9

(Unit) SurfaceCondition	Code	No.
DRY	1	21
WET	2	2
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		23

PLACE HOLDER (clear fill before printing)

	<- LOCATION						->		<-DATE & TIME->		<- UNITS														->	<- PERSON										->	<- SEVERITY								->	<- GENERAL						--->
INCIDNT	ON STREET	MP	OFF-SET	D R	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	D W	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	H R	LT CN	WE CN	JCT REL	TRF CWY	HE CD	M C
2698813	Scottsdale Rd			P	50	Indian Bend Rd	725	725	130102	13:03	4	3	1	1	1	1	1	1	0	0	1	1	N	N	1	1	5	0	1	4	2	1	16	-1	0	0	255		1		2	2	0	0			N	1	1	2	5	16	4
													1		1		1		0		1		N		1				1	4	1	1	1	-1	0	0	255																
																													1		2		1		0																			
2699155	Scottsdale Rd			P	97	Indian Bend Rd	725	725	130104	14:36	6	2	1	1	1	1	1	1	0	0	1	1	S	S	3	1	2	0	1	1	1	1	2	1	0	0	255	1			0			0			N	1	1	2	4	16	4
2714548	Scottsdale Rd			P	800	Indian Bend Rd	725	725	130221	12:41	5	3	1	1	1	1	1	1	0	0	1	1	S	S	2	3	3	0	1	1	3	2	2	1	0	0	255		1		2	2	0	0			N	1	1	2	5	16	4
													1		1		1		0		1		S		2				1		1		1		0																		
2739153	Scottsdale Rd			P	128	Indian Bend Rd	719	725	130424	16:50	4	3	1	1	1	1	1	1	0	0	1	1	S	S	1	3	3	0	1	1	1	1	1	1	0	0	255	1			0			0			N	1	1	2	5	16	4
													1		1		1		0		1		S		3				1		1		2		0																		
2754673	Indian Bend Rd			P	0	Scottsdale Rd	725	725	130531	14:25	6	4	1	1	1	1	1	1	0	0	1	1	E	S	3	1	5	0	1	1	2	1	6	1	0	0	255		1		1	1	0	0			N	1	1	2	4	16	2
													1	1	1	1	1	1	99	0	1	1	W	E	1	3			4	1	1	1	-1	1	0	0	255																
																													1		1		1		0																			
2761932	Scottsdale Rd			P	39	Indian Bend Rd	725	725	130712	10:20	6	2	1	1	1	1	1	1	0	0	1	1	S	S	1	3	2	0	1	1	1	1	1	2	0	0	255	1			0			0			N	1	2	2	4	16	4
2769399	Lincoln Dr			M	42	Scottsdale Rd	725	725	130730	07:06	3	2	1	1	1	1	1	1	0	0	1	1	E	E	3	2	2	0	1	1	1	1	1	2	0	0	255	1			0			0			N	1	1	2	5	16	4
2805071	Scottsdale Rd			P	30	Indian Bend Rd	725	725	131122	12:45	6	2	2	2	1	1	1	1	0	0	1	1	S	S	3	1	3	0	1	4	1	1	2	-1	0	0	255	1			0			0			N	1	4	2	5	16	4
2805088	Scottsdale Rd			M	3	Indian Bend Rd	725	725	131113	18:15	4	2	1	1	1	1	1	1	-1	0	2	1	W	S	17	1	1	1	1	2	1	3	1	6	0	0	1		1		1	0	1	0			N	4	1	2	5	17	97

CRASH STATISTICS

2014

Scottsdale Road at Indian Bend Road

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	2	8	13	0
Severity				
Fatal	0	0	0	0
Injury	0	0	0	0
PDO	2			
Total	2			

	PDO	INJ	FAT	TOTAL
Units	8	0	0	8

LightCondition	Code	No.
DAYLIGHT	1	2
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	0
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		2

Weather	Code	No.
CLEAR	1	2
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		2

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	0
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	0
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	1
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	1
UNKNOWN	99	0
Check Total		2

Weekday	Code	No.
Sunday	1	1
Monday	2	0
Tuesday	3	0
Wednesday	4	0
Thursday	5	1
Friday	6	0
Saturday	7	0
Check Total		2

Circumstances	
Intersection Related?	2
Hit & Run?	0

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	2
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		2

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	0
LEFT_TURN	3	0
REAR_END	4	2
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		2

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE ~~TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	2
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		2

Month	Code	No.
January	1	1
February	2	0
March	3	0
April	4	1
May	5	0
June	6	0
July	7	0
August	8	0
September	9	0
October	10	0
November	11	0
December	12	0
Total		2

(Unit) SurfaceCondition	Code	No.
DRY	1	8
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		8

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LT CN	WE CN	JCT REL	TRF CWY	HE CD	MC
2818095	Scottsdale Rd			P	140	Indian Bend Rd	719	725	140102	09:10	5	5	1	1	1	1	1	1	0	0	1	1	N	N	3	1	6	0	1	4	1	1	1	-1	0	0	255	1			0			0			N	1	1	2	5	16	4
													1	1	1	1	1	1	0	0	1	1	N	N	3	3			1	1	1	1	1	2	0	0	255																
													1		1		1		0		1		N		3				1	1	1	1	1	1	0	0	255																
2848687	Scottsdale Rd			P	210	Indian Bend Rd	719	725	140413	12:11	1	3	1	1	1	1	1	1	0	0	1	1	N	N	3	1	7	0	4	1	1	1	-1	1	0	0	255	1			0			0			N	1	1	2	4	16	4
													1		1		1		0		1		N		3				4	1	1	1	-1	1	0	0	255																
																													4	1	1	1	-1	2	0	0	255																
																													4		1		-1		0																		

CRASH STATISTICS

2013

Scottsdale Road at Joshua Tree Lane

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	1	2	2	0
Severity				
Fatal	0	0	0	0
Injury	0	0	0	0
PDO	1			
Total	1			

	PDO	INJ	FAT	TOTAL
Units	2	0	0	2

LightCondition	Code	No.
DAYLIGHT	1	1
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	0
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		1

Weather	Code	No.
CLEAR	1	1
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		1

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	0
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	0
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	0
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	1
UNKNOWN	99	0
Check Total		1

Weekday	Code	No.
Sunday	1	0
Monday	2	0
Tuesday	3	0
Wednesday	4	1
Thursday	5	0
Friday	6	0
Saturday	7	0
Check Total		1

Circumstances	
Intersection Related?	1
Hit & Run?	0

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	1
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		1

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	0
LEFT_TURN	3	0
REAR_END	4	1
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		1

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	1
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		1

Month	Code	No.
January	1	0
February	2	0
March	3	0
April	4	0
May	5	0
June	6	0
July	7	0
August	8	0
September	9	0
October	10	1
November	11	0
December	12	0
Total		1

(Unit) SurfaceCondition	Code	No.
DRY	1	2
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		2

PLACE HOLDER (clear fill before printing)

INCIDNT	LOCATION: ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	DATE & TIME: YYMMDD	HH:MM	DW	TO-TAL
2800390	Scottsdale Rd			M	144	Joshua Tree Ln	725	725	131002	07:37	4	2

INCIDNT	UNITS: SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2
2800390	1	1	1	1	1	1	0	0	1	1	N	N	2	1

INCIDNT	PERSON: TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	SEVERITY: INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	GENERAL: HR	LT CN	WE CN	JCT REL	TRF CWY	HE CD	MC
2800390	2	0	1	1	1	1	2	1	0	0	255	1			0			0			N	1	1	2	5	16	4

CRASH STATISTICS

2012

Scottsdale Road at Lincoln Drive

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	7	14	14	0
Severity				
Fatal	0	0	0	0
Injury	1	1	1	0
PDO	6			
Total	7			

	PDO	INJ	FAT	TOTAL
Units	12	2	0	14

LightCondition	Code	No.
DAYLIGHT	1	4
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	3
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		7

Weather	Code	No.
CLEAR	1	5
CLOUDY	2	1
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	1
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		7

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	1
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	1
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	1
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	4
UNKNOWN	99	0
Check Total		7

Weekday	Code	No.
Sunday	1	2
Monday	2	1
Tuesday	3	0
Wednesday	4	1
Thursday	5	1
Friday	6	1
Saturday	7	1
Check Total		7

Circumstances

Intersection Related?	7
Hit & Run?	0

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	7
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		7

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	1
LEFT_TURN	3	1
REAR_END	4	5
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		7

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE ~~TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	7
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		7

Month	Code	No.
January	1	2
February	2	0
March	3	0
April	4	1
May	5	1
June	6	1
July	7	0
August	8	0
September	9	0
October	10	1
November	11	1
December	12	0
Total		7

(Unit) SurfaceCondition	Code	No.
DRY	1	14
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		14

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LT CN	WE CN	JCT REL	TRF CWY	HE CD	MC
2608447	Lincoln Dr			M	440	Scottsdale Rd	725	725	120118	18:22	4	2	1	1	1	1	1	1	0	0	1	1	E	E	1	3	2	0	1	1	1	1	16	1	0	0	255	1			0			0			N	4	1	2	4	16	4
2616355	Scottsdale Rd			M	63	Lincoln Dr	725	725	120120	08:17	6	2	1	1	1	1	1	1	0	0	1	1	N	N	3	1	2	0	1	1	1	2	2	1	0	0	255		1		1	1	0	0			N	1	1	2	2	16	4
2625701	Lincoln Dr			M	10	Scottsdale Rd	725	719	120426	09:10	5	2	1	1	1	1	1	1	0	0	1	1	NW	W	4	1	2	0	1	1	1	1	1	103	0	0	255	1			0			0			N	1	2	2	3	16	3
2636321	Lincoln Dr			P	0	Scottsdale Rd	725	725	120617	12:28	1	2	1	1	1	1	1	1	0	0	1	1	E	E	1	1	2	0	1	1	1	1	1	16	0	0	255	1			0			0			N	4	7	2	5	16	4
2644797	Lincoln Dr			P	0	Scottsdale Rd	725	725	120519	17:35	7	2	1	1	1	1	1	1	97	0	1	1	S	W	1	4	2	0	1	1	1	1	6	1	0	0	255	1			0			0			N	1	1	2	5	16	2
2685054	Scottsdale Rd			M	100	Lincoln Dr	725	725	121008	09:42	2	2	1	1	1	1	1	1	97	0	1	1	N	N	1	3	2	0	1	1	1	1	1	16	0	0	255	1			0			0			N	1	1	2	5	16	4
2695070	Scottsdale Rd			M	20	Lincoln Dr	725	725	121104	23:09	1	2	1	1	1	1	1	1	0	0	1	1	N	S	3	10	2	0	1	1	1	1	16	1	0	0	255	1			0			0			N	4	1	2	5	16	4

CRASH STATISTICS — Scootsdale Road at Lincoln Drive

2013

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	7	14	17	0
Severity				
Fatal	0	0	0	0
Injury	2	2	2	0
PDO	5			
Total	7			

	PDO	INJ	FAT	TOTAL
Units	10	4	0	14

Circumstances

Intersection Related?	7
Hit & Run?	0

LightCondition	Code	No.
DAYLIGHT	1	7
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	0
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		7

Weather	Code	No.
CLEAR	1	7
CLOUDY	2	0
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		7

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	0
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	2
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	0
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	5
UNKNOWN	99	0
Check Total		7

Weekday	Code	No.
Sunday	1	0
Monday	2	1
Tuesday	3	1
Wednesday	4	2
Thursday	5	2
Friday	6	1
Saturday	7	0
Check Total		7

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	7
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		7

CollisionManner	Code	No.
SINGLE_VEHICLE	1	1
ANGLE (front to side)(other than left turn)	2	1
LEFT_TURN	3	1
REAR_END	4	4
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		7

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE ~~TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	6
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	1
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		7

Month	Code	No.
January	1	1
February	2	2
March	3	3
April	4	1
May	5	0
June	6	0
July	7	0
August	8	0
September	9	0
October	10	0
November	11	0
December	12	0
Total		7

(Unit) SurfaceCondition	Code	No.
DRY	1	14
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		14

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LT CN	WE CN	JCT REL	TRF CWY	HE CD	MC
2701264	Lincoln Dr			M	54	Scottsdale Rd	725	725	130131	12:42	5	1	1		1		1		97		1		NE		4		1	0	1		1		16		0			1			0			0			N	1	1	2	5	44	1
2708796	Lincoln Dr			M	350	Scottsdale Rd	725	725	130313	16:10	4	3	1	1	1	1	1	1	0	0	1	1	S	E	4	2	3	0	1	1	1	1	1	1	0	0	255	1			0			0			N	1	1	2	5	16	2
													1		1		1		0		1		E		3					1		1		97		0	255																
2711103	Lincoln Dr			P	0	Scottsdale Rd	725	725	130205	13:32	3	2	1	1	1	1	1	1	0	0	1	1	NW	S	4	1	4	0	4	1	1	1	-1	6	0	0	255	1			0			0			N	1	1	2	5	16	3
2712728	Lincoln Dr			M	100	Scottsdale Rd	725	725	130213	09:35	4	2	1	1	1	1	1	1	0	0	1	1	E	E	3	1	2	0	1	1	1	1	1	2	0	0	255	1			0			0			N	1	1	2	5	16	4
2722542	Scottsdale Rd			M	50	Lincoln Dr	725	725	130329	12:07	6	2	1	1	1	1	1	1	0	0	1	1	S	S	2	3	2	0	1	1	1	1	2	1	0	0	255	1			0			0			N	1	1	2	5	16	4
2723384	Lincoln Dr			M	550	Scottsdale Rd	725	725	130401	16:38	2	2	1	1	1	1	1	1	99	0	1	1	E	E	1	2	2	0	1	1	3	1	1	4	0	0	255		1		1	1	0	0			N	1	1	2	3	16	4
2725951	Lincoln Dr			M	600	Scottsdale Rd	725	719	130314	17:48	5	2	1	1	1	1	1	1	0	0	1	1	E	E	1	3	3	0	4	1	1	1	-1	1	0	0	255		1		1	1	0	0			N	1	1	2	3	16	4

CRASH STATISTICS *Involvement*

2012

Tatum Boulevard at Lincoln Drive

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	6	14	15	0
Severity				
Fatal	0	0	0	0
Injury	1	1	1	0
PDO	5			
Total	6			

	PDO	INJ	FAT	TOTAL
Units	12	2	0	14

LightCondition	Code	No.
DAYLIGHT	1	3
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	3
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		6

Weather	Code	No.
CLEAR	1	5
CLOUDY	2	1
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		6

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	2
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	1
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	0
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	3
UNKNOWN	99	0
Check Total		6

Weekday	Code	No.
Sunday	1	1
Monday	2	2
Tuesday	3	0
Wednesday	4	0
Thursday	5	2
Friday	6	1
Saturday	7	0
Check Total		6

Circumstances	
Intersection Related?	6
Hit & Run?	0

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	6
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		6

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	0
LEFT_TURN	3	0
REAR_END	4	6
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		6

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	6
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		6

Month	Code	No.
January	1	0
February	2	2
March	3	1
April	4	0
May	5	0
June	6	0
July	7	0
August	8	1
September	9	0
October	10	1
November	11	1
December	12	0
Total		6

(Unit) SurfaceCondition	Code	No.
DRY	1	13
WET	2	0
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	1
Total		14

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LT CN	WE CN	JCT REL	TRF CWY	HE CD	MC
	<---------------------- LOCATION					---------------------->			<-DATE & TIME->			<----------------- UNITS														----------------->	<----------- PERSON										------------>	<-------- SEVERITY								-------->	<------ GENERAL						---->
2603383	Lincoln Dr			P	20	Tatum Blvd	719	719	120217	21:07	6	2	1	1	1	1	1	1	0	0	1	1	W	W	3	1	2	0	1		1		16		0				1		1	1	0	0			N	4	1	2	2	16	4
2603399	Tatum Blvd			M	39	Lincoln Dr	719	719	120205	20:43	1	2	1	1	1	1	1	1	0	0	1	1	N	N	1	1	3	0	4	1	1	1	-1	4	0	0	255	1			0			0			N	4	1	2	5	16	4
2610820	Lincoln Dr			P	10	Tatum Blvd	719	719	120315	18:03	5	2	1	1	1	1	1	1	0	-1	1	1	W	W	3	1	2	0	1	1	1	1	16	1	0	0	255	1			0			0			N	1	1	2	3	16	4
2647416	Tatum Blvd			M	25	Lincoln Dr	719	719	120806	09:45	2	2	1	1	1	1	1	1	0	0	1	1	N	N	1	3	2	0	1	1	1	1	1	16	0	0	255	1			0			0			N	1	1	2	5	16	4
2677004	Lincoln Dr			P	20	Tatum Blvd	719	719	121001	16:16	2	2	1	1	1	1	1	1	0	-1	1	1	W	W	3	1	2	0	1	1	1	1	16	1	0	0	255	1			0			0			N	1	1	2	5	16	4
2678185	Tatum Blvd			P	20	Lincoln Dr	719	719	121115	17:55	5	4	1	1	1	1	2	1	0	99	1	1	S	S	1	3	4	0	1	1	1	1	1	1	0	0	255	1			0			0			N	4	2	2	2	16	4
													99	1	##	1	99	1	99	0	1	1	99	S	99	3			1	1	1	99	4	99	0	0	255																

CRASH STATISTICS *Involvement* **Tatum Boulevard at Lincoln Drive**

2013

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	8	16	26	0
Severity				
Fatal	0	0	0	0
Injury	4	7	7	0
PDO	4			
Total	8			

	PDO	INJ	FAT	TOTAL
Units	8	8	0	16

Circumstances

Intersection Related?	8
Hit & Run?	2

LightCondition	Code	No.
DAYLIGHT	1	4
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	4
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		8

Weather	Code	No.
CLEAR	1	7
CLOUDY	2	1
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		8

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	0
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	2
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	4
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	2
UNKNOWN	99	0
Check Total		8

Weekday	Code	No.
Sunday	1	1
Monday	2	1
Tuesday	3	1
Wednesday	4	1
Thursday	5	2
Friday	6	2
Saturday	7	0
Check Total		8

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	8
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	0
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		8

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	3
LEFT_TURN	3	0
REAR_END	4	5
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	0
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		8

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	8
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		8

Month	Code	No.
January	1	0
February	2	1
March	3	0
April	4	0
May	5	0
June	6	2
July	7	1
August	8	0
September	9	0
October	10	1
November	11	0
December	12	3
Total		8

(Unit) SurfaceCondition	Code	No.
DRY	1	14
WET	2	2
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		16

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LTCN	WECN	JCTREL	TRFCWY	HECD	MC
2708423	Lincoln Dr			P	0	Tatum Blvd	719	719	130228	07:39	5	2	1	1	1	1	1	1	0	0	1	1	E	E	1	5	4	0	1	4	1	1	103	-1	0	0	255	1			0			0			N	1	1	2	5	16	2
2743897	Lincoln Dr			M	75	Tatum Blvd	719	719	130605	07:27	4	2	1	1	1	1	1	1	0	0	1	1	E	E	2	1	2	0	1		3		1		0				1		1	1	0	0			N	1	1	2	4	16	4
																														1		1		4		0	255																
2743898	Lincoln Dr			M	45	Tatum Blvd	719	719	130607	20:27	6	2	1	1	1	1	1	1	0	0	1	1	E	E	2	3	3	0	1	1	2	2	1	6	0	0	255		1		3	3	0	0			N	4	1	2	3	16	4
																														4		2		-1		0	255																
2759102	Lincoln Dr			M	60	Tatum Blvd	719	719	130722	07:55	2	2	1	1	1	1	1	1	0	0	1	1	E	E	4	4	2	0	1	1	1	2	4	97	0	0	255		1		1	1	0	0			N	1	1	2	4	16	4
2776473	Tatum Blvd			P	25	Lincoln Dr	719	719	131027	20:46	1	2	1	1	1	1	2	1	0	0	1	1	S	S	1	3	4	0	4	4	2	1	-1	-1	0	0	255		1		2	2	0	0			N	4	1	2	5	16	4
																													1	1	1	2	6	1	0	0	255																
2792730	Lincoln Dr			M	50	Tatum Blvd	719	719	131217	18:44	3	2	1	1	1	1	1	1	0	0	1	1	E	E	3	1	4	0	1		1		1		0			1			0			0			N	4	1	2	3	16	4
																														4		1		-1		0	255																
2792739	Tatum Blvd			P	0	Lincoln Dr	719	719	131212	18:29	5	2	1	1	1	1	1	1	99	0	1	1	E	N	99	1	3	0	1		1		16		0			1			0			0			Y	4	1	2	4	16	2
2792758	Tatum Blvd			P	15	Lincoln Dr	719	719	131220	13:04	6	2	2	2	1	1	3	1	0	0	1	1	N	N	4	4	4	0	4		99		-1		0			1			0			0			Y	1	2	2	4	16	2
																													1		99		1		0																		

CRASH STATISTICS

2014

Tatum Boulevard at Lincoln Drive

Involvement

	# Incidents	Totals	# Motorists	# Non-Motorists
Incidents	12	24	31	0
Severity				
Fatal	0	0	0	0
Injury	3	4	4	0
PDO	9			
Total	12			

	PDO	INJ	FAT	TOTAL
Units	18	6	0	24

LightCondition	Code	No.
DAYLIGHT	1	9
DAWN	2	0
DUSK	3	0
DARK_LIGHTED	4	3
DARK_NOT_LIGHTED	5	0
DARK_UNKNOWN_LIGHTING	6	0
UNKNOWN	99	0
Check Total		12

Weather	Code	No.
CLEAR	1	10
CLOUDY	2	2
SLEET_HAIL_FREEZING_RAIN_OR_DRIZZLE	3	0
RAIN	4	0
SNOW	5	0
SEVERE_CROSSWINDS	6	0
BLOWING_SAND_SOIL_DIRT	7	0
FOG_SMOG_SMOKE	8	0
BLOWING_SNOW	9	0
OTHER	97	0
UNKNOWN	99	0
Check Total		12

TrafficWayType	Code	No.
ONE_WAY_TRAFFICWAY	1	0
TWO_WAY_NOT_DIVIDED	2	1
TWO_WAY_NOT_DIVIDED_WITH_CONTINUOUS_LEFT_TURN_LANE	3	0
TWO_WAY_DIVIDED_UNPROTECTED_PAINTED_4_FEET_MEDIAN	4	1
TWO_WAY_DIVIDED_POSITIVE_MEDIAN_BARRIER	5	8
UNKNOWN	99	2
Check Total		12

Weekday	Code	No.
Sunday	1	0
Monday	2	4
Tuesday	3	5
Wednesday	4	0
Thursday	5	1
Friday	6	0
Saturday	7	2
Check Total		12

Circumstances	
Intersection Related?	12
Hit & Run?	1

JunctionRelation	Code	No.
NOT_JUNCTION_RELATED	0	0
INTERSECTION_NON_INTERCHANGE	1	0
INTERSECTION_RELATED_NON_INTERCHANGE	2	11
ENTRANCE_EXIT_RAMP_NON_INTERCHANGE	3	0
RAILWAY_GRADE_CROSSING	4	0
CROSSOVER_RELATED	5	0
FRONTAGE_ROAD_NON_INTERCHANGE	6	0
DRIVEWAY	7	0
ALLEY_ACCESS_RELATED	8	0
UNKNOWN_NON_INTERCHANGE	9	0
THRU_ROADWAY	10	0
INTERSECTION_INTERCHANGE	11	0
INTERSECTION_RELATED_INTERCHANGE	12	1
ENTRANCE_EXIT_RAMP_INTERCHANGE	13	0
FRONTAGE_ROAD_INTERCHANGE	14	0
OTHER_PART_OF_INTERCHANGE	15	0
UNKNOWN_INTERCHANGE	17	0
UNKNOWN_JUNCTION	18	0
UNKNOWN	99	0
OTHER_NON_INTERCHANGE	109	0
Check Total		12

CollisionManner	Code	No.
SINGLE_VEHICLE	1	0
ANGLE (front to side)(other than left turn)	2	2
LEFT_TURN	3	0
REAR_END	4	8
HEAD_ON	5	0
SIDESWIPE_SAME_DIRECTION	6	1
SIDESWIPE_OPPOSITE_DIRECTION	7	0
REAR_TO_SIDE	8	0
REAR_TO_REAR	9	0
OTHER	97	0
UNKNOWN	99	1
Check Total		12

TravelDirection		
1	NORTH	N
2	SOUTH	S
3	EAST	E
4	WEST	W
5	NORTHWEST	NW
6	NORTHEAST	NE
7	SOUTHWEST	SW
8	SOUTHEAST	SE
99	UNKNOWN	99

First Harmful Event	Code	No.
OVERTURN_ROLLOVER	1	0
FIRE_EXPLOSION	2	0
IMMERSION	3	0
JACKKNIFE	4	0
CARGO_EQUIPMENT_LOSS_SHIFT	5	0
FELL_JUMPED_FROM_VEHICLE	6	0
THROWN_OR_FALLING_OBJECT	7	0
OTHER_NON_COLLISION	8	0
EQUIPMENT_FAILURE~~_TIRES_BRAKES~~	9	0
SEPARATION_OF_UNITS	10	0
RAN_OFF_ROAD_RIGHT	11	0
RAN_OFF_ROAD_LEFT	12	0
CROSS_MEDIAN	13	0
CROSS_CENTERLINE	14	0
DOWNHILL_RUNAWAY	15	0
MOTOR_VEHICLE_IN_TRANSPORT	16	12
PEDESTRIAN	17	0
PEDALCYCLE	18	0
RAILWAY_VEHICLE_TRAIN_ENGINE	19	0
LIGHT_RAILWAY_RAILCAR_VEHICLE	20	0
ANIMAL_WILD_NON_GAME	21	0
ANIMAL_WILD_GAME	22	0
ANIMAL_PET	23	0
ANIMAL_LIVESTOCK	24	0
PARKED_MOTOR_VEHICLE	25	0
WORK_ZONE_MAINTENANCE_EQUIPMENT	26	0
STRUCK_BY_FALLING_SHIFTING_CARGO_OR_OBJECT	27	0
OTHER_NON_FIXED_OBJECT	28	0
IMPACT_ATTENUATOR_CRASH_CUSHION	29	0
BRIDGE_OVERHEAD_STRUCTURE	30	0
BRIDGE_RAIL	31	0
CULVERT	32	0
CURB	33	0
DITCH	34	0
EMBANKMENT	35	0
GUARDRAIL_FACE	36	0
GUARDRAIL_END	37	0
CONCRETE_TRAFFIC_BARRIER	38	0
CABLE_TRAFFIC_BARRIER	39	0
OTHER_TRAFFIC_BARRIER	40	0
TREE_BUSH_STUMP_STANDING	41	0
TRAFFIC_SIGN_SUPPORT	42	0
TRAFFIC_SIGNAL_SUPPORT	43	0
UTILITY_POLE_LIGHT_SUPPORT	44	0
OTHER_POST_POLE_OR_SUPPORT	45	0
FENCE	46	0
MAILBOX	47	0
BUILDING	48	0
OTHER_FIXED_OBJECT	49	0
UNKNOWN	99	0
Not Reported	255	0
Check Total		12

Month	Code	No.
January	1	4
February	2	0
March	3	1
April	4	1
May	5	0
June	6	0
July	7	0
August	8	4
September	9	0
October	10	1
November	11	0
December	12	1
Total		12

(Unit) SurfaceCondition	Code	No.
DRY	1	22
WET	2	2
SNOW	3	0
SLUSH	4	0
ICE_FROST	5	0
WATER_STANDING_MOVING	6	0
SAND	7	0
MUD_DIRT_GRAVEL	8	0
OIL	9	0
OTHER	97	0
UNKNOWN	99	0
Total		24

PLACE HOLDER (clear fill before printing)

INCIDNT	ON STREET	MP	OFF-SET	DR	DIS-TANCE	INTERSECT STREET	NCIC	OFCR NCIC	YYMMDD	HH:MM	DW	TO-TAL	SRFCND U1	SRFCND U2	ALGMT 1	ALGMT 2	GRADE 1	GRADE 2	DFCTS U1	DFCTS U2	TYPE U1	TYPE U2	TRDR 1	TRDR 2	UACT U1	UACT U2	TTL MOT	TTL NON	TYP 1	TYP 2	INJR 1	INJR 2	VIOLTN D1	VIOLTN D2	PHSCND D1	PHSCND D2	NON LOC	INCIDENTS PDO	INCIDENTS INJ	INCIDENTS FAT	INJURIES TTL	INJURIES MOT	INJURIES NON	FATALITIES TTL	FATALITIES MOT	FATALITIES NON	HR	LT CN	WE CN	JCT REL	TRF CWY	HE CD	MC
2813338	Lincoln Dr			P	50	Tatum Blvd	719	719	140127	10:23	2	2	1	1	1	1	1	1	0	0	1	1	W	W	1	3	3	0	1		3		1		0				1		2	2	0	0			N	1	1	2	5	16	4
2813344	Tatum Blvd			P	30	Lincoln Dr	719	719	140128	14:30	3	2	1	1	1	1	1	1	0	0	1	1	N	N	3	1	2	0	1	1	1	1	16	1	0	0	255	1			0			0			N	1	1	2	99	16	4
2813388	Tatum Blvd			P	0	Lincoln Dr	719	719	140109	19:27	5	2	1	1	1	1	1	1	0	0	1	1	S	N	4	1	5	0	4		1		-1		0			1			0			0			N	4	1	12	5	16	2
																														1		1		99		0	255																
																														4		1		-1		0	255																
2813412	Lincoln Dr			M	50	Tatum Blvd	719	719	140113	15:02	2	2	1	1	1	1	1	1	0	0	1	1	W	W	1	1	2	0	1		1		1		0			1			0			0			N	1	1	2	5	16	4
2825434	Lincoln Dr			M	63	Tatum Blvd	719	719	140331	17:46	2	2	1	1	1	1	1	1	99	99	1	1	E	E	3	2	2	0	1	1	1	1	4	1	0	0	255	1			0			0			Y	1	1	2	5	16	4
2834429	Lincoln Dr			M	50	Tatum Blvd	719	719	140408	15:44	3	2	1	1	1	1	1	1	99	99	1	1	W	W	1	1	2	0	1	1	1	1	1	16	0	0	255	1			0			0			N	1	1	2	5	16	6
2871597	Lincoln Dr			P	30	Tatum Blvd	719	719	140819	18:58	3	2	1	1	1	1	1	1	0	99	1	1	W	W	3	1	2	0	1		1		1		0			1			0			0			N	1	2	2	5	16	4
2871608	Lincoln Dr			P	20	Tatum Blvd	719	719	140812	20:55	3	2	2	2	1	1	1	1	97	0	1	1	W	W	1	3	2	0	1		2		1		0				1		1	1	0	0			N	4	2	2	2	16	4
2871614	Tatum Blvd			M	50	Lincoln Dr	719	719	140825	08:27	2	2	1	1	1	1	1	1	0	0	1	1	N	N	3	1	2	0	1		3		1		0				1		1	1	0	0			N	1	1	2	99	16	99
2871619	Tatum Blvd			M	5	Lincoln Dr	719	719	140823	12:42	7	2	1	1	1	1	1	1	0	90	1	1	N	E	3	1	2	0	1		1		97		0			1			0			0			N	1	1	2	5	16	2
2887271	Tatum Blvd			P	0	Lincoln Dr	719	719	141025	18:15	7	2	1	1	1	1	1	1	0	99	1	1	W	W	3	1	4	0	1	4	1	1	2	-1	0	0	255	1			0			0			N	4	1	2	4	16	4
																													1	4	1	1	1	-1	0	0	255																
2911286	Tatum Blvd			P	30	Lincoln Dr	719	719	141223	11:31	3	2	1	1	1	1	1	1	0	-1	1	1	S	S	3	1	3	0	1	4	1	1	16	-1	0	0	255	1			0			0			N	1	1	2	5	16	4
																													1		1		1		0																		

APPENDIX D

EXISTING PEAK HOUR ANALYSIS

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	0		0	75		0	0		0
Storage Lanes	1		0	0		0	1		0	0		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.853						0.895			0.992	
Flt Protected	0.950				0.957		0.950				0.999	
Satd. Flow (prot)	1770	1589	0	0	1783	0	1770	1667	0	0	1846	0
Flt Permitted	0.950				0.957		0.950				0.999	
Satd. Flow (perm)	1770	1589	0	0	1783	0	1770	1667	0	0	1846	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		803			802			5205			554	
Travel Time (s)		18.3			18.2			118.3			12.6	

Intersection Summary	
Area Type:	Other

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	4	6	283	0	33	4	0	0	123	12	28
Future Vol, veh/h	0	4	6	283	0	33	4	0	0	123	12	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	7	308	0	36	4	0	0	134	13	30
Number of Lanes	0	1	1	0	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	10.1	9.1	9.7
HCM LOS	B	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	89%	3%
Vol Thru, %	0%	30%	0%	2%	11%	91%
Vol Right, %	0%	70%	0%	98%	0%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	123	40	4	289	37	32
LT Vol	123	0	4	0	33	1
Through Vol	0	12	0	6	4	29
RT Vol	0	28	0	283	0	2
Lane Flow Rate	134	43	4	314	40	35
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.22	0.059	0.007	0.391	0.063	0.054
Departure Headway (Hd)	5.911	4.914	5.678	4.486	5.671	5.604
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	606	726	631	801	630	636
Service Time	3.661	2.665	3.408	2.216	3.721	3.666
HCM Lane V/C Ratio	0.221	0.059	0.006	0.392	0.063	0.055
HCM Control Delay	10.3	8	8.4	10.1	9.1	9
HCM Lane LOS	B	A	A	B	A	A
HCM 95th-tile Q	0.8	0.2	0	1.9	0.2	0.2

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	1	29	2
Future Vol, veh/h	0	1	29	2
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	32	2
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9
HCM LOS	A

Lane

Two Way Analysis cannot be performed on an All Way Stop Intersection.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	75	0		0	75	
Storage Lanes	1	1		0	1	
Taper Length (ft)	75				75	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.964			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1796	0	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1796	0	1770	1863
Link Speed (mph)	30		30			30
Link Distance (ft)	1540		2640			5205
Travel Time (s)	35.0		60.0			118.3

Intersection Summary	
Area Type:	Other

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	107	34	212	76	58	354
Future Vol, veh/h	107	34	212	76	58	354
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	116	37	230	83	63	385

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	783	272	0	0	313	0
Stage 1	272	-	-	-	-	-
Stage 2	511	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	362	767	-	-	1247	-
Stage 1	774	-	-	-	-	-
Stage 2	602	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	344	767	-	-	1247	-
Mov Cap-2 Maneuver	450	-	-	-	-	-
Stage 1	774	-	-	-	-	-
Stage 2	572	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.4	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	450	767	1247	-
HCM Lane V/C Ratio	-	-	0.258	0.048	0.051	-
HCM Control Delay (s)	-	-	15.8	9.9	8	-
HCM Lane LOS	-	-	C	A	A	-
HCM 95th %tile Q(veh)	-	-	1	0.2	0.2	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	75				75	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.944	
Flt Protected		0.998			0.972	
Satd. Flow (prot)	0	1859	1855	0	1709	0
Flt Permitted		0.998			0.972	
Satd. Flow (perm)	0	1859	1855	0	1709	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		220	310		318	
Travel Time (s)		5.0	7.0		7.2	

Intersection Summary	
Area Type:	Other

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	5	122	142	5	6	5
Future Vol, veh/h	5	122	142	5	6	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	133	154	5	7	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	160	0	-	0	300	157
Stage 1	-	-	-	-	157	-
Stage 2	-	-	-	-	143	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1419	-	-	-	691	889
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	884	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1419	-	-	-	688	889
Mov Cap-2 Maneuver	-	-	-	-	871	-
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	880	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1419	-	-	-	879
HCM Lane V/C Ratio	0.004	-	-	-	0.014
HCM Control Delay (s)	7.5	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		200	265		265	235		210	210		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	5085	1583	1770	5075	0
Flt Permitted	0.950			0.950			0.086			0.151		
Satd. Flow (perm)	1770	1863	1583	3433	1863	1583	160	5085	1583	281	5075	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			154			306		2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		310			1000			430			1000	
Travel Time (s)		7.0			22.7			9.8			22.7	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	76	17	541	117	142	15	1189	369	148	1487	21
Future Volume (veh/h)	26	76	17	541	117	142	15	1189	369	148	1487	21
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	28	83	18	588	127	154	16	1292	401	161	1616	23
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	36	113	96	652	475	628	353	2076	946	360	2110	30
Arrive On Green	0.02	0.06	0.06	0.19	0.25	0.25	0.05	0.13	0.13	0.14	0.41	0.41
Sat Flow, veh/h	1774	1863	1583	3442	1863	1583	1774	5085	1583	1774	5166	74
Grp Volume(v), veh/h	28	83	18	588	127	154	16	1292	401	161	1060	579
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1721	1863	1583	1774	1695	1583	1774	1695	1850
Q Serve(g_s), s	1.9	5.3	1.3	20.0	6.5	0.7	0.0	28.8	3.9	2.2	32.3	32.3
Cycle Q Clear(g_c), s	1.9	5.3	1.3	20.0	6.5	0.7	0.0	28.8	3.9	2.2	32.3	32.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	36	113	96	652	475	628	353	2076	946	360	1384	755
V/C Ratio(X)	0.78	0.73	0.19	0.90	0.27	0.25	0.05	0.62	0.42	0.45	0.77	0.77
Avail Cap(c_a), veh/h	177	155	132	803	475	628	353	2076	946	360	1384	755
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.5	55.4	53.5	47.5	35.7	14.2	36.6	43.2	22.4	41.4	30.6	30.6
Incr Delay (d2), s/veh	12.6	6.0	0.3	10.4	0.1	0.1	0.0	1.4	1.4	0.3	4.1	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.9	0.6	10.5	3.4	2.6	0.5	13.8	2.0	4.7	15.8	17.9
LnGrp Delay(d),s/veh	71.2	61.4	53.9	58.0	35.9	14.2	36.6	44.6	23.8	41.7	34.7	37.9
LnGrp LOS	E	E	D	E	D	B	D	D	C	D	C	D
Approach Vol, veh/h		129			869			1709			1800	
Approach Delay, s/veh		62.5			47.0			39.6			36.3	
Approach LOS		E			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	55.0	29.7	14.3	21.0	55.0	6.4	37.6
Change Period (Y+Rc), s	* 4	6.0	* 7	* 7	* 4	6.0	4.0	* 7
Max Green Setting (Gmax), s	* 12	49.0	* 28	* 10	* 12	49.0	12.0	* 26
Max Q Clear Time (g_c+I1), s	4.2	30.8	22.0	7.3	2.0	34.3	3.9	8.5
Green Ext Time (p_c), s	0.0	2.0	0.7	0.0	0.1	2.3	0.0	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	40.4
HCM 2010 LOS	D

Notes

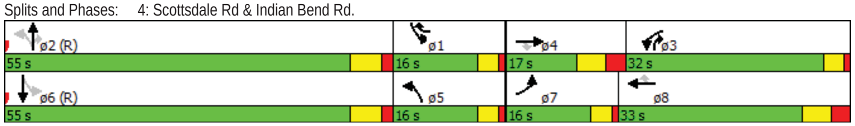
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Two Way Analysis cannot be performed on Signalized Intersection.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	16	55	32	17	16	55	16	33
Maximum Split (%)	13.3%	45.8%	26.7%	14.2%	13.3%	45.8%	13.3%	27.5%
Minimum Split (s)	9.4	29.4	8.5	13	8.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	85	30	118	101	85	30	101	117
End Time (s)	101	85	30	118	101	85	117	30
Yield/Force Off (s)	97	79	26	111	97	79	113	23
Yield/Force Off 170(s)	97	63	26	80	97	63	113	112
Local Start Time (s)	55	0	88	71	55	0	71	87
Local Yield (s)	67	49	116	81	67	49	83	113
Local Yield 170(s)	67	33	116	50	67	33	83	82

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	150	
Storage Lanes	1	0		0	1	
Taper Length (ft)	75				75	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Ped Bike Factor						
Frt	0.913					
Flt Protected	0.982				0.950	
Satd. Flow (prot)	1670	0	5085	0	1770	5085
Flt Permitted	0.982				0.950	
Satd. Flow (perm)	1670	0	5085	0	1770	5085
Link Speed (mph)	30		30			30
Link Distance (ft)	250		450			430
Travel Time (s)	5.7		10.2			9.8

Intersection Summary	
Area Type:	Other

Intersection						
Int Delay, s/veh	0.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	5	8	1547	5	5	1934
Future Vol, veh/h	5	8	1547	5	5	1934
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	9	1682	5	5	2102

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2536	843	0	0	1687	0
Stage 1	1684	-	-	-	-	-
Stage 2	852	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	48	264	-	-	180	-
Stage 1	91	-	-	-	-	-
Stage 2	343	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	47	264	-	-	180	-
Mov Cap-2 Maneuver	91	-	-	-	-	-
Stage 1	91	-	-	-	-	-
Stage 2	333	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.1	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	152	180	-
HCM Lane V/C Ratio	-	-	0.093	0.03	-
HCM Control Delay (s)	-	-	31.1	25.6	-
HCM Lane LOS	-	-	D	D	-
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	200	0	100			150
Storage Lanes	1	1	1			1
Taper Length (ft)	75		75			
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	5085	5085	1583
Flt Permitted	0.950		0.073			
Satd. Flow (perm)	1770	1583	136	5085	5085	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		5				97
Link Speed (mph)	30			30	30	
Link Distance (ft)	560			1330	450	
Travel Time (s)	12.7			30.2	10.2	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	5	44	1497	1996	89
Future Volume (veh/h)	18	5	44	1497	1996	89
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	20	5	48	1627	2170	97
Adj No. of Lanes	1	1	1	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	42	37	204	4457	4457	1388
Arrive On Green	0.02	0.02	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1774	1583	165	5253	5253	1583
Grp Volume(v), veh/h	20	5	48	1627	2170	97
Grp Sat Flow(s),veh/h/ln	1774	1583	165	1695	1695	1583
Q Serve(g_s), s	1.3	0.4	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.3	0.4	0.0	0.0	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	42	37	204	4457	4457	1388
V/C Ratio(X)	0.48	0.13	0.23	0.37	0.49	0.07
Avail Cap(c_a), veh/h	281	251	204	4457	4457	1388
HCM Platoon Ratio	1.00	1.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.81	0.81	1.00	1.00
Uniform Delay (d), s/veh	57.9	57.4	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	8.2	1.6	2.2	0.2	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.2	0.1	0.1	0.2	0.0
LnGrp Delay(d),s/veh	66.1	59.0	2.2	0.2	0.4	0.1
LnGrp LOS	E	E	A	A	A	A
Approach Vol, veh/h	25			1675	2267	
Approach Delay, s/veh	64.7			0.2	0.4	
Approach LOS	E			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		111.2		8.8		111.2		
Change Period (Y+Rc), s		* 6		6.0		* 6		
Max Green Setting (Gmax), s		* 89		19.0		* 89		
Max Q Clear Time (g_c+I1), s		2.0		3.3		2.0		
Green Ext Time (p_c), s		79.9		0.0		79.9		

Intersection Summary	
HCM 2010 Ctrl Delay	0.7
HCM 2010 LOS	A

Notes

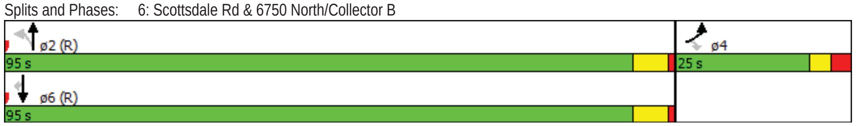
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Two Way Analysis cannot be performed on Signalized Intersection.

Phase Number	2	4	6
Movement	NBTL	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	C-Max	None	C-Max
Maximum Split (s)	95	25	95
Maximum Split (%)	79.2%	20.8%	79.2%
Minimum Split (s)	36	36.2	36.9
Yellow Time (s)	4.9	3	4.9
All-Red Time (s)	1.1	3	1.1
Minimum Initial (s)	10	5	10
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	20	8	20
Flash Dont Walk (s)	10	22	10
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	65	40	65
End Time (s)	40	65	40
Yield/Force Off (s)	34	59	34
Yield/Force Off 170(s)	24	37	24
Local Start Time (s)	0	95	0
Local Yield (s)	89	114	89
Local Yield 170(s)	79	92	79

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 65 (54%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	300		0	125		150	175		310	200		300
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.987				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3493	0	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.117			0.232			0.280		
Satd. Flow (perm)	3433	3493	0	218	3539	1583	432	3539	1583	522	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				143			235			324
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1215			9855			1081			1119	
Travel Time (s)		27.6			224.0			24.6			25.4	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	709	66	166	656	87	47	533	216	288	904	388
Future Volume (veh/h)	164	709	66	166	656	87	47	533	216	288	904	388
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	178	771	72	180	713	95	51	579	235	313	983	422
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	230	881	82	240	1029	460	191	1194	534	422	1547	692
Arrive On Green	0.07	0.27	0.27	0.09	0.29	0.29	0.03	0.34	0.34	0.13	0.44	0.44
Sat Flow, veh/h	3442	3273	306	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	178	417	426	180	713	95	51	579	235	313	983	422
Grp Sat Flow(s),veh/h/ln	1721	1770	1809	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	6.6	29.3	29.3	9.4	23.3	5.9	2.4	16.8	15.0	14.5	28.1	26.6
Cycle Q Clear(g_c), s	6.6	29.3	29.3	9.4	23.3	5.9	2.4	16.8	15.0	14.5	28.1	26.6
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	230	476	487	240	1029	460	191	1194	534	422	1547	692
V/C Ratio(X)	0.78	0.87	0.88	0.75	0.69	0.21	0.27	0.48	0.44	0.74	0.64	0.61
Avail Cap(c_a), veh/h	318	476	487	275	1029	460	194	1194	534	576	1547	692
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.7	45.4	45.4	34.1	41.0	34.8	27.9	34.1	33.5	23.8	28.5	28.1
Incr Delay (d2), s/veh	4.9	19.6	19.3	7.1	3.6	0.9	0.3	1.4	2.6	1.9	2.0	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	16.8	17.2	5.0	11.9	2.7	1.2	8.4	6.9	7.3	14.1	12.4
LnGrp Delay(d),s/veh	64.6	65.0	64.7	41.3	44.6	35.7	28.2	35.5	36.1	25.7	30.5	32.1
LnGrp LOS	E	E	E	D	D	D	C	D	D	C	C	C
Approach Vol, veh/h		1021			988			865			1718	
Approach Delay, s/veh		64.8			43.1			35.3			30.0	
Approach LOS		E			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	44.8	20.7	50.9	16.5	42.0	7.7	63.8
Change Period (Y+Rc), s	5.0	7.0	4.0	7.0	5.0	7.0	4.0	7.0
Max Green Setting (Gmax), s	12.0	37.0	28.0	30.0	14.0	35.0	4.0	54.0
Max Q Clear Time (g_c+I1), s	8.6	25.3	16.5	18.8	11.4	31.3	4.4	30.1
Green Ext Time (p_c), s	0.1	10.4	0.2	10.6	0.0	3.5	0.0	21.9

Intersection Summary	
HCM 2010 Ctrl Delay	41.6
HCM 2010 LOS	D

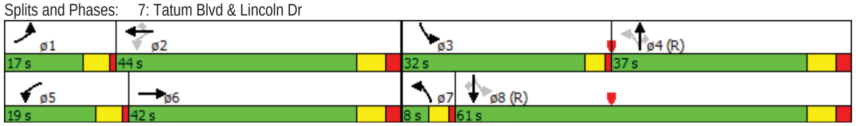
Two Way Analysis cannot be performed on Signalized Intersection.

Phase Number	1	2	3	4	5	6	7	8
Movement	EBL	WBTL	SBL	NBTL	WBL	EBT	NBL	SBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	17	44	32	37	19	42	8	61
Maximum Split (%)	13.1%	33.8%	24.6%	28.5%	14.6%	32.3%	6.2%	46.9%
Minimum Split (s)	9	35	8	36	9	35	8	36
Yellow Time (s)	4	4.5	3	4.5	4	4.5	3	4.5
All-Red Time (s)	1	2.5	1	2.5	1	2.5	1	2.5
Minimum Initial (s)	4	15	4	15	4	15	4	15
Vehicle Extension (s)	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		23		24		23		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	101	15	47	84	103	15	23
End Time (s)	101	15	47	84	103	15	23	84
Yield/Force Off (s)	96	8	43	77	98	8	19	77
Yield/Force Off 170(s)	96	115	43	53	98	115	19	53
Local Start Time (s)	37	54	98	0	37	56	98	106
Local Yield (s)	49	91	126	30	51	91	102	30
Local Yield 170(s)	49	68	126	6	51	68	102	6

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	90

Offset: 47 (36%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green

Splits and Phases: 7: Tatum Blvd & Lincoln Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↱			✥	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	85		0	85		0	110		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.971			0.996			0.856			0.982	
Flt Protected	0.950			0.950			0.950				0.974	
Satd. Flow (prot)	1770	3437	0	1770	3525	0	1770	1595	0	0	1782	0
Flt Permitted	0.299			0.224			0.733				0.775	
Satd. Flow (perm)	557	3437	0	417	3525	0	1365	1595	0	0	1418	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		55			5			76			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		9855			2715			561			529	
Travel Time (s)		224.0			61.7			12.8			12.0	

Intersection Summary

Area Type: Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↱			✥	
Traffic Volume (veh/h)	10	837	197	55	813	21	103	4	93	18	11	5
Future Volume (veh/h)	10	837	197	55	813	21	103	4	93	18	11	5
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	11	910	214	60	884	23	112	4	101	20	12	5
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	443	1887	443	358	2337	61	327	9	223	150	79	23
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	612	2846	669	499	3524	92	1390	61	1532	466	544	158
Grp Volume(v), veh/h	11	566	558	60	444	463	112	0	105	37	0	0
Grp Sat Flow(s),veh/h/ln	612	1770	1745	499	1770	1847	1390	0	1592	1167	0	0
Q Serve(g_s), s	0.6	10.8	10.8	4.6	7.7	7.7	0.0	0.0	4.1	0.1	0.0	0.0
Cycle Q Clear(g_c), s	8.2	10.8	10.8	15.4	7.7	7.7	4.1	0.0	4.1	4.2	0.0	0.0
Prop In Lane	1.00		0.38	1.00		0.05	1.00		0.96	0.54		0.14
Lane Grp Cap(c), veh/h	443	1173	1157	358	1173	1224	327	0	232	252	0	0
V/C Ratio(X)	0.02	0.48	0.48	0.17	0.38	0.38	0.34	0.00	0.45	0.15	0.00	0.00
Avail Cap(c_a), veh/h	443	1173	1157	358	1173	1224	615	0	562	556	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.60	0.60	0.88	0.88	0.88	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.0	5.7	5.7	9.5	5.2	5.2	26.6	0.0	26.6	25.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.9	0.9	0.9	0.8	0.8	0.6	0.0	1.4	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	5.5	5.4	0.7	4.0	4.1	2.0	0.0	1.9	0.6	0.0	0.0
LnGrp Delay(d),s/veh	7.1	6.5	6.6	10.4	6.0	5.9	27.2	0.0	27.9	25.6	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	C		C	C		
Approach Vol, veh/h		1135			967			217			37	
Approach Delay, s/veh		6.5			6.2			27.5			25.6	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.1		16.9		51.1		16.9
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0
Max Green Setting (Gmax), s		31.0		24.0		31.0		24.0
Max Q Clear Time (g_c+I1), s		17.4		6.1		12.8		6.2
Green Ext Time (p_c), s		10.5		1.0		13.2		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

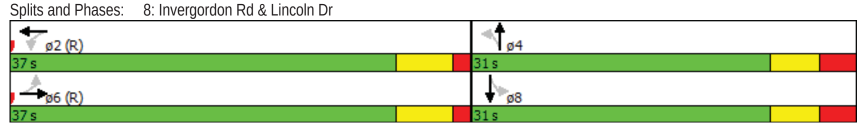
Two Way Analysis cannot be performed on Signalized Intersection.

Phase Number	2	4	6	8
Movement	WBTL	NBTL	EBTL	SBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	37	31	37	31
Maximum Split (%)	54.4%	45.6%	54.4%	45.6%
Minimum Split (s)	24	31	24	17
Yellow Time (s)	4.5	4	4.5	4
All-Red Time (s)	1.5	3	1.5	3
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	
Flash Dont Walk (s)	11	17	11	
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	59	28	59	28
End Time (s)	28	59	28	59
Yield/Force Off (s)	22	52	22	52
Yield/Force Off 170(s)	11	35	11	52
Local Start Time (s)	0	37	0	37
Local Yield (s)	31	61	31	61
Local Yield 170(s)	20	44	20	61

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Coordinated
Natural Cycle	60

Offset: 59 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Splits and Phases: 8: Invergordon Rd & Lincoln Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	100		0	100		0	135		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.996			0.952			0.893	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3522	0	1770	3525	0	1770	1773	0	1770	1663	0
Flt Permitted	0.257			0.233			0.281			0.555		
Satd. Flow (perm)	479	3522	0	434	3525	0	523	1773	0	1034	1663	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			2			17			115	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2715			1300			2640			2640	
Travel Time (s)		61.7			29.5			60.0			60.0	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	227	895	34	20	779	21	16	53	25	90	106	266
Future Volume (veh/h)	227	895	34	20	779	21	16	53	25	90	106	266
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	247	973	37	22	847	23	17	58	27	98	115	289
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	537	2169	82	171	1246	34	102	231	107	355	132	331
Arrive On Green	0.22	0.62	0.62	0.35	0.35	0.35	0.19	0.19	0.19	0.06	0.28	0.28
Sat Flow, veh/h	1774	3477	132	556	3520	96	977	1204	560	1774	471	1183
Grp Volume(v), veh/h	247	495	515	22	426	444	17	0	85	98	0	404
Grp Sat Flow(s),veh/h/ln	1774	1770	1839	556	1770	1846	977	0	1764	1774	0	1654
Q Serve(g_s), s	4.4	19.0	19.0	4.2	26.6	26.6	2.2	0.0	5.3	5.6	0.0	30.3
Cycle Q Clear(g_c), s	4.4	19.0	19.0	23.2	26.6	26.6	20.9	0.0	5.3	5.6	0.0	30.3
Prop In Lane	1.00		0.07	1.00		0.05	1.00		0.32	1.00		0.72
Lane Grp Cap(c), veh/h	537	1104	1148	171	626	653	102	0	338	355	0	463
V/C Ratio(X)	0.46	0.45	0.45	0.13	0.68	0.68	0.17	0.00	0.25	0.28	0.00	0.87
Avail Cap(c_a), veh/h	537	1104	1148	171	626	653	144	0	414	484	0	655
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.6	12.8	12.8	42.5	35.7	35.7	60.0	0.0	44.6	37.4	0.0	44.6
Incr Delay (d2), s/veh	0.5	1.2	1.1	1.6	5.9	5.6	0.8	0.0	0.4	0.4	0.0	9.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	9.6	9.9	0.7	14.0	14.6	0.6	0.0	2.6	2.8	0.0	15.0
LnGrp Delay(d),s/veh	37.2	13.9	13.9	44.0	41.6	41.4	60.8	0.0	45.0	37.8	0.0	53.7
LnGrp LOS	D	B	B	D	D	D	E		D	D		D
Approach Vol, veh/h		1257			892			102			502	
Approach Delay, s/veh		18.5			41.6			47.7			50.6	
Approach LOS		B			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6		8
Phs Duration (G+Y+Rc), s	35.1	52.0	11.5	31.4		87.1		42.9
Change Period (Y+Rc), s	6.0	* 6	4.0	6.5		6.0		6.5
Max Green Setting (Gmax), s	16.0	* 46	17.0	30.5		66.0		51.5
Max Q Clear Time (g_c+I1), s	6.4	28.6	7.6	22.9		21.0		32.3
Green Ext Time (p_c), s	5.0	5.5	0.1	2.0		9.5		3.2

Intersection Summary			
HCM 2010 Ctrl Delay			32.9
HCM 2010 LOS			C

Notes

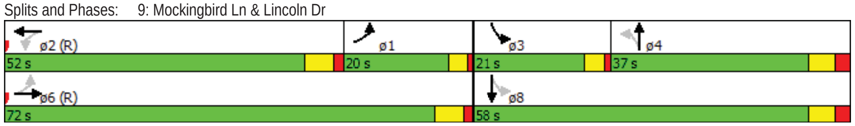
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Two Way Analysis cannot be performed on Signalized Intersection.

Phase Number	1	2	3	4	6	8
Movement	EBL	WBTL	SBL	NBTL	EBTL	SBTL
Lead/Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	20	52	21	37	72	58
Maximum Split (%)	15.4%	40.0%	16.2%	28.5%	55.4%	44.6%
Minimum Split (s)	8	27	8	34	27	34
Yellow Time (s)	3	4.5	3	4	4.5	4
All-Red Time (s)	1	1.5	1	2.5	1.5	2.5
Minimum Initial (s)	4	15	4	7	15	7
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7		7	7	7
Flash Dont Walk (s)		14		20	14	20
Dual Entry	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	50	128	70	91	128	70
End Time (s)	70	50	91	128	70	128
Yield/Force Off (s)	66	44	87	121.5	64	121.5
Yield/Force Off 170(s)	66	30	87	101.5	50	101.5
Local Start Time (s)	52	0	72	93	0	72
Local Yield (s)	68	46	89	123.5	66	123.5
Local Yield 170(s)	68	32	89	103.5	52	103.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 128 (98%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 9: Mockingbird Ln & Lincoln Dr



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			75		75	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.932	
Flt Protected			0.950		0.976	
Satd. Flow (prot)	3536	0	1770	3539	1694	0
Flt Permitted			0.950		0.976	
Satd. Flow (perm)	3536	0	1770	3539	1694	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1300			1360	352	
Travel Time (s)	29.5			30.9	8.0	

Intersection Summary	
Area Type:	Other

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	1024	5	5	1109	5	5
Future Vol, veh/h	1024	5	5	1109	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1113	5	5	1205	5	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1118	0	1730	559
Stage 1	-	-	-	-	1116	-
Stage 2	-	-	-	-	614	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	620	-	79	472
Stage 1	-	-	-	-	275	-
Stage 2	-	-	-	-	502	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	620	-	78	472
Mov Cap-2 Maneuver	-	-	-	-	275	-
Stage 1	-	-	-	-	275	-
Stage 2	-	-	-	-	498	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	348	-	-	620	-
HCM Lane V/C Ratio	0.031	-	-	0.009	-
HCM Control Delay (s)	15.7	-	-	10.9	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	180		0	100		0	275		0	185		165
Storage Lanes	1		1	1		0	2		0	1		1
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.97	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor												
Frt			0.850		0.918			0.996				0.850
Flt Protected	0.950	0.959		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1697	1583	1770	3249	0	3433	5065	0	1770	5085	1583
Flt Permitted	0.950	0.959		0.950			0.950			0.950		
Satd. Flow (perm)	1681	1697	1583	1770	3249	0	3433	5065	0	1770	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		42			4				402
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1360			455			2640			1330	
Travel Time (s)		30.9			10.3			60.0			30.2	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	551	44	368	24	32	39	266	1082	28	27	1584	570
Future Volume (veh/h)	551	44	368	24	32	39	266	1082	28	27	1584	570
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	633	0	400	26	35	42	289	1176	30	29	1722	620
Adj No. of Lanes	2	0	1	1	2	0	2	3	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	562	0	474	75	75	67	628	2337	60	250	2119	727
Arrive On Green	0.16	0.00	0.16	0.04	0.04	0.04	0.37	0.92	0.92	0.28	0.83	0.83
Sat Flow, veh/h	3548	0	1583	1774	1770	1583	3442	5100	130	1774	5085	1583
Grp Volume(v), veh/h	633	0	400	26	35	42	289	782	424	29	1722	620
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	1770	1583	1721	1695	1840	1774	1695	1583
Q Serve(g_s), s	19.0	0.0	11.5	1.7	2.3	3.1	7.7	4.3	4.3	1.5	21.0	33.5
Cycle Q Clear(g_c), s	19.0	0.0	11.5	1.7	2.3	3.1	7.7	4.3	4.3	1.5	21.0	33.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	562	0	474	75	75	67	628	1554	843	250	2119	727
V/C Ratio(X)	1.13	0.00	0.84	0.35	0.47	0.63	0.46	0.50	0.50	0.12	0.81	0.85
Avail Cap(c_a), veh/h	562	0	474	177	177	158	628	1554	843	250	2119	727
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.87	0.87	0.87	0.88	0.88	0.88
Uniform Delay (d), s/veh	50.5	0.0	39.4	55.8	56.1	56.5	33.6	2.9	2.9	37.5	7.6	7.6
Incr Delay (d2), s/veh	77.9	0.0	12.5	1.0	1.7	3.5	0.2	1.0	1.9	0.1	3.1	10.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.4	0.0	6.6	0.9	1.2	1.4	3.6	2.0	2.3	0.7	9.5	16.7
LnGrp Delay(d),s/veh	128.4	0.0	51.9	56.9	57.8	60.0	33.7	3.9	4.8	37.6	10.7	18.4
LnGrp LOS	F		D	E	E	E	C	A	A	D	B	B
Approach Vol, veh/h		1033			103			1495			2371	
Approach Delay, s/veh		98.8			58.5			9.9			13.1	
Approach LOS		F			E			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.9	61.0		12.1	25.9	56.0		26.0
Change Period (Y+Rc), s	4.0	6.0		7.0	4.0	6.0		7.0
Max Green Setting (Gmax), s	10.0	55.0		12.0	15.0	50.0		19.0
Max Q Clear Time (g_c+I1), s	3.5	6.3		5.1	9.7	35.5		21.0
Green Ext Time (p_c), s	0.1	1.7		0.1	0.1	2.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.8
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

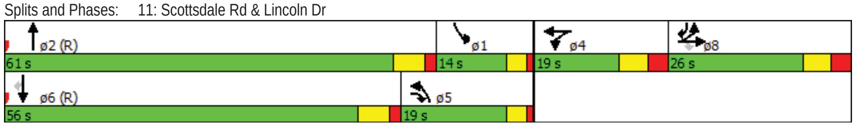
Two Way Analysis cannot be performed on Signalized Intersection.

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	WBTL	NBL	SBT	EBTL
Lead/Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	14	61	19	19	56	26
Maximum Split (%)	11.7%	50.8%	15.8%	15.8%	46.7%	21.7%
Minimum Split (s)	9	28	40	9	28	40
Yellow Time (s)	3	4.5	4	3	4.5	4
All-Red Time (s)	1	1.5	3	1	1.5	3
Minimum Initial (s)	5	20	5	5	20	8
Vehicle Extension (s)	1	0.2	2	1	0.2	2
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		15	26		15	26
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	31	90	45	26	90	64
End Time (s)	45	31	64	45	26	90
Yield/Force Off (s)	41	25	57	41	20	83
Yield/Force Off 170(s)	41	10	31	41	5	57
Local Start Time (s)	61	0	75	56	0	94
Local Yield (s)	71	55	87	71	50	113
Local Yield 170(s)	71	40	61	71	35	87

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150

Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Splits and Phases: 11: Scottsdale Rd & Lincoln Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	75		0	75		0	0		0	75		0
Storage Lanes	1		0	1		0	0		0	1		1
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.982			0.955				0.850
Flt Protected	0.950			0.950				0.984		0.950		
Satd. Flow (prot)	1770	1852	0	1770	1829	0	0	1750	0	1770	0	1583
Flt Permitted	0.950			0.950				0.984		0.950		
Satd. Flow (perm)	1770	1852	0	1770	1829	0	0	1750	0	1770	0	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		950			2680			459			2640	
Travel Time (s)		21.6			60.9			10.4			60.0	

Intersection Summary	
Area Type:	Other

Intersection	
Intersection Delay, s/veh	11.5
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	44	218	9	0	8	273	38	0	5	5	5
Future Vol, veh/h	0	44	218	9	0	8	273	38	0	5	5	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	48	237	10	0	9	297	41	0	5	5	5
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	10.9	12.9	9.6
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	33%	100%	0%	100%	0%	100%	0%
Vol Thru, %	33%	0%	96%	0%	88%	0%	8%
Vol Right, %	33%	0%	4%	0%	12%	0%	92%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	44	227	8	311	73	65
LT Vol	5	44	0	8	0	73	0
Through Vol	5	0	218	0	273	0	5
RT Vol	5	0	9	0	38	0	60
Lane Flow Rate	16	48	247	9	338	79	71
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.029	0.078	0.365	0.014	0.491	0.146	0.107
Departure Headway (Hd)	6.373	5.855	5.323	5.819	5.229	6.717	5.459
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	565	607	671	611	683	537	649
Service Time	4.373	3.633	3.1	3.593	3.003	4.417	3.258
HCM Lane V/C Ratio	0.028	0.079	0.368	0.015	0.495	0.147	0.109
HCM Control Delay	9.6	9.1	11.2	8.7	13	10.6	8.9
HCM Lane LOS	A	A	B	A	B	B	A
HCM 95th-tile Q	0.1	0.3	1.7	0	2.7	0.5	0.4

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	73	5	60
Future Vol, veh/h	0	73	5	60
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	79	5	65
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9.8
HCM LOS	A

Lane

Two Way Analysis cannot be performed on an All Way Stop Intersection.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	165		100	200		300	260		100
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.91	1.00
Ped Bike Factor												
Frt		0.980				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3468	0	1770	3539	1583	1770	5085	1583	3433	5085	1583
Flt Permitted	0.351			0.494			0.950			0.950		
Satd. Flow (perm)	654	3468	0	920	3539	1583	1770	5085	1583	3433	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12				118			149			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2680			809			883			2640	
Travel Time (s)		60.9			18.4			20.1			60.0	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	227	34	289	332	286	45	1010	137	169	1669	68
Future Volume (veh/h)	118	227	34	289	332	286	45	1010	137	169	1669	68
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	128	247	37	314	361	311	49	1098	149	184	1814	74
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	326	48	281	478	588	419	1907	594	814	1907	594
Arrive On Green	0.08	0.11	0.11	0.11	0.14	0.14	0.24	0.38	0.38	0.31	0.50	0.50
Sat Flow, veh/h	1774	3094	458	1774	3539	1583	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	128	140	144	314	361	311	49	1098	149	184	1814	74
Grp Sat Flow(s),veh/h/ln	1774	1770	1782	1774	1770	1583	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	3.8	9.2	9.4	13.0	11.8	0.0	2.6	20.7	7.8	4.7	40.8	3.0
Cycle Q Clear(g_c), s	3.8	9.2	9.4	13.0	11.8	0.0	2.6	20.7	7.8	4.7	40.8	3.0
Prop In Lane	1.00		0.26	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	205	186	188	281	478	588	419	1907	594	814	1907	594
V/C Ratio(X)	0.63	0.75	0.77	1.12	0.75	0.53	0.12	0.58	0.25	0.23	0.95	0.12
Avail Cap(c_a), veh/h	258	339	342	281	678	678	419	1907	594	814	1907	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.56	0.56	0.56
Uniform Delay (d), s/veh	51.7	52.2	52.3	51.3	50.0	29.5	36.0	29.9	25.9	33.0	29.0	19.5
Incr Delay (d2), s/veh	3.1	6.0	6.5	88.8	3.0	0.7	0.1	1.3	1.0	0.1	7.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	4.8	5.0	15.9	6.0	8.1	1.3	9.9	3.6	2.3	20.2	1.3
LnGrp Delay(d),s/veh	54.8	58.1	58.7	140.0	53.0	30.2	36.1	31.2	26.9	33.1	36.7	19.8
LnGrp LOS	D	E	E	F	D	C	D	C	C	C	D	B
Approach Vol, veh/h		412			986			1296			2072	
Approach Delay, s/veh		57.3			73.5			30.9			35.8	
Approach LOS		E			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.4	51.0	17.0	19.6	32.4	51.0	13.4	23.2
Change Period (Y+Rc), s	4.0	6.0	* 4	7.0	4.0	6.0	* 4	7.0
Max Green Setting (Gmax), s	18.0	45.0	* 13	23.0	18.0	45.0	* 13	23.0
Max Q Clear Time (g_c+I1), s	6.7	22.7	15.0	11.4	4.6	42.8	5.8	13.8
Green Ext Time (p_c), s	0.6	9.0	0.0	1.2	0.6	1.9	0.9	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	44.1
HCM 2010 LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Two Way Analysis cannot be performed on Signalized Intersection.

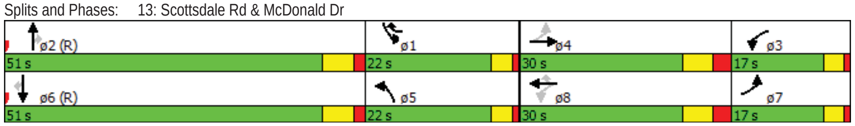
Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	51	17	30	22	51	17	30
Maximum Split (%)	18.3%	42.5%	14.2%	25.0%	18.3%	42.5%	14.2%	25.0%
Minimum Split (s)	14	31	10	37	14	31	10	37
Yellow Time (s)	3	4.5	3	4.3	3	4.5	3	4.3
All-Red Time (s)	1	1.5	1	2.7	1	1.5	1	2.7
Minimum Initial (s)	10	20	6	8	10	20	6	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	1	0.2	1	2	1	0.2	1	2
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		9		6		9		6
Flash Dont Walk (s)		16		24		16		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	81	30	13	103	81	30	13	103
End Time (s)	103	81	30	13	103	81	30	13
Yield/Force Off (s)	99	75	26	6	99	75	26	6
Yield/Force Off 170(s)	99	59	26	102	99	59	26	102
Local Start Time (s)	51	0	103	73	51	0	103	73
Local Yield (s)	69	45	116	96	69	45	116	96
Local Yield 170(s)	69	29	116	72	69	29	116	72

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95

Offset: 30 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Splits and Phases: 13: Scottsdale Rd & McDonald Dr



Lanes and Geometrics

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	0		0	75		0	0		0
Storage Lanes	1		0	0		0	1		0	0		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.873			0.987			0.918			0.981	
Flt Protected	0.950				0.976		0.950				0.998	
Satd. Flow (prot)	1770	1626	0	0	1794	0	1770	1710	0	0	1824	0
Flt Permitted	0.950				0.976		0.950				0.998	
Satd. Flow (perm)	1770	1626	0	0	1794	0	1770	1710	0	0	1824	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		803			802			5205			554	
Travel Time (s)		18.3			18.2			118.3			12.6	

Intersection Summary	
Area Type:	Other

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	4	31	177	0	18	16	4	0	250	38	45
Future Vol, veh/h	0	4	31	177	0	18	16	4	0	250	38	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	34	192	0	20	17	4	0	272	41	49
Number of Lanes	0	1	1	0	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	10.1	9.4	11.8
HCM LOS	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	47%	4%
Vol Thru, %	0%	46%	0%	15%	42%	81%
Vol Right, %	0%	54%	0%	85%	11%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	250	83	4	208	38	27
LT Vol	250	0	4	0	18	1
Through Vol	0	38	0	31	16	22
RT Vol	0	45	0	177	4	4
Lane Flow Rate	272	90	4	226	41	29
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.434	0.122	0.007	0.316	0.068	0.046
Departure Headway (Hd)	5.754	4.869	6.141	5.037	5.905	5.627
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	622	731	581	710	603	630
Service Time	3.518	2.633	3.893	2.789	3.98	3.715
HCM Lane V/C Ratio	0.437	0.123	0.007	0.318	0.068	0.046
HCM Control Delay	12.9	8.3	8.9	10.1	9.4	9
HCM Lane LOS	B	A	A	B	A	A
HCM 95th-tile Q	2.2	0.4	0	1.4	0.2	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	1	22	4
Future Vol, veh/h	0	1	22	4
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	24	4
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9
HCM LOS	A

Lane

Two Way Analysis cannot be performed on an All Way Stop Intersection.

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	75	0		0	75	
Storage Lanes	1	1		0	1	
Taper Length (ft)	75				75	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850	0.967			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1801	0	1770	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1583	1801	0	1770	1863
Link Speed (mph)	30		30			30
Link Distance (ft)	1540		2640			5205
Travel Time (s)	35.0		60.0			118.3

Intersection Summary	
Area Type:	Other

Intersection	
Int Delay, s/veh	2.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	89	43	313	99	35	188
Future Vol, veh/h	89	43	313	99	35	188
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	47	340	108	38	204

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	674	394	0	0	448	0
Stage 1	394	-	-	-	-	-
Stage 2	280	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	420	655	-	-	1112	-
Stage 1	681	-	-	-	-	-
Stage 2	767	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	406	655	-	-	1112	-
Mov Cap-2 Maneuver	508	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	741	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	1.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	508	655	1112	-
HCM Lane V/C Ratio	-	-	0.19	0.071	0.034	-
HCM Control Delay (s)	-	-	13.7	10.9	8.4	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0.2	0.1	-

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	75				75	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.989		0.932	
Flt Protected		0.998			0.976	
Satd. Flow (prot)	0	1859	1842	0	1694	0
Flt Permitted		0.998			0.976	
Satd. Flow (perm)	0	1859	1842	0	1694	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		220	310		318	
Travel Time (s)		5.0	7.0		7.2	

Intersection Summary	
Area Type:	Other

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	5	118	152	14	5	5
Future Vol, veh/h	5	118	152	14	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	128	165	15	5	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	180	0	-	0	312	173
Stage 1	-	-	-	-	173	-
Stage 2	-	-	-	-	139	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1396	-	-	-	681	871
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	888	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1396	-	-	-	678	871
Mov Cap-2 Maneuver	-	-	-	-	706	-
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	884	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1396	-	-	-	780
HCM Lane V/C Ratio	0.004	-	-	-	0.014
HCM Control Delay (s)	7.6	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		200	265		265	235		210	210		0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.91	1.00	1.00	0.91	0.91
Ped Bike Factor												
Frt			0.850			0.850			0.850		0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	3433	1863	1583	1770	5085	1583	1770	5065	0
Flt Permitted	0.950			0.950			0.092			0.066		
Satd. Flow (perm)	1770	1863	1583	3433	1863	1583	171	5085	1583	123	5065	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127			114			228		4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		310			1000			430			1000	
Travel Time (s)		7.0			22.7			9.8			22.7	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	92	11	411	130	127	40	1714	465	175	1418	37
Future Volume (veh/h)	46	92	11	411	130	127	40	1714	465	175	1418	37
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	50	100	12	447	141	138	43	1863	505	190	1541	40
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	64	130	110	510	385	576	395	2161	908	349	2166	56
Arrive On Green	0.04	0.07	0.07	0.15	0.21	0.21	0.05	0.14	0.14	0.16	0.43	0.43
Sat Flow, veh/h	1774	1863	1583	3442	1863	1583	1774	5085	1583	1774	5097	132
Grp Volume(v), veh/h	50	100	12	447	141	138	43	1863	505	190	1025	556
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1721	1863	1583	1774	1695	1583	1774	1695	1839
Q Serve(g_s), s	3.4	6.3	0.9	15.3	7.8	0.8	0.0	43.0	16.9	6.8	29.9	29.9
Cycle Q Clear(g_c), s	3.4	6.3	0.9	15.3	7.8	0.8	0.0	43.0	16.9	6.8	29.9	29.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	64	130	110	510	385	576	395	2161	908	349	1441	782
V/C Ratio(X)	0.78	0.77	0.11	0.88	0.37	0.24	0.11	0.86	0.56	0.55	0.71	0.71
Avail Cap(c_a), veh/h	207	171	145	660	385	576	395	2161	908	349	1441	782
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.3	54.9	52.3	50.0	40.9	15.1	35.3	48.1	28.9	44.0	28.4	28.4
Incr Delay (d2), s/veh	7.3	10.0	0.2	8.8	0.2	0.1	0.0	4.8	2.5	1.0	3.0	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	3.6	0.4	7.9	4.0	2.4	1.3	21.2	8.0	5.7	14.6	16.3
LnGrp Delay(d),s/veh	64.6	64.9	52.5	58.8	41.1	15.2	35.4	53.0	31.3	45.0	31.4	33.9
LnGrp LOS	E	E	D	E	D	B	D	D	C	D	C	C
Approach Vol, veh/h		162			726			2411			1771	
Approach Delay, s/veh		63.9			47.1			48.1			33.7	
Approach LOS		E			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.8	57.0	24.8	15.4	22.8	57.0	8.3	31.8
Change Period (Y+Rc), s	* 4	6.0	* 7	* 7	* 4	6.0	4.0	* 7
Max Green Setting (Gmax), s	* 14	51.0	* 23	* 11	* 14	51.0	14.0	* 20
Max Q Clear Time (g_c+I1), s	8.8	45.0	17.3	8.3	2.0	31.9	5.4	9.8
Green Ext Time (p_c), s	0.1	2.3	0.5	0.0	0.1	2.3	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	43.4
HCM 2010 LOS	D

Notes

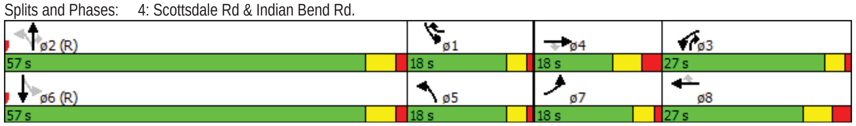
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Two Way Analysis cannot be performed on Signalized Intersection.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	18	57	27	18	18	57	18	27
Maximum Split (%)	15.0%	47.5%	22.5%	15.0%	15.0%	47.5%	15.0%	22.5%
Minimum Split (s)	9.4	29.4	8.5	13	8.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	87	30	3	105	87	30	105	3
End Time (s)	105	87	30	3	105	87	3	30
Yield/Force Off (s)	101	81	26	116	101	81	119	23
Yield/Force Off 170(s)	101	65	26	85	101	65	119	112
Local Start Time (s)	57	0	93	75	57	0	75	93
Local Yield (s)	71	51	116	86	71	51	89	113
Local Yield 170(s)	71	35	116	55	71	35	89	82

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	150	
Storage Lanes	1	0		0	1	
Taper Length (ft)	75				75	
Lane Util. Factor	1.00	1.00	0.91	0.91	1.00	0.91
Ped Bike Factor						
Frt	0.907					
Flt Protected	0.985				0.950	
Satd. Flow (prot)	1664	0	5085	0	1770	5085
Flt Permitted	0.985				0.950	
Satd. Flow (perm)	1664	0	5085	0	1770	5085
Link Speed (mph)	30		30			30
Link Distance (ft)	250		450			430
Travel Time (s)	5.7		10.2			9.8

Intersection Summary	
Area Type:	Other

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	5	10	2190	6	9	1922
Future Vol, veh/h	5	10	2190	6	9	1922
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	11	2380	7	10	2089

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	3239	1193	0	0	2387	0
Stage 1	2384	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	19	154	-	-	79	-
Stage 1	32	-	-	-	-	-
Stage 2	342	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	17	154	-	-	79	-
Mov Cap-2 Maneuver	32	-	-	-	-	-
Stage 1	32	-	-	-	-	-
Stage 2	299	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	73.9	0	0.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	68	79	-
HCM Lane V/C Ratio	-	-	0.24	0.124	-
HCM Control Delay (s)	-	-	73.9	56.9	-
HCM Lane LOS	-	-	F	F	-
HCM 95th %tile Q(veh)	-	-	0.8	0.4	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	200	0	100			150
Storage Lanes	1	1	1			1
Taper Length (ft)	75		75			
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	1583	1770	5085	5085	1583
Flt Permitted	0.950		0.072			
Satd. Flow (perm)	1770	1583	134	5085	5085	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		22				12
Link Speed (mph)	30			30	30	
Link Distance (ft)	560			1330	450	
Travel Time (s)	12.7			30.2	10.2	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	61	36	5	2131	1979	11
Future Volume (veh/h)	61	36	5	2131	1979	11
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	66	39	5	2316	2151	12
Adj No. of Lanes	1	1	1	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	94	84	215	4307	4307	1341
Arrive On Green	0.05	0.05	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1774	1583	183	5253	5253	1583
Grp Volume(v), veh/h	66	39	5	2316	2151	12
Grp Sat Flow(s),veh/h/ln	1774	1583	183	1695	1695	1583
Q Serve(g_s), s	4.4	2.9	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.4	2.9	0.0	0.0	0.0	0.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	94	84	215	4307	4307	1341
V/C Ratio(X)	0.70	0.46	0.02	0.54	0.50	0.01
Avail Cap(c_a), veh/h	266	237	215	4307	4307	1341
HCM Platoon Ratio	1.00	1.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	0.56	0.56	1.00	1.00
Uniform Delay (d), s/veh	55.9	55.2	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	9.1	3.9	0.1	0.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	1.3	0.0	0.1	0.2	0.0
LnGrp Delay(d),s/veh	64.9	59.1	0.1	0.3	0.4	0.0
LnGrp LOS	E	E	A	A	A	A
Approach Vol, veh/h	105			2321	2163	
Approach Delay, s/veh	62.8			0.3	0.4	
Approach LOS	E			A	A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		107.6		12.4		107.6		
Change Period (Y+Rc), s		* 6		6.0		* 6		
Max Green Setting (Gmax), s		* 90		18.0		* 90		
Max Q Clear Time (g_c+I1), s		2.0		6.4		2.0		
Green Ext Time (p_c), s		84.4		0.2		84.4		

Intersection Summary	
HCM 2010 Ctrl Delay	1.8
HCM 2010 LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

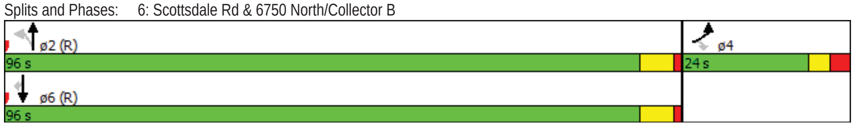
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Two Way Analysis cannot be performed on Signalized Intersection.

Phase Number	2	4	6
Movement	NBTL	EBL	SBT
Lead/Lag			
Lead-Lag Optimize			
Recall Mode	C-Max	None	C-Max
Maximum Split (s)	96	24	96
Maximum Split (%)	80.0%	20.0%	80.0%
Minimum Split (s)	36	36.2	36.9
Yellow Time (s)	4.9	3	4.9
All-Red Time (s)	1.1	3	1.1
Minimum Initial (s)	10	5	10
Vehicle Extension (s)	3	3	3
Minimum Gap (s)	3	3	3
Time Before Reduce (s)	0	0	0
Time To Reduce (s)	0	0	0
Walk Time (s)	20	8	20
Flash Dont Walk (s)	10	22	10
Dual Entry	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes
Start Time (s)	65	41	65
End Time (s)	41	65	41
Yield/Force Off (s)	35	59	35
Yield/Force Off 170(s)	25	37	25
Local Start Time (s)	0	96	0
Local Yield (s)	90	114	90
Local Yield 170(s)	80	92	80

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 65 (54%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	300		0	125		150	175		310	200		300
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.992				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3511	0	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.149			0.376			0.082		
Satd. Flow (perm)	3433	3511	0	278	3539	1583	700	3539	1583	153	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				166			163			182
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1215			9855			1081			1119	
Travel Time (s)		27.6			224.0			24.6			25.4	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	347	669	38	209	771	248	86	1017	181	186	616	167
Future Volume (veh/h)	347	669	38	209	771	248	86	1017	181	186	616	167
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	377	727	41	227	838	270	93	1105	197	202	670	182
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	318	920	52	295	1007	451	290	1276	571	237	1470	658
Arrive On Green	0.09	0.27	0.27	0.11	0.28	0.28	0.03	0.36	0.36	0.09	0.42	0.42
Sat Flow, veh/h	3442	3406	192	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	377	378	390	227	838	270	93	1105	197	202	670	182
Grp Sat Flow(s),veh/h/ln	1721	1770	1829	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	12.0	25.7	25.8	11.9	28.9	19.1	4.0	37.7	11.8	9.0	17.7	9.9
Cycle Q Clear(g_c), s	12.0	25.7	25.8	11.9	28.9	19.1	4.0	37.7	11.8	9.0	17.7	9.9
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	318	478	494	295	1007	451	290	1276	571	237	1470	658
V/C Ratio(X)	1.19	0.79	0.79	0.77	0.83	0.60	0.32	0.87	0.35	0.85	0.46	0.28
Avail Cap(c_a), veh/h	318	478	494	297	1007	451	290	1276	571	467	1470	658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.0	44.0	44.0	32.6	43.6	40.1	26.6	38.7	30.4	29.8	27.4	25.1
Incr Delay (d2), s/veh	111.2	12.5	12.2	8.4	6.4	4.6	0.2	8.1	1.7	3.3	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	14.2	14.7	6.4	15.0	8.9	0.5	19.8	5.4	4.6	8.9	4.5
LnGrp Delay(d),s/veh	170.2	56.5	56.2	41.1	50.0	44.7	26.8	46.7	32.0	33.1	28.4	26.1
LnGrp LOS	F	E	E	D	D	D	C	D	C	C	C	C
Approach Vol, veh/h		1145			1335			1395			1054	
Approach Delay, s/veh		93.8			47.4			43.3			28.9	
Approach LOS		F			D			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	44.0	15.1	53.9	18.9	42.1	8.0	61.0
Change Period (Y+Rc), s	5.0	7.0	4.0	7.0	5.0	7.0	4.0	7.0
Max Green Setting (Gmax), s	12.0	37.0	28.0	30.0	14.0	35.0	4.0	54.0
Max Q Clear Time (g_c+I1), s	14.0	30.9	11.0	39.7	13.9	27.8	6.0	19.7
Green Ext Time (p_c), s	0.0	5.8	0.2	0.0	0.0	6.8	0.0	30.5

Intersection Summary	
HCM 2010 Ctrl Delay	53.1
HCM 2010 LOS	D

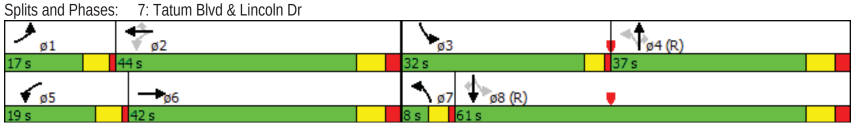
Two Way Analysis cannot be performed on Signalized Intersection.

Timing Report, Sorted By Phase

Phase Number	1	2	3	4	5	6	7	8
Movement	EBL	WBTL	SBL	NBTL	WBL	EBT	NBL	SBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	17	44	32	37	19	42	8	61
Maximum Split (%)	13.1%	33.8%	24.6%	28.5%	14.6%	32.3%	6.2%	46.9%
Minimum Split (s)	9	35	8	36	9	35	8	36
Yellow Time (s)	4	4.5	3	4.5	4	4.5	3	4.5
All-Red Time (s)	1	2.5	1	2.5	1	2.5	1	2.5
Minimum Initial (s)	4	15	4	15	4	15	4	15
Vehicle Extension (s)	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		23		24		23		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	101	15	47	84	103	15	23
End Time (s)	101	15	47	84	103	15	23	84
Yield/Force Off (s)	96	8	43	77	98	8	19	77
Yield/Force Off 170(s)	96	115	43	53	98	115	19	53
Local Start Time (s)	37	54	98	0	37	56	98	106
Local Yield (s)	49	91	126	30	51	91	102	30
Local Yield 170(s)	49	68	126	6	51	68	102	6

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 47 (36%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	

Splits and Phases: 7: Tatum Blvd & Lincoln Dr



Lanes and Geometrics

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	85		0	85		0	110		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.980			0.996			0.880			0.973	
Flt Protected	0.950			0.950			0.950				0.976	
Satd. Flow (prot)	1770	3468	0	1770	3525	0	1770	1639	0	0	1769	0
Flt Permitted	0.224			0.175			0.720				0.829	
Satd. Flow (perm)	417	3468	0	326	3525	0	1341	1639	0	0	1503	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			5			56			11	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		9855			2715			561			529	
Travel Time (s)		224.0			61.7			12.8			12.0	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	928	145	61	916	25	245	21	84	25	17	10
Future Volume (veh/h)	5	928	145	61	916	25	245	21	84	25	17	10
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	5	1009	158	66	996	27	266	23	91	27	18	11
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	341	1810	283	292	2077	56	427	72	285	193	122	58
Arrive On Green	0.59	0.59	0.59	0.59	0.59	0.59	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	549	3068	480	479	3520	95	1375	329	1303	523	556	264
Grp Volume(v), veh/h	5	582	585	66	501	522	266	0	114	56	0	0
Grp Sat Flow(s),veh/h/ln	549	1770	1778	479	1770	1846	1375	0	1633	1342	0	0
Q Serve(g_s), s	0.4	13.6	13.7	6.6	11.0	11.0	7.4	0.0	4.0	0.1	0.0	0.0
Cycle Q Clear(g_c), s	11.4	13.6	13.7	20.3	11.0	11.0	11.5	0.0	4.0	4.1	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.05	1.00		0.80	0.48		0.20
Lane Grp Cap(c), veh/h	341	1044	1049	292	1044	1089	427	0	357	372	0	0
V/C Ratio(X)	0.01	0.56	0.56	0.23	0.48	0.48	0.62	0.00	0.32	0.15	0.00	0.00
Avail Cap(c_a), veh/h	341	1044	1049	292	1044	1089	611	0	576	571	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.62	0.62	0.62	0.84	0.84	0.84	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.2	8.5	8.5	14.7	8.0	8.0	25.0	0.0	22.3	21.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.3	1.3	1.5	1.3	1.3	1.5	0.0	0.5	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	7.0	7.1	1.0	5.7	5.9	4.9	0.0	1.9	0.9	0.0	0.0
LnGrp Delay(d),s/veh	11.3	9.8	9.9	16.2	9.3	9.2	26.5	0.0	22.8	21.6	0.0	0.0
LnGrp LOS	B	A	A	B	A	A	C		C	C		
Approach Vol, veh/h		1172			1089			380			56	
Approach Delay, s/veh		9.9			9.7			25.4			21.6	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		46.1		21.9		46.1		21.9
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0
Max Green Setting (Gmax), s		31.0		24.0		31.0		24.0
Max Q Clear Time (g_c+I1), s		22.3		13.5		15.7		6.1
Green Ext Time (p_c), s		7.4		1.4		12.2		1.7

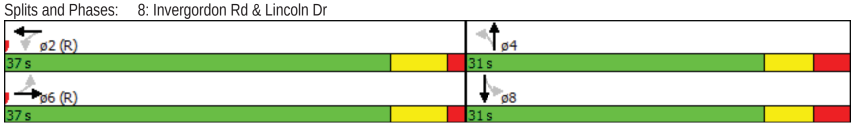
Intersection Summary		
HCM 2010 Ctrl Delay		12.2
HCM 2010 LOS		B

Two Way Analysis cannot be performed on Signalized Intersection.

Phase Number	2	4	6	8
Movement	WBTL	NBTL	EBTL	SBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	37	31	37	31
Maximum Split (%)	54.4%	45.6%	54.4%	45.6%
Minimum Split (s)	24	31	24	17
Yellow Time (s)	4.5	4	4.5	4
All-Red Time (s)	1.5	3	1.5	3
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	
Flash Dont Walk (s)	11	17	11	
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	59	28	59	28
End Time (s)	28	59	28	59
Yield/Force Off (s)	22	52	22	52
Yield/Force Off 170(s)	11	35	11	52
Local Start Time (s)	0	37	0	37
Local Yield (s)	31	61	31	61
Local Yield 170(s)	20	44	20	61

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 59 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 8: Invergordon Rd & Lincoln Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	100		0	100		0	135		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.986			0.973			0.903	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3529	0	1770	3490	0	1770	1812	0	1770	1682	0
Flt Permitted	0.213			0.255			0.594			0.425		
Satd. Flow (perm)	397	3529	0	475	3490	0	1106	1812	0	792	1682	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			9			8			84	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2715			1300			2640			2640	
Travel Time (s)		61.7			29.5			60.0			60.0	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	876	17	13	844	87	12	103	23	54	87	160
Future Volume (veh/h)	253	876	17	13	844	87	12	103	23	54	87	160
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	275	952	18	14	917	95	13	112	25	59	95	174
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	644	2507	47	197	1146	119	105	190	42	195	117	214
Arrive On Green	0.31	0.71	0.71	0.35	0.35	0.35	0.13	0.13	0.13	0.04	0.20	0.20
Sat Flow, veh/h	1774	3553	67	577	3238	335	1106	1475	329	1774	590	1081
Grp Volume(v), veh/h	275	474	496	14	501	511	13	0	137	59	0	269
Grp Sat Flow(s),veh/h/ln	1774	1770	1851	577	1770	1804	1106	0	1805	1774	0	1672
Q Serve(g_s), s	7.8	14.0	14.0	2.4	33.2	33.2	1.5	0.0	9.3	3.7	0.0	20.0
Cycle Q Clear(g_c), s	7.8	14.0	14.0	16.4	33.2	33.2	12.4	0.0	9.3	3.7	0.0	20.0
Prop In Lane	1.00		0.04	1.00		0.19	1.00		0.18	1.00		0.65
Lane Grp Cap(c), veh/h	644	1249	1306	197	626	638	105	0	232	195	0	331
V/C Ratio(X)	0.43	0.38	0.38	0.07	0.80	0.80	0.12	0.00	0.59	0.30	0.00	0.81
Avail Cap(c_a), veh/h	644	1249	1306	197	626	638	222	0	423	358	0	662
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.7	7.7	7.7	37.9	37.9	37.9	60.1	0.0	53.4	45.4	0.0	49.8
Incr Delay (d2), s/veh	0.3	0.7	0.6	0.7	10.3	10.2	0.5	0.0	2.4	0.9	0.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	6.9	7.3	0.4	17.9	18.3	0.5	0.0	4.8	1.8	0.0	9.7
LnGrp Delay(d),s/veh	32.0	8.4	8.3	38.6	48.2	48.0	60.6	0.0	55.8	46.3	0.0	54.6
LnGrp LOS	C	A	A	D	D	D	E		E	D		D
Approach Vol, veh/h		1245			1026			150			328	
Approach Delay, s/veh		13.6			48.0			56.2			53.1	
Approach LOS		B			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6		8
Phs Duration (G+Y+Rc), s	45.7	52.0	9.0	23.2		97.7		32.3
Change Period (Y+Rc), s	6.0	* 6	4.0	6.5		6.0		6.5
Max Green Setting (Gmax), s	16.0	* 46	17.0	30.5		66.0		51.5
Max Q Clear Time (g_c+I1), s	9.8	35.2	5.7	14.4		16.0		22.0
Green Ext Time (p_c), s	3.6	5.0	0.1	2.3		9.2		2.7

Intersection Summary	
HCM 2010 Ctrl Delay	33.5
HCM 2010 LOS	C

Notes

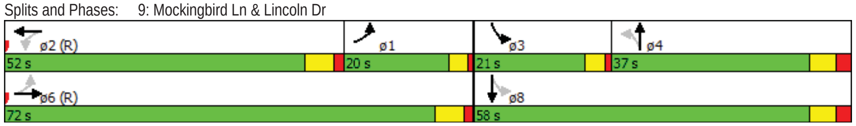
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Two Way Analysis cannot be performed on Signalized Intersection.

Phase Number	1	2	3	4	6	8
Movement	EBL	WBTL	SBL	NBTL	EBTL	SBTL
Lead/Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	20	52	21	37	72	58
Maximum Split (%)	15.4%	40.0%	16.2%	28.5%	55.4%	44.6%
Minimum Split (s)	8	27	8	34	27	34
Yellow Time (s)	3	4.5	3	4	4.5	4
All-Red Time (s)	1	1.5	1	2.5	1.5	2.5
Minimum Initial (s)	4	15	4	7	15	7
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7		7	7	7
Flash Dont Walk (s)		14		20	14	20
Dual Entry	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	50	128	70	91	128	70
End Time (s)	70	50	91	128	70	128
Yield/Force Off (s)	66	44	87	121.5	64	121.5
Yield/Force Off 170(s)	66	30	87	101.5	50	101.5
Local Start Time (s)	52	0	72	93	0	72
Local Yield (s)	68	46	89	123.5	66	123.5
Local Yield 170(s)	68	32	89	103.5	52	103.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 128 (98%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 9: Mockingbird Ln & Lincoln Dr



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	100		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			75		75	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.999				0.932	
Flt Protected			0.950		0.976	
Satd. Flow (prot)	3536	0	1770	3539	1694	0
Flt Permitted			0.950		0.976	
Satd. Flow (perm)	3536	0	1770	3539	1694	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1300			1360	352	
Travel Time (s)	29.5			30.9	8.0	

Intersection Summary	
Area Type:	Other

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	498	5	5	870	5	5
Future Vol, veh/h	498	5	5	870	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	541	5	5	946	5	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	547	0	1028	273
Stage 1	-	-	-	-	544	-
Stage 2	-	-	-	-	484	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1018	-	230	725
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	585	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1018	-	229	725
Mov Cap-2 Maneuver	-	-	-	-	546	-
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	582	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	623	-	-	1018	-
HCM Lane V/C Ratio	0.017	-	-	0.005	-
HCM Control Delay (s)	10.9	-	-	8.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lanes and Geometrics

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	180		0	100		0	275		0	185		165
Storage Lanes	1		1	1		0	2		0	1		1
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.97	0.91	0.91	1.00	0.91	1.00
Ped Bike Factor												
Frt			0.850		0.926			0.997				0.850
Flt Protected	0.950	0.959		0.950			0.950			0.950		
Satd. Flow (prot)	1681	1697	1583	1770	3277	0	3433	5070	0	1770	5085	1583
Flt Permitted	0.950	0.959		0.950			0.950			0.950		
Satd. Flow (perm)	1681	1697	1583	1770	3277	0	3433	5070	0	1770	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			171		57			3				312
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1360			455			2640			1330	
Travel Time (s)		30.9			10.3			60.0			30.2	

Intersection Summary	
Area Type:	Other

HCM 2010 Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	539	45	358	41	54	52	328	1523	36	54	1439	398
Future Volume (veh/h)	539	45	358	41	54	52	328	1523	36	54	1439	398
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	621	0	389	45	59	57	357	1655	39	59	1564	433
Adj No. of Lanes	2	0	1	1	2	0	2	3	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	591	0	507	97	99	85	816	2172	51	273	1737	627
Arrive On Green	0.17	0.00	0.17	0.05	0.05	0.05	0.47	0.85	0.85	0.31	0.68	0.68
Sat Flow, veh/h	3548	0	1583	1774	1807	1551	3442	5111	120	1774	5085	1583
Grp Volume(v), veh/h	621	0	389	45	58	58	357	1098	596	59	1564	433
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	1770	1589	1721	1695	1841	1774	1695	1583
Q Serve(g_s), s	20.0	0.0	8.1	3.0	3.8	4.3	8.3	16.5	16.5	3.0	30.4	21.0
Cycle Q Clear(g_c), s	20.0	0.0	8.1	3.0	3.8	4.3	8.3	16.5	16.5	3.0	30.4	21.0
Prop In Lane	1.00		1.00	1.00		0.98	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	591	0	507	97	97	87	816	1441	783	273	1737	627
V/C Ratio(X)	1.05	0.00	0.77	0.46	0.60	0.67	0.44	0.76	0.76	0.22	0.90	0.69
Avail Cap(c_a), veh/h	591	0	507	207	206	185	816	1441	783	273	1737	627
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	0.66	0.66	0.66	0.86	0.86	0.86
Uniform Delay (d), s/veh	50.0	0.0	36.7	55.0	55.4	55.7	26.2	6.4	6.4	36.2	17.3	13.6
Incr Delay (d2), s/veh	50.9	0.0	6.3	1.3	2.2	3.4	0.1	2.6	4.7	0.1	7.0	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.0	0.0	4.3	1.5	1.9	2.0	3.9	7.5	8.6	1.5	14.7	10.5
LnGrp Delay(d),s/veh	100.9	0.0	43.0	56.3	57.6	59.0	26.3	9.0	11.1	36.3	24.3	18.9
LnGrp LOS	F		D	E	E	E	C	A	B	D	C	B
Approach Vol, veh/h		1010			161			2051			2056	
Approach Delay, s/veh		78.6			57.8			12.6			23.5	
Approach LOS		E			E			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	22.5	57.0		13.5	32.5	47.0		27.0
Change Period (Y+Rc), s	4.0	6.0		7.0	4.0	6.0		7.0
Max Green Setting (Gmax), s	11.0	51.0		14.0	21.0	41.0		20.0
Max Q Clear Time (g_c+I1), s	5.0	18.5		6.3	10.3	32.4		22.0
Green Ext Time (p_c), s	0.2	2.6		0.3	0.2	2.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	30.9
HCM 2010 LOS	C

Notes

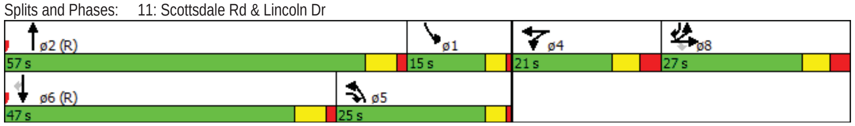
User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Two Way Analysis cannot be performed on Signalized Intersection.

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	WBTL	NBL	SBT	EBTL
Lead/Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	57	21	25	47	27
Maximum Split (%)	12.5%	47.5%	17.5%	20.8%	39.2%	22.5%
Minimum Split (s)	9	28	40	9	28	40
Yellow Time (s)	3	4.5	4	3	4.5	4
All-Red Time (s)	1	1.5	3	1	1.5	3
Minimum Initial (s)	5	20	5	5	20	8
Vehicle Extension (s)	1	0.2	2	1	0.2	2
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		15	26		15	26
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	27	90	42	17	90	63
End Time (s)	42	27	63	42	17	90
Yield/Force Off (s)	38	21	56	38	11	83
Yield/Force Off 170(s)	38	6	30	38	116	57
Local Start Time (s)	57	0	72	47	0	93
Local Yield (s)	68	51	86	68	41	113
Local Yield 170(s)	68	36	60	68	26	87

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 11: Scottsdale Rd & Lincoln Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	75		0	75		0	0		0	75		0
Storage Lanes	1		0	1		0	0		0	1		1
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.966			0.953				0.850
Flt Protected	0.950			0.950				0.983		0.950		
Satd. Flow (prot)	1770	1857	0	1770	1799	0	0	1745	0	1770	0	1583
Flt Permitted	0.950			0.950				0.983		0.950		
Satd. Flow (perm)	1770	1857	0	1770	1799	0	0	1745	0	1770	0	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		950			2680			459			2640	
Travel Time (s)		21.6			60.9			10.4			60.0	

Intersection Summary	
Area Type:	Other

Intersection	
Intersection Delay, s/veh	11.2
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	65	192	4	0	22	237	70	0	13	11	13
Future Vol, veh/h	0	65	192	4	0	22	237	70	0	13	11	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	71	209	4	0	24	258	76	0	14	12	14
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	10.5	12.6	9.8
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	35%	100%	0%	100%	0%	100%	0%
Vol Thru, %	30%	0%	98%	0%	77%	0%	10%
Vol Right, %	35%	0%	2%	0%	23%	0%	90%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	37	65	196	22	307	51	92
LT Vol	13	65	0	22	0	51	0
Through Vol	11	0	192	0	237	0	9
RT Vol	13	0	4	0	70	0	83
Lane Flow Rate	40	71	213	24	334	55	100
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.071	0.117	0.322	0.039	0.485	0.104	0.156
Departure Headway (Hd)	6.359	6.057	5.537	5.896	5.231	6.769	5.624
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	566	596	654	601	681	533	641
Service Time	4.364	3.757	3.237	3.695	3.029	4.471	3.326
HCM Lane V/C Ratio	0.071	0.119	0.326	0.04	0.49	0.103	0.156
HCM Control Delay	9.8	9.6	10.8	8.9	12.9	10.3	9.4
HCM Lane LOS	A	A	B	A	B	B	A
HCM 95th-tile Q	0.2	0.4	1.4	0.1	2.7	0.3	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	51	9	83
Future Vol, veh/h	0	51	9	83
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	55	10	90
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9.7
HCM LOS	A

Lane

Two Way Analysis cannot be performed on an All Way Stop Intersection.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	100		0	165		100	200		300	260		100
Storage Lanes	1		0	1		1	1		1	2		1
Taper Length (ft)	75			75			75			75		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	0.91	1.00	0.97	0.91	1.00
Ped Bike Factor												
Frt		0.978				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3461	0	1770	3539	1583	1770	5085	1583	3433	5085	1583
Flt Permitted	0.598			0.525			0.950			0.950		
Satd. Flow (perm)	1114	3461	0	978	3539	1583	1770	5085	1583	3433	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				141			243			109
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2680			809			883			2640	
Travel Time (s)		60.9			18.4			20.1			60.0	

Intersection Summary

Area Type: Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	203	35	227	205	183	35	1694	232	292	1504	90
Future Volume (veh/h)	77	203	35	227	205	183	35	1694	232	292	1504	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	84	221	38	247	223	199	38	1841	252	317	1635	98
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	278	298	50	260	328	505	402	2034	633	780	2034	633
Arrive On Green	0.11	0.10	0.10	0.10	0.09	0.09	0.23	0.40	0.40	0.30	0.53	0.53
Sat Flow, veh/h	1774	3029	513	1774	3539	1583	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	84	128	131	247	223	199	38	1841	252	317	1635	98
Grp Sat Flow(s),veh/h/ln	1774	1770	1772	1774	1770	1583	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	0.0	8.4	8.7	11.0	7.3	0.0	2.0	40.9	13.6	8.8	31.5	3.8
Cycle Q Clear(g_c), s	0.0	8.4	8.7	11.0	7.3	0.0	2.0	40.9	13.6	8.8	31.5	3.8
Prop In Lane	1.00		0.29	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	278	174	174	260	328	505	402	2034	633	780	2034	633
V/C Ratio(X)	0.30	0.73	0.75	0.95	0.68	0.39	0.09	0.91	0.40	0.41	0.80	0.15
Avail Cap(c_a), veh/h	278	354	354	260	708	675	402	2034	633	780	2034	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.48	0.48	0.48
Uniform Delay (d), s/veh	47.3	52.6	52.7	51.6	52.7	31.8	36.7	33.9	25.7	35.5	24.2	17.7
Incr Delay (d2), s/veh	0.6	5.9	6.4	41.9	2.5	0.5	0.1	7.2	1.9	0.2	1.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	4.4	4.5	11.1	3.7	5.2	1.0	20.5	6.3	4.2	14.9	1.7
LnGrp Delay(d),s/veh	47.9	58.4	59.1	93.5	55.2	32.3	36.8	41.1	27.6	35.7	25.9	18.0
LnGrp LOS	D	E	E	F	E	C	D	D	C	D	C	B
Approach Vol, veh/h		343			669			2131			2050	
Approach Delay, s/veh		56.1			62.5			39.4			27.1	
Approach LOS		E			E			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.2	54.0	16.0	18.8	31.2	54.0	16.7	18.1
Change Period (Y+Rc), s	4.0	6.0	* 4	7.0	4.0	6.0	* 4	7.0
Max Green Setting (Gmax), s	15.0	48.0	* 12	24.0	15.0	48.0	* 12	24.0
Max Q Clear Time (g_c+I1), s	10.8	42.9	13.0	10.7	4.0	33.5	2.0	9.3
Green Ext Time (p_c), s	0.5	4.5	0.0	1.2	0.9	10.0	0.7	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	38.6
HCM 2010 LOS	D

Notes

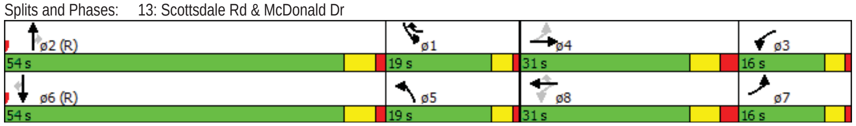
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Two Way Analysis cannot be performed on Signalized Intersection.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	19	54	16	31	19	54	16	31
Maximum Split (%)	15.8%	45.0%	13.3%	25.8%	15.8%	45.0%	13.3%	25.8%
Minimum Split (s)	14	31	10	37	14	31	10	37
Yellow Time (s)	3	4.5	3	4.3	3	4.5	3	4.3
All-Red Time (s)	1	1.5	1	2.7	1	1.5	1	2.7
Minimum Initial (s)	10	20	6	8	10	20	6	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	1	0.2	1	2	1	0.2	1	2
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		9		6		9		6
Flash Dont Walk (s)		16		24		16		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	30	14	103	84	30	14	103
End Time (s)	103	84	30	14	103	84	30	14
Yield/Force Off (s)	99	78	26	7	99	78	26	7
Yield/Force Off 170(s)	99	62	26	103	99	62	26	103
Local Start Time (s)	54	0	104	73	54	0	104	73
Local Yield (s)	69	48	116	97	69	48	116	97
Local Yield 170(s)	69	32	116	73	69	32	116	73

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 30 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 13: Scottsdale Rd & McDonald Dr



APPENDIX E

TRIP GENERATION CALCULATIONS

Ritz Carlton Resort

Traffic Impact Analysis

Proposed

Trip Generation

Land Use	ITE LUC	ITE Land Use Name	Quantity	Units	AM Distribution In	AM Distribution Out	PM Distribution In	PM Distribution Out
Parcel A								
Resort Hotel	330	Resort Hotel	200	Rooms	72%	28%	43%	57%
Parcel A1								
Resort Hotel	330	Resort Hotel	120	Rooms	72%	28%	43%	57%
Parcel B								
Homes	210	Single-Family Detached Housing	89	Dwelling Units	25%	75%	63%	37%
Parcel C								
Homes	210	Single-Family Detached Housing	55	Dwelling Units	25%	75%	63%	37%
Parcel D								
Residential Condominium/ Townhouse	230	Residential Condominium/Townhouse	100	Dwelling Units	17%	83%	67%	33%
Parcel E								
Residential Condominium/ Townhouse	230	Residential Condominium/Townhouse	200	Dwelling Units	17%	83%	67%	33%
Shopping Center	820	Shopping Center	85.000	KSF	62%	38%	48%	52%
Grocery store/Supermarket	850	Supermarket	10.000	KSF	62%	38%	51%	49%
Quality Restaurant	931	Quality Restaurant	12.000	KSF	75%	25%	67%	33%
General Office Building	710	General Office Building	44.000	KSF	88%	12%	17%	83%

Land Use	ADT Avg Rate	ADT Total	AM Peak Hour Avg Rate	AM In	AM Out	AM Total	PM Peak Hour Avg Rate	PM In	PM Out	PM Total
Parcel A										
Resort Hotel	5.00	1,000	0.60	87	34	121	0.42	36	48	84
Parcel A1										
Resort Hotel	5.00	600	0.74	64	25	89	0.42	22	29	51
Parcel B										
Homes	10.60	944	0.81	18	55	73	1.06	60	35	95
Parcel C										
Homes	11.02	606	0.88	12	37	49	1.12	39	23	62
Parcel D										
Residential Condominium/ Townhouse	6.43	644	0.52	9	43	52	0.60	41	20	61
Parcel E										
Residential Condominium/ Townhouse	5.88	1,176	0.45	15	75	90	0.53	72	35	107
Shopping Center	71.89	6,112	1.66	88	54	142	6.32	258	280	538
Grocery store/Supermarket	206.11	2,062	3.40	21	13	34	14.84	76	73	149
Quality Restaurant	89.95	1,080	0.81	8	2	10	7.49	60	30	90
General Office Building	11.03	486	1.56	61	8	69	1.49	11	55	66
TOTALS		**14,710**		**383**	**346**	**729**		**675**	**628**	**1,303**

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<u>Notes</u> : 1. *This trip generation calculation is provided for the entire development without applied volume reductions taken as part of this study. If applicable, trips net of interaction and pass-by trips are shown below.*

		Daily		AM Peak Hour				PM Peak Hour			
		Percentage	Trips	Percentage	In	Out	Total	Percentage	In	Out	Total
Interaction/Internal Capture	Factor		20%	20%				20%			
	Differences		2,942		77	69	146		135	126	261
	Net Trips		11,768		306	277	583		540	502	1,042

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Land Use	ITE LUC	ITE Land Use Name	Quantity	Units	AM Distribution In	AM Distribution Out	PM Distribution In	PM Distribution Out
Parcel A								
Resort Hotel	330	Resort Hotel	200	Rooms	72%	28%	43%	57%
Parcel A1								
Resort Hotel	330	Resort Hotel	120	Rooms	72%	28%	43%	57%
Parcel B								
Homes	210	Single-Family Detached Housing	89	Dwelling Units	25%	75%	63%	37%
Parcel C								
Homes	210	Single-Family Detached Housing	55	Dwelling Units	25%	75%	63%	37%
Parcel D								
Residential Condominium/ Townhouse	230	Residential Condominium/Townhouse	100	Dwelling Units	17%	83%	67%	33%
Parcel E								

Land Use	ADT Avg Rate	ADT Total	AM Peak Hour Avg Rate	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour Avg Rate	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total
Parcel A										
Resort Hotel	5.00	1,000	0.60	87	34	121	0.42	36	48	84
Parcel A1										
Resort Hotel	5.00	600	0.74	64	25	89	0.42	22	29	51
Parcel B										
Homes	10.60	944	0.81	18	55	73	1.06	60	35	95
Parcel C										
Homes	11.02	606	0.88	12	37	49	1.12	39	23	62
Parcel D										
Residential Condominium/ Townhouse	6.43	644	0.52	9	43	52	0.60	41	20	61
Parcel E										
TOTALS		**3,794**		**190**	**194**	**384**		**198**	**155**	**353**

Ritz Carlton Resort

Traffic Impact Analysis

Proposed

Trip Generation

Notes: *1. This trip generation calculation is provided for the entire development without applied volume reductions taken as part of this study. If applicable, trips net of interaction and pass-by trips are shown below.*

	Daily		AM Peak Hour				PM Peak Hour			
	Percentage	Trips	Percentage	In	Out	Total	Percentage	In	Out	Total
Interaction/Internal Capture	Factor									
	Differences									
	Net Trips	3,794		190	194	384		198	155	353

ITE MULTI-USE PROJECT INTERNAL CAPTURE WORKSHEET

(Source: Chapter 7, ITE *Trip Generation Handbook, Second Edition*, June 2004)

Analyst: Ruth Gutierrez
Date: 8/7/2015

Analysis Period:
Midday ______ PM ______ Daily X

Land Use A: Office

ITE LUC: 710
Size: 44 KSF

	Total	Internal	External
Enter	243	36	207
Exit	243	63	180
Total	486	99	387
%	100%	20%	80%

Enter from External: 207
Exit to External: 180

A to B: Demand 2% 5; Balanced 5
B to A: Demand 3% 24
A to C: Demand 22% 53; Balanced 53
C to A: Demand 4% 185
A to D: Demand; Balanced; Demand

<- Demand -> (B–D): Balanced; 2% 5; Balanced 5
D: Demand 3% 51

Land Use B: Residential

Land Use: 330
Size: 320 Units

	Total	Internal	External
Enter	800	269	531
Exit	800	304	496
Total	1,600	573	1,027
%	100%	36%	64%

Enter from External: 531
Exit to External: 496

Demand; Demand; Balanced; Demand

Land Use D: Residential

ITE LUC: 210, 230
Size: 444 DU

	Total	Internal	External
Enter	1,685	514	1,171
Exit	1,685	416	1,269
Total	3,370	930	2,440
%	100%	28%	72%

1,171 Enter from External:
1,269 Exit to External:

Demand; Balanced; Demand

B: 33% 264 Demand; 264 Balanced; 11% 509
<- Demand ->
D: Demand 38% 640; Balanced 416; 9% 416

C to A: 15% 36 Demand; 36 Balanced; 3% 139 Demand

B to C: Demand 38% 304; Balanced 304; Demand 9% 416

D to C: 33% 556 Demand; 509 Balanced; 11% 509 Demand

Land Use C: Retail

ITE LUC: 820, 850, 931
Size: 107 KSF

	Total	Internal	External
Enter	4,627	773	3,854
Exit	4,627	809	3,818
Total	9,254	1,582	7,672
%	100%	17%	83%

3,854 Enter from External:
3,818 Exit to External:

NET EXTERNAL TRIPS FOR MULTI-USE DEVELOPMENT

Category	Land Use A Office	Land Use B Residen	Land Use C Retail	Land Use D Residen	Total
Enter	207	531	3,818	1,171	5,727
Exit	180	496	3,854	1,269	5,799
Total	387	1,027	7,672	2,440	11,526
Single Use Trip Gen Estima	486	1,600	9,254	3,370	14,710

Internal Capture: 21.65%

Print Date = 08/11/15
Print Time = 10:51 AM

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APPENDIX F

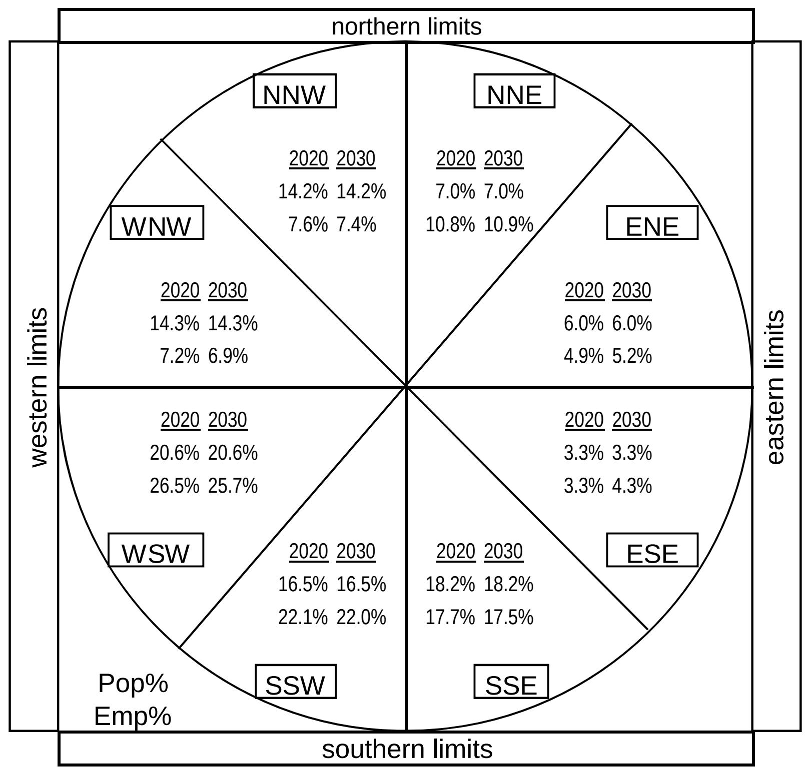
TRIP DISTRIBUTION CALCULATIONS

Ritz-Carlton **Trip Distribution - Summaries**

	2020				2030			
Quadrant	**Population**	**Percent**	**Employment**	**Percent**	**Population**	**Percent**	**Employment**	**Percent**
North Northwest	151,760	14.2%	68,119	7.6%	151,760	14.2%	73,664	7.4%
North Northeast	74,408	7.0%	96,569	10.8%	74,408	7.0%	107,701	10.9%
North	226,168	21.2%	164,688	18.4%	226,168	**21.2%**	181,365	**18.3%**
East Northeast	63,704	6.0%	43,636	4.9%	63,704	6.0%	51,788	5.2%
East Southeast	34,942	3.3%	29,525	3.3%	34,942	3.3%	42,449	4.3%
East	98,646	9.3%	73,161	8.2%	98,646	**9.3%**	94,237	**9.5%**
South Southeast	194,635	18.2%	158,456	17.7%	194,635	18.2%	173,613	17.5%
South Southwest	176,374	16.5%	198,590	22.1%	176,374	16.5%	218,249	22.0%
South	371,009	34.7%	357,046	39.8%	371,009	**34.7%**	391,863	**39.6%**
West Southwest	219,912	20.6%	237,714	26.5%	219,912	20.6%	254,589	25.7%
West Northwest	153,121	14.3%	64,519	7.2%	153,121	14.3%	68,093	6.9%
West	373,033	34.9%	302,234	33.7%	373,033	**34.9%**	322,682	**32.6%**
Totals	1,068,855	100.1%	897,128	100.1%	1,068,855	100.1%	990,147	100.0%

Radii

Population (Applied to Office Trips): 10-mile
Employment (Applied to Residential): 10-mile



10-mile

RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted
NNW							**NNE**						
226	PH	72,964	72,964	15%	10,945	10,945	228	PH	43,702	43,702	10%	4,370	4,370
227	PH	66,288	66,288	50%	33,144	33,144	230	SC	35,670	35,670	60%	21,402	21,402
228	PH	43,702	43,702	45%	19,666	19,666	246	PH	61,815	61,815	5%	3,091	3,091
242	PH	30,883	30,883	15%	4,632	4,632	247	SC	14,007	14,007	95%	13,307	13,307
245	PH	59,725	59,725	35%	20,904	20,904	248	SC	41,120	41,120	50%	20,560	20,560
246	PH	61,815	61,815	95%	58,724	58,724	262	PA	15,224	15,224	5%	761	761
247	SC	14,007	14,007	5%	700	700	263	SC	36,390	36,390	30%	10,917	10,917
262	PA	15,224	15,224	20%	3,045	3,045		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
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	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
From North					151,760	151,760						74,408	74,408
												226,168	226,168

Ritz-Carlton

10-mile

RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted
ENE							**ESE**						
230	SC	35,670	35,670	20%	7,134	7,134	263	SC	36,390	36,390	30%	10,917	10,917
248	SC	41,120	41,120	50%	20,560	20,560	264	SA	7,308	7,308	50%	3,654	3,654
249	SC	26,257	26,257	90%	23,631	23,631	290	ME	90,250	90,250	10%	9,025	9,025
263	SC	36,390	36,390	30%	10,917	10,917	291	ME	56,729	56,729	20%	11,346	11,346
264	SA	7,308	7,308	20%	1,462	1,462		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
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	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	From East				63,704	63,704						34,942	34,942
												98,646	98,646

Ritz-Carlton **Trip Distribution - Pop from South**

10-mile

RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted
SSE							**SSW**						
262	PA	15,224	15,224	5%	761	761	262	PA	15,224	15,224	10%	1,522	1,522
263	SC	36,390	36,390	10%	3,639	3,639	271	PH	65,950	65,950	35%	23,083	23,083
264	SA	7,308	7,308	30%	2,192	2,192	272	SC	72,196	72,196	15%	10,829	10,829
272	SC	72,196	72,196	85%	61,367	61,367	276	PH	54,236	54,236	80%	43,389	43,389
288	TE	80,881	80,881	50%	40,441	40,441	286	PH	24,040	24,040	5%	1,202	1,202
289	ME	72,270	72,270	70%	50,589	50,589	287	PH	35,438	35,438	80%	28,350	28,350
290	ME	90,250	90,250	25%	22,563	22,563	288	TE	80,881	80,881	50%	40,441	40,441
297	TE	52,336	52,336	25%	13,084	13,084	296	PH	48,246	48,246	30%	14,474	14,474
	-	-	-		-	-	297	TE	52,336	52,336	25%	13,084	13,084
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	-	-	-		-	-		-	-	-		-	-
From South					194,635	194,635						176,374	176,374
												371,009	371,009

Ritz-Carlton **Trip Distribution - Pop from West**

10-mile

RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted
WSW							**WNW**						
260	PH	61,089	61,089	60%	36,653	36,653	242	PH	30,883	30,883	50%	15,442	15,442
261	PH	33,390	33,390	55%	18,365	18,365	243	PH	72,963	72,963	5%	3,648	3,648
262	PA	15,224	15,224	30%	4,567	4,567	244	PH	60,306	60,306	95%	57,291	57,291
270	PH	89,683	89,683	80%	71,746	71,746	245	PH	59,725	59,725	65%	38,821	38,821
271	PH	65,950	65,950	65%	42,868	42,868	260	PH	61,089	61,089	30%	18,327	18,327
275	PH	60,239	60,239	50%	30,120	30,120	261	PH	33,390	33,390	45%	15,026	15,026
276	PH	54,236	54,236	20%	10,847	10,847	262	PA	15,224	15,224	30%	4,567	4,567
286	PH	24,040	24,040	5%	1,202	1,202		-	-	-		-	-
287	PH	35,438	35,438	10%	3,544	3,544		-	-	-		-	-
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	From West				219,912	219,912						153,121	153,121
												373,033	373,033

10-mile

RAZ	MPA	2020 Em-ployment	2030 Em-ployment	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Em-ployment	2030 Em-ployment	% of TAZ	2020 Adjusted	2030 Adjusted
NNW							**NNE**						
226	PH	22,773	23,681	15%	3,416	3,552	228	PH	33,621	42,763	10%	3,362	4,276
227	PH	16,077	18,036	50%	8,039	9,018	230	SC	36,850	49,197	60%	22,110	29,518
228	PH	33,621	42,763	45%	15,129	19,243	246	PH	31,742	31,757	5%	1,587	1,588
242	PH	9,341	9,284	15%	1,401	1,393	247	SC	48,204	50,778	95%	45,794	48,239
245	PH	17,221	17,152	35%	6,027	6,003	248	SC	27,822	28,456	50%	13,911	14,228
246	PH	31,742	31,757	95%	30,155	30,169	262	PA	7,707	8,734	5%	385	437
247	SC	48,204	50,778	5%	2,410	2,539	263	SC	31,399	31,383	30%	9,420	9,415
262	PA	7,707	8,734	20%	1,541	1,747		-	-	-		-	-
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From North					68,119	73,664						96,569	107,701
												164,688	181,365

10-mile

RAZ	MPA	2020 Em-ployment	2030 Em-ployment	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Em-ployment	2030 Em-ployment	% of TAZ	2020 Adjusted	2030 Adjusted
ENE							**ESE**						
230	SC	36,850	49,197	20%	7,370	9,839	263	SC	31,399	31,383	30%	9,420	9,415
248	SC	27,822	28,456	50%	13,911	14,228	264	SA	25,587	49,905	50%	12,794	24,953
249	SC	8,687	9,250	90%	7,818	8,325	290	ME	38,852	39,199	10%	3,885	3,920
263	SC	31,399	31,383	30%	9,420	9,415	291	ME	17,131	20,806	20%	3,426	4,161
264	SA	25,587	49,905	20%	5,117	9,981		-	-	-		-	-
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	From East				43,636	51,788						29,525	42,449
												73,161	94,237

10-mile

RAZ	MPA	2020 Em-ployment	2030 Em-ployment	% of TAZ	2020 Adjusted	2030 Adjusted
SSE						
262	PA	7,707	8,734	5%	385	437
263	SC	31,399	31,383	10%	3,140	3,138
264	SA	25,587	49,905	30%	7,676	14,972
272	SC	56,988	56,913	85%	48,440	48,376
288	TE	105,832	120,280	50%	52,916	60,140
289	ME	32,873	33,713	70%	23,011	23,599
290	ME	38,852	39,199	25%	9,713	9,800
297	TE	52,700	52,608	25%	13,175	13,152
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From South					158,456	173,613

RAZ	MPA	2020 Em-ployment	2030 Em-ployment	% of TAZ	2020 Adjusted	2030 Adjusted
SSW						
262	PA	7,707	8,734	10%	771	873
271	PH	50,862	50,850	35%	17,802	17,798
272	SC	56,988	56,913	15%	8,548	8,537
276	PH	26,422	27,288	80%	21,138	21,830
286	PH	21,000	21,455	5%	1,050	1,073
287	PH	82,722	96,393	80%	66,178	77,114
288	TE	105,832	120,280	50%	52,916	60,140
296	PH	56,709	59,106	30%	17,013	17,732
297	TE	52,700	52,608	25%	13,175	13,152
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					198,590	218,249
					357,046	391,863

CivTech

Ritz-Carlton **Trip Distribution - Emp from West**

10-mile

RAZ	MPA	2020 Em-ployment	2030 Em-ployment	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Em-ployment	2030 Em-ployment	% of TAZ	2020 Adjusted	2030 Adjusted
WSW							**WNW**						
260	PH	39,927	48,280	60%	23,956	28,968	242	PH	9,341	9,284	50%	4,671	4,642
261	PH	35,618	35,610	55%	19,590	19,586	243	PH	52,268	71,341	5%	2,613	3,567
262	PA	7,707	8,734	30%	2,312	2,620	244	PH	16,551	16,428	95%	15,723	15,607
270	PH	107,042	117,712	80%	85,634	94,170	245	PH	17,221	17,152	65%	11,194	11,149
271	PH	50,862	50,850	65%	33,060	33,053	260	PH	39,927	48,280	30%	11,978	14,484
275	PH	117,111	120,047	50%	58,556	60,024	261	PH	35,618	35,610	45%	16,028	16,025
276	PH	26,422	27,288	20%	5,284	5,458	262	PA	7,707	8,734	30%	2,312	2,620
286	PH	21,000	21,455	5%	1,050	1,073		-	-	-		-	-
287	PH	82,722	96,393	10%	8,272	9,639		-	-	-		-	-
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From West					237,714	254,589						64,519	68,093
												302,234	322,682

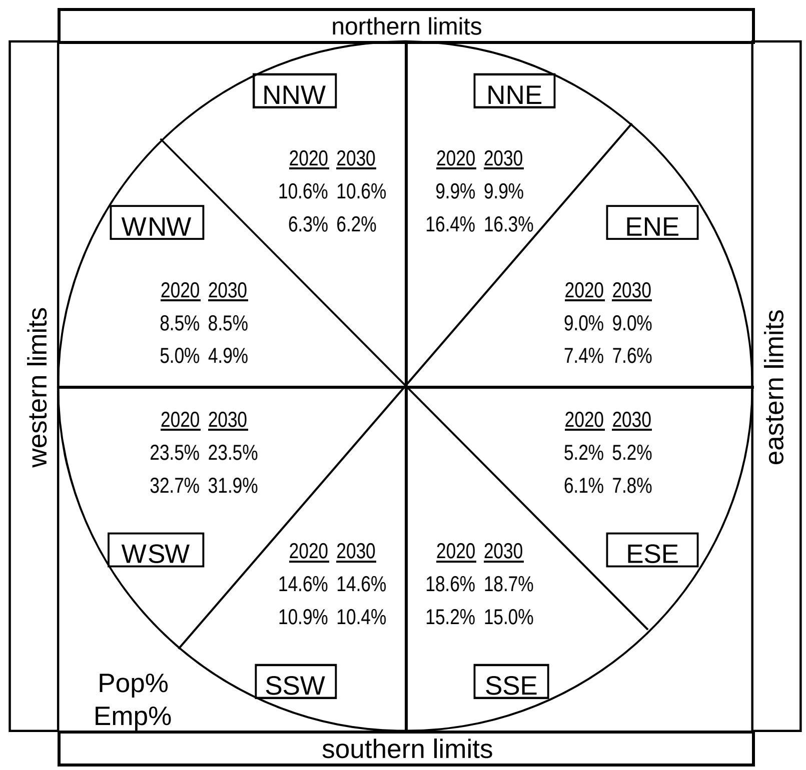
Ritz-Carlton

Trip Distribution - Summaries

	2020				2030			
Quadrant	Population	Percent	Employment	Percent	Population	Percent	Employment	Percent
North Northwest	25,380	10.6%	15,061	6.3%	25,380	10.6%	15,401	6.2%
North Northeast	23,494	9.9%	39,099	16.4%	23,494	9.9%	40,625	16.3%
North	48,874	20.5%	54,161	22.7%	48,874	**20.5%**	56,026	**22.4%**
East Northeast	21,562	9.0%	17,655	7.4%	21,562	9.0%	19,024	7.6%
East Southeast	12,379	5.2%	14,537	6.1%	12,379	5.2%	19,396	7.8%
East	33,941	14.2%	32,192	13.5%	33,941	**14.2%**	38,420	**15.4%**
South Southeast	44,473	18.6%	36,148	15.2%	44,473	18.7%	37,372	15.0%
South Southwest	34,849	14.6%	25,899	10.9%	34,849	14.6%	26,030	10.4%
South	79,322	33.2%	62,047	26.1%	79,322	**33.3%**	63,402	**25.4%**
West Southwest	56,141	23.5%	77,907	32.7%	56,141	23.5%	79,679	31.9%
West Northwest	20,204	8.5%	12,019	5.0%	20,204	8.5%	12,315	4.9%
West	76,345	32.0%	89,926	37.7%	76,345	**32.0%**	91,994	**36.8%**
Totals	238,483	99.9%	238,325	100.0%	238,483	100.0%	249,842	100.0%

Radii

Population (Applied to Retail Trips): 5-mile
Employment (Not Used): 5-mile



Ritz-Carlton

Trip Distribution - Pop from North

5-mile

RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted
NNW							**NNE**						
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-	247	SC	14,007	14,007	55%	7,704	7,704
	-	-	-		-	-	248	SC	41,120	41,120	10%	4,112	4,112
246	PH	61,815	61,815	35%	21,635	21,635	262	PA	15,224	15,224	5%	761	761
247	SC	14,007	14,007	5%	700	700	263	SC	36,390	36,390	30%	10,917	10,917
262	PA	15,224	15,224	20%	3,045	3,045		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
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From North					25,380	25,380						23,494	23,494
												48,874	48,874

5-mile

RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted
ENE							**ESE**						
	-	-	-		-	-	263	SC	36,390	36,390	30%	10,917	10,917
248	SC	41,120	41,120	25%	10,280	10,280	264	SA	7,308	7,308	20%	1,462	1,462
	-	-	-	90%	-	-		-	-	-		-	-
263	SC	36,390	36,390	30%	10,917	10,917		-	-	-		-	-
264	SA	7,308	7,308	5%	365	365		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
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	From East				21,562	21,562						12,379	12,379
												33,941	33,941

5-mile

RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted
SSE							**SSW**						
262	PA	15,224	15,224	5%	761	761	262	PA	15,224	15,224	10%	1,522	1,522
263	SC	36,390	36,390	10%	3,639	3,639	271	PH	65,950	65,950	30%	19,785	19,785
264	SA	7,308	7,308	5%	365	365	272	SC	72,196	72,196	15%	10,829	10,829
272	SC	72,196	72,196	55%	39,708	39,708	276	PH	54,236	54,236	5%	2,712	2,712
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	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
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	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
From South					44,473	44,473						34,849	34,849
												79,322	79,322

5-mile

RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted
WSW							**WNW**						
	-	-	-		-	-		-	-	-		-	-
261	PH	33,390	33,390	5%	1,670	1,670		-	-	-		-	-
262	PA	15,224	15,224	30%	4,567	4,567		-	-	-		-	-
	-	-	-		-	-	245	PH	59,725	59,725	15%	8,959	8,959
271	PH	65,950	65,950	30%	19,785	19,785		-	-	-		-	-
275	PH	60,239	60,239	50%	30,120	30,120	261	PH	33,390	33,390	20%	6,678	6,678
	-	-	-		-	-	262	PA	15,224	15,224	30%	4,567	4,567
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
	-	-	-		-	-		-	-	-		-	-
From West					56,141	56,141						20,204	20,204
												76,345	76,345

APPENDIX G

BACKGROUND TRAFFIC CALCULATIONS AND EXCERPTS FROM BACKGROUND DEVELOPMENTS

Mountain Shadows Resort

Crown Realty and Development

CivTech

MOUNTAIN SHADOWS RESORT
TRAFFIC IMPACT ANALYSIS
Submittal for June 26, 2007 Site Plan

Portion of Southeast Section 8, and Southwest Section 9
Township 2 North, Range 4 East

Prepared for:
Crown Realty and Development
18201 Von Karman Avenue
Suite 950
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(949) 476-2200

By:

CivTech, Inc.
8590 East Shea Boulevard
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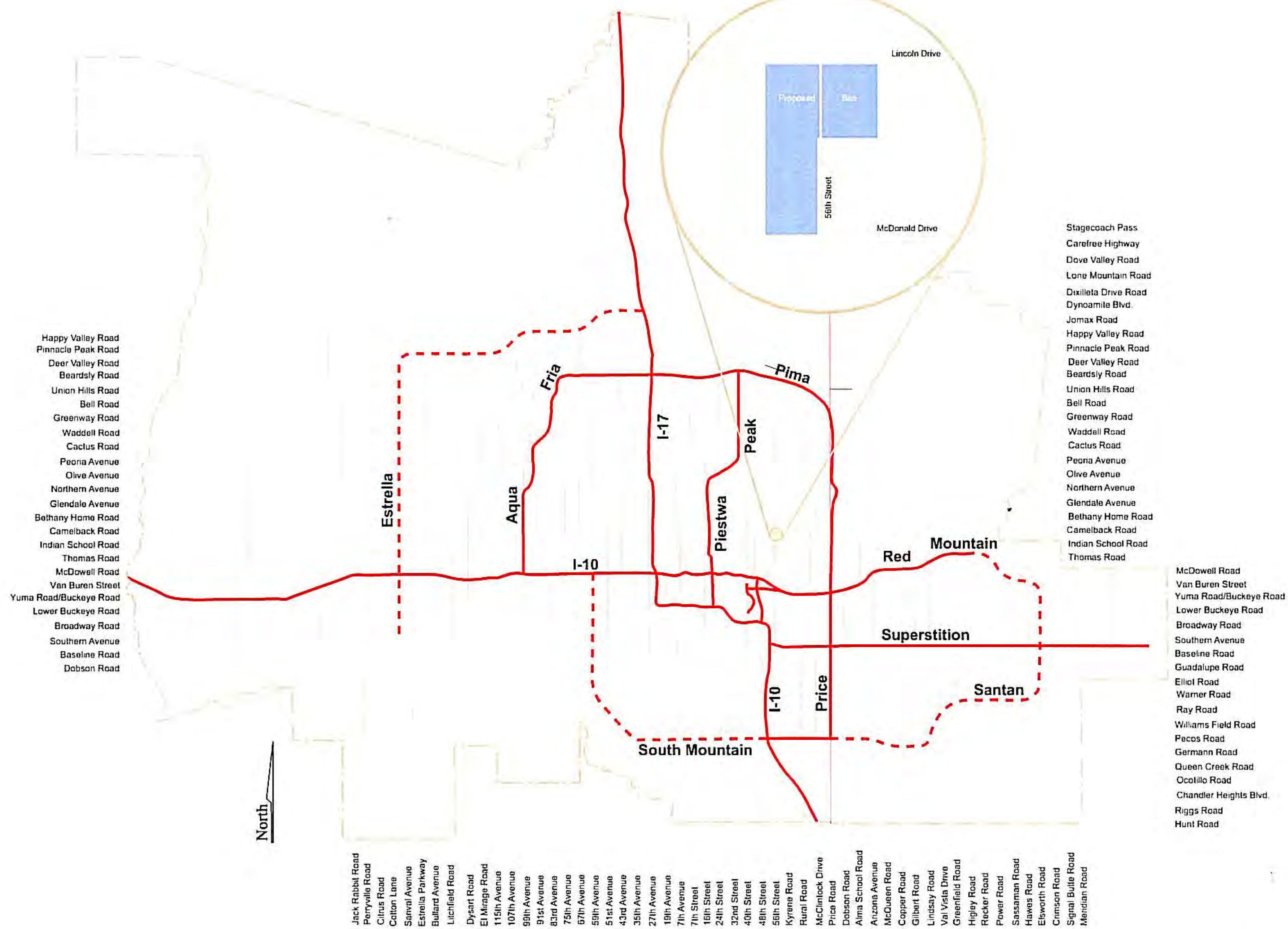
Scottsdale, Arizona 85260
(480) 659-4250

Registered Professional Engineer (Civil)
CERTIFICATE NO.
35879
DAWN D.
CARTIER
Date Signed 8/8/07
ARIZONA, U.S.A.

August 2007
CivTech Project No. 05-380



Mountain Shadows

Figure 1:
Location Map

CivTech

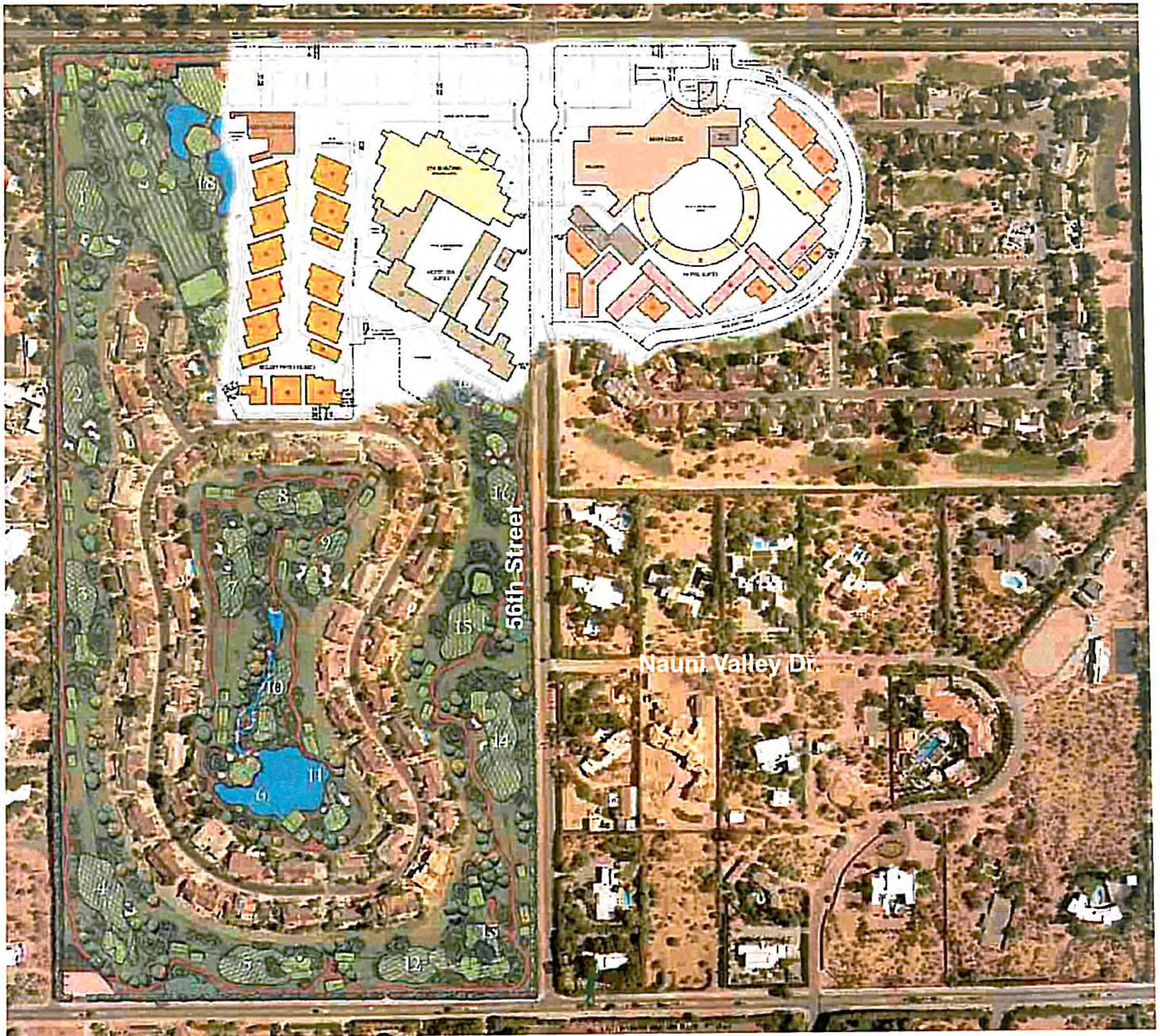


Figure 4:
Site Plan

Mountain Shadows

CivTech

TRIP GENERATION

The average daily traffic (ADT), AM peak hour and PM peak hour volumes have been estimated by trip rates given in the Institute of Transportation Engineers (ITE) *Trip Generation, 7th Edition.* Table 2 shows the trip generation established for this redevelopment. Detailed trip generation calculations for both the existing and planned redevelopment have been included in Appendix D. Average trip rates from ITE's *Trip Generation* were used in the calculation of site generated traffic.

To obtain a conservative estimate of the number of external trips generated by the site, interaction between the uses at the site was not considered.

Table 2 – Trip Generation

Proposed Use	ITE LUC	Land Use	Units	Total	AM Distribution In	AM Distribution Out	PM Distribution In	PM Distribution Out
East Side of 56th St	330	Resort Hotel	Rooms	200	72%	28%	43%	57%
West Side of 56th St								
Hotel Spa Suites	330	Resort Hotel	Rooms	120	72%	28%	43%	57%
Resort Patio Homes	233	Attached Residential	Dwelling Units	26	23%	77%	63%	37%

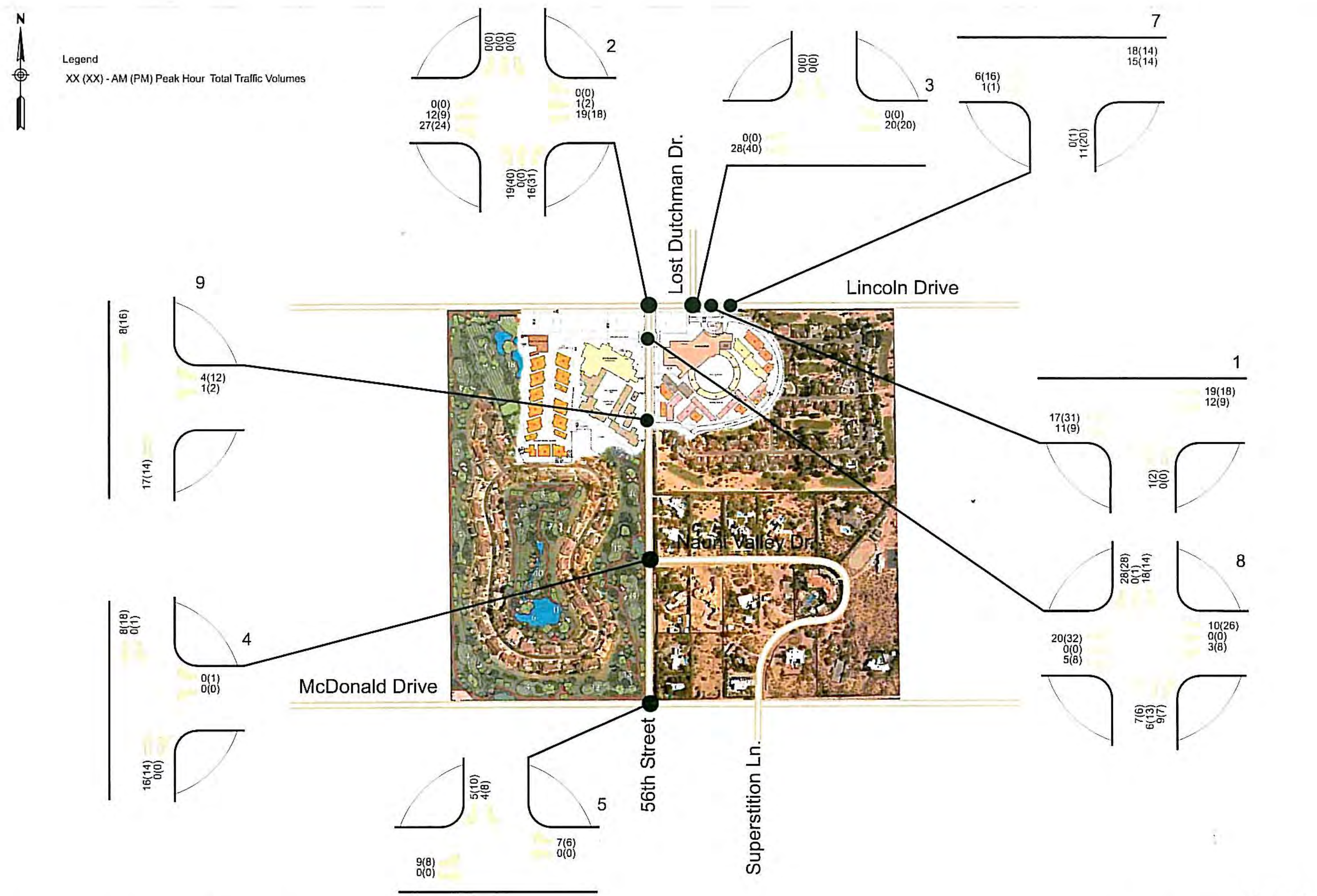
Proposed Use	ADT Avg Rate	ADT Total	AM Peak Hour Avg Rate	AM Peak Hour Total	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour Avg Rate	PM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out
East Side of 56th St	6.24[1]	1,248	0.37	74	53	21	0.49	98	42	56
West Side of 56th St										
Hotel Spa Suites	6.24[1]	750	0.37	45	32	13	0.49	59	24	34
Resort Patio Homes	5.86[2]	154	0.56	15	3	12	0.55	15	9	6
TOTALS		2,152		134	88	46		172	76	96

<u>Notes:</u> *1. In the absence of a published rate, this trip generation rate was taken from "All Suites Hotel" (LUC 311), a use considered in Trip Generation as related to a "Resort Hotel".*

2. In the absence of a published rate, this trip generation rate was taken from "Residential Condominiums/Townhouses" (LUC 230) since these will be privately-owned units.

The resort patio homes have been studied herein as a residential land use, Luxury Condominium/Townhouse (ITE Land Use Code 233), with the daily rate taken from Residential Condominium/Townhouse (ITE LUC 230).

The hotel spa suites on the west side of 56th Street will be 90 units with a total of 120 keys. Although they will be privately-owned, they will be made available for rental through the hotel. Thus, for the purposes of this analysis, they are considered as being included in the hotel rental pool and are treated as 120 individual resort hotel rooms. This is a conservative approach as the multiple-key units will often operate as single-key units. Since there is no published ITE daily trip generation rate for a Resort Hotel, the daily trip generation rate for an "All Suites Hotel" (ITE LUC 311) was used. This rate was updated in the most recent version of the Trip Generation manual and varies from the value used in previous versions of this study.



Mountain Shadows

Figure 6:
Buildout Site Generated Traffic

CivTech

Palmeraie

Traffic
Impact
and
Mitigation
Analysis

SWC Scottsdale Road and Indian Bend
Scottsdale, Arizona

April 2009
Project No. 07-180B

Prepared For:
City of Scottsdale
7900 East Indian School Road
Scottsdale, Arizona
(480) 312-7696

Prepared By:
CivTech

10605 North Hayden Road
Suite 140
Scottsdale, Arizona 85260
480-659-4250

PALMERAIE
TRAFFIC IMPACT AND MITIGATION ANALYSIS

1048-PA-2008

SWC Scottsdale Road and Indian Bend Road
Scottsdale, Arizona

Prepared for:

City of Scottsdale
7900 East Indian School Road
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CITY OF SCOTTSDALE

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Registered Professional Engineer (Civil)
CERTIFICATE NO. 16255
JOSEPH F. SPADAFINO
Date Signed 4-20-09
ARIZONA, U.S.A.
Expires 6/30/2010

Joseph F. Spadafino

Prepared: February 2009
Updated: April 2009
CivTech Project No. 07-180B

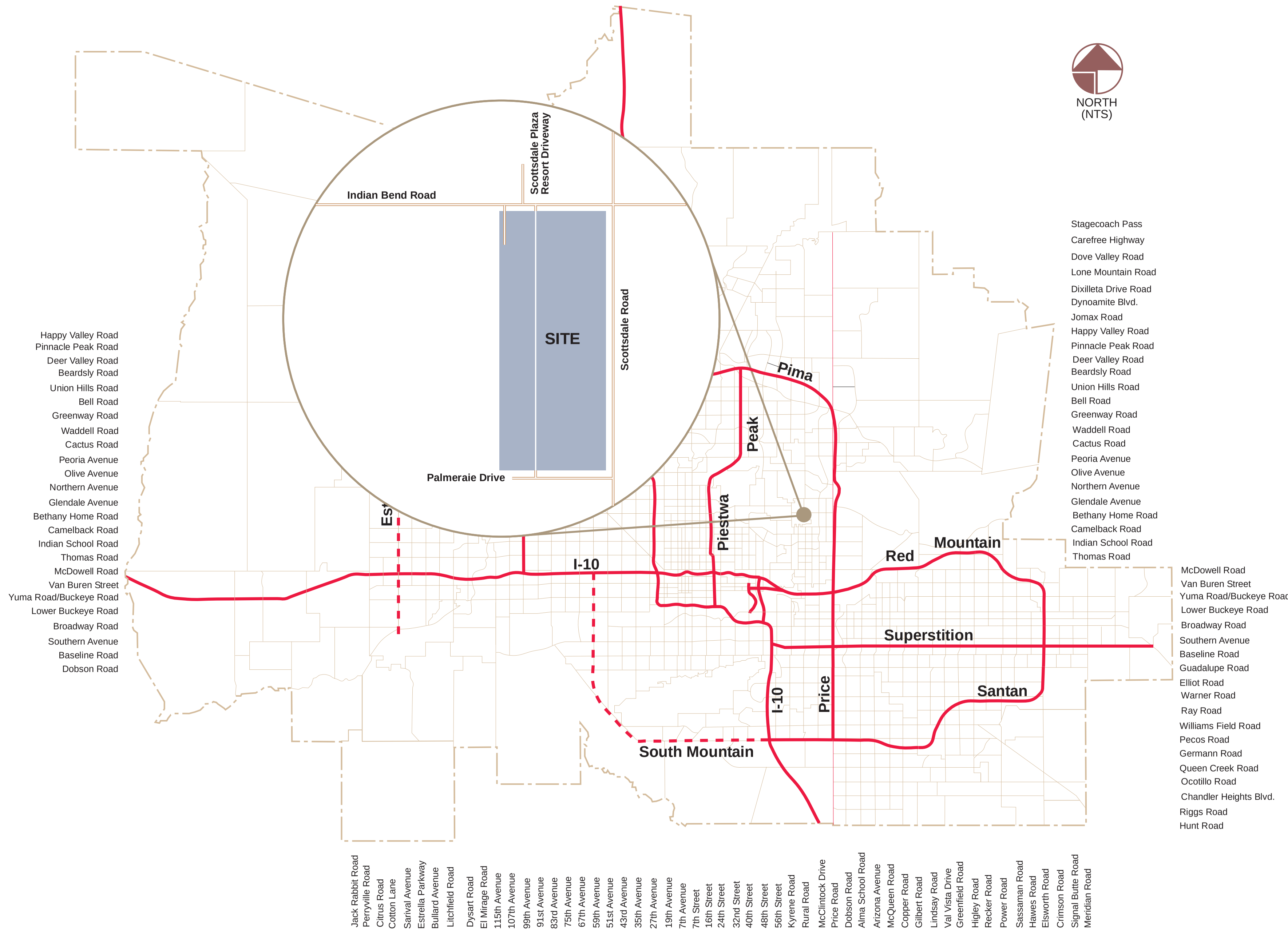


Figure 1: Vicinity Map

PROPOSED DEVELOPMENT

LOCATION AND ACCESS

The proposed development site is located on the southwest corner of Scottsdale Road and Indian Bend Road. With reference to **Figure 4**, three driveways will provide direct access to and from the site. In the northwest corner of the site, there will be a full-access (i.e., no movements restricted) service driveway to Indian Bend Road. The second driveway is a full access driveway at Indian Bend Road, from which a main drive will run the length of the site south to 6750 North, dividing the residential and hotel uses from the retail uses. The third driveway is along 6750 North and will be located between two driveways approaching 6750 North from the south. This driveway is considered an internal driveway because 6750 North is privately owned; therefore, the level of service is not considered at issue in this analysis.

- Access A will be the eastern of the two proposed driveways for Indian Bend Road. It will be a full access driveway approximately 475 feet (on center) west of Scottsdale Road. This driveway will provide two outbound lanes for separate left- and right-turn lanes.
- Access B will be the western of the two proposed driveways for Indian Bend Road. It will be a truck entrance configured to provide full access without restriction, although truck drivers will be directed to enter from and exit to Scottsdale Road and the movements thus limited to left in and right out. It will provide be located approximately 180 feet west of Access A and 45 feet west of the Scottsdale Plaza Resort Driveway. Access B will provide one inbound and one outbound lane at Indian Bend Road.

PROPOSED LAND USE AND INTENSITY

Subject to the approval of a request to rezone the property from its current R-4R, Resort Residential, zoning to PRC, the subject property will be allowed to develop into approximately 300,000 square feet of retail and restaurant land uses, a 175 room hotel, and 235 resort/hotel condominium dwelling units. The site plan is shown in **Figure 4**.

Build-out of the retail component is expected to be reached by the end of 2010, the first analysis year, with full build-out of the project by the second analysis year, 2015. To ensure that the estimate of traffic impacts is conservatively calculated, it will be assumed that the development will attract 100 percent of its trips upon opening in 2010.

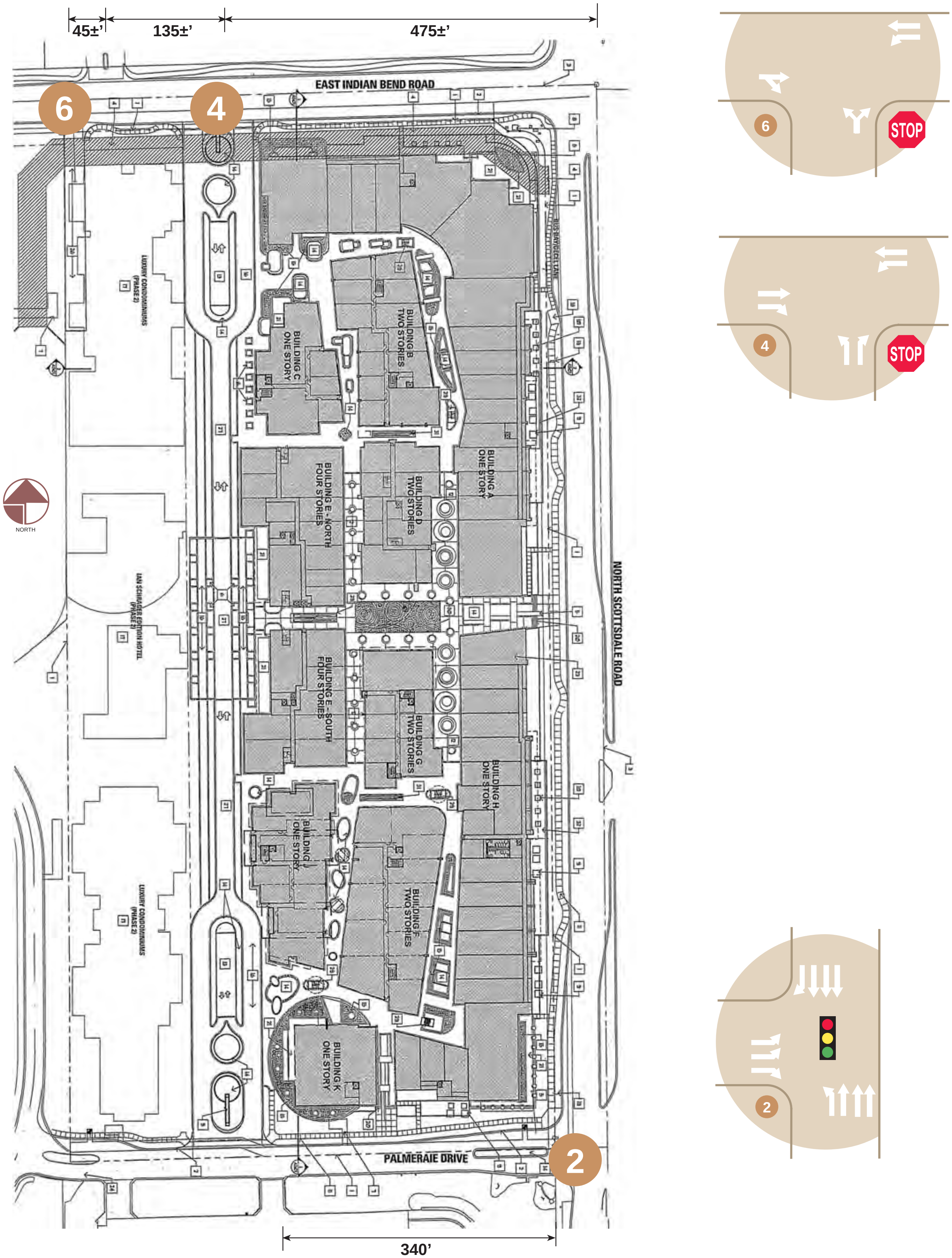


Figure 4: Site Plan and Access

with there not being a published ITE pass-by factor for the AM peak hour. The pass-by trips for the proposed development are presented in **Figure 7**.

Table 7 – Trip Generation

Proposed Use	ITE LUC	ITE Land Use Name	Total	Units	AM Distribution In	AM Distribution Out	PM Distribution In	PM Distribution Out
Under Current R-4R Zoning, no further permitting required								
Hotel or motel	310	Hotel	180	Rooms	58%	42%	49%	51%
Under Proposed PRC Zoning								
Luxury Condo/Townhouse	233	Luxury Condominium/Townhouse	235	Dwelling Units	23%	77%	63%	37%
Hotel or motel	310	Hotel	175	Rooms	58%	42%	49%	51%
Shopping Center	820	Shopping Center	300.000	KSF	61%	39%	48%	52%

Proposed Use	ADT Avg Rate	ADT Total	AM Peak Hour Avg Rate	AM Peak Hour Total	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour Avg Rate	PM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out
Under Current R-4R Zoning, no further permitting required										
Hotel or motel	8.92	1,606	0.67	121	70	51	0.70	126	62	64
Under Proposed PRC Zoning										
Luxury Condo/Townhouse	5.86	1,378	0.56	132	30	102	0.55	130	82	48
Hotel or motel	8.92	1,562	0.67	118	68	50	0.70	123	60	63
Shopping Center (5% reduction for other modes applied)	42.94	12,238	1.03	294	179	115	3.75	1,069	513	556
Totals		15,178		544	277	267		1,322	655	667
Additional Trips		13,572		423	207	216		1,196	593	603

Note: *1. This trip generation calculation is provided for the entire development without applied volume reductions taken as part of this study. If applicable, trips net of interaction and pass-by trips are shown below.*

	Daily Percentage	Daily Trips	AM Peak Hour Percentage	AM Peak Hour Trips	AM Peak Hour In	AM Peak Hour Out	PM Peak Hour Percentage	PM Peak Hour Trips	PM Peak Hour In	PM Peak Hour Out
Interaction/Internal Capture Factor	9%						12%			
Differences		1,368						159	79	80
Net Trips		13,810		544	277	267		1,163	576	587
Pass-By Trips										
Under Proposed PRC Zoning										
Shopping Center	5%	556					34%	330	165	165
Total Pass-By Trips		**556**						**330**	**165**	**165**
NET "NEW" TRIPS (After interaction/internal capture & net of pass-by trips)		**13,254**		**544**	**277**	**267**		**833**	**411**	**422**

TRIP GENERATION COMPARISON – APPROVED USES VS. PROPOSED USES

Had the entire 17-acre site been developed into a 180-room hotel, it would have added approximately 1,606 trips per day to the adjacent roadway, 121 of which would have been added during the AM peak hour and 126 of which would have been added during the PM peak hour. The rezoned development could generate 15,178 trips per day, 544 during the AM peak hour and 1,196 during the PM peak hour.

SITE TRAFFIC DISTRIBUTION

There are two major factors to consider when estimating the direction from which site traffic will be arriving when entering the development and where it will be headed when

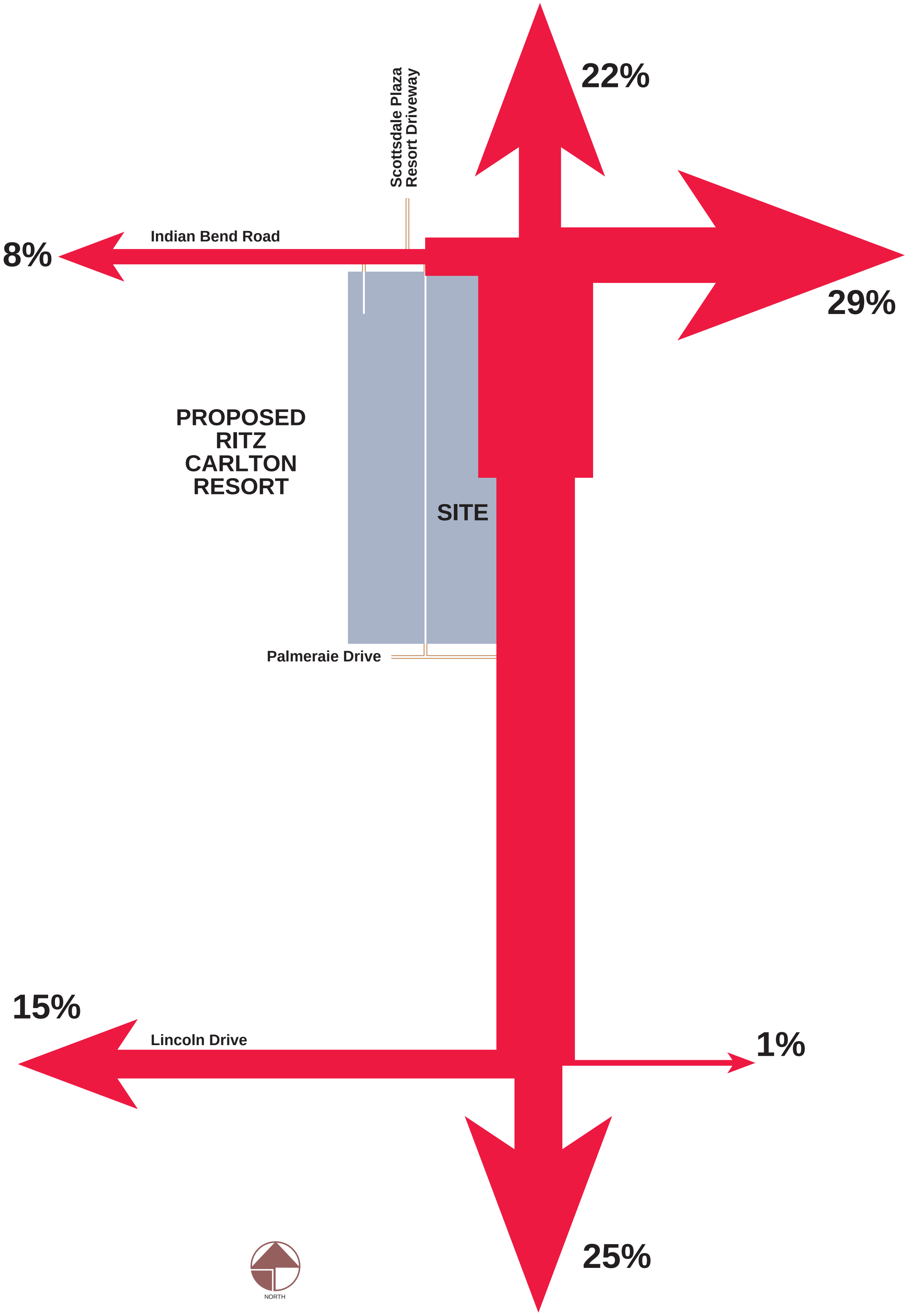


Figure 5: Trip Distribution

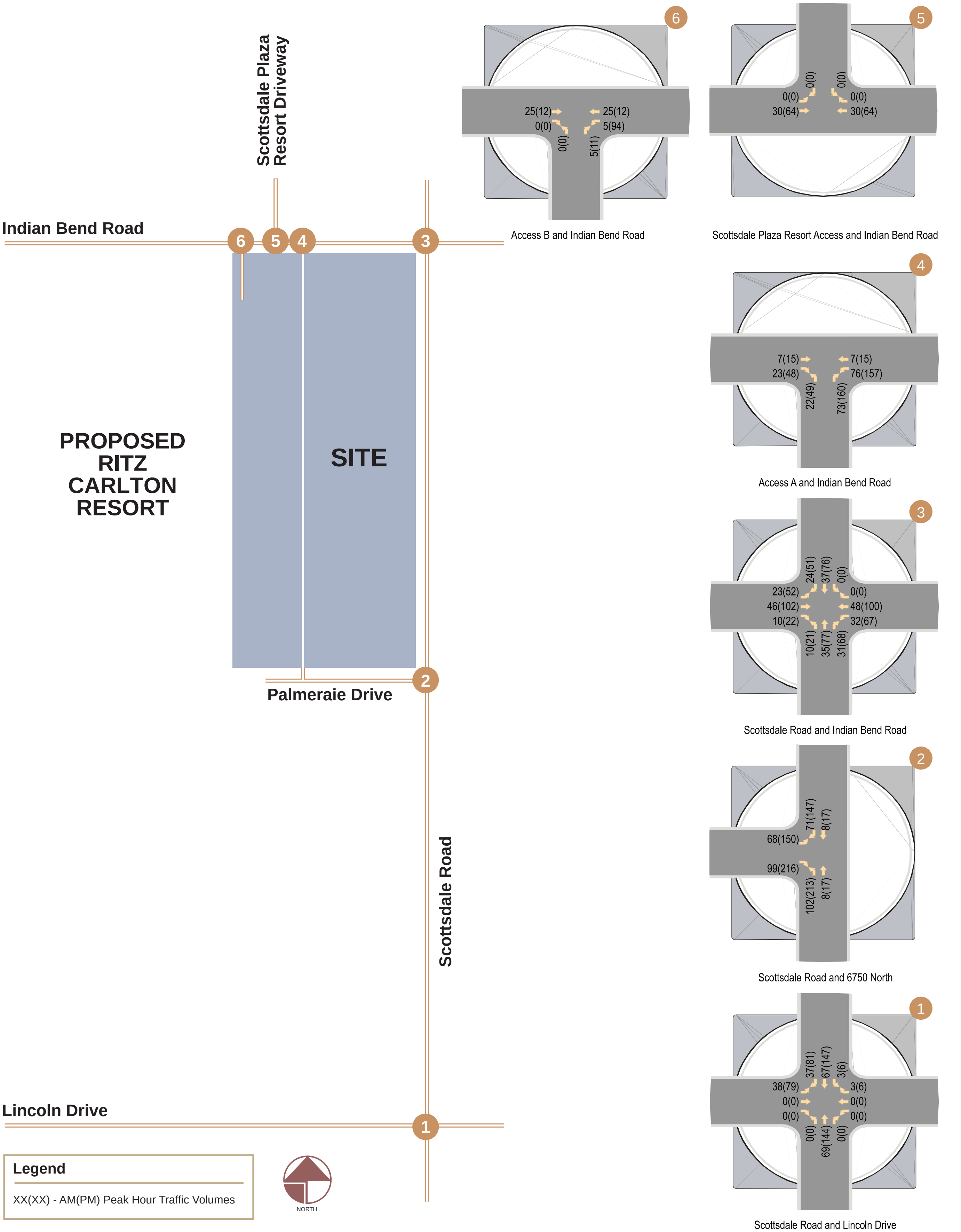
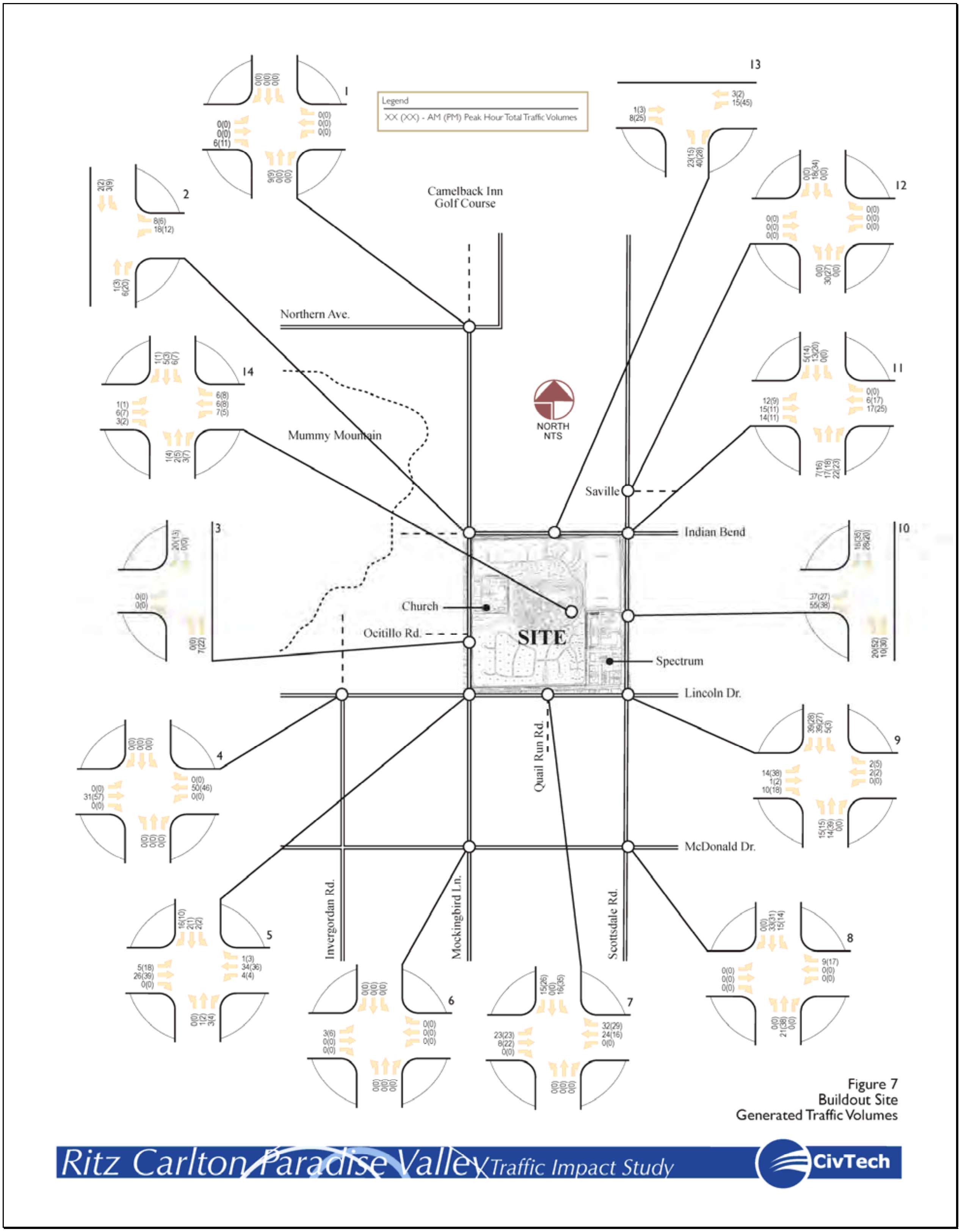


Figure 6: Site Traffic Volumes

Figure 10 – 2015 Trips from Other Developments



APPENDIX H

2018 PEAK HOUR ANALYSIS

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	4	6	288	0	33	4	0	0	128	12	28
Future Vol, veh/h	0	4	6	288	0	33	4	0	0	128	12	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	7	313	0	36	4	0	0	139	13	30
Number of Lanes	0	1	1	0	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	10.2	9.1	9.8
HCM LOS	B	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	89%	3%
Vol Thru, %	0%	30%	0%	2%	11%	91%
Vol Right, %	0%	70%	0%	98%	0%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	128	40	4	294	37	32
LT Vol	128	0	4	0	33	1
Through Vol	0	12	0	6	4	29
RT Vol	0	28	0	288	0	2
Lane Flow Rate	139	43	4	320	40	35
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.229	0.06	0.007	0.4	0.064	0.054
Departure Headway (Hd)	5.924	4.928	5.696	4.505	5.697	5.628
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	604	723	629	799	627	633
Service Time	3.681	2.684	3.427	2.235	3.75	3.696
HCM Lane V/C Ratio	0.23	0.059	0.006	0.401	0.064	0.055
HCM Control Delay	10.4	8	8.5	10.2	9.1	9
HCM Lane LOS	B	A	A	B	A	A
HCM 95th-tile Q	0.9	0.2	0	1.9	0.2	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	1	29	2
Future Vol, veh/h	0	1	29	2
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	32	2
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	130	36	217	84	59	359
Future Vol, veh/h	130	36	217	84	59	359
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	141	39	236	91	64	390

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	800	282	0	0	327	0
Stage 1	282	-	-	-	-	-
Stage 2	518	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	354	757	-	-	1233	-
Stage 1	766	-	-	-	-	-
Stage 2	598	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	336	757	-	-	1233	-
Mov Cap-2 Maneuver	444	-	-	-	-	-
Stage 1	766	-	-	-	-	-
Stage 2	567	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	1.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	444	757	1233	-
HCM Lane V/C Ratio	-	-	0.318	0.052	0.052	-
HCM Control Delay (s)	-	-	16.8	10	8.1	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.4	0.2	0.2	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	4	160	164	1	6	1
Future Vol, veh/h	4	160	164	1	6	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	174	178	1	7	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	179	0	-	0	362	179
Stage 1	-	-	-	-	179	-
Stage 2	-	-	-	-	183	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1397	-	-	-	637	864
Stage 1	-	-	-	-	852	-
Stage 2	-	-	-	-	848	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1397	-	-	-	635	864
Mov Cap-2 Maneuver	-	-	-	-	677	-
Stage 1	-	-	-	-	852	-
Stage 2	-	-	-	-	845	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1397	-	-	-	699
HCM Lane V/C Ratio	0.003	-	-	-	0.011
HCM Control Delay (s)	7.6	0	-	-	10.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	95	28	558	129	144	19	1223	399	150	1525	27
Future Volume (veh/h)	34	95	28	558	129	144	19	1223	399	150	1525	27
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	37	103	30	607	140	157	21	1329	434	163	1658	29
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	47	133	113	670	493	618	320	2076	955	337	2102	37
Arrive On Green	0.03	0.07	0.07	0.19	0.26	0.26	0.13	0.41	0.41	0.13	0.41	0.41
Sat Flow, veh/h	1774	1863	1583	3442	1863	1583	1774	5085	1583	1774	5147	90
Grp Volume(v), veh/h	37	103	30	607	140	157	21	1329	434	163	1092	595
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1721	1863	1583	1774	1695	1583	1774	1695	1847
Q Serve(g_s), s	2.5	6.5	2.2	20.7	7.2	0.8	0.0	25.1	0.0	2.1	33.7	33.7
Cycle Q Clear(g_c), s	2.5	6.5	2.2	20.7	7.2	0.8	0.0	25.1	0.0	2.1	33.7	33.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	47	133	113	670	493	618	320	2076	955	337	1384	754
V/C Ratio(X)	0.79	0.78	0.27	0.91	0.28	0.25	0.07	0.64	0.45	0.48	0.79	0.79
Avail Cap(c_a), veh/h	177	155	132	803	493	618	320	2076	955	337	1384	754
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.1	54.8	52.8	47.2	35.1	14.2	36.1	28.4	13.0	42.1	31.0	31.0
Incr Delay (d2), s/veh	10.2	15.5	0.5	11.2	0.1	0.1	0.0	1.5	1.6	0.4	4.6	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	3.9	1.0	10.9	3.7	2.6	0.6	12.0	8.2	4.9	16.7	18.9
LnGrp Delay(d),s/veh	68.2	70.3	53.2	58.5	35.2	14.3	36.1	30.0	14.6	42.5	35.6	39.2
LnGrp LOS	E	E	D	E	D	B	D	C	B	D	D	D
Approach Vol, veh/h		170			904			1784			1850	
Approach Delay, s/veh		66.8			47.2			26.3			37.4	
Approach LOS		E			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.1	55.0	30.4	15.6	19.1	55.0	7.2	38.7
Change Period (Y+Rc), s	* 4	6.0	* 7	* 7	* 4	6.0	4.0	* 7
Max Green Setting (Gmax), s	* 12	49.0	* 28	* 10	* 12	49.0	12.0	* 26
Max Q Clear Time (g_c+l1), s	4.1	27.1	22.7	8.5	2.0	35.7	4.5	9.2
Green Ext Time (p_c), s	0.1	2.1	0.7	0.0	0.1	2.4	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	36.1
HCM 2010 LOS	D

Notes

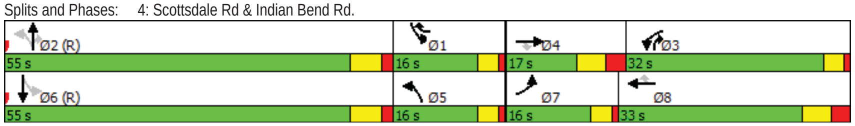
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Timing Report, Sorted By Phase
4: Scottsdale Rd & Indian Bend Rd.
11/5/2015

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	16	55	32	17	16	55	16	33
Maximum Split (%)	13.3%	45.8%	26.7%	14.2%	13.3%	45.8%	13.3%	27.5%
Minimum Split (s)	9.4	29.4	8.5	13	8.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	85	30	118	101	85	30	101	117
End Time (s)	101	85	30	118	101	85	117	30
Yield/Force Off (s)	97	79	26	111	97	79	113	23
Yield/Force Off 170(s)	97	63	26	80	97	63	113	112
Local Start Time (s)	55	0	88	71	55	0	71	87
Local Yield (s)	67	49	116	81	67	49	83	113
Local Yield 170(s)	67	33	116	50	67	33	83	82

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



HCM 2010 TWSC
5: Scottsdale Rd & Joshua Tree Ln
11/5/2015

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	8	1614	4	1	1999
Future Vol, veh/h	0	8	1614	4	1	1999
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	9	1754	4	1	2173

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2628	879	0	0	1759	0
Stage 1	1757	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	42	250	-	-	165	-
Stage 1	81	-	-	-	-	-
Stage 2	335	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	42	250	-	-	165	-
Mov Cap-2 Maneuver	42	-	-	-	-	-
Stage 1	81	-	-	-	-	-
Stage 2	333	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	250	165	-
HCM Lane V/C Ratio	-	-	0.035	0.007	-
HCM Control Delay (s)	-	-	19.9	27	-
HCM Lane LOS	-	-	C	D	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	0	45	1563	2062	90
Future Volume (veh/h)	18	0	45	1563	2062	90
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	20	0	49	1699	2241	98
Adj No. of Lanes	1	1	1	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	35	540	645	4511	2641	822
Arrive On Green	0.02	0.00	0.32	0.89	0.52	0.52
Sat Flow, veh/h	1774	1583	1774	5253	5253	1583
Grp Volume(v), veh/h	20	0	49	1699	2241	98
Grp Sat Flow(s),veh/h/ln	1774	1583	1774	1695	1695	1583
Q Serve(g_s), s	1.4	0.0	0.0	7.3	48.8	4.1
Cycle Q Clear(g_c), s	1.4	0.0	0.0	7.3	48.8	4.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	35	540	645	4511	2641	822
V/C Ratio(X)	0.57	0.00	0.08	0.38	0.85	0.12
Avail Cap(c_a), veh/h	415	879	645	4511	2641	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.79	0.79	1.00	1.00
Uniform Delay (d), s/veh	62.7	0.0	26.5	1.2	26.6	15.9
Incr Delay (d2), s/veh	13.6	0.0	0.0	0.2	3.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	1.2	3.4	23.7	1.9
LnGrp Delay(d),s/veh	76.3	0.0	26.6	1.4	30.3	16.2
LnGrp LOS	E		C	A	C	B
Approach Vol, veh/h	20			1748	2339	
Approach Delay, s/veh	76.3			2.1	29.7	
Approach LOS	E			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		120.4		8.6	47.4	73.0		
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6		
Max Green Setting (Gmax), s		* 87		30.2	* 16	* 67		
Max Q Clear Time (g_c+I1), s		9.3		3.4	2.0	50.8		
Green Ext Time (p_c), s		23.8		0.0	9.9	13.6		

Intersection Summary	
HCM 2010 Ctrl Delay	18.2
HCM 2010 LOS	B

Notes

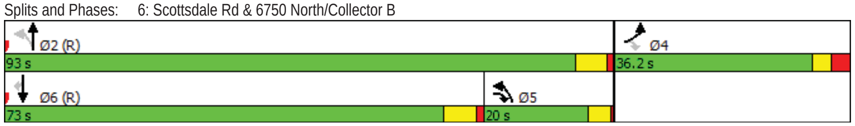
User approved pedestrian interval to be less than phase max green.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	2	4	5	6
Movement	NBTL	EBL	NBL	SBT
Lead/Lag			Lag	Lead
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	93	36.2	20	73
Maximum Split (%)	72.0%	28.0%	15.5%	56.5%
Minimum Split (s)	36	36.2	8	36.9
Yellow Time (s)	4.9	3	3.5	4.9
All-Red Time (s)	1.1	3	0.5	1.1
Minimum Initial (s)	10	5	4	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8	8		8
Flash Dont Walk (s)	22	19		22
Dual Entry	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	65	28.8	8.8	65
End Time (s)	28.8	65	28.8	8.8
Yield/Force Off (s)	22.8	59	24.8	2.8
Yield/Force Off 170(s)	0.8	40	24.8	110
Local Start Time (s)	0	93	73	0
Local Yield (s)	87	123.2	89	67
Local Yield 170(s)	65	104.2	89	45

Intersection Summary	
Cycle Length	129.2
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 65 (50%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	745	67	246	694	91	48	541	372	293	918	394
Future Volume (veh/h)	166	745	67	246	694	91	48	541	372	293	918	394
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	180	810	73	267	754	99	52	588	404	318	998	428
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	884	80	265	1096	490	178	1102	493	393	1473	659
Arrive On Green	0.07	0.27	0.27	0.11	0.31	0.31	0.03	0.31	0.31	0.13	0.42	0.42
Sat Flow, veh/h	3442	3284	296	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	180	436	447	267	754	99	52	588	404	318	998	428
Grp Sat Flow(s),veh/h/ln	1721	1770	1811	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	6.7	31.1	31.1	14.0	24.3	6.0	2.6	17.8	30.7	15.3	29.8	28.1
Cycle Q Clear(g_c), s	6.7	31.1	31.1	14.0	24.3	6.0	2.6	17.8	30.7	15.3	29.8	28.1
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	232	476	487	265	1096	490	178	1102	493	393	1473	659
V/C Ratio(X)	0.78	0.92	0.92	1.01	0.69	0.20	0.29	0.53	0.82	0.81	0.68	0.65
Avail Cap(c_a), veh/h	318	476	487	265	1096	490	180	1102	493	536	1473	659
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.7	46.1	46.1	33.8	39.4	33.0	30.2	37.0	41.4	26.4	30.8	30.4
Incr Delay (d2), s/veh	5.2	24.9	24.5	54.4	3.2	0.8	0.3	1.9	14.1	4.6	2.5	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	18.4	18.8	13.5	12.3	2.7	1.3	9.0	15.3	7.9	15.1	13.1
LnGrp Delay(d),s/veh	64.9	70.9	70.6	88.2	42.6	33.9	30.6	38.8	55.5	31.0	33.4	35.3
LnGrp LOS	E	E	E	F	D	C	C	D	E	C	C	D
Approach Vol, veh/h		1063			1120			1044			1744	
Approach Delay, s/veh		69.7			52.7			44.9			33.4	
Approach LOS		E			D			D			C	

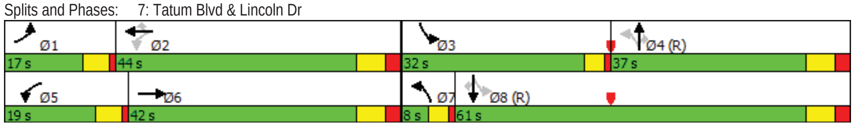
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	47.3	21.5	47.5	19.0	42.0	7.9	61.1
Change Period (Y+Rc), s	5.0	7.0	4.0	7.0	5.0	7.0	4.0	7.0
Max Green Setting (Gmax), s	12.0	37.0	28.0	30.0	14.0	35.0	4.0	54.0
Max Q Clear Time (g_c+I1), s	8.7	26.3	17.3	32.7	16.0	33.1	4.6	31.8
Green Ext Time (p_c), s	0.1	9.7	0.2	0.0	0.0	1.8	0.0	20.9

Intersection Summary	
HCM 2010 Ctrl Delay	47.9
HCM 2010 LOS	D

Phase Number	1	2	3	4	5	6	7	8
Movement	EBL	WBTL	SBL	NBTL	WBL	EBT	NBL	SBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	17	44	32	37	19	42	8	61
Maximum Split (%)	13.1%	33.8%	24.6%	28.5%	14.6%	32.3%	6.2%	46.9%
Minimum Split (s)	9	35	8	36	9	35	8	36
Yellow Time (s)	4	4.5	3	4.5	4	4.5	3	4.5
All-Red Time (s)	1	2.5	1	2.5	1	2.5	1	2.5
Minimum Initial (s)	4	15	4	15	4	15	4	15
Vehicle Extension (s)	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		23		24		23		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	101	15	47	84	103	15	23
End Time (s)	101	15	47	84	103	15	23	84
Yield/Force Off (s)	96	8	43	77	98	8	19	77
Yield/Force Off 170(s)	96	115	43	53	98	115	19	53
Local Start Time (s)	37	54	98	0	37	56	98	106
Local Yield (s)	49	91	126	30	51	91	102	30
Local Yield 170(s)	49	68	126	6	51	68	102	6

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 47 (36%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	

Splits and Phases: 7: Tatum Blvd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1000	200	56	934	21	105	4	94	18	11	5
Future Volume (veh/h)	10	1000	200	56	934	21	105	4	94	18	11	5
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	11	1087	217	61	1015	23	114	4	102	20	12	5
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	391	1951	388	301	2345	53	327	9	224	149	79	23
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	541	2944	585	420	3538	80	1390	60	1532	462	541	157
Grp Volume(v), veh/h	11	652	652	61	508	530	114	0	106	37	0	0
Grp Sat Flow(s),veh/h/ln	541	1770	1759	420	1770	1849	1390	0	1592	1161	0	0
Q Serve(g_s), s	0.7	13.4	13.5	6.2	9.2	9.2	0.0	0.0	4.1	0.1	0.0	0.0
Cycle Q Clear(g_c), s	9.9	13.4	13.5	19.7	9.2	9.2	4.2	0.0	4.1	4.2	0.0	0.0
Prop In Lane	1.00		0.33	1.00		0.04	1.00		0.96	0.54		0.14
Lane Grp Cap(c), veh/h	391	1173	1166	301	1173	1225	327	0	232	251	0	0
V/C Ratio(X)	0.03	0.56	0.56	0.20	0.43	0.43	0.35	0.00	0.46	0.15	0.00	0.00
Avail Cap(c_a), veh/h	391	1173	1166	301	1173	1225	615	0	562	555	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.49	0.49	0.49	0.84	0.84	0.84	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.8	6.1	6.1	11.4	5.4	5.4	26.6	0.0	26.6	25.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.9	0.9	1.3	1.0	0.9	0.6	0.0	1.4	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	6.6	6.6	0.8	4.7	4.9	2.0	0.0	1.9	0.6	0.0	0.0
LnGrp Delay(d),s/veh	7.8	7.0	7.1	12.7	6.4	6.4	27.2	0.0	28.0	25.6	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	C		C	C		
Approach Vol, veh/h		1315			1099			220			37	
Approach Delay, s/veh		7.1			6.7			27.6			25.6	
Approach LOS		A			A			C			C	

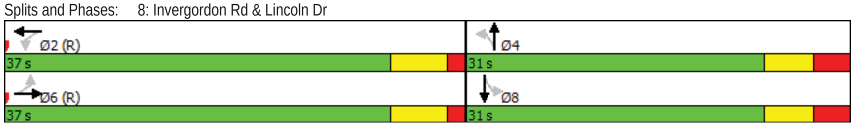
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.1		16.9		51.1		16.9
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0
Max Green Setting (Gmax), s		31.0		24.0		31.0		24.0
Max Q Clear Time (g_c+I1), s		21.7		6.2		15.5		6.2
Green Ext Time (p_c), s		8.2		1.0		12.9		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.9
HCM 2010 LOS	A

Phase Number	2	4	6	8
Movement	WBTL	NBTL	EBTL	SBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	37	31	37	31
Maximum Split (%)	54.4%	45.6%	54.4%	45.6%
Minimum Split (s)	24	31	24	17
Yellow Time (s)	4.5	4	4.5	4
All-Red Time (s)	1.5	3	1.5	3
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	
Flash Dont Walk (s)	11	17	11	
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	59	28	59	28
End Time (s)	28	59	28	59
Yield/Force Off (s)	22	52	22	52
Yield/Force Off 170(s)	11	35	11	52
Local Start Time (s)	0	37	0	37
Local Yield (s)	31	61	31	61
Local Yield 170(s)	20	44	20	61

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 59 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 8: Invergordon Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	235	1053	35	20	885	23	16	56	25	91	114	285
Future Volume (veh/h)	235	1053	35	20	885	23	16	56	25	91	114	285
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	255	1145	38	22	962	25	17	61	27	99	124	310
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	646	2379	79	149	1247	32	180	160	71	276	416	353
Arrive On Green	0.28	0.68	0.68	0.71	0.71	0.71	0.13	0.13	0.13	0.06	0.22	0.22
Sat Flow, veh/h	1774	3496	116	472	3525	92	951	1225	542	1774	1863	1583
Grp Volume(v), veh/h	255	579	604	22	483	504	17	0	88	99	124	310
Grp Sat Flow(s),veh/h/ln	1774	1770	1842	472	1770	1847	951	0	1767	1774	1863	1583
Q Serve(g_s), s	3.0	20.2	20.2	4.0	22.8	22.8	2.1	0.0	5.9	6.1	7.2	24.6
Cycle Q Clear(g_c), s	3.0	20.2	20.2	24.3	22.8	22.8	2.1	0.0	5.9	6.1	7.2	24.6
Prop In Lane	1.00		0.06	1.00		0.05	1.00		0.31	1.00		1.00
Lane Grp Cap(c), veh/h	646	1204	1254	149	626	653	180	0	232	276	416	353
V/C Ratio(X)	0.39	0.48	0.48	0.15	0.77	0.77	0.09	0.00	0.38	0.36	0.30	0.88
Avail Cap(c_a), veh/h	646	1204	1254	149	626	653	278	0	415	399	738	627
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	0.86	0.86	0.86	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	9.9	9.9	22.6	15.6	15.6	50.0	0.0	51.7	43.5	42.0	48.8
Incr Delay (d2), s/veh	0.3	1.1	1.1	1.8	7.8	7.5	0.2	0.0	1.0	0.8	0.4	7.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	10.2	10.6	0.6	12.1	12.6	0.6	0.0	3.0	3.0	3.8	11.4
LnGrp Delay(d),s/veh	30.3	11.0	11.0	24.4	23.4	23.1	50.2	0.0	52.7	44.2	42.4	55.7
LnGrp LOS	C	B	B	C	C	C	D		D	D	D	E
Approach Vol, veh/h		1438			1009			105			533	
Approach Delay, s/veh		14.4			23.3			52.3			50.5	
Approach LOS		B			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6		8
Phs Duration (G+Y+Rc), s	42.5	52.0	12.0	23.5		94.5		35.5
Change Period (Y+Rc), s	6.0	* 6	4.0	6.5		6.0		6.5
Max Green Setting (Gmax), s	16.0	* 46	17.0	30.5		66.0		51.5
Max Q Clear Time (g_c+I1), s	5.0	26.3	8.1	7.9		22.2		26.6
Green Ext Time (p_c), s	6.3	6.8	0.1	2.4		12.0		2.4

Intersection Summary	
HCM 2010 Ctrl Delay	24.8
HCM 2010 LOS	C

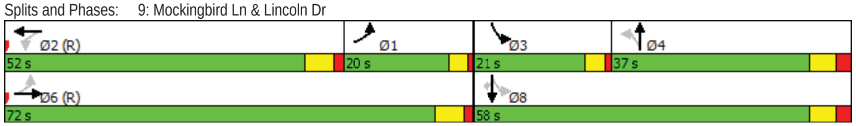
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	6	8
Movement	EBL	WBTL	SBL	NBTL	EBTL	SBTL
Lead/Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	20	52	21	37	72	58
Maximum Split (%)	15.4%	40.0%	16.2%	28.5%	55.4%	44.6%
Minimum Split (s)	8	27	8	34	27	34
Yellow Time (s)	3	4.5	3	4	4.5	4
All-Red Time (s)	1	1.5	1	2.5	1.5	2.5
Minimum Initial (s)	4	15	4	7	15	7
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7		7	7	7
Flash Dont Walk (s)		14		20	14	20
Dual Entry	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	50	128	70	91	128	70
End Time (s)	70	50	91	128	70	128
Yield/Force Off (s)	66	44	87	121.5	64	121.5
Yield/Force Off 170(s)	66	30	87	101.5	50	101.5
Local Start Time (s)	52	0	72	93	0	72
Local Yield (s)	68	46	89	123.5	66	123.5
Local Yield 170(s)	68	32	89	103.5	52	103.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 128 (98%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 9: Mockingbird Ln & Lincoln Dr



HCM 2010 Signalized Intersection Summary
10: Quail Run Rd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	135	1050	5	5	1147	29	5	0	5	61	0	74
Future Volume (veh/h)	135	1050	5	5	1147	29	5	0	5	61	0	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	147	1141	5	5	1247	32	5	0	5	66	0	80
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	394	3017	13	431	2713	70	56	13	27	148	0	109
Arrive On Green	0.07	1.00	1.00	0.77	0.77	0.77	0.07	0.00	0.07	0.07	0.00	0.07
Sat Flow, veh/h	1774	3614	16	489	3526	90	207	182	389	1341	0	1583
Grp Volume(v), veh/h	147	559	587	5	626	653	10	0	0	66	0	80
Grp Sat Flow(s),veh/h/ln	1774	1770	1860	489	1770	1847	779	0	0	1341	0	1583
Q Serve(g_s), s	2.2	0.0	0.0	0.3	16.4	16.4	0.0	0.0	0.0	0.0	0.0	6.4
Cycle Q Clear(g_c), s	2.2	0.0	0.0	0.3	16.4	16.4	6.4	0.0	0.0	6.4	0.0	6.4
Prop In Lane	1.00		0.01	1.00		0.05	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	394	1477	1553	431	1362	1421	95	0	0	148	0	109
V/C Ratio(X)	0.37	0.38	0.38	0.01	0.46	0.46	0.10	0.00	0.00	0.45	0.00	0.73
Avail Cap(c_a), veh/h	551	1477	1553	431	1362	1421	294	0	0	343	0	329
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	0.77	0.77	0.77	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	4.1	0.0	0.0	3.5	5.3	5.3	56.8	0.0	0.0	59.3	0.0	59.3
Incr Delay (d2), s/veh	0.5	0.7	0.6	0.0	0.9	0.8	0.5	0.0	0.0	2.1	0.0	9.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.3	0.3	0.0	8.1	8.5	0.3	0.0	0.0	2.4	0.0	3.1
LnGrp Delay(d),s/veh	4.6	0.7	0.6	3.5	6.2	6.2	57.2	0.0	0.0	61.4	0.0	68.4
LnGrp LOS	A	A	A	A	A	A	E			E		E
Approach Vol, veh/h		1293			1284			10			146	
Approach Delay, s/veh		1.1			6.2			57.2			65.3	
Approach LOS		A			A			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		15.0		115.0		15.0	8.5	106.5
Change Period (Y+Rc), s		6.0		6.5		6.0	4.0	6.5
Max Green Setting (Gmax), s		27.0		90.5		27.0	16.0	70.5
Max Q Clear Time (g_c+I1), s		8.4		2.0		8.4	4.2	18.4
Green Ext Time (p_c), s		0.6		39.3		0.6	0.3	30.8

Intersection Summary	
HCM 2010 Ctrl Delay	7.1
HCM 2010 LOS	A

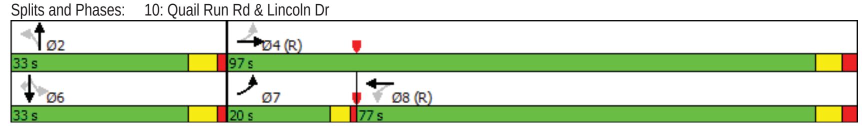
Timing Report, Sorted By Phase
10: Quail Run Rd & Lincoln Dr

11/5/2015

Phase Number	2	4	6	7	8
Movement	NBTL	EBTL	SBTL	EBL	WBTL
Lead/Lag				Lead	Lag
Lead-Lag Optimize				Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max
Maximum Split (s)	33	97	33	20	77
Maximum Split (%)	25.4%	74.6%	25.4%	15.4%	59.2%
Minimum Split (s)	33	28	33	8	28
Yellow Time (s)	4.5	4	4.5	3	4
All-Red Time (s)	1.5	2.5	1.5	1	2.5
Minimum Initial (s)	7	15	7	4	15
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7	7		7
Flash Dont Walk (s)	20	14	20		14
Dual Entry	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	54	87	54	87	107
End Time (s)	87	54	87	107	54
Yield/Force Off (s)	81	47.5	81	103	47.5
Yield/Force Off 170(s)	61	33.5	61	103	33.5
Local Start Time (s)	77	110	77	110	0
Local Yield (s)	104	70.5	104	126	70.5
Local Yield 170(s)	84	56.5	84	126	56.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	75
Offset: 107 (82%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 10: Quail Run Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	599	45	406	24	32	40	294	1102	28	27	1619	604
Future Volume (veh/h)	599	45	406	24	32	40	294	1102	28	27	1619	604
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	686	0	441	26	35	43	320	1198	30	29	1760	657
Adj No. of Lanes	2	0	1	1	2	0	2	3	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	562	0	473	76	76	68	626	2339	59	249	2119	728
Arrive On Green	0.16	0.00	0.16	0.04	0.04	0.04	0.36	0.92	0.92	0.14	0.42	0.42
Sat Flow, veh/h	3548	0	1583	1774	1770	1583	3442	5103	128	1774	5085	1583
Grp Volume(v), veh/h	686	0	441	26	35	43	320	796	432	29	1760	657
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	1770	1583	1721	1695	1840	1774	1695	1583
Q Serve(g_s), s	19.0	0.0	15.7	1.7	2.3	3.2	8.7	4.4	4.4	1.7	37.0	46.0
Cycle Q Clear(g_c), s	19.0	0.0	15.7	1.7	2.3	3.2	8.7	4.4	4.4	1.7	37.0	46.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	562	0	473	76	76	68	626	1554	843	249	2119	728
V/C Ratio(X)	1.22	0.00	0.93	0.34	0.46	0.63	0.51	0.51	0.51	0.12	0.83	0.90
Avail Cap(c_a), veh/h	562	0	473	177	177	158	626	1554	843	249	2119	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.00	0.92	1.00	1.00	1.00	0.85	0.85	0.85	0.81	0.81	0.81
Uniform Delay (d), s/veh	50.5	0.0	40.9	55.8	56.1	56.5	34.0	2.9	2.9	45.1	31.2	29.9
Incr Delay (d2), s/veh	113.8	0.0	23.9	1.0	1.6	3.5	0.3	1.0	1.9	0.1	3.2	14.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.2	0.0	9.9	0.9	1.2	1.5	4.1	2.0	2.4	0.8	17.9	24.4
LnGrp Delay(d),s/veh	164.3	0.0	64.8	56.7	57.7	60.0	34.3	3.9	4.8	45.1	34.5	44.0
LnGrp LOS	F		E	E	E	E	C	A	A	D	C	D
Approach Vol, veh/h		1127			104			1548			2446	
Approach Delay, s/veh		125.3			58.4			10.4			37.2	
Approach LOS		F			E			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	20.8	61.0		12.2	25.8	56.0		26.0
Change Period (Y+Rc), s	4.0	6.0		7.0	4.0	6.0		7.0
Max Green Setting (Gmax), s	10.0	55.0		12.0	15.0	50.0		19.0
Max Q Clear Time (g_c+I1), s	3.7	6.4		5.2	10.7	48.0		21.0
Green Ext Time (p_c), s	0.2	1.7		0.1	0.1	1.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	48.7
HCM 2010 LOS	D

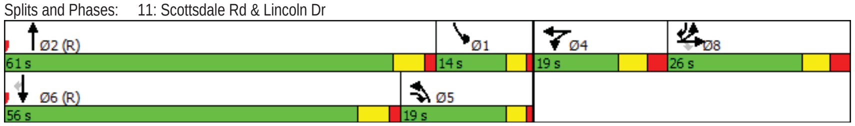
Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	WBTL	NBL	SBT	EBTL
Lead/Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	14	61	19	19	56	26
Maximum Split (%)	11.7%	50.8%	15.8%	15.8%	46.7%	21.7%
Minimum Split (s)	9	28	40	9	28	40
Yellow Time (s)	3	4.5	4	3	4.5	4
All-Red Time (s)	1	1.5	3	1	1.5	3
Minimum Initial (s)	5	20	5	5	20	8
Vehicle Extension (s)	1	0.2	2	1	0.2	2
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		15	26		15	26
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	31	90	45	26	90	64
End Time (s)	45	31	64	45	26	90
Yield/Force Off (s)	41	25	57	41	20	83
Yield/Force Off 170(s)	41	10	31	41	5	57
Local Start Time (s)	61	0	75	56	0	94
Local Yield (s)	71	55	87	71	50	113
Local Yield 170(s)	71	40	61	71	35	87

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 11: Scottsdale Rd & Lincoln Dr



Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	45	221	9	0	8	277	41	0	5	5	5
Future Vol, veh/h	0	45	221	9	0	8	277	41	0	5	5	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	49	240	10	0	9	301	45	0	5	5	5
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	11	13.3	9.6
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	33%	100%	0%	100%	0%	100%	0%
Vol Thru, %	33%	0%	96%	0%	87%	0%	8%
Vol Right, %	33%	0%	4%	0%	13%	0%	92%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	45	230	8	318	80	66
LT Vol	5	45	0	8	0	80	0
Through Vol	5	0	221	0	277	0	5
RT Vol	5	0	9	0	41	0	61
Lane Flow Rate	16	49	250	9	346	87	72
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.029	0.08	0.372	0.014	0.505	0.163	0.111
Departure Headway (Hd)	6.435	5.895	5.363	5.855	5.261	6.753	5.593
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	559	602	663	606	677	535	645
Service Time	4.44	3.688	3.155	3.643	3.047	4.453	3.293
HCM Lane V/C Ratio	0.029	0.081	0.377	0.015	0.511	0.163	0.112
HCM Control Delay	9.6	9.2	11.4	8.7	13.4	10.8	9
HCM Lane LOS	A	A	B	A	B	B	A
HCM 95th-tile Q	0.1	0.3	1.7	0	2.9	0.6	0.4

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	80	5	61
Future Vol, veh/h	0	80	5	61
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	87	5	66
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	10
HCM LOS	A

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	236	35	293	339	292	46	1051	139	180	1729	69
Future Volume (veh/h)	120	236	35	293	339	292	46	1051	139	180	1729	69
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	130	257	38	318	368	317	50	1142	151	196	1879	75
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	208	336	49	281	485	586	414	1907	594	802	1907	594
Arrive On Green	0.08	0.11	0.11	0.11	0.14	0.14	0.23	0.38	0.38	0.31	0.50	0.50
Sat Flow, veh/h	1774	3100	453	1774	3539	1583	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	130	145	150	318	368	317	50	1142	151	196	1879	75
Grp Sat Flow(s),veh/h/ln	1774	1770	1783	1774	1770	1583	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	3.9	9.6	9.8	13.0	12.0	0.0	2.7	21.7	7.9	5.1	43.7	3.0
Cycle Q Clear(g_c), s	3.9	9.6	9.8	13.0	12.0	0.0	2.7	21.7	7.9	5.1	43.7	3.0
Prop In Lane	1.00		0.25	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	208	192	193	281	485	586	414	1907	594	802	1907	594
V/C Ratio(X)	0.63	0.76	0.77	1.13	0.76	0.54	0.12	0.60	0.25	0.24	0.99	0.13
Avail Cap(c_a), veh/h	259	339	342	281	678	673	414	1907	594	802	1907	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.52	0.52	0.52
Uniform Delay (d), s/veh	51.6	52.0	52.1	51.3	49.9	29.7	36.3	30.2	25.9	33.5	29.7	19.6
Incr Delay (d2), s/veh	3.1	6.0	6.4	93.7	3.2	0.8	0.1	1.4	1.0	0.1	11.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	5.0	5.2	16.6	6.1	8.3	1.3	10.4	3.6	2.4	22.3	1.3
LnGrp Delay(d),s/veh	54.7	57.9	58.5	144.9	53.0	30.5	36.4	31.6	26.9	33.6	41.6	19.8
LnGrp LOS	D	E	E	F	D	C	D	C	C	C	D	B
Approach Vol, veh/h		425			1003			1343			2150	
Approach Delay, s/veh		57.2			75.1			31.3			40.1	
Approach LOS		E			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	32.0	51.0	17.0	20.0	32.0	51.0	13.6	23.5
Change Period (Y+Rc), s	4.0	6.0	* 4	7.0	4.0	6.0	* 4	7.0
Max Green Setting (Gmax), s	18.0	45.0	* 13	23.0	18.0	45.0	* 13	23.0
Max Q Clear Time (g_c+I1), s	7.1	23.7	15.0	11.8	4.7	45.7	5.9	14.0
Green Ext Time (p_c), s	0.6	9.2	0.0	1.2	0.6	0.0	0.9	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	46.3
HCM 2010 LOS	D

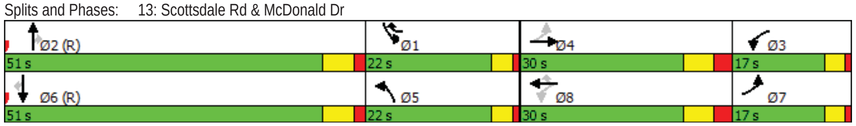
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	51	17	30	22	51	17	30
Maximum Split (%)	18.3%	42.5%	14.2%	25.0%	18.3%	42.5%	14.2%	25.0%
Minimum Split (s)	14	31	10	37	14	31	10	37
Yellow Time (s)	3	4.5	3	4.3	3	4.5	3	4.3
All-Red Time (s)	1	1.5	1	2.7	1	1.5	1	2.7
Minimum Initial (s)	10	20	6	8	10	20	6	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		9		6		9		6
Flash Dont Walk (s)		16		24		16		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	81	30	13	103	81	30	13	103
End Time (s)	103	81	30	13	103	81	30	13
Yield/Force Off (s)	99	75	26	6	99	75	26	6
Yield/Force Off 170(s)	99	59	26	102	99	59	26	102
Local Start Time (s)	51	0	103	73	51	0	103	73
Local Yield (s)	69	45	116	96	69	45	116	96
Local Yield 170(s)	69	29	116	72	69	29	116	72

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 30 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 13: Scottsdale Rd & McDonald Dr



Intersection	
Intersection Delay, s/veh	4.6
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	147	180	63
Demand Flow Rate, veh/h	150	183	64
Vehicles Circulating, veh/h	22	24	142
Vehicles Exiting, veh/h	185	182	30
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.5	4.8	4.3
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	150	183	64
Cap Entry Lane, veh/h	1105	1103	980
Entry HV Adj Factor	0.981	0.983	0.984
Flow Entry, veh/h	147	180	63
Cap Entry, veh/h	1085	1084	965
V/C Ratio	0.136	0.166	0.065
Control Delay, s/veh	4.5	4.8	4.3
LOS	A	A	A
95th %tile Queue, veh	0	1	0

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	55	0	0	3	9	18
Future Vol, veh/h	55	0	0	3	9	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	60	0	0	3	10	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	23	20	29	0	-	0
Stage 1	20	-	-	-	-	-
Stage 2	3	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	993	1058	1584	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	1020	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	993	1058	1584	-	-	-
Mov Cap-2 Maneuver	993	-	-	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	1020	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1584	-	993	-	-
HCM Lane V/C Ratio	-	-	0.06	-	-
HCM Control Delay (s)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

HCM 2010 TWSC
30: Quail Run Rd/Hotel Access & Collector A

11/5/2015

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	9	78	0	3	31
Future Vol, veh/h	0	9	78	0	3	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	10	85	0	3	34

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	125	85	0	0	85	0
Stage 1	85	-	-	-	-	-
Stage 2	40	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	870	974	-	-	1512	-
Stage 1	938	-	-	-	-	-
Stage 2	982	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	868	974	-	-	1512	-
Mov Cap-2 Maneuver	868	-	-	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	980	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	974	1512	-
HCM Lane V/C Ratio	-	-	0.01	0.002	-
HCM Control Delay (s)	-	-	8.7	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

HCM 2010 Roundabout
31: Quail Run Rd & South Residential Access

11/5/2015

Intersection	
Intersection Delay, s/veh	4.3
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	40	27	168	34
Demand Flow Rate, veh/h	41	28	171	35
Vehicles Circulating, veh/h	63	100	0	41
Vehicles Exiting, veh/h	13	71	104	87
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.8	3.9	4.6	3.7
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	41	28	171	35
Cap Entry Lane, veh/h	1061	1022	1130	1085
Entry HV Adj Factor	0.976	0.964	0.984	0.980
Flow Entry, veh/h	40	27	168	34
Cap Entry, veh/h	1035	986	1112	1063
V/C Ratio	0.039	0.027	0.151	0.032
Control Delay, s/veh	3.8	3.9	4.6	3.7
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	0

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	43	0	154	9	0	93
Future Vol, veh/h	43	0	154	9	0	93
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	0	167	10	0	101

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	273	172	0	0	177	0
Stage 1	172	-	-	-	-	-
Stage 2	101	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	716	872	-	-	1399	-
Stage 1	858	-	-	-	-	-
Stage 2	923	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	716	872	-	-	1399	-
Mov Cap-2 Maneuver	716	-	-	-	-	-
Stage 1	858	-	-	-	-	-
Stage 2	923	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	716	1399	-
HCM Lane V/C Ratio	-	-	0.065	-	-
HCM Control Delay (s)	-	-	10.4	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	4	31	183	0	18	16	4	0	256	39	46
Future Vol, veh/h	0	4	31	183	0	18	16	4	0	256	39	46
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	34	199	0	20	17	4	0	278	42	50
Number of Lanes	0	1	1	0	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	10.3	9.5	12
HCM LOS	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	47%	4%
Vol Thru, %	0%	46%	0%	14%	42%	81%
Vol Right, %	0%	54%	0%	86%	11%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	256	85	4	214	38	27
LT Vol	256	0	4	0	18	1
Through Vol	0	39	0	31	16	22
RT Vol	0	46	0	183	4	4
Lane Flow Rate	278	92	4	233	41	29
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.446	0.125	0.007	0.327	0.068	0.046
Departure Headway (Hd)	5.772	4.888	6.166	5.058	5.939	5.657
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	621	728	579	707	599	626
Service Time	3.539	2.655	3.919	2.812	4.018	3.751
HCM Lane V/C Ratio	0.448	0.126	0.007	0.33	0.068	0.046
HCM Control Delay	13.2	8.4	9	10.3	9.5	9
HCM Lane LOS	B	A	A	B	A	A
HCM 95th-tile Q	2.3	0.4	0	1.4	0.2	0.1

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	1	22	4
Future Vol, veh/h	0	1	22	4
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	24	4
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	103	45	319	123	37	193
Future Vol, veh/h	103	45	319	123	37	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	112	49	347	134	40	210

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	704	414	0	0	480	0
Stage 1	414	-	-	-	-	-
Stage 2	290	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	403	638	-	-	1082	-
Stage 1	667	-	-	-	-	-
Stage 2	759	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	388	638	-	-	1082	-
Mov Cap-2 Maneuver	495	-	-	-	-	-
Stage 1	667	-	-	-	-	-
Stage 2	731	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	1.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	495	638	1082	-
HCM Lane V/C Ratio	-	-	0.226	0.077	0.037	-
HCM Control Delay (s)	-	-	14.4	11.1	8.5	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.9	0.2	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	4	146	194	14	4	4
Future Vol, veh/h	4	146	194	14	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	159	211	15	4	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	226	0	-	0	385	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	167	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1342	-	-	-	618	822
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	863	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1342	-	-	-	616	822
Mov Cap-2 Maneuver	-	-	-	-	616	-
Stage 1	-	-	-	-	818	-
Stage 2	-	-	-	-	860	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1342	-	-	-	704
HCM Lane V/C Ratio	0.003	-	-	-	0.012
HCM Control Delay (s)	7.7	0	-	-	10.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	106	18	441	151	129	53	1758	486	178	1458	46
Future Volume (veh/h)	53	106	18	441	151	129	53	1758	486	178	1458	46
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	58	115	20	479	164	140	58	1911	528	193	1585	50
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	145	123	541	406	567	359	2161	922	320	2153	68
Arrive On Green	0.04	0.08	0.08	0.16	0.22	0.22	0.14	0.43	0.43	0.14	0.43	0.43
Sat Flow, veh/h	1774	1863	1583	3442	1863	1583	1774	5085	1583	1774	5065	160
Grp Volume(v), veh/h	58	115	20	479	164	140	58	1911	528	193	1061	574
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1721	1863	1583	1774	1695	1583	1774	1695	1835
Q Serve(g_s), s	3.9	7.3	1.4	16.4	9.1	0.9	0.0	41.5	6.2	7.2	31.4	31.4
Cycle Q Clear(g_c), s	3.9	7.3	1.4	16.4	9.1	0.9	0.0	41.5	6.2	7.2	31.4	31.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	75	145	123	541	406	567	359	2161	922	320	1441	780
V/C Ratio(X)	0.78	0.80	0.16	0.89	0.40	0.25	0.16	0.88	0.57	0.60	0.74	0.74
Avail Cap(c_a), veh/h	207	171	145	660	406	567	359	2161	922	320	1441	780
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.9	54.4	51.7	49.5	40.3	15.2	35.9	31.8	15.7	45.9	28.9	28.9
Incr Delay (d2), s/veh	6.4	16.4	0.2	10.6	0.2	0.1	0.1	5.7	2.6	2.3	3.4	6.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	4.4	0.6	8.6	4.7	2.4	1.7	20.4	3.2	6.1	15.3	17.1
LnGrp Delay(d),s/veh	63.3	70.8	51.9	60.1	40.5	15.3	36.0	37.5	18.3	48.2	32.3	35.0
LnGrp LOS	E	E	D	E	D	B	D	D	B	D	C	D
Approach Vol, veh/h		193			783			2497			1828	
Approach Delay, s/veh		66.6			48.0			33.4			34.8	
Approach LOS		E			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.8	57.0	25.9	16.3	20.8	57.0	9.0	33.1
Change Period (Y+Rc), s	* 4	6.0	* 7	* 7	* 4	6.0	4.0	* 7
Max Green Setting (Gmax), s	* 14	51.0	* 23	* 11	* 14	51.0	14.0	* 20
Max Q Clear Time (g_c+I1), s	9.2	43.5	18.4	9.3	2.0	33.4	5.9	11.1
Green Ext Time (p_c), s	0.1	2.7	0.5	0.0	0.1	2.4	0.0	1.2

Intersection Summary	
HCM 2010 Ctrl Delay	37.3
HCM 2010 LOS	D

Notes

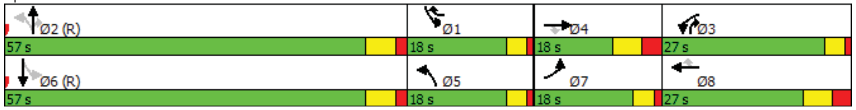
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	18	57	27	18	18	57	18	27
Maximum Split (%)	15.0%	47.5%	22.5%	15.0%	15.0%	47.5%	15.0%	22.5%
Minimum Split (s)	9.4	29.4	8.5	13	9.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	87	30	3	105	87	30	105	3
End Time (s)	105	87	30	3	105	87	3	30
Yield/Force Off (s)	101	81	26	116	101	81	119	23
Yield/Force Off 170(s)	101	65	26	85	101	65	119	112
Local Start Time (s)	57	0	93	75	57	0	75	93
Local Yield (s)	71	51	116	86	71	51	89	113
Local Yield 170(s)	71	35	116	55	71	35	89	82

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90

Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	10	2267	6	9	2001
Future Vol, veh/h	0	10	2267	6	9	2001
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	2464	7	10	2175

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	3357	1235	0	0	2471	0
Stage 1	2467	-	-	-	-	-
Stage 2	890	-	-	-	-	-
Critical Hdwy	5.74	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	16	144	-	-	72	-
Stage 1	28	-	-	-	-	-
Stage 2	327	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	14	144	-	-	72	-
Mov Cap-2 Maneuver	14	-	-	-	-	-
Stage 1	28	-	-	-	-	-
Stage 2	282	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	32	0	0.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	144	72	-
HCM Lane V/C Ratio	-	-	0.075	0.136	-
HCM Control Delay (s)	-	-	32	62.7	-
HCM Lane LOS	-	-	D	F	-
HCM 95th %tile Q(veh)	-	-	0.2	0.4	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	62	37	3	2207	2059	11
Future Volume (veh/h)	62	37	3	2207	2059	11
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	67	40	3	2399	2238	12
Adj No. of Lanes	1	1	1	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	95	540	587	4340	2641	822
Arrive On Green	0.05	0.05	0.29	0.85	0.52	0.52
Sat Flow, veh/h	1774	1583	1774	5253	5253	1583
Grp Volume(v), veh/h	67	40	3	2399	2238	12
Grp Sat Flow(s),veh/h/ln	1774	1583	1774	1695	1695	1583
Q Serve(g_s), s	4.8	0.0	0.0	16.9	48.7	0.5
Cycle Q Clear(g_c), s	4.8	0.0	0.0	16.9	48.7	0.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	95	540	587	4340	2641	822
V/C Ratio(X)	0.71	0.07	0.01	0.55	0.85	0.01
Avail Cap(c_a), veh/h	415	826	587	4340	2641	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.52	0.52	1.00	1.00
Uniform Delay (d), s/veh	60.0	28.7	22.6	2.6	26.6	15.0
Incr Delay (d2), s/veh	9.2	0.1	0.0	0.3	3.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	1.4	0.1	7.9	23.5	0.2
LnGrp Delay(d),s/veh	69.2	28.8	22.6	2.9	30.2	15.0
LnGrp LOS	E	C	C	A	C	B
Approach Vol, veh/h	107			2402	2250	
Approach Delay, s/veh	54.1			2.9	30.1	
Approach LOS	D			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		116.1		12.9	43.1	73.0		
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6		
Max Green Setting (Gmax), s		* 87		30.2	* 16	* 67		
Max Q Clear Time (g_c+I1), s		18.9		6.8	2.0	50.7		
Green Ext Time (p_c), s		43.0		0.3	12.4	13.6		

Intersection Summary	
HCM 2010 Ctrl Delay	16.9
HCM 2010 LOS	B

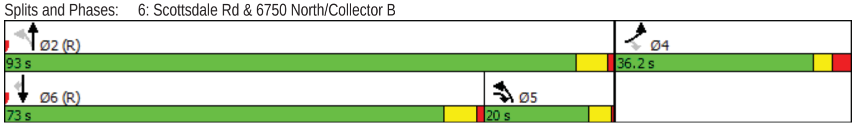
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	2	4	5	6
Movement	NBTL	EBL	NBL	SBT
Lead/Lag			Lag	Lead
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	93	36.2	20	73
Maximum Split (%)	72.0%	28.0%	15.5%	56.5%
Minimum Split (s)	36	36.2	8	36.9
Yellow Time (s)	4.9	3	3.5	4.9
All-Red Time (s)	1.1	3	0.5	1.1
Minimum Initial (s)	10	5	4	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8	8		8
Flash Dont Walk (s)	22	19		22
Dual Entry	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	65	28.8	8.8	65
End Time (s)	28.8	65	28.8	8.8
Yield/Force Off (s)	22.8	59	24.8	2.8
Yield/Force Off 170(s)	0.8	40	24.8	110
Local Start Time (s)	0	93	73	0
Local Yield (s)	87	123.2	89	67
Local Yield 170(s)	65	104.2	89	45

Intersection Summary	
Cycle Length	129.2
Control Type	Actuated-Coordinated
Natural Cycle	85
Offset: 65 (50%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	352	710	39	317	807	254	87	1032	273	192	625	170
Future Volume (veh/h)	352	710	39	317	807	254	87	1032	273	192	625	170
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	383	772	42	345	877	276	95	1122	297	209	679	185
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	454	840	46	236	845	378	324	1422	636	249	1579	706
Arrive On Green	0.10	0.25	0.25	0.09	0.24	0.24	0.04	0.40	0.40	0.08	0.45	0.45
Sat Flow, veh/h	3442	3414	186	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	383	400	414	345	877	276	95	1122	297	209	679	185
Grp Sat Flow(s),veh/h/ln	1721	1770	1830	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	10.8	28.6	28.6	12.0	31.0	20.9	4.1	36.1	18.0	8.7	17.1	9.5
Cycle Q Clear(g_c), s	10.8	28.6	28.6	12.0	31.0	20.9	4.1	36.1	18.0	8.7	17.1	9.5
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	454	436	450	236	845	378	324	1422	636	249	1579	706
V/C Ratio(X)	0.84	0.92	0.92	1.46	1.04	0.73	0.29	0.79	0.47	0.84	0.43	0.26
Avail Cap(c_a), veh/h	534	436	450	236	845	378	324	1422	636	320	1579	706
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.73	0.73	0.73	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.7	47.7	47.7	39.2	49.5	45.6	22.1	34.1	28.6	27.9	24.7	22.6
Incr Delay (d2), s/veh	9.1	26.9	26.3	223.0	36.8	8.7	0.2	4.5	2.5	11.7	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	17.3	17.8	17.3	19.5	10.0	2.0	18.5	8.3	5.0	8.5	4.3
LnGrp Delay(d),s/veh	44.8	74.6	74.0	262.3	86.3	54.4	22.3	38.6	31.1	39.6	25.5	23.5
LnGrp LOS	D	E	E	F	F	D	C	D	C	D	C	C
Approach Vol, veh/h		1197			1498			1514			1073	
Approach Delay, s/veh		64.9			120.9			36.1			27.9	
Approach LOS		E			F			D			C	

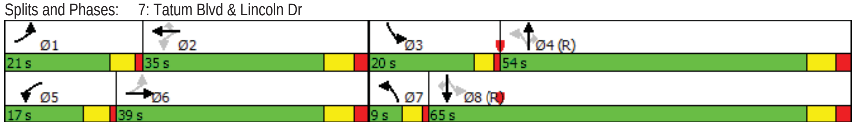
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	38.0	14.8	59.2	17.0	39.0	9.0	65.0
Change Period (Y+Rc), s	5.0	7.0	4.0	7.0	5.0	7.0	4.0	7.0
Max Green Setting (Gmax), s	16.0	28.0	16.0	47.0	12.0	32.0	5.0	58.0
Max Q Clear Time (g_c+I1), s	12.8	33.0	10.7	38.1	14.0	30.6	6.1	19.1
Green Ext Time (p_c), s	0.2	0.0	0.1	8.6	0.0	1.3	0.0	35.0

Intersection Summary	
HCM 2010 Ctrl Delay	65.0
HCM 2010 LOS	E

Phase Number	1	2	3	4	5	6	7	8
Movement	EBL	WBTL	SBL	NBTL	WBL	EBTL	NBL	SBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	21	35	20	54	17	39	9	65
Maximum Split (%)	16.2%	26.9%	15.4%	41.5%	13.1%	30.0%	6.9%	50.0%
Minimum Split (s)	9	35	8	36	9	35	8	36
Yellow Time (s)	4	4.5	3	4.5	4	4.5	3	4.5
All-Red Time (s)	1	2.5	1	2.5	1	2.5	1	2.5
Minimum Initial (s)	4	15	4	15	4	15	4	15
Vehicle Extension (s)	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		23		24		23		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	64	85	120	10	64	81	120	129
End Time (s)	85	120	10	64	81	120	129	64
Yield/Force Off (s)	80	113	6	57	76	113	125	57
Yield/Force Off 170(s)	80	90	6	33	76	90	125	33
Local Start Time (s)	54	75	110	0	54	71	110	119
Local Yield (s)	70	103	126	47	66	103	115	47
Local Yield 170(s)	70	80	126	23	66	80	115	23

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 10 (8%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	

Splits and Phases: 7: Tatum Blvd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1054	147	62	1036	25	249	21	85	25	17	10
Future Volume (veh/h)	5	1054	147	62	1036	25	249	21	85	25	17	10
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	5	1146	160	67	1126	27	271	23	92	27	18	11
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	295	1824	254	250	2065	49	435	73	293	197	124	59
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	485	3121	435	420	3533	85	1375	326	1306	527	553	264
Grp Volume(v), veh/h	5	648	658	67	564	589	271	0	115	56	0	0
Grp Sat Flow(s),veh/h/ln	485	1770	1786	420	1770	1848	1375	0	1632	1344	0	0
Q Serve(g_s), s	0.4	16.3	16.5	8.5	13.2	13.2	7.6	0.0	4.0	0.1	0.0	0.0
Cycle Q Clear(g_c), s	13.7	16.3	16.5	25.0	13.2	13.2	11.7	0.0	4.0	4.1	0.0	0.0
Prop In Lane	1.00		0.24	1.00		0.05	1.00		0.80	0.48		0.20
Lane Grp Cap(c), veh/h	295	1034	1044	250	1034	1080	435	0	366	380	0	0
V/C Ratio(X)	0.02	0.63	0.63	0.27	0.55	0.55	0.62	0.00	0.31	0.15	0.00	0.00
Avail Cap(c_a), veh/h	295	1034	1044	250	1034	1080	672	0	648	570	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.50	0.50	0.50	0.81	0.81	0.81	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.8	9.3	9.3	17.5	8.6	8.6	24.7	0.0	22.0	21.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	1.5	1.5	2.1	1.7	1.6	1.5	0.0	0.5	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	8.3	8.5	1.1	6.9	7.2	5.0	0.0	1.8	0.9	0.0	0.0
LnGrp Delay(d),s/veh	12.8	10.7	10.8	19.6	10.3	10.2	26.2	0.0	22.5	21.3	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	C		C	C		
Approach Vol, veh/h		1311			1220			386			56	
Approach Delay, s/veh		10.8			10.8			25.1			21.3	
Approach LOS		B			B			C			C	

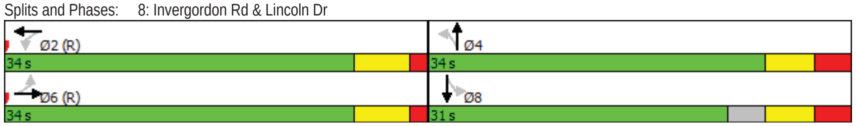
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.7		22.3		45.7		22.3
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0
Max Green Setting (Gmax), s		28.0		27.0		28.0		24.0
Max Q Clear Time (g_c+I1), s		27.0		13.7		18.5		6.1
Green Ext Time (p_c), s		1.0		1.6		8.5		1.7

Intersection Summary	
HCM 2010 Ctrl Delay	12.8
HCM 2010 LOS	B

Phase Number	2	4	6	8
Movement	WBTL	NBTL	EBTL	SBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	34	34	34	31
Maximum Split (%)	50.0%	50.0%	50.0%	45.6%
Minimum Split (s)	24	31	24	17
Yellow Time (s)	4.5	4	4.5	4
All-Red Time (s)	1.5	3	1.5	3
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	
Flash Dont Walk (s)	11	17	11	
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	59	25	59	25
End Time (s)	25	59	25	59
Yield/Force Off (s)	19	52	19	52
Yield/Force Off 170(s)	8	35	8	52
Local Start Time (s)	0	34	0	34
Local Yield (s)	28	61	28	61
Local Yield 170(s)	17	44	17	61

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 59 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 8: Invergordon Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	274	984	17	13	953	89	12	111	23	57	92	172
Future Volume (veh/h)	274	984	17	13	953	89	12	111	23	57	92	172
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	298	1070	18	14	1036	97	13	121	25	62	100	187
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	642	2616	44	199	1388	621	173	162	33	147	316	268
Arrive On Green	0.30	0.73	0.73	0.39	0.39	0.39	0.11	0.11	0.11	0.03	0.17	0.17
Sat Flow, veh/h	1774	3562	60	516	3539	1583	1088	1499	310	1774	1863	1583
Grp Volume(v), veh/h	298	532	556	14	1036	97	13	0	146	62	100	187
Grp Sat Flow(s),veh/h/ln	1774	1770	1852	516	1770	1583	1088	0	1808	1774	1863	1583
Q Serve(g_s), s	8.1	14.8	14.8	2.6	32.7	4.2	1.4	0.0	10.2	4.0	6.1	14.5
Cycle Q Clear(g_c), s	8.1	14.8	14.8	17.4	32.7	4.2	1.4	0.0	10.2	4.0	6.1	14.5
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	642	1299	1360	199	1388	621	173	0	195	147	316	268
V/C Ratio(X)	0.46	0.41	0.41	0.07	0.75	0.16	0.08	0.00	0.75	0.42	0.32	0.70
Avail Cap(c_a), veh/h	642	1299	1360	199	1388	621	285	0	382	147	509	432
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.64	0.64	0.64	0.94	0.94	0.94	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.8	6.6	6.6	34.8	33.9	17.3	52.3	0.0	56.3	48.8	47.4	50.8
Incr Delay (d2), s/veh	0.3	0.6	0.6	0.6	3.5	0.5	0.2	0.0	5.6	1.9	0.6	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	7.5	7.8	0.4	16.6	1.9	0.4	0.0	5.4	2.0	3.2	6.6
LnGrp Delay(d),s/veh	32.1	7.2	7.1	35.4	37.4	17.8	52.5	0.0	61.9	50.7	47.9	54.1
LnGrp LOS	C	A	A	D	D	B	D		E	D	D	D
Approach Vol, veh/h		1386			1147			159			349	
Approach Delay, s/veh		12.5			35.7			61.1			51.7	
Approach LOS		B			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6		8
Phs Duration (G+Y+Rc), s	44.5	57.0	8.0	20.5		101.5		28.5
Change Period (Y+Rc), s	6.0	* 6	4.0	6.5		6.0		6.5
Max Green Setting (Gmax), s	27.0	* 51	4.0	27.5		82.0		35.5
Max Q Clear Time (g_c+I1), s	10.1	34.7	6.0	12.2		16.8		16.5
Green Ext Time (p_c), s	7.7	7.3	0.0	1.8		11.2		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	28.3
HCM 2010 LOS	C

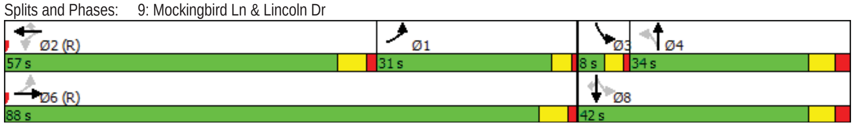
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	6	8
Movement	EBL	WBTL	SBL	NBTL	EBTL	SBTL
Lead/Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	31	57	8	34	88	42
Maximum Split (%)	23.8%	43.8%	6.2%	26.2%	67.7%	32.3%
Minimum Split (s)	9	27	8	34	27	34
Yellow Time (s)	3	4.5	3	4	4.5	4
All-Red Time (s)	1	1.5	1	2.5	1.5	2.5
Minimum Initial (s)	4	15	4	7	15	7
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7		7	7	7
Flash Dont Walk (s)		14		20	14	20
Dual Entry	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	73	16	104	112	16	104
End Time (s)	104	73	112	16	104	16
Yield/Force Off (s)	100	67	108	9.5	98	9.5
Yield/Force Off 170(s)	100	53	108	119.5	84	119.5
Local Start Time (s)	57	0	88	96	0	88
Local Yield (s)	84	51	92	123.5	82	123.5
Local Yield 170(s)	84	37	92	103.5	68	103.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 16 (12%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 9: Mockingbird Ln & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	528	5	5	901	61	5	0	5	37	0	78
Future Volume (veh/h)	73	528	5	5	901	61	5	0	5	37	0	78
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	79	574	5	5	979	66	5	0	5	40	0	85
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	476	2994	26	698	2736	1224	77	13	48	163	0	113
Arrive On Green	0.06	1.00	1.00	0.77	0.77	0.77	0.07	0.00	0.07	0.07	0.00	0.07
Sat Flow, veh/h	1774	3596	31	831	3539	1583	500	178	678	1517	0	1583
Grp Volume(v), veh/h	79	282	297	5	979	66	10	0	0	40	0	85
Grp Sat Flow(s),veh/h/ln	1774	1770	1857	831	1770	1583	1356	0	0	1517	0	1583
Q Serve(g_s), s	1.1	0.0	0.0	0.2	11.3	1.3	0.0	0.0	0.0	0.0	0.0	6.9
Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.2	11.3	1.3	2.8	0.0	0.0	2.8	0.0	6.9
Prop In Lane	1.00		0.02	1.00		1.00	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	476	1474	1547	698	2736	1224	138	0	0	163	0	113
V/C Ratio(X)	0.17	0.19	0.19	0.01	0.36	0.05	0.07	0.00	0.00	0.25	0.00	0.76
Avail Cap(c_a), veh/h	643	1474	1547	698	2736	1224	367	0	0	388	0	365
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.78	0.78	0.78	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	3.0	0.0	0.0	3.4	4.6	3.5	56.4	0.0	0.0	57.4	0.0	59.3
Incr Delay (d2), s/veh	0.1	0.3	0.3	0.0	0.3	0.1	0.2	0.0	0.0	0.8	0.0	9.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.1	0.1	0.0	5.5	0.6	0.3	0.0	0.0	1.4	0.0	3.3
LnGrp Delay(d),s/veh	3.1	0.3	0.3	3.4	4.9	3.6	56.6	0.0	0.0	58.2	0.0	69.0
LnGrp LOS	A	A	A	A	A	A	E			E		E
Approach Vol, veh/h		658			1050			10			125	
Approach Delay, s/veh		0.6			4.8			56.6			65.6	
Approach LOS		A			A			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		15.2		114.8		15.2	7.8	107.0
Change Period (Y+Rc), s		6.0		6.5		6.0	4.0	6.5
Max Green Setting (Gmax), s		30.0		87.5		30.0	16.0	67.5
Max Q Clear Time (g_c+I1), s		4.8		2.0		8.9	3.1	13.3
Green Ext Time (p_c), s		0.5		17.8		0.5	0.1	16.7

Intersection Summary	
HCM 2010 Ctrl Delay	7.7
HCM 2010 LOS	A

Timing Report, Sorted By Phase
10: Quail Run Rd & Lincoln Dr

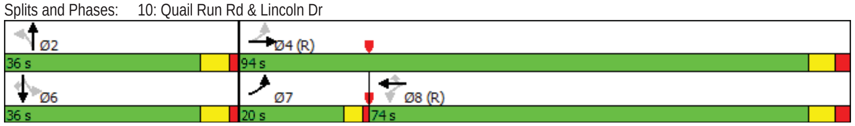
11/5/2015

Phase Number	2	4	6	7	8
Movement	NBTL	EBTL	SBTL	EBL	WBTL
Lead/Lag				Lead	Lag
Lead-Lag Optimize				Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max
Maximum Split (s)	36	94	36	20	74
Maximum Split (%)	27.7%	72.3%	27.7%	15.4%	56.9%
Minimum Split (s)	33	28	33	8	28
Yellow Time (s)	4.5	4	4.5	3	4
All-Red Time (s)	1.5	2.5	1.5	1	2.5
Minimum Initial (s)	7	15	7	4	15
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7	7		7
Flash Dont Walk (s)	20	14	20		14
Dual Entry	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	74	110	74	110	0
End Time (s)	110	74	110	0	74
Yield/Force Off (s)	104	67.5	104	126	67.5
Yield/Force Off 170(s)	84	53.5	84	126	53.5
Local Start Time (s)	74	110	74	110	0
Local Yield (s)	104	67.5	104	126	67.5
Local Yield 170(s)	84	53.5	84	126	53.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	70

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Splits and Phases: 10: Quail Run Rd & Lincoln Dr



HCM 2010 Signalized Intersection Summary
11: Scottsdale Rd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	579	46	391	42	55	53	369	1558	37	55	1468	447
Future Volume (veh/h)	579	46	391	42	55	53	369	1558	37	55	1468	447
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	665	0	425	46	60	58	401	1693	40	60	1596	486
Adj No. of Lanes	2	0	1	1	2	0	2	3	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	591	0	506	98	100	86	814	2172	51	272	1737	628
Arrive On Green	0.17	0.00	0.17	0.06	0.06	0.06	0.47	0.85	0.85	0.15	0.34	0.34
Sat Flow, veh/h	3548	0	1583	1774	1806	1552	3442	5111	121	1774	5085	1583
Grp Volume(v), veh/h	665	0	425	46	59	59	401	1123	610	60	1596	486
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	1770	1589	1721	1695	1841	1774	1695	1583
Q Serve(g_s), s	20.0	0.0	11.6	3.0	3.9	4.4	9.6	17.7	17.7	3.6	36.1	32.1
Cycle Q Clear(g_c), s	20.0	0.0	11.6	3.0	3.9	4.4	9.6	17.7	17.7	3.6	36.1	32.1
Prop In Lane	1.00		1.00	1.00		0.98	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	591	0	506	98	98	88	814	1441	783	272	1737	628
V/C Ratio(X)	1.12	0.00	0.84	0.47	0.60	0.68	0.49	0.78	0.78	0.22	0.92	0.77
Avail Cap(c_a), veh/h	591	0	506	207	206	185	814	1441	783	272	1737	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.00	0.99	1.00	1.00	1.00	0.62	0.62	0.62	0.78	0.78	0.78
Uniform Delay (d), s/veh	50.0	0.0	38.0	55.0	55.4	55.6	26.7	6.5	6.5	44.5	37.9	31.5
Incr Delay (d2), s/veh	76.1	0.0	11.2	1.3	2.2	3.4	0.1	2.7	4.8	0.1	7.5	7.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.0	0.0	6.6	1.5	2.0	2.0	4.6	8.0	9.2	1.8	18.1	16.5
LnGrp Delay(d),s/veh	126.1	0.0	49.2	56.3	57.6	59.0	26.8	9.2	11.3	44.7	45.4	38.6
LnGrp LOS	F		D	E	E	E	C	A	B	D	D	D
Approach Vol, veh/h		1090			164			2134			2142	
Approach Delay, s/veh		96.1			57.7			13.1			43.8	
Approach LOS		F			E			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	22.4	57.0		13.6	32.4	47.0		27.0
Change Period (Y+Rc), s	4.0	6.0		7.0	4.0	6.0		7.0
Max Green Setting (Gmax), s	11.0	51.0		14.0	21.0	41.0		20.0
Max Q Clear Time (g_c+I1), s	5.6	19.7		6.4	11.6	38.1		22.0
Green Ext Time (p_c), s	0.2	2.7		0.3	0.3	1.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	42.7
HCM 2010 LOS	D

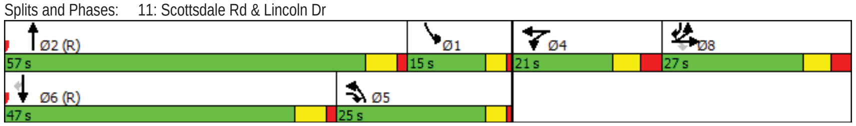
Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	WBTL	NBL	SBT	EBTL
Lead/Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	57	21	25	47	27
Maximum Split (%)	12.5%	47.5%	17.5%	20.8%	39.2%	22.5%
Minimum Split (s)	9	28	40	9	28	40
Yellow Time (s)	3	4.5	4	3	4.5	4
All-Red Time (s)	1	1.5	3	1	1.5	3
Minimum Initial (s)	4.5	20	5	4.5	20	8
Vehicle Extension (s)	1	0.2	2	1	0.2	2
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		15	26		15	26
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	12	75	27	2	75	48
End Time (s)	27	12	48	27	2	75
Yield/Force Off (s)	23	6	41	23	116	68
Yield/Force Off 170(s)	23	111	15	23	101	42
Local Start Time (s)	57	0	72	47	0	93
Local Yield (s)	68	51	86	68	41	113
Local Yield 170(s)	68	36	60	68	26	87

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 75 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 11: Scottsdale Rd & Lincoln Dr



Intersection	
Intersection Delay, s/veh	11.5
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	66	195	4	0	22	241	77	0	13	11	13
Future Vol, veh/h	0	66	195	4	0	22	241	77	0	13	11	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	72	212	4	0	24	262	84	0	14	12	14
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	10.7	13.1	9.9
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	35%	100%	0%	100%	0%	100%	0%
Vol Thru, %	30%	0%	98%	0%	76%	0%	10%
Vol Right, %	35%	0%	2%	0%	24%	0%	90%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	37	66	199	22	318	56	93
LT Vol	13	66	0	22	0	56	0
Through Vol	11	0	195	0	241	0	9
RT Vol	13	0	4	0	77	0	84
Lane Flow Rate	40	72	216	24	346	61	101
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.072	0.119	0.329	0.039	0.504	0.115	0.159
Departure Headway (Hd)	6.423	6.102	5.583	6.031	5.355	6.815	5.669
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	561	591	649	597	677	529	636
Service Time	4.429	3.802	3.283	3.731	3.055	4.517	3.371
HCM Lane V/C Ratio	0.071	0.122	0.333	0.04	0.511	0.115	0.159
HCM Control Delay	9.9	9.6	11	9	13.4	10.4	9.4
HCM Lane LOS	A	A	B	A	B	B	A
HCM 95th-tile Q	0.2	0.4	1.4	0.1	2.9	0.4	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	56	9	84
Future Vol, veh/h	0	56	9	84
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	61	10	91
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9.8
HCM LOS	A

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	210	36	230	214	194	36	1759	235	300	1558	91
Future Volume (veh/h)	78	210	36	230	214	194	36	1759	235	300	1558	91
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	85	228	39	250	233	211	39	1912	255	326	1693	99
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	276	306	52	261	340	507	398	2034	633	771	2034	633
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.22	0.40	0.40	0.15	0.27	0.27
Sat Flow, veh/h	1774	3031	511	1774	3539	1583	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	85	132	135	250	233	211	39	1912	255	326	1693	99
Grp Sat Flow(s),veh/h/ln	1774	1770	1773	1774	1770	1583	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	0.0	8.7	8.9	11.1	7.6	0.0	2.1	43.4	13.8	10.3	37.6	5.7
Cycle Q Clear(g_c), s	0.0	8.7	8.9	11.1	7.6	0.0	2.1	43.4	13.8	10.3	37.6	5.7
Prop In Lane	1.00		0.29	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	276	178	179	261	340	507	398	2034	633	771	2034	633
V/C Ratio(X)	0.31	0.74	0.76	0.96	0.69	0.42	0.10	0.94	0.40	0.42	0.83	0.16
Avail Cap(c_a), veh/h	276	354	355	261	708	672	398	2034	633	771	2034	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.44	0.44	0.44
Uniform Delay (d), s/veh	47.4	52.4	52.5	51.6	52.5	32.0	36.9	34.6	25.7	43.9	40.1	28.5
Incr Delay (d2), s/veh	0.6	5.8	6.4	43.5	2.4	0.5	0.1	10.1	1.9	0.2	1.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.5	4.7	11.1	3.9	5.5	1.0	22.1	6.4	4.9	18.0	2.5
LnGrp Delay(d),s/veh	48.0	58.3	58.9	95.1	54.9	32.5	37.0	44.7	27.6	44.1	42.0	28.7
LnGrp LOS	D	E	E	F	D	C	D	D	C	D	D	C
Approach Vol, veh/h		352			694			2206			2118	
Approach Delay, s/veh		56.0			62.6			42.6			41.7	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.9	54.0	16.0	19.1	30.9	54.0	16.6	18.5
Change Period (Y+Rc), s	4.0	6.0	* 4	7.0	4.0	6.0	* 4	7.0
Max Green Setting (Gmax), s	15.0	48.0	* 12	24.0	15.0	48.0	* 12	24.0
Max Q Clear Time (g_c+I1), s	12.3	45.4	13.1	10.9	4.1	39.6	2.0	9.6
Green Ext Time (p_c), s	0.4	2.4	0.0	1.2	1.0	6.5	0.7	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	45.7
HCM 2010 LOS	D

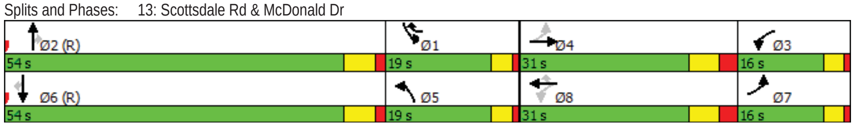
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	19	54	16	31	19	54	16	31
Maximum Split (%)	15.8%	45.0%	13.3%	25.8%	15.8%	45.0%	13.3%	25.8%
Minimum Split (s)	14	31	10	37	14	31	10	37
Yellow Time (s)	3	4.5	3	4.3	3	4.5	3	4.3
All-Red Time (s)	1	1.5	1	2.7	1	1.5	1	2.7
Minimum Initial (s)	10	20	6	8	10	20	6	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	1	0.2	1	2	1	0.2	1	2
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		9		6		9		6
Flash Dont Walk (s)		16		24		16		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	30	14	103	84	30	14	103
End Time (s)	103	84	30	14	103	84	30	14
Yield/Force Off (s)	99	78	26	7	99	78	26	7
Yield/Force Off 170(s)	99	62	26	103	99	62	26	103
Local Start Time (s)	54	0	104	73	54	0	104	73
Local Yield (s)	69	48	116	97	69	48	116	97
Local Yield 170(s)	69	32	116	73	69	32	116	73

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 30 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 13: Scottsdale Rd & McDonald Dr



Intersection	
Intersection Delay, s/veh	4.9
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	161	215	43
Demand Flow Rate, veh/h	165	219	44
Vehicles Circulating, veh/h	44	15	138
Vehicles Exiting, veh/h	190	167	71
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.8	5.1	4.1
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	165	219	44
Cap Entry Lane, veh/h	1081	1113	984
Entry HV Adj Factor	0.978	0.980	0.977
Flow Entry, veh/h	161	215	43
Cap Entry, veh/h	1057	1091	962
V/C Ratio	0.153	0.197	0.045
Control Delay, s/veh	4.8	5.1	4.1
LOS	A	A	A
95th %tile Queue, veh	1	1	0

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	35	0	0	5	4	60
Future Vol, veh/h	35	0	0	5	4	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	0	0	5	4	65

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	42	37	70	0	-	0
Stage 1	37	-	-	-	-	-
Stage 2	5	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	969	1035	1531	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	1018	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	969	1035	1531	-	-	-
Mov Cap-2 Maneuver	969	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	1018	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1531	-	969	-	-
HCM Lane V/C Ratio	-	-	0.039	-	-
HCM Control Delay (s)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	4	32	0	5	43
Future Vol, veh/h	0	4	32	0	5	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	35	0	5	47

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	93	35	0	0	35	0
Stage 1	35	-	-	-	-	-
Stage 2	58	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	907	1038	-	-	1576	-
Stage 1	987	-	-	-	-	-
Stage 2	965	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	904	1038	-	-	1576	-
Mov Cap-2 Maneuver	904	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	962	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1038	1576	-
HCM Lane V/C Ratio	-	-	0.004	0.003	-
HCM Control Delay (s)	-	-	8.5	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	3.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	25	32	101	47
Demand Flow Rate, veh/h	26	33	103	48
Vehicles Circulating, veh/h	81	79	0	76
Vehicles Exiting, veh/h	43	24	106	36
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.8	3.8	4.0	3.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	26	33	103	48
Cap Entry Lane, veh/h	1042	1044	1130	1047
Entry HV Adj Factor	0.962	0.970	0.983	0.980
Flow Entry, veh/h	25	32	101	47
Cap Entry, veh/h	1002	1012	1111	1027
V/C Ratio	0.025	0.032	0.091	0.046
Control Delay, s/veh	3.8	3.8	4.0	3.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	20	0	93	41	0	95
Future Vol, veh/h	20	0	93	41	0	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	0	101	45	0	103

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	226	123	0	0	146	0
Stage 1	123	-	-	-	-	-
Stage 2	103	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	762	928	-	-	1436	-
Stage 1	902	-	-	-	-	-
Stage 2	921	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	762	928	-	-	1436	-
Mov Cap-2 Maneuver	762	-	-	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	921	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	762	1436	-
HCM Lane V/C Ratio	-	-	0.029	-	-
HCM Control Delay (s)	-	-	9.9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

APPENDIX I

2023 PEAK HOUR ANALYSIS

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	4	6	308	0	34	4	0	0	140	12	29
Future Vol, veh/h	0	4	6	308	0	34	4	0	0	140	12	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	7	335	0	37	4	0	0	152	13	32
Number of Lanes	0	1	1	0	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	10.7	9.3	10.2
HCM LOS	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	89%	3%
Vol Thru, %	0%	29%	0%	2%	11%	91%
Vol Right, %	0%	71%	0%	98%	0%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	140	41	4	314	38	33
LT Vol	140	0	4	0	34	1
Through Vol	0	12	0	6	4	30
RT Vol	0	29	0	308	0	2
Lane Flow Rate	152	45	4	341	41	36
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.253	0.062	0.007	0.432	0.066	0.057
Departure Headway (Hd)	5.984	4.982	5.745	4.552	5.775	5.713
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	598	714	623	788	617	622
Service Time	3.749	2.746	3.483	2.289	3.84	3.793
HCM Lane V/C Ratio	0.254	0.063	0.006	0.433	0.066	0.058
HCM Control Delay	10.8	8.1	8.5	10.7	9.3	9.1
HCM Lane LOS	B	A	A	B	A	A
HCM 95th-tile Q	1	0.2	0	2.2	0.2	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	1	30	2
Future Vol, veh/h	0	1	30	2
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	33	2
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9.1
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	161	45	222	102	73	369
Future Vol, veh/h	161	45	222	102	73	369
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	175	49	241	111	79	401

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	857	297	0	0	352	0
Stage 1	297	-	-	-	-	-
Stage 2	560	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	328	742	-	-	1207	-
Stage 1	754	-	-	-	-	-
Stage 2	572	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	307	742	-	-	1207	-
Mov Cap-2 Maneuver	418	-	-	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	535	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.6	0	1.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	418	742	1207	-
HCM Lane V/C Ratio	-	-	0.419	0.066	0.066	-
HCM Control Delay (s)	-	-	19.7	10.2	8.2	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	2	0.2	0.2	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	4	206	2	36	197	1	1	0	47	6	0	1
Future Vol, veh/h	4	206	2	36	197	1	1	0	47	6	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	224	2	39	214	1	1	0	51	7	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	215	0	0	226	0	0	527	527	225	552	528	215
Stage 1	-	-	-	-	-	-	234	234	-	293	293	-
Stage 2	-	-	-	-	-	-	293	293	-	259	235	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1355	-	-	1342	-	-	462	456	814	444	456	825
Stage 1	-	-	-	-	-	-	769	711	-	715	670	-
Stage 2	-	-	-	-	-	-	715	670	-	746	710	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1355	-	-	1342	-	-	450	441	814	406	441	825
Mov Cap-2 Maneuver	-	-	-	-	-	-	450	441	-	406	441	-
Stage 1	-	-	-	-	-	-	767	709	-	713	651	-
Stage 2	-	-	-	-	-	-	693	651	-	697	708	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.2	9.8	13.4
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	801	1355	-	-	1342	-	-	438
HCM Lane V/C Ratio	0.065	0.003	-	-	0.029	-	-	0.017
HCM Control Delay (s)	9.8	7.7	-	-	7.8	-	-	13.4
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	157	63	583	180	148	39	1266	408	154	1611	44
Future Volume (veh/h)	68	157	63	583	180	148	39	1266	408	154	1611	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	74	171	68	634	196	161	42	1376	443	167	1751	48
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	94	155	132	696	480	576	274	2076	967	296	2076	647
Arrive On Green	0.05	0.08	0.08	0.20	0.26	0.26	0.11	0.41	0.41	0.11	0.41	0.41
Sat Flow, veh/h	1774	1863	1583	3442	1863	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	74	171	68	634	196	161	42	1376	443	167	1751	48
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1721	1863	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	4.9	10.0	4.9	21.6	10.5	1.2	0.0	26.3	0.0	3.1	37.3	1.7
Cycle Q Clear(g_c), s	4.9	10.0	4.9	21.6	10.5	1.2	0.0	26.3	0.0	3.1	37.3	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	94	155	132	696	480	576	274	2076	967	296	2076	647
V/C Ratio(X)	0.79	1.10	0.52	0.91	0.41	0.28	0.15	0.66	0.46	0.56	0.84	0.07
Avail Cap(c_a), veh/h	177	155	132	803	480	576	274	2076	967	296	2076	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.1	55.0	52.7	46.8	37.0	14.5	44.4	28.8	12.6	45.0	32.0	12.8
Incr Delay (d2), s/veh	5.3	102.0	1.6	12.3	0.2	0.1	0.1	1.7	1.6	1.5	4.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	9.5	2.2	11.5	5.4	2.7	1.3	12.6	8.3	5.2	18.2	0.8
LnGrp Delay(d),s/veh	61.5	157.0	54.2	59.1	37.2	14.6	44.5	30.5	14.2	46.6	36.4	13.0
LnGrp LOS	E	F	D	E	D	B	D	C	B	D	D	B
Approach Vol, veh/h		313			991			1861			1966	
Approach Delay, s/veh		112.1			47.6			26.9			36.7	
Approach LOS		F			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.7	55.0	31.3	17.0	16.7	55.0	10.4	37.9
Change Period (Y+Rc), s	* 4	6.0	* 7	* 7	* 4	6.0	4.0	* 7
Max Green Setting (Gmax), s	* 12	49.0	* 28	* 10	* 12	49.0	12.0	* 26
Max Q Clear Time (g_c+I1), s	5.1	28.3	23.6	12.0	2.0	39.3	6.9	12.5
Green Ext Time (p_c), s	0.1	2.2	0.7	0.0	0.1	2.8	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	39.9
HCM 2010 LOS	D

Notes

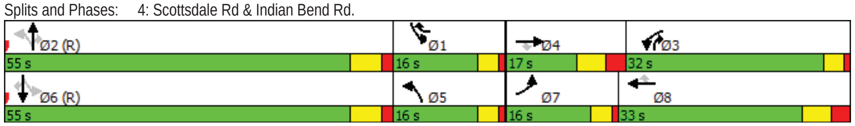
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	16	55	32	17	16	55	16	33
Maximum Split (%)	13.3%	45.8%	26.7%	14.2%	13.3%	45.8%	13.3%	27.5%
Minimum Split (s)	9.4	29.4	8.5	13	8.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	85	30	118	101	85	30	101	117
End Time (s)	101	85	30	118	101	85	117	30
Yield/Force Off (s)	97	79	26	111	97	79	113	23
Yield/Force Off 170(s)	97	63	26	80	97	63	113	112
Local Start Time (s)	55	0	88	71	55	0	71	87
Local Yield (s)	67	49	116	81	67	49	83	113
Local Yield 170(s)	67	33	116	50	67	33	83	82

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90

Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	62	0	0	8	0	1683	4	1	2109	28
Future Vol, veh/h	0	0	62	0	0	8	0	1683	4	1	2109	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	150	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	67	0	0	9	0	1829	4	1	2292	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3027	4129	1146	2751	4127	917	2292	0	0	1834	0	0
Stage 1	2295	2295	-	1832	1832	-	-	-	-	-	-	-
Stage 2	732	1834	-	919	2295	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	14	2	166	21	2	236	89	-	-	152	-	-
Stage 1	23	73	-	51	126	-	-	-	-	-	-	-
Stage 2	344	125	-	264	73	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	13	2	166	12	2	236	89	-	-	152	-	-
Mov Cap-2 Maneuver	13	2	-	12	2	-	-	-	-	-	-	-
Stage 1	23	73	-	51	126	-	-	-	-	-	-	-
Stage 2	331	125	-	156	73	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	40.8	20.8	0	0
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	89	-	-	166	236	152	-	-
HCM Lane V/C Ratio	-	-	-	0.406	0.037	0.007	-	-
HCM Control Delay (s)	0	-	-	40.8	20.8	28.9	-	-
HCM Lane LOS	A	-	-	E	C	D	-	-
HCM 95th %tile Q(veh)	0	-	-	1.8	0.1	0	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	43	194	1616	2212	117
Future Volume (veh/h)	34	43	194	1616	2212	117
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	37	47	211	1757	2404	127
Adj No. of Lanes	2	1	2	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	127	540	1177	4425	2641	822
Arrive On Green	0.04	0.04	0.30	0.87	0.52	0.52
Sat Flow, veh/h	3442	1583	3442	5253	5253	1583
Grp Volume(v), veh/h	37	47	211	1757	2404	127
Grp Sat Flow(s),veh/h/ln	1721	1583	1721	1695	1695	1583
Q Serve(g_s), s	1.4	0.0	0.7	8.8	55.6	5.4
Cycle Q Clear(g_c), s	1.4	0.0	0.7	8.8	55.6	5.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	127	540	1177	4425	2641	822
V/C Ratio(X)	0.29	0.09	0.18	0.40	0.91	0.15
Avail Cap(c_a), veh/h	806	852	1177	4425	2641	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.74	0.74	1.00	1.00
Uniform Delay (d), s/veh	60.5	28.9	30.9	1.7	28.3	16.2
Incr Delay (d2), s/veh	1.3	0.1	0.1	0.2	6.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.7	2.6	4.1	27.3	2.5
LnGrp Delay(d),s/veh	61.7	28.9	30.9	1.9	34.3	16.6
LnGrp LOS	E	C	C	A	C	B
Approach Vol, veh/h	84			1968	2531	
Approach Delay, s/veh	43.4			5.0	33.4	
Approach LOS	D			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		118.2		10.8	45.2	73.0		
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6		
Max Green Setting (Gmax), s		* 87		30.2	* 16	* 67		
Max Q Clear Time (g_c+I1), s		10.8		3.4	2.7	57.6		
Green Ext Time (p_c), s		27.4		0.2	10.1	8.6		

Intersection Summary	
HCM 2010 Ctrl Delay	21.4
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

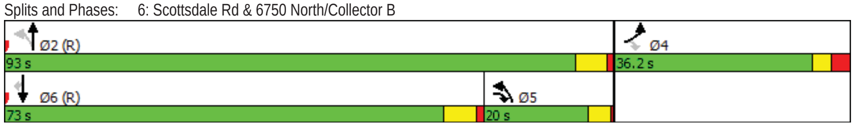
Timing Report, Sorted By Phase
6: Scottsdale Rd & 6750 North/Collector B

11/5/2015

Phase Number	2	4	5	6
Movement	NBTL	EBL	NBL	SBT
Lead/Lag			Lag	Lead
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	93	36.2	20	73
Maximum Split (%)	72.0%	28.0%	15.5%	56.5%
Minimum Split (s)	36	36.2	8	36.9
Yellow Time (s)	4.9	3	3.5	4.9
All-Red Time (s)	1.1	3	0.5	1.1
Minimum Initial (s)	10	5	4	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8	8		8
Flash Dont Walk (s)	22	19		22
Dual Entry	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	65	28.8	8.8	65
End Time (s)	28.8	65	28.8	8.8
Yield/Force Off (s)	22.8	59	24.8	2.8
Yield/Force Off 170(s)	0.8	40	24.8	110
Local Start Time (s)	0	93	73	0
Local Yield (s)	87	123.2	89	67
Local Yield 170(s)	65	104.2	89	45

Intersection Summary	
Cycle Length	129.2
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 65 (50%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



HCM 2010 Signalized Intersection Summary
7: Tatum Blvd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	171	794	69	296	744	103	49	555	421	314	941	404
Future Volume (veh/h)	171	794	69	296	744	103	49	555	421	314	941	404
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	186	863	75	322	809	112	53	603	458	341	1023	439
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	238	887	77	252	1090	488	174	1065	476	397	1470	658
Arrive On Green	0.07	0.27	0.27	0.11	0.31	0.31	0.03	0.30	0.30	0.15	0.42	0.42
Sat Flow, veh/h	3442	3295	286	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	186	463	475	322	809	112	53	603	458	341	1023	439
Grp Sat Flow(s),veh/h/ln	1721	1770	1812	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	6.9	33.7	33.7	14.0	26.7	6.8	2.7	18.7	37.0	16.7	30.9	29.2
Cycle Q Clear(g_c), s	6.9	33.7	33.7	14.0	26.7	6.8	2.7	18.7	37.0	16.7	30.9	29.2
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	238	476	488	252	1090	488	174	1065	476	397	1471	658
V/C Ratio(X)	0.78	0.97	0.97	1.28	0.74	0.23	0.30	0.57	0.96	0.86	0.70	0.67
Avail Cap(c_a), veh/h	318	476	488	252	1090	488	174	1065	476	521	1471	658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.6	47.0	47.0	37.1	40.4	33.5	31.1	38.3	44.7	27.3	31.2	30.7
Incr Delay (d2), s/veh	6.1	35.0	34.5	148.5	4.0	1.0	0.4	2.2	32.7	8.9	2.7	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	21.1	21.6	19.4	13.6	3.1	1.3	9.5	20.5	9.0	15.6	13.6
LnGrp Delay(d),s/veh	65.7	82.0	81.5	185.6	44.4	34.5	31.5	40.5	77.4	36.2	34.0	36.0
LnGrp LOS	E	F	F	F	D	C	C	D	E	D	C	D
Approach Vol, veh/h		1124			1243			1114			1803	
Approach Delay, s/veh		79.1			80.1			55.2			34.9	
Approach LOS		E			F			E			C	

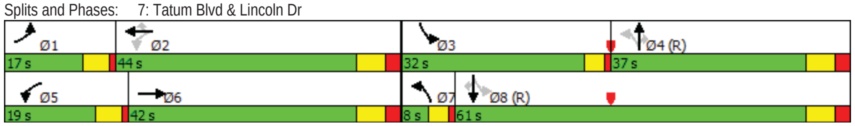
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	47.0	22.9	46.1	19.0	42.0	8.0	61.0
Change Period (Y+Rc), s	5.0	7.0	4.0	7.0	5.0	7.0	4.0	7.0
Max Green Setting (Gmax), s	12.0	37.0	28.0	30.0	14.0	35.0	4.0	54.0
Max Q Clear Time (g_c+I1), s	8.9	28.7	18.7	39.0	16.0	35.7	4.7	32.9
Green Ext Time (p_c), s	0.1	7.8	0.2	0.0	0.0	0.0	0.0	20.1

Intersection Summary	
HCM 2010 Ctrl Delay	59.2
HCM 2010 LOS	E

Phase Number	1	2	3	4	5	6	7	8
Movement	EBL	WBTL	SBL	NBTL	WBL	EBT	NBL	SBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	17	44	32	37	19	42	8	61
Maximum Split (%)	13.1%	33.8%	24.6%	28.5%	14.6%	32.3%	6.2%	46.9%
Minimum Split (s)	9	35	8	36	9	35	8	36
Yellow Time (s)	4	4.5	3	4.5	4	4.5	3	4.5
All-Red Time (s)	1	2.5	1	2.5	1	2.5	1	2.5
Minimum Initial (s)	4	15	4	15	4	15	4	15
Vehicle Extension (s)	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		23		24		23		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	101	15	47	84	103	15	23
End Time (s)	101	15	47	84	103	15	23	84
Yield/Force Off (s)	96	8	43	77	98	8	19	77
Yield/Force Off 170(s)	96	115	43	53	98	115	19	53
Local Start Time (s)	37	54	98	0	37	56	98	106
Local Yield (s)	49	91	126	30	51	91	102	30
Local Yield 170(s)	49	68	126	6	51	68	102	6

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 47 (36%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	

Splits and Phases: 7: Tatum Blvd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1109	205	57	1042	22	107	4	97	19	11	5
Future Volume (veh/h)	10	1109	205	57	1042	22	107	4	97	19	11	5
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	11	1205	223	62	1133	24	116	4	105	21	12	5
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	350	1979	364	267	2349	50	326	9	224	149	75	22
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	484	2987	549	373	3544	75	1390	58	1534	460	516	148
Grp Volume(v), veh/h	11	711	717	62	566	591	116	0	109	38	0	0
Grp Sat Flow(s),veh/h/ln	484	1770	1766	373	1770	1849	1390	0	1592	1124	0	0
Q Serve(g_s), s	0.8	15.4	15.7	7.7	10.8	10.8	0.0	0.0	4.3	0.1	0.0	0.0
Cycle Q Clear(g_c), s	11.6	15.4	15.7	23.4	10.8	10.8	4.4	0.0	4.3	4.3	0.0	0.0
Prop In Lane	1.00		0.31	1.00		0.04	1.00		0.96	0.55		0.13
Lane Grp Cap(c), veh/h	350	1173	1170	267	1173	1226	326	0	233	246	0	0
V/C Ratio(X)	0.03	0.61	0.61	0.23	0.48	0.48	0.36	0.00	0.47	0.15	0.00	0.00
Avail Cap(c_a), veh/h	350	1173	1170	267	1173	1226	614	0	562	549	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.37	0.37	0.37	0.79	0.79	0.79	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.5	6.5	6.5	13.1	5.7	5.7	26.7	0.0	26.6	25.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.9	0.9	1.6	1.1	1.1	0.7	0.0	1.5	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	7.6	7.9	0.9	5.6	5.8	2.1	0.0	2.0	0.6	0.0	0.0
LnGrp Delay(d),s/veh	8.6	7.3	7.4	14.8	6.8	6.8	27.3	0.0	28.1	25.7	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	C		C	C		
Approach Vol, veh/h		1439			1219			225			38	
Approach Delay, s/veh		7.4			7.2			27.7			25.7	
Approach LOS		A			A			C			C	

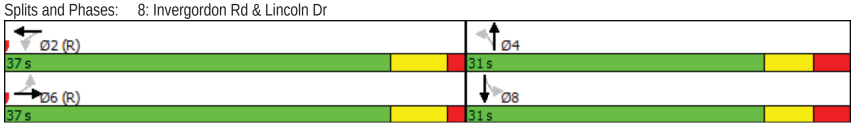
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.1		16.9		51.1		16.9
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0
Max Green Setting (Gmax), s		31.0		24.0		31.0		24.0
Max Q Clear Time (g_c+I1), s		25.4		6.4		17.7		6.3
Green Ext Time (p_c), s		5.3		1.1		11.9		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.1
HCM 2010 LOS	A

Phase Number	2	4	6	8
Movement	WBTL	NBTL	EBTL	SBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	37	31	37	31
Maximum Split (%)	54.4%	45.6%	54.4%	45.6%
Minimum Split (s)	24	31	24	17
Yellow Time (s)	4.5	4	4.5	4
All-Red Time (s)	1.5	3	1.5	3
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	
Flash Dont Walk (s)	11	17	11	
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	59	28	59	28
End Time (s)	28	59	28	59
Yield/Force Off (s)	22	52	22	52
Yield/Force Off 170(s)	11	35	11	52
Local Start Time (s)	0	37	0	37
Local Yield (s)	31	61	31	61
Local Yield 170(s)	20	44	20	61

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 59 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 8: Invergordon Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	257	1149	35	26	962	23	17	57	35	94	115	322
Future Volume (veh/h)	257	1149	35	26	962	23	17	57	35	94	115	322
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	279	1249	38	28	1046	25	18	62	38	102	125	350
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	574	2297	70	125	1250	30	199	169	104	300	464	394
Arrive On Green	0.25	0.65	0.65	0.71	0.71	0.71	0.16	0.16	0.16	0.06	0.25	0.25
Sat Flow, veh/h	1774	3507	107	427	3533	84	915	1082	663	1774	1863	1583
Grp Volume(v), veh/h	279	630	657	28	524	547	18	0	100	102	125	350
Grp Sat Flow(s),veh/h/ln	1774	1770	1844	427	1770	1848	915	0	1746	1774	1863	1583
Q Serve(g_s), s	7.5	24.8	24.8	6.6	27.6	27.6	2.2	0.0	6.7	6.1	7.0	27.7
Cycle Q Clear(g_c), s	7.5	24.8	24.8	31.4	27.6	27.6	2.2	0.0	6.7	6.1	7.0	27.7
Prop In Lane	1.00		0.06	1.00		0.05	1.00		0.38	1.00		1.00
Lane Grp Cap(c), veh/h	574	1159	1208	125	626	654	199	0	273	300	464	394
V/C Ratio(X)	0.49	0.54	0.54	0.22	0.84	0.84	0.09	0.00	0.37	0.34	0.27	0.89
Avail Cap(c_a), veh/h	574	1159	1208	125	626	654	270	0	410	423	738	627
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.78	0.84	0.84	0.84	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	12.0	12.0	26.5	16.3	16.3	47.2	0.0	49.1	40.8	39.3	47.1
Incr Delay (d2), s/veh	0.5	1.4	1.4	3.5	10.8	10.4	0.2	0.0	0.8	0.7	0.3	9.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	12.5	13.1	0.9	15.0	15.6	0.6	0.0	3.3	3.0	3.7	13.1
LnGrp Delay(d),s/veh	35.8	13.4	13.4	30.0	27.1	26.7	47.4	0.0	49.9	41.5	39.6	56.5
LnGrp LOS	D	B	B	C	C	C	D		D	D	D	E
Approach Vol, veh/h		1566			1099			118			577	
Approach Delay, s/veh		17.4			26.9			49.5			50.2	
Approach LOS		B			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6		8
Phs Duration (G+Y+Rc), s	39.1	52.0	12.0	26.8		91.1		38.9
Change Period (Y+Rc), s	6.0	* 6	4.0	6.5		6.0		6.5
Max Green Setting (Gmax), s	16.0	* 46	17.0	30.5		66.0		51.5
Max Q Clear Time (g_c+I1), s	9.5	33.4	8.1	8.7		26.8		29.7
Green Ext Time (p_c), s	4.5	6.0	0.1	2.6		13.4		2.6

Intersection Summary	
HCM 2010 Ctrl Delay	27.3
HCM 2010 LOS	C

Notes

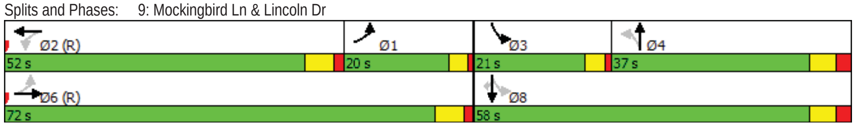
User approved pedestrian interval to be less than phase max green.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	6	8
Movement	EBL	WBTL	SBL	NBTL	EBTL	SBTL
Lead/Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	20	52	21	37	72	58
Maximum Split (%)	15.4%	40.0%	16.2%	28.5%	55.4%	44.6%
Minimum Split (s)	8	27	8	34	27	34
Yellow Time (s)	3	4.5	3	4	4.5	4
All-Red Time (s)	1	1.5	1	2.5	1.5	2.5
Minimum Initial (s)	4	15	4	7	15	7
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7		7	7	7
Flash Dont Walk (s)		14		20	14	20
Dual Entry	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	50	128	70	91	128	70
End Time (s)	70	50	91	128	70	128
Yield/Force Off (s)	66	44	87	121.5	64	121.5
Yield/Force Off 170(s)	66	30	87	101.5	50	101.5
Local Start Time (s)	52	0	72	93	0	72
Local Yield (s)	68	46	89	123.5	66	123.5
Local Yield 170(s)	68	32	89	103.5	52	103.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 128 (98%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 9: Mockingbird Ln & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	1135	5	5	1220	27	5	0	5	50	0	91
Future Volume (veh/h)	157	1135	5	5	1220	27	5	0	5	50	0	91
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	171	1234	5	5	1326	29	5	0	5	54	0	99
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	368	2976	12	392	2665	58	78	13	50	179	0	128
Arrive On Green	0.08	1.00	1.00	0.75	0.75	0.75	0.08	0.00	0.08	0.08	0.00	0.08
Sat Flow, veh/h	1774	3615	15	447	3541	77	457	159	616	1538	0	1583
Grp Volume(v), veh/h	171	604	635	5	662	693	10	0	0	54	0	99
Grp Sat Flow(s),veh/h/ln	1774	1770	1860	447	1770	1849	1231	0	0	1538	0	1583
Q Serve(g_s), s	2.9	0.0	0.0	0.4	19.2	19.3	0.0	0.0	0.0	0.0	0.0	8.0
Cycle Q Clear(g_c), s	2.9	0.0	0.0	0.4	19.2	19.3	3.8	0.0	0.0	3.8	0.0	8.0
Prop In Lane	1.00		0.01	1.00		0.04	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	368	1457	1531	392	1332	1392	141	0	0	179	0	128
V/C Ratio(X)	0.46	0.41	0.41	0.01	0.50	0.50	0.07	0.00	0.00	0.30	0.00	0.78
Avail Cap(c_a), veh/h	516	1457	1531	392	1332	1392	322	0	0	358	0	329
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	0.71	0.71	0.71	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.4	0.0	0.0	4.0	6.4	6.4	55.3	0.0	0.0	56.7	0.0	58.6
Incr Delay (d2), s/veh	0.8	0.7	0.7	0.0	0.9	0.9	0.2	0.0	0.0	0.9	0.0	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.3	0.3	0.0	9.5	10.0	0.3	0.0	0.0	1.9	0.0	3.8
LnGrp Delay(d),s/veh	6.2	0.7	0.7	4.1	7.3	7.3	55.5	0.0	0.0	57.6	0.0	68.2
LnGrp LOS	A	A	A	A	A	A	E			E		E
Approach Vol, veh/h		1410			1360			10			153	
Approach Delay, s/veh		1.4			7.3			55.5			64.5	
Approach LOS		A			A			E			E	

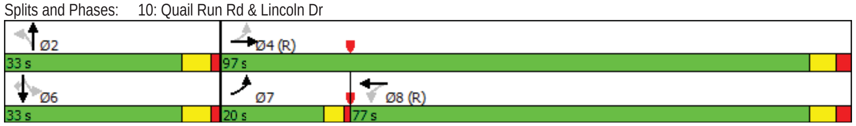
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		16.5		113.5		16.5	9.2	104.3
Change Period (Y+Rc), s		6.0		6.5		6.0	4.0	6.5
Max Green Setting (Gmax), s		27.0		90.5		27.0	16.0	70.5
Max Q Clear Time (g_c+I1), s		5.8		2.0		10.0	4.9	21.3
Green Ext Time (p_c), s		0.6		45.4		0.5	0.3	32.8

Intersection Summary		
HCM 2010 Ctrl Delay		7.6
HCM 2010 LOS		A

Phase Number	2	4	6	7	8
Movement	NBTL	EBTL	SBTL	EBL	WBTL
Lead/Lag				Lead	Lag
Lead-Lag Optimize				Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max
Maximum Split (s)	33	97	33	20	77
Maximum Split (%)	25.4%	74.6%	25.4%	15.4%	59.2%
Minimum Split (s)	33	28	33	8	28
Yellow Time (s)	4.5	4	4.5	3	4
All-Red Time (s)	1.5	2.5	1.5	1	2.5
Minimum Initial (s)	7	15	7	4	15
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7	7		7
Flash Dont Walk (s)	20	14	20		14
Dual Entry	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	54	87	54	87	107
End Time (s)	87	54	87	107	54
Yield/Force Off (s)	81	47.5	81	103	47.5
Yield/Force Off 170(s)	61	33.5	61	103	33.5
Local Start Time (s)	77	110	77	110	0
Local Yield (s)	104	70.5	104	126	70.5
Local Yield 170(s)	84	56.5	84	126	56.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 107 (82%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 10: Quail Run Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	666	46	410	25	33	45	299	1236	29	30	1752	664
Future Volume (veh/h)	666	46	410	25	33	45	299	1236	29	30	1752	664
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	760	0	446	27	36	49	325	1343	32	33	1904	722
Adj No. of Lanes	2	0	1	1	2	0	2	3	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	355	0	196	85	85	76	373	3213	77	42	2765	937
Arrive On Green	0.10	0.00	0.10	0.05	0.05	0.05	0.22	1.00	1.00	0.02	0.54	0.54
Sat Flow, veh/h	3548	0	1583	1774	1770	1583	3442	5110	122	1774	5085	1583
Grp Volume(v), veh/h	760	0	446	27	36	49	325	891	484	33	1904	722
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	1770	1583	1721	1695	1841	1774	1695	1583
Q Serve(g_s), s	12.0	0.0	12.0	1.8	2.4	3.6	10.9	0.0	0.0	2.2	32.8	41.1
Cycle Q Clear(g_c), s	12.0	0.0	12.0	1.8	2.4	3.6	10.9	0.0	0.0	2.2	32.8	41.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	355	0	196	85	85	76	373	2131	1158	42	2765	937
V/C Ratio(X)	2.14	0.00	2.28	0.32	0.43	0.65	0.87	0.42	0.42	0.79	0.69	0.77
Avail Cap(c_a), veh/h	355	0	196	281	280	251	430	2131	1158	148	2765	937
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.00	0.91	1.00	1.00	1.00	0.80	0.80	0.80	0.73	0.73	0.73
Uniform Delay (d), s/veh	54.0	0.0	52.6	55.2	55.5	56.1	46.2	0.0	0.0	58.3	20.0	18.4
Incr Delay (d2), s/veh	522.4	0.0	591.0	0.8	1.3	3.4	11.9	0.5	0.9	8.8	1.0	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	31.6	0.0	38.6	0.9	1.2	1.7	5.8	0.1	0.3	1.2	15.4	21.0
LnGrp Delay(d),s/veh	576.4	0.0	643.6	56.0	56.8	59.6	58.1	0.5	0.9	67.1	21.0	22.9
LnGrp LOS	F		F	E	E	E	E	A	A	E	C	C
Approach Vol, veh/h		1206			112			1700			2659	
Approach Delay, s/veh		601.3			57.8			11.6			22.1	
Approach LOS		F			E			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.8	81.4		12.7	17.0	71.3		19.0
Change Period (Y+Rc), s	4.0	6.0		7.0	4.0	6.0		7.0
Max Green Setting (Gmax), s	10.0	55.0		19.0	15.0	50.0		12.0
Max Q Clear Time (g_c+I1), s	4.2	2.0		5.6	12.9	43.1		14.0
Green Ext Time (p_c), s	0.0	7.3		0.2	0.1	4.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	142.7
HCM 2010 LOS	F

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Timing Report, Sorted By Phase
11: Scottsdale Rd & Lincoln Dr

11/5/2015

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	WBTL	NBL	SBT	EBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	14	61	26	19	56	19
Maximum Split (%)	11.7%	50.8%	21.7%	15.8%	46.7%	15.8%
Minimum Split (s)	9	28	40	9	28	40
Yellow Time (s)	3	4.5	4	3	4.5	4
All-Red Time (s)	1	1.5	3	1	1.5	3
Minimum Initial (s)	4	4	4	4	4	4
Vehicle Extension (s)	1	0.2	2	1	0.2	2
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		15	26		15	26
Dual Entry	No	Yes	No	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	71	85	26	71	90	52
End Time (s)	85	26	52	90	26	71
Yield/Force Off (s)	81	20	45	86	20	64
Yield/Force Off 170(s)	81	5	19	86	5	38
Local Start Time (s)	101	115	56	101	0	82
Local Yield (s)	111	50	75	116	50	94
Local Yield 170(s)	111	35	49	116	35	68

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150

Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Splits and Phases: 11: Scottsdale Rd & Lincoln Dr

HCM 2010 AWSC
12: Mockingbird Ln & McDonald Dr

11/5/2015

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	55	229	9	0	8	285	41	0	5	5	5
Future Vol, veh/h	0	55	229	9	0	8	285	41	0	5	5	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	60	249	10	0	9	310	45	0	5	5	5
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	11.2	13.8	9.7
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	33%	100%	0%	100%	0%	100%	0%
Vol Thru, %	33%	0%	96%	0%	87%	0%	7%
Vol Right, %	33%	0%	4%	0%	13%	0%	93%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	55	238	8	326	80	72
LT Vol	5	55	0	8	0	80	0
Through Vol	5	0	229	0	285	0	5
RT Vol	5	0	9	0	41	0	67
Lane Flow Rate	16	60	259	9	354	87	78
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.03	0.098	0.388	0.014	0.522	0.165	0.123
Departure Headway (Hd)	6.53	6.031	5.499	5.901	5.308	6.827	5.662
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	551	598	660	600	670	529	637
Service Time	4.537	3.731	3.199	3.699	3.106	4.529	3.363
HCM Lane V/C Ratio	0.029	0.1	0.392	0.015	0.528	0.164	0.122
HCM Control Delay	9.7	9.4	11.6	8.8	13.9	10.9	9.2
HCM Lane LOS	A	A	B	A	B	B	A
HCM 95th-tile Q	0.1	0.3	1.8	0	3	0.6	0.4

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	80	5	67
Future Vol, veh/h	0	80	5	67
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	87	5	73
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	10.1
HCM LOS	B

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	240	35	301	347	326	47	1152	143	209	1833	72
Future Volume (veh/h)	125	240	35	301	347	326	47	1152	143	209	1833	72
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	136	261	38	327	377	354	51	1252	155	227	1992	78
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	203	341	49	281	497	590	412	1907	594	798	1907	594
Arrive On Green	0.08	0.11	0.11	0.11	0.14	0.14	0.23	0.38	0.38	0.31	0.50	0.50
Sat Flow, veh/h	1774	3106	447	1774	3539	1583	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	136	147	152	327	377	354	51	1252	155	227	1992	78
Grp Sat Flow(s),veh/h/ln	1774	1770	1784	1774	1770	1583	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	4.4	9.7	9.9	13.0	12.3	0.0	2.7	24.5	8.1	6.0	45.0	3.2
Cycle Q Clear(g_c), s	4.4	9.7	9.9	13.0	12.3	0.0	2.7	24.5	8.1	6.0	45.0	3.2
Prop In Lane	1.00		0.25	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	194	196	281	497	590	412	1907	594	798	1907	594
V/C Ratio(X)	0.67	0.76	0.78	1.16	0.76	0.60	0.12	0.66	0.26	0.28	1.04	0.13
Avail Cap(c_a), veh/h	257	339	342	281	678	671	412	1907	594	798	1907	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.48	0.48	0.48
Uniform Delay (d), s/veh	52.0	51.9	52.0	51.3	49.6	30.4	36.4	31.1	26.0	33.9	30.1	19.6
Incr Delay (d2), s/veh	4.6	6.0	6.4	105.1	3.4	1.2	0.1	1.8	1.1	0.1	27.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	5.1	5.2	17.5	6.3	9.6	1.3	11.8	3.7	2.9	25.8	1.4
LnGrp Delay(d),s/veh	56.6	57.9	58.4	156.4	53.0	31.6	36.6	32.9	27.0	34.0	57.8	19.8
LnGrp LOS	E	E	E	F	D	C	D	C	C	C	F	B
Approach Vol, veh/h		435			1058			1458			2297	
Approach Delay, s/veh		57.7			77.8			32.4			54.1	
Approach LOS		E			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.8	51.0	17.0	20.2	31.8	51.0	13.3	23.8
Change Period (Y+Rc), s	4.0	6.0	* 4	7.0	4.0	6.0	* 4	7.0
Max Green Setting (Gmax), s	18.0	45.0	* 13	23.0	18.0	45.0	* 13	23.0
Max Q Clear Time (g_c+I1), s	8.0	26.5	15.0	11.9	4.7	47.0	6.4	14.3
Green Ext Time (p_c), s	0.7	9.4	0.0	1.2	0.7	0.0	0.9	2.5

Intersection Summary	
HCM 2010 Ctrl Delay	53.2
HCM 2010 LOS	D

Notes

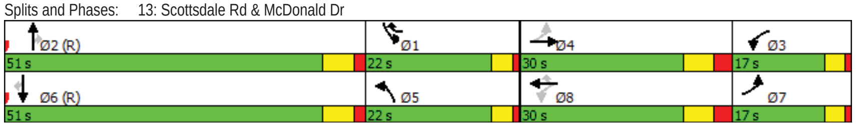
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	51	17	30	22	51	17	30
Maximum Split (%)	18.3%	42.5%	14.2%	25.0%	18.3%	42.5%	14.2%	25.0%
Minimum Split (s)	14	31	10	37	14	31	10	37
Yellow Time (s)	3	4.5	3	4.3	3	4.5	3	4.3
All-Red Time (s)	1	1.5	1	2.7	1	1.5	1	2.7
Minimum Initial (s)	10	20	6	8	10	20	6	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		9		6		9		6
Flash Dont Walk (s)		16		24		16		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	81	30	13	103	81	30	13	103
End Time (s)	103	81	30	13	103	81	30	13
Yield/Force Off (s)	99	75	26	6	99	75	26	6
Yield/Force Off 170(s)	99	59	26	102	99	59	26	102
Local Start Time (s)	51	0	103	73	51	0	103	73
Local Yield (s)	69	45	116	96	69	45	116	96
Local Yield 170(s)	69	29	116	72	69	29	116	72

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	105

Offset: 30 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Splits and Phases: 13: Scottsdale Rd & McDonald Dr



Intersection			
Intersection Delay, s/veh	5.0		
Intersection LOS	A		

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	181	224	61
Demand Flow Rate, veh/h	184	228	63
Vehicles Circulating, veh/h	22	25	168
Vehicles Exiting, veh/h	231	205	38
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.8	5.2	4.5
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	184	228	63
Cap Entry Lane, veh/h	1105	1102	955
Entry HV Adj Factor	0.982	0.982	0.968
Flow Entry, veh/h	181	224	61
Cap Entry, veh/h	1086	1083	925
V/C Ratio	0.166	0.207	0.066
Control Delay, s/veh	4.8	5.2	4.5
LOS	A	A	A
95th %tile Queue, veh	1	1	0

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	183	3	6	193	13	29
Future Vol, veh/h	183	3	6	193	13	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	199	3	7	210	14	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	202	0	424	201
Stage 1	-	-	-	-	201	-
Stage 2	-	-	-	-	223	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1370	-	587	840
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	814	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1370	-	584	840
Mov Cap-2 Maneuver	-	-	-	-	641	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	810	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	766	-	-	1370	-
HCM Lane V/C Ratio	0.06	-	-	0.005	-
HCM Control Delay (s)	10	-	-	7.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	239	17	40	215	23	54
Future Vol, veh/h	239	17	40	215	23	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	260	18	43	234	25	59

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	278	0	473	269
Stage 1	-	-	-	-	269	-
Stage 2	-	-	-	-	204	-
Critical Hdwy	-	-	4.12	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.218	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1285	-	535	769
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	811	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1285	-	517	769
Mov Cap-2 Maneuver	-	-	-	-	592	-
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	784	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	706	-	-	1285	-
HCM Lane V/C Ratio	0.119	-	-	0.034	-
HCM Control Delay (s)	10.8	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	3	1	0	1710	1840	6
Future Vol, veh/h	3	1	0	1710	1840	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	1	0	1859	2000	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2743	1000	2000	0	-	0
Stage 1	2000	-	-	-	-	-
Stage 2	743	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	37	207	125	-	-	-
Stage 1	57	-	-	-	-	-
Stage 2	392	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	37	207	125	-	-	-
Mov Cap-2 Maneuver	37	-	-	-	-	-
Stage 1	57	-	-	-	-	-
Stage 2	392	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	125	-	207	-	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	0	-	22.5	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	44	0	0	13	21	14
Future Vol, veh/h	44	0	0	13	21	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	0	0	14	23	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	44	30	38	0	-	0
Stage 1	30	-	-	-	-	-
Stage 2	14	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	967	1044	1572	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	1009	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	967	1044	1572	-	-	-
Mov Cap-2 Maneuver	967	-	-	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1572	-	967	-	-
HCM Lane V/C Ratio	-	-	0.049	-	-
HCM Control Delay (s)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	10	5	7	22	11	10
Future Vol, veh/h	10	5	7	22	11	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	5	8	24	12	11

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	55	20	0	0	32	0
Stage 1	20	-	-	-	-	-
Stage 2	35	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	953	1058	-	-	1580	-
Stage 1	1003	-	-	-	-	-
Stage 2	987	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	945	1058	-	-	1580	-
Mov Cap-2 Maneuver	945	-	-	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	979	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	3.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	980	1580	-
HCM Lane V/C Ratio	-	-	0.017	0.008	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection						
Int Delay, s/veh	2.8					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	15	5	25	19	8	13
Future Vol, veh/h	15	5	25	19	8	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	5	27	21	9	14

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	70	38	0	0	48	0
Stage 1	38	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	934	1034	-	-	1559	-
Stage 1	984	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	928	1034	-	-	1559	-
Mov Cap-2 Maneuver	928	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	985	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	2.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	952	1559	-
HCM Lane V/C Ratio	-	-	0.023	0.006	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection						
Int Delay, s/veh	2.7					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	15	9	33	18	9	20
Future Vol, veh/h	15	9	33	18	9	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	10	36	20	10	22

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	87	46	0	0	55	0
Stage 1	46	-	-	-	-	-
Stage 2	41	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	914	1023	-	-	1550	-
Stage 1	976	-	-	-	-	-
Stage 2	981	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	908	1023	-	-	1550	-
Mov Cap-2 Maneuver	908	-	-	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	974	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	2.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	948	1550	-
HCM Lane V/C Ratio	-	-	0.028	0.006	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

29: Collector B/6750 North/Collector B & Collector C

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	19	8	12	160	49	13
Future Vol, veh/h	19	8	12	160	49	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	9	13	174	53	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	187	0	-	0	150	100
Stage 1	-	-	-	-	100	-
Stage 2	-	-	-	-	50	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1387	-	-	-	842	956
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	972	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1387	-	-	-	829	956
Mov Cap-2 Maneuver	-	-	-	-	806	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	957	-

Approach	EB	WB	SB
HCM Control Delay, s	5.4	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1387	-	-	-	833
HCM Lane V/C Ratio	0.015	-	-	-	0.081
HCM Control Delay (s)	7.6	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3

30: Quail Run Rd/Hotel Access & Collector A

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	31	4	67	49	1	26
Future Vol, veh/h	31	4	67	49	1	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	4	73	53	1	28

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	129	99	0	0	126	0
Stage 1	99	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	865	957	-	-	1460	-
Stage 1	925	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	864	957	-	-	1460	-
Mov Cap-2 Maneuver	864	-	-	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	992	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	874	1460	-
HCM Lane V/C Ratio	-	-	0.044	0.001	-
HCM Control Delay (s)	-	-	9.3	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Intersection Delay, s/veh	4.4
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	33	22	192	62
Demand Flow Rate, veh/h	34	22	196	63
Vehicles Circulating, veh/h	85	140	0	33
Vehicles Exiting, veh/h	11	56	119	129
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.9	3.9	4.8	3.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	34	22	196	63
Cap Entry Lane, veh/h	1038	982	1130	1093
Entry HV Adj Factor	0.971	1.000	0.982	0.980
Flow Entry, veh/h	33	22	192	62
Cap Entry, veh/h	1007	982	1110	1072
V/C Ratio	0.033	0.022	0.173	0.058
Control Delay, s/veh	3.9	3.9	4.8	3.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	0

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	34	0	177	7	0	107
Future Vol, veh/h	34	0	177	7	0	107
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	0	192	8	0	116

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	312	196	0	0	200	0
Stage 1	196	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	681	845	-	-	1372	-
Stage 1	837	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	681	845	-	-	1372	-
Mov Cap-2 Maneuver	681	-	-	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	909	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	681	1372	-
HCM Lane V/C Ratio	-	-	0.054	-	-
HCM Control Delay (s)	-	-	10.6	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	4	32	222	0	19	17	4	0	297	40	47
Future Vol, veh/h	0	4	32	222	0	19	17	4	0	297	40	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	35	241	0	21	18	4	0	323	43	51
Number of Lanes	0	1	1	0	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	11.4	9.8	13.7
HCM LOS	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	47%	4%
Vol Thru, %	0%	46%	0%	13%	43%	82%
Vol Right, %	0%	54%	0%	87%	10%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	297	87	4	254	40	28
LT Vol	297	0	4	0	19	1
Through Vol	0	40	0	32	17	23
RT Vol	0	47	0	222	4	4
Lane Flow Rate	323	95	4	276	43	30
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.529	0.132	0.008	0.399	0.076	0.051
Departure Headway (Hd)	5.9	5.017	6.319	5.197	6.271	6.007
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	604	705	563	687	574	599
Service Time	3.698	2.814	4.095	2.973	4.273	4.011
HCM Lane V/C Ratio	0.535	0.135	0.007	0.402	0.075	0.05
HCM Control Delay	15.2	8.6	9.1	11.4	9.8	9.3
HCM Lane LOS	C	A	A	B	A	A
HCM 95th-tile Q	3.1	0.5	0	1.9	0.2	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	1	23	4
Future Vol, veh/h	0	1	23	4
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	25	4
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9.3
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	4.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	149	82	327	175	72	197
Future Vol, veh/h	149	82	327	175	72	197
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	162	89	355	190	78	214

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	822	451	0	0	546	0
Stage 1	451	-	-	-	-	-
Stage 2	371	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	344	608	-	-	1023	-
Stage 1	642	-	-	-	-	-
Stage 2	698	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	318	608	-	-	1023	-
Mov Cap-2 Maneuver	439	-	-	-	-	-
Stage 1	642	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	2.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	439	608	1023	-
HCM Lane V/C Ratio	-	-	0.369	0.147	0.077	-
HCM Control Delay (s)	-	-	17.9	11.9	8.8	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.7	0.5	0.2	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	4	221	5	78	268	15	5	0	155	4	0	4
Future Vol, veh/h	4	221	5	78	268	15	5	0	155	4	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	240	5	85	291	16	5	0	168	4	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	308	0	0	246	0	0	723	729	243	805	723	299
Stage 1	-	-	-	-	-	-	252	252	-	469	469	-
Stage 2	-	-	-	-	-	-	471	477	-	336	254	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1253	-	-	1320	-	-	342	350	796	301	352	741
Stage 1	-	-	-	-	-	-	752	698	-	575	561	-
Stage 2	-	-	-	-	-	-	573	556	-	678	697	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1253	-	-	1320	-	-	322	326	796	225	328	741
Mov Cap-2 Maneuver	-	-	-	-	-	-	322	326	-	225	328	-
Stage 1	-	-	-	-	-	-	750	696	-	573	525	-
Stage 2	-	-	-	-	-	-	533	520	-	533	695	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.7	11.1	15.7
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	761	1253	-	-	1320	-	-	345
HCM Lane V/C Ratio	0.229	0.003	-	-	0.064	-	-	0.025
HCM Control Delay (s)	11.1	7.9	-	-	7.9	-	-	15.7
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.9	0	-	-	0.2	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	156	241	69	478	281	132	113	1871	515	182	1628	78
Future Volume (veh/h)	156	241	69	478	281	132	113	1871	515	182	1628	78
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	170	262	75	520	305	143	123	2034	560	198	1770	85
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	196	171	145	580	325	458	293	2161	940	268	2161	673
Arrive On Green	0.11	0.09	0.09	0.17	0.17	0.17	0.11	0.43	0.43	0.11	0.43	0.43
Sat Flow, veh/h	1774	1863	1583	3442	1863	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	170	262	75	520	305	143	123	2034	560	198	1770	85
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1721	1863	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	11.3	11.0	5.4	17.8	19.4	1.7	1.4	46.0	6.4	8.4	36.8	2.6
Cycle Q Clear(g_c), s	11.3	11.0	5.4	17.8	19.4	1.7	1.4	46.0	6.4	8.4	36.8	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	196	171	145	580	325	458	293	2161	940	268	2161	673
V/C Ratio(X)	0.87	1.53	0.52	0.90	0.94	0.31	0.42	0.94	0.60	0.74	0.82	0.13
Avail Cap(c_a), veh/h	207	171	145	660	325	458	296	2161	940	272	2161	673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.5	54.5	52.0	48.8	48.9	16.2	45.5	33.1	15.3	49.3	30.4	9.2
Incr Delay (d2), s/veh	27.4	267.7	1.5	12.8	33.4	0.1	0.4	9.7	2.8	8.8	3.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	18.3	2.4	9.5	13.0	2.5	3.7	23.4	3.3	6.9	17.9	1.2
LnGrp Delay(d),s/veh	79.9	322.2	53.4	61.6	82.3	16.4	45.8	42.8	18.1	58.1	34.0	9.6
LnGrp LOS	E	F	D	E	F	B	D	D	B	E	C	A
Approach Vol, veh/h		507			968			2717			2053	
Approach Delay, s/veh		201.2			61.5			37.8			35.3	
Approach LOS		F			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.8	57.0	27.2	18.0	17.8	57.0	17.3	28.0
Change Period (Y+Rc), s	* 4	6.0	* 7	* 7	* 4	6.0	4.0	* 7
Max Green Setting (Gmax), s	* 14	51.0	* 23	* 11	* 14	51.0	14.0	* 20
Max Q Clear Time (g_c+I1), s	10.4	48.0	19.8	13.0	3.4	38.8	13.3	21.4
Green Ext Time (p_c), s	0.1	1.6	0.5	0.0	0.1	3.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	53.9
HCM 2010 LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

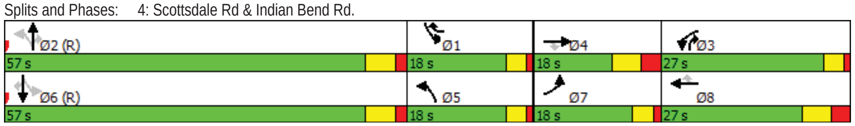
Timing Report, Sorted By Phase
4: Scottsdale Rd & Indian Bend Rd.

11/5/2015

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	18	57	27	18	18	57	18	27
Maximum Split (%)	15.0%	47.5%	22.5%	15.0%	15.0%	47.5%	15.0%	22.5%
Minimum Split (s)	9.4	29.4	8.5	13	9.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	87	30	3	105	87	30	105	3
End Time (s)	105	87	30	3	105	87	3	30
Yield/Force Off (s)	101	81	26	116	101	81	119	23
Yield/Force Off 170(s)	101	65	26	85	101	65	119	112
Local Start Time (s)	57	0	93	75	57	0	75	93
Local Yield (s)	71	51	116	86	71	51	89	113
Local Yield 170(s)	71	35	116	55	71	35	89	82

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



HCM 2010 TWSC
5: Scottsdale Rd & Joshua Tree Ln

11/5/2015

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	115	0	0	10	0	2455	6	9	2171	79
Future Vol, veh/h	0	0	115	0	0	10	0	2455	6	9	2171	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	150	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	125	0	0	11	0	2668	7	10	2360	86

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3446	5054	1180	3635	5051	1338	2360	0	0	2675	0	0
Stage 1	2379	2379	-	2672	2672	-	-	-	-	-	-	-
Stage 2	1067	2675	-	963	2379	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	7	1	157	6	1	123	82	-	-	56	-	-
Stage 1	20	66	-	12	46	-	-	-	-	-	-	-
Stage 2	214	46	-	248	66	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	6	1	157	1	1	123	82	-	-	56	-	-
Mov Cap-2 Maneuver	6	1	-	1	1	-	-	-	-	-	-	-
Stage 1	20	54	-	12	46	-	-	-	-	-	-	-
Stage 2	195	46	-	42	54	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	83.7	37.1	0	0.3
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	82	-	-	157	123	56	-	-
HCM Lane V/C Ratio	-	-	-	0.796	0.088	0.175	-	-
HCM Control Delay (s)	0	-	-	83.7	37.1	82.4	-	-
HCM Lane LOS	A	-	-	F	E	F	-	-
HCM 95th %tile Q(veh)	0	-	-	5.1	0.3	0.6	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	139	244	316	2318	2276	79
Future Volume (veh/h)	139	244	316	2318	2276	79
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	151	265	343	2520	2474	86
Adj No. of Lanes	2	1	2	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	238	540	1059	4260	2641	822
Arrive On Green	0.07	0.07	0.27	0.84	0.52	0.52
Sat Flow, veh/h	3442	1583	3442	5253	5253	1583
Grp Volume(v), veh/h	151	265	343	2520	2474	86
Grp Sat Flow(s),veh/h/ln	1721	1583	1721	1695	1695	1583
Q Serve(g_s), s	5.5	0.0	5.3	20.6	58.7	3.6
Cycle Q Clear(g_c), s	5.5	0.0	5.3	20.6	58.7	3.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	238	540	1059	4260	2641	822
V/C Ratio(X)	0.63	0.49	0.32	0.59	0.94	0.10
Avail Cap(c_a), veh/h	806	801	1059	4260	2641	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.22	0.22	1.00	1.00
Uniform Delay (d), s/veh	58.4	33.6	35.1	3.4	29.0	15.8
Incr Delay (d2), s/veh	2.8	0.7	0.0	0.1	7.9	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	9.5	4.7	9.4	29.2	1.6
LnGrp Delay(d),s/veh	61.2	34.3	35.1	3.5	36.9	16.0
LnGrp LOS	E	C	D	A	D	B
Approach Vol, veh/h	416			2863	2560	
Approach Delay, s/veh	44.1			7.3	36.2	
Approach LOS	D			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		114.1		14.9	41.1	73.0		
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6		
Max Green Setting (Gmax), s		* 87		30.2	* 16	* 67		
Max Q Clear Time (g_c+I1), s		22.6		7.5	7.3	60.7		
Green Ext Time (p_c), s		48.0		1.4	6.9	5.9		

Intersection Summary	
HCM 2010 Ctrl Delay	22.6
HCM 2010 LOS	C

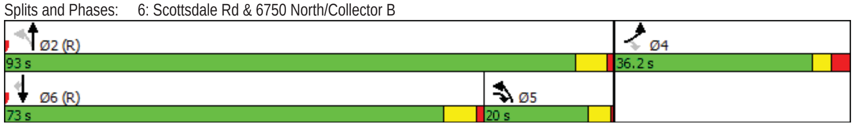
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	2	4	5	6
Movement	NBTL	EBL	NBL	SBT
Lead/Lag			Lag	Lead
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	93	36.2	20	73
Maximum Split (%)	72.0%	28.0%	15.5%	56.5%
Minimum Split (s)	36	36.2	8	36.9
Yellow Time (s)	4.9	3	3.5	4.9
All-Red Time (s)	1.1	3	0.5	1.1
Minimum Initial (s)	10	5	4	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8	8		8
Flash Dont Walk (s)	22	19		22
Dual Entry	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	65	28.8	8.8	65
End Time (s)	28.8	65	28.8	8.8
Yield/Force Off (s)	22.8	59	24.8	2.8
Yield/Force Off 170(s)	0.8	40	24.8	110
Local Start Time (s)	0	93	73	0
Local Yield (s)	87	123.2	89	67
Local Yield 170(s)	65	104.2	89	45

Intersection Summary	
Cycle Length	129.2
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 65 (50%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	361	802	40	414	902	297	90	1059	371	233	641	174
Future Volume (veh/h)	361	802	40	414	902	297	90	1059	371	233	641	174
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	392	872	43	450	980	323	98	1151	403	253	697	189
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	462	845	42	219	837	375	317	1320	590	277	1579	706
Arrive On Green	0.10	0.25	0.25	0.09	0.24	0.24	0.04	0.37	0.37	0.11	0.45	0.45
Sat Flow, veh/h	3442	3433	169	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	392	449	466	450	980	323	98	1151	403	253	697	189
Grp Sat Flow(s),veh/h/ln	1721	1770	1833	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	11.1	32.0	32.0	12.0	30.8	25.4	4.5	39.3	27.8	12.5	17.7	9.8
Cycle Q Clear(g_c), s	11.1	32.0	32.0	12.0	30.8	25.4	4.5	39.3	27.8	12.5	17.7	9.8
Prop In Lane	1.00		0.09	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	462	436	451	219	837	375	317	1320	590	277	1579	706
V/C Ratio(X)	0.85	1.03	1.03	2.05	1.17	0.86	0.31	0.87	0.68	0.91	0.44	0.27
Avail Cap(c_a), veh/h	534	436	451	219	837	375	317	1320	590	297	1579	706
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.57	0.57	0.57	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.7	49.0	49.0	37.5	49.6	47.6	24.1	37.9	34.3	34.2	24.8	22.6
Incr Delay (d2), s/veh	9.8	51.5	50.8	483.1	84.4	14.1	0.2	8.1	6.3	28.7	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	21.8	22.5	31.4	24.8	12.6	2.2	20.7	13.2	11.1	8.8	4.4
LnGrp Delay(d),s/veh	45.5	100.5	99.8	520.6	134.1	61.7	24.3	46.0	40.6	63.0	25.7	23.6
LnGrp LOS	D	F	F	F	F	E	C	D	D	E	C	C
Approach Vol, veh/h		1307			1753			1652			1139	
Approach Delay, s/veh		83.8			220.0			43.4			33.6	
Approach LOS		F			F			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.2	37.8	18.5	55.5	17.0	39.0	9.0	65.0
Change Period (Y+Rc), s	5.0	7.0	4.0	7.0	5.0	7.0	4.0	7.0
Max Green Setting (Gmax), s	16.0	28.0	16.0	47.0	12.0	32.0	5.0	58.0
Max Q Clear Time (g_c+I1), s	13.1	32.8	14.5	41.3	14.0	34.0	6.5	19.7
Green Ext Time (p_c), s	0.2	0.0	0.0	5.6	0.0	0.0	0.0	35.4

Intersection Summary	
HCM 2010 Ctrl Delay	103.4
HCM 2010 LOS	F

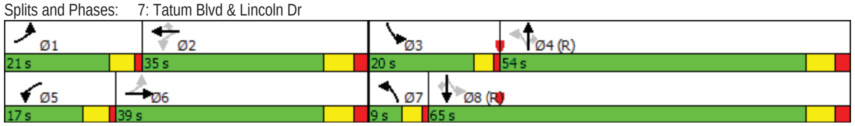
Timing Report, Sorted By Phase
7: Tatum Blvd & Lincoln Dr

11/5/2015

Phase Number	1	2	3	4	5	6	7	8
Movement	EBL	WBTL	SBL	NBTL	WBL	EBTL	NBL	SBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	21	35	20	54	17	39	9	65
Maximum Split (%)	16.2%	26.9%	15.4%	41.5%	13.1%	30.0%	6.9%	50.0%
Minimum Split (s)	9	35	8	36	9	35	8	36
Yellow Time (s)	4	4.5	3	4.5	4	4.5	3	4.5
All-Red Time (s)	1	2.5	1	2.5	1	2.5	1	2.5
Minimum Initial (s)	4	15	4	15	4	15	4	15
Vehicle Extension (s)	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		23		24		23		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	64	85	120	10	64	81	120	129
End Time (s)	85	120	10	64	81	120	129	64
Yield/Force Off (s)	80	113	6	57	76	113	125	57
Yield/Force Off 170(s)	80	90	6	33	76	90	125	33
Local Start Time (s)	54	75	110	0	54	71	110	119
Local Yield (s)	70	103	126	47	66	103	115	47
Local Yield 170(s)	70	80	126	23	66	80	115	23

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 10 (8%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	

Splits and Phases: 7: Tatum Blvd & Lincoln Dr



HCM 2010 Signalized Intersection Summary
8: Invergordon Rd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1283	151	64	1263	26	255	22	87	26	18	10
Future Volume (veh/h)	5	1283	151	64	1263	26	255	22	87	26	18	10
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	5	1395	164	70	1373	28	277	24	95	28	20	11
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	225	1847	216	187	2052	42	441	76	300	198	133	58
Arrive On Green	0.58	0.58	0.58	0.58	0.58	0.58	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	383	3194	373	329	3547	72	1373	329	1303	519	577	251
Grp Volume(v), veh/h	5	768	791	70	684	717	277	0	119	59	0	0
Grp Sat Flow(s),veh/h/ln	383	1770	1797	329	1770	1850	1373	0	1633	1347	0	0
Q Serve(g_s), s	0.6	22.0	22.5	13.8	18.1	18.1	7.9	0.0	4.1	0.1	0.0	0.0
Cycle Q Clear(g_c), s	18.7	22.0	22.5	36.3	18.1	18.1	12.1	0.0	4.1	4.2	0.0	0.0
Prop In Lane	1.00		0.21	1.00		0.04	1.00		0.80	0.47		0.19
Lane Grp Cap(c), veh/h	225	1024	1039	187	1024	1070	441	0	376	388	0	0
V/C Ratio(X)	0.02	0.75	0.76	0.37	0.67	0.67	0.63	0.00	0.32	0.15	0.00	0.00
Avail Cap(c_a), veh/h	225	1024	1039	187	1024	1070	670	0	648	570	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.31	0.31	0.31	0.68	0.68	0.68	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.3	10.7	10.8	24.5	9.9	9.9	24.5	0.0	21.7	20.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	1.6	1.7	3.8	2.4	2.3	1.5	0.0	0.5	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	10.9	11.5	1.4	9.4	9.8	5.1	0.0	1.9	0.9	0.0	0.0
LnGrp Delay(d),s/veh	16.4	12.3	12.5	28.3	12.2	12.1	26.0	0.0	22.2	21.0	0.0	0.0
LnGrp LOS	B	B	B	C	B	B	C		C	C		
Approach Vol, veh/h		1564			1471			396			59	
Approach Delay, s/veh		12.4			12.9			24.9			21.0	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.3		22.7		45.3		22.7
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0
Max Green Setting (Gmax), s		28.0		27.0		28.0		24.0
Max Q Clear Time (g_c+I1), s		38.3		14.1		24.5		6.2
Green Ext Time (p_c), s		0.0		1.6		3.4		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	14.2
HCM 2010 LOS	B

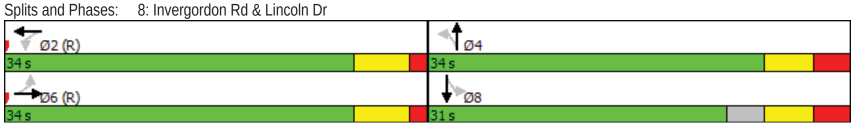
Timing Report, Sorted By Phase
8: Invergordon Rd & Lincoln Dr

11/5/2015

Phase Number	2	4	6	8
Movement	WBTL	NBTL	EBTL	SBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	34	34	34	31
Maximum Split (%)	50.0%	50.0%	50.0%	45.6%
Minimum Split (s)	24	31	24	17
Yellow Time (s)	4.5	4	4.5	4
All-Red Time (s)	1.5	3	1.5	3
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	
Flash Dont Walk (s)	11	17	11	
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	59	25	59	25
End Time (s)	25	59	25	59
Yield/Force Off (s)	19	52	19	52
Yield/Force Off 170(s)	8	35	8	52
Local Start Time (s)	0	34	0	34
Local Yield (s)	28	61	28	61
Local Yield 170(s)	17	44	17	61

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 59 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 8: Invergordon Rd & Lincoln Dr



HCM 2010 Signalized Intersection Summary
9: Mockingbird Ln & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	328	1164	18	39	1138	92	12	114	47	57	96	218
Future Volume (veh/h)	328	1164	18	39	1138	92	12	114	47	57	96	218
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	357	1265	20	42	1237	100	13	124	51	62	104	237
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	573	2550	40	156	1388	621	187	160	66	148	352	299
Arrive On Green	0.28	0.72	0.72	0.52	0.52	0.52	0.13	0.13	0.13	0.03	0.19	0.19
Sat Flow, veh/h	1774	3566	56	428	3539	1583	1035	1255	516	1774	1863	1583
Grp Volume(v), veh/h	357	628	657	42	1237	100	13	0	175	62	104	237
Grp Sat Flow(s),veh/h/ln	1774	1770	1853	428	1770	1583	1035	0	1772	1774	1863	1583
Q Serve(g_s), s	16.2	20.4	20.4	10.1	40.6	3.5	1.4	0.0	12.4	3.9	6.2	18.6
Cycle Q Clear(g_c), s	16.2	20.4	20.4	30.4	40.6	3.5	1.4	0.0	12.4	3.9	6.2	18.6
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	573	1265	1325	156	1388	621	187	0	225	148	352	299
V/C Ratio(X)	0.62	0.50	0.50	0.27	0.89	0.16	0.07	0.00	0.78	0.42	0.30	0.79
Avail Cap(c_a), veh/h	573	1265	1325	156	1388	621	274	0	375	148	509	432
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.41	0.41	0.41	0.89	0.89	0.89	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	8.2	8.2	34.2	28.6	13.5	50.1	0.0	54.9	46.9	45.3	50.3
Incr Delay (d2), s/veh	0.9	0.6	0.5	3.7	8.1	0.5	0.2	0.0	5.7	1.9	0.5	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.0	10.0	10.4	1.4	21.2	1.6	0.4	0.0	6.4	2.0	3.3	8.7
LnGrp Delay(d),s/veh	38.6	8.7	8.7	37.9	36.7	14.0	50.3	0.0	60.6	48.8	45.8	56.6
LnGrp LOS	D	A	A	D	D	B	D		E	D	D	E
Approach Vol, veh/h		1642			1379			188			403	
Approach Delay, s/veh		15.2			35.1			59.9			52.6	
Approach LOS		B			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6		8
Phs Duration (G+Y+Rc), s	42.0	57.0	8.0	23.0		99.0		31.0
Change Period (Y+Rc), s	6.0	* 6	4.0	6.5		6.0		6.5
Max Green Setting (Gmax), s	27.0	* 51	4.0	27.5		82.0		35.5
Max Q Clear Time (g_c+I1), s	18.2	42.6	5.9	14.4		22.4		20.6
Green Ext Time (p_c), s	5.9	5.6	0.0	2.1		15.2		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	29.3
HCM 2010 LOS	C

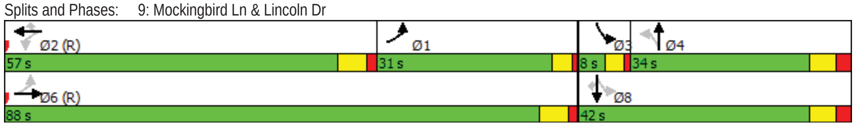
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	6	8
Movement	EBL	WBTL	SBL	NBTL	EBTL	SBTL
Lead/Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	31	57	8	34	88	42
Maximum Split (%)	23.8%	43.8%	6.2%	26.2%	67.7%	32.3%
Minimum Split (s)	9	27	8	34	27	34
Yellow Time (s)	3	4.5	3	4	4.5	4
All-Red Time (s)	1	1.5	1	2.5	1.5	2.5
Minimum Initial (s)	4	15	4	7	15	7
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7		7	7	7
Flash Dont Walk (s)		14		20	14	20
Dual Entry	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	73	16	104	112	16	104
End Time (s)	104	73	112	16	104	16
Yield/Force Off (s)	100	67	108	9.5	98	9.5
Yield/Force Off 170(s)	100	53	108	119.5	84	119.5
Local Start Time (s)	57	0	88	96	0	88
Local Yield (s)	84	51	92	123.5	82	123.5
Local Yield 170(s)	84	37	92	103.5	68	103.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 16 (12%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 9: Mockingbird Ln & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	620	5	5	1007	50	5	0	5	31	0	183
Future Volume (veh/h)	174	620	5	5	1007	50	5	0	5	31	0	183
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	189	674	5	5	1095	54	5	0	5	34	0	199
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	406	2737	20	570	2402	1075	127	13	99	263	0	227
Arrive On Green	0.10	1.00	1.00	0.68	0.68	0.68	0.14	0.00	0.14	0.14	0.00	0.14
Sat Flow, veh/h	1774	3601	27	758	3539	1583	597	92	688	1448	0	1583
Grp Volume(v), veh/h	189	331	348	5	1095	54	10	0	0	34	0	199
Grp Sat Flow(s),veh/h/ln	1774	1770	1858	758	1770	1583	1377	0	0	1448	0	1583
Q Serve(g_s), s	4.3	0.0	0.0	0.3	18.7	1.5	0.0	0.0	0.0	0.0	0.0	16.0
Cycle Q Clear(g_c), s	4.3	0.0	0.0	0.3	18.7	1.5	2.2	0.0	0.0	2.2	0.0	16.0
Prop In Lane	1.00		0.01	1.00		1.00	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	406	1345	1412	570	2402	1075	239	0	0	263	0	227
V/C Ratio(X)	0.47	0.25	0.25	0.01	0.46	0.05	0.04	0.00	0.00	0.13	0.00	0.87
Avail Cap(c_a), veh/h	534	1345	1412	570	2402	1075	357	0	0	386	0	365
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	0.77	0.77	0.77	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.0	0.0	0.0	6.8	9.7	6.9	47.9	0.0	0.0	48.6	0.0	54.5
Incr Delay (d2), s/veh	0.7	0.4	0.4	0.0	0.5	0.1	0.1	0.0	0.0	0.2	0.0	12.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.1	0.1	0.1	9.3	0.7	0.3	0.0	0.0	1.1	0.0	7.8
LnGrp Delay(d),s/veh	7.7	0.4	0.4	6.8	10.2	7.0	48.0	0.0	0.0	48.8	0.0	67.4
LnGrp LOS	A	A	A	A	B	A	D			D		E
Approach Vol, veh/h		868			1154			10			233	
Approach Delay, s/veh		2.0			10.0			48.0			64.7	
Approach LOS		A			B			D			E	

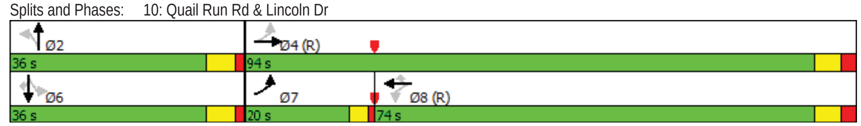
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		24.7		105.3		24.7	10.6	94.7
Change Period (Y+Rc), s		6.0		6.5		6.0	4.0	6.5
Max Green Setting (Gmax), s		30.0		87.5		30.0	16.0	67.5
Max Q Clear Time (g_c+I1), s		4.2		2.0		18.0	6.3	20.7
Green Ext Time (p_c), s		0.9		22.7		0.7	0.3	19.6

Intersection Summary	
HCM 2010 Ctrl Delay	12.7
HCM 2010 LOS	B

Phase Number	2	4	6	7	8
Movement	NBTL	EBTL	SBTL	EBL	WBTL
Lead/Lag				Lead	Lag
Lead-Lag Optimize				Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max
Maximum Split (s)	36	94	36	20	74
Maximum Split (%)	27.7%	72.3%	27.7%	15.4%	56.9%
Minimum Split (s)	33	28	33	8	28
Yellow Time (s)	4.5	4	4.5	3	4
All-Red Time (s)	1.5	2.5	1.5	1	2.5
Minimum Initial (s)	7	15	7	4	15
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7	7		7
Flash Dont Walk (s)	20	14	20		14
Dual Entry	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	74	110	74	110	0
End Time (s)	110	74	110	0	74
Yield/Force Off (s)	104	67.5	104	126	67.5
Yield/Force Off 170(s)	84	53.5	84	126	53.5
Local Start Time (s)	74	110	74	110	0
Local Yield (s)	104	67.5	104	126	67.5
Local Yield 170(s)	84	53.5	84	126	53.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 10: Quail Run Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	669	47	398	43	56	66	372	1877	37	69	1788	534
Future Volume (veh/h)	669	47	398	43	56	66	372	1877	37	69	1788	534
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	763	0	433	47	61	72	404	2040	40	75	1943	580
Adj No. of Lanes	2	0	1	1	2	0	2	3	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	591	0	492	114	114	102	782	2182	43	255	1737	643
Arrive On Green	0.17	0.00	0.17	0.06	0.06	0.06	0.45	0.85	0.85	0.14	0.34	0.34
Sat Flow, veh/h	3548	0	1583	1774	1770	1583	3442	5135	101	1774	5085	1583
Grp Volume(v), veh/h	763	0	433	47	61	72	404	1346	734	75	1943	580
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	1770	1583	1721	1695	1845	1774	1695	1583
Q Serve(g_s), s	20.0	0.0	13.9	3.1	4.0	5.3	10.0	34.7	35.0	4.5	41.0	41.0
Cycle Q Clear(g_c), s	20.0	0.0	13.9	3.1	4.0	5.3	10.0	34.7	35.0	4.5	41.0	41.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	591	0	492	114	114	102	782	1441	784	255	1737	643
V/C Ratio(X)	1.29	0.00	0.88	0.41	0.53	0.71	0.52	0.93	0.94	0.29	1.12	0.90
Avail Cap(c_a), veh/h	591	0	492	207	206	185	782	1441	784	255	1737	643
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.00	0.98	1.00	1.00	1.00	0.42	0.42	0.42	0.62	0.62	0.62
Uniform Delay (d), s/veh	50.0	0.0	39.3	53.9	54.4	55.0	28.0	7.8	7.8	45.9	39.5	33.3
Incr Delay (d2), s/veh	142.8	0.0	16.5	2.3	3.8	8.6	0.3	6.2	10.4	0.4	58.7	12.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.5	0.0	8.3	1.6	2.1	2.6	4.7	15.8	18.6	2.3	28.6	21.4
LnGrp Delay(d),s/veh	192.8	0.0	55.8	56.3	58.2	63.6	28.3	14.0	18.2	46.3	98.2	45.8
LnGrp LOS	F		E	E	E	E	C	B	B	D	F	D
Approach Vol, veh/h		1196			180			2484			2598	
Approach Delay, s/veh		143.2			59.9			17.5			85.0	
Approach LOS		F			E			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.3	57.0		14.7	31.3	47.0		27.0
Change Period (Y+Rc), s	4.0	6.0		7.0	4.0	6.0		7.0
Max Green Setting (Gmax), s	11.0	51.0		14.0	21.0	41.0		20.0
Max Q Clear Time (g_c+I1), s	6.5	37.0		7.3	12.0	43.0		22.0
Green Ext Time (p_c), s	0.8	11.1		0.4	1.2	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	69.1
HCM 2010 LOS	E

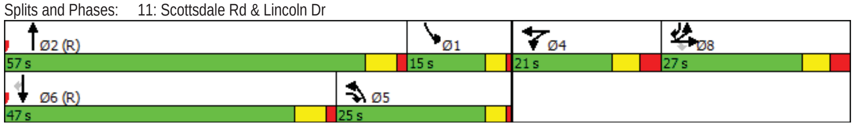
Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	WBTL	NBL	SBT	EBTL
Lead/Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	57	21	25	47	27
Maximum Split (%)	12.5%	47.5%	17.5%	20.8%	39.2%	22.5%
Minimum Split (s)	9	28	40	9	28	40
Yellow Time (s)	3	4.5	4	3	4.5	4
All-Red Time (s)	1	1.5	3	1	1.5	3
Minimum Initial (s)	4.5	20	5	4.5	20	8
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		15	26		15	26
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	12	75	27	2	75	48
End Time (s)	27	12	48	27	2	75
Yield/Force Off (s)	23	6	41	23	116	68
Yield/Force Off 170(s)	23	111	15	23	101	42
Local Start Time (s)	57	0	72	47	0	93
Local Yield (s)	68	51	86	68	41	113
Local Yield 170(s)	68	36	60	68	26	87

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 75 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 11: Scottsdale Rd & Lincoln Dr



Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	93	208	4	0	23	255	78	0	14	11	14
Future Vol, veh/h	0	93	208	4	0	23	255	78	0	14	11	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	101	226	4	0	25	277	85	0	15	12	15
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	11.3	14.6	10.3
HCM LOS	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	36%	100%	0%	100%	0%	100%	0%
Vol Thru, %	28%	0%	98%	0%	77%	0%	7%
Vol Right, %	36%	0%	2%	0%	23%	0%	93%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	39	93	212	23	333	56	122
LT Vol	14	93	0	23	0	56	0
Through Vol	11	0	208	0	255	0	9
RT Vol	14	0	4	0	78	0	113
Lane Flow Rate	42	101	230	25	362	61	133
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.079	0.176	0.367	0.043	0.557	0.118	0.215
Departure Headway (Hd)	6.685	6.256	5.736	6.212	5.541	7.003	5.839
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	535	574	627	577	652	512	614
Service Time	4.734	3.987	3.468	3.943	3.271	4.744	3.579
HCM Lane V/C Ratio	0.079	0.176	0.367	0.043	0.555	0.119	0.217
HCM Control Delay	10.3	10.3	11.8	9.2	15	10.7	10.2
HCM Lane LOS	B	B	B	A	B	B	B
HCM 95th-tile Q	0.3	0.6	1.7	0.1	3.4	0.4	0.8

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	56	9	113
Future Vol, veh/h	0	56	9	113
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	61	10	123
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	10.4
HCM LOS	B

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	214	36	236	218	269	36	2000	242	378	1799	102
Future Volume (veh/h)	88	214	36	236	218	269	36	2000	242	378	1799	102
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	96	233	39	257	237	292	39	2174	263	411	1955	111
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	311	51	264	353	510	395	2034	633	766	2034	633
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.22	0.40	0.40	0.15	0.27	0.27
Sat Flow, veh/h	1774	3042	502	1774	3539	1583	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	96	134	138	257	237	292	39	2174	263	411	1955	111
Grp Sat Flow(s),veh/h/ln	1774	1770	1774	1774	1770	1583	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	0.0	8.8	9.1	11.5	7.8	0.0	2.1	48.0	14.3	13.3	45.5	6.5
Cycle Q Clear(g_c), s	0.0	8.8	9.1	11.5	7.8	0.0	2.1	48.0	14.3	13.3	45.5	6.5
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	273	181	182	264	353	510	395	2034	633	766	2034	633
V/C Ratio(X)	0.35	0.74	0.76	0.97	0.67	0.57	0.10	1.07	0.42	0.54	0.96	0.18
Avail Cap(c_a), veh/h	273	354	355	264	708	669	395	2034	633	766	2034	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	47.6	52.3	52.4	51.7	52.1	33.8	37.1	36.0	25.9	45.3	43.0	28.7
Incr Delay (d2), s/veh	0.8	5.8	6.4	48.1	2.2	1.0	0.1	41.3	2.0	0.1	1.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	4.6	4.8	12.0	3.9	8.2	1.0	30.2	6.6	6.3	21.7	2.8
LnGrp Delay(d),s/veh	48.4	58.2	58.8	99.7	54.4	34.8	37.2	77.3	27.9	45.4	44.8	28.8
LnGrp LOS	D	E	E	F	D	C	D	F	C	D	D	C
Approach Vol, veh/h		368			786			2476			2477	
Approach Delay, s/veh		55.9			61.9			71.4			44.2	
Approach LOS		E			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.7	54.0	16.0	19.3	30.7	54.0	16.3	19.0
Change Period (Y+Rc), s	4.0	6.0	* 4	7.0	4.0	6.0	* 4	7.0
Max Green Setting (Gmax), s	15.0	48.0	* 12	24.0	15.0	48.0	* 12	24.0
Max Q Clear Time (g_c+I1), s	15.3	50.0	13.5	11.1	4.1	47.5	2.0	9.8
Green Ext Time (p_c), s	0.0	0.0	0.0	1.2	1.2	0.5	0.8	2.2

Intersection Summary			
HCM 2010 Ctrl Delay			58.2
HCM 2010 LOS			E

Notes

User approved pedestrian interval to be less than phase max green.

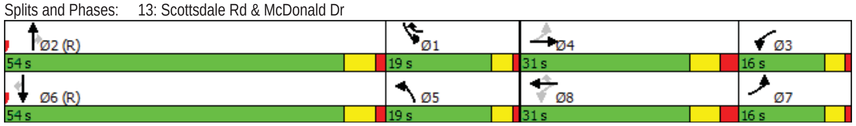
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	19	54	16	31	19	54	16	31
Maximum Split (%)	15.8%	45.0%	13.3%	25.8%	15.8%	45.0%	13.3%	25.8%
Minimum Split (s)	14	31	10	37	14	31	10	37
Yellow Time (s)	3	4.5	3	4.3	3	4.5	3	4.3
All-Red Time (s)	1	1.5	1	2.7	1	1.5	1	2.7
Minimum Initial (s)	10	20	6	8	10	20	6	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		9		6		9		6
Flash Dont Walk (s)		16		24		16		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	30	14	103	84	30	14	103
End Time (s)	103	84	30	14	103	84	30	14
Yield/Force Off (s)	99	78	26	7	99	78	26	7
Yield/Force Off 170(s)	99	62	26	103	99	62	26	103
Local Start Time (s)	54	0	104	73	54	0	104	73
Local Yield (s)	69	48	116	97	69	48	116	97
Local Yield 170(s)	69	32	116	73	69	32	116	73

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	115

Offset: 30 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Splits and Phases: 13: Scottsdale Rd & McDonald Dr



HCM 2010 Roundabout
21: Collector A & Indian Bend Rd.

11/5/2015

Intersection	
Intersection Delay, s/veh	5.7
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	257	277	83
Demand Flow Rate, veh/h	262	283	85
Vehicles Circulating, veh/h	43	43	211
Vehicles Exiting, veh/h	283	253	94
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	5.7	5.9	4.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	262	283	85
Cap Entry Lane, veh/h	1082	1082	915
Entry HV Adj Factor	0.980	0.980	0.976
Flow Entry, veh/h	257	277	83
Cap Entry, veh/h	1061	1061	893
V/C Ratio	0.242	0.261	0.093
Control Delay, s/veh	5.7	5.9	4.9
LOS	A	A	A
95th %tile Queue, veh	1	1	0

HCM 2010 TWSC
22: Garage Access & Indian Bend Rd.

11/5/2015

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	216	12	29	249	6	14
Future Vol, veh/h	216	12	29	249	6	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	235	13	32	271	7	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	248	0	575	241
Stage 1	-	-	-	-	241	-
Stage 2	-	-	-	-	334	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1318	-	480	798
Stage 1	-	-	-	-	799	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1318	-	468	798
Mov Cap-2 Maneuver	-	-	-	-	554	-
Stage 1	-	-	-	-	799	-
Stage 2	-	-	-	-	707	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	705	-	-	1318	-
HCM Lane V/C Ratio	0.031	-	-	0.024	-
HCM Control Delay (s)	10.3	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	349	45	110	338	43	103
Future Vol, veh/h	349	45	110	338	43	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	379	49	120	367	47	112

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	428	0	827	404
Stage 1	-	-	-	-	404	-
Stage 2	-	-	-	-	423	-
Critical Hdwy	-	-	4.12	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.218	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1131	-	325	646
Stage 1	-	-	-	-	673	-
Stage 2	-	-	-	-	630	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1131	-	291	646
Mov Cap-2 Maneuver	-	-	-	-	291	-
Stage 1	-	-	-	-	673	-
Stage 2	-	-	-	-	563	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	475	-	-	1131	-
HCM Lane V/C Ratio	0.334	-	-	0.106	-
HCM Control Delay (s)	16.3	-	-	8.6	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.5	-	-	0.4	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	13	5	0	2485	1868	17
Future Vol, veh/h	13	5	0	2485	1868	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	5	0	2701	2030	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3110	1015	2030	0	-	0
Stage 1	2030	-	-	-	-	-
Stage 2	1080	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	23	203	121	-	-	-
Stage 1	54	-	-	-	-	-
Stage 2	259	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	23	203	121	-	-	-
Mov Cap-2 Maneuver	23	-	-	-	-	-
Stage 1	54	-	-	-	-	-
Stage 2	259	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	121	-	203	-	-
HCM Lane V/C Ratio	-	-	0.027	-	-
HCM Control Delay (s)	0	-	23.2	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 2010 TWSC
25: Collector A & North Residential Access

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	28	0	0	49	37	48
Future Vol, veh/h	28	0	0	49	37	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	0	0	53	40	52

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	119	66	92	0	-	0
Stage 1	66	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	877	998	1503	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	877	998	1503	-	-	-
Mov Cap-2 Maneuver	877	-	-	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1503	-	877	-	-
HCM Lane V/C Ratio	-	-	0.035	-	-
HCM Control Delay (s)	0	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM 2010 TWSC
26: Collector A & Garage Access

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	22	11	37	11	6	31
Future Vol, veh/h	22	11	37	11	6	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	12	40	12	7	34

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	93	46	0	0	52	0
Stage 1	46	-	-	-	-	-
Stage 2	47	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	907	1023	-	-	1554	-
Stage 1	976	-	-	-	-	-
Stage 2	975	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	902	1023	-	-	1554	-
Mov Cap-2 Maneuver	902	-	-	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	939	1554	-
HCM Lane V/C Ratio	-	-	0.038	0.004	-
HCM Control Delay (s)	-	-	9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	63	23	25	54	24	30
Future Vol, veh/h	63	23	25	54	24	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	25	27	59	26	33

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	142	57	0	0	86	0
Stage 1	57	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	851	1009	-	-	1510	-
Stage 1	966	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	836	1009	-	-	1510	-
Mov Cap-2 Maneuver	836	-	-	-	-	-
Stage 1	966	-	-	-	-	-
Stage 2	921	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	3.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	876	1510	-
HCM Lane V/C Ratio	-	-	0.107	0.017	-
HCM Control Delay (s)	-	-	9.6	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	53	10	61	56	33	70
Future Vol, veh/h	53	10	61	56	33	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	11	66	61	36	76

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	245	97	0	0	127	0
Stage 1	97	-	-	-	-	-
Stage 2	148	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	743	959	-	-	1459	-
Stage 1	927	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	724	959	-	-	1459	-
Mov Cap-2 Maneuver	724	-	-	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	857	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	2.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	753	1459	-
HCM Lane V/C Ratio	-	-	0.091	0.025	-
HCM Control Delay (s)	-	-	10.3	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	61	27	5	375	255	57
Future Vol, veh/h	61	27	5	375	255	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	29	5	408	277	62

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	413	0	-	0	371	209
Stage 1	-	-	-	-	209	-
Stage 2	-	-	-	-	162	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1146	-	-	-	630	831
Stage 1	-	-	-	-	826	-
Stage 2	-	-	-	-	867	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1146	-	-	-	593	831
Mov Cap-2 Maneuver	-	-	-	-	645	-
Stage 1	-	-	-	-	826	-
Stage 2	-	-	-	-	816	-

Approach	EB	WB	SB
HCM Control Delay, s	5.8	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1146	-	-	-	672
HCM Lane V/C Ratio	0.058	-	-	-	0.505
HCM Control Delay (s)	8.3	0	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.9

Intersection	
Int Delay, s/veh	4.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	121	1	28	115	2	36
Future Vol, veh/h	121	1	28	115	2	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	132	1	30	125	2	39

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	136	93	0	0	155	0
Stage 1	93	-	-	-	-	-
Stage 2	43	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	857	964	-	-	1425	-
Stage 1	931	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	856	964	-	-	1425	-
Mov Cap-2 Maneuver	856	-	-	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	978	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	857	1425	-
HCM Lane V/C Ratio	-	-	0.155	0.002	-
HCM Control Delay (s)	-	-	10	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection	
Intersection Delay, s/veh	4.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	20	25	208	171
Demand Flow Rate, veh/h	20	26	212	174
Vehicles Circulating, veh/h	199	192	0	60
Vehicles Exiting, veh/h	35	20	219	157
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.1	4.3	4.9	4.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	20	26	212	174
Cap Entry Lane, veh/h	926	933	1130	1064
Entry HV Adj Factor	1.000	0.962	0.981	0.980
Flow Entry, veh/h	20	25	208	171
Cap Entry, veh/h	926	897	1108	1043
V/C Ratio	0.022	0.028	0.188	0.164
Control Delay, s/veh	4.1	4.3	4.9	4.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	1

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	16	0	191	33	0	198
Future Vol, veh/h	16	0	191	33	0	198
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	0	208	36	0	215

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	441	226	0	0	243	0
Stage 1	226	-	-	-	-	-
Stage 2	215	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	574	813	-	-	1323	-
Stage 1	812	-	-	-	-	-
Stage 2	821	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	574	813	-	-	1323	-
Mov Cap-2 Maneuver	574	-	-	-	-	-
Stage 1	812	-	-	-	-	-
Stage 2	821	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	574	1323	-
HCM Lane V/C Ratio	-	-	0.03	-	-
HCM Control Delay (s)	-	-	11.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

APPENDIX J

2028 PEAK HOUR ANALYSIS

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	4	6	315	0	35	4	0	0	143	13	30
Future Vol, veh/h	0	4	6	315	0	35	4	0	0	143	13	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	7	342	0	38	4	0	0	155	14	33
Number of Lanes	0	1	1	0	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	10.9	9.3	10.3
HCM LOS	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	90%	3%
Vol Thru, %	0%	30%	0%	2%	10%	91%
Vol Right, %	0%	70%	0%	98%	0%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	143	43	4	321	39	34
LT Vol	143	0	4	0	35	1
Through Vol	0	13	0	6	4	31
RT Vol	0	30	0	315	0	2
Lane Flow Rate	155	47	4	349	42	37
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.259	0.065	0.007	0.443	0.068	0.059
Departure Headway (Hd)	6.009	5.013	5.768	4.575	5.809	5.748
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	595	710	620	785	613	618
Service Time	3.776	2.78	3.504	2.31	3.873	3.829
HCM Lane V/C Ratio	0.261	0.066	0.006	0.445	0.069	0.06
HCM Control Delay	10.9	8.1	8.5	10.9	9.3	9.2
HCM Lane LOS	B	A	A	B	A	A
HCM 95th-tile Q	1	0.2	0	2.3	0.2	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	1	31	2
Future Vol, veh/h	0	1	31	2
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	34	2
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9.2
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	4.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	164	46	227	104	75	378
Future Vol, veh/h	164	46	227	104	75	378
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	178	50	247	113	82	411

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	877	303	0	0	360	0
Stage 1	303	-	-	-	-	-
Stage 2	574	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	319	737	-	-	1199	-
Stage 1	749	-	-	-	-	-
Stage 2	563	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	297	737	-	-	1199	-
Mov Cap-2 Maneuver	409	-	-	-	-	-
Stage 1	749	-	-	-	-	-
Stage 2	524	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.2	0	1.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	409	737	1199	-
HCM Lane V/C Ratio	-	-	0.436	0.068	0.068	-
HCM Control Delay (s)	-	-	20.4	10.2	8.2	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	2.2	0.2	0.2	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	209	2	36	201	5	1	0	47	6	0	5
Future Vol, veh/h	5	209	2	36	201	5	1	0	47	6	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	227	2	39	218	5	1	0	51	7	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	224	0	0	229	0	0	541	541	228	564	539	221
Stage 1	-	-	-	-	-	-	239	239	-	299	299	-
Stage 2	-	-	-	-	-	-	302	302	-	265	240	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1345	-	-	1339	-	-	452	448	811	436	449	819
Stage 1	-	-	-	-	-	-	764	708	-	710	666	-
Stage 2	-	-	-	-	-	-	707	664	-	740	707	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1345	-	-	1339	-	-	438	433	811	398	434	819
Mov Cap-2 Maneuver	-	-	-	-	-	-	438	433	-	398	434	-
Stage 1	-	-	-	-	-	-	761	705	-	707	647	-
Stage 2	-	-	-	-	-	-	682	645	-	691	704	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.2	9.8	12.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	797	1345	-	-	1339	-	-	519
HCM Lane V/C Ratio	0.065	0.004	-	-	0.029	-	-	0.023
HCM Control Delay (s)	9.8	7.7	-	-	7.8	-	-	12.1
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	159	63	597	183	152	39	1297	418	158	1650	44
Future Volume (veh/h)	69	159	63	597	183	152	39	1297	418	158	1650	44
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	75	173	68	649	199	165	42	1410	454	172	1793	48
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	95	155	132	710	486	575	263	2076	973	285	2076	647
Arrive On Green	0.05	0.08	0.08	0.21	0.26	0.26	0.10	0.41	0.41	0.10	0.41	0.41
Sat Flow, veh/h	1774	1863	1583	3442	1863	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	75	173	68	649	199	165	42	1410	454	172	1793	48
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1721	1863	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	5.0	10.0	4.9	22.1	10.6	1.2	0.0	27.2	0.0	3.7	38.7	1.7
Cycle Q Clear(g_c), s	5.0	10.0	4.9	22.1	10.6	1.2	0.0	27.2	0.0	3.7	38.7	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	95	155	132	710	486	575	263	2076	973	285	2076	647
V/C Ratio(X)	0.79	1.11	0.52	0.91	0.41	0.29	0.16	0.68	0.47	0.60	0.86	0.07
Avail Cap(c_a), veh/h	177	155	132	803	486	575	263	2076	973	285	2076	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.1	55.0	52.7	46.6	36.7	14.6	45.7	29.1	12.5	46.1	32.4	12.8
Incr Delay (d2), s/veh	5.3	106.3	1.6	13.0	0.2	0.1	0.1	1.8	1.6	2.5	5.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	9.7	2.2	11.8	5.5	2.8	1.3	13.0	8.5	5.5	19.1	0.8
LnGrp Delay(d),s/veh	61.4	161.3	54.2	59.6	36.9	14.7	45.8	30.9	14.1	48.7	37.5	13.0
LnGrp LOS	E	F	D	E	D	B	D	C	B	D	D	B
Approach Vol, veh/h		316			1013			1906			2013	
Approach Delay, s/veh		114.5			47.8			27.2			37.9	
Approach LOS		F			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.2	55.0	31.8	17.0	16.2	55.0	10.4	38.3
Change Period (Y+Rc), s	* 4	6.0	* 7	* 7	* 4	6.0	4.0	* 7
Max Green Setting (Gmax), s	* 12	49.0	* 28	* 10	* 12	49.0	12.0	* 26
Max Q Clear Time (g_c+I1), s	5.7	29.2	24.1	12.0	2.0	40.7	7.0	12.6
Green Ext Time (p_c), s	0.1	2.3	0.6	0.0	0.1	2.7	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	40.5
HCM 2010 LOS	D

Notes

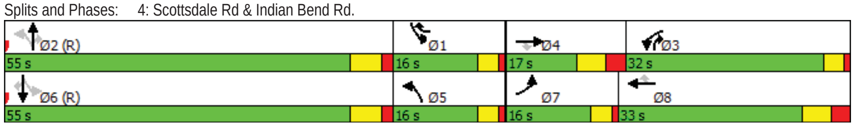
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Timing Report, Sorted By Phase
4: Scottsdale Rd & Indian Bend Rd. 11/5/2015

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	16	55	32	17	16	55	16	33
Maximum Split (%)	13.3%	45.8%	26.7%	14.2%	13.3%	45.8%	13.3%	27.5%
Minimum Split (s)	9.4	29.4	8.5	13	8.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	85	30	118	101	85	30	101	117
End Time (s)	101	85	30	118	101	85	117	30
Yield/Force Off (s)	97	79	26	111	97	79	113	23
Yield/Force Off 170(s)	97	63	26	80	97	63	113	112
Local Start Time (s)	55	0	88	71	55	0	71	87
Local Yield (s)	67	49	116	81	67	49	83	113
Local Yield 170(s)	67	33	116	50	67	33	83	82

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



HCM 2010 TWSC
5: Scottsdale Rd & Joshua Tree Ln 11/5/2015

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	62	5	0	9	0	1724	5	5	2160	28
Future Vol, veh/h	0	0	62	5	0	9	0	1724	5	5	2160	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	150	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	67	5	0	10	0	1874	5	5	2348	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3109	4238	1174	2827	4236	940	2348	0	0	1879	0	0
Stage 1	2359	2359	-	1877	1877	-	-	-	-	-	-	-
Stage 2	750	1879	-	950	2359	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	12	2	159	19	2	227	83	-	-	144	-	-
Stage 1	21	67	-	47	119	-	-	-	-	-	-	-
Stage 2	336	119	-	253	67	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	11	2	159	11	2	227	83	-	-	144	-	-
Mov Cap-2 Maneuver	11	2	-	11	2	-	-	-	-	-	-	-
Stage 1	21	65	-	47	119	-	-	-	-	-	-	-
Stage 2	322	119	-	141	65	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	43.3	235.8	0	0.1
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	83	-	-	159	28	144	-	-
HCM Lane V/C Ratio	-	-	-	0.424	0.543	0.038	-	-
HCM Control Delay (s)	0	-	-	43.3	235.8	31	-	-
HCM Lane LOS	A	-	-	E	F	D	-	-
HCM 95th %tile Q(veh)	0	-	-	1.9	1.7	0.1	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	43	195	1655	2264	119
Future Volume (veh/h)	34	43	195	1655	2264	119
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	37	47	212	1799	2461	129
Adj No. of Lanes	2	1	2	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	127	540	1171	4425	2641	822
Arrive On Green	0.04	0.04	0.30	0.87	0.52	0.52
Sat Flow, veh/h	3442	1583	3442	5253	5253	1583
Grp Volume(v), veh/h	37	47	212	1799	2461	129
Grp Sat Flow(s),veh/h/ln	1721	1583	1721	1695	1695	1583
Q Serve(g_s), s	1.4	0.0	0.9	9.2	58.1	5.5
Cycle Q Clear(g_c), s	1.4	0.0	0.9	9.2	58.1	5.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	127	540	1171	4425	2641	822
V/C Ratio(X)	0.29	0.09	0.18	0.41	0.93	0.16
Avail Cap(c_a), veh/h	806	852	1171	4425	2641	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.69	0.69	1.00	1.00
Uniform Delay (d), s/veh	60.5	28.9	31.1	1.7	28.9	16.2
Incr Delay (d2), s/veh	1.3	0.1	0.1	0.2	7.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.7	2.7	4.2	28.9	2.5
LnGrp Delay(d),s/veh	61.7	28.9	31.1	1.9	36.4	16.6
LnGrp LOS	E	C	C	A	D	B
Approach Vol, veh/h	84			2011	2590	
Approach Delay, s/veh	43.4			5.0	35.4	
Approach LOS	D			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		118.2		10.8	45.2	73.0		
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6		
Max Green Setting (Gmax), s		* 87		30.2	* 16	* 67		
Max Q Clear Time (g_c+I1), s		11.2		3.4	2.9	60.1		
Green Ext Time (p_c), s		28.7		0.2	10.1	6.4		

Intersection Summary			
HCM 2010 Ctrl Delay			22.5
HCM 2010 LOS			C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

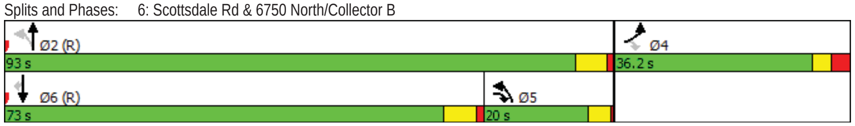
Timing Report, Sorted By Phase
6: Scottsdale Rd & 6750 North/Collector B

11/5/2015

Phase Number	2	4	5	6
Movement	NBTL	EBL	NBL	SBT
Lead/Lag			Lag	Lead
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	93	36.2	20	73
Maximum Split (%)	72.0%	28.0%	15.5%	56.5%
Minimum Split (s)	36	36.2	8	36.9
Yellow Time (s)	4.9	3	3.5	4.9
All-Red Time (s)	1.1	3	0.5	1.1
Minimum Initial (s)	10	5	4	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8	8		8
Flash Dont Walk (s)	22	19		22
Dual Entry	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	65	28.8	8.8	65
End Time (s)	28.8	65	28.8	8.8
Yield/Force Off (s)	22.8	59	24.8	2.8
Yield/Force Off 170(s)	0.8	40	24.8	110
Local Start Time (s)	0	93	73	0
Local Yield (s)	87	123.2	89	67
Local Yield 170(s)	65	104.2	89	45

Intersection Summary	
Cycle Length	129.2
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 65 (50%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



HCM 2010 Signalized Intersection Summary
7: Tatum Blvd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	175	813	70	300	761	105	50	569	426	321	965	414
Future Volume (veh/h)	175	813	70	300	761	105	50	569	426	321	965	414
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	190	884	76	326	827	114	54	618	463	349	1049	450
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	241	888	76	247	1086	486	169	1051	470	397	1470	658
Arrive On Green	0.07	0.27	0.27	0.11	0.31	0.31	0.03	0.30	0.30	0.15	0.42	0.42
Sat Flow, veh/h	3442	3299	284	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	190	474	486	326	827	114	54	618	463	349	1049	450
Grp Sat Flow(s),veh/h/ln	1721	1770	1813	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	7.1	34.8	34.8	14.0	27.5	7.0	2.7	19.3	37.8	17.1	32.0	30.2
Cycle Q Clear(g_c), s	7.1	34.8	34.8	14.0	27.5	7.0	2.7	19.3	37.8	17.1	32.0	30.2
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	241	476	488	247	1086	486	169	1051	470	397	1470	658
V/C Ratio(X)	0.79	1.00	1.00	1.32	0.76	0.23	0.32	0.59	0.98	0.88	0.71	0.68
Avail Cap(c_a), veh/h	318	476	488	247	1086	486	169	1051	470	515	1470	658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.5	47.4	47.4	38.4	40.8	33.7	31.6	38.9	45.4	27.7	31.6	31.0
Incr Delay (d2), s/veh	6.7	40.1	39.6	165.6	4.4	1.0	0.4	2.4	37.8	11.2	3.0	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	22.3	22.8	20.2	14.1	3.2	1.4	9.8	21.5	9.6	16.2	14.2
LnGrp Delay(d),s/veh	66.2	87.5	87.0	204.0	45.2	34.7	31.9	41.3	83.2	38.8	34.6	36.7
LnGrp LOS	E	F	F	F	D	C	C	D	F	D	C	D
Approach Vol, veh/h		1150			1267			1135			1848	
Approach Delay, s/veh		83.8			85.1			58.0			35.9	
Approach LOS		F			F			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.1	46.9	23.4	45.6	19.0	42.0	8.0	61.0
Change Period (Y+Rc), s	5.0	7.0	4.0	7.0	5.0	7.0	4.0	7.0
Max Green Setting (Gmax), s	12.0	37.0	28.0	30.0	14.0	35.0	4.0	54.0
Max Q Clear Time (g_c+I1), s	9.1	29.5	19.1	39.8	16.0	36.8	4.7	34.0
Green Ext Time (p_c), s	0.1	7.1	0.2	0.0	0.0	0.0	0.0	19.2

Intersection Summary	
HCM 2010 Ctrl Delay	62.3
HCM 2010 LOS	E

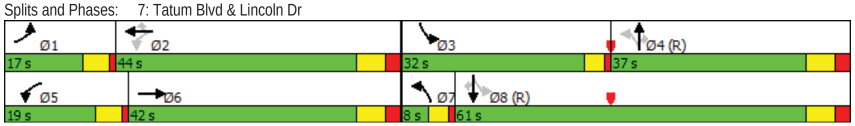
Timing Report, Sorted By Phase
7: Tatum Blvd & Lincoln Dr
11/5/2015

Phase Number	1	2	3	4	5	6	7	8
Movement	EBL	WBTL	SBL	NBTL	WBL	EBT	NBL	SBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	17	44	32	37	19	42	8	61
Maximum Split (%)	13.1%	33.8%	24.6%	28.5%	14.6%	32.3%	6.2%	46.9%
Minimum Split (s)	9	35	8	36	9	35	8	36
Yellow Time (s)	4	4.5	3	4.5	4	4.5	3	4.5
All-Red Time (s)	1	2.5	1	2.5	1	2.5	1	2.5
Minimum Initial (s)	4	15	4	15	4	15	4	15
Vehicle Extension (s)	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		23		24		23		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	101	15	47	84	103	15	23
End Time (s)	101	15	47	84	103	15	23	84
Yield/Force Off (s)	96	8	43	77	98	8	19	77
Yield/Force Off 170(s)	96	115	43	53	98	115	19	53
Local Start Time (s)	37	54	98	0	37	56	98	106
Local Yield (s)	49	91	126	30	51	91	102	30
Local Yield 170(s)	49	68	126	6	51	68	102	6

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	100

Offset: 47 (36%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green

Splits and Phases: 7: Tatum Blvd & Lincoln Dr



HCM 2010 Signalized Intersection Summary
8: Invergordon Rd & Lincoln Dr
11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1131	210	59	1063	22	110	4	99	19	12	5
Future Volume (veh/h)	11	1131	210	59	1063	22	110	4	99	19	12	5
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	12	1229	228	64	1155	24	120	4	108	21	13	5
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	343	1978	364	260	2350	49	324	8	224	146	79	21
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	474	2986	550	363	3546	74	1389	57	1535	441	541	144
Grp Volume(v), veh/h	12	725	732	64	576	603	120	0	112	39	0	0
Grp Sat Flow(s),veh/h/ln	474	1770	1766	363	1770	1850	1389	0	1592	1125	0	0
Q Serve(g_s), s	0.9	15.9	16.3	8.4	11.1	11.1	0.2	0.0	4.4	0.1	0.0	0.0
Cycle Q Clear(g_c), s	12.0	15.9	16.3	24.6	11.1	11.1	4.7	0.0	4.4	4.5	0.0	0.0
Prop In Lane	1.00		0.31	1.00		0.04	1.00		0.96	0.54		0.13
Lane Grp Cap(c), veh/h	343	1173	1170	260	1173	1226	324	0	233	246	0	0
V/C Ratio(X)	0.04	0.62	0.63	0.25	0.49	0.49	0.37	0.00	0.48	0.16	0.00	0.00
Avail Cap(c_a), veh/h	343	1173	1170	260	1173	1226	612	0	562	549	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.32	0.32	0.32	0.78	0.78	0.78	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.7	6.6	6.6	13.7	5.7	5.7	26.8	0.0	26.7	25.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.8	0.8	1.8	1.2	1.1	0.7	0.0	1.5	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	7.9	8.0	1.0	5.7	5.9	2.1	0.0	2.0	0.7	0.0	0.0
LnGrp Delay(d),s/veh	8.8	7.3	7.4	15.5	6.9	6.8	27.5	0.0	28.2	25.7	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	C		C	C		
Approach Vol, veh/h		1469			1243			232			39	
Approach Delay, s/veh		7.4			7.3			27.8			25.7	
Approach LOS		A			A			C			C	

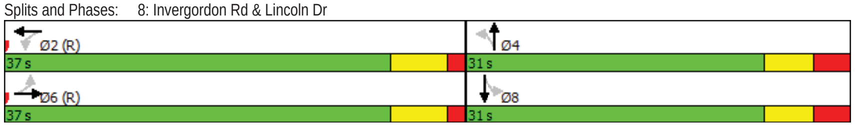
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.1		16.9		51.1		16.9
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0
Max Green Setting (Gmax), s		31.0		24.0		31.0		24.0
Max Q Clear Time (g_c+I1), s		26.6		6.7		18.3		6.5
Green Ext Time (p_c), s		4.1		1.1		11.5		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.2
HCM 2010 LOS	A

Phase Number	2	4	6	8
Movement	WBTL	NBTL	EBTL	SBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	37	31	37	31
Maximum Split (%)	54.4%	45.6%	54.4%	45.6%
Minimum Split (s)	24	31	24	17
Yellow Time (s)	4.5	4	4.5	4
All-Red Time (s)	1.5	3	1.5	3
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	
Flash Dont Walk (s)	11	17	11	
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	59	28	59	28
End Time (s)	28	59	28	59
Yield/Force Off (s)	22	52	22	52
Yield/Force Off 170(s)	11	35	11	52
Local Start Time (s)	0	37	0	37
Local Yield (s)	31	61	31	61
Local Yield 170(s)	20	44	20	61

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 59 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 8: Invergordon Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	263	1172	36	26	982	23	17	59	36	96	118	329
Future Volume (veh/h)	263	1172	36	26	982	23	17	59	36	96	118	329
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	286	1274	39	28	1067	25	18	64	39	104	128	358
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	558	2278	70	119	1251	29	201	175	106	305	473	402
Arrive On Green	0.25	0.65	0.65	0.71	0.71	0.71	0.16	0.16	0.16	0.06	0.25	0.25
Sat Flow, veh/h	1774	3506	107	417	3535	83	906	1085	661	1774	1863	1583
Grp Volume(v), veh/h	286	643	670	28	534	558	18	0	103	104	128	358
Grp Sat Flow(s),veh/h/ln	1774	1770	1844	417	1770	1848	906	0	1746	1774	1863	1583
Q Serve(g_s), s	8.7	26.0	26.0	7.0	28.9	28.9	2.2	0.0	6.8	6.2	7.2	28.3
Cycle Q Clear(g_c), s	8.7	26.0	26.0	33.0	28.9	28.9	2.2	0.0	6.8	6.2	7.2	28.3
Prop In Lane	1.00		0.06	1.00		0.04	1.00		0.38	1.00		1.00
Lane Grp Cap(c), veh/h	558	1150	1198	119	626	654	201	0	281	305	473	402
V/C Ratio(X)	0.51	0.56	0.56	0.23	0.85	0.85	0.09	0.00	0.37	0.34	0.27	0.89
Avail Cap(c_a), veh/h	558	1150	1198	119	626	654	268	0	410	427	738	627
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.77	0.77	0.77	0.83	0.83	0.83	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	12.5	12.5	27.5	16.5	16.5	46.7	0.0	48.6	40.3	38.8	46.7
Incr Delay (d2), s/veh	0.6	1.5	1.5	3.8	11.7	11.3	0.2	0.0	0.8	0.7	0.3	9.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	13.2	13.7	0.9	15.7	16.3	0.6	0.0	3.4	3.0	3.7	13.5
LnGrp Delay(d),s/veh	37.1	14.0	14.0	31.3	28.2	27.8	46.9	0.0	49.4	41.0	39.1	56.6
LnGrp LOS	D	B	B	C	C	C	D		D	D	D	E
Approach Vol, veh/h		1599			1120			121			590	
Approach Delay, s/veh		18.1			28.1			49.0			50.1	
Approach LOS		B			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6		8
Phs Duration (G+Y+Rc), s	38.5	52.0	12.1	27.4		90.5		39.5
Change Period (Y+Rc), s	6.0	* 6	4.0	6.5		6.0		6.5
Max Green Setting (Gmax), s	16.0	* 46	17.0	30.5		66.0		51.5
Max Q Clear Time (g_c+I1), s	10.7	35.0	8.2	8.8		28.0		30.3
Green Ext Time (p_c), s	3.4	5.6	0.1	2.7		13.7		2.7

Intersection Summary	
HCM 2010 Ctrl Delay	28.0
HCM 2010 LOS	C

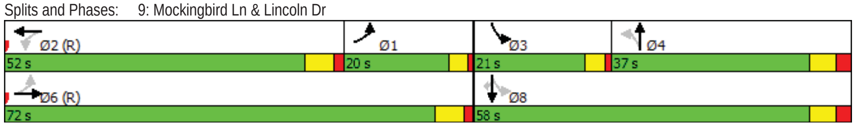
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	6	8
Movement	EBL	WBTL	SBL	NBTL	EBTL	SBTL
Lead/Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	20	52	21	37	72	58
Maximum Split (%)	15.4%	40.0%	16.2%	28.5%	55.4%	44.6%
Minimum Split (s)	8	27	8	34	27	34
Yellow Time (s)	3	4.5	3	4	4.5	4
All-Red Time (s)	1	1.5	1	2.5	1.5	2.5
Minimum Initial (s)	4	15	4	7	15	7
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7		7	7	7
Flash Dont Walk (s)		14		20	14	20
Dual Entry	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	50	128	70	91	128	70
End Time (s)	70	50	91	128	70	128
Yield/Force Off (s)	66	44	87	121.5	64	121.5
Yield/Force Off 170(s)	66	30	87	101.5	50	101.5
Local Start Time (s)	52	0	72	93	0	72
Local Yield (s)	68	46	89	123.5	66	123.5
Local Yield 170(s)	68	32	89	103.5	52	103.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 128 (98%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 9: Mockingbird Ln & Lincoln Dr



HCM 2010 Signalized Intersection Summary
10: Quail Run Rd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	1162	5	5	1249	27	5	0	5	50	0	91
Future Volume (veh/h)	157	1162	5	5	1249	27	5	0	5	50	0	91
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	171	1263	5	5	1358	29	5	0	5	54	0	99
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	359	2976	12	383	2667	57	78	13	50	179	0	128
Arrive On Green	0.08	1.00	1.00	0.75	0.75	0.75	0.08	0.00	0.08	0.08	0.00	0.08
Sat Flow, veh/h	1774	3616	14	435	3543	76	457	159	616	1538	0	1583
Grp Volume(v), veh/h	171	618	650	5	678	709	10	0	0	54	0	99
Grp Sat Flow(s),veh/h/ln	1774	1770	1860	435	1770	1849	1231	0	0	1538	0	1583
Q Serve(g_s), s	2.9	0.0	0.0	0.4	20.0	20.0	0.0	0.0	0.0	0.0	0.0	8.0
Cycle Q Clear(g_c), s	2.9	0.0	0.0	0.4	20.0	20.0	3.8	0.0	0.0	3.8	0.0	8.0
Prop In Lane	1.00		0.01	1.00		0.04	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	359	1457	1531	383	1332	1392	141	0	0	179	0	128
V/C Ratio(X)	0.48	0.42	0.42	0.01	0.51	0.51	0.07	0.00	0.00	0.30	0.00	0.78
Avail Cap(c_a), veh/h	506	1457	1531	383	1332	1392	322	0	0	358	0	329
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.68	0.68	0.68	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.7	0.0	0.0	4.0	6.4	6.5	55.3	0.0	0.0	56.7	0.0	58.6
Incr Delay (d2), s/veh	0.8	0.8	0.7	0.0	1.0	0.9	0.2	0.0	0.0	0.9	0.0	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.3	0.3	0.0	10.0	10.4	0.3	0.0	0.0	1.9	0.0	3.8
LnGrp Delay(d),s/veh	6.5	0.8	0.7	4.1	7.4	7.4	55.5	0.0	0.0	57.6	0.0	68.2
LnGrp LOS	A	A	A	A	A	A	E			E		E
Approach Vol, veh/h		1439			1392			10			153	
Approach Delay, s/veh		1.4			7.4			55.5			64.5	
Approach LOS		A			A			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		16.5		113.5		16.5	9.2	104.3
Change Period (Y+Rc), s		6.0		6.5		6.0	4.0	6.5
Max Green Setting (Gmax), s		27.0		90.5		27.0	16.0	70.5
Max Q Clear Time (g_c+I1), s		5.8		2.0		10.0	4.9	22.0
Green Ext Time (p_c), s		0.6		47.7		0.5	0.3	33.5

Intersection Summary	
HCM 2010 Ctrl Delay	7.6
HCM 2010 LOS	A

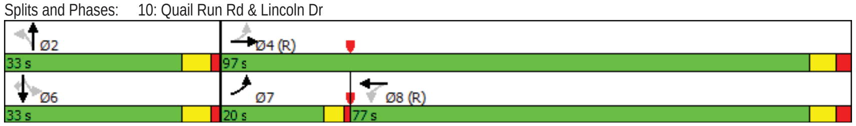
Timing Report, Sorted By Phase
10: Quail Run Rd & Lincoln Dr

11/5/2015

Phase Number	2	4	6	7	8
Movement	NBTL	EBTL	SBTL	EBL	WBTL
Lead/Lag				Lead	Lag
Lead-Lag Optimize				Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max
Maximum Split (s)	33	97	33	20	77
Maximum Split (%)	25.4%	74.6%	25.4%	15.4%	59.2%
Minimum Split (s)	33	28	33	8	28
Yellow Time (s)	4.5	4	4.5	3	4
All-Red Time (s)	1.5	2.5	1.5	1	2.5
Minimum Initial (s)	7	15	7	4	15
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7	7		7
Flash Dont Walk (s)	20	14	20		14
Dual Entry	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	54	87	54	87	107
End Time (s)	87	54	87	107	54
Yield/Force Off (s)	81	47.5	81	103	47.5
Yield/Force Off 170(s)	61	33.5	61	103	33.5
Local Start Time (s)	77	110	77	110	0
Local Yield (s)	104	70.5	104	126	70.5
Local Yield 170(s)	84	56.5	84	126	56.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 107 (82%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 10: Quail Run Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	680	47	420	26	34	46	306	1264	30	31	1793	679
Future Volume (veh/h)	680	47	420	26	34	46	306	1264	30	31	1793	679
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	775	0	457	28	37	50	333	1374	33	34	1949	738
Adj No. of Lanes	2	0	1	1	2	0	2	3	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	355	0	197	86	86	77	381	3204	77	43	2750	933
Arrive On Green	0.10	0.00	0.10	0.05	0.05	0.05	0.22	1.00	1.00	0.02	0.54	0.54
Sat Flow, veh/h	3548	0	1583	1774	1770	1583	3442	5109	123	1774	5085	1583
Grp Volume(v), veh/h	775	0	457	28	37	50	333	912	495	34	1949	738
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	1770	1583	1721	1695	1841	1774	1695	1583
Q Serve(g_s), s	12.0	0.0	12.0	1.8	2.4	3.7	11.2	0.0	0.0	2.3	34.2	43.0
Cycle Q Clear(g_c), s	12.0	0.0	12.0	1.8	2.4	3.7	11.2	0.0	0.0	2.3	34.2	43.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	355	0	197	86	86	77	381	2126	1155	43	2750	933
V/C Ratio(X)	2.18	0.00	2.32	0.32	0.43	0.65	0.87	0.43	0.43	0.79	0.71	0.79
Avail Cap(c_a), veh/h	355	0	197	281	280	251	430	2126	1155	148	2750	933
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.00	0.90	1.00	1.00	1.00	0.78	0.78	0.78	0.72	0.72	0.72
Uniform Delay (d), s/veh	54.0	0.0	52.5	55.2	55.5	56.1	45.9	0.0	0.0	58.2	20.5	19.0
Incr Delay (d2), s/veh	541.2	0.0	609.5	0.8	1.3	3.4	12.3	0.5	0.9	8.3	1.1	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	32.5	0.0	39.8	0.9	1.2	1.7	5.9	0.1	0.3	1.2	16.2	22.2
LnGrp Delay(d),s/veh	595.2	0.0	662.1	56.0	56.7	59.5	58.3	0.5	0.9	66.5	21.6	23.9
LnGrp LOS	F		F	E	E	E	E	A	A	E	C	C
Approach Vol, veh/h		1232			115			1740			2721	
Approach Delay, s/veh		620.0			57.8			11.7			22.8	
Approach LOS		F			E			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.9	81.3		12.8	17.3	70.9		19.0
Change Period (Y+Rc), s	4.0	6.0		7.0	4.0	6.0		7.0
Max Green Setting (Gmax), s	10.0	55.0		19.0	15.0	50.0		12.0
Max Q Clear Time (g_c+I1), s	4.3	2.0		5.7	13.2	45.0		14.0
Green Ext Time (p_c), s	0.0	7.6		0.2	0.1	3.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	146.9
HCM 2010 LOS	F

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Timing Report, Sorted By Phase
11: Scottsdale Rd & Lincoln Dr

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	WBTL	NBL	SBT	EBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	14	61	26	19	56	19
Maximum Split (%)	11.7%	50.8%	21.7%	15.8%	46.7%	15.8%
Minimum Split (s)	9	28	40	9	28	40
Yellow Time (s)	3	4.5	4	3	4.5	4
All-Red Time (s)	1	1.5	3	1	1.5	3
Minimum Initial (s)	4	4	4	4	4	4
Vehicle Extension (s)	1	0.2	2	1	0.2	2
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		15	26		15	26
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	71	85	26	71	90	52
End Time (s)	85	26	52	90	26	71
Yield/Force Off (s)	81	20	45	86	20	64
Yield/Force Off 170(s)	81	5	19	86	5	38
Local Start Time (s)	101	115	56	101	0	82
Local Yield (s)	111	50	75	116	50	94
Local Yield 170(s)	111	35	49	116	35	68

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 11: Scottsdale Rd & Lincoln Dr

HCM 2010 AWSC
12: Mockingbird Ln & McDonald Dr

Intersection	
Intersection Delay, s/veh	12.3
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	56	235	10	0	9	292	42	0	5	5	5
Future Vol, veh/h	0	56	235	10	0	9	292	42	0	5	5	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	61	255	11	0	10	317	46	0	5	5	5
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	11.4	14.2	9.8
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	33%	100%	0%	100%	0%	100%	0%
Vol Thru, %	33%	0%	96%	0%	87%	0%	7%
Vol Right, %	33%	0%	4%	0%	13%	0%	93%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	56	245	9	334	82	74
LT Vol	5	56	0	9	0	82	0
Through Vol	5	0	235	0	292	0	5
RT Vol	5	0	10	0	42	0	69
Lane Flow Rate	16	61	266	10	363	89	80
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.03	0.101	0.401	0.016	0.538	0.17	0.128
Departure Headway (Hd)	6.599	6.066	5.532	6.032	5.438	6.879	5.712
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	545	594	655	597	668	525	631
Service Time	4.606	3.766	3.232	3.732	3.138	4.58	3.413
HCM Lane V/C Ratio	0.029	0.103	0.406	0.017	0.543	0.17	0.127
HCM Control Delay	9.8	9.4	11.9	8.8	14.3	11	9.2
HCM Lane LOS	A	A	B	A	B	B	A
HCM 95th-tile Q	0.1	0.3	1.9	0	3.2	0.6	0.4

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	82	5	69
Future Vol, veh/h	0	82	5	69
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	89	5	75
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	10.1
HCM LOS	B

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	246	36	308	355	333	48	1179	146	213	1877	74
Future Volume (veh/h)	128	246	36	308	355	333	48	1179	146	213	1877	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	139	267	39	335	386	362	52	1282	159	232	2040	80
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	202	347	50	281	506	590	408	1907	594	791	1907	594
Arrive On Green	0.08	0.11	0.11	0.11	0.14	0.14	0.23	0.38	0.38	0.31	0.50	0.50
Sat Flow, veh/h	1774	3105	448	1774	3539	1583	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	139	151	155	335	386	362	52	1282	159	232	2040	80
Grp Sat Flow(s),veh/h/ln	1774	1770	1784	1774	1770	1583	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	4.7	9.9	10.2	13.0	12.6	0.0	2.8	25.3	8.4	6.2	45.0	3.3
Cycle Q Clear(g_c), s	4.7	9.9	10.2	13.0	12.6	0.0	2.8	25.3	8.4	6.2	45.0	3.3
Prop In Lane	1.00		0.25	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	202	198	199	281	506	590	408	1907	594	791	1907	594
V/C Ratio(X)	0.69	0.76	0.78	1.19	0.76	0.61	0.13	0.67	0.27	0.29	1.07	0.13
Avail Cap(c_a), veh/h	257	339	342	281	678	667	408	1907	594	791	1907	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.43	0.43	0.43
Uniform Delay (d), s/veh	52.1	51.7	51.8	51.3	49.5	30.6	36.7	31.3	26.1	34.2	30.1	19.6
Incr Delay (d2), s/veh	5.3	6.0	6.4	115.7	3.6	1.4	0.1	1.9	1.1	0.1	36.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	5.2	5.4	18.3	6.4	9.9	1.4	12.1	3.8	2.9	27.4	1.5
LnGrp Delay(d),s/veh	57.5	57.7	58.3	167.0	53.1	32.0	36.8	33.2	27.2	34.3	66.8	19.8
LnGrp LOS	E	E	E	F	D	C	D	C	C	C	F	B
Approach Vol, veh/h		445			1083			1493			2352	
Approach Delay, s/veh		57.8			81.3			32.7			62.0	
Approach LOS		E			F			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.6	51.0	17.0	20.4	31.6	51.0	13.3	24.1
Change Period (Y+Rc), s	4.0	6.0	* 4	7.0	4.0	6.0	* 4	7.0
Max Green Setting (Gmax), s	18.0	45.0	* 13	23.0	18.0	45.0	* 13	23.0
Max Q Clear Time (g_c+I1), s	8.2	27.3	15.0	12.2	4.8	47.0	6.7	14.6
Green Ext Time (p_c), s	0.7	9.4	0.0	1.3	0.8	0.0	0.9	2.6

Intersection Summary	
HCM 2010 Ctrl Delay	57.4
HCM 2010 LOS	E

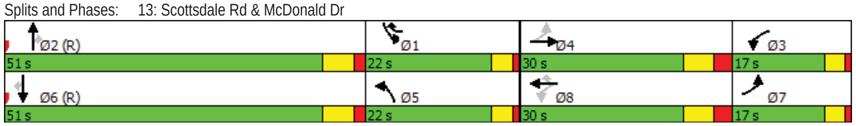
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	51	17	30	22	51	17	30
Maximum Split (%)	18.3%	42.5%	14.2%	25.0%	18.3%	42.5%	14.2%	25.0%
Minimum Split (s)	14	31	10	37	14	31	10	37
Yellow Time (s)	3	4.5	3	4.3	3	4.5	3	4.3
All-Red Time (s)	1	1.5	1	2.7	1	1.5	1	2.7
Minimum Initial (s)	10	20	6	8	10	20	6	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		9		6		9		6
Flash Dont Walk (s)		16		24		16		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	81	30	13	103	81	30	13	103
End Time (s)	103	81	30	13	103	81	30	13
Yield/Force Off (s)	99	75	26	6	99	75	26	6
Yield/Force Off 170(s)	99	59	26	102	99	59	26	102
Local Start Time (s)	51	0	103	73	51	0	103	73
Local Yield (s)	69	45	116	96	69	45	116	96
Local Yield 170(s)	69	29	116	72	69	29	116	72

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 30 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 13: Scottsdale Rd & McDonald Dr



Intersection	
Intersection Delay, s/veh	5.0
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	184	229	61
Demand Flow Rate, veh/h	187	233	63
Vehicles Circulating, veh/h	22	25	171
Vehicles Exiting, veh/h	236	208	38
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.8	5.3	4.5
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	187	233	63
Cap Entry Lane, veh/h	1105	1102	952
Entry HV Adj Factor	0.982	0.982	0.968
Flow Entry, veh/h	184	229	61
Cap Entry, veh/h	1086	1082	922
V/C Ratio	0.169	0.211	0.066
Control Delay, s/veh	4.8	5.3	4.5
LOS	A	A	A
95th %tile Queue, veh	1	1	0

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	186	3	6	197	13	29
Future Vol, veh/h	186	3	6	197	13	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	202	3	7	214	14	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	205	0	431	204
Stage 1	-	-	-	-	204	-
Stage 2	-	-	-	-	227	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1366	-	581	837
Stage 1	-	-	-	-	830	-
Stage 2	-	-	-	-	811	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1366	-	578	837
Mov Cap-2 Maneuver	-	-	-	-	578	-
Stage 1	-	-	-	-	830	-
Stage 2	-	-	-	-	807	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	735	-	-	1366	-
HCM Lane V/C Ratio	0.062	-	-	0.005	-
HCM Control Delay (s)	10.2	-	-	7.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	242	17	40	219	23	54
Future Vol, veh/h	242	17	40	219	23	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	263	18	43	238	25	59

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	282	0	478	272
Stage 1	-	-	-	-	272	-
Stage 2	-	-	-	-	206	-
Critical Hdwy	-	-	4.12	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.218	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1280	-	531	766
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	809	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1280	-	513	766
Mov Cap-2 Maneuver	-	-	-	-	589	-
Stage 1	-	-	-	-	773	-
Stage 2	-	-	-	-	782	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	703	-	-	1280	-
HCM Lane V/C Ratio	0.119	-	-	0.034	-
HCM Control Delay (s)	10.8	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	3	1	0	1751	1882	6
Future Vol, veh/h	3	1	0	1751	1882	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	1	0	1903	2046	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2807	1023	2046	0	-	0
Stage 1	2046	-	-	-	-	-
Stage 2	761	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	34	200	118	-	-	-
Stage 1	53	-	-	-	-	-
Stage 2	383	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	34	200	118	-	-	-
Mov Cap-2 Maneuver	34	-	-	-	-	-
Stage 1	53	-	-	-	-	-
Stage 2	383	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	118	-	200	-	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	0	-	23.1	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	44	0	0	13	21	14
Future Vol, veh/h	44	0	0	13	21	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	0	0	14	23	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	44	30	38	0	-	0
Stage 1	30	-	-	-	-	-
Stage 2	14	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	967	1044	1572	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	1009	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	967	1044	1572	-	-	-
Mov Cap-2 Maneuver	967	-	-	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1572	-	967	-	-
HCM Lane V/C Ratio	-	-	0.049	-	-
HCM Control Delay (s)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	10	5	7	22	11	10
Future Vol, veh/h	10	5	7	22	11	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	5	8	24	12	11

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	55	20	0	0	32	0
Stage 1	20	-	-	-	-	-
Stage 2	35	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	953	1058	-	-	1580	-
Stage 1	1003	-	-	-	-	-
Stage 2	987	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	945	1058	-	-	1580	-
Mov Cap-2 Maneuver	945	-	-	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	979	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	3.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	980	1580	-
HCM Lane V/C Ratio	-	-	0.017	0.008	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	15	5	25	19	8	13
Future Vol, veh/h	15	5	25	19	8	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	5	27	21	9	14

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	70	38	0	0	48	0
Stage 1	38	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	934	1034	-	-	1559	-
Stage 1	984	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	928	1034	-	-	1559	-
Mov Cap-2 Maneuver	928	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	985	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	2.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	952	1559	-
HCM Lane V/C Ratio	-	-	0.023	0.006	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	15	9	33	18	9	20
Future Vol, veh/h	15	9	33	18	9	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	10	36	20	10	22

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	87	46	0	0	55	0
Stage 1	46	-	-	-	-	-
Stage 2	41	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	914	1023	-	-	1550	-
Stage 1	976	-	-	-	-	-
Stage 2	981	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	908	1023	-	-	1550	-
Mov Cap-2 Maneuver	908	-	-	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	974	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	2.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	948	1550	-
HCM Lane V/C Ratio	-	-	0.028	0.006	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	19	8	12	160	49	13
Future Vol, veh/h	19	8	12	160	49	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	9	13	174	53	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	187	0	-	0	150	100
Stage 1	-	-	-	-	100	-
Stage 2	-	-	-	-	50	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1387	-	-	-	842	956
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	972	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1387	-	-	-	829	956
Mov Cap-2 Maneuver	-	-	-	-	806	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	957	-

Approach	EB	WB	SB
HCM Control Delay, s	5.4	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1387	-	-	-	833
HCM Lane V/C Ratio	0.015	-	-	-	0.081
HCM Control Delay (s)	7.6	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	31	4	67	49	1	26
Future Vol, veh/h	31	4	67	49	1	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	4	73	53	1	28

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	129	99	0	0	126	0
Stage 1	99	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	865	957	-	-	1460	-
Stage 1	925	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	864	957	-	-	1460	-
Mov Cap-2 Maneuver	864	-	-	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	992	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	874	1460	-
HCM Lane V/C Ratio	-	-	0.044	0.001	-
HCM Control Delay (s)	-	-	9.3	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Intersection Delay, s/veh	4.4
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	33	22	192	62
Demand Flow Rate, veh/h	34	22	196	63
Vehicles Circulating, veh/h	85	140	0	33
Vehicles Exiting, veh/h	11	56	119	129
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.9	3.9	4.8	3.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	34	22	196	63
Cap Entry Lane, veh/h	1038	982	1130	1093
Entry HV Adj Factor	0.971	1.000	0.982	0.980
Flow Entry, veh/h	33	22	192	62
Cap Entry, veh/h	1007	982	1110	1072
V/C Ratio	0.033	0.022	0.173	0.058
Control Delay, s/veh	3.9	3.9	4.8	3.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	0

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	34	0	177	7	0	107
Future Vol, veh/h	34	0	177	7	0	107
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	0	192	8	0	116

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	312	196	0	0	200	0
Stage 1	196	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	681	845	-	-	1372	-
Stage 1	837	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	681	845	-	-	1372	-
Mov Cap-2 Maneuver	681	-	-	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	909	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	681	1372	-
HCM Lane V/C Ratio	-	-	0.054	-	-
HCM Control Delay (s)	-	-	10.6	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	4	33	227	0	19	17	4	0	304	41	48
Future Vol, veh/h	0	4	33	227	0	19	17	4	0	304	41	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	36	247	0	21	18	4	0	330	45	52
Number of Lanes	0	1	1	0	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	11.6	9.8	14
HCM LOS	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	47%	4%
Vol Thru, %	0%	46%	0%	13%	43%	82%
Vol Right, %	0%	54%	0%	87%	10%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	304	89	4	260	40	28
LT Vol	304	0	4	0	19	1
Through Vol	0	41	0	33	17	23
RT Vol	0	48	0	227	4	4
Lane Flow Rate	330	97	4	283	43	30
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.543	0.135	0.008	0.41	0.076	0.051
Departure Headway (Hd)	6.019	5.135	6.347	5.225	6.313	6.048
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	605	702	560	684	571	596
Service Time	3.719	2.835	4.125	3.003	4.315	4.05
HCM Lane V/C Ratio	0.545	0.138	0.007	0.414	0.075	0.05
HCM Control Delay	15.6	8.6	9.2	11.6	9.8	9.4
HCM Lane LOS	C	A	A	B	A	A
HCM 95th-tile Q	3.3	0.5	0	2	0.2	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	1	23	4
Future Vol, veh/h	0	1	23	4
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	25	4
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9.4
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	4.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	151	83	335	178	73	202
Future Vol, veh/h	151	83	335	178	73	202
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	164	90	364	193	79	220

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	839	461	0	0	558	0
Stage 1	461	-	-	-	-	-
Stage 2	378	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	336	600	-	-	1013	-
Stage 1	635	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	310	600	-	-	1013	-
Mov Cap-2 Maneuver	432	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	639	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.1	0	2.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	432	600	1013	-
HCM Lane V/C Ratio	-	-	0.38	0.15	0.078	-
HCM Control Delay (s)	-	-	18.3	12.1	8.9	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.7	0.5	0.3	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	224	5	78	272	15	5	0	155	5	0	5
Future Vol, veh/h	5	224	5	78	272	15	5	0	155	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	243	5	85	296	16	5	0	168	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	312	0	0	249	0	0	733	739	246	814	733	304
Stage 1	-	-	-	-	-	-	257	257	-	473	473	-
Stage 2	-	-	-	-	-	-	476	482	-	341	260	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1248	-	-	1317	-	-	336	345	793	297	348	736
Stage 1	-	-	-	-	-	-	748	695	-	572	558	-
Stage 2	-	-	-	-	-	-	570	553	-	674	693	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1248	-	-	1317	-	-	316	321	793	222	324	736
Mov Cap-2 Maneuver	-	-	-	-	-	-	316	321	-	222	324	-
Stage 1	-	-	-	-	-	-	745	692	-	570	522	-
Stage 2	-	-	-	-	-	-	529	517	-	529	690	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.7	11.2	15.9
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	757	1248	-	-	1317	-	-	341
HCM Lane V/C Ratio	0.23	0.004	-	-	0.064	-	-	0.032
HCM Control Delay (s)	11.2	7.9	-	-	7.9	-	-	15.9
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.9	0	-	-	0.2	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	243	70	489	285	136	114	1916	527	187	1665	78
Future Volume (veh/h)	157	243	70	489	285	136	114	1916	527	187	1665	78
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	171	264	76	532	310	148	124	2083	573	203	1810	85
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	197	171	145	591	330	457	283	2161	945	261	2161	673
Arrive On Green	0.11	0.09	0.09	0.17	0.18	0.18	0.11	0.43	0.43	0.11	0.43	0.43
Sat Flow, veh/h	1774	1863	1583	3442	1863	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	171	264	76	532	310	148	124	2083	573	203	1810	85
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1721	1863	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	11.4	11.0	5.5	18.2	19.7	1.8	1.8	47.9	6.8	9.0	38.1	2.6
Cycle Q Clear(g_c), s	11.4	11.0	5.5	18.2	19.7	1.8	1.8	47.9	6.8	9.0	38.1	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	197	171	145	591	330	457	283	2161	945	261	2161	673
V/C Ratio(X)	0.87	1.55	0.52	0.90	0.94	0.32	0.44	0.96	0.61	0.78	0.84	0.13
Avail Cap(c_a), veh/h	207	171	145	660	330	457	292	2161	945	270	2161	673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.5	54.5	52.0	48.7	48.7	16.3	46.2	33.6	15.3	49.9	30.8	9.2
Incr Delay (d2), s/veh	27.7	272.6	1.7	13.5	33.4	0.2	0.4	12.5	2.9	11.8	4.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	18.6	2.5	9.8	13.2	2.6	3.8	24.9	3.6	7.3	18.6	1.2
LnGrp Delay(d),s/veh	80.2	327.1	53.7	62.2	82.1	16.5	46.6	46.1	18.2	61.7	34.9	9.6
LnGrp LOS	F	F	D	E	F	B	D	D	B	E	C	A
Approach Vol, veh/h		511			990			2780			2098	
Approach Delay, s/veh		203.8			61.6			40.4			36.4	
Approach LOS		F			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.4	57.0	27.6	18.0	17.4	57.0	17.3	28.3
Change Period (Y+Rc), s	* 4	6.0	* 7	* 7	* 4	6.0	4.0	* 7
Max Green Setting (Gmax), s	* 14	51.0	* 23	* 11	* 14	51.0	14.0	* 20
Max Q Clear Time (g_c+I1), s	11.0	49.9	20.2	13.0	3.8	40.1	13.4	21.7
Green Ext Time (p_c), s	0.1	0.7	0.4	0.0	0.1	3.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	55.5
HCM 2010 LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Timing Report, Sorted By Phase
4: Scottsdale Rd & Indian Bend Rd.

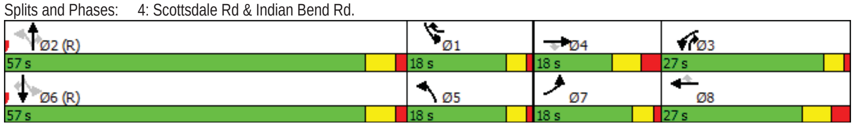
11/5/2015

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	18	57	27	18	18	57	18	27
Maximum Split (%)	15.0%	47.5%	22.5%	15.0%	15.0%	47.5%	15.0%	22.5%
Minimum Split (s)	9.4	29.4	8.5	13	9.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	87	30	3	105	87	30	105	3
End Time (s)	105	87	30	3	105	87	3	30
Yield/Force Off (s)	101	81	26	116	101	81	119	23
Yield/Force Off 170(s)	101	65	26	85	101	65	119	112
Local Start Time (s)	57	0	93	75	57	0	75	93
Local Yield (s)	71	51	116	86	71	51	89	113
Local Yield 170(s)	71	35	116	55	71	35	89	82

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100

Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



HCM 2010 TWSC
5: Scottsdale Rd & Joshua Tree Ln

11/5/2015

Intersection	
Int Delay, s/veh	16.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	115	5	0	11	0	2512	6	10	2221	79
Future Vol, veh/h	0	0	115	5	0	11	0	2512	6	10	2221	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	150	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	125	5	0	12	0	2730	7	11	2414	86

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3528	5173	1207	3721	5170	1368	2414	0	0	2737	0	0
Stage 1	2436	2436	-	2734	2734	-	-	-	-	-	-	-
Stage 2	1092	2737	-	987	2436	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	7	0	151	~ 5	0	117	77	-	-	52	-	-
Stage 1	18	61	-	11	43	-	-	-	-	-	-	-
Stage 2	206	43	-	240	61	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	5	0	151	~ 1	0	117	77	-	-	52	-	-
Mov Cap-2 Maneuver	5	0	-	~ 1	0	-	-	-	-	-	-	-
Stage 1	18	48	-	11	43	-	-	-	-	-	-	-
Stage 2	185	43	-	33	48	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	92	$ 4356.9	0	0.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	77	-	-	151	3	52	-	-
HCM Lane V/C Ratio	-	-	-	0.828	5.797	0.209	-	-
HCM Control Delay (s)	0	-	-	92	$ 4356.9	91.7	-	-
HCM Lane LOS	A	-	-	F	F	F	-	-
HCM 95th %tile Q(veh)	0	-	-	5.4	3.6	0.7	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	140	245	316	2374	2328	80
Future Volume (veh/h)	140	245	316	2374	2328	80
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	152	266	343	2580	2530	87
Adj No. of Lanes	2	1	2	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	239	540	1052	4259	2641	822
Arrive On Green	0.07	0.07	0.27	0.84	0.52	0.52
Sat Flow, veh/h	3442	1583	3442	5253	5253	1583
Grp Volume(v), veh/h	152	266	343	2580	2530	87
Grp Sat Flow(s),veh/h/ln	1721	1583	1721	1695	1695	1583
Q Serve(g_s), s	5.5	0.0	5.5	21.6	61.4	3.6
Cycle Q Clear(g_c), s	5.5	0.0	5.5	21.6	61.4	3.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	239	540	1052	4259	2641	822
V/C Ratio(X)	0.64	0.49	0.33	0.61	0.96	0.11
Avail Cap(c_a), veh/h	806	801	1052	4259	2641	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.17	0.17	1.00	1.00
Uniform Delay (d), s/veh	58.4	33.7	35.3	3.5	29.7	15.8
Incr Delay (d2), s/veh	2.8	0.7	0.0	0.1	10.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	9.6	4.7	9.8	31.1	1.6
LnGrp Delay(d),s/veh	61.2	34.4	35.3	3.6	39.8	16.0
LnGrp LOS	E	C	D	A	D	B
Approach Vol, veh/h	418			2923	2617	
Approach Delay, s/veh	44.1			7.3	39.0	
Approach LOS	D			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		114.0		15.0	41.0	73.0		
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6		
Max Green Setting (Gmax), s		* 87		30.2	* 16	* 67		
Max Q Clear Time (g_c+I1), s		23.6		7.5	7.5	63.4		
Green Ext Time (p_c), s		48.8		1.4	6.7	3.5		

Intersection Summary		
HCM 2010 Ctrl Delay		23.8
HCM 2010 LOS		C

Notes

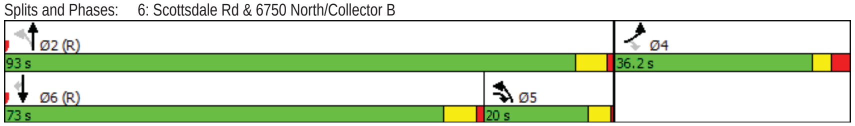
HCM 2010 Signalized Intersection Summary
6: Scottsdale Rd & 6750 North/Collector B 11/5/2015

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	2	4	5	6
Movement	NBTL	EBL	NBL	SBT
Lead/Lag			Lag	Lead
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	93	36.2	20	73
Maximum Split (%)	72.0%	28.0%	15.5%	56.5%
Minimum Split (s)	36	36.2	8	36.9
Yellow Time (s)	4.9	3	3.5	4.9
All-Red Time (s)	1.1	3	0.5	1.1
Minimum Initial (s)	10	5	4	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8	8		8
Flash Dont Walk (s)	22	19		22
Dual Entry	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	65	28.8	8.8	65
End Time (s)	28.8	65	28.8	8.8
Yield/Force Off (s)	22.8	59	24.8	2.8
Yield/Force Off 170(s)	0.8	40	24.8	110
Local Start Time (s)	0	93	73	0
Local Yield (s)	87	123.2	89	67
Local Yield 170(s)	65	104.2	89	45

Intersection Summary	
Cycle Length	129.2
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 65 (50%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	370	820	41	419	922	304	92	1085	376	237	657	178
Future Volume (veh/h)	370	820	41	419	922	304	92	1085	376	237	657	178
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	402	891	45	455	1002	330	100	1179	409	258	714	193
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	470	844	43	219	829	371	311	1296	580	282	1579	706
Arrive On Green	0.10	0.25	0.25	0.09	0.23	0.23	0.04	0.37	0.37	0.12	0.45	0.45
Sat Flow, veh/h	3442	3429	173	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	402	460	476	455	1002	330	100	1179	409	258	714	193
Grp Sat Flow(s),veh/h/ln	1721	1770	1832	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	11.4	32.0	32.0	12.0	30.4	26.2	4.6	41.2	28.7	13.4	18.2	10.0
Cycle Q Clear(g_c), s	11.4	32.0	32.0	12.0	30.4	26.2	4.6	41.2	28.7	13.4	18.2	10.0
Prop In Lane	1.00		0.09	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	470	436	451	219	829	371	311	1296	580	282	1579	706
V/C Ratio(X)	0.86	1.06	1.06	2.08	1.21	0.89	0.32	0.91	0.71	0.92	0.45	0.27
Avail Cap(c_a), veh/h	534	436	451	219	829	371	311	1296	580	290	1579	706
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.55	0.55	0.55	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	49.0	49.0	37.8	49.8	48.2	24.7	39.2	35.2	36.4	25.0	22.7
Incr Delay (d2), s/veh	10.6	58.6	57.9	492.8	100.5	16.2	0.2	11.0	7.1	30.8	0.9	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	22.7	23.4	32.0	26.4	13.1	2.3	22.1	13.7	11.5	9.0	4.5
LnGrp Delay(d),s/veh	46.4	107.6	106.9	530.6	150.2	64.3	24.9	50.2	42.3	67.2	25.9	23.7
LnGrp LOS	D	F	F	F	F	E	C	D	D	E	C	C
Approach Vol, veh/h		1338			1787			1688			1165	
Approach Delay, s/veh		88.9			231.2			46.8			34.7	
Approach LOS		F			F			D			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.6	37.4	19.4	54.6	17.0	39.0	9.0	65.0
Change Period (Y+Rc), s	5.0	7.0	4.0	7.0	5.0	7.0	4.0	7.0
Max Green Setting (Gmax), s	16.0	28.0	16.0	47.0	12.0	32.0	5.0	58.0
Max Q Clear Time (g_c+I1), s	13.4	32.4	15.4	43.2	14.0	34.0	6.6	20.2
Green Ext Time (p_c), s	0.2	0.0	0.0	3.8	0.0	0.0	0.0	35.2

Intersection Summary	
HCM 2010 Ctrl Delay	109.0
HCM 2010 LOS	F

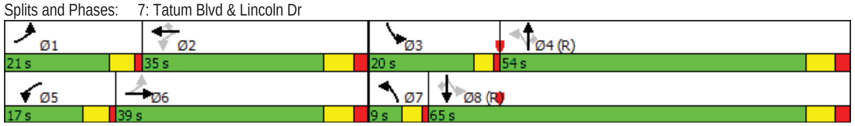
Timing Report, Sorted By Phase
7: Tatum Blvd & Lincoln Dr

11/5/2015

Phase Number	1	2	3	4	5	6	7	8
Movement	EBL	WBTL	SBL	NBTL	WBL	EBTL	NBL	SBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	21	35	20	54	17	39	9	65
Maximum Split (%)	16.2%	26.9%	15.4%	41.5%	13.1%	30.0%	6.9%	50.0%
Minimum Split (s)	9	35	8	36	9	35	8	36
Yellow Time (s)	4	4.5	3	4.5	4	4.5	3	4.5
All-Red Time (s)	1	2.5	1	2.5	1	2.5	1	2.5
Minimum Initial (s)	4	15	4	15	4	15	4	15
Vehicle Extension (s)	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		23		24		23		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	64	85	120	10	64	81	120	129
End Time (s)	85	120	10	64	81	120	129	64
Yield/Force Off (s)	80	113	6	57	76	113	125	57
Yield/Force Off 170(s)	80	90	6	33	76	90	125	33
Local Start Time (s)	54	75	110	0	54	71	110	119
Local Yield (s)	70	103	126	47	66	103	115	47
Local Yield 170(s)	70	80	126	23	66	80	115	23

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	120
Offset: 10 (8%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	

Splits and Phases: 7: Tatum Blvd & Lincoln Dr



HCM 2010 Signalized Intersection Summary
8: Invergordon Rd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1307	155	65	1286	27	261	22	90	27	18	11
Future Volume (veh/h)	5	1307	155	65	1286	27	261	22	90	27	18	11
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	5	1421	168	71	1398	29	284	24	98	29	20	12
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	216	1827	214	178	2029	42	448	76	310	201	131	62
Arrive On Green	0.57	0.57	0.57	0.57	0.57	0.57	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	374	3192	374	320	3546	73	1372	321	1311	519	556	263
Grp Volume(v), veh/h	5	783	806	71	697	730	284	0	122	61	0	0
Grp Sat Flow(s),veh/h/ln	374	1770	1797	320	1770	1850	1372	0	1631	1338	0	0
Q Serve(g_s), s	0.7	23.1	23.7	15.1	18.9	19.0	8.2	0.0	4.2	0.1	0.0	0.0
Cycle Q Clear(g_c), s	19.6	23.1	23.7	38.7	18.9	19.0	12.5	0.0	4.2	4.3	0.0	0.0
Prop In Lane	1.00		0.21	1.00		0.04	1.00		0.80	0.48		0.20
Lane Grp Cap(c), veh/h	216	1013	1028	178	1013	1059	448	0	386	395	0	0
V/C Ratio(X)	0.02	0.77	0.78	0.40	0.69	0.69	0.63	0.00	0.32	0.15	0.00	0.00
Avail Cap(c_a), veh/h	216	1013	1028	178	1013	1059	668	0	648	567	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.27	0.27	0.27	0.66	0.66	0.66	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	17.2	11.2	11.3	26.3	10.3	10.3	24.3	0.0	21.4	20.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	1.6	1.7	4.4	2.5	2.4	1.5	0.0	0.5	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	11.5	11.9	1.5	9.8	10.2	5.2	0.0	1.9	0.9	0.0	0.0
LnGrp Delay(d),s/veh	17.2	12.8	13.0	30.7	12.8	12.7	25.8	0.0	21.9	20.7	0.0	0.0
LnGrp LOS	B	B	B	C	B	B	C		C	C		
Approach Vol, veh/h		1594			1498			406			61	
Approach Delay, s/veh		12.9			13.6			24.6			20.7	
Approach LOS		B			B			C			C	

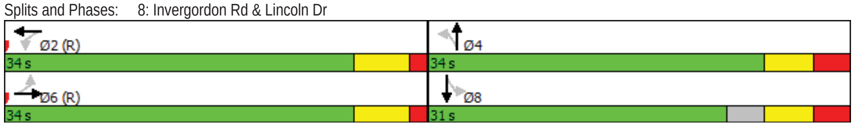
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		44.9		23.1		44.9		23.1
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0
Max Green Setting (Gmax), s		28.0		27.0		28.0		24.0
Max Q Clear Time (g_c+I1), s		40.7		14.5		25.7		6.3
Green Ext Time (p_c), s		0.0		1.6		2.3		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	14.7
HCM 2010 LOS	B

Phase Number	2	4	6	8
Movement	WBTL	NBTL	EBTL	SBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	34	34	34	31
Maximum Split (%)	50.0%	50.0%	50.0%	45.6%
Minimum Split (s)	24	31	24	17
Yellow Time (s)	4.5	4	4.5	4
All-Red Time (s)	1.5	3	1.5	3
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	
Flash Dont Walk (s)	11	17	11	
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	59	25	59	25
End Time (s)	25	59	25	59
Yield/Force Off (s)	19	52	19	52
Yield/Force Off 170(s)	8	35	8	52
Local Start Time (s)	0	34	0	34
Local Yield (s)	28	61	28	61
Local Yield 170(s)	17	44	17	61

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 59 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 8: Invergordon Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	335	1187	18	39	1160	94	13	117	48	59	98	222
Future Volume (veh/h)	335	1187	18	39	1160	94	13	117	48	59	98	222
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	364	1290	20	42	1261	102	14	127	52	64	107	241
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	563	2542	39	151	1388	621	189	163	67	148	356	303
Arrive On Green	0.27	0.71	0.71	0.52	0.52	0.52	0.13	0.13	0.13	0.03	0.19	0.19
Sat Flow, veh/h	1774	3567	55	418	3539	1583	1029	1257	515	1774	1863	1583
Grp Volume(v), veh/h	364	640	670	42	1261	102	14	0	179	64	107	241
Grp Sat Flow(s),veh/h/ln	1774	1770	1853	418	1770	1583	1029	0	1772	1774	1863	1583
Q Serve(g_s), s	17.3	21.1	21.2	10.5	42.1	3.6	1.6	0.0	12.7	4.0	6.4	18.9
Cycle Q Clear(g_c), s	17.3	21.1	21.2	31.6	42.1	3.6	1.6	0.0	12.7	4.0	6.4	18.9
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	563	1261	1321	151	1388	621	189	0	230	148	356	303
V/C Ratio(X)	0.65	0.51	0.51	0.28	0.91	0.16	0.07	0.00	0.78	0.43	0.30	0.80
Avail Cap(c_a), veh/h	563	1261	1321	151	1388	621	273	0	375	148	509	432
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.36	0.36	0.36	0.88	0.88	0.88	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.5	8.4	8.4	34.9	29.0	13.5	49.9	0.0	54.8	46.7	45.1	50.2
Incr Delay (d2), s/veh	0.9	0.5	0.5	4.0	9.3	0.5	0.2	0.0	5.7	2.0	0.5	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.4	10.5	11.0	1.4	22.2	1.6	0.5	0.0	6.6	2.0	3.3	8.8
LnGrp Delay(d),s/veh	39.4	8.9	8.9	38.9	38.2	14.0	50.1	0.0	60.4	48.7	45.6	56.8
LnGrp LOS	D	A	A	D	D	B	D		E	D	D	E
Approach Vol, veh/h		1674			1405			193			412	
Approach Delay, s/veh		15.6			36.5			59.7			52.6	
Approach LOS		B			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6		8
Phs Duration (G+Y+Rc), s	41.7	57.0	8.0	23.3		98.7		31.3
Change Period (Y+Rc), s	6.0	* 6	4.0	6.5		6.0		6.5
Max Green Setting (Gmax), s	27.0	* 51	4.0	27.5		82.0		35.5
Max Q Clear Time (g_c+I1), s	19.3	44.1	6.0	14.7		23.2		20.9
Green Ext Time (p_c), s	5.4	4.8	0.0	2.1		15.7		2.3

Intersection Summary	
HCM 2010 Ctrl Delay	30.0
HCM 2010 LOS	C

Notes

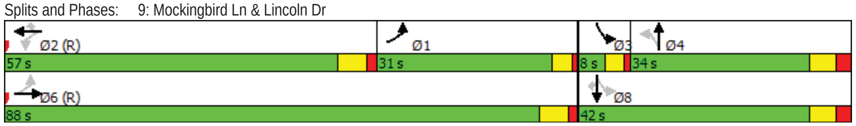
User approved pedestrian interval to be less than phase max green.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	6	8
Movement	EBL	WBTL	SBL	NBTL	EBTL	SBTL
Lead/Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	31	57	8	34	88	42
Maximum Split (%)	23.8%	43.8%	6.2%	26.2%	67.7%	32.3%
Minimum Split (s)	9	27	8	34	27	34
Yellow Time (s)	3	4.5	3	4	4.5	4
All-Red Time (s)	1	1.5	1	2.5	1.5	2.5
Minimum Initial (s)	4	15	4	7	15	7
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7		7	7	7
Flash Dont Walk (s)		14		20	14	20
Dual Entry	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	73	16	104	112	16	104
End Time (s)	104	73	112	16	104	16
Yield/Force Off (s)	100	67	108	9.5	98	9.5
Yield/Force Off 170(s)	100	53	108	119.5	84	119.5
Local Start Time (s)	57	0	88	96	0	88
Local Yield (s)	84	51	92	123.5	82	123.5
Local Yield 170(s)	84	37	92	103.5	68	103.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 16 (12%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 9: Mockingbird Ln & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	633	5	5	1029	50	5	0	5	31	0	183
Future Volume (veh/h)	174	633	5	5	1029	50	5	0	5	31	0	183
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	189	688	5	5	1118	54	5	0	5	34	0	199
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	398	2738	20	563	2402	1075	127	13	99	263	0	227
Arrive On Green	0.10	1.00	1.00	0.68	0.68	0.68	0.14	0.00	0.14	0.14	0.00	0.14
Sat Flow, veh/h	1774	3602	26	748	3539	1583	597	92	688	1448	0	1583
Grp Volume(v), veh/h	189	338	355	5	1118	54	10	0	0	34	0	199
Grp Sat Flow(s),veh/h/ln	1774	1770	1858	748	1770	1583	1377	0	0	1448	0	1583
Q Serve(g_s), s	4.3	0.0	0.0	0.3	19.3	1.5	0.0	0.0	0.0	0.0	0.0	16.0
Cycle Q Clear(g_c), s	4.3	0.0	0.0	0.3	19.3	1.5	2.2	0.0	0.0	2.2	0.0	16.0
Prop In Lane	1.00		0.01	1.00		1.00	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	398	1345	1413	563	2402	1075	239	0	0	263	0	227
V/C Ratio(X)	0.47	0.25	0.25	0.01	0.47	0.05	0.04	0.00	0.00	0.13	0.00	0.87
Avail Cap(c_a), veh/h	527	1345	1413	563	2402	1075	357	0	0	386	0	365
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	0.76	0.76	0.76	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.2	0.0	0.0	6.8	9.8	6.9	47.9	0.0	0.0	48.6	0.0	54.5
Incr Delay (d2), s/veh	0.7	0.4	0.4	0.0	0.5	0.1	0.1	0.0	0.0	0.2	0.0	12.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.1	0.1	0.1	9.5	0.7	0.3	0.0	0.0	1.1	0.0	7.8
LnGrp Delay(d),s/veh	7.9	0.4	0.4	6.8	10.3	7.0	48.0	0.0	0.0	48.8	0.0	67.4
LnGrp LOS	A	A	A	A	B	A	D			D		E
Approach Vol, veh/h		882			1177			10			233	
Approach Delay, s/veh		2.0			10.1			48.0			64.7	
Approach LOS		A			B			D			E	

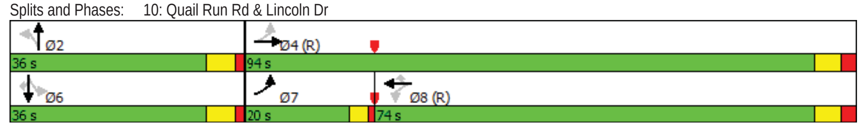
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		24.7		105.3		24.7	10.6	94.7
Change Period (Y+Rc), s		6.0		6.5		6.0	4.0	6.5
Max Green Setting (Gmax), s		30.0		87.5		30.0	16.0	67.5
Max Q Clear Time (g_c+I1), s		4.2		2.0		18.0	6.3	21.3
Green Ext Time (p_c), s		0.9		23.7		0.7	0.3	20.2

Intersection Summary	
HCM 2010 Ctrl Delay	12.7
HCM 2010 LOS	B

Phase Number	2	4	6	7	8
Movement	NBTL	EBTL	SBTL	EBL	WBTL
Lead/Lag				Lead	Lag
Lead-Lag Optimize				Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max
Maximum Split (s)	36	94	36	20	74
Maximum Split (%)	27.7%	72.3%	27.7%	15.4%	56.9%
Minimum Split (s)	33	28	33	8	28
Yellow Time (s)	4.5	4	4.5	3	4
All-Red Time (s)	1.5	2.5	1.5	1	2.5
Minimum Initial (s)	7	15	7	4	15
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7	7		7
Flash Dont Walk (s)	20	14	20		14
Dual Entry	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	74	110	74	110	0
End Time (s)	110	74	110	0	74
Yield/Force Off (s)	104	67.5	104	126	67.5
Yield/Force Off 170(s)	84	53.5	84	126	53.5
Local Start Time (s)	74	110	74	110	0
Local Yield (s)	104	67.5	104	126	67.5
Local Yield 170(s)	84	53.5	84	126	53.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 10: Quail Run Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	683	48	407	44	58	67	381	1917	38	71	1825	545
Future Volume (veh/h)	683	48	407	44	58	67	381	1917	38	71	1825	545
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	779	0	442	48	63	73	414	2084	41	77	1984	592
Adj No. of Lanes	2	0	1	1	2	0	2	3	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	591	0	491	116	115	103	779	2182	43	254	1737	644
Arrive On Green	0.17	0.00	0.17	0.07	0.07	0.07	0.45	0.85	0.85	0.14	0.34	0.34
Sat Flow, veh/h	3548	0	1583	1774	1770	1583	3442	5134	101	1774	5085	1583
Grp Volume(v), veh/h	779	0	442	48	63	73	414	1375	750	77	1984	592
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	1770	1583	1721	1695	1845	1774	1695	1583
Q Serve(g_s), s	20.0	0.0	14.9	3.1	4.1	5.4	10.4	38.7	39.1	4.7	41.0	41.0
Cycle Q Clear(g_c), s	20.0	0.0	14.9	3.1	4.1	5.4	10.4	38.7	39.1	4.7	41.0	41.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	591	0	491	116	115	103	779	1441	784	254	1737	644
V/C Ratio(X)	1.32	0.00	0.90	0.41	0.55	0.71	0.53	0.95	0.96	0.30	1.14	0.92
Avail Cap(c_a), veh/h	591	0	491	207	206	185	779	1441	784	254	1737	644
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.00	0.98	1.00	1.00	1.00	0.37	0.37	0.37	0.60	0.60	0.60
Uniform Delay (d), s/veh	50.0	0.0	39.7	53.9	54.4	55.0	28.2	8.1	8.1	46.1	39.5	33.3
Incr Delay (d2), s/veh	154.3	0.0	19.3	2.4	4.0	8.5	0.3	7.2	11.7	0.4	68.5	13.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.4	0.0	9.1	1.6	2.2	2.6	4.9	17.9	20.5	2.3	30.2	22.0
LnGrp Delay(d),s/veh	204.3	0.0	59.0	56.3	58.3	63.5	28.5	15.3	19.8	46.5	108.0	47.0
LnGrp LOS	F		E	E	E	E	C	B	B	D	F	D
Approach Vol, veh/h		1221			184			2539			2653	
Approach Delay, s/veh		151.7			59.8			18.8			92.6	
Approach LOS		F			E			B			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.2	57.0		14.8	31.2	47.0		27.0
Change Period (Y+Rc), s	4.0	6.0		7.0	4.0	6.0		7.0
Max Green Setting (Gmax), s	11.0	51.0		14.0	21.0	41.0		20.0
Max Q Clear Time (g_c+I1), s	6.7	41.1		7.4	12.4	43.0		22.0
Green Ext Time (p_c), s	0.8	8.4		0.4	1.2	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	74.2
HCM 2010 LOS	E

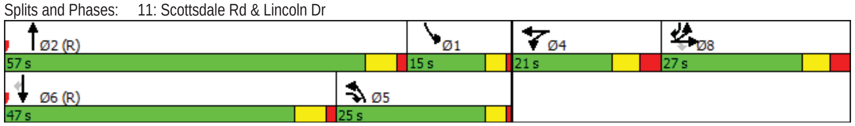
Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	WBTL	NBL	SBT	EBTL
Lead/Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	57	21	25	47	27
Maximum Split (%)	12.5%	47.5%	17.5%	20.8%	39.2%	22.5%
Minimum Split (s)	9	28	40	9	28	40
Yellow Time (s)	3	4.5	4	3	4.5	4
All-Red Time (s)	1	1.5	3	1	1.5	3
Minimum Initial (s)	4.5	20	5	4.5	20	8
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		15	26		15	26
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	12	75	27	2	75	48
End Time (s)	27	12	48	27	2	75
Yield/Force Off (s)	23	6	41	23	116	68
Yield/Force Off 170(s)	23	111	15	23	101	42
Local Start Time (s)	57	0	72	47	0	93
Local Yield (s)	68	51	86	68	41	113
Local Yield 170(s)	68	36	60	68	26	87

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 75 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 11: Scottsdale Rd & Lincoln Dr



Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	94	213	4	0	23	261	80	0	14	12	14
Future Vol, veh/h	0	94	213	4	0	23	261	80	0	14	12	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	102	232	4	0	25	284	87	0	15	13	15
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	11.5	15.2	10.4
HCM LOS	B	C	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	35%	100%	0%	100%	0%	100%	0%
Vol Thru, %	30%	0%	98%	0%	77%	0%	8%
Vol Right, %	35%	0%	2%	0%	23%	0%	92%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	94	217	23	341	57	126
LT Vol	14	94	0	23	0	57	0
Through Vol	12	0	213	0	261	0	10
RT Vol	14	0	4	0	80	0	116
Lane Flow Rate	43	102	236	25	371	62	137
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.082	0.179	0.379	0.043	0.575	0.121	0.224
Departure Headway (Hd)	6.754	6.299	5.78	6.252	5.58	7.054	5.893
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	530	570	623	573	649	508	608
Service Time	4.809	4.034	3.514	3.985	3.313	4.798	3.637
HCM Lane V/C Ratio	0.081	0.179	0.379	0.044	0.572	0.122	0.225
HCM Control Delay	10.4	10.4	12	9.3	15.6	10.8	10.3
HCM Lane LOS	B	B	B	A	C	B	B
HCM 95th-tile Q	0.3	0.6	1.8	0.1	3.7	0.4	0.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	57	10	116
Future Vol, veh/h	0	57	10	116
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	62	11	126
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	10.5
HCM LOS	B

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	220	37	242	224	273	37	2044	248	386	1838	104
Future Volume (veh/h)	90	220	37	242	224	273	37	2044	248	386	1838	104
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	98	239	40	263	243	297	40	2222	270	420	1998	113
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	318	52	264	359	510	391	2034	633	759	2034	633
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.22	0.40	0.40	0.15	0.27	0.27
Sat Flow, veh/h	1774	3042	502	1774	3539	1583	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	98	138	141	263	243	297	40	2222	270	420	1998	113
Grp Sat Flow(s),veh/h/ln	1774	1770	1774	1774	1770	1583	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	0.0	9.1	9.3	11.9	7.9	0.0	2.2	48.0	14.8	13.6	46.8	6.6
Cycle Q Clear(g_c), s	0.0	9.1	9.3	11.9	7.9	0.0	2.2	48.0	14.8	13.6	46.8	6.6
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	273	185	185	264	359	510	391	2034	633	759	2034	633
V/C Ratio(X)	0.36	0.74	0.76	1.00	0.68	0.58	0.10	1.09	0.43	0.55	0.98	0.18
Avail Cap(c_a), veh/h	273	354	355	264	708	666	391	2034	633	759	2034	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	47.6	52.2	52.3	51.9	52.0	33.9	37.3	36.0	26.0	45.6	43.5	28.8
Incr Delay (d2), s/veh	0.8	5.8	6.4	54.6	2.2	1.1	0.1	50.2	2.1	0.1	3.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	4.7	4.9	12.7	4.0	8.3	1.1	31.9	6.8	6.5	22.5	2.9
LnGrp Delay(d),s/veh	48.4	58.0	58.7	106.5	54.2	35.0	37.4	86.2	28.1	45.7	46.7	28.8
LnGrp LOS	D	E	E	F	D	C	D	F	C	D	D	C
Approach Vol, veh/h		377			803			2532			2531	
Approach Delay, s/veh		55.8			64.2			79.3			45.7	
Approach LOS		E			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.5	54.0	16.0	19.5	30.5	54.0	16.3	19.2
Change Period (Y+Rc), s	4.0	6.0	* 4	7.0	4.0	6.0	* 4	7.0
Max Green Setting (Gmax), s	15.0	48.0	* 12	24.0	15.0	48.0	* 12	24.0
Max Q Clear Time (g_c+I1), s	15.6	50.0	13.9	11.3	4.2	48.8	2.0	9.9
Green Ext Time (p_c), s	0.0	0.0	0.0	1.2	1.3	0.0	0.8	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	62.3
HCM 2010 LOS	E

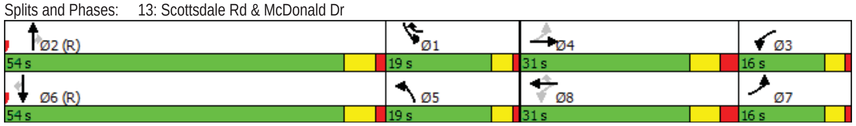
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	19	54	16	31	19	54	16	31
Maximum Split (%)	15.8%	45.0%	13.3%	25.8%	15.8%	45.0%	13.3%	25.8%
Minimum Split (s)	14	31	10	37	14	31	10	37
Yellow Time (s)	3	4.5	3	4.3	3	4.5	3	4.3
All-Red Time (s)	1	1.5	1	2.7	1	1.5	1	2.7
Minimum Initial (s)	10	20	6	8	10	20	6	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		9		6		9		6
Flash Dont Walk (s)		16		24		16		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	30	14	103	84	30	14	103
End Time (s)	103	84	30	14	103	84	30	14
Yield/Force Off (s)	99	78	26	7	99	78	26	7
Yield/Force Off 170(s)	99	62	26	103	99	62	26	103
Local Start Time (s)	54	0	104	73	54	0	104	73
Local Yield (s)	69	48	116	97	69	48	116	97
Local Yield 170(s)	69	32	116	73	69	32	116	73

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	125
Offset: 30 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 13: Scottsdale Rd & McDonald Dr



Intersection	
Intersection Delay, s/veh	5.7
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	260	281	83
Demand Flow Rate, veh/h	265	287	85
Vehicles Circulating, veh/h	43	43	214
Vehicles Exiting, veh/h	287	256	94
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	5.7	5.9	4.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	265	287	85
Cap Entry Lane, veh/h	1082	1082	912
Entry HV Adj Factor	0.980	0.980	0.976
Flow Entry, veh/h	260	281	83
Cap Entry, veh/h	1061	1061	891
V/C Ratio	0.245	0.265	0.093
Control Delay, s/veh	5.7	5.9	4.9
LOS	A	A	A
95th %tile Queue, veh	1	1	0

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	219	12	29	253	6	14
Future Vol, veh/h	219	12	29	253	6	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	238	13	32	275	7	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	251	0	583	245
Stage 1	-	-	-	-	245	-
Stage 2	-	-	-	-	338	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1314	-	475	794
Stage 1	-	-	-	-	796	-
Stage 2	-	-	-	-	722	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1314	-	463	794
Mov Cap-2 Maneuver	-	-	-	-	550	-
Stage 1	-	-	-	-	796	-
Stage 2	-	-	-	-	704	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	701	-	-	1314	-
HCM Lane V/C Ratio	0.031	-	-	0.024	-
HCM Control Delay (s)	10.3	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	352	45	110	342	43	103
Future Vol, veh/h	352	45	110	342	43	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	383	49	120	372	47	112

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	432	0	832	407
Stage 1	-	-	-	-	407	-
Stage 2	-	-	-	-	425	-
Critical Hdwy	-	-	4.12	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.218	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1128	-	323	643
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	628	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1128	-	289	643
Mov Cap-2 Maneuver	-	-	-	-	289	-
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	561	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	16.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	473	-	-	1128	-
HCM Lane V/C Ratio	0.336	-	-	0.106	-
HCM Control Delay (s)	16.4	-	-	8.6	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.5	-	-	0.4	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	13	5	0	2543	1909	17
Future Vol, veh/h	13	5	0	2543	1909	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	5	0	2764	2075	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3181	1038	2075	0	-	0
Stage 1	2075	-	-	-	-	-
Stage 2	1106	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	21	196	115	-	-	-
Stage 1	51	-	-	-	-	-
Stage 2	250	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	21	196	115	-	-	-
Mov Cap-2 Maneuver	21	-	-	-	-	-
Stage 1	51	-	-	-	-	-
Stage 2	250	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	115	-	196	-	-
HCM Lane V/C Ratio	-	-	0.028	-	-
HCM Control Delay (s)	0	-	23.9	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	28	0	0	49	37	48
Future Vol, veh/h	28	0	0	49	37	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	0	0	53	40	52

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	119	66	92	0	-	0
Stage 1	66	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	877	998	1503	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	877	998	1503	-	-	-
Mov Cap-2 Maneuver	877	-	-	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1503	-	877	-	-
HCM Lane V/C Ratio	-	-	0.035	-	-
HCM Control Delay (s)	0	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	22	11	37	11	6	31
Future Vol, veh/h	22	11	37	11	6	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	12	40	12	7	34

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	93	46	0	0	52	0
Stage 1	46	-	-	-	-	-
Stage 2	47	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	907	1023	-	-	1554	-
Stage 1	976	-	-	-	-	-
Stage 2	975	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	902	1023	-	-	1554	-
Mov Cap-2 Maneuver	902	-	-	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	939	1554	-
HCM Lane V/C Ratio	-	-	0.038	0.004	-
HCM Control Delay (s)	-	-	9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection						
Int Delay, s/veh	4.6					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	63	23	25	54	24	30
Future Vol, veh/h	63	23	25	54	24	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	25	27	59	26	33

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	142	57	0	0	86	0
Stage 1	57	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	851	1009	-	-	1510	-
Stage 1	966	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	836	1009	-	-	1510	-
Mov Cap-2 Maneuver	836	-	-	-	-	-
Stage 1	966	-	-	-	-	-
Stage 2	921	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	3.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	876	1510	-
HCM Lane V/C Ratio	-	-	0.107	0.017	-
HCM Control Delay (s)	-	-	9.6	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection						
Int Delay, s/veh	3.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	53	10	61	56	33	70
Future Vol, veh/h	53	10	61	56	33	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	11	66	61	36	76

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	245	97	0	0	127	0
Stage 1	97	-	-	-	-	-
Stage 2	148	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	743	959	-	-	1459	-
Stage 1	927	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	724	959	-	-	1459	-
Mov Cap-2 Maneuver	724	-	-	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	857	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	2.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	753	1459	-
HCM Lane V/C Ratio	-	-	0.091	0.025	-
HCM Control Delay (s)	-	-	10.3	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

HCM 2010 TWSC
29: Collector B/6750 North/Collector B & Collector C

11/5/2015

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	61	27	5	375	255	57
Future Vol, veh/h	61	27	5	375	255	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	29	5	408	277	62

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	413	0	-	0	371	209
Stage 1	-	-	-	-	209	-
Stage 2	-	-	-	-	162	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1146	-	-	-	630	831
Stage 1	-	-	-	-	826	-
Stage 2	-	-	-	-	867	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1146	-	-	-	593	831
Mov Cap-2 Maneuver	-	-	-	-	645	-
Stage 1	-	-	-	-	826	-
Stage 2	-	-	-	-	816	-

Approach	EB	WB	SB
HCM Control Delay, s	5.8	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1146	-	-	-	672
HCM Lane V/C Ratio	0.058	-	-	-	0.505
HCM Control Delay (s)	8.3	0	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.9

HCM 2010 TWSC
30: Quail Run Rd/Hotel Access

11/5/2015

Intersection	
Int Delay, s/veh	4.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	121	1	28	115	2	36
Future Vol, veh/h	121	1	28	115	2	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	132	1	30	125	2	39

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	136	93	0	0	155	0
Stage 1	93	-	-	-	-	-
Stage 2	43	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	857	964	-	-	1425	-
Stage 1	931	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	856	964	-	-	1425	-
Mov Cap-2 Maneuver	856	-	-	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	978	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	857	1425	-
HCM Lane V/C Ratio	-	-	0.155	0.002	-
HCM Control Delay (s)	-	-	10	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

HCM 2010 Roundabout
31: Quail Run Rd & South Residential Access

11/5/2015

Intersection	
Intersection Delay, s/veh	4.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	20	25	208	171
Demand Flow Rate, veh/h	20	26	212	174
Vehicles Circulating, veh/h	199	192	0	60
Vehicles Exiting, veh/h	35	20	219	157
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.1	4.3	4.9	4.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	20	26	212	174
Cap Entry Lane, veh/h	926	933	1130	1064
Entry HV Adj Factor	1.000	0.962	0.981	0.980
Flow Entry, veh/h	20	25	208	171
Cap Entry, veh/h	926	897	1108	1043
V/C Ratio	0.022	0.028	0.188	0.164
Control Delay, s/veh	4.1	4.3	4.9	4.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	1

HCM 2010 TWSC
32: Quail Run Rd & Townhome Access

11/5/2015

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	16	0	191	33	0	198
Future Vol, veh/h	16	0	191	33	0	198
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	0	208	36	0	215

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	441	226	0	0	243	0
Stage 1	226	-	-	-	-	-
Stage 2	215	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	574	813	-	-	1323	-
Stage 1	812	-	-	-	-	-
Stage 2	821	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	574	813	-	-	1323	-
Mov Cap-2 Maneuver	574	-	-	-	-	-
Stage 1	812	-	-	-	-	-
Stage 2	821	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	574	1323	-
HCM Lane V/C Ratio	-	-	0.03	-	-
HCM Control Delay (s)	-	-	11.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

APPENDIX K

2033 PEAK HOUR ANALYSIS

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	4	7	323	0	36	4	0	0	147	13	31
Future Vol, veh/h	0	4	7	323	0	36	4	0	0	147	13	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	8	351	0	39	4	0	0	160	14	34
Number of Lanes	0	1	1	0	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	11.2	9.4	10.4
HCM LOS	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	90%	3%
Vol Thru, %	0%	30%	0%	2%	10%	91%
Vol Right, %	0%	70%	0%	98%	0%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	147	44	4	330	40	35
LT Vol	147	0	4	0	36	1
Through Vol	0	13	0	7	4	32
RT Vol	0	31	0	323	0	2
Lane Flow Rate	160	48	4	359	43	38
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.268	0.067	0.007	0.458	0.071	0.061
Departure Headway (Hd)	6.039	5.039	5.79	4.598	5.844	5.788
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	591	705	618	782	610	613
Service Time	3.812	2.811	3.53	2.338	3.914	3.877
HCM Lane V/C Ratio	0.271	0.068	0.006	0.459	0.07	0.062
HCM Control Delay	11	8.2	8.6	11.2	9.4	9.3
HCM Lane LOS	B	A	A	B	A	A
HCM 95th-tile Q	1.1	0.2	0	2.4	0.2	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	1	32	2
Future Vol, veh/h	0	1	32	2
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	35	2
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9.3
HCM LOS	A

Lane

HCM 2010 TWSC
2: Mockingbird Ln & Indian Bend Rd.
11/5/2015

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	167	47	233	106	76	387
Future Vol, veh/h	167	47	233	106	76	387
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	182	51	253	115	83	421

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	897	311	0	0	368	0
Stage 1	311	-	-	-	-	-
Stage 2	586	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	310	729	-	-	1191	-
Stage 1	743	-	-	-	-	-
Stage 2	556	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	288	729	-	-	1191	-
Mov Cap-2 Maneuver	402	-	-	-	-	-
Stage 1	743	-	-	-	-	-
Stage 2	517	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.7	0	1.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	402	729	1191	-
HCM Lane V/C Ratio	-	-	0.452	0.07	0.069	-
HCM Control Delay (s)	-	-	21.1	10.3	8.2	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	2.3	0.2	0.2	-

HCM 2010 TWSC
3: Indian Bend Rd.
11/5/2015

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	212	2	36	204	5	1	0	47	7	0	5
Future Vol, veh/h	5	212	2	36	204	5	1	0	47	7	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	230	2	39	222	5	1	0	51	8	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	227	0	0	233	0	0	547	547	232	571	546	224
Stage 1	-	-	-	-	-	-	242	242	-	303	303	-
Stage 2	-	-	-	-	-	-	305	305	-	268	243	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1341	-	-	1335	-	-	448	445	807	432	445	815
Stage 1	-	-	-	-	-	-	762	705	-	706	664	-
Stage 2	-	-	-	-	-	-	705	662	-	738	705	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1341	-	-	1335	-	-	434	430	807	395	430	815
Mov Cap-2 Maneuver	-	-	-	-	-	-	434	430	-	395	430	-
Stage 1	-	-	-	-	-	-	759	702	-	703	645	-
Stage 2	-	-	-	-	-	-	680	643	-	689	702	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.1	9.9	12.3
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	793	1341	-	-	1335	-	-	503
HCM Lane V/C Ratio	0.066	0.004	-	-	0.029	-	-	0.026
HCM Control Delay (s)	9.9	7.7	-	-	7.8	-	-	12.3
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	161	64	612	186	155	39	1329	428	162	1690	45
Future Volume (veh/h)	69	161	64	612	186	155	39	1329	428	162	1690	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	75	175	70	665	202	168	42	1445	465	176	1837	49
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	95	155	132	725	494	575	251	2076	980	274	2076	647
Arrive On Green	0.05	0.08	0.08	0.21	0.27	0.27	0.10	0.41	0.41	0.10	0.41	0.41
Sat Flow, veh/h	1774	1863	1583	3442	1863	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	75	175	70	665	202	168	42	1445	465	176	1837	49
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1721	1863	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	5.0	10.0	5.1	22.7	10.7	1.2	0.0	28.2	0.0	4.4	40.2	1.7
Cycle Q Clear(g_c), s	5.0	10.0	5.1	22.7	10.7	1.2	0.0	28.2	0.0	4.4	40.2	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	95	155	132	725	494	575	251	2076	980	274	2076	647
V/C Ratio(X)	0.79	1.13	0.53	0.92	0.41	0.29	0.17	0.70	0.47	0.64	0.88	0.08
Avail Cap(c_a), veh/h	177	155	132	803	494	575	255	2076	980	278	2076	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.1	55.0	52.7	46.4	36.3	14.6	47.0	29.3	12.3	47.2	32.9	12.8
Incr Delay (d2), s/veh	5.3	110.5	2.1	13.8	0.2	0.1	0.1	2.0	1.6	3.7	6.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	9.9	2.3	12.2	5.5	2.9	1.3	13.5	8.7	5.8	19.9	0.8
LnGrp Delay(d),s/veh	61.4	165.5	54.8	60.2	36.5	14.7	47.1	31.3	14.0	50.9	38.8	13.0
LnGrp LOS	E	F	D	E	D	B	D	C	B	D	D	B
Approach Vol, veh/h		320			1035			1952			2062	
Approach Delay, s/veh		116.9			48.2			27.5			39.3	
Approach LOS		F			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.7	55.0	32.3	17.0	15.7	55.0	10.4	38.8
Change Period (Y+Rc), s	* 4	6.0	* 7	* 7	* 4	6.0	4.0	* 7
Max Green Setting (Gmax), s	* 12	49.0	* 28	* 10	* 12	49.0	12.0	* 26
Max Q Clear Time (g_c+I1), s	6.4	30.2	24.7	12.0	2.0	42.2	7.0	12.7
Green Ext Time (p_c), s	0.1	2.3	0.6	0.0	0.1	2.5	0.0	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	41.3
HCM 2010 LOS	D

Notes

HCM 2010 Signalized Intersection Summary
4: Scottsdale Rd & Indian Bend Rd. 11/5/2015

User approved pedestrian interval to be less than phase max green.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

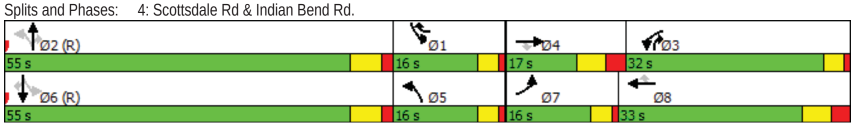
Timing Report, Sorted By Phase
4: Scottsdale Rd & Indian Bend Rd.

11/5/2015

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	16	55	32	17	16	55	16	33
Maximum Split (%)	13.3%	45.8%	26.7%	14.2%	13.3%	45.8%	13.3%	27.5%
Minimum Split (s)	9.4	29.4	8.5	13	8.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	85	30	118	101	85	30	101	117
End Time (s)	101	85	30	118	101	85	117	30
Yield/Force Off (s)	97	79	26	111	97	79	113	23
Yield/Force Off 170(s)	97	63	26	80	97	63	113	112
Local Start Time (s)	55	0	88	71	55	0	71	87
Local Yield (s)	67	49	116	81	67	49	83	113
Local Yield 170(s)	67	33	116	50	67	33	83	82

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



HCM 2010 TWSC
5: Scottsdale Rd & Joshua Tree Ln

11/5/2015

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	62	5	0	9	0	1765	5	5	2212	28
Future Vol, veh/h	0	0	62	5	0	9	0	1765	5	5	2212	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	150	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	67	5	0	10	0	1918	5	5	2404	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3182	4339	1202	2894	4336	962	2404	0	0	1924	0	0
Stage 1	2415	2415	-	1921	1921	-	-	-	-	-	-	-
Stage 2	767	1924	-	973	2415	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	11	2	152	17	2	220	78	-	-	137	-	-
Stage 1	19	63	-	44	113	-	-	-	-	-	-	-
Stage 2	328	113	-	244	63	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	10	2	152	9	2	220	78	-	-	137	-	-
Mov Cap-2 Maneuver	10	2	-	9	2	-	-	-	-	-	-	-
Stage 1	19	61	-	44	113	-	-	-	-	-	-	-
Stage 2	313	113	-	131	61	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	46.3	$ 314.3	0	0.1
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	78	-	-	152	23	137	-	-
HCM Lane V/C Ratio	-	-	-	0.443	0.662	0.04	-	-
HCM Control Delay (s)	0	-	-	46.3	$ 314.3	32.4	-	-
HCM Lane LOS	A	-	-	E	F	D	-	-
HCM 95th %tile Q(veh)	0	-	-	2	2	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	43	196	1696	2318	121
Future Volume (veh/h)	35	43	196	1696	2318	121
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	38	47	213	1843	2520	132
Adj No. of Lanes	2	1	2	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	127	540	1165	4425	2641	822
Arrive On Green	0.04	0.04	0.30	0.87	0.52	0.52
Sat Flow, veh/h	3442	1583	3442	5253	5253	1583
Grp Volume(v), veh/h	38	47	213	1843	2520	132
Grp Sat Flow(s),veh/h/ln	1721	1583	1721	1695	1695	1583
Q Serve(g_s), s	1.4	0.0	1.2	9.5	60.9	5.6
Cycle Q Clear(g_c), s	1.4	0.0	1.2	9.5	60.9	5.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	127	540	1165	4425	2641	822
V/C Ratio(X)	0.30	0.09	0.18	0.42	0.95	0.16
Avail Cap(c_a), veh/h	806	852	1165	4425	2641	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.67	0.67	1.00	1.00
Uniform Delay (d), s/veh	60.5	28.9	31.2	1.7	29.5	16.3
Incr Delay (d2), s/veh	1.3	0.1	0.1	0.2	9.7	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.7	2.7	4.3	30.6	2.6
LnGrp Delay(d),s/veh	61.8	28.9	31.3	1.9	39.2	16.7
LnGrp LOS	E	C	C	A	D	B
Approach Vol, veh/h	85			2056	2652	
Approach Delay, s/veh	43.6			4.9	38.1	
Approach LOS	D			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		118.2		10.8	45.2	73.0		
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6		
Max Green Setting (Gmax), s		* 87		30.2	* 16	* 67		
Max Q Clear Time (g_c+I1), s		11.5		3.4	3.2	62.9		
Green Ext Time (p_c), s		30.0		0.2	10.1	3.9		

Intersection Summary	
HCM 2010 Ctrl Delay	24.0
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Timing Report, Sorted By Phase
6: Scottsdale Rd & 6750 North/Collector B

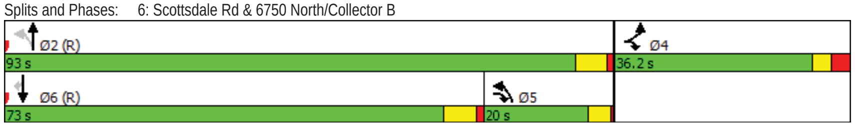
11/5/2015

Phase Number	2	4	5	6
Movement	NBTL	EBL	NBL	SBT
Lead/Lag			Lag	Lead
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	93	36.2	20	73
Maximum Split (%)	72.0%	28.0%	15.5%	56.5%
Minimum Split (s)	36	36.2	8	36.9
Yellow Time (s)	4.9	3	3.5	4.9
All-Red Time (s)	1.1	3	0.5	1.1
Minimum Initial (s)	10	5	4	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8	8		8
Flash Dont Walk (s)	22	19		22
Dual Entry	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	65	28.8	8.8	65
End Time (s)	28.8	65	28.8	8.8
Yield/Force Off (s)	22.8	59	24.8	2.8
Yield/Force Off 170(s)	0.8	40	24.8	110
Local Start Time (s)	0	93	73	0
Local Yield (s)	87	123.2	89	67
Local Yield 170(s)	65	104.2	89	45

Intersection Summary	
Cycle Length	129.2
Control Type	Actuated-Coordinated
Natural Cycle	95

Offset: 65 (50%), Referenced to phase 2:NBTL and 6:SBT, Start of Green

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



HCM 2010 Signalized Intersection Summary
7: Tatum Blvd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	832	72	305	779	107	51	583	432	329	989	424
Future Volume (veh/h)	179	832	72	305	779	107	51	583	432	329	989	424
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	195	904	78	332	847	116	55	634	470	358	1075	461
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	246	888	77	246	1081	483	164	1036	464	398	1470	658
Arrive On Green	0.07	0.27	0.27	0.11	0.31	0.31	0.03	0.29	0.29	0.15	0.42	0.42
Sat Flow, veh/h	3442	3298	285	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	195	485	497	332	847	116	55	634	470	358	1075	461
Grp Sat Flow(s),veh/h/ln	1721	1770	1813	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	7.2	35.0	35.0	14.0	28.4	7.1	2.8	20.1	38.1	17.7	33.2	31.2
Cycle Q Clear(g_c), s	7.2	35.0	35.0	14.0	28.4	7.1	2.8	20.1	38.1	17.7	33.2	31.2
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	246	476	488	246	1081	483	164	1036	464	398	1470	658
V/C Ratio(X)	0.79	1.02	1.02	1.35	0.78	0.24	0.34	0.61	1.01	0.90	0.73	0.70
Avail Cap(c_a), veh/h	318	476	488	246	1081	483	164	1036	464	508	1470	658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.4	47.5	47.5	38.6	41.2	33.8	32.1	39.6	46.0	28.0	31.9	31.3
Incr Delay (d2), s/veh	7.4	45.9	45.4	177.8	5.0	1.0	0.4	2.7	45.3	14.1	3.2	6.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	23.1	23.6	21.0	14.6	3.3	1.4	10.2	22.4	10.1	16.8	14.7
LnGrp Delay(d),s/veh	66.8	93.4	92.9	216.4	46.2	34.9	32.5	42.3	91.3	42.1	35.2	37.5
LnGrp LOS	E	F	F	F	D	C	C	D	F	D	D	D
Approach Vol, veh/h		1177			1295			1159			1894	
Approach Delay, s/veh		88.8			88.8			61.7			37.0	
Approach LOS		F			F			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	46.7	23.9	45.1	19.0	42.0	8.0	61.0
Change Period (Y+Rc), s	5.0	7.0	4.0	7.0	5.0	7.0	4.0	7.0
Max Green Setting (Gmax), s	12.0	37.0	28.0	30.0	14.0	35.0	4.0	54.0
Max Q Clear Time (g_c+I1), s	9.2	30.4	19.7	40.1	16.0	37.0	4.8	35.2
Green Ext Time (p_c), s	0.1	6.3	0.2	0.0	0.0	0.0	0.0	18.2

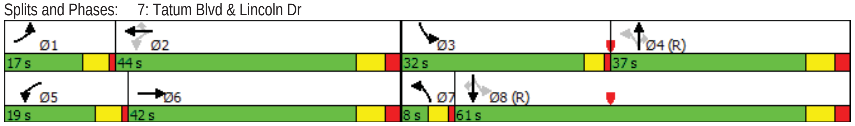
Intersection Summary	
HCM 2010 Ctrl Delay	65.4
HCM 2010 LOS	E

Timing Report, Sorted By Phase
7: Tatum Blvd & Lincoln Dr
11/5/2015

Phase Number	1	2	3	4	5	6	7	8
Movement	EBL	WBTL	SBL	NBTL	WBL	EBT	NBL	SBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	17	44	32	37	19	42	8	61
Maximum Split (%)	13.1%	33.8%	24.6%	28.5%	14.6%	32.3%	6.2%	46.9%
Minimum Split (s)	9	35	8	36	9	35	8	36
Yellow Time (s)	4	4.5	3	4.5	4	4.5	3	4.5
All-Red Time (s)	1	2.5	1	2.5	1	2.5	1	2.5
Minimum Initial (s)	4	15	4	15	4	15	4	15
Vehicle Extension (s)	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		23		24		23		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	101	15	47	84	103	15	23
End Time (s)	101	15	47	84	103	15	23	84
Yield/Force Off (s)	96	8	43	77	98	8	19	77
Yield/Force Off 170(s)	96	115	43	53	98	115	19	53
Local Start Time (s)	37	54	98	0	37	56	98	106
Local Yield (s)	49	91	126	30	51	91	102	30
Local Yield 170(s)	49	68	126	6	51	68	102	6

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 47 (36%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	

Splits and Phases: 7: Tatum Blvd & Lincoln Dr



HCM 2010 Signalized Intersection Summary
8: Invergordon Rd & Lincoln Dr
11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1154	216	60	1085	23	113	4	102	20	12	5
Future Volume (veh/h)	11	1154	216	60	1085	23	113	4	102	20	12	5
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	12	1254	235	65	1179	25	123	4	111	22	13	5
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	334	1975	367	252	2348	50	323	8	225	146	75	20
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	463	2981	554	352	3544	75	1389	55	1536	438	516	136
Grp Volume(v), veh/h	12	740	749	65	589	615	123	0	115	40	0	0
Grp Sat Flow(s),veh/h/ln	463	1770	1765	352	1770	1849	1389	0	1592	1090	0	0
Q Serve(g_s), s	0.9	16.5	16.9	9.0	11.4	11.4	0.3	0.0	4.5	0.1	0.0	0.0
Cycle Q Clear(g_c), s	12.4	16.5	16.9	25.9	11.4	11.4	4.9	0.0	4.5	4.6	0.0	0.0
Prop In Lane	1.00		0.31	1.00		0.04	1.00		0.97	0.55		0.12
Lane Grp Cap(c), veh/h	334	1172	1169	252	1172	1225	323	0	233	241	0	0
V/C Ratio(X)	0.04	0.63	0.64	0.26	0.50	0.50	0.38	0.00	0.49	0.17	0.00	0.00
Avail Cap(c_a), veh/h	334	1172	1169	252	1172	1225	610	0	562	543	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.27	0.27	0.27	0.77	0.77	0.77	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.9	6.7	6.7	14.3	5.8	5.8	26.8	0.0	26.7	25.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.7	0.7	1.9	1.2	1.1	0.7	0.0	1.6	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	8.0	8.4	1.0	5.8	6.0	2.2	0.0	2.1	0.7	0.0	0.0
LnGrp Delay(d),s/veh	9.0	7.4	7.5	16.2	7.0	6.9	27.6	0.0	28.3	25.7	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	C		C	C		
Approach Vol, veh/h		1501			1269			238			40	
Approach Delay, s/veh		7.4			7.4			27.9			25.7	
Approach LOS		A			A			C			C	

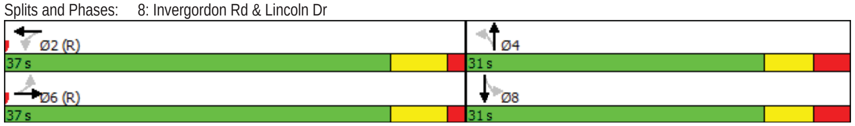
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.1		16.9		51.1		16.9
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0
Max Green Setting (Gmax), s		31.0		24.0		31.0		24.0
Max Q Clear Time (g_c+I1), s		27.9		6.9		18.9		6.6
Green Ext Time (p_c), s		2.9		1.1		11.0		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Phase Number	2	4	6	8
Movement	WBTL	NBTL	EBTL	SBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	37	31	37	31
Maximum Split (%)	54.4%	45.6%	54.4%	45.6%
Minimum Split (s)	24	31	24	17
Yellow Time (s)	4.5	4	4.5	4
All-Red Time (s)	1.5	3	1.5	3
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	
Flash Dont Walk (s)	11	17	11	
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	59	28	59	28
End Time (s)	28	59	28	59
Yield/Force Off (s)	22	52	22	52
Yield/Force Off 170(s)	11	35	11	52
Local Start Time (s)	0	37	0	37
Local Yield (s)	31	61	31	61
Local Yield 170(s)	20	44	20	61

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 59 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 8: Invergordon Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	269	1196	37	27	1003	24	18	60	36	98	121	336
Future Volume (veh/h)	269	1196	37	27	1003	24	18	60	36	98	121	336
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	292	1300	40	29	1090	26	20	65	39	107	132	365
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	542	2262	70	114	1250	30	203	179	108	311	482	410
Arrive On Green	0.25	0.65	0.65	0.71	0.71	0.71	0.16	0.16	0.16	0.06	0.26	0.26
Sat Flow, veh/h	1774	3506	108	406	3533	84	897	1092	655	1774	1863	1583
Grp Volume(v), veh/h	292	656	684	29	546	570	20	0	104	107	132	365
Grp Sat Flow(s),veh/h/ln	1774	1770	1844	406	1770	1848	897	0	1747	1774	1863	1583
Q Serve(g_s), s	9.9	27.2	27.2	7.7	30.6	30.6	2.5	0.0	6.9	6.3	7.3	28.9
Cycle Q Clear(g_c), s	9.9	27.2	27.2	34.9	30.6	30.6	2.5	0.0	6.9	6.3	7.3	28.9
Prop In Lane	1.00		0.06	1.00		0.05	1.00		0.38	1.00		1.00
Lane Grp Cap(c), veh/h	542	1142	1189	114	626	654	203	0	287	311	482	410
V/C Ratio(X)	0.54	0.57	0.58	0.25	0.87	0.87	0.10	0.00	0.36	0.34	0.27	0.89
Avail Cap(c_a), veh/h	542	1142	1189	114	626	654	266	0	410	430	738	627
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	0.81	0.81	0.81	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.8	13.0	13.0	28.7	16.7	16.8	46.4	0.0	48.3	39.9	38.4	46.4
Incr Delay (d2), s/veh	0.8	1.6	1.5	4.3	13.0	12.5	0.2	0.0	0.8	0.7	0.3	10.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	13.6	14.2	1.0	16.5	17.5	0.6	0.0	3.4	3.1	3.8	13.8
LnGrp Delay(d),s/veh	38.6	14.6	14.5	33.0	29.7	29.3	46.6	0.0	49.0	40.6	38.7	56.7
LnGrp LOS	D	B	B	C	C	C	D		D	D	D	E
Approach Vol, veh/h		1632			1145			124			604	
Approach Delay, s/veh		18.9			29.6			48.7			49.9	
Approach LOS		B			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6		8
Phs Duration (G+Y+Rc), s	37.9	52.0	12.3	27.9		89.9		40.1
Change Period (Y+Rc), s	6.0	* 6	4.0	6.5		6.0		6.5
Max Green Setting (Gmax), s	16.0	* 46	17.0	30.5		66.0		51.5
Max Q Clear Time (g_c+I1), s	11.9	36.9	8.3	8.9		29.2		30.9
Green Ext Time (p_c), s	2.2	5.0	0.1	2.8		14.1		2.8

Intersection Summary	
HCM 2010 Ctrl Delay	28.8
HCM 2010 LOS	C

Notes

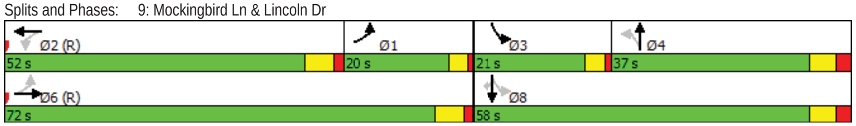
User approved pedestrian interval to be less than phase max green.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	6	8
Movement	EBL	WBTL	SBL	NBTL	EBTL	SBTL
Lead/Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	20	52	21	37	72	58
Maximum Split (%)	15.4%	40.0%	16.2%	28.5%	55.4%	44.6%
Minimum Split (s)	8	27	8	34	27	34
Yellow Time (s)	3	4.5	3	4	4.5	4
All-Red Time (s)	1	1.5	1	2.5	1.5	2.5
Minimum Initial (s)	4	15	4	7	15	7
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7		7	7	7
Flash Dont Walk (s)		14		20	14	20
Dual Entry	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	50	128	70	91	128	70
End Time (s)	70	50	91	128	70	128
Yield/Force Off (s)	66	44	87	121.5	64	121.5
Yield/Force Off 170(s)	66	30	87	101.5	50	101.5
Local Start Time (s)	52	0	72	93	0	72
Local Yield (s)	68	46	89	123.5	66	123.5
Local Yield 170(s)	68	32	89	103.5	52	103.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 128 (98%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 9: Mockingbird Ln & Lincoln Dr



HCM 2010 Signalized Intersection Summary
10: Quail Run Rd & Lincoln Dr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	1189	5	5	1279	27	5	0	5	50	0	91
Future Volume (veh/h)	157	1189	5	5	1279	27	5	0	5	50	0	91
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	171	1292	5	5	1390	29	5	0	5	54	0	99
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	349	2977	12	374	2668	56	78	13	50	179	0	128
Arrive On Green	0.08	1.00	1.00	0.75	0.75	0.75	0.08	0.00	0.08	0.08	0.00	0.08
Sat Flow, veh/h	1774	3616	14	423	3545	74	457	159	616	1538	0	1583
Grp Volume(v), veh/h	171	632	665	5	693	726	10	0	0	54	0	99
Grp Sat Flow(s),veh/h/ln	1774	1770	1860	423	1770	1850	1231	0	0	1538	0	1583
Q Serve(g_s), s	2.9	0.0	0.0	0.4	20.7	20.8	0.0	0.0	0.0	0.0	0.0	8.0
Cycle Q Clear(g_c), s	2.9	0.0	0.0	0.4	20.7	20.8	3.8	0.0	0.0	3.8	0.0	8.0
Prop In Lane	1.00		0.01	1.00		0.04	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	349	1457	1531	374	1332	1392	141	0	0	179	0	128
V/C Ratio(X)	0.49	0.43	0.43	0.01	0.52	0.52	0.07	0.00	0.00	0.30	0.00	0.78
Avail Cap(c_a), veh/h	497	1457	1531	374	1332	1392	322	0	0	358	0	329
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	0.67	0.67	0.67	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.9	0.0	0.0	4.0	6.5	6.5	55.3	0.0	0.0	56.7	0.0	58.6
Incr Delay (d2), s/veh	0.9	0.8	0.7	0.0	1.0	0.9	0.2	0.0	0.0	0.9	0.0	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.3	0.3	0.0	10.4	10.8	0.3	0.0	0.0	1.9	0.0	3.8
LnGrp Delay(d),s/veh	6.8	0.8	0.7	4.1	7.5	7.5	55.5	0.0	0.0	57.6	0.0	68.2
LnGrp LOS	A	A	A	A	A	A	E			E		E
Approach Vol, veh/h		1468			1424			10			153	
Approach Delay, s/veh		1.5			7.5			55.5			64.5	
Approach LOS		A			A			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		16.5		113.5		16.5	9.2	104.3
Change Period (Y+Rc), s		6.0		6.5		6.0	4.0	6.5
Max Green Setting (Gmax), s		27.0		90.5		27.0	16.0	70.5
Max Q Clear Time (g_c+I1), s		5.8		2.0		10.0	4.9	22.8
Green Ext Time (p_c), s		0.6		49.9		0.5	0.3	34.1

Intersection Summary	
HCM 2010 Ctrl Delay	7.6
HCM 2010 LOS	A

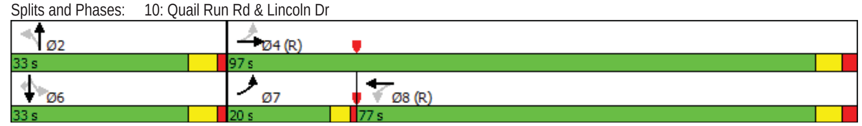
Timing Report, Sorted By Phase
10: Quail Run Rd & Lincoln Dr

Phase Number	2	4	6	7	8
Movement	NBTL	EBTL	SBTL	EBL	WBTL
Lead/Lag				Lead	Lag
Lead-Lag Optimize				Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max
Maximum Split (s)	33	97	33	20	77
Maximum Split (%)	25.4%	74.6%	25.4%	15.4%	59.2%
Minimum Split (s)	33	28	33	8	28
Yellow Time (s)	4.5	4	4.5	3	4
All-Red Time (s)	1.5	2.5	1.5	1	2.5
Minimum Initial (s)	7	15	7	4	15
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7	7		7
Flash Dont Walk (s)	20	14	20		14
Dual Entry	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	54	87	54	87	107
End Time (s)	87	54	87	107	54
Yield/Force Off (s)	81	47.5	81	103	47.5
Yield/Force Off 170(s)	61	33.5	61	103	33.5
Local Start Time (s)	77	110	77	110	0
Local Yield (s)	104	70.5	104	126	70.5
Local Yield 170(s)	84	56.5	84	126	56.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	80

Offset: 107 (82%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Splits and Phases: 10: Quail Run Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	695	48	430	26	35	47	313	1294	31	32	1836	695
Future Volume (veh/h)	695	48	430	26	35	47	313	1294	31	32	1836	695
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	792	0	467	28	38	51	340	1407	34	35	1996	755
Adj No. of Lanes	2	0	1	1	2	0	2	3	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	355	0	198	87	87	78	387	3196	77	44	2737	930
Arrive On Green	0.10	0.00	0.10	0.05	0.05	0.05	0.23	1.00	1.00	0.03	0.54	0.54
Sat Flow, veh/h	3548	0	1583	1774	1770	1583	3442	5108	123	1774	5085	1583
Grp Volume(v), veh/h	792	0	467	28	38	51	340	934	507	35	1996	755
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	1770	1583	1721	1695	1841	1774	1695	1583
Q Serve(g_s), s	12.0	0.0	12.0	1.8	2.5	3.8	11.4	0.0	0.0	2.4	35.8	45.1
Cycle Q Clear(g_c), s	12.0	0.0	12.0	1.8	2.5	3.8	11.4	0.0	0.0	2.4	35.8	45.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	355	0	198	87	87	78	387	2121	1152	44	2737	930
V/C Ratio(X)	2.23	0.00	2.36	0.32	0.44	0.65	0.88	0.44	0.44	0.79	0.73	0.81
Avail Cap(c_a), veh/h	355	0	198	281	280	251	430	2121	1152	148	2737	930
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.00	0.90	1.00	1.00	1.00	0.76	0.76	0.76	0.67	0.67	0.67
Uniform Delay (d), s/veh	54.0	0.0	52.5	55.1	55.4	56.0	45.7	0.0	0.0	58.2	21.1	19.5
Incr Delay (d2), s/veh	562.6	0.0	625.6	0.8	1.3	3.4	12.6	0.5	0.9	7.6	1.2	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	33.6	0.0	40.9	0.9	1.3	1.7	6.1	0.1	0.3	1.3	16.9	23.4
LnGrp Delay(d),s/veh	616.6	0.0	678.1	55.9	56.7	59.4	58.3	0.5	0.9	65.8	22.3	24.8
LnGrp LOS	F		F	E	E	E	E	A	A	E	C	C
Approach Vol, veh/h		1259			117			1781			2786	
Approach Delay, s/veh		639.4			57.7			11.7			23.5	
Approach LOS		F			E			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.0	81.1		12.9	17.5	70.6		19.0
Change Period (Y+Rc), s	4.0	6.0		7.0	4.0	6.0		7.0
Max Green Setting (Gmax), s	10.0	55.0		19.0	15.0	50.0		12.0
Max Q Clear Time (g_c+I1), s	4.4	2.0		5.8	13.4	47.1		14.0
Green Ext Time (p_c), s	0.0	8.0		0.2	0.1	2.2		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	151.1
HCM 2010 LOS	F

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	WBTL	NBL	SBT	EBTL
Lead/Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	14	61	26	19	56	19
Maximum Split (%)	11.7%	50.8%	21.7%	15.8%	46.7%	15.8%
Minimum Split (s)	9	28	40	9	28	40
Yellow Time (s)	3	4.5	4	3	4.5	4
All-Red Time (s)	1	1.5	3	1	1.5	3
Minimum Initial (s)	4	4	4	4	4	4
Vehicle Extension (s)	1	0.2	2	1	0.2	2
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		15	26		15	26
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	71	85	26	71	90	52
End Time (s)	85	26	52	90	26	71
Yield/Force Off (s)	81	20	45	86	20	64
Yield/Force Off 170(s)	81	5	19	86	5	38
Local Start Time (s)	101	115	56	101	0	82
Local Yield (s)	111	50	75	116	50	94
Local Yield 170(s)	111	35	49	116	35	68

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 90 (75%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 11: Scottsdale Rd & Lincoln Dr

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	57	240	10	0	9	300	43	0	5	5	5
Future Vol, veh/h	0	57	240	10	0	9	300	43	0	5	5	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	62	261	11	0	10	326	47	0	5	5	5
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	11.6	14.6	9.9
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	33%	100%	0%	100%	0%	100%	0%
Vol Thru, %	33%	0%	96%	0%	87%	0%	7%
Vol Right, %	33%	0%	4%	0%	13%	0%	93%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	57	250	9	343	84	76
LT Vol	5	57	0	9	0	84	0
Through Vol	5	0	240	0	300	0	5
RT Vol	5	0	10	0	43	0	71
Lane Flow Rate	16	62	272	10	373	91	83
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.03	0.103	0.411	0.016	0.555	0.176	0.132
Departure Headway (Hd)	6.661	6.1	5.566	6.062	5.468	6.924	5.755
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	540	591	652	594	664	521	627
Service Time	4.67	3.8	3.266	3.762	3.168	4.625	3.456
HCM Lane V/C Ratio	0.03	0.105	0.417	0.017	0.562	0.175	0.132
HCM Control Delay	9.9	9.5	12.1	8.9	14.8	11.1	9.3
HCM Lane LOS	A	A	B	A	B	B	A
HCM 95th-tile Q	0.1	0.3	2	0	3.4	0.6	0.5

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	84	5	71
Future Vol, veh/h	0	84	5	71
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	91	5	77
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	10.2
HCM LOS	B

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	252	37	316	364	341	49	1206	150	218	1922	75
Future Volume (veh/h)	131	252	37	316	364	341	49	1206	150	218	1922	75
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	142	274	40	343	396	371	53	1311	163	237	2089	82
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	201	354	51	281	515	591	404	1907	594	783	1907	594
Arrive On Green	0.08	0.11	0.11	0.11	0.15	0.15	0.23	0.38	0.38	0.30	0.50	0.50
Sat Flow, veh/h	1774	3105	448	1774	3539	1583	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	142	155	159	343	396	371	53	1311	163	237	2089	82
Grp Sat Flow(s),veh/h/ln	1774	1770	1784	1774	1770	1583	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	4.9	10.2	10.4	13.0	12.9	0.0	2.9	26.1	8.6	6.3	45.0	3.3
Cycle Q Clear(g_c), s	4.9	10.2	10.4	13.0	12.9	0.0	2.9	26.1	8.6	6.3	45.0	3.3
Prop In Lane	1.00		0.25	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	201	202	204	281	515	591	404	1907	594	783	1907	594
V/C Ratio(X)	0.71	0.77	0.78	1.22	0.77	0.63	0.13	0.69	0.27	0.30	1.10	0.14
Avail Cap(c_a), veh/h	257	339	342	281	678	664	404	1907	594	783	1907	594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.39	0.39	0.39
Uniform Delay (d), s/veh	52.3	51.6	51.7	51.3	49.3	30.8	36.9	31.6	26.1	34.5	30.1	19.6
Incr Delay (d2), s/veh	6.2	6.0	6.4	126.7	3.9	1.6	0.1	2.0	1.1	0.1	46.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	5.3	5.5	19.2	6.6	10.3	1.4	12.5	3.9	3.0	29.2	1.5
LnGrp Delay(d),s/veh	58.5	57.6	58.1	178.0	53.2	32.4	37.0	33.6	27.3	34.6	76.9	19.8
LnGrp LOS	E	E	E	F	D	C	D	C	C	C	F	B
Approach Vol, veh/h		456			1110			1527			2408	
Approach Delay, s/veh		58.1			84.8			33.1			70.8	
Approach LOS		E			F			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.3	51.0	17.0	20.7	31.3	51.0	13.2	24.5
Change Period (Y+Rc), s	4.0	6.0	* 4	7.0	4.0	6.0	* 4	7.0
Max Green Setting (Gmax), s	18.0	45.0	* 13	23.0	18.0	45.0	* 13	23.0
Max Q Clear Time (g_c+I1), s	8.3	28.1	15.0	12.4	4.9	47.0	6.9	14.9
Green Ext Time (p_c), s	0.7	9.3	0.0	1.3	0.8	0.0	0.9	2.6

Intersection Summary		
HCM 2010 Ctrl Delay		62.1
HCM 2010 LOS		E

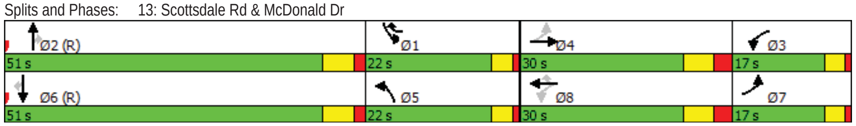
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	51	17	30	22	51	17	30
Maximum Split (%)	18.3%	42.5%	14.2%	25.0%	18.3%	42.5%	14.2%	25.0%
Minimum Split (s)	14	31	10	37	14	31	10	37
Yellow Time (s)	3	4.5	3	4.3	3	4.5	3	4.3
All-Red Time (s)	1	1.5	1	2.7	1	1.5	1	2.7
Minimum Initial (s)	10	20	6	8	10	20	6	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		9		6		9		6
Flash Dont Walk (s)		16		24		16		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	81	30	13	103	81	30	13	103
End Time (s)	103	81	30	13	103	81	30	13
Yield/Force Off (s)	99	75	26	6	99	75	26	6
Yield/Force Off 170(s)	99	59	26	102	99	59	26	102
Local Start Time (s)	51	0	103	73	51	0	103	73
Local Yield (s)	69	45	116	96	69	45	116	96
Local Yield 170(s)	69	29	116	72	69	29	116	72

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 30 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 13: Scottsdale Rd & McDonald Dr



Intersection	
Intersection Delay, s/veh	5.0
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	189	232	61
Demand Flow Rate, veh/h	192	236	63
Vehicles Circulating, veh/h	22	25	176
Vehicles Exiting, veh/h	239	213	38
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.9	5.3	4.5
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	192	236	63
Cap Entry Lane, veh/h	1105	1102	948
Entry HV Adj Factor	0.982	0.982	0.968
Flow Entry, veh/h	189	232	61
Cap Entry, veh/h	1085	1082	918
V/C Ratio	0.174	0.214	0.066
Control Delay, s/veh	4.9	5.3	4.5
LOS	A	A	A
95th %tile Queue, veh	1	1	0

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	190	3	6	200	13	29
Future Vol, veh/h	190	3	6	200	13	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	207	3	7	217	14	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	210	0	438	208
Stage 1	-	-	-	-	208	-
Stage 2	-	-	-	-	230	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1361	-	576	832
Stage 1	-	-	-	-	827	-
Stage 2	-	-	-	-	808	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1361	-	573	832
Mov Cap-2 Maneuver	-	-	-	-	573	-
Stage 1	-	-	-	-	827	-
Stage 2	-	-	-	-	804	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	730	-	-	1361	-
HCM Lane V/C Ratio	0.063	-	-	0.005	-
HCM Control Delay (s)	10.3	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	1.9					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	246	17	40	223	23	54
Future Vol, veh/h	246	17	40	223	23	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	267	18	43	242	25	59

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	286	0	485	277
Stage 1	-	-	-	-	277	-
Stage 2	-	-	-	-	208	-
Critical Hdwy	-	-	4.12	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.218	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1276	-	526	761
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	807	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1276	-	508	761
Mov Cap-2 Maneuver	-	-	-	-	585	-
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	780	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	698	-	-	1276	-
HCM Lane V/C Ratio	0.12	-	-	0.034	-
HCM Control Delay (s)	10.9	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection						
Int Delay, s/veh	0					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	3	1	0	1794	1927	6
Future Vol, veh/h	3	1	0	1794	1927	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	1	0	1950	2095	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2875	1047	2095	0	-	0
Stage 1	2095	-	-	-	-	-
Stage 2	780	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	31	193	112	-	-	-
Stage 1	49	-	-	-	-	-
Stage 2	374	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	31	193	112	-	-	-
Mov Cap-2 Maneuver	31	-	-	-	-	-
Stage 1	49	-	-	-	-	-
Stage 2	374	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	112	-	193	-	-
HCM Lane V/C Ratio	-	-	0.006	-	-
HCM Control Delay (s)	0	-	23.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 2010 TWSC
25: Collector A & North Residential Access

11/5/2015

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	44	0	0	13	21	14
Future Vol, veh/h	44	0	0	13	21	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	0	0	14	23	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	44	30	38	0	-	0
Stage 1	30	-	-	-	-	-
Stage 2	14	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	967	1044	1572	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	1009	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	967	1044	1572	-	-	-
Mov Cap-2 Maneuver	967	-	-	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1572	-	967	-	-
HCM Lane V/C Ratio	-	-	0.049	-	-
HCM Control Delay (s)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

HCM 2010 TWSC
26: Collector A & Garage Access

11/5/2015

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	10	5	7	22	11	10
Future Vol, veh/h	10	5	7	22	11	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	5	8	24	12	11

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	55	20	0	0	32	0
Stage 1	20	-	-	-	-	-
Stage 2	35	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	953	1058	-	-	1580	-
Stage 1	1003	-	-	-	-	-
Stage 2	987	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	945	1058	-	-	1580	-
Mov Cap-2 Maneuver	945	-	-	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	979	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	3.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	980	1580	-
HCM Lane V/C Ratio	-	-	0.017	0.008	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	15	5	25	19	8	13
Future Vol, veh/h	15	5	25	19	8	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	5	27	21	9	14

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	70	38	0	0	48	0
Stage 1	38	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	934	1034	-	-	1559	-
Stage 1	984	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	928	1034	-	-	1559	-
Mov Cap-2 Maneuver	928	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	985	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	2.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	952	1559	-
HCM Lane V/C Ratio	-	-	0.023	0.006	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	15	9	33	18	9	20
Future Vol, veh/h	15	9	33	18	9	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	10	36	20	10	22

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	87	46	0	0	55	0
Stage 1	46	-	-	-	-	-
Stage 2	41	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	914	1023	-	-	1550	-
Stage 1	976	-	-	-	-	-
Stage 2	981	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	908	1023	-	-	1550	-
Mov Cap-2 Maneuver	908	-	-	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	974	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	2.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	948	1550	-
HCM Lane V/C Ratio	-	-	0.028	0.006	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	19	8	12	160	49	13
Future Vol, veh/h	19	8	12	160	49	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	9	13	174	53	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	187	0	-	0	150	100
Stage 1	-	-	-	-	100	-
Stage 2	-	-	-	-	50	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1387	-	-	-	842	956
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	972	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1387	-	-	-	829	956
Mov Cap-2 Maneuver	-	-	-	-	806	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	957	-

Approach	EB	WB	SB
HCM Control Delay, s	5.4	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1387	-	-	-	833
HCM Lane V/C Ratio	0.015	-	-	-	0.081
HCM Control Delay (s)	7.6	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	31	4	67	49	1	26
Future Vol, veh/h	31	4	67	49	1	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	4	73	53	1	28

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	129	99	0	0	126	0
Stage 1	99	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	865	957	-	-	1460	-
Stage 1	925	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	864	957	-	-	1460	-
Mov Cap-2 Maneuver	864	-	-	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	992	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	874	1460	-
HCM Lane V/C Ratio	-	-	0.044	0.001	-
HCM Control Delay (s)	-	-	9.3	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Intersection Delay, s/veh	4.4
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	33	22	192	62
Demand Flow Rate, veh/h	34	22	196	63
Vehicles Circulating, veh/h	85	140	0	33
Vehicles Exiting, veh/h	11	56	119	129
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.9	3.9	4.8	3.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	34	22	196	63
Cap Entry Lane, veh/h	1038	982	1130	1093
Entry HV Adj Factor	0.971	1.000	0.982	0.980
Flow Entry, veh/h	33	22	192	62
Cap Entry, veh/h	1007	982	1110	1072
V/C Ratio	0.033	0.022	0.173	0.058
Control Delay, s/veh	3.9	3.9	4.8	3.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	0

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	34	0	177	7	0	107
Future Vol, veh/h	34	0	177	7	0	107
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	0	192	8	0	116

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	312	196	0	0	200	0
Stage 1	196	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	681	845	-	-	1372	-
Stage 1	837	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	681	845	-	-	1372	-
Mov Cap-2 Maneuver	681	-	-	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	909	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	681	1372	-
HCM Lane V/C Ratio	-	-	0.054	-	-
HCM Control Delay (s)	-	-	10.6	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Intersection Delay, s/veh	13.2
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	4	34	232	0	20	18	4	0	311	42	49
Future Vol, veh/h	0	4	34	232	0	20	18	4	0	311	42	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	37	252	0	22	20	4	0	338	46	53
Number of Lanes	0	1	1	0	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	11.9	10	14.7
HCM LOS	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	48%	3%
Vol Thru, %	0%	46%	0%	13%	43%	83%
Vol Right, %	0%	54%	0%	87%	10%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	311	91	4	266	42	29
LT Vol	311	0	4	0	20	1
Through Vol	0	42	0	34	18	24
RT Vol	0	49	0	232	4	4
Lane Flow Rate	338	99	4	289	46	32
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.568	0.142	0.008	0.423	0.081	0.053
Departure Headway (Hd)	6.051	5.167	6.487	5.365	6.367	6.104
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	598	697	555	677	564	589
Service Time	3.755	2.871	4.187	3.065	4.39	4.12
HCM Lane V/C Ratio	0.565	0.142	0.007	0.427	0.082	0.054
HCM Control Delay	16.4	8.7	9.2	11.9	10	9.5
HCM Lane LOS	C	A	A	B	A	A
HCM 95th-tile Q	3.6	0.5	0	2.1	0.3	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	1	24	4
Future Vol, veh/h	0	1	24	4
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	26	4
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9.5
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	153	84	343	180	74	207
Future Vol, veh/h	153	84	343	180	74	207
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	166	91	373	196	80	225

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	857	471	0	0	568	0
Stage 1	471	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	328	593	-	-	1004	-
Stage 1	628	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	302	593	-	-	1004	-
Mov Cap-2 Maneuver	425	-	-	-	-	-
Stage 1	628	-	-	-	-	-
Stage 2	632	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	425	593	1004	-
HCM Lane V/C Ratio	-	-	0.391	0.154	0.08	-
HCM Control Delay (s)	-	-	18.8	12.2	8.9	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.8	0.5	0.3	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	227	5	78	276	15	5	0	155	5	0	5
Future Vol, veh/h	5	227	5	78	276	15	5	0	155	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	247	5	85	300	16	5	0	168	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	316	0	0	252	0	0	740	746	249	823	741	308
Stage 1	-	-	-	-	-	-	260	260	-	478	478	-
Stage 2	-	-	-	-	-	-	480	486	-	345	263	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1244	-	-	1313	-	-	333	342	790	292	344	732
Stage 1	-	-	-	-	-	-	745	693	-	568	556	-
Stage 2	-	-	-	-	-	-	567	551	-	671	691	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1244	-	-	1313	-	-	313	319	790	218	320	732
Mov Cap-2 Maneuver	-	-	-	-	-	-	313	319	-	218	320	-
Stage 1	-	-	-	-	-	-	742	690	-	566	520	-
Stage 2	-	-	-	-	-	-	526	515	-	526	688	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.7	11.2	16.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	754	1244	-	-	1313	-	-	336
HCM Lane V/C Ratio	0.231	0.004	-	-	0.065	-	-	0.032
HCM Control Delay (s)	11.2	7.9	-	-	7.9	-	-	16.1
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.9	0	-	-	0.2	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	246	70	500	288	139	115	1962	540	191	1703	79
Future Volume (veh/h)	158	246	70	500	288	139	115	1962	540	191	1703	79
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	172	267	76	543	313	151	125	2133	587	208	1851	86
Adj No. of Lanes	1	1	1	2	1	1	1	3	1	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	198	171	145	601	335	456	275	2161	949	254	2161	673
Arrive On Green	0.11	0.09	0.09	0.17	0.18	0.18	0.11	0.43	0.43	0.11	0.43	0.43
Sat Flow, veh/h	1774	1863	1583	3442	1863	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	172	267	76	543	313	151	125	2133	587	208	1851	86
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1721	1863	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	11.4	11.0	5.5	18.6	19.9	1.8	2.1	49.9	7.3	9.5	39.5	2.6
Cycle Q Clear(g_c), s	11.4	11.0	5.5	18.6	19.9	1.8	2.1	49.9	7.3	9.5	39.5	2.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	171	145	601	335	456	275	2161	949	254	2161	673
V/C Ratio(X)	0.87	1.56	0.52	0.90	0.94	0.33	0.46	0.99	0.62	0.82	0.86	0.13
Avail Cap(c_a), veh/h	207	171	145	660	335	456	289	2161	949	268	2161	673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.4	54.5	52.0	48.5	48.5	16.4	46.9	34.2	15.3	50.5	31.2	9.2
Incr Delay (d2), s/veh	28.0	280.1	1.7	14.2	32.5	0.2	0.4	16.5	3.0	15.9	4.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	18.9	2.5	10.0	13.3	2.6	3.8	26.6	3.8	7.8	19.3	1.2
LnGrp Delay(d),s/veh	80.4	334.6	53.7	62.8	81.0	16.5	47.4	50.7	18.3	66.4	35.8	9.6
LnGrp LOS	F	F	D	E	F	B	D	D	B	E	D	A
Approach Vol, veh/h		515			1007			2845			2145	
Approach Delay, s/veh		208.3			61.5			43.9			37.7	
Approach LOS		F			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	57.0	28.0	18.0	17.0	57.0	17.4	28.6
Change Period (Y+Rc), s	* 4	6.0	* 7	* 7	* 4	6.0	4.0	* 7
Max Green Setting (Gmax), s	* 14	51.0	* 23	* 11	* 14	51.0	14.0	* 20
Max Q Clear Time (g_c+I1), s	11.5	51.9	20.6	13.0	4.1	41.5	13.4	21.9
Green Ext Time (p_c), s	0.1	0.0	0.4	0.0	0.1	3.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	57.6
HCM 2010 LOS	E

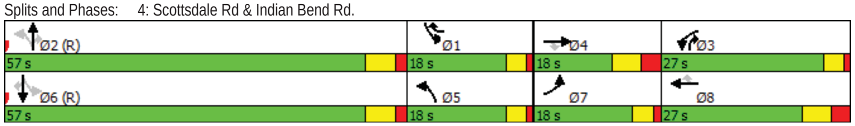
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	18	57	27	18	18	57	18	27
Maximum Split (%)	15.0%	47.5%	22.5%	15.0%	15.0%	47.5%	15.0%	22.5%
Minimum Split (s)	9.4	29.4	8.5	13	9.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	87	30	3	105	87	30	105	3
End Time (s)	105	87	30	3	105	87	3	30
Yield/Force Off (s)	101	81	26	116	101	81	119	23
Yield/Force Off 170(s)	101	65	26	85	101	65	119	112
Local Start Time (s)	57	0	93	75	57	0	75	93
Local Yield (s)	71	51	116	86	71	51	89	113
Local Yield 170(s)	71	35	116	55	71	35	89	82

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	115	5	0	11	0	2571	7	10	2273	79
Future Vol, veh/h	0	0	115	5	0	11	0	2571	7	10	2273	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	150	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	125	5	0	12	0	2795	8	11	2471	86

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3610	5294	1235	3808	5290	1401	2471	0	0	2802	0	0
Stage 1	2492	2492	-	2798	2798	-	-	-	-	-	-	-
Stage 2	1118	2802	-	1010	2492	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	6	0	144	~ 4	0	111	72	-	-	48	-	-
Stage 1	17	57	-	10	39	-	-	-	-	-	-	-
Stage 2	198	39	-	232	57	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	4	0	144	0	0	111	72	-	-	48	-	-
Mov Cap-2 Maneuver	4	0	-	0	0	-	-	-	-	-	-	-
Stage 1	17	44	-	10	39	-	-	-	-	-	-	-
Stage 2	177	39	-	24	44	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	103.5	43.4	0	0.4
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	72	-	-	144	111	48	-	-
HCM Lane V/C Ratio	-	-	-	0.868	0.157	0.226	-	-
HCM Control Delay (s)	0	-	-	103.5	43.4	100.7	-	-
HCM Lane LOS	A	-	-	F	E	F	-	-
HCM 95th %tile Q(veh)	0	-	-	5.8	0.5	0.8	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	142	246	316	2431	2381	80
Future Volume (veh/h)	142	246	316	2431	2381	80
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	154	267	343	2642	2588	87
Adj No. of Lanes	2	1	2	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	242	540	1045	4255	2641	822
Arrive On Green	0.07	0.07	0.27	0.84	0.52	0.52
Sat Flow, veh/h	3442	1583	3442	5253	5253	1583
Grp Volume(v), veh/h	154	267	343	2642	2588	87
Grp Sat Flow(s),veh/h/ln	1721	1583	1721	1695	1695	1583
Q Serve(g_s), s	5.6	0.0	5.7	22.8	64.3	3.6
Cycle Q Clear(g_c), s	5.6	0.0	5.7	22.8	64.3	3.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	242	540	1045	4255	2641	822
V/C Ratio(X)	0.64	0.49	0.33	0.62	0.98	0.11
Avail Cap(c_a), veh/h	806	800	1045	4255	2641	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.12	0.12	1.00	1.00
Uniform Delay (d), s/veh	58.4	33.7	35.4	3.6	30.3	15.8
Incr Delay (d2), s/veh	2.8	0.7	0.0	0.1	13.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	9.6	4.7	10.3	33.2	1.6
LnGrp Delay(d),s/veh	61.2	34.4	35.5	3.7	43.7	16.0
LnGrp LOS	E	C	D	A	D	B
Approach Vol, veh/h	421			2985	2675	
Approach Delay, s/veh	44.2			7.3	42.8	
Approach LOS	D			A	D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		113.9		15.1	40.9	73.0		
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6		
Max Green Setting (Gmax), s		* 87		30.2	* 16	* 67		
Max Q Clear Time (g_c+I1), s		24.8		7.6	7.7	66.3		
Green Ext Time (p_c), s		49.4		1.4	6.5	0.7		

Intersection Summary	
HCM 2010 Ctrl Delay	25.5
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

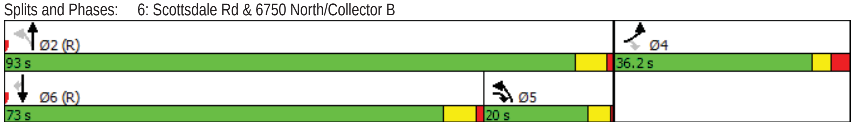
Timing Report, Sorted By Phase
6: Scottsdale Rd & 6750 North/Collector B

11/5/2015

Phase Number	2	4	5	6
Movement	NBTL	EBL	NBL	SBT
Lead/Lag			Lag	Lead
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	93	36.2	20	73
Maximum Split (%)	72.0%	28.0%	15.5%	56.5%
Minimum Split (s)	36	36.2	8	36.9
Yellow Time (s)	4.9	3	3.5	4.9
All-Red Time (s)	1.1	3	0.5	1.1
Minimum Initial (s)	10	5	4	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8	8		8
Flash Dont Walk (s)	22	19		22
Dual Entry	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	65	28.8	8.8	65
End Time (s)	28.8	65	28.8	8.8
Yield/Force Off (s)	22.8	59	24.8	2.8
Yield/Force Off 170(s)	0.8	40	24.8	110
Local Start Time (s)	0	93	73	0
Local Yield (s)	87	123.2	89	67
Local Yield 170(s)	65	104.2	89	45

Intersection Summary	
Cycle Length	129.2
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 65 (50%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



HCM 2010 Signalized Intersection Summary
7: Tatum Blvd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	380	838	42	425	942	310	94	1113	381	242	674	183
Future Volume (veh/h)	380	838	42	425	942	310	94	1113	381	242	674	183
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	413	911	46	462	1024	337	102	1210	414	263	733	199
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	479	844	43	219	820	367	304	1280	572	283	1579	706
Arrive On Green	0.11	0.25	0.25	0.09	0.23	0.23	0.04	0.36	0.36	0.12	0.45	0.45
Sat Flow, veh/h	3442	3429	173	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	413	470	487	462	1024	337	102	1210	414	263	733	199
Grp Sat Flow(s),veh/h/ln	1721	1770	1832	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	11.7	32.0	32.0	12.0	30.1	27.0	4.8	43.1	29.4	14.3	18.8	10.4
Cycle Q Clear(g_c), s	11.7	32.0	32.0	12.0	30.1	27.0	4.8	43.1	29.4	14.3	18.8	10.4
Prop In Lane	1.00		0.09	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	479	436	451	219	820	367	304	1280	572	283	1579	706
V/C Ratio(X)	0.86	1.08	1.08	2.11	1.25	0.92	0.34	0.95	0.72	0.93	0.46	0.28
Avail Cap(c_a), veh/h	534	436	451	219	820	367	304	1280	572	283	1579	706
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.52	0.52	0.52	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	49.0	49.0	38.0	49.9	48.8	25.1	40.3	35.9	38.5	25.1	22.8
Incr Delay (d2), s/veh	11.6	66.1	65.4	506.6	117.7	18.9	0.2	15.1	7.7	34.8	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	23.6	24.4	32.8	28.1	13.7	2.3	23.7	14.1	12.1	9.4	4.7
LnGrp Delay(d),s/veh	47.4	115.1	114.4	544.6	167.6	67.7	25.3	55.4	43.6	73.2	26.1	23.8
LnGrp LOS	D	F	F	F	F	E	C	E	D	E	C	C
Approach Vol, veh/h		1370			1823			1726			1195	
Approach Delay, s/veh		94.4			244.7			50.8			36.1	
Approach LOS		F			F			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.9	37.1	20.0	54.0	17.0	39.0	9.0	65.0
Change Period (Y+Rc), s	5.0	7.0	4.0	7.0	5.0	7.0	4.0	7.0
Max Green Setting (Gmax), s	16.0	28.0	16.0	47.0	12.0	32.0	5.0	58.0
Max Q Clear Time (g_c+I1), s	13.7	32.1	16.3	45.1	14.0	34.0	6.8	20.8
Green Ext Time (p_c), s	0.2	0.0	0.0	1.9	0.0	0.0	0.0	35.0

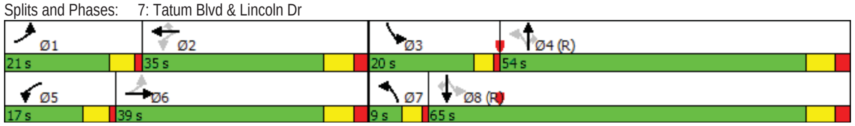
Intersection Summary	
HCM 2010 Ctrl Delay	115.5
HCM 2010 LOS	F

Timing Report, Sorted By Phase
7: Tatum Blvd & Lincoln Dr

Phase Number	1	2	3	4	5	6	7	8
Movement	EBL	WBTL	SBL	NBTL	WBL	EBTL	NBL	SBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	21	35	20	54	17	39	9	65
Maximum Split (%)	16.2%	26.9%	15.4%	41.5%	13.1%	30.0%	6.9%	50.0%
Minimum Split (s)	9	35	8	36	9	35	8	36
Yellow Time (s)	4	4.5	3	4.5	4	4.5	3	4.5
All-Red Time (s)	1	2.5	1	2.5	1	2.5	1	2.5
Minimum Initial (s)	4	15	4	15	4	15	4	15
Vehicle Extension (s)	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		23		24		23		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	64	85	120	10	64	81	120	129
End Time (s)	85	120	10	64	81	120	129	64
Yield/Force Off (s)	80	113	6	57	76	113	125	57
Yield/Force Off 170(s)	80	90	6	33	76	90	125	33
Local Start Time (s)	54	75	110	0	54	71	110	119
Local Yield (s)	70	103	126	47	66	103	115	47
Local Yield 170(s)	70	80	126	23	66	80	115	23

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 10 (8%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	

Splits and Phases: 7: Tatum Blvd & Lincoln Dr



HCM 2010 Signalized Intersection Summary
8: Invergordon Rd & Lincoln Dr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1332	159	67	1311	27	268	23	92	27	19	11
Future Volume (veh/h)	5	1332	159	67	1311	27	268	23	92	27	19	11
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	5	1448	173	73	1425	29	291	25	100	29	21	12
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	206	1806	214	168	2009	41	455	79	317	202	138	63
Arrive On Green	0.57	0.57	0.57	0.57	0.57	0.57	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	364	3188	378	310	3547	72	1370	326	1306	513	571	260
Grp Volume(v), veh/h	5	798	823	73	710	744	291	0	125	62	0	0
Grp Sat Flow(s),veh/h/ln	364	1770	1796	310	1770	1850	1370	0	1632	1345	0	0
Q Serve(g_s), s	0.7	24.2	24.9	13.6	19.8	19.8	8.5	0.0	4.3	0.1	0.0	0.0
Cycle Q Clear(g_c), s	20.5	24.2	24.9	38.5	19.8	19.8	12.8	0.0	4.3	4.4	0.0	0.0
Prop In Lane	1.00		0.21	1.00		0.04	1.00		0.80	0.47		0.19
Lane Grp Cap(c), veh/h	206	1002	1017	168	1002	1048	455	0	396	404	0	0
V/C Ratio(X)	0.02	0.80	0.81	0.44	0.71	0.71	0.64	0.00	0.32	0.15	0.00	0.00
Avail Cap(c_a), veh/h	206	1002	1017	168	1002	1048	667	0	648	567	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.23	0.23	0.23	0.64	0.64	0.64	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.1	11.6	11.8	28.2	10.7	10.7	24.1	0.0	21.1	20.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	1.6	1.7	5.2	2.7	2.6	1.5	0.0	0.5	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	12.0	12.6	1.6	10.2	10.7	5.4	0.0	2.0	0.9	0.0	0.0
LnGrp Delay(d),s/veh	18.2	13.2	13.5	33.4	13.4	13.3	25.6	0.0	21.6	20.4	0.0	0.0
LnGrp LOS	B	B	B	C	B	B	C		C	C		
Approach Vol, veh/h		1626			1527			416			62	
Approach Delay, s/veh		13.4			14.3			24.4			20.4	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		44.5		23.5		44.5		23.5
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0
Max Green Setting (Gmax), s		28.0		27.0		28.0		24.0
Max Q Clear Time (g_c+I1), s		40.5		14.8		26.9		6.4
Green Ext Time (p_c), s		0.0		1.7		1.0		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Timing Report, Sorted By Phase
8: Invergordon Rd & Lincoln Dr

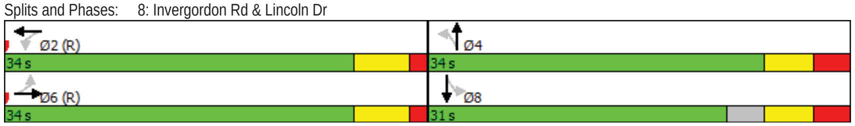
11/5/2015

Phase Number	2	4	6	8
Movement	WBTL	NBTL	EBTL	SBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	34	34	34	31
Maximum Split (%)	50.0%	50.0%	50.0%	45.6%
Minimum Split (s)	24	31	24	17
Yellow Time (s)	4.5	4	4.5	4
All-Red Time (s)	1.5	3	1.5	3
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	
Flash Dont Walk (s)	11	17	11	
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	59	25	59	25
End Time (s)	25	59	25	59
Yield/Force Off (s)	19	52	19	52
Yield/Force Off 170(s)	8	35	8	52
Local Start Time (s)	0	34	0	34
Local Yield (s)	28	61	28	61
Local Yield 170(s)	17	44	17	61

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Coordinated
Natural Cycle	90

Offset: 59 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Splits and Phases: 8: Invergordon Rd & Lincoln Dr



HCM 2010 Signalized Intersection Summary
9: Mockingbird Ln & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	342	1210	19	39	1182	96	13	120	48	60	100	226
Future Volume (veh/h)	342	1210	19	39	1182	96	13	120	48	60	100	226
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	372	1315	21	42	1285	104	14	130	52	65	109	246
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	555	2535	40	146	1388	621	190	166	67	148	359	305
Arrive On Green	0.27	0.71	0.71	0.52	0.52	0.52	0.13	0.13	0.13	0.03	0.19	0.19
Sat Flow, veh/h	1774	3565	57	408	3539	1583	1022	1267	507	1774	1863	1583
Grp Volume(v), veh/h	372	652	684	42	1285	104	14	0	182	65	109	246
Grp Sat Flow(s),veh/h/ln	1774	1770	1853	408	1770	1583	1022	0	1773	1774	1863	1583
Q Serve(g_s), s	18.5	21.9	22.0	10.9	43.7	3.7	1.6	0.0	12.9	4.0	6.5	19.3
Cycle Q Clear(g_c), s	18.5	21.9	22.0	32.9	43.7	3.7	1.6	0.0	12.9	4.0	6.5	19.3
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	555	1258	1317	146	1388	621	190	0	233	148	359	305
V/C Ratio(X)	0.67	0.52	0.52	0.29	0.93	0.17	0.07	0.00	0.78	0.44	0.30	0.81
Avail Cap(c_a), veh/h	555	1258	1317	146	1388	621	272	0	375	148	509	432
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.31	0.31	0.31	0.88	0.88	0.88	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	8.6	8.6	35.7	29.3	13.5	49.7	0.0	54.7	46.8	45.0	50.1
Incr Delay (d2), s/veh	1.0	0.5	0.5	4.3	10.7	0.5	0.2	0.0	5.6	2.0	0.5	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	10.7	11.2	1.4	23.1	1.7	0.5	0.0	6.7	0.4	3.4	9.1
LnGrp Delay(d),s/veh	40.2	9.1	9.1	40.0	40.0	14.0	49.9	0.0	60.3	48.8	45.4	57.4
LnGrp LOS	D	A	A	D	D	B	D		E	D	D	E
Approach Vol, veh/h		1708			1431			196			420	
Approach Delay, s/veh		15.9			38.2			59.6			53.0	
Approach LOS		B			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6		8
Phs Duration (G+Y+Rc), s	41.4	57.0	8.0	23.6		98.4		31.6
Change Period (Y+Rc), s	6.0	* 6	4.0	6.5		6.0		6.5
Max Green Setting (Gmax), s	27.0	* 51	4.0	27.5		82.0		35.5
Max Q Clear Time (g_c+I1), s	20.5	45.7	6.0	14.9		24.0		21.3
Green Ext Time (p_c), s	4.6	3.9	0.0	2.2		16.3		2.3

Intersection Summary	
HCM 2010 Ctrl Delay	30.8
HCM 2010 LOS	C

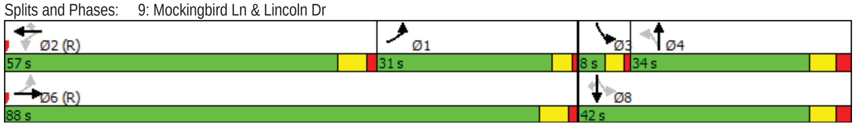
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	6	8
Movement	EBL	WBTL	SBL	NBTL	EBTL	SBTL
Lead/Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	31	57	8	34	88	42
Maximum Split (%)	23.8%	43.8%	6.2%	26.2%	67.7%	32.3%
Minimum Split (s)	9	27	8	34	27	34
Yellow Time (s)	3	4.5	3	4	4.5	4
All-Red Time (s)	1	1.5	1	2.5	1.5	2.5
Minimum Initial (s)	4	15	4	7	15	7
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7		7	7	7
Flash Dont Walk (s)		14		20	14	20
Dual Entry	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	73	16	104	112	16	104
End Time (s)	104	73	112	16	104	16
Yield/Force Off (s)	100	67	108	9.5	98	9.5
Yield/Force Off 170(s)	100	53	108	119.5	84	119.5
Local Start Time (s)	57	0	88	96	0	88
Local Yield (s)	84	51	92	123.5	82	123.5
Local Yield 170(s)	84	37	92	103.5	68	103.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 16 (12%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 9: Mockingbird Ln & Lincoln Dr



HCM 2010 Signalized Intersection Summary
10: Quail Run Rd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	647	5	5	1053	50	5	0	5	31	0	183
Future Volume (veh/h)	174	647	5	5	1053	50	5	0	5	31	0	183
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	189	703	5	5	1145	54	5	0	5	34	0	199
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	389	2738	19	556	2402	1075	127	13	99	263	0	227
Arrive On Green	0.10	1.00	1.00	0.68	0.68	0.68	0.14	0.00	0.14	0.14	0.00	0.14
Sat Flow, veh/h	1774	3602	26	738	3539	1583	597	92	688	1448	0	1583
Grp Volume(v), veh/h	189	345	363	5	1145	54	10	0	0	34	0	199
Grp Sat Flow(s),veh/h/ln	1774	1770	1858	738	1770	1583	1377	0	0	1448	0	1583
Q Serve(g_s), s	4.3	0.0	0.0	0.3	20.0	1.5	0.0	0.0	0.0	0.0	0.0	16.0
Cycle Q Clear(g_c), s	4.3	0.0	0.0	0.3	20.0	1.5	2.2	0.0	0.0	2.2	0.0	16.0
Prop In Lane	1.00		0.01	1.00		1.00	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	389	1345	1413	556	2402	1075	239	0	0	263	0	227
V/C Ratio(X)	0.49	0.26	0.26	0.01	0.48	0.05	0.04	0.00	0.00	0.13	0.00	0.87
Avail Cap(c_a), veh/h	518	1345	1413	556	2402	1075	357	0	0	386	0	365
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.75	0.75	0.75	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.4	0.0	0.0	6.8	9.9	6.9	47.9	0.0	0.0	48.6	0.0	54.5
Incr Delay (d2), s/veh	0.8	0.4	0.4	0.0	0.5	0.1	0.1	0.0	0.0	0.2	0.0	12.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.1	0.1	0.1	9.9	0.7	0.3	0.0	0.0	1.1	0.0	7.8
LnGrp Delay(d),s/veh	8.2	0.4	0.4	6.8	10.4	7.0	48.0	0.0	0.0	48.8	0.0	67.4
LnGrp LOS	A	A	A	A	B	A	D			D		E
Approach Vol, veh/h		897			1204			10			233	
Approach Delay, s/veh		2.0			10.3			48.0			64.7	
Approach LOS		A			B			D			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		24.7		105.3		24.7	10.6	94.7
Change Period (Y+Rc), s		6.0		6.5		6.0	4.0	6.5
Max Green Setting (Gmax), s		30.0		87.5		30.0	16.0	67.5
Max Q Clear Time (g_c+I1), s		4.2		2.0		18.0	6.3	22.0
Green Ext Time (p_c), s		0.9		24.8		0.7	0.3	20.8

Intersection Summary		
HCM 2010 Ctrl Delay		12.7
HCM 2010 LOS		B

Timing Report, Sorted By Phase
10: Quail Run Rd & Lincoln Dr

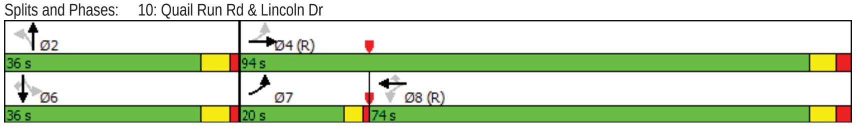
11/5/2015

Phase Number	2	4	6	7	8
Movement	NBTL	EBTL	SBTL	EBL	WBTL
Lead/Lag				Lead	Lag
Lead-Lag Optimize				Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max
Maximum Split (s)	36	94	36	20	74
Maximum Split (%)	27.7%	72.3%	27.7%	15.4%	56.9%
Minimum Split (s)	33	28	33	8	28
Yellow Time (s)	4.5	4	4.5	3	4
All-Red Time (s)	1.5	2.5	1.5	1	2.5
Minimum Initial (s)	7	15	7	4	15
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7	7		7
Flash Dont Walk (s)	20	14	20		14
Dual Entry	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	74	110	74	110	0
End Time (s)	110	74	110	0	74
Yield/Force Off (s)	104	67.5	104	126	67.5
Yield/Force Off 170(s)	84	53.5	84	126	53.5
Local Start Time (s)	74	110	74	110	0
Local Yield (s)	104	67.5	104	126	67.5
Local Yield 170(s)	84	53.5	84	126	53.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	70

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Splits and Phases: 10: Quail Run Rd & Lincoln Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	698	49	417	45	59	69	390	1958	39	72	1864	555
Future Volume (veh/h)	698	49	417	45	59	69	390	1958	39	72	1864	555
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	797	0	453	49	64	75	424	2128	42	78	2026	603
Adj No. of Lanes	2	0	1	1	2	0	2	3	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	591	0	488	118	118	105	775	2182	43	252	1737	646
Arrive On Green	0.17	0.00	0.17	0.07	0.07	0.07	0.45	0.85	0.85	0.14	0.34	0.34
Sat Flow, veh/h	3548	0	1583	1774	1770	1583	3442	5134	101	1774	5085	1583
Grp Volume(v), veh/h	797	0	453	49	64	75	424	1404	766	78	2026	603
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	1770	1583	1721	1695	1845	1774	1695	1583
Q Serve(g_s), s	20.0	0.0	16.2	3.2	4.2	5.6	10.8	43.4	44.0	4.7	41.0	41.0
Cycle Q Clear(g_c), s	20.0	0.0	16.2	3.2	4.2	5.6	10.8	43.4	44.0	4.7	41.0	41.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	591	0	488	118	118	105	775	1441	784	252	1737	646
V/C Ratio(X)	1.35	0.00	0.93	0.42	0.54	0.71	0.55	0.97	0.98	0.31	1.17	0.93
Avail Cap(c_a), veh/h	591	0	488	207	206	185	775	1441	784	252	1737	646
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.00	0.98	1.00	1.00	1.00	0.32	0.32	0.32	0.57	0.57	0.57
Uniform Delay (d), s/veh	50.0	0.0	40.2	53.8	54.2	54.9	28.5	8.4	8.5	46.2	39.5	33.1
Incr Delay (d2), s/veh	167.3	0.0	23.7	2.3	3.9	8.6	0.3	8.6	13.4	0.4	78.7	14.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.5	0.0	10.2	1.6	2.2	2.7	5.1	20.1	23.3	2.3	31.8	22.6
LnGrp Delay(d),s/veh	217.3	0.0	63.9	56.1	58.1	63.5	28.8	17.1	21.9	46.6	118.2	48.0
LnGrp LOS	F		E	E	E	E	C	B	C	D	F	D
Approach Vol, veh/h		1250			188			2594			2707	
Approach Delay, s/veh		161.7			59.7			20.4			100.5	
Approach LOS		F			E			C			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.0	57.0		15.0	31.0	47.0		27.0
Change Period (Y+Rc), s	4.0	6.0		7.0	4.0	6.0		7.0
Max Green Setting (Gmax), s	11.0	51.0		14.0	21.0	41.0		20.0
Max Q Clear Time (g_c+I1), s	6.7	46.0		7.6	12.8	43.0		22.0
Green Ext Time (p_c), s	0.8	4.5		0.4	1.2	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	79.9
HCM 2010 LOS	E

Notes

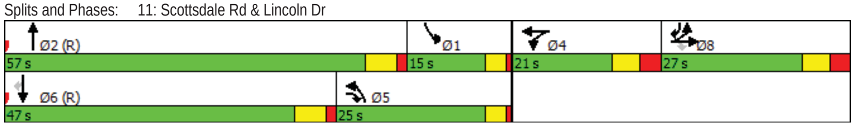
User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	WBTL	NBL	SBT	EBTL
Lead/Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	15	57	21	25	47	27
Maximum Split (%)	12.5%	47.5%	17.5%	20.8%	39.2%	22.5%
Minimum Split (s)	9	28	40	9	28	40
Yellow Time (s)	3	4.5	4	3	4.5	4
All-Red Time (s)	1	1.5	3	1	1.5	3
Minimum Initial (s)	4.5	20	5	4.5	20	8
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		15	26		15	26
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	12	75	27	2	75	48
End Time (s)	27	12	48	27	2	75
Yield/Force Off (s)	23	6	41	23	116	68
Yield/Force Off 170(s)	23	111	15	23	101	42
Local Start Time (s)	57	0	72	47	0	93
Local Yield (s)	68	51	86	68	41	113
Local Yield 170(s)	68	36	60	68	26	87

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150

Offset: 75 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Splits and Phases: 11: Scottsdale Rd & Lincoln Dr



Intersection	
Intersection Delay, s/veh	13.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	96	218	4	0	24	267	82	0	14	12	14
Future Vol, veh/h	0	96	218	4	0	24	267	82	0	14	12	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	104	237	4	0	26	290	89	0	15	13	15
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	11.7	15.8	10.5
HCM LOS	B	C	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	35%	100%	0%	100%	0%	100%	0%
Vol Thru, %	30%	0%	98%	0%	77%	0%	8%
Vol Right, %	35%	0%	2%	0%	23%	0%	92%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	96	222	24	349	59	128
LT Vol	14	96	0	24	0	59	0
Through Vol	12	0	218	0	267	0	10
RT Vol	14	0	4	0	82	0	118
Lane Flow Rate	43	104	241	26	379	64	139
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.082	0.184	0.39	0.046	0.591	0.127	0.23
Departure Headway (Hd)	6.819	6.336	5.817	6.285	5.613	7.102	5.94
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	524	567	618	570	641	505	604
Service Time	4.88	4.074	3.554	4.022	3.349	4.848	3.685
HCM Lane V/C Ratio	0.082	0.183	0.39	0.046	0.591	0.127	0.23
HCM Control Delay	10.5	10.5	12.2	9.3	16.2	10.9	10.5
HCM Lane LOS	B	B	B	A	C	B	B
HCM 95th-tile Q	0.3	0.7	1.8	0.1	3.9	0.4	0.9

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	59	10	118
Future Vol, veh/h	0	59	10	118
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	64	11	128
Number of Lanes	0	1	0	1

Approach		SB
Opposing Approach		NB
Opposing Lanes		1
Conflicting Approach Left		WB
Conflicting Lanes Left		2
Conflicting Approach Right		EB
Conflicting Lanes Right		2
HCM Control Delay		10.6
HCM LOS		B

Lane

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	225	38	248	229	278	38	2090	254	393	1878	106
Future Volume (veh/h)	92	225	38	248	229	278	38	2090	254	393	1878	106
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	100	245	41	270	249	302	41	2272	276	427	2041	115
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	324	53	264	366	510	388	2034	633	752	2034	633
Arrive On Green	0.10	0.11	0.11	0.10	0.10	0.10	0.22	0.40	0.40	0.22	0.40	0.40
Sat Flow, veh/h	1774	3042	502	1774	3539	1583	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	100	141	145	270	249	302	41	2272	276	427	2041	115
Grp Sat Flow(s),veh/h/ln	1774	1770	1774	1774	1770	1583	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	0.0	9.3	9.5	12.0	8.1	0.0	2.2	48.0	15.2	13.3	48.0	5.6
Cycle Q Clear(g_c), s	0.0	9.3	9.5	12.0	8.1	0.0	2.2	48.0	15.2	13.3	48.0	5.6
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	273	189	189	264	366	510	388	2034	633	752	2034	633
V/C Ratio(X)	0.37	0.75	0.77	1.02	0.68	0.59	0.11	1.12	0.44	0.57	1.00	0.18
Avail Cap(c_a), veh/h	273	354	355	264	708	663	388	2034	633	752	2034	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.09	0.09	0.09
Uniform Delay (d), s/veh	47.6	52.0	52.2	51.9	51.9	34.1	37.5	36.0	26.2	41.8	36.0	23.3
Incr Delay (d2), s/veh	0.8	5.8	6.4	61.8	2.2	1.1	0.1	60.0	2.2	0.1	6.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	4.9	5.0	12.9	4.1	8.5	1.1	33.7	7.0	6.3	23.7	2.5
LnGrp Delay(d),s/veh	48.4	57.9	58.5	113.8	54.1	35.2	37.6	96.0	28.3	41.9	42.8	23.3
LnGrp LOS	D	E	E	F	D	D	D	F	C	D	F	C
Approach Vol, veh/h		386			821			2589			2583	
Approach Delay, s/veh		55.7			66.8			87.9			41.8	
Approach LOS		E			E			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.2	54.0	16.0	19.8	30.2	54.0	16.4	19.4
Change Period (Y+Rc), s	4.0	6.0	* 4	7.0	4.0	6.0	* 4	7.0
Max Green Setting (Gmax), s	15.0	48.0	* 12	24.0	15.0	48.0	* 12	24.0
Max Q Clear Time (g_c+I1), s	15.3	50.0	14.0	11.5	4.2	50.0	2.0	10.1
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	1.3	0.0	0.8	2.3

Intersection Summary			
HCM 2010 Ctrl Delay			64.6
HCM 2010 LOS			E

Notes

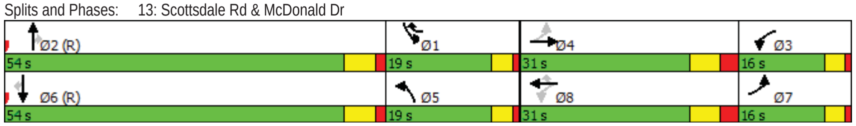
User approved pedestrian interval to be less than phase max green.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	19	54	16	31	19	54	16	31
Maximum Split (%)	15.8%	45.0%	13.3%	25.8%	15.8%	45.0%	13.3%	25.8%
Minimum Split (s)	14	31	10	37	14	31	10	37
Yellow Time (s)	3	4.5	3	4.3	3	4.5	3	4.3
All-Red Time (s)	1	1.5	1	2.7	1	1.5	1	2.7
Minimum Initial (s)	10	20	6	8	10	20	6	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		9		6		9		6
Flash Dont Walk (s)		16		24		16		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	30	14	103	84	30	14	103
End Time (s)	103	84	30	14	103	84	30	14
Yield/Force Off (s)	99	78	26	7	99	78	26	7
Yield/Force Off 170(s)	99	62	26	103	99	62	26	103
Local Start Time (s)	54	0	104	73	54	0	104	73
Local Yield (s)	69	48	116	97	69	48	116	97
Local Yield 170(s)	69	32	116	73	69	32	116	73

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	125
Offset: 30 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 13: Scottsdale Rd & McDonald Dr



Intersection	
Intersection Delay, s/veh	5.8
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	263	287	83
Demand Flow Rate, veh/h	268	293	85
Vehicles Circulating, veh/h	43	43	217
Vehicles Exiting, veh/h	293	259	94
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	5.7	6.0	4.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	268	293	85
Cap Entry Lane, veh/h	1082	1082	910
Entry HV Adj Factor	0.980	0.980	0.976
Flow Entry, veh/h	263	287	83
Cap Entry, veh/h	1061	1061	888
V/C Ratio	0.248	0.271	0.093
Control Delay, s/veh	5.7	6.0	4.9
LOS	A	A	A
95th %tile Queue, veh	1	1	0

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	222	12	29	258	6	14
Future Vol, veh/h	222	12	29	258	6	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	241	13	32	280	7	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	591	248
Stage 1	-	-	-	-	248	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1311	-	470	791
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	459	791
Mov Cap-2 Maneuver	-	-	-	-	547	-
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	701	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	698	-	-	1311	-
HCM Lane V/C Ratio	0.031	-	-	0.024	-
HCM Control Delay (s)	10.3	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	356	45	110	347	43	103
Future Vol, veh/h	356	45	110	347	43	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	387	49	120	377	47	112

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	436	0	839	411
Stage 1	-	-	-	-	411	-
Stage 2	-	-	-	-	428	-
Critical Hdwy	-	-	4.12	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.218	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1124	-	320	640
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	626	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1124	-	286	640
Mov Cap-2 Maneuver	-	-	-	-	286	-
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	559	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	469	-	-	1124	-
HCM Lane V/C Ratio	0.338	-	-	0.106	-
HCM Control Delay (s)	16.6	-	-	8.6	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.5	-	-	0.4	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	13	5	0	2603	1951	17
Future Vol, veh/h	13	5	0	2603	1951	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	5	0	2829	2121	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3253	1060	2121	0	-	0
Stage 1	2121	-	-	-	-	-
Stage 2	1132	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	19	189	109	-	-	-
Stage 1	47	-	-	-	-	-
Stage 2	242	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	19	189	109	-	-	-
Mov Cap-2 Maneuver	19	-	-	-	-	-
Stage 1	47	-	-	-	-	-
Stage 2	242	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	109	-	189	-	-
HCM Lane V/C Ratio	-	-	0.029	-	-
HCM Control Delay (s)	0	-	24.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	28	0	0	49	37	48
Future Vol, veh/h	28	0	0	49	37	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	0	0	53	40	52

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	119	66	92	0	-	0
Stage 1	66	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	877	998	1503	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	877	998	1503	-	-	-
Mov Cap-2 Maneuver	877	-	-	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1503	-	877	-	-
HCM Lane V/C Ratio	-	-	0.035	-	-
HCM Control Delay (s)	0	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	22	11	37	11	6	31
Future Vol, veh/h	22	11	37	11	6	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	12	40	12	7	34

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	93	46	0	0	52	0
Stage 1	46	-	-	-	-	-
Stage 2	47	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	907	1023	-	-	1554	-
Stage 1	976	-	-	-	-	-
Stage 2	975	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	902	1023	-	-	1554	-
Mov Cap-2 Maneuver	902	-	-	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	939	1554	-
HCM Lane V/C Ratio	-	-	0.038	0.004	-
HCM Control Delay (s)	-	-	9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	63	23	25	54	24	30
Future Vol, veh/h	63	23	25	54	24	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	25	27	59	26	33

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	142	57	0	0	86	0
Stage 1	57	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	851	1009	-	-	1510	-
Stage 1	966	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	836	1009	-	-	1510	-
Mov Cap-2 Maneuver	836	-	-	-	-	-
Stage 1	966	-	-	-	-	-
Stage 2	921	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	3.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	876	1510	-
HCM Lane V/C Ratio	-	-	0.107	0.017	-
HCM Control Delay (s)	-	-	9.6	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	53	10	61	56	33	70
Future Vol, veh/h	53	10	61	56	33	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	11	66	61	36	76

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	245	97	0	0	127	0
Stage 1	97	-	-	-	-	-
Stage 2	148	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	743	959	-	-	1459	-
Stage 1	927	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	724	959	-	-	1459	-
Mov Cap-2 Maneuver	724	-	-	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	857	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	2.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	753	1459	-
HCM Lane V/C Ratio	-	-	0.091	0.025	-
HCM Control Delay (s)	-	-	10.3	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	61	27	5	375	255	57
Future Vol, veh/h	61	27	5	375	255	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	29	5	408	277	62

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	413	0	-	0	371	209
Stage 1	-	-	-	-	209	-
Stage 2	-	-	-	-	162	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1146	-	-	-	630	831
Stage 1	-	-	-	-	826	-
Stage 2	-	-	-	-	867	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1146	-	-	-	593	831
Mov Cap-2 Maneuver	-	-	-	-	645	-
Stage 1	-	-	-	-	826	-
Stage 2	-	-	-	-	816	-

Approach	EB	WB	SB
HCM Control Delay, s	5.8	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1146	-	-	-	672
HCM Lane V/C Ratio	0.058	-	-	-	0.505
HCM Control Delay (s)	8.3	0	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.9

Intersection	
Int Delay, s/veh	4.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	121	1	28	115	2	36
Future Vol, veh/h	121	1	28	115	2	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	132	1	30	125	2	39

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	136	93	0	0	155	0
Stage 1	93	-	-	-	-	-
Stage 2	43	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	857	964	-	-	1425	-
Stage 1	931	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	856	964	-	-	1425	-
Mov Cap-2 Maneuver	856	-	-	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	978	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	857	1425	-
HCM Lane V/C Ratio	-	-	0.155	0.002	-
HCM Control Delay (s)	-	-	10	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

HCM 2010 Roundabout
31: Quail Run Rd & South Residential Access

11/5/2015

Intersection	
Intersection Delay, s/veh	4.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	20	25	208	171
Demand Flow Rate, veh/h	20	26	212	174
Vehicles Circulating, veh/h	199	192	0	60
Vehicles Exiting, veh/h	35	20	219	157
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.1	4.3	4.9	4.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	20	26	212	174
Cap Entry Lane, veh/h	926	933	1130	1064
Entry HV Adj Factor	1.000	0.962	0.981	0.980
Flow Entry, veh/h	20	25	208	171
Cap Entry, veh/h	926	897	1108	1043
V/C Ratio	0.022	0.028	0.188	0.164
Control Delay, s/veh	4.1	4.3	4.9	4.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	1

HCM 2010 TWSC
32: Quail Run Rd & Townhome Access

11/5/2015

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	16	0	191	33	0	198
Future Vol, veh/h	16	0	191	33	0	198
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	0	208	36	0	215

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	441	226	0	0	243	0
Stage 1	226	-	-	-	-	-
Stage 2	215	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	574	813	-	-	1323	-
Stage 1	812	-	-	-	-	-
Stage 2	821	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	574	813	-	-	1323	-
Mov Cap-2 Maneuver	574	-	-	-	-	-
Stage 1	812	-	-	-	-	-
Stage 2	821	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	574	1323	-
HCM Lane V/C Ratio	-	-	0.03	-	-
HCM Control Delay (s)	-	-	11.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

APPENDIX L

2033 MITIGATED PEAK HOUR ANALYSIS AND QUEUING

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	4	7	323	0	36	4	0	0	147	13	31
Future Vol, veh/h	0	4	7	323	0	36	4	0	0	147	13	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	8	351	0	39	4	0	0	160	14	34
Number of Lanes	0	1	1	0	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	11.2	9.4	10.4
HCM LOS	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	90%	3%
Vol Thru, %	0%	30%	0%	2%	10%	91%
Vol Right, %	0%	70%	0%	98%	0%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	147	44	4	330	40	35
LT Vol	147	0	4	0	36	1
Through Vol	0	13	0	7	4	32
RT Vol	0	31	0	323	0	2
Lane Flow Rate	160	48	4	359	43	38
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.268	0.067	0.007	0.458	0.071	0.061
Departure Headway (Hd)	6.039	5.039	5.79	4.598	5.844	5.788
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	591	705	618	782	610	613
Service Time	3.812	2.811	3.53	2.338	3.914	3.877
HCM Lane V/C Ratio	0.271	0.068	0.006	0.459	0.07	0.062
HCM Control Delay	11	8.2	8.6	11.2	9.4	9.3
HCM Lane LOS	B	A	A	B	A	A
HCM 95th-tile Q	1.1	0.2	0	2.4	0.2	0.2

HCM 2010 AWSC
1: Mockingbird Ln & Northern Avenue & 68th Street 11/5/2015

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	1	32	2
Future Vol, veh/h	0	1	32	2
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	35	2
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9.3
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	167	47	233	106	76	387
Future Vol, veh/h	167	47	233	106	76	387
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	182	51	253	115	83	421

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	897	311	0	0	368	0
Stage 1	311	-	-	-	-	-
Stage 2	586	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	310	729	-	-	1191	-
Stage 1	743	-	-	-	-	-
Stage 2	556	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	288	729	-	-	1191	-
Mov Cap-2 Maneuver	402	-	-	-	-	-
Stage 1	743	-	-	-	-	-
Stage 2	517	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.7	0	1.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	402	729	1191	-
HCM Lane V/C Ratio	-	-	0.452	0.07	0.069	-
HCM Control Delay (s)	-	-	21.1	10.3	8.2	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	2.3	0.2	0.2	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	212	2	36	204	5	1	0	47	7	0	5
Future Vol, veh/h	5	212	2	36	204	5	1	0	47	7	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	230	2	39	222	5	1	0	51	8	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	227	0	0	233	0	0	547	547	232	571	546	224
Stage 1	-	-	-	-	-	-	242	242	-	303	303	-
Stage 2	-	-	-	-	-	-	305	305	-	268	243	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1341	-	-	1335	-	-	448	445	807	432	445	815
Stage 1	-	-	-	-	-	-	762	705	-	706	664	-
Stage 2	-	-	-	-	-	-	705	662	-	738	705	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1341	-	-	1335	-	-	434	430	807	395	430	815
Mov Cap-2 Maneuver	-	-	-	-	-	-	434	430	-	395	430	-
Stage 1	-	-	-	-	-	-	759	702	-	703	645	-
Stage 2	-	-	-	-	-	-	680	643	-	689	702	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.1	9.9	12.3
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	793	1341	-	-	1335	-	-	503
HCM Lane V/C Ratio	0.066	0.004	-	-	0.029	-	-	0.026
HCM Control Delay (s)	9.9	7.7	-	-	7.8	-	-	12.3
HCM Lane LOS	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0.1

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	75	245	665	202	168	42	1445	465	176	1837	49
v/c Ratio	0.43	0.74	0.91	0.41	0.25	0.21	0.64	0.40	0.78	0.78	0.06
Control Delay	62.6	58.3	63.7	40.0	7.3	31.5	22.6	2.7	59.9	32.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	58.3	63.7	40.0	7.3	31.5	22.6	2.7	59.9	32.0	0.2
Queue Length 50th (ft)	29	82	253	127	21	15	424	49	65	475	0
Queue Length 95th (ft)	54	125	#373	207	59	41	468	74	#155	545	0
Internal Link Dist (ft)		230		920			350			920	
Turn Bay Length (ft)	100		265		265	235		210	210		250
Base Capacity (vph)	400	402	745	488	672	243	2275	1170	265	2343	788
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.61	0.89	0.41	0.25	0.17	0.64	0.40	0.66	0.78	0.06

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	161	64	612	186	155	39	1329	428	162	1690	45
Future Volume (veh/h)	69	161	64	612	186	155	39	1329	428	162	1690	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	75	175	70	665	202	168	42	1445	465	176	1837	49
Adj No. of Lanes	2	2	0	2	1	1	1	3	1	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	121	223	86	712	533	604	247	2076	974	297	2076	647
Arrive On Green	0.04	0.09	0.09	0.21	0.29	0.29	0.19	0.82	0.82	0.10	0.41	0.41
Sat Flow, veh/h	3442	2499	963	3442	1863	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	75	122	123	665	202	168	42	1445	465	176	1837	49
Grp Sat Flow(s),veh/h/ln	1721	1770	1693	1721	1863	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	2.6	8.1	8.6	22.8	10.4	1.0	0.0	14.5	0.0	2.4	40.2	1.8
Cycle Q Clear(g_c), s	2.6	8.1	8.6	22.8	10.4	1.0	0.0	14.5	0.0	2.4	40.2	1.8
Prop In Lane	1.00		0.57	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	121	158	151	712	533	604	247	2076	974	297	2076	647
V/C Ratio(X)	0.62	0.77	0.82	0.93	0.38	0.28	0.17	0.70	0.48	0.59	0.88	0.08
Avail Cap(c_a), veh/h	402	192	183	717	533	604	255	2076	974	305	2076	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.1	53.5	53.7	46.8	34.3	14.4	42.0	7.8	3.0	42.7	32.9	13.9
Incr Delay (d2), s/veh	1.9	11.6	17.2	18.9	0.2	0.1	0.1	2.0	1.7	1.9	6.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	4.5	4.7	12.7	5.4	2.8	1.1	6.8	2.5	5.5	19.9	0.8
LnGrp Delay(d),s/veh	59.0	65.0	70.9	65.6	34.5	14.5	42.2	9.8	4.7	44.6	38.8	14.1
LnGrp LOS	E	E	E	E	C	B	D	A	A	D	D	B
Approach Vol, veh/h		320			1035			1952			2062	
Approach Delay, s/veh		65.9			51.2			9.3			38.8	
Approach LOS		E			D			A			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.5	55.0	31.8	17.7	15.5	55.0	8.2	41.3
Change Period (Y+Rc), s	* 4	6.0	* 7	* 7	* 4	6.0	4.0	* 7
Max Green Setting (Gmax), s	* 12	49.0	* 25	* 13	* 12	49.0	14.0	* 24
Max Q Clear Time (g_c+I1), s	4.4	16.5	24.8	10.6	2.0	42.2	4.6	12.4
Green Ext Time (p_c), s	0.1	2.4	0.0	0.1	0.1	2.5	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	32.1
HCM 2010 LOS	C

Notes

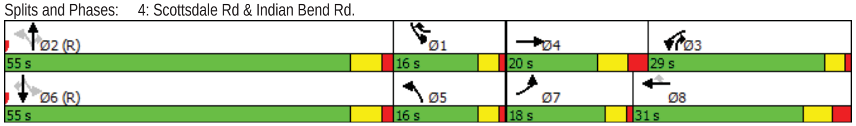
User approved pedestrian interval to be less than phase max green.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	16	55	29	20	16	55	18	31
Maximum Split (%)	13.3%	45.8%	24.2%	16.7%	13.3%	45.8%	15.0%	25.8%
Minimum Split (s)	9.4	29.4	8.5	13	8.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	85	30	1	101	85	30	101	119
End Time (s)	101	85	30	1	101	85	119	30
Yield/Force Off (s)	97	79	26	114	97	79	115	23
Yield/Force Off 170(s)	97	63	26	83	97	63	115	112
Local Start Time (s)	55	0	91	71	55	0	71	89
Local Yield (s)	67	49	116	84	67	49	85	113
Local Yield 170(s)	67	33	116	53	67	33	85	82

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	62	5	0	9	0	1765	5	5	2212	28
Future Vol, veh/h	0	0	62	5	0	9	0	1765	5	5	2212	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	150	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	67	5	0	10	0	1918	5	5	2404	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3182	4339	1202	2894	4336	962	2404	0	0	1924	0	0
Stage 1	2415	2415	-	1921	1921	-	-	-	-	-	-	-
Stage 2	767	1924	-	973	2415	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	11	2	152	17	2	220	78	-	-	137	-	-
Stage 1	19	63	-	44	113	-	-	-	-	-	-	-
Stage 2	328	113	-	244	63	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	10	2	152	9	2	220	78	-	-	137	-	-
Mov Cap-2 Maneuver	10	2	-	9	2	-	-	-	-	-	-	-
Stage 1	19	61	-	44	113	-	-	-	-	-	-	-
Stage 2	313	113	-	131	61	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	46.3	$ 314.3	0	0.1
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	78	-	-	152	23	137	-	-
HCM Lane V/C Ratio	-	-	-	0.443	0.662	0.04	-	-
HCM Control Delay (s)	0	-	-	46.3	$ 314.3	32.4	-	-
HCM Lane LOS	A	-	-	E	F	D	-	-
HCM 95th %tile Q(veh)	0	-	-	2	2	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	38	47	213	1843	2520	132
v/c Ratio	0.20	0.15	0.37	0.40	0.69	0.11
Control Delay	55.9	36.5	30.6	3.0	17.1	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	36.5	30.6	3.0	17.1	7.9
Queue Length 50th (ft)	14	27	42	91	467	38
Queue Length 95th (ft)	32	60	m61	m155	513	m58
Internal Link Dist (ft)	480			1250	370	
Turn Bay Length (ft)	200		100			150
Base Capacity (vph)	600	318	582	4591	3641	1152
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.15	0.37	0.40	0.69	0.11

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	43	196	1696	2318	121
Future Volume (veh/h)	35	43	196	1696	2318	121
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	38	47	213	1843	2520	132
Adj No. of Lanes	2	1	2	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	135	462	1025	4377	2839	884
Arrive On Green	0.04	0.04	0.34	1.00	0.74	0.74
Sat Flow, veh/h	3442	1583	3442	5253	5253	1583
Grp Volume(v), veh/h	38	47	213	1843	2520	132
Grp Sat Flow(s),veh/h/ln	1721	1583	1721	1695	1695	1583
Q Serve(g_s), s	1.3	0.0	0.0	0.0	44.9	2.9
Cycle Q Clear(g_c), s	1.3	0.0	0.0	0.0	44.9	2.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	135	462	1025	4377	2839	884
V/C Ratio(X)	0.28	0.10	0.21	0.42	0.89	0.15
Avail Cap(c_a), veh/h	602	677	1025	4377	2839	884
HCM Platoon Ratio	1.00	1.00	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	0.65	0.65	1.00	1.00
Uniform Delay (d), s/veh	56.0	31.0	28.1	0.0	12.6	7.2
Incr Delay (d2), s/veh	1.1	0.1	0.1	0.2	4.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.6	2.3	0.1	21.4	1.3
LnGrp Delay(d),s/veh	57.1	31.1	28.1	0.2	17.2	7.6
LnGrp LOS	E	C	C	A	B	A
Approach Vol, veh/h	85			2056	2652	
Approach Delay, s/veh	42.7			3.1	16.7	
Approach LOS	D			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		109.3		10.7	36.3	73.0		
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6		
Max Green Setting (Gmax), s		* 87		21.0	* 16	* 67		
Max Q Clear Time (g_c+I1), s		2.0		3.3	2.0	46.9		
Green Ext Time (p_c), s		31.0		0.2	10.9	17.8		

Intersection Summary		
HCM 2010 Ctrl Delay		11.3
HCM 2010 LOS		B

Notes

User approved pedestrian interval to be less than phase max green.

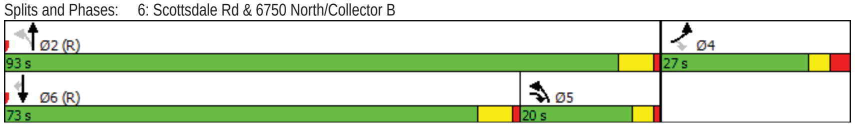
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Timing Report, Sorted By Phase
6: Scottsdale Rd & 6750 North/Collector B
11/5/2015

Phase Number	2	4	5	6
Movement	NBTL	EBL	NBL	SBT
Lead/Lag			Lag	Lead
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	93	27	20	73
Maximum Split (%)	77.5%	22.5%	16.7%	60.8%
Minimum Split (s)	36	36	8	37
Yellow Time (s)	4.9	3	3	4.9
All-Red Time (s)	1.1	3	1	1.1
Minimum Initial (s)	10	5	4	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8	8		8
Flash Dont Walk (s)	22	19		22
Dual Entry	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	93	73	0
End Time (s)	93	0	93	73
Yield/Force Off (s)	87	114	89	67
Yield/Force Off 170(s)	65	95	89	45
Local Start Time (s)	0	93	73	0
Local Yield (s)	87	114	89	67
Local Yield 170(s)	65	95	89	45

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



Queues
7: Tatum Blvd & Lincoln Dr
11/5/2015

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	195	982	332	847	116	55	634	470	358	1075	461
v/c Ratio	0.70	1.04	1.33	0.81	0.20	0.33	0.64	0.75	0.82	0.71	0.54
Control Delay	71.8	85.4	202.8	49.8	3.7	25.5	45.8	27.7	38.2	34.2	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	85.4	202.8	49.8	3.7	25.5	45.8	27.7	38.2	34.2	11.4
Queue Length 50th (ft)	83	~466	~311	351	0	23	248	167	184	395	88
Queue Length 95th (ft)	124	#603	#507	436	28	47	336	#362	281	478	191
Internal Link Dist (ft)		1135		9775			1001			1039	
Turn Bay Length (ft)	300		125		150	175		310	200		300
Base Capacity (vph)	316	946	250	1046	568	167	988	629	499	1513	853
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	1.04	1.33	0.81	0.20	0.33	0.64	0.75	0.72	0.71	0.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	832	72	305	779	107	51	583	432	329	989	424
Future Volume (veh/h)	179	832	72	305	779	107	51	583	432	329	989	424
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	195	904	78	332	847	116	55	634	470	358	1075	461
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	246	888	77	246	1081	483	164	1036	464	398	1470	658
Arrive On Green	0.07	0.27	0.27	0.11	0.31	0.31	0.03	0.29	0.29	0.15	0.42	0.42
Sat Flow, veh/h	3442	3298	285	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	195	485	497	332	847	116	55	634	470	358	1075	461
Grp Sat Flow(s),veh/h/ln	1721	1770	1813	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	7.2	35.0	35.0	14.0	28.4	7.1	2.8	20.1	38.1	17.7	33.2	31.2
Cycle Q Clear(g_c), s	7.2	35.0	35.0	14.0	28.4	7.1	2.8	20.1	38.1	17.7	33.2	31.2
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	246	476	488	246	1081	483	164	1036	464	398	1470	658
V/C Ratio(X)	0.79	1.02	1.02	1.35	0.78	0.24	0.34	0.61	1.01	0.90	0.73	0.70
Avail Cap(c_a), veh/h	318	476	488	246	1081	483	164	1036	464	508	1470	658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.4	47.5	47.5	38.6	41.2	33.8	32.1	39.6	46.0	28.0	31.9	31.3
Incr Delay (d2), s/veh	7.4	45.9	45.4	177.8	5.0	1.0	0.4	2.7	45.3	14.1	3.2	6.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	23.1	23.6	21.0	14.6	3.3	1.4	10.2	22.4	10.1	16.8	14.7
LnGrp Delay(d),s/veh	66.8	93.4	92.9	216.4	46.2	34.9	32.5	42.3	91.3	42.1	35.2	37.5
LnGrp LOS	E	F	F	F	D	C	C	D	F	D	D	D
Approach Vol, veh/h		1177			1295			1159			1894	
Approach Delay, s/veh		88.8			88.8			61.7			37.0	
Approach LOS		F			F			E			D	

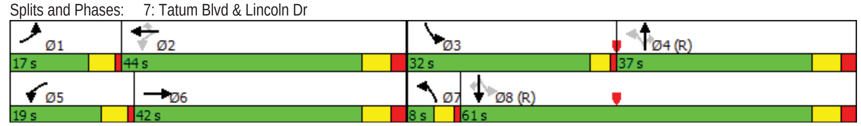
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	46.7	23.9	45.1	19.0	42.0	8.0	61.0
Change Period (Y+Rc), s	5.0	7.0	4.0	7.0	5.0	7.0	4.0	7.0
Max Green Setting (Gmax), s	12.0	37.0	28.0	30.0	14.0	35.0	4.0	54.0
Max Q Clear Time (g_c+I1), s	9.2	30.4	19.7	40.1	16.0	37.0	4.8	35.2
Green Ext Time (p_c), s	0.1	6.3	0.2	0.0	0.0	0.0	0.0	18.2

Intersection Summary	
HCM 2010 Ctrl Delay	65.4
HCM 2010 LOS	E

Phase Number	1	2	3	4	5	6	7	8
Movement	EBL	WBTL	SBL	NBTL	WBL	EBT	NBL	SBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	17	44	32	37	19	42	8	61
Maximum Split (%)	13.1%	33.8%	24.6%	28.5%	14.6%	32.3%	6.2%	46.9%
Minimum Split (s)	9	35	8	36	9	35	8	36
Yellow Time (s)	4	4.5	3	4.5	4	4.5	3	4.5
All-Red Time (s)	1	2.5	1	2.5	1	2.5	1	2.5
Minimum Initial (s)	4	15	4	15	4	15	4	15
Vehicle Extension (s)	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		23		24		23		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	101	15	47	84	103	15	23
End Time (s)	101	15	47	84	103	15	23	84
Yield/Force Off (s)	96	8	43	77	98	8	19	77
Yield/Force Off 170(s)	96	115	43	53	98	115	19	53
Local Start Time (s)	37	54	98	0	37	56	98	106
Local Yield (s)	49	91	126	30	51	91	102	30
Local Yield 170(s)	49	68	126	6	51	68	102	6

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 47 (36%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	

Splits and Phases: 7: Tatum Blvd & Lincoln Dr



Queues
8: Invergordon Rd & Lincoln Dr

11/5/2015

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	12	1489	65	1204	123	115	40
v/c Ratio	0.05	0.62	0.39	0.49	0.50	0.37	0.16
Control Delay	6.6	9.2	18.0	7.7	31.8	22.0	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	9.2	18.0	7.7	31.8	22.0	21.5
Queue Length 50th (ft)	2	169	12	122	48	33	13
Queue Length 95th (ft)	9	299	#69	213	87	69	34
Internal Link Dist (ft)		9775		2635		481	449
Turn Bay Length (ft)	85		85		110		
Base Capacity (vph)	258	2415	165	2456	480	579	498
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.62	0.39	0.49	0.26	0.20	0.08

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 2010 Signalized Intersection Summary
8: Invergordon Rd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	1154	216	60	1085	23	113	4	102	20	12	5
Future Volume (veh/h)	11	1154	216	60	1085	23	113	4	102	20	12	5
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	12	1254	235	65	1179	25	123	4	111	22	13	5
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	334	1975	367	252	2348	50	323	8	225	146	75	20
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	463	2981	554	352	3544	75	1389	55	1536	438	516	136
Grp Volume(v), veh/h	12	740	749	65	589	615	123	0	115	40	0	0
Grp Sat Flow(s),veh/h/ln	463	1770	1765	352	1770	1849	1389	0	1592	1090	0	0
Q Serve(g_s), s	0.9	16.5	16.9	9.0	11.4	11.4	0.3	0.0	4.5	0.1	0.0	0.0
Cycle Q Clear(g_c), s	12.4	16.5	16.9	25.9	11.4	11.4	4.9	0.0	4.5	4.6	0.0	0.0
Prop In Lane	1.00		0.31	1.00		0.04	1.00		0.97	0.55		0.12
Lane Grp Cap(c), veh/h	334	1172	1169	252	1172	1225	323	0	233	241	0	0
V/C Ratio(X)	0.04	0.63	0.64	0.26	0.50	0.50	0.38	0.00	0.49	0.17	0.00	0.00
Avail Cap(c_a), veh/h	334	1172	1169	252	1172	1225	610	0	562	543	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.27	0.27	0.27	0.77	0.77	0.77	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.9	6.7	6.7	14.3	5.8	5.8	26.8	0.0	26.7	25.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.7	0.7	1.9	1.2	1.1	0.7	0.0	1.6	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	8.0	8.4	1.0	5.8	6.0	2.2	0.0	2.1	0.7	0.0	0.0
LnGrp Delay(d),s/veh	9.0	7.4	7.5	16.2	7.0	6.9	27.6	0.0	28.3	25.7	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	C		C	C		
Approach Vol, veh/h		1501			1269			238			40	
Approach Delay, s/veh		7.4			7.4			27.9			25.7	
Approach LOS		A			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.1		16.9		51.1		16.9
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0
Max Green Setting (Gmax), s		31.0		24.0		31.0		24.0
Max Q Clear Time (g_c+I1), s		27.9		6.9		18.9		6.6
Green Ext Time (p_c), s		2.9		1.1		11.0		1.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

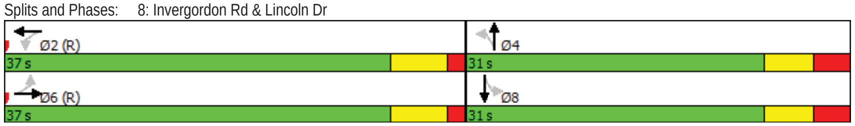
Timing Report, Sorted By Phase
8: Invergordon Rd & Lincoln Dr

11/5/2015

Phase Number	2	4	6	8
Movement	WBTL	NBTL	EBTL	SBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	37	31	37	31
Maximum Split (%)	54.4%	45.6%	54.4%	45.6%
Minimum Split (s)	24	31	24	17
Yellow Time (s)	4.5	4	4.5	4
All-Red Time (s)	1.5	3	1.5	3
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	
Flash Dont Walk (s)	11	17	11	
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	59	28	59	28
End Time (s)	28	59	28	59
Yield/Force Off (s)	22	52	22	52
Yield/Force Off 170(s)	11	35	11	52
Local Start Time (s)	0	37	0	37
Local Yield (s)	31	61	31	61
Local Yield 170(s)	20	44	20	61

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Coordinated
Natural Cycle	65
Offset: 59 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 8: Invergordon Rd & Lincoln Dr



Queues
9: Mockingbird Ln & Lincoln Dr

11/5/2015

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	292	1340	29	1116	20	104	107	132	365
v/c Ratio	0.71	0.55	0.20	0.59	0.18	0.59	0.37	0.33	0.67
Control Delay	37.2	11.8	16.4	15.2	56.5	57.5	42.9	44.2	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	11.8	16.4	15.2	56.5	57.5	42.9	44.2	18.4
Queue Length 50th (ft)	78	268	8	155	16	67	74	95	71
Queue Length 95th (ft)	#199	405	m15	179	41	124	116	142	167
Internal Link Dist (ft)		2635		1220		2560		2560	
Turn Bay Length (ft)	150		100		100		135		150
Base Capacity (vph)	411	2439	146	1899	294	429	321	738	788
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.55	0.20	0.59	0.07	0.24	0.33	0.18	0.46

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	269	1196	37	27	1003	24	18	60	36	98	121	336
Future Volume (veh/h)	269	1196	37	27	1003	24	18	60	36	98	121	336
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	292	1300	40	29	1090	26	20	65	39	107	132	365
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	542	2262	70	114	1250	30	203	179	108	311	482	410
Arrive On Green	0.25	0.65	0.65	0.71	0.71	0.71	0.16	0.16	0.16	0.06	0.26	0.26
Sat Flow, veh/h	1774	3506	108	406	3533	84	897	1092	655	1774	1863	1583
Grp Volume(v), veh/h	292	656	684	29	546	570	20	0	104	107	132	365
Grp Sat Flow(s),veh/h/ln	1774	1770	1844	406	1770	1848	897	0	1747	1774	1863	1583
Q Serve(g_s), s	9.9	27.2	27.2	7.7	30.6	30.6	2.5	0.0	6.9	6.3	7.3	28.9
Cycle Q Clear(g_c), s	9.9	27.2	27.2	34.9	30.6	30.6	2.5	0.0	6.9	6.3	7.3	28.9
Prop In Lane	1.00		0.06	1.00		0.05	1.00		0.38	1.00		1.00
Lane Grp Cap(c), veh/h	542	1142	1189	114	626	654	203	0	287	311	482	410
V/C Ratio(X)	0.54	0.57	0.58	0.25	0.87	0.87	0.10	0.00	0.36	0.34	0.27	0.89
Avail Cap(c_a), veh/h	542	1142	1189	114	626	654	266	0	410	430	738	627
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	0.83	0.83	0.83	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.8	13.0	13.0	28.7	16.7	16.8	46.4	0.0	48.3	39.9	38.4	46.4
Incr Delay (d2), s/veh	0.8	1.6	1.5	4.4	13.3	12.8	0.2	0.0	0.8	0.7	0.3	10.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	13.6	14.2	1.0	16.6	17.5	0.6	0.0	3.4	3.1	3.8	13.8
LnGrp Delay(d),s/veh	38.6	14.6	14.5	33.1	30.0	29.5	46.6	0.0	49.0	40.6	38.7	56.7
LnGrp LOS	D	B	B	C	C	C	D		D	D	D	E
Approach Vol, veh/h		1632			1145			124			604	
Approach Delay, s/veh		18.9			29.9			48.7			49.9	
Approach LOS		B			C			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4		6		8
Phs Duration (G+Y+Rc), s	37.9	52.0	12.3	27.9		89.9		40.1
Change Period (Y+Rc), s	6.0	* 6	4.0	6.5		6.0		6.5
Max Green Setting (Gmax), s	16.0	* 46	17.0	30.5		66.0		51.5
Max Q Clear Time (g_c+I1), s	11.9	36.9	8.3	8.9		29.2		30.9
Green Ext Time (p_c), s	2.2	5.0	0.1	2.8		14.1		2.8

Intersection Summary	
HCM 2010 Ctrl Delay	28.9
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

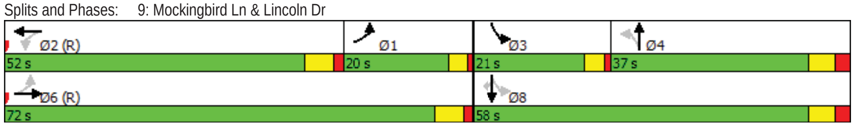
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Timing Report, Sorted By Phase
9: Mockingbird Ln & Lincoln Dr
11/5/2015

Phase Number	1	2	3	4	6	8
Movement	EBL	WBTL	SBL	NBTL	EBTL	SBTL
Lead/Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	20	52	21	37	72	58
Maximum Split (%)	15.4%	40.0%	16.2%	28.5%	55.4%	44.6%
Minimum Split (s)	8	27	8	34	27	34
Yellow Time (s)	3	4.5	3	4	4.5	4
All-Red Time (s)	1	1.5	1	2.5	1.5	2.5
Minimum Initial (s)	4	15	4	7	15	7
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7		7	7	7
Flash Dont Walk (s)		14		20	14	20
Dual Entry	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	50	128	70	91	128	70
End Time (s)	70	50	91	128	70	128
Yield/Force Off (s)	66	44	87	121.5	64	121.5
Yield/Force Off 170(s)	66	30	87	101.5	50	101.5
Local Start Time (s)	52	0	72	93	0	72
Local Yield (s)	68	46	89	123.5	66	123.5
Local Yield 170(s)	68	32	89	103.5	52	103.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 128 (98%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 9: Mockingbird Ln & Lincoln Dr



Queues
10: Quail Run Rd & Lincoln Dr
11/5/2015

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	SBR
Lane Group Flow (vph)	171	1297	5	1419	10	54	99
v/c Ratio	0.50	0.43	0.02	0.54	0.06	0.47	0.32
Control Delay	14.0	3.5	7.6	9.9	0.7	69.7	29.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	3.5	7.6	9.9	0.7	69.7	29.6
Queue Length 50th (ft)	21	108	1	251	0	44	47
Queue Length 95th (ft)	113	208	7	423	0	87	89
Internal Link Dist (ft)		1220		1280	272	280	
Turn Bay Length (ft)	100		100				
Base Capacity (vph)	408	3013	293	2607	360	301	380
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.43	0.02	0.54	0.03	0.18	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	1189	5	5	1279	27	5	0	5	50	0	91
Future Volume (veh/h)	157	1189	5	5	1279	27	5	0	5	50	0	91
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	171	1292	5	5	1390	29	5	0	5	54	0	99
Adj No. of Lanes	1	2	0	1	2	0	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	350	2985	12	375	2678	56	77	13	48	176	0	186
Arrive On Green	0.08	1.00	1.00	0.76	0.76	0.76	0.08	0.00	0.08	0.08	0.00	0.08
Sat Flow, veh/h	1774	3616	14	423	3545	74	448	163	612	1542	0	1583
Grp Volume(v), veh/h	171	632	665	5	693	726	10	0	0	54	0	99
Grp Sat Flow(s),veh/h/ln	1774	1770	1860	423	1770	1850	1223	0	0	1542	0	1583
Q Serve(g_s), s	2.8	0.0	0.0	0.4	20.5	20.5	0.0	0.0	0.0	0.0	0.0	7.6
Cycle Q Clear(g_c), s	2.8	0.0	0.0	0.4	20.5	20.5	3.8	0.0	0.0	3.8	0.0	7.6
Prop In Lane	1.00		0.01	1.00		0.04	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	350	1461	1536	375	1337	1397	137	0	0	176	0	186
V/C Ratio(X)	0.49	0.43	0.43	0.01	0.52	0.52	0.07	0.00	0.00	0.31	0.00	0.53
Avail Cap(c_a), veh/h	485	1461	1536	375	1337	1397	332	0	0	369	0	403
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	0.64	0.64	0.64	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.8	0.0	0.0	3.9	6.4	6.4	55.6	0.0	0.0	57.0	0.0	54.0
Incr Delay (d2), s/veh	0.9	0.8	0.7	0.0	0.9	0.9	0.2	0.0	0.0	1.0	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.3	0.3	0.0	10.2	10.6	0.3	0.0	0.0	1.9	0.0	3.5
LnGrp Delay(d),s/veh	6.7	0.8	0.7	4.0	7.3	7.3	55.8	0.0	0.0	57.9	0.0	56.3
LnGrp LOS	A	A	A	A	A	A	E			E		E
Approach Vol, veh/h		1468			1424			10			153	
Approach Delay, s/veh		1.4			7.3			55.8			56.9	
Approach LOS		A			A			E			E	

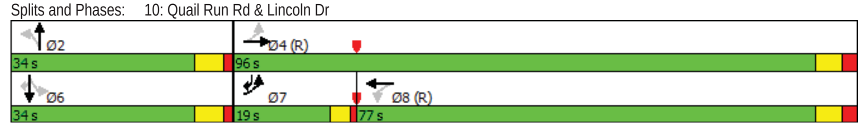
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		16.2		113.8		16.2	9.1	104.7
Change Period (Y+Rc), s		6.0		6.5		6.0	4.0	6.5
Max Green Setting (Gmax), s		28.0		89.5		28.0	15.0	70.5
Max Q Clear Time (g_c+I1), s		5.8		2.0		9.6	4.8	22.5
Green Ext Time (p_c), s		0.6		49.6		0.6	0.3	34.2

Intersection Summary	
HCM 2010 Ctrl Delay	7.1
HCM 2010 LOS	A

Phase Number	2	4	6	7	8
Movement	NBTL	EBTL	SBTL	EBL	WBTL
Lead/Lag				Lead	Lag
Lead-Lag Optimize				Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max
Maximum Split (s)	34	96	34	19	77
Maximum Split (%)	26.2%	73.8%	26.2%	14.6%	59.2%
Minimum Split (s)	33	28	33	8	28
Yellow Time (s)	4.5	4	4.5	3	4
All-Red Time (s)	1.5	2.5	1.5	1	2.5
Minimum Initial (s)	7	15	7	4	15
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7	7		7
Flash Dont Walk (s)	20	14	20		14
Dual Entry	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	54	88	54	88	107
End Time (s)	88	54	88	107	54
Yield/Force Off (s)	82	47.5	82	103	47.5
Yield/Force Off 170(s)	62	33.5	62	103	33.5
Local Start Time (s)	77	111	77	111	0
Local Yield (s)	105	70.5	105	126	70.5
Local Yield 170(s)	85	56.5	85	126	56.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 107 (82%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 10: Quail Run Rd & Lincoln Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	400	407	467	28	89	340	1441	35	1996	755
v/c Ratio	1.00	1.01	0.71	0.34	0.45	0.85	0.62	0.23	0.98	0.67
Control Delay	91.9	93.9	26.5	66.8	34.4	62.2	14.0	67.8	60.0	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.9	93.9	26.5	66.8	34.4	62.2	14.0	67.8	60.0	17.8
Queue Length 50th (ft)	~346	~354	187	21	15	142	142	25	605	496
Queue Length 95th (ft)	#552	#564	286	53	43	#216	159	m40	#695	698
Internal Link Dist (ft)		1280			375		2560		1250	
Turn Bay Length (ft)	180			100		275		185		165
Base Capacity (vph)	399	402	656	88	210	400	2328	206	2034	1131
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	1.01	0.71	0.32	0.42	0.85	0.62	0.17	0.98	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	695	48	430	26	35	47	313	1294	31	32	1836	695
Future Volume (veh/h)	695	48	430	26	35	47	313	1294	31	32	1836	695
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	792	0	467	28	38	51	340	1407	34	35	1996	755
Adj No. of Lanes	2	0	1	1	2	0	2	3	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	828	0	558	84	84	75	410	2043	49	212	2034	708
Arrive On Green	0.23	0.00	0.23	0.05	0.05	0.05	0.24	0.80	0.80	0.04	0.13	0.13
Sat Flow, veh/h	3548	0	1583	1774	1770	1583	3442	5108	123	1774	5085	1583
Grp Volume(v), veh/h	792	0	467	28	38	51	340	934	507	35	1996	755
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	1770	1583	1721	1695	1841	1774	1695	1583
Q Serve(g_s), s	26.4	0.0	18.2	1.8	2.5	3.8	11.3	14.7	14.7	2.3	47.0	48.0
Cycle Q Clear(g_c), s	26.4	0.0	18.2	1.8	2.5	3.8	11.3	14.7	14.7	2.3	47.0	48.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	828	0	558	84	84	75	410	1356	736	212	2034	708
V/C Ratio(X)	0.96	0.00	0.84	0.33	0.45	0.68	0.83	0.69	0.69	0.17	0.98	1.07
Avail Cap(c_a), veh/h	828	0	558	89	88	79	410	1356	736	212	2034	708
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	0.90	0.00	0.90	1.00	1.00	1.00	0.77	0.77	0.77	0.67	0.67	0.67
Uniform Delay (d), s/veh	45.4	0.0	35.7	55.3	55.6	56.3	44.5	8.7	8.7	51.9	51.6	45.7
Incr Delay (d2), s/veh	19.8	0.0	9.3	0.9	1.4	15.8	9.9	2.2	4.0	0.1	12.5	47.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.3	0.0	9.3	0.9	1.3	2.0	5.9	6.9	7.9	1.1	24.4	32.8
LnGrp Delay(d),s/veh	65.2	0.0	44.9	56.2	57.1	72.0	54.4	10.9	12.7	52.0	64.2	92.7
LnGrp LOS	E		D	E	E	E	D	B	B	D	E	F
Approach Vol, veh/h		1259			117			1781			2786	
Approach Delay, s/veh		57.7			63.4			19.7			71.8	
Approach LOS		E			E			B			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.3	54.0		12.7	18.3	54.0		35.0
Change Period (Y+Rc), s	4.0	6.0		7.0	4.0	6.0		7.0
Max Green Setting (Gmax), s	14.0	48.0		6.0	14.0	48.0		28.0
Max Q Clear Time (g_c+I1), s	4.3	16.7		5.8	13.3	50.0		28.4
Green Ext Time (p_c), s	0.2	2.1		0.0	0.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	53.0
HCM 2010 LOS	D

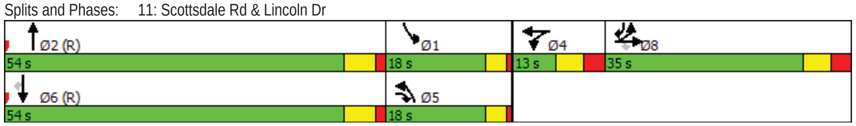
Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	WBTL	NBL	SBT	EBTL
Lead/Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	18	54	13	18	54	35
Maximum Split (%)	15.0%	45.0%	10.8%	15.0%	45.0%	29.2%
Minimum Split (s)	9	28	40	9	28	40
Yellow Time (s)	3	4.5	4	3	4.5	4
All-Red Time (s)	1	1.5	3	1	1.5	3
Minimum Initial (s)	4	4	4	4	4	4
Vehicle Extension (s)	1	0.2	2	1	0.2	2
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		15	26		15	26
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	10	76	28	10	76	41
End Time (s)	28	10	41	28	10	76
Yield/Force Off (s)	24	4	34	24	4	69
Yield/Force Off 170(s)	24	109	8	24	109	43
Local Start Time (s)	54	0	72	54	0	85
Local Yield (s)	68	48	78	68	48	113
Local Yield 170(s)	68	33	52	68	33	87

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 76 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 11: Scottsdale Rd & Lincoln Dr



Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	57	240	10	0	9	300	43	0	5	5	5
Future Vol, veh/h	0	57	240	10	0	9	300	43	0	5	5	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	62	261	11	0	10	326	47	0	5	5	5
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	11.6	14.6	9.9
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	33%	100%	0%	100%	0%	100%	0%
Vol Thru, %	33%	0%	96%	0%	87%	0%	7%
Vol Right, %	33%	0%	4%	0%	13%	0%	93%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	57	250	9	343	84	76
LT Vol	5	57	0	9	0	84	0
Through Vol	5	0	240	0	300	0	5
RT Vol	5	0	10	0	43	0	71
Lane Flow Rate	16	62	272	10	373	91	83
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.03	0.103	0.411	0.016	0.555	0.176	0.132
Departure Headway (Hd)	6.661	6.1	5.566	6.062	5.468	6.924	5.755
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	540	591	652	594	664	521	627
Service Time	4.67	3.8	3.266	3.762	3.168	4.625	3.456
HCM Lane V/C Ratio	0.03	0.105	0.417	0.017	0.562	0.175	0.132
HCM Control Delay	9.9	9.5	12.1	8.9	14.8	11.1	9.3
HCM Lane LOS	A	A	B	A	B	B	A
HCM 95th-tile Q	0.1	0.3	2	0	3.4	0.6	0.5

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	84	5	71
Future Vol, veh/h	0	84	5	71
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	91	5	77
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	10.2
HCM LOS	B

Lane

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	142	314	343	396	371	53	1311	163	237	2089	82
v/c Ratio	0.49	0.68	0.63	0.73	0.63	0.22	0.60	0.21	0.48	0.90	0.09
Control Delay	51.6	55.0	51.9	56.1	19.7	47.5	28.9	3.8	48.8	21.2	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	55.0	51.9	56.1	19.7	47.5	28.9	3.8	48.8	21.2	0.6
Queue Length 50th (ft)	102	118	126	155	119	36	290	0	100	620	1
Queue Length 95th (ft)	161	162	167	202	180	76	364	39	m109	m#721	m3
Internal Link Dist (ft)		2600		729			803			2560	
Turn Bay Length (ft)	100		165		100	200		300	260		100
Base Capacity (vph)	290	675	554	678	596	265	2172	775	514	2326	945
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.47	0.62	0.58	0.62	0.20	0.60	0.21	0.46	0.90	0.09

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	252	37	316	364	341	49	1206	150	218	1922	75
Future Volume (veh/h)	131	252	37	316	364	341	49	1206	150	218	1922	75
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	142	274	40	343	396	371	53	1311	163	237	2089	82
Adj No. of Lanes	1	2	0	2	2	1	1	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	228	354	51	491	538	562	360	1907	594	699	1907	744
Arrive On Green	0.09	0.11	0.11	0.11	0.15	0.15	0.20	0.38	0.38	0.20	0.38	0.38
Sat Flow, veh/h	1774	3105	448	3442	3539	1583	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	142	155	159	343	396	371	53	1311	163	237	2089	82
Grp Sat Flow(s),veh/h/ln	1774	1770	1784	1721	1770	1583	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	9.4	10.2	10.4	7.2	12.8	4.7	2.9	26.1	8.6	7.1	45.0	1.4
Cycle Q Clear(g_c), s	9.4	10.2	10.4	7.2	12.8	4.7	2.9	26.1	8.6	7.1	45.0	1.4
Prop In Lane	1.00		0.25	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	228	202	204	491	538	562	360	1907	594	699	1907	744
V/C Ratio(X)	0.62	0.77	0.78	0.70	0.74	0.66	0.15	0.69	0.27	0.34	1.10	0.11
Avail Cap(c_a), veh/h	252	339	342	493	678	625	360	1907	594	699	1907	744
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.26	0.26	0.26
Uniform Delay (d), s/veh	53.1	51.6	51.7	49.7	48.6	15.4	39.3	31.6	26.1	40.9	37.5	6.3
Incr Delay (d2), s/veh	4.0	6.0	6.4	4.3	3.2	2.2	0.2	2.0	1.1	0.1	45.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	5.3	5.5	5.7	6.5	7.0	1.5	12.5	3.9	3.4	29.1	0.7
LnGrp Delay(d),s/veh	57.1	57.6	58.1	54.0	51.7	17.7	39.5	33.6	27.3	41.0	83.1	6.4
LnGrp LOS	E	E	E	D	D	B	D	C	C	D	F	A
Approach Vol, veh/h		456			1110			1527			2408	
Approach Delay, s/veh		57.6			41.1			33.1			76.4	
Approach LOS		E			D			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.4	51.0	19.9	20.7	28.4	51.0	15.4	25.3
Change Period (Y+Rc), s	4.0	6.0	* 7	* 7	4.0	6.0	4.0	* 7
Max Green Setting (Gmax), s	18.0	45.0	* 13	* 23	18.0	45.0	13.0	* 23
Max Q Clear Time (g_c+I1), s	9.1	28.1	9.2	12.4	4.9	47.0	11.4	14.8
Green Ext Time (p_c), s	0.6	9.3	1.9	1.3	0.8	0.0	0.1	3.4

Intersection Summary	
HCM 2010 Ctrl Delay	55.7
HCM 2010 LOS	E

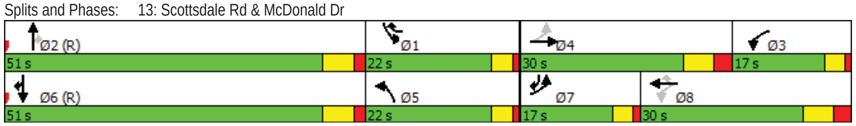
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	51	17	30	22	51	17	30
Maximum Split (%)	18.3%	42.5%	14.2%	25.0%	18.3%	42.5%	14.2%	25.0%
Minimum Split (s)	14	31	10	37	14	31	10	37
Yellow Time (s)	3	4.5	3	4.3	3	4.5	3	4.3
All-Red Time (s)	1	1.5	1	2.7	1	1.5	1	2.7
Minimum Initial (s)	10	20	6	8	10	20	6	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		9		6		9		6
Flash Dont Walk (s)		16		24		16		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	81	30	13	103	81	30	103	0
End Time (s)	103	81	30	13	103	81	0	30
Yield/Force Off (s)	99	75	26	6	99	75	116	23
Yield/Force Off 170(s)	99	59	26	102	99	59	116	119
Local Start Time (s)	51	0	103	73	51	0	73	90
Local Yield (s)	69	45	116	96	69	45	86	113
Local Yield 170(s)	69	29	116	72	69	29	86	89

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	105
Offset: 30 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 13: Scottsdale Rd & McDonald Dr



Intersection	
Intersection Delay, s/veh	5.0
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	189	232	61
Demand Flow Rate, veh/h	192	236	63
Vehicles Circulating, veh/h	22	25	176
Vehicles Exiting, veh/h	239	213	38
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.9	5.3	4.5
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	192	236	63
Cap Entry Lane, veh/h	1105	1102	948
Entry HV Adj Factor	0.982	0.982	0.968
Flow Entry, veh/h	189	232	61
Cap Entry, veh/h	1085	1082	918
V/C Ratio	0.174	0.214	0.066
Control Delay, s/veh	4.9	5.3	4.5
LOS	A	A	A
95th %tile Queue, veh	1	1	0

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	190	3	6	200	13	29
Future Vol, veh/h	190	3	6	200	13	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	207	3	7	217	14	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	210	0	438	208
Stage 1	-	-	-	-	208	-
Stage 2	-	-	-	-	230	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1361	-	576	832
Stage 1	-	-	-	-	827	-
Stage 2	-	-	-	-	808	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1361	-	573	832
Mov Cap-2 Maneuver	-	-	-	-	573	-
Stage 1	-	-	-	-	827	-
Stage 2	-	-	-	-	804	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	730	-	-	1361	-
HCM Lane V/C Ratio	0.063	-	-	0.005	-
HCM Control Delay (s)	10.3	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	246	17	40	223	23	54
Future Vol, veh/h	246	17	40	223	23	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	267	18	43	242	25	59

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	286	0	485	277
Stage 1	-	-	-	-	277	-
Stage 2	-	-	-	-	208	-
Critical Hdwy	-	-	4.12	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.218	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1276	-	526	761
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	807	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1276	-	508	761
Mov Cap-2 Maneuver	-	-	-	-	585	-
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	780	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	698	-	-	1276	-
HCM Lane V/C Ratio	0.12	-	-	0.034	-
HCM Control Delay (s)	10.9	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	3	1	0	1794	1927	6
Future Vol, veh/h	3	1	0	1794	1927	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	1	0	1950	2095	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2875	1047	2095	0	-	0
Stage 1	2095	-	-	-	-	-
Stage 2	780	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	31	193	112	-	-	-
Stage 1	49	-	-	-	-	-
Stage 2	374	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	31	193	112	-	-	-
Mov Cap-2 Maneuver	31	-	-	-	-	-
Stage 1	49	-	-	-	-	-
Stage 2	374	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	112	-	193	-	-
HCM Lane V/C Ratio	-	-	0.006	-	-
HCM Control Delay (s)	0	-	23.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	44	0	0	13	21	14
Future Vol, veh/h	44	0	0	13	21	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	0	0	14	23	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	44	30	38	0	-	0
Stage 1	30	-	-	-	-	-
Stage 2	14	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	967	1044	1572	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	1009	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	967	1044	1572	-	-	-
Mov Cap-2 Maneuver	967	-	-	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1572	-	967	-	-
HCM Lane V/C Ratio	-	-	0.049	-	-
HCM Control Delay (s)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	10	5	7	22	11	10
Future Vol, veh/h	10	5	7	22	11	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	5	8	24	12	11

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	55	20	0	0	32	0
Stage 1	20	-	-	-	-	-
Stage 2	35	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	953	1058	-	-	1580	-
Stage 1	1003	-	-	-	-	-
Stage 2	987	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	945	1058	-	-	1580	-
Mov Cap-2 Maneuver	945	-	-	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	979	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	3.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	980	1580	-
HCM Lane V/C Ratio	-	-	0.017	0.008	-
HCM Control Delay (s)	-	-	8.7	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

HCM 2010 TWSC
27: Collector A & Joshua Tree Ln

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	15	5	25	19	8	13
Future Vol, veh/h	15	5	25	19	8	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	5	27	21	9	14

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	70	38	0	0	48	0
Stage 1	38	-	-	-	-	-
Stage 2	32	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	934	1034	-	-	1559	-
Stage 1	984	-	-	-	-	-
Stage 2	991	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	928	1034	-	-	1559	-
Mov Cap-2 Maneuver	928	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	985	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	2.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	952	1559	-
HCM Lane V/C Ratio	-	-	0.023	0.006	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

HCM 2010 TWSC
28: Collector A & Collector B

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	15	9	33	18	9	20
Future Vol, veh/h	15	9	33	18	9	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	10	36	20	10	22

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	87	46	0	0	55	0
Stage 1	46	-	-	-	-	-
Stage 2	41	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	914	1023	-	-	1550	-
Stage 1	976	-	-	-	-	-
Stage 2	981	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	908	1023	-	-	1550	-
Mov Cap-2 Maneuver	908	-	-	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	974	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	2.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	948	1550	-
HCM Lane V/C Ratio	-	-	0.028	0.006	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	19	8	12	160	49	13
Future Vol, veh/h	19	8	12	160	49	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	9	13	174	53	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	187	0	-	0	150	100
Stage 1	-	-	-	-	100	-
Stage 2	-	-	-	-	50	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1387	-	-	-	842	956
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	972	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1387	-	-	-	829	956
Mov Cap-2 Maneuver	-	-	-	-	806	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	957	-

Approach	EB	WB	SB
HCM Control Delay, s	5.4	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1387	-	-	-	833
HCM Lane V/C Ratio	0.015	-	-	-	0.081
HCM Control Delay (s)	7.6	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	31	4	67	49	1	26
Future Vol, veh/h	31	4	67	49	1	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	4	73	53	1	28

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	129	99	0	0	126	0
Stage 1	99	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	865	957	-	-	1460	-
Stage 1	925	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	864	957	-	-	1460	-
Mov Cap-2 Maneuver	864	-	-	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	992	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	874	1460	-
HCM Lane V/C Ratio	-	-	0.044	0.001	-
HCM Control Delay (s)	-	-	9.3	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Intersection Delay, s/veh	4.4
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	33	22	192	62
Demand Flow Rate, veh/h	34	22	196	63
Vehicles Circulating, veh/h	85	140	0	33
Vehicles Exiting, veh/h	11	56	119	129
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.9	3.9	4.8	3.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	34	22	196	63
Cap Entry Lane, veh/h	1038	982	1130	1093
Entry HV Adj Factor	0.971	1.000	0.982	0.980
Flow Entry, veh/h	33	22	192	62
Cap Entry, veh/h	1007	982	1110	1072
V/C Ratio	0.033	0.022	0.173	0.058
Control Delay, s/veh	3.9	3.9	4.8	3.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	0

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	34	0	177	7	0	107
Future Vol, veh/h	34	0	177	7	0	107
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	0	192	8	0	116

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	312	196	0	0	200	0
Stage 1	196	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	681	845	-	-	1372	-
Stage 1	837	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	681	845	-	-	1372	-
Mov Cap-2 Maneuver	681	-	-	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	909	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	681	1372	-
HCM Lane V/C Ratio	-	-	0.054	-	-
HCM Control Delay (s)	-	-	10.6	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Intersection Delay, s/veh	13.2
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	4	34	232	0	20	18	4	0	311	42	49
Future Vol, veh/h	0	4	34	232	0	20	18	4	0	311	42	49
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	4	37	252	0	22	20	4	0	338	46	53
Number of Lanes	0	1	1	0	0	0	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	2	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	1
HCM Control Delay	11.9	10	14.7
HCM LOS	B	A	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	100%	0%	48%	3%
Vol Thru, %	0%	46%	0%	13%	43%	83%
Vol Right, %	0%	54%	0%	87%	10%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	311	91	4	266	42	29
LT Vol	311	0	4	0	20	1
Through Vol	0	42	0	34	18	24
RT Vol	0	49	0	232	4	4
Lane Flow Rate	338	99	4	289	46	32
Geometry Grp	7	7	7	7	6	6
Degree of Util (X)	0.568	0.142	0.008	0.423	0.081	0.053
Departure Headway (Hd)	6.051	5.167	6.487	5.365	6.367	6.104
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	598	697	555	677	564	589
Service Time	3.755	2.871	4.187	3.065	4.39	4.12
HCM Lane V/C Ratio	0.565	0.142	0.007	0.427	0.082	0.054
HCM Control Delay	16.4	8.7	9.2	11.9	10	9.5
HCM Lane LOS	C	A	A	B	A	A
HCM 95th-tile Q	3.6	0.5	0	2.1	0.3	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	1	24	4
Future Vol, veh/h	0	1	24	4
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	1	26	4
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	9.5
HCM LOS	A

Lane

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	153	84	343	180	74	207
Future Vol, veh/h	153	84	343	180	74	207
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	75	0	-	-	75	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	166	91	373	196	80	225

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	857	471	0	0	568	0
Stage 1	471	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	328	593	-	-	1004	-
Stage 1	628	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	302	593	-	-	1004	-
Mov Cap-2 Maneuver	425	-	-	-	-	-
Stage 1	628	-	-	-	-	-
Stage 2	632	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	2.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	425	593	1004	-
HCM Lane V/C Ratio	-	-	0.391	0.154	0.08	-
HCM Control Delay (s)	-	-	18.8	12.2	8.9	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.8	0.5	0.3	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	227	5	78	276	15	5	0	155	5	0	5
Future Vol, veh/h	5	227	5	78	276	15	5	0	155	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	247	5	85	300	16	5	0	168	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	316	0	0	252	0	0	740	746	249	823	741	308
Stage 1	-	-	-	-	-	-	260	260	-	478	478	-
Stage 2	-	-	-	-	-	-	480	486	-	345	263	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1244	-	-	1313	-	-	333	342	790	292	344	732
Stage 1	-	-	-	-	-	-	745	693	-	568	556	-
Stage 2	-	-	-	-	-	-	567	551	-	671	691	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1244	-	-	1313	-	-	313	319	790	218	320	732
Mov Cap-2 Maneuver	-	-	-	-	-	-	313	319	-	218	320	-
Stage 1	-	-	-	-	-	-	742	690	-	566	520	-
Stage 2	-	-	-	-	-	-	526	515	-	526	688	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.7	11.2	16.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	754	1244	-	-	1313	-	-	336
HCM Lane V/C Ratio	0.231	0.004	-	-	0.065	-	-	0.032
HCM Control Delay (s)	11.2	7.9	-	-	7.9	-	-	16.1
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.9	0	-	-	0.2	-	-	0.1

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	172	343	543	313	151	125	2133	587	208	1851	86
v/c Ratio	0.46	0.82	0.91	0.94	0.27	0.55	0.94	0.54	0.92	0.82	0.11
Control Delay	54.0	64.2	70.1	85.1	17.5	44.1	28.8	4.1	84.6	33.5	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	64.2	70.1	85.1	17.5	44.1	28.8	4.1	84.6	33.5	2.5
Queue Length 50th (ft)	64	127	213	240	47	62	649	56	109	466	0
Queue Length 95th (ft)	101	178	#325	#410	99	m111	#704	95	#248	534	20
Internal Link Dist (ft)		230		920			350			920	
Turn Bay Length (ft)	100		265		265	235		210	210		250
Base Capacity (vph)	400	477	596	341	563	241	2259	1082	241	2259	764
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.72	0.91	0.92	0.27	0.52	0.94	0.54	0.86	0.82	0.11

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	246	70	500	288	139	115	1962	540	191	1703	79
Future Volume (veh/h)	158	246	70	500	288	139	115	1962	540	191	1703	79
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	172	267	76	543	313	151	125	2133	587	208	1851	86
Adj No. of Lanes	2	2	0	2	1	1	1	3	1	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	346	317	89	574	339	474	290	2161	937	272	2161	673
Arrive On Green	0.10	0.12	0.12	0.17	0.18	0.18	0.23	0.85	0.85	0.12	0.43	0.43
Sat Flow, veh/h	3442	2735	763	3442	1863	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	172	171	172	543	313	151	125	2133	587	208	1851	86
Grp Sat Flow(s),veh/h/ln	1721	1770	1728	1721	1863	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	5.7	11.3	11.7	18.7	19.8	0.0	1.1	46.9	0.0	9.2	39.5	4.0
Cycle Q Clear(g_c), s	5.7	11.3	11.7	18.7	19.8	0.0	1.1	46.9	0.0	9.2	39.5	4.0
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	346	205	201	574	339	474	290	2161	937	272	2161	673
V/C Ratio(X)	0.50	0.83	0.86	0.95	0.92	0.32	0.43	0.99	0.63	0.77	0.86	0.13
Avail Cap(c_a), veh/h	402	236	230	574	342	476	290	2161	937	272	2161	673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	51.9	52.1	49.5	48.2	32.6	39.6	8.7	2.9	49.4	31.2	21.0
Incr Delay (d2), s/veh	0.4	17.4	21.6	24.7	29.1	0.1	0.4	16.5	3.2	11.2	4.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	6.5	6.8	10.9	12.9	3.9	3.2	23.1	3.1	7.5	19.3	1.8
LnGrp Delay(d),s/veh	51.5	69.3	73.7	74.2	77.4	32.7	40.0	25.2	6.1	60.5	35.8	21.4
LnGrp LOS	D	E	E	E	E	C	D	C	A	E	D	C
Approach Vol, veh/h		515			1007			2845			2145	
Approach Delay, s/veh		64.8			69.0			21.9			37.6	
Approach LOS		E			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.1	57.0	24.0	20.9	18.1	57.0	16.1	28.9
Change Period (Y+Rc), s	* 4	6.0	* 4	7.0	* 4	6.0	* 4	7.0
Max Green Setting (Gmax), s	* 12	51.0	* 20	16.0	* 12	51.0	* 14	22.0
Max Q Clear Time (g_c+I1), s	11.2	48.9	20.7	13.7	3.1	41.5	7.7	21.8
Green Ext Time (p_c), s	0.0	1.3	0.0	0.2	0.1	3.0	0.6	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	37.8
HCM 2010 LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

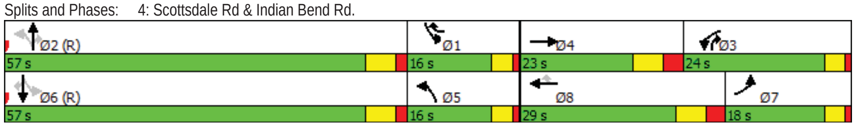
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	16	57	24	23	16	57	18	29
Maximum Split (%)	13.3%	47.5%	20.0%	19.2%	13.3%	47.5%	15.0%	24.2%
Minimum Split (s)	9.4	29.4	8.5	13	9.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	87	30	6	103	87	30	12	103
End Time (s)	103	87	30	6	103	87	30	12
Yield/Force Off (s)	99	81	26	119	99	81	26	5
Yield/Force Off 170(s)	99	65	26	88	99	65	26	94
Local Start Time (s)	57	0	96	73	57	0	102	73
Local Yield (s)	69	51	116	89	69	51	116	95
Local Yield 170(s)	69	35	116	58	69	35	116	64

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90

Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	115	5	0	11	0	2571	7	10	2273	79
Future Vol, veh/h	0	0	115	5	0	11	0	2571	7	10	2273	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	150	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	125	5	0	12	0	2795	8	11	2471	86

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3610	5294	1235	3808	5290	1401	2471	0	0	2802	0	0
Stage 1	2492	2492	-	2798	2798	-	-	-	-	-	-	-
Stage 2	1118	2802	-	1010	2492	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	6	0	144	~ 4	0	111	72	-	-	48	-	-
Stage 1	17	57	-	10	39	-	-	-	-	-	-	-
Stage 2	198	39	-	232	57	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	4	0	144	0	0	111	72	-	-	48	-	-
Mov Cap-2 Maneuver	4	0	-	0	0	-	-	-	-	-	-	-
Stage 1	17	44	-	10	39	-	-	-	-	-	-	-
Stage 2	177	39	-	24	44	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	103.5	43.4	0	0.4
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	72	-	-	144	111	48	-	-
HCM Lane V/C Ratio	-	-	-	0.868	0.157	0.226	-	-
HCM Control Delay (s)	0	-	-	103.5	43.4	100.7	-	-
HCM Lane LOS	A	-	-	F	E	F	-	-
HCM 95th %tile Q(veh)	0	-	-	5.8	0.5	0.8	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	154	267	343	2642	2588	87
v/c Ratio	0.50	0.62	0.59	0.64	0.79	0.08
Control Delay	57.5	44.5	42.2	8.6	24.8	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	44.5	42.2	8.6	24.8	10.6
Queue Length 50th (ft)	59	180	90	602	513	27
Queue Length 95th (ft)	92	264	m96	m684	568	m41
Internal Link Dist (ft)	480			1250	370	
Turn Bay Length (ft)	200		100			150
Base Capacity (vph)	600	433	577	4122	3274	1034
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.62	0.59	0.64	0.79	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	142	246	316	2431	2381	80
Future Volume (veh/h)	142	246	316	2431	2381	80
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	154	267	343	2642	2588	87
Adj No. of Lanes	2	1	2	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	243	462	899	4217	2839	884
Arrive On Green	0.07	0.07	0.22	0.83	0.56	0.56
Sat Flow, veh/h	3442	1583	3442	5253	5253	1583
Grp Volume(v), veh/h	154	267	343	2642	2588	87
Grp Sat Flow(s),veh/h/ln	1721	1583	1721	1695	1695	1583
Q Serve(g_s), s	5.2	0.0	5.0	22.1	54.9	3.1
Cycle Q Clear(g_c), s	5.2	0.0	5.0	22.1	54.9	3.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	243	462	899	4217	2839	884
V/C Ratio(X)	0.63	0.58	0.38	0.63	0.91	0.10
Avail Cap(c_a), veh/h	602	627	899	4217	2839	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.17	0.17	1.00	1.00
Uniform Delay (d), s/veh	54.2	36.2	37.1	3.6	23.8	12.4
Incr Delay (d2), s/veh	2.7	1.1	0.0	0.1	5.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	9.0	4.7	10.1	26.9	1.4
LnGrp Delay(d),s/veh	57.0	37.4	37.1	3.8	29.5	12.6
LnGrp LOS	E	D	D	A	C	B
Approach Vol, veh/h	421			2985	2675	
Approach Delay, s/veh	44.5			7.6	29.0	
Approach LOS	D			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		105.5		14.5	32.5	73.0		
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6		
Max Green Setting (Gmax), s		* 87		21.0	* 16	* 67		
Max Q Clear Time (g_c+I1), s		24.1		7.2	7.0	56.9		
Green Ext Time (p_c), s		49.8		1.3	7.2	9.4		

Intersection Summary	
HCM 2010 Ctrl Delay	19.6
HCM 2010 LOS	B

Notes

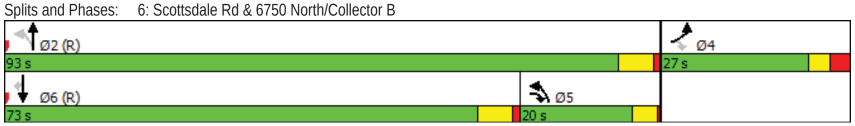
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Timing Report, Sorted By Phase
6: Scottsdale Rd & 6750 North/Collector B
11/5/2015

Phase Number	2	4	5	6
Movement	NBTL	EBL	NBL	SBT
Lead/Lag			Lag	Lead
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	93	27	20	73
Maximum Split (%)	77.5%	22.5%	16.7%	60.8%
Minimum Split (s)	36	22	8	36
Yellow Time (s)	4.9	3	3.5	4.9
All-Red Time (s)	1.1	3	0.5	1.1
Minimum Initial (s)	10	5	4	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8	8		8
Flash Dont Walk (s)	22	19		22
Dual Entry	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	93	73	0
End Time (s)	93	0	93	73
Yield/Force Off (s)	87	114	89	67
Yield/Force Off 170(s)	65	95	89	45
Local Start Time (s)	0	93	73	0
Local Yield (s)	87	114	89	67
Local Yield 170(s)	65	95	89	45

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



Queues
7: Tatum Blvd & Lincoln Dr
11/5/2015

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	413	957	462	1024	337	102	1210	414	263	733	199
v/c Ratio	0.84	1.10	2.06	1.27	0.70	0.31	0.94	0.55	0.96	0.46	0.24
Control Delay	45.1	107.7	514.8	170.4	33.7	19.2	54.5	12.8	79.9	26.4	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.1	107.7	514.8	170.4	33.7	19.2	54.5	12.8	79.9	26.4	3.6
Queue Length 50th (ft)	122	~481	~566	~581	145	41	517	79	168	223	0
Queue Length 95th (ft)	177	#618	#785	#727	262	71	#663	182	#340	278	44
Internal Link Dist (ft)		1135		9775			1001			1039	
Turn Bay Length (ft)	300		125		150	175		310	200		300
Base Capacity (vph)	540	868	224	809	480	326	1288	756	278	1578	816
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	1.10	2.06	1.27	0.70	0.31	0.94	0.55	0.95	0.46	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 2010 Signalized Intersection Summary
7: Tatum Blvd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	380	838	42	425	942	310	94	1113	381	242	674	183
Future Volume (veh/h)	380	838	42	425	942	310	94	1113	381	242	674	183
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	413	911	46	462	1024	337	102	1210	414	263	733	199
Adj No. of Lanes	2	2	0	1	2	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	479	844	43	219	820	367	304	1280	572	283	1579	706
Arrive On Green	0.11	0.25	0.25	0.09	0.23	0.23	0.04	0.36	0.36	0.12	0.45	0.45
Sat Flow, veh/h	3442	3429	173	1774	3539	1583	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	413	470	487	462	1024	337	102	1210	414	263	733	199
Grp Sat Flow(s),veh/h/ln	1721	1770	1832	1774	1770	1583	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	11.7	32.0	32.0	12.0	30.1	27.0	4.8	43.1	29.4	14.3	18.8	10.4
Cycle Q Clear(g_c), s	11.7	32.0	32.0	12.0	30.1	27.0	4.8	43.1	29.4	14.3	18.8	10.4
Prop In Lane	1.00		0.09	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	479	436	451	219	820	367	304	1280	572	283	1579	706
V/C Ratio(X)	0.86	1.08	1.08	2.11	1.25	0.92	0.34	0.95	0.72	0.93	0.46	0.28
Avail Cap(c_a), veh/h	534	436	451	219	820	367	304	1280	572	283	1579	706
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.52	0.52	0.52	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	49.0	49.0	38.0	49.9	48.8	25.1	40.3	35.9	38.5	25.1	22.8
Incr Delay (d2), s/veh	11.6	66.1	65.4	506.6	117.7	18.9	0.2	15.1	7.7	34.8	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	23.6	24.4	32.8	28.1	13.7	2.3	23.7	14.1	12.1	9.4	4.7
LnGrp Delay(d),s/veh	47.4	115.1	114.4	544.6	167.6	67.7	25.3	55.4	43.6	73.2	26.1	23.8
LnGrp LOS	D	F	F	F	F	E	C	E	D	E	C	C
Approach Vol, veh/h		1370			1823			1726			1195	
Approach Delay, s/veh		94.4			244.7			50.8			36.1	
Approach LOS		F			F			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.9	37.1	20.0	54.0	17.0	39.0	9.0	65.0
Change Period (Y+Rc), s	5.0	7.0	4.0	7.0	5.0	7.0	4.0	7.0
Max Green Setting (Gmax), s	16.0	28.0	16.0	47.0	12.0	32.0	5.0	58.0
Max Q Clear Time (g_c+I1), s	13.7	32.1	16.3	45.1	14.0	34.0	6.8	20.8
Green Ext Time (p_c), s	0.2	0.0	0.0	1.9	0.0	0.0	0.0	35.0

Intersection Summary	
HCM 2010 Ctrl Delay	115.5
HCM 2010 LOS	F

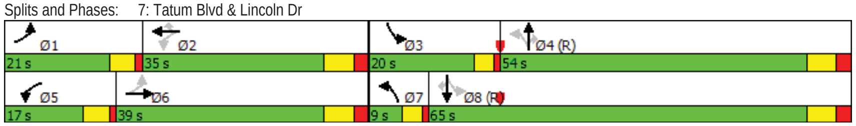
Timing Report, Sorted By Phase
7: Tatum Blvd & Lincoln Dr

11/5/2015

Phase Number	1	2	3	4	5	6	7	8
Movement	EBL	WBTL	SBL	NBTL	WBL	EBTL	NBL	SBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	C-Max	None	Max	None	C-Max
Maximum Split (s)	21	35	20	54	17	39	9	65
Maximum Split (%)	16.2%	26.9%	15.4%	41.5%	13.1%	30.0%	6.9%	50.0%
Minimum Split (s)	9	35	8	36	9	35	8	36
Yellow Time (s)	4	4.5	3	4.5	4	4.5	3	4.5
All-Red Time (s)	1	2.5	1	2.5	1	2.5	1	2.5
Minimum Initial (s)	4	15	4	15	4	15	4	15
Vehicle Extension (s)	1.5	5.5	1.5	5.5	1.5	5.5	1.5	5.5
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		5		5		5		5
Flash Dont Walk (s)		23		24		23		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	64	85	120	10	64	81	120	129
End Time (s)	85	120	10	64	81	120	129	64
Yield/Force Off (s)	80	113	6	57	76	113	125	57
Yield/Force Off 170(s)	80	90	6	33	76	90	125	33
Local Start Time (s)	54	75	110	0	54	71	110	119
Local Yield (s)	70	103	126	47	66	103	115	47
Local Yield 170(s)	70	80	126	23	66	80	115	23

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 10 (8%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	

Splits and Phases: 7: Tatum Blvd & Lincoln Dr



Queues
8: Invergordon Rd & Lincoln Dr
11/5/2015

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	5	1621	73	1454	291	125	62
v/c Ratio	0.05	0.90	0.68	0.80	0.74	0.26	0.14
Control Delay	12.8	26.2	53.6	20.4	32.5	16.4	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	26.2	53.6	20.4	32.5	16.4	14.1
Queue Length 50th (ft)	1	296	21	245	108	36	16
Queue Length 95th (ft)	8	#550	#102	#467	163	63	35
Internal Link Dist (ft)		9775		2635		481	449
Turn Bay Length (ft)	85		85		110		
Base Capacity (vph)	108	1801	108	1816	530	656	604
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.90	0.68	0.80	0.55	0.19	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 2010 Signalized Intersection Summary
8: Invergordon Rd & Lincoln Dr
11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	1332	159	67	1311	27	268	23	92	27	19	11
Future Volume (veh/h)	5	1332	159	67	1311	27	268	23	92	27	19	11
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1900	1900	1863	1900
Adj Flow Rate, veh/h	5	1448	173	73	1425	29	291	25	100	29	21	12
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	206	1806	214	168	2009	41	455	79	317	202	138	63
Arrive On Green	0.57	0.57	0.57	0.57	0.57	0.57	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	364	3188	378	310	3547	72	1370	326	1306	513	571	260
Grp Volume(v), veh/h	5	798	823	73	710	744	291	0	125	62	0	0
Grp Sat Flow(s),veh/h/ln	364	1770	1796	310	1770	1850	1370	0	1632	1345	0	0
Q Serve(g_s), s	0.7	24.2	24.9	13.6	19.8	19.8	8.5	0.0	4.3	0.1	0.0	0.0
Cycle Q Clear(g_c), s	20.5	24.2	24.9	38.5	19.8	19.8	12.8	0.0	4.3	4.4	0.0	0.0
Prop In Lane	1.00		0.21	1.00		0.04	1.00		0.80	0.47		0.19
Lane Grp Cap(c), veh/h	206	1002	1017	168	1002	1048	455	0	396	404	0	0
V/C Ratio(X)	0.02	0.80	0.81	0.44	0.71	0.71	0.64	0.00	0.32	0.15	0.00	0.00
Avail Cap(c_a), veh/h	206	1002	1017	168	1002	1048	667	0	648	567	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.23	0.23	0.23	0.64	0.64	0.64	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.1	11.6	11.8	28.2	10.7	10.7	24.1	0.0	21.1	20.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	1.6	1.7	5.2	2.7	2.6	1.5	0.0	0.5	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	12.0	12.6	1.6	10.2	10.7	5.4	0.0	2.0	0.9	0.0	0.0
LnGrp Delay(d),s/veh	18.2	13.2	13.5	33.4	13.4	13.3	25.6	0.0	21.6	20.4	0.0	0.0
LnGrp LOS	B	B	B	C	B	B	C		C	C		
Approach Vol, veh/h		1626			1527			416			62	
Approach Delay, s/veh		13.4			14.3			24.4			20.4	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		44.5		23.5		44.5		23.5
Change Period (Y+Rc), s		6.0		7.0		6.0		7.0
Max Green Setting (Gmax), s		28.0		27.0		28.0		24.0
Max Q Clear Time (g_c+I1), s		40.5		14.8		26.9		6.4
Green Ext Time (p_c), s		0.0		1.7		1.0		1.9

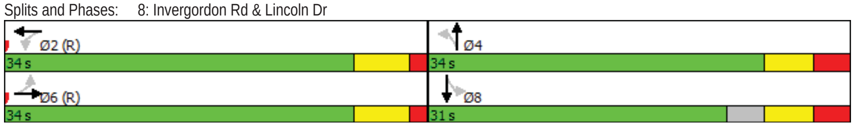
Intersection Summary	
HCM 2010 Ctrl Delay	15.2
HCM 2010 LOS	B

Timing Report, Sorted By Phase
8: Invergordon Rd & Lincoln Dr

Phase Number	2	4	6	8
Movement	WBTL	NBTL	EBTL	SBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	34	34	34	31
Maximum Split (%)	50.0%	50.0%	50.0%	45.6%
Minimum Split (s)	24	31	24	17
Yellow Time (s)	4.5	4	4.5	4
All-Red Time (s)	1.5	3	1.5	3
Minimum Initial (s)	15	10	15	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	
Flash Dont Walk (s)	11	17	11	
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	59	25	59	25
End Time (s)	25	59	25	59
Yield/Force Off (s)	19	52	19	52
Yield/Force Off 170(s)	8	35	8	52
Local Start Time (s)	0	34	0	34
Local Yield (s)	28	61	28	61
Local Yield 170(s)	17	44	17	61

Intersection Summary	
Cycle Length	68
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 59 (87%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 8: Invergordon Rd & Lincoln Dr



Queues
9: Mockingbird Ln & Lincoln Dr

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	372	1336	42	1285	104	14	182	65	109	246
v/c Ratio	0.79	0.53	0.33	0.76	0.13	0.08	0.72	0.40	0.32	0.50
Control Delay	49.7	10.0	27.1	27.1	1.4	47.3	65.1	47.6	46.3	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	10.0	27.1	27.1	1.4	47.3	65.1	47.6	46.3	8.5
Queue Length 50th (ft)	203	252	19	465	0	10	138	45	79	0
Queue Length 95th (ft)	#368	362	63	621	9	29	208	81	126	67
Internal Link Dist (ft)		2635		1220			2560		2560	
Turn Bay Length (ft)	150		100		100	100		135		150
Base Capacity (vph)	469	2541	129	1701	820	270	388	164	508	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.53	0.33	0.76	0.13	0.05	0.47	0.40	0.21	0.40

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	342	1210	19	39	1182	96	13	120	48	60	100	226
Future Volume (veh/h)	342	1210	19	39	1182	96	13	120	48	60	100	226
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	372	1315	21	42	1285	104	14	130	52	65	109	246
Adj No. of Lanes	1	2	0	1	2	1	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	555	2535	40	146	1388	621	190	166	67	148	359	305
Arrive On Green	0.27	0.71	0.71	0.52	0.52	0.52	0.13	0.13	0.13	0.03	0.19	0.19
Sat Flow, veh/h	1774	3565	57	408	3539	1583	1022	1267	507	1774	1863	1583
Grp Volume(v), veh/h	372	652	684	42	1285	104	14	0	182	65	109	246
Grp Sat Flow(s),veh/h/ln	1774	1770	1853	408	1770	1583	1022	0	1773	1774	1863	1583
Q Serve(g_s), s	18.5	21.9	22.0	10.9	43.7	3.7	1.6	0.0	12.9	4.0	6.5	19.3
Cycle Q Clear(g_c), s	18.5	21.9	22.0	32.9	43.7	3.7	1.6	0.0	12.9	4.0	6.5	19.3
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	555	1258	1317	146	1388	621	190	0	233	148	359	305
V/C Ratio(X)	0.67	0.52	0.52	0.29	0.93	0.17	0.07	0.00	0.78	0.44	0.30	0.81
Avail Cap(c_a), veh/h	555	1258	1317	146	1388	621	272	0	375	148	509	432
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.31	0.31	0.31	0.88	0.88	0.88	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	8.6	8.6	35.7	29.3	13.5	49.7	0.0	54.7	46.8	45.0	50.1
Incr Delay (d2), s/veh	1.0	0.5	0.5	4.3	10.7	0.5	0.2	0.0	5.6	2.0	0.5	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	10.7	11.2	1.4	23.1	1.7	0.5	0.0	6.7	0.4	3.4	9.1
LnGrp Delay(d),s/veh	40.2	9.1	9.1	40.0	40.0	14.0	49.9	0.0	60.3	48.8	45.4	57.4
LnGrp LOS	D	A	A	D	D	B	D		E	D	D	E
Approach Vol, veh/h		1708			1431			196			420	
Approach Delay, s/veh		15.9			38.2			59.6			53.0	
Approach LOS		B			D			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4		6		8				
Phs Duration (G+Y+Rc), s	41.4	57.0	8.0	23.6		98.4		31.6				
Change Period (Y+Rc), s	6.0	* 6	4.0	6.5		6.0		6.5				
Max Green Setting (Gmax), s	27.0	* 51	4.0	27.5		82.0		35.5				
Max Q Clear Time (g_c+I1), s	20.5	45.7	6.0	14.9		24.0		21.3				
Green Ext Time (p_c), s	4.6	3.9	0.0	2.2		16.3		2.3				
Intersection Summary												
HCM 2010 Ctrl Delay			30.8									
HCM 2010 LOS			C									
Notes												

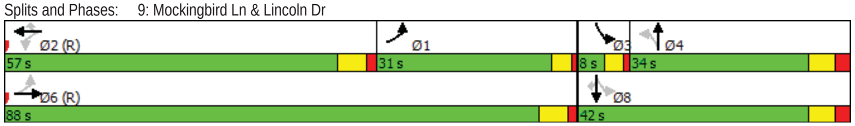
User approved pedestrian interval to be less than phase max green.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	6	8
Movement	EBL	WBTL	SBL	NBTL	EBTL	SBTL
Lead/Lag	Lag	Lead	Lead	Lag		
Lead-Lag Optimize	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	31	57	8	34	88	42
Maximum Split (%)	23.8%	43.8%	6.2%	26.2%	67.7%	32.3%
Minimum Split (s)	9	27	8	34	27	34
Yellow Time (s)	3	4.5	3	4	4.5	4
All-Red Time (s)	1	1.5	1	2.5	1.5	2.5
Minimum Initial (s)	4	15	4	7	15	7
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7		7	7	7
Flash Dont Walk (s)		14		20	14	20
Dual Entry	No	Yes	No	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	73	16	104	112	16	104
End Time (s)	104	73	112	16	104	16
Yield/Force Off (s)	100	67	108	9.5	98	9.5
Yield/Force Off 170(s)	100	53	108	119.5	84	119.5
Local Start Time (s)	57	0	88	96	0	88
Local Yield (s)	84	51	92	123.5	82	123.5
Local Yield 170(s)	84	37	92	103.5	68	103.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 16 (12%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	

Splits and Phases: 9: Mockingbird Ln & Lincoln Dr



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	189	708	5	1145	54	10	34	199
v/c Ratio	0.45	0.24	0.01	0.44	0.05	0.06	0.34	0.67
Control Delay	8.3	3.1	5.8	7.6	1.5	0.7	65.3	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.3	3.1	5.8	7.6	1.5	0.7	65.3	18.7
Queue Length 50th (ft)	17	44	1	165	0	0	28	0
Queue Length 95th (ft)	98	123	6	262	12	0	61	74
Internal Link Dist (ft)		1220		1280		272	320	
Turn Bay Length (ft)	100		100		150			
Base Capacity (vph)	505	2940	526	2616	1185	386	322	518
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.24	0.01	0.44	0.05	0.03	0.11	0.38

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	647	5	5	1053	50	5	0	5	31	0	183
Future Volume (veh/h)	174	647	5	5	1053	50	5	0	5	31	0	183
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	189	703	5	5	1145	54	5	0	5	34	0	199
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	389	2738	19	556	2402	1075	127	13	99	263	0	227
Arrive On Green	0.10	1.00	1.00	0.68	0.68	0.68	0.14	0.00	0.14	0.14	0.00	0.14
Sat Flow, veh/h	1774	3602	26	738	3539	1583	597	92	688	1448	0	1583
Grp Volume(v), veh/h	189	345	363	5	1145	54	10	0	0	34	0	199
Grp Sat Flow(s),veh/h/ln	1774	1770	1858	738	1770	1583	1377	0	0	1448	0	1583
Q Serve(g_s), s	4.3	0.0	0.0	0.3	20.0	1.5	0.0	0.0	0.0	0.0	0.0	16.0
Cycle Q Clear(g_c), s	4.3	0.0	0.0	0.3	20.0	1.5	2.2	0.0	0.0	2.2	0.0	16.0
Prop In Lane	1.00		0.01	1.00		1.00	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	389	1345	1413	556	2402	1075	239	0	0	263	0	227
V/C Ratio(X)	0.49	0.26	0.26	0.01	0.48	0.05	0.04	0.00	0.00	0.13	0.00	0.87
Avail Cap(c_a), veh/h	518	1345	1413	556	2402	1075	357	0	0	386	0	365
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.63	0.63	0.63	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.4	0.0	0.0	6.8	9.9	6.9	47.9	0.0	0.0	48.6	0.0	54.5
Incr Delay (d2), s/veh	0.8	0.4	0.4	0.0	0.4	0.1	0.1	0.0	0.0	0.2	0.0	12.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.1	0.1	0.1	9.8	0.7	0.3	0.0	0.0	1.1	0.0	7.8
LnGrp Delay(d),s/veh	8.2	0.4	0.4	6.8	10.3	7.0	48.0	0.0	0.0	48.8	0.0	67.4
LnGrp LOS	A	A	A	A	B	A	D			D		E
Approach Vol, veh/h		897			1204			10			233	
Approach Delay, s/veh		2.0			10.2			48.0			64.7	
Approach LOS		A			B			D			E	

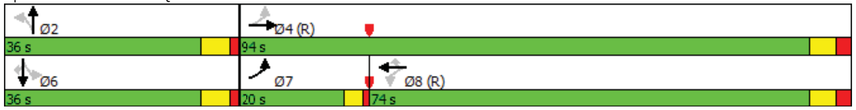
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		24.7		105.3		24.7	10.6	94.7
Change Period (Y+Rc), s		6.0		6.5		6.0	4.0	6.5
Max Green Setting (Gmax), s		30.0		87.5		30.0	16.0	67.5
Max Q Clear Time (g_c+I1), s		4.2		2.0		18.0	6.3	22.0
Green Ext Time (p_c), s		0.9		24.8		0.7	0.3	20.8

Intersection Summary	
HCM 2010 Ctrl Delay	12.6
HCM 2010 LOS	B

Phase Number	2	4	6	7	8
Movement	NBTL	EBTL	SBTL	EBL	WBTL
Lead/Lag				Lead	Lag
Lead-Lag Optimize				Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max
Maximum Split (s)	36	94	36	20	74
Maximum Split (%)	27.7%	72.3%	27.7%	15.4%	56.9%
Minimum Split (s)	33	28	33	8	28
Yellow Time (s)	4.5	4	4.5	3	4
All-Red Time (s)	1.5	2.5	1.5	1	2.5
Minimum Initial (s)	7	15	7	4	15
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7	7		7
Flash Dont Walk (s)	20	14	20		14
Dual Entry	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	74	110	74	110	0
End Time (s)	110	74	110	0	74
Yield/Force Off (s)	104	67.5	104	126	67.5
Yield/Force Off 170(s)	84	53.5	84	126	53.5
Local Start Time (s)	74	110	74	110	0
Local Yield (s)	104	67.5	104	126	67.5
Local Yield 170(s)	84	53.5	84	126	53.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 10: Quail Run Rd & Lincoln Dr



Queues
11: Scottsdale Rd & Lincoln Dr

11/5/2015

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	402	410	453	49	139	424	2170	78	2026	603
v/c Ratio	1.06	1.07	0.70	0.56	0.60	0.99	0.95	0.48	1.00	0.55
Control Delay	108.0	111.2	25.1	80.4	38.4	62.7	23.8	76.3	54.7	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.0	111.2	25.1	80.4	38.4	62.7	23.8	76.3	54.7	9.5
Queue Length 50th (ft)	~361	~372	178	38	25	181	~327	61	602	293
Queue Length 95th (ft)	#569	#581	274	#92	60	m#204	m#663	m82	#707	365
Internal Link Dist (ft)		1280			375		2560		1250	
Turn Bay Length (ft)	180			100		275		185		165
Base Capacity (vph)	379	382	651	88	233	429	2291	177	2034	1093
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	1.07	0.70	0.56	0.60	0.99	0.95	0.44	1.00	0.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM 2010 Signalized Intersection Summary
11: Scottsdale Rd & Lincoln Dr

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	698	49	417	45	59	69	390	1958	39	72	1864	555
Future Volume (veh/h)	698	49	417	45	59	69	390	1958	39	72	1864	555
Number	3	8	18	7	4	14	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	797	0	453	49	64	75	424	2128	42	78	2026	603
Adj No. of Lanes	2	0	1	1	2	0	2	3	0	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	798	0	515	89	88	79	430	2182	43	177	2034	712
Arrive On Green	0.22	0.00	0.22	0.05	0.05	0.05	0.25	0.85	0.85	0.03	0.13	0.13
Sat Flow, veh/h	3548	0	1583	1774	1770	1583	3442	5134	101	1774	5085	1583
Grp Volume(v), veh/h	797	0	453	49	64	75	424	1404	766	78	2026	603
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	1770	1583	1721	1695	1845	1774	1695	1583
Q Serve(g_s), s	26.9	0.0	20.5	3.2	4.3	5.7	14.7	43.4	44.0	5.2	47.8	41.6
Cycle Q Clear(g_c), s	26.9	0.0	20.5	3.2	4.3	5.7	14.7	43.4	44.0	5.2	47.8	41.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	798	0	515	89	88	79	430	1441	784	177	2034	712
V/C Ratio(X)	1.00	0.00	0.88	0.55	0.72	0.95	0.99	0.97	0.98	0.44	1.00	0.85
Avail Cap(c_a), veh/h	798	0	515	89	88	79	430	1441	784	177	2034	712
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	0.98	0.00	0.98	1.00	1.00	1.00	0.32	0.32	0.32	0.54	0.54	0.54
Uniform Delay (d), s/veh	46.5	0.0	38.3	55.7	56.2	56.8	44.9	8.4	8.5	54.7	52.0	42.8
Incr Delay (d2), s/veh	31.1	0.0	15.8	7.2	25.1	83.2	20.9	8.6	13.4	0.9	13.8	6.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.6	0.0	11.2	1.8	2.7	4.3	8.2	20.1	23.3	2.6	25.0	21.3
LnGrp Delay(d),s/veh	77.6	0.0	54.1	62.9	81.2	140.0	65.8	17.1	21.9	55.6	65.8	49.7
LnGrp LOS	E		D	E	F	F	E	B	C	E	E	D
Approach Vol, veh/h		1250			188			2594			2707	
Approach Delay, s/veh		69.1			99.9			26.5			61.9	
Approach LOS		E			F			C			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.0	57.0		13.0	19.0	54.0		34.0
Change Period (Y+Rc), s	4.0	6.0		7.0	4.0	6.0		7.0
Max Green Setting (Gmax), s	12.0	51.0		6.0	15.0	48.0		27.0
Max Q Clear Time (g_c+I1), s	7.2	46.0		7.7	16.7	49.8		28.9
Green Ext Time (p_c), s	0.9	4.5		0.0	0.0	0.0		0.0

Intersection Summary			
HCM 2010 Ctrl Delay			50.6
HCM 2010 LOS			D

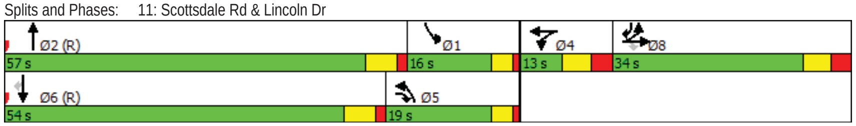
Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

Phase Number	1	2	4	5	6	8
Movement	SBL	NBT	WBTL	NBL	SBT	EBTL
Lead/Lag	Lag	Lead		Lag	Lead	
Lead-Lag Optimize	Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max	None	None	C-Max	None
Maximum Split (s)	16	57	13	19	54	34
Maximum Split (%)	13.3%	47.5%	10.8%	15.8%	45.0%	28.3%
Minimum Split (s)	9	28	40	9	28	40
Yellow Time (s)	3	4.5	4	3	4.5	4
All-Red Time (s)	1	1.5	3	1	1.5	3
Minimum Initial (s)	4.5	20	5	4.5	20	8
Vehicle Extension (s)	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0
Walk Time (s)		7	7		7	7
Flash Dont Walk (s)		15	26		15	26
Dual Entry	No	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	12	75	28	9	75	41
End Time (s)	28	12	41	28	9	75
Yield/Force Off (s)	24	6	34	24	3	68
Yield/Force Off 170(s)	24	111	8	24	108	42
Local Start Time (s)	57	0	73	54	0	86
Local Yield (s)	69	51	79	69	48	113
Local Yield 170(s)	69	36	53	69	33	87

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	150
Offset: 75 (63%), Referenced to phase 2:NBT and 6:SBT, Start of Green	

Splits and Phases: 11: Scottsdale Rd & Lincoln Dr



Intersection	
Intersection Delay, s/veh	13.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	96	218	4	0	24	267	82	0	14	12	14
Future Vol, veh/h	0	96	218	4	0	24	267	82	0	14	12	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	104	237	4	0	26	290	89	0	15	13	15
Number of Lanes	0	1	1	0	0	1	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	2	2	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	2
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	2
HCM Control Delay	11.7	15.8	10.5
HCM LOS	B	C	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	35%	100%	0%	100%	0%	100%	0%
Vol Thru, %	30%	0%	98%	0%	77%	0%	8%
Vol Right, %	35%	0%	2%	0%	23%	0%	92%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	96	222	24	349	59	128
LT Vol	14	96	0	24	0	59	0
Through Vol	12	0	218	0	267	0	10
RT Vol	14	0	4	0	82	0	118
Lane Flow Rate	43	104	241	26	379	64	139
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.082	0.184	0.39	0.046	0.591	0.127	0.23
Departure Headway (Hd)	6.819	6.336	5.817	6.285	5.613	7.102	5.94
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	524	567	618	570	641	505	604
Service Time	4.88	4.074	3.554	4.022	3.349	4.848	3.685
HCM Lane V/C Ratio	0.082	0.183	0.39	0.046	0.591	0.127	0.23
HCM Control Delay	10.5	10.5	12.2	9.3	16.2	10.9	10.5
HCM Lane LOS	B	B	B	A	C	B	B
HCM 95th-tile Q	0.3	0.7	1.8	0.1	3.9	0.4	0.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	59	10	118
Future Vol, veh/h	0	59	10	118
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	64	11	128
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	2
Conflicting Approach Right	EB
Conflicting Lanes Right	2
HCM Control Delay	10.6
HCM LOS	B

Lane

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	100	286	270	249	302	41	2272	276	427	2041	115
v/c Ratio	0.27	0.65	0.82	0.62	0.54	0.20	0.97	0.33	1.00	0.82	0.14
Control Delay	33.2	54.6	62.1	57.1	23.6	49.8	46.0	6.9	79.3	17.6	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	54.6	62.1	57.1	23.6	49.8	46.0	6.9	79.3	17.6	1.0
Queue Length 50th (ft)	57	107	171	98	113	29	623	26	182	591	3
Queue Length 95th (ft)	93	148	236	137	195	64	#834	89	m#206	m#640	m10
Internal Link Dist (ft)		2600		729			803			2560	
Turn Bay Length (ft)	100		165		100	200		300	260		100
Base Capacity (vph)	380	703	338	707	558	221	2333	843	429	2494	832
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.41	0.80	0.35	0.54	0.19	0.97	0.33	1.00	0.82	0.14

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	225	38	248	229	278	38	2090	254	393	1878	106
Future Volume (veh/h)	92	225	38	248	229	278	38	2090	254	393	1878	106
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	100	245	41	270	249	302	41	2272	276	427	2041	115
Adj No. of Lanes	1	2	0	1	2	1	1	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	273	324	53	264	366	510	388	2034	633	752	2034	633
Arrive On Green	0.10	0.11	0.11	0.10	0.10	0.10	0.22	0.40	0.40	0.22	0.40	0.40
Sat Flow, veh/h	1774	3042	502	1774	3539	1583	1774	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	100	141	145	270	249	302	41	2272	276	427	2041	115
Grp Sat Flow(s),veh/h/ln	1774	1770	1774	1774	1770	1583	1774	1695	1583	1721	1695	1583
Q Serve(g_s), s	0.0	9.3	9.5	12.0	8.1	0.0	2.2	48.0	15.2	13.3	48.0	5.6
Cycle Q Clear(g_c), s	0.0	9.3	9.5	12.0	8.1	0.0	2.2	48.0	15.2	13.3	48.0	5.6
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	273	189	189	264	366	510	388	2034	633	752	2034	633
V/C Ratio(X)	0.37	0.75	0.77	1.02	0.68	0.59	0.11	1.12	0.44	0.57	1.00	0.18
Avail Cap(c_a), veh/h	273	354	355	264	708	663	388	2034	633	752	2034	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.24	0.24	0.24
Uniform Delay (d), s/veh	47.6	52.0	52.2	51.9	51.9	34.1	37.5	36.0	26.2	41.8	36.0	23.3
Incr Delay (d2), s/veh	0.8	5.8	6.4	61.8	2.2	1.1	0.1	60.0	2.2	0.2	10.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	4.9	5.0	12.9	4.1	8.5	1.1	33.7	7.0	6.3	24.4	2.5
LnGrp Delay(d),s/veh	48.4	57.9	58.5	113.8	54.1	35.2	37.6	96.0	28.3	42.1	46.6	23.4
LnGrp LOS	D	E	E	F	D	D	D	F	C	D	F	C
Approach Vol, veh/h		386			821			2589			2583	
Approach Delay, s/veh		55.7			66.8			87.9			44.8	
Approach LOS		E			E			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.2	54.0	16.0	19.8	30.2	54.0	16.4	19.4
Change Period (Y+Rc), s	4.0	6.0	* 4	7.0	4.0	6.0	* 4	7.0
Max Green Setting (Gmax), s	15.0	48.0	* 12	24.0	15.0	48.0	* 12	24.0
Max Q Clear Time (g_c+I1), s	15.3	50.0	14.0	11.5	4.2	50.0	2.0	10.1
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	1.3	0.0	0.8	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	65.8
HCM 2010 LOS	E

Notes

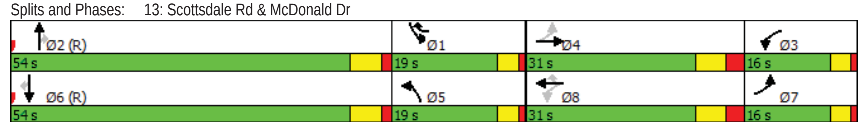
User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBT	WBL	EBTL	NBL	SBT	EBL	WBTL
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	19	54	16	31	19	54	16	31
Maximum Split (%)	15.8%	45.0%	13.3%	25.8%	15.8%	45.0%	13.3%	25.8%
Minimum Split (s)	14	31	10	37	14	31	10	37
Yellow Time (s)	3	4.5	3	4.3	3	4.5	3	4.3
All-Red Time (s)	1	1.5	1	2.7	1	1.5	1	2.7
Minimum Initial (s)	10	20	6	8	10	20	6	8
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		9		6		9		6
Flash Dont Walk (s)		16		24		16		24
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	84	30	14	103	84	30	14	103
End Time (s)	103	84	30	14	103	84	30	14
Yield/Force Off (s)	99	78	26	7	99	78	26	7
Yield/Force Off 170(s)	99	62	26	103	99	62	26	103
Local Start Time (s)	54	0	104	73	54	0	104	73
Local Yield (s)	69	48	116	97	69	48	116	97
Local Yield 170(s)	69	32	116	73	69	32	116	73

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	125

Offset: 30 (25%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Splits and Phases: 13: Scottsdale Rd & McDonald Dr



Intersection	
Intersection Delay, s/veh	5.8
Intersection LOS	A

Approach	EB	WB	NB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	263	287	83
Demand Flow Rate, veh/h	268	293	85
Vehicles Circulating, veh/h	43	43	217
Vehicles Exiting, veh/h	293	259	94
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	5.7	6.0	4.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LR
Assumed Moves	TR	LT	LR
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	268	293	85
Cap Entry Lane, veh/h	1082	1082	910
Entry HV Adj Factor	0.980	0.980	0.976
Flow Entry, veh/h	263	287	83
Cap Entry, veh/h	1061	1061	888
V/C Ratio	0.248	0.271	0.093
Control Delay, s/veh	5.7	6.0	4.9
LOS	A	A	A
95th %tile Queue, veh	1	1	0

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	222	12	29	258	6	14
Future Vol, veh/h	222	12	29	258	6	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	0	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	241	13	32	280	7	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	591	248
Stage 1	-	-	-	-	248	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1311	-	470	791
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1311	-	459	791
Mov Cap-2 Maneuver	-	-	-	-	547	-
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	701	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	698	-	-	1311	-
HCM Lane V/C Ratio	0.031	-	-	0.024	-
HCM Control Delay (s)	10.3	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	356	45	110	347	43	103
Future Vol, veh/h	356	45	110	347	43	103
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	387	49	120	377	47	112

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	436	0	839	411
Stage 1	-	-	-	-	411	-
Stage 2	-	-	-	-	428	-
Critical Hdwy	-	-	4.12	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.218	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	1124	-	320	640
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	626	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1124	-	286	640
Mov Cap-2 Maneuver	-	-	-	-	286	-
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	559	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	469	-	-	1124	-
HCM Lane V/C Ratio	0.338	-	-	0.106	-
HCM Control Delay (s)	16.6	-	-	8.6	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.5	-	-	0.4	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	13	5	0	2603	1951	17
Future Vol, veh/h	13	5	0	2603	1951	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	5	0	2829	2121	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3253	1060	2121	0	-	0
Stage 1	2121	-	-	-	-	-
Stage 2	1132	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	19	189	109	-	-	-
Stage 1	47	-	-	-	-	-
Stage 2	242	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	19	189	109	-	-	-
Mov Cap-2 Maneuver	19	-	-	-	-	-
Stage 1	47	-	-	-	-	-
Stage 2	242	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	109	-	189	-	-
HCM Lane V/C Ratio	-	-	0.029	-	-
HCM Control Delay (s)	0	-	24.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	28	0	0	49	37	48
Future Vol, veh/h	28	0	0	49	37	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	0	0	53	40	52

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	119	66	92	0	-	0
Stage 1	66	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	877	998	1503	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	877	998	1503	-	-	-
Mov Cap-2 Maneuver	877	-	-	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1503	-	877	-	-
HCM Lane V/C Ratio	-	-	0.035	-	-
HCM Control Delay (s)	0	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	22	11	37	11	6	31
Future Vol, veh/h	22	11	37	11	6	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	12	40	12	7	34

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	93	46	0	0	52	0
Stage 1	46	-	-	-	-	-
Stage 2	47	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	907	1023	-	-	1554	-
Stage 1	976	-	-	-	-	-
Stage 2	975	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	902	1023	-	-	1554	-
Mov Cap-2 Maneuver	902	-	-	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	1.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	939	1554	-
HCM Lane V/C Ratio	-	-	0.038	0.004	-
HCM Control Delay (s)	-	-	9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	63	23	25	54	24	30
Future Vol, veh/h	63	23	25	54	24	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	25	27	59	26	33

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	142	57	0	0	86	0
Stage 1	57	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	851	1009	-	-	1510	-
Stage 1	966	-	-	-	-	-
Stage 2	938	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	836	1009	-	-	1510	-
Mov Cap-2 Maneuver	836	-	-	-	-	-
Stage 1	966	-	-	-	-	-
Stage 2	921	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	3.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	876	1510	-
HCM Lane V/C Ratio	-	-	0.107	0.017	-
HCM Control Delay (s)	-	-	9.6	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	53	10	61	56	33	70
Future Vol, veh/h	53	10	61	56	33	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	11	66	61	36	76

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	245	97	0	0	127	0
Stage 1	97	-	-	-	-	-
Stage 2	148	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	743	959	-	-	1459	-
Stage 1	927	-	-	-	-	-
Stage 2	880	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	724	959	-	-	1459	-
Mov Cap-2 Maneuver	724	-	-	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	857	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	2.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	753	1459	-
HCM Lane V/C Ratio	-	-	0.091	0.025	-
HCM Control Delay (s)	-	-	10.3	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	61	27	5	375	255	57
Future Vol, veh/h	61	27	5	375	255	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	29	5	408	277	62

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	413	0	-	0	371	209
Stage 1	-	-	-	-	209	-
Stage 2	-	-	-	-	162	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1146	-	-	-	630	831
Stage 1	-	-	-	-	826	-
Stage 2	-	-	-	-	867	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1146	-	-	-	593	831
Mov Cap-2 Maneuver	-	-	-	-	645	-
Stage 1	-	-	-	-	826	-
Stage 2	-	-	-	-	816	-

Approach	EB	WB	SB
HCM Control Delay, s	5.8	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1146	-	-	-	672
HCM Lane V/C Ratio	0.058	-	-	-	0.505
HCM Control Delay (s)	8.3	0	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	2.9

Intersection	
Int Delay, s/veh	4.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	121	1	28	115	2	36
Future Vol, veh/h	121	1	28	115	2	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	132	1	30	125	2	39

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	136	93	0	0	155	0
Stage 1	93	-	-	-	-	-
Stage 2	43	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	857	964	-	-	1425	-
Stage 1	931	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	856	964	-	-	1425	-
Mov Cap-2 Maneuver	856	-	-	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	978	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	857	1425	-
HCM Lane V/C Ratio	-	-	0.155	0.002	-
HCM Control Delay (s)	-	-	10	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection	
Intersection Delay, s/veh	4.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	20	25	208	171
Demand Flow Rate, veh/h	20	26	212	174
Vehicles Circulating, veh/h	199	192	0	60
Vehicles Exiting, veh/h	35	20	219	157
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.1	4.3	4.9	4.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	20	26	212	174
Cap Entry Lane, veh/h	926	933	1130	1064
Entry HV Adj Factor	1.000	0.962	0.981	0.980
Flow Entry, veh/h	20	25	208	171
Cap Entry, veh/h	926	897	1108	1043
V/C Ratio	0.022	0.028	0.188	0.164
Control Delay, s/veh	4.1	4.3	4.9	4.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	1	1

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	16	0	191	33	0	198
Future Vol, veh/h	16	0	191	33	0	198
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	0	208	36	0	215

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	441	226	0	0	243	0
Stage 1	226	-	-	-	-	-
Stage 2	215	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	574	813	-	-	1323	-
Stage 1	812	-	-	-	-	-
Stage 2	821	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	574	813	-	-	1323	-
Mov Cap-2 Maneuver	574	-	-	-	-	-
Stage 1	812	-	-	-	-	-
Stage 2	821	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	574	1323	-
HCM Lane V/C Ratio	-	-	0.03	-	-
HCM Control Delay (s)	-	-	11.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

APPENDIX M

ALTERNATIVE ACCESS CONDITIONS PEAK HOUR ANALYSIS

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	75	245	665	202	168	146	1445	465	176	1837	49
v/c Ratio	0.43	0.74	0.91	0.41	0.25	0.72	0.64	0.40	0.79	0.81	0.06
Control Delay	62.6	58.3	63.7	40.0	7.3	65.9	22.6	2.6	60.5	33.3	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	58.3	63.7	40.0	7.3	65.9	22.6	2.6	60.5	33.3	0.2
Queue Length 50th (ft)	29	82	253	127	21	91	422	48	65	475	0
Queue Length 95th (ft)	54	125	#373	207	59	153	464	74	#155	545	0
Internal Link Dist (ft)		230		920			350			920	
Turn Bay Length (ft)	100		265		265	235		210	210		250
Base Capacity (vph)	400	402	745	488	672	242	2275	1170	263	2275	768
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.61	0.89	0.41	0.25	0.60	0.64	0.40	0.67	0.81	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	161	64	612	186	155	134	1329	428	162	1690	45
Future Volume (veh/h)	69	161	64	612	186	155	134	1329	428	162	1690	45
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	75	175	70	665	202	168	146	1445	465	176	1837	49
Adj No. of Lanes	2	2	0	2	1	1	1	3	1	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	121	223	86	712	533	604	247	2076	974	297	2076	647
Arrive On Green	0.04	0.09	0.09	0.21	0.29	0.29	0.19	0.82	0.82	0.10	0.41	0.41
Sat Flow, veh/h	3442	2499	963	3442	1863	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	75	122	123	665	202	168	146	1445	465	176	1837	49
Grp Sat Flow(s),veh/h/ln	1721	1770	1693	1721	1863	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	2.6	8.1	8.6	22.8	10.4	1.0	3.3	14.5	0.0	2.4	40.2	1.8
Cycle Q Clear(g_c), s	2.6	8.1	8.6	22.8	10.4	1.0	3.3	14.5	0.0	2.4	40.2	1.8
Prop In Lane	1.00		0.57	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	121	158	151	712	533	604	247	2076	974	297	2076	647
V/C Ratio(X)	0.62	0.77	0.82	0.93	0.38	0.28	0.59	0.70	0.48	0.59	0.88	0.08
Avail Cap(c_a), veh/h	402	192	183	717	533	604	255	2076	974	305	2076	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.1	53.5	53.7	46.8	34.3	14.4	43.8	7.8	3.0	42.7	32.9	13.9
Incr Delay (d2), s/veh	1.9	11.6	17.2	18.9	0.2	0.1	2.2	2.0	1.7	1.9	6.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	4.5	4.7	12.7	5.4	2.8	4.3	6.8	2.5	5.5	19.9	0.8
LnGrp Delay(d),s/veh	59.0	65.0	70.9	65.6	34.5	14.5	46.0	9.8	4.7	44.6	38.8	14.1
LnGrp LOS	E	E	E	E	C	B	D	A	A	D	D	B
Approach Vol, veh/h		320			1035			2056			2062	
Approach Delay, s/veh		65.9			51.2			11.2			38.8	
Approach LOS		E			D			B			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.5	55.0	31.8	17.7	15.5	55.0	8.2	41.3
Change Period (Y+Rc), s	* 4	6.0	* 7	* 7	* 4	6.0	4.0	* 7
Max Green Setting (Gmax), s	* 12	49.0	* 25	* 13	* 12	49.0	14.0	* 24
Max Q Clear Time (g_c+I1), s	4.4	16.5	24.8	10.6	5.3	42.2	4.6	12.4
Green Ext Time (p_c), s	0.1	2.4	0.0	0.1	0.1	2.5	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	32.4
HCM 2010 LOS	C

Notes

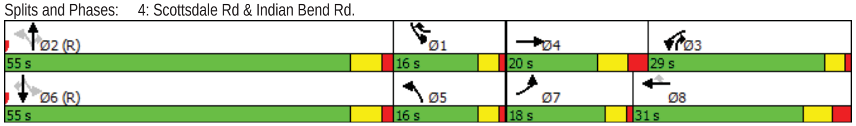
User approved pedestrian interval to be less than phase max green.

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	16	55	29	20	16	55	18	31
Maximum Split (%)	13.3%	45.8%	24.2%	16.7%	13.3%	45.8%	15.0%	25.8%
Minimum Split (s)	9.4	29.4	8.5	13	8.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	85	30	1	101	85	30	101	119
End Time (s)	101	85	30	1	101	85	119	30
Yield/Force Off (s)	97	79	26	114	97	79	115	23
Yield/Force Off 170(s)	97	63	26	83	97	63	115	112
Local Start Time (s)	55	0	91	71	55	0	71	89
Local Yield (s)	67	49	116	84	67	49	85	113
Local Yield 170(s)	67	33	116	53	67	33	85	82

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	80
Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



Queues
6: Scottsdale Rd & 6750 North/Collector B

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	38	47	142	1882	2520	132
v/c Ratio	0.20	0.15	0.47	0.41	0.69	0.11
Control Delay	55.9	36.5	39.3	3.1	17.1	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	36.5	39.3	3.1	17.1	7.9
Queue Length 50th (ft)	14	27	62	104	467	38
Queue Length 95th (ft)	32	60	m98	m166	513	m56
Internal Link Dist (ft)	480			1250	370	
Turn Bay Length (ft)	200		100			150
Base Capacity (vph)	600	318	300	4591	3641	1152
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.15	0.47	0.41	0.69	0.11

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 2010 Signalized Intersection Summary
6: Scottsdale Rd & 6750 North/Collector B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	43	131	1731	2318	121
Future Volume (veh/h)	35	43	131	1731	2318	121
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	38	47	142	1882	2520	132
Adj No. of Lanes	2	1	1	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	135	462	527	4377	2839	884
Arrive On Green	0.04	0.04	0.34	1.00	0.74	0.74
Sat Flow, veh/h	3442	1583	1774	5253	5253	1583
Grp Volume(v), veh/h	38	47	142	1882	2520	132
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1695	1695	1583
Q Serve(g_s), s	1.3	0.0	1.2	0.0	44.9	2.9
Cycle Q Clear(g_c), s	1.3	0.0	1.2	0.0	44.9	2.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	135	462	527	4377	2839	884
V/C Ratio(X)	0.28	0.10	0.27	0.43	0.89	0.15
Avail Cap(c_a), veh/h	602	677	527	4377	2839	884
HCM Platoon Ratio	1.00	1.00	1.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	0.65	0.65	1.00	1.00
Uniform Delay (d), s/veh	56.0	31.0	28.5	0.0	12.6	7.2
Incr Delay (d2), s/veh	1.1	0.1	0.2	0.2	4.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.6	3.2	0.1	21.4	1.3
LnGrp Delay(d),s/veh	57.1	31.1	28.7	0.2	17.2	7.6
LnGrp LOS	E	C	C	A	B	A
Approach Vol, veh/h	85			2024	2652	
Approach Delay, s/veh	42.7			2.2	16.7	
Approach LOS	D			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		109.3		10.7	36.3	73.0		
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6		
Max Green Setting (Gmax), s		* 87		21.0	* 16	* 67		
Max Q Clear Time (g_c+I1), s		2.0		3.3	3.2	46.9		
Green Ext Time (p_c), s		31.0		0.2	10.1	17.8		

Intersection Summary	
HCM 2010 Ctrl Delay	11.0
HCM 2010 LOS	B

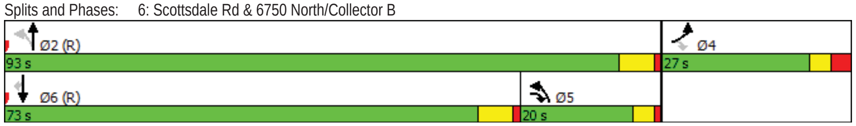
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	2	4	5	6
Movement	NBTL	EBL	NBL	SBT
Lead/Lag			Lag	Lead
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	93	27	20	73
Maximum Split (%)	77.5%	22.5%	16.7%	60.8%
Minimum Split (s)	36	36	8	37
Yellow Time (s)	4.9	3	3	4.9
All-Red Time (s)	1.1	3	1	1.1
Minimum Initial (s)	10	5	4	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8	8		8
Flash Dont Walk (s)	22	19		22
Dual Entry	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	93	73	0
End Time (s)	93	0	93	73
Yield/Force Off (s)	87	114	89	67
Yield/Force Off 170(s)	65	95	89	45
Local Start Time (s)	0	93	73	0
Local Yield (s)	87	114	89	67
Local Yield 170(s)	65	95	89	45

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



Queues
4: Scottsdale Rd & Indian Bend Rd.

11/5/2015

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	172	343	543	313	151	240	2133	587	208	1851	86
v/c Ratio	0.46	0.82	0.91	0.94	0.26	0.95	0.96	0.54	0.88	0.85	0.12
Control Delay	54.0	64.2	70.1	85.1	17.5	94.3	39.9	6.4	76.0	35.6	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	64.2	70.1	85.1	17.5	94.3	39.9	6.4	76.0	35.6	2.6
Queue Length 50th (ft)	64	127	213	240	47	145	634	112	108	473	0
Queue Length 95th (ft)	101	178	#325	#410	99	#309	#731	157	#246	543	20
Internal Link Dist (ft)		230		920			350			920	
Turn Bay Length (ft)	100		265		265	235		210	210		250
Base Capacity (vph)	400	477	596	341	565	256	2230	1073	241	2187	743
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.72	0.91	0.92	0.27	0.94	0.96	0.55	0.86	0.85	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 2010 Signalized Intersection Summary
4: Scottsdale Rd & Indian Bend Rd.

11/5/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	246	70	500	288	139	221	1962	540	191	1703	79
Future Volume (veh/h)	158	246	70	500	288	139	221	1962	540	191	1703	79
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	172	267	76	543	313	151	240	2133	587	208	1851	86
Adj No. of Lanes	2	2	0	2	1	1	1	3	1	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	346	317	89	574	339	474	302	2161	937	271	2119	660
Arrive On Green	0.10	0.12	0.12	0.17	0.18	0.18	0.25	0.85	0.85	0.12	0.42	0.42
Sat Flow, veh/h	3442	2735	763	3442	1863	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	172	171	172	543	313	151	240	2133	587	208	1851	86
Grp Sat Flow(s),veh/h/ln	1721	1770	1728	1721	1863	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	5.7	11.3	11.7	18.7	19.8	0.0	9.4	46.9	0.0	9.3	40.1	4.0
Cycle Q Clear(g_c), s	5.7	11.3	11.7	18.7	19.8	0.0	9.4	46.9	0.0	9.3	40.1	4.0
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	346	205	201	574	339	474	302	2161	937	271	2119	660
V/C Ratio(X)	0.50	0.83	0.86	0.95	0.92	0.32	0.80	0.99	0.63	0.77	0.87	0.13
Avail Cap(c_a), veh/h	402	236	230	574	342	476	302	2161	937	271	2119	660
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.1	51.9	52.1	49.5	48.2	32.6	40.9	8.7	2.9	49.4	32.1	21.6
Incr Delay (d2), s/veh	0.4	17.4	21.6	24.7	29.1	0.1	12.7	16.5	3.2	11.4	5.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	6.5	6.8	10.9	12.9	3.9	8.1	23.1	3.1	7.5	19.7	1.8
LnGrp Delay(d),s/veh	51.5	69.3	73.7	74.2	77.4	32.7	53.6	25.2	6.1	60.8	37.5	22.0
LnGrp LOS	D	E	E	E	E	C	D	C	A	E	D	C
Approach Vol, veh/h		515			1007			2960			2145	
Approach Delay, s/veh		64.8			69.0			23.7			39.1	
Approach LOS		E			E			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.1	57.0	24.0	20.9	19.1	56.0	16.1	28.9
Change Period (Y+Rc), s	* 4	6.0	* 4	7.0	* 4	6.0	* 4	7.0
Max Green Setting (Gmax), s	* 12	51.0	* 20	16.0	* 13	50.0	* 14	22.0
Max Q Clear Time (g_c+I1), s	11.3	48.9	20.7	13.7	11.4	42.1	7.7	21.8
Green Ext Time (p_c), s	0.0	1.3	0.0	0.2	0.1	2.7	0.6	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	38.8
HCM 2010 LOS	D

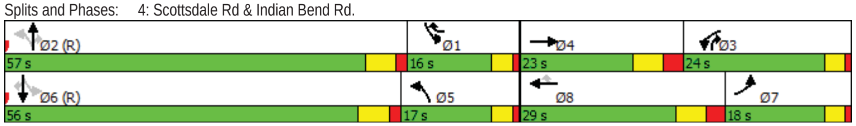
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	1	2	3	4	5	6	7	8
Movement	SBL	NBTL	WBL	EBT	NBL	SBTL	EBL	WBT
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	16	57	24	23	17	56	18	29
Maximum Split (%)	13.3%	47.5%	20.0%	19.2%	14.2%	46.7%	15.0%	24.2%
Minimum Split (s)	9.4	29.4	8.5	13	9.5	29.4	8.5	13
Yellow Time (s)	3	4.4	3	4.2	3	4.4	3	4.2
All-Red Time (s)	1	1.6	1	2.8	1	1.6	1	2.8
Minimum Initial (s)	4	20	4	6	4	20	4	6
Vehicle Extension (s)	1	0.2	1.5	1	1	0.2	1	2
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		16		31		16		31
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	87	30	6	103	86	30	12	103
End Time (s)	103	87	30	6	103	86	30	12
Yield/Force Off (s)	99	81	26	119	99	80	26	5
Yield/Force Off 170(s)	99	65	26	88	99	64	26	94
Local Start Time (s)	57	0	96	73	56	0	102	73
Local Yield (s)	69	51	116	89	69	50	116	95
Local Yield 170(s)	69	35	116	58	69	34	116	64

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 30 (25%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	

Splits and Phases: 4: Scottsdale Rd & Indian Bend Rd.



Queues
6: Scottsdale Rd & 6750 North/Collector B

11/5/2015

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	154	267	228	1671	2588	87
v/c Ratio	0.50	0.62	0.77	0.41	0.79	0.08
Control Delay	57.5	44.5	51.2	3.5	25.3	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.5	44.5	51.2	3.5	25.3	10.7
Queue Length 50th (ft)	59	180	126	101	513	27
Queue Length 95th (ft)	92	264	m132	m158	567	m40
Internal Link Dist (ft)	480			1250	370	
Turn Bay Length (ft)	200		100			150
Base Capacity (vph)	600	433	297	4122	3274	1034
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.62	0.77	0.41	0.79	0.08

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 2010 Signalized Intersection Summary
6: Scottsdale Rd & 6750 North/Collector B

11/5/2015

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	142	246	210	1537	2381	80
Future Volume (veh/h)	142	246	210	1537	2381	80
Number	7	14	5	2	6	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	154	267	228	1671	2588	87
Adj No. of Lanes	2	1	1	3	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	243	462	461	4217	2839	884
Arrive On Green	0.07	0.07	0.15	0.56	0.56	0.56
Sat Flow, veh/h	3442	1583	1774	5253	5253	1583
Grp Volume(v), veh/h	154	267	228	1671	2588	87
Grp Sat Flow(s),veh/h/ln	1721	1583	1774	1695	1695	1583
Q Serve(g_s), s	5.2	0.0	9.3	22.5	54.9	3.1
Cycle Q Clear(g_c), s	5.2	0.0	9.3	22.5	54.9	3.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	243	462	461	4217	2839	884
V/C Ratio(X)	0.63	0.58	0.49	0.40	0.91	0.10
Avail Cap(c_a), veh/h	602	627	461	4217	2839	884
HCM Platoon Ratio	1.00	1.00	0.67	0.67	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.17	0.17	1.00	1.00
Uniform Delay (d), s/veh	54.2	36.2	42.2	9.5	23.8	12.4
Incr Delay (d2), s/veh	2.7	1.1	0.1	0.0	5.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	9.0	6.9	10.5	26.9	1.4
LnGrp Delay(d),s/veh	57.0	37.4	42.3	9.6	29.5	12.6
LnGrp LOS	E	D	D	A	C	B
Approach Vol, veh/h	421			1899	2675	
Approach Delay, s/veh	44.5			13.5	29.0	
Approach LOS	D			B	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		105.5		14.5	32.5	73.0		
Change Period (Y+Rc), s		* 6		6.0	* 6	* 6		
Max Green Setting (Gmax), s		* 87		21.0	* 16	* 67		
Max Q Clear Time (g_c+I1), s		24.5		7.2	11.3	56.9		
Green Ext Time (p_c), s		23.5		1.3	2.9	9.4		

Intersection Summary	
HCM 2010 Ctrl Delay	24.4
HCM 2010 LOS	C

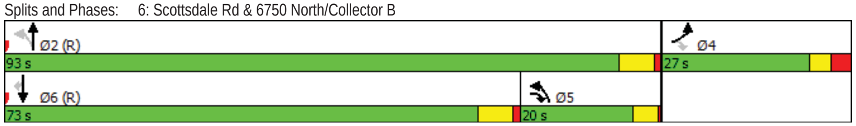
Notes

User approved pedestrian interval to be less than phase max green.
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Phase Number	2	4	5	6
Movement	NBTL	EBL	NBL	SBT
Lead/Lag			Lag	Lead
Lead-Lag Optimize			Yes	Yes
Recall Mode	C-Max	None	None	C-Max
Maximum Split (s)	93	27	20	73
Maximum Split (%)	77.5%	22.5%	16.7%	60.8%
Minimum Split (s)	36	22	8	36
Yellow Time (s)	4.9	3	3.5	4.9
All-Red Time (s)	1.1	3	0.5	1.1
Minimum Initial (s)	10	5	4	10
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	8	8		8
Flash Dont Walk (s)	22	19		22
Dual Entry	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	0	93	73	0
End Time (s)	93	0	93	73
Yield/Force Off (s)	87	114	89	67
Yield/Force Off 170(s)	65	95	89	45
Local Start Time (s)	0	93	73	0
Local Yield (s)	87	114	89	67
Local Yield 170(s)	65	95	89	45

Intersection Summary	
Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	

Splits and Phases: 6: Scottsdale Rd & 6750 North/Collector B



APPENDIX N

EVENT PEAK HOUR ANALYSIS

Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	40	290	3	490	35	6	176	105
v/c Ratio	0.06	0.11	0.00	0.21	0.03	0.02	0.76	0.30
Control Delay	4.9	5.1	10.0	9.4	1.0	0.2	71.5	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	5.1	10.0	9.4	1.0	0.2	71.5	9.9
Queue Length 50th (ft)	7	29	1	79	0	0	143	0
Queue Length 95th (ft)	19	53	5	128	6	0	211	48
Internal Link Dist (ft)		1220		1280		272	320	
Turn Bay Length (ft)	100		100		150			
Base Capacity (vph)	748	2609	720	2385	1086	402	324	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.11	0.00	0.21	0.03	0.01	0.54	0.24

Intersection Summary

HCM 2010 Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	264	3	3	451	32	3	0	3	162	0	97
Future Volume (veh/h)	37	264	3	3	451	32	3	0	3	162	0	97
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	40	287	3	3	490	35	3	0	3	176	0	105
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	612	2514	26	756	2287	1023	56	13	27	256	0	322
Arrive On Green	0.05	1.00	1.00	0.65	0.65	0.65	0.20	0.00	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1774	3588	37	1085	3539	1583	69	65	134	985	0	1583
Grp Volume(v), veh/h	40	141	149	3	490	35	6	0	0	176	0	105
Grp Sat Flow(s),veh/h/ln	1774	1770	1856	1085	1770	1583	268	0	0	985	0	1583
Q Serve(g_s), s	0.9	0.0	0.0	0.1	7.4	1.0	0.1	0.0	0.0	0.0	0.0	7.4
Cycle Q Clear(g_c), s	0.9	0.0	0.0	0.1	7.4	1.0	23.9	0.0	0.0	23.8	0.0	7.4
Prop In Lane	1.00		0.02	1.00		1.00	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	612	1240	1300	756	2287	1023	96	0	0	256	0	322
V/C Ratio(X)	0.07	0.11	0.11	0.00	0.21	0.03	0.06	0.00	0.00	0.69	0.00	0.33
Avail Cap(c_a), veh/h	789	1240	1300	756	2287	1023	135	0	0	294	0	365
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	0.99	0.95	0.95	0.95	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.8	0.0	0.0	8.2	9.4	8.3	43.3	0.0	0.0	50.8	0.0	44.2
Incr Delay (d2), s/veh	0.0	0.2	0.2	0.0	0.2	0.1	0.3	0.0	0.0	5.5	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	0.1	0.0	3.7	0.5	0.2	0.0	0.0	6.6	0.0	3.3
LnGrp Delay(d),s/veh	6.8	0.2	0.2	8.2	9.6	8.4	43.5	0.0	0.0	56.3	0.0	44.8
LnGrp LOS	A	A	A	A	A	A	D			E		D
Approach Vol, veh/h		330			528			6			281	
Approach Delay, s/veh		1.0			9.5			43.5			52.0	
Approach LOS		A			A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		32.4		97.6		32.4	7.1	90.5
Change Period (Y+Rc), s		6.0		6.5		6.0	4.0	6.5
Max Green Setting (Gmax), s		30.0		87.5		30.0	16.0	67.5
Max Q Clear Time (g_c+I1), s		25.9		2.0		25.8	2.9	9.4
Green Ext Time (p_c), s		0.5		6.1		0.5	0.0	6.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.7
HCM 2010 LOS	B

Timing Report, Sorted By Phase
10: Quail Run Rd & Lincoln Dr

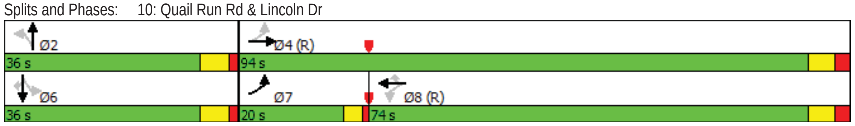
11/5/2015

Phase Number	2	4	6	7	8
Movement	NBTL	EBTL	SBTL	EBL	WBTL
Lead/Lag				Lead	Lag
Lead-Lag Optimize				Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max
Maximum Split (s)	36	94	36	20	74
Maximum Split (%)	27.7%	72.3%	27.7%	15.4%	56.9%
Minimum Split (s)	33	28	33	8	28
Yellow Time (s)	4.5	4	4.5	3	4
All-Red Time (s)	1.5	2.5	1.5	1	2.5
Minimum Initial (s)	7	15	7	4	15
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7	7		7
Flash Dont Walk (s)	20	14	20		14
Dual Entry	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	74	110	74	110	0
End Time (s)	110	74	110	0	74
Yield/Force Off (s)	104	67.5	104	126	67.5
Yield/Force Off 170(s)	84	53.5	84	126	53.5
Local Start Time (s)	74	110	74	110	0
Local Yield (s)	104	67.5	104	126	67.5
Local Yield 170(s)	84	53.5	84	126	53.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	70

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Splits and Phases: 10: Quail Run Rd & Lincoln Dr



HCM 2010 TWSC
30: Quail Run Rd/Hotel Access

11/5/2015

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	0	1	17	0	1	23
Future Vol, veh/h	0	1	17	0	1	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	18	0	1	25

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	45	18	0	0	18	0
Stage 1	18	-	-	-	-	-
Stage 2	27	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	965	1061	-	-	1599	-
Stage 1	1005	-	-	-	-	-
Stage 2	996	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	964	1061	-	-	1599	-
Mov Cap-2 Maneuver	964	-	-	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	995	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.4	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1061	1599	-
HCM Lane V/C Ratio	-	-	0.001	0.001	-
HCM Control Delay (s)	-	-	8.4	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Intersection Delay, s/veh	5.0
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	13	16	52	242
Demand Flow Rate, veh/h	13	16	52	247
Vehicles Circulating, veh/h	263	40	0	38
Vehicles Exiting, veh/h	22	12	276	18
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.3	3.4	3.6	5.5
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	13	16	52	247
Cap Entry Lane, veh/h	869	1086	1130	1088
Entry HV Adj Factor	1.000	1.000	0.993	0.980
Flow Entry, veh/h	13	16	52	242
Cap Entry, veh/h	869	1086	1122	1066
V/C Ratio	0.015	0.015	0.046	0.227
Control Delay, s/veh	4.3	3.4	3.6	5.5
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	1

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	10	0	48	21	0	249
Future Vol, veh/h	10	0	48	21	0	249
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	0	52	23	0	271

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	335	64	0	0	75	0
Stage 1	64	-	-	-	-	-
Stage 2	271	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	660	1000	-	-	1524	-
Stage 1	959	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	660	1000	-	-	1524	-
Mov Cap-2 Maneuver	660	-	-	-	-	-
Stage 1	959	-	-	-	-	-
Stage 2	775	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	660	1524	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	-	-	10.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	95	354	3	572	27	6	172	163
v/c Ratio	0.15	0.14	0.00	0.25	0.03	0.02	0.75	0.41
Control Delay	5.0	5.1	10.7	10.6	0.3	0.2	70.7	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	5.1	10.7	10.6	0.3	0.2	70.7	9.4
Queue Length 50th (ft)	16	36	1	97	0	0	140	0
Queue Length 95th (ft)	38	64	6	158	2	0	206	58
Internal Link Dist (ft)		1220		1280		272	320	
Turn Bay Length (ft)	100		100		150			
Base Capacity (vph)	697	2617	656	2308	1053	402	324	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.14	0.00	0.25	0.03	0.01	0.53	0.33

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	323	3	3	526	25	3	0	3	158	0	150
Future Volume (veh/h)	87	323	3	3	526	25	3	0	3	158	0	150
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	95	351	3	3	572	27	3	0	3	172	0	163
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	580	2532	22	710	2264	1013	56	13	28	253	0	316
Arrive On Green	0.07	1.00	1.00	0.64	0.64	0.64	0.20	0.00	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1774	3596	31	1023	3539	1583	73	66	139	989	0	1583
Grp Volume(v), veh/h	95	173	181	3	572	27	6	0	0	172	0	163
Grp Sat Flow(s),veh/h/ln	1774	1770	1857	1023	1770	1583	277	0	0	989	0	1583
Q Serve(g_s), s	2.3	0.0	0.0	0.1	9.0	0.8	0.1	0.0	0.0	0.0	0.0	11.9
Cycle Q Clear(g_c), s	2.3	0.0	0.0	0.1	9.0	0.8	23.3	0.0	0.0	23.2	0.0	11.9
Prop In Lane	1.00		0.02	1.00		1.00	0.50		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	580	1246	1308	710	2264	1013	97	0	0	253	0	316
V/C Ratio(X)	0.16	0.14	0.14	0.00	0.25	0.03	0.06	0.00	0.00	0.68	0.00	0.52
Avail Cap(c_a), veh/h	739	1246	1308	710	2264	1013	139	0	0	297	0	365
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	0.95	0.95	0.95	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.9	0.0	0.0	8.5	10.1	8.6	43.5	0.0	0.0	50.9	0.0	46.4
Incr Delay (d2), s/veh	0.1	0.2	0.2	0.0	0.3	0.0	0.3	0.0	0.0	5.0	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.1	0.1	0.0	4.4	0.4	0.2	0.0	0.0	6.4	0.0	5.3
LnGrp Delay(d),s/veh	7.1	0.2	0.2	8.5	10.3	8.6	43.8	0.0	0.0	55.9	0.0	47.7
LnGrp LOS	A	A	A	A	B	A	D			E		D
Approach Vol, veh/h		449			602			6			335	
Approach Delay, s/veh		1.7			10.2			43.8			51.9	
Approach LOS		A			B			D			D	

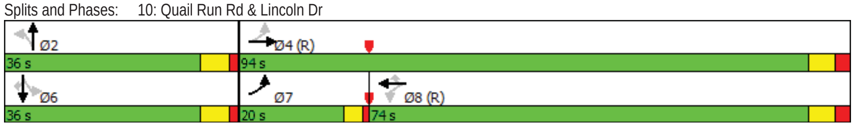
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6	7	8
Phs Duration (G+Y+Rc), s		32.0		98.0		32.0	8.3	89.7
Change Period (Y+Rc), s		6.0		6.5		6.0	4.0	6.5
Max Green Setting (Gmax), s		30.0		87.5		30.0	16.0	67.5
Max Q Clear Time (g_c+I1), s		25.3		2.0		25.2	4.3	11.0
Green Ext Time (p_c), s		0.7		7.6		0.7	0.1	7.6

Intersection Summary		
HCM 2010 Ctrl Delay		17.6
HCM 2010 LOS		B

Phase Number	2	4	6	7	8
Movement	NBTL	EBTL	SBTL	EBL	WBTL
Lead/Lag				Lead	Lag
Lead-Lag Optimize				Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max
Maximum Split (s)	36	94	36	20	74
Maximum Split (%)	27.7%	72.3%	27.7%	15.4%	56.9%
Minimum Split (s)	33	28	33	8	28
Yellow Time (s)	4.5	4	4.5	3	4
All-Red Time (s)	1.5	2.5	1.5	1	2.5
Minimum Initial (s)	7	15	7	4	15
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7	7	7		7
Flash Dont Walk (s)	20	14	20		14
Dual Entry	Yes	Yes	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	74	110	74	110	0
End Time (s)	110	74	110	0	74
Yield/Force Off (s)	104	67.5	104	126	67.5
Yield/Force Off 170(s)	84	53.5	84	126	53.5
Local Start Time (s)	74	110	74	110	0
Local Yield (s)	104	67.5	104	126	67.5
Local Yield 170(s)	84	53.5	84	126	53.5

Intersection Summary	
Cycle Length	130
Control Type	Actuated-Coordinated
Natural Cycle	70
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	

Splits and Phases: 10: Quail Run Rd & Lincoln Dr



Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	61	1	14	58	1	18
Future Vol, veh/h	61	1	14	58	1	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	1	15	63	1	20

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	69	47	0	0	78	0
Stage 1	47	-	-	-	-	-
Stage 2	22	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	936	1022	-	-	1520	-
Stage 1	975	-	-	-	-	-
Stage 2	1001	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	935	1022	-	-	1520	-
Mov Cap-2 Maneuver	935	-	-	-	-	-
Stage 1	975	-	-	-	-	-
Stage 2	1000	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	936	1520	-
HCM Lane V/C Ratio	-	-	0.072	0.001	-
HCM Control Delay (s)	-	-	9.1	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Intersection Delay, s/veh	5.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	10	13	104	303
Demand Flow Rate, veh/h	10	13	106	309
Vehicles Circulating, veh/h	322	96	0	30
Vehicles Exiting, veh/h	17	10	332	79
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.5	3.6	4.0	6.1
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	10	13	106	309
Cap Entry Lane, veh/h	819	1027	1130	1097
Entry HV Adj Factor	1.000	1.000	0.985	0.980
Flow Entry, veh/h	10	13	104	303
Cap Entry, veh/h	819	1027	1113	1075
V/C Ratio	0.012	0.013	0.094	0.282
Control Delay, s/veh	4.5	3.6	4.0	6.1
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	1

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	8	0	96	17	0	299
Future Vol, veh/h	8	0	96	17	0	299
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	0	104	18	0	325

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	439	114	0	0	123	0
Stage 1	114	-	-	-	-	-
Stage 2	325	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	575	939	-	-	1464	-
Stage 1	911	-	-	-	-	-
Stage 2	732	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	575	939	-	-	1464	-
Mov Cap-2 Maneuver	575	-	-	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	732	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	575	1464	-
HCM Lane V/C Ratio	-	-	0.015	-	-
HCM Control Delay (s)	-	-	11.4	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

APPENDIX O

ADT CALCULATIONS

Roadway	Between		And	Existing Volume	volume	Year	GR	GF
Scottsdale Road		-	Indian Bend Road	39,100	39100	2012	0.0%	1
Scottsdale Road	Indian Bend Road	-	6750 North	43,500	43500	2012	0.0%	1
Scottsdale Road	6750 North	-	Lincoln Drive	43,500	43500	2012	0.0%	1
Scottsdale Road	Lincoln Drive	-	McDowell Road	43,200	43200	2012	0.0%	1
Scottsdale Road	McDowell Road	-		40,700	40700	2012	0.0%	1
Mockingbird Lane		-	Indian Bend Road					
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	6,000	5999	2011	0.0%	1
Mockingbird Lane	Lincoln Drive	-	McDowell Road					
Indian Bend Road	Mockingbird Lane	-	Collector A					
Indian Bend Road	Collector A	-	Scottsdale Road					
Indian Bend Road	Scottsdale Road	-		16,300	16300	2012	0.0%	1
Lincoln Drive	Tatum Road			22,500	22483	2011	0.0%	1
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	13,900	13870	2015	0.0%	1
Lincoln Drive	Quail Run Road	-	Scottsdale Road	13,900	13870	2015	0.0%	1
Lincoln Drive	Scottsdale Road	-						1
McDonald Drive		-	Mockingbird Lane					
McDonald Drive	Mockingbird Lane	-	Scottsdale Road					
McDonald Drive	Scottsdale Road	-		18,700	18700	2012	0.0%	1

Roadway	Between		And	Volume from	Palmeraie
Scottsdale Road		-	Indian Bend Road	2,187	2,200
Scottsdale Road	Indian Bend Road	-	6750 North	3,388	3,400
Scottsdale Road	6750 North	-	Lincoln Drive	4,957	5,000
Scottsdale Road	Lincoln Drive	-	McDowell Road	3,526	3,500
Scottsdale Road	McDowell Road	-		2,632	2,600
Mockingbird Lane		-	Indian Bend Road	430	400
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	922	900
Mockingbird Lane	Lincoln Drive	-	McDowell Road	410	400
Indian Bend Road	Mockingbird Lane	-	Collector A	1,352	1,400
Indian Bend Road	Collector A	-	Scottsdale Road	4,062	4,100
Indian Bend Road	Scottsdale Road	-		2,056	2,100
Lincoln Drive	Tatum Road			3,392	3,400
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	3,394	3,400
Lincoln Drive	Quail Run Road	-	Scottsdale Road	2,882	2,900
Lincoln Drive	Scottsdale Road	-		1,289	1,300
McDonald Drive		-	Mockingbird Lane	408	400
McDonald Drive	Mockingbird Lane	-	Scottsdale Road	0	0
McDonald Drive	Scottsdale Road	-		894	900

Roadway	Between		And	Volume from site	
Scottsdale Road		-	Indian Bend Road	330	300
Scottsdale Road	Indian Bend Road	-	6750 North	456	500
Scottsdale Road	6750 North	-	Lincoln Drive	456	500
Scottsdale Road	Lincoln Drive	-	McDowell Road	456	500
Scottsdale Road	McDowell Road	-		390	400
Mockingbird Lane		-	Indian Bend Road	14	0
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	184	200
Mockingbird Lane	Lincoln Drive	-	McDowell Road	0	0
Indian Bend Road	Mockingbird Lane	-	Collector A	198	200
Indian Bend Road	Collector A	-	Scottsdale Road	462	500
Indian Bend Road	Scottsdale Road	-		192	200
Lincoln Drive	Tatum Road			1,154	1,200
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	700	700
Lincoln Drive	Quail Run Road	-	Scottsdale Road	516	500
Lincoln Drive	Scottsdale Road	-		516	500
McDonald Drive		-	Mockingbird Lane	0	0
McDonald Drive	Mockingbird Lane	-	Scottsdale Road	0	0
McDonald Drive	Scottsdale Road	-		66	100

Roadway	Between		And	Volume from site	
Scottsdale Road		-	Indian Bend Road	322	300
Scottsdale Road	Indian Bend Road	-	6750 North	748	700
Scottsdale Road	6750 North	-	Lincoln Drive	748	700
Scottsdale Road	Lincoln Drive	-	McDowell Road	644	600
Scottsdale Road	McDowell Road	-		518	500
Mockingbird Lane		-	Indian Bend Road	44	0
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	384	400
Mockingbird Lane	Lincoln Drive	-	McDowell Road	94	100
Indian Bend Road	Mockingbird Lane	-	Collector A	378	400
Indian Bend Road	Collector A	-	Scottsdale Road	666	700
Indian Bend Road	Scottsdale Road	-		716	700
Lincoln Drive	Tatum Road			1,976	2,000
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	1,974	2,000
Lincoln Drive	Quail Run Road	-	Scottsdale Road	1,736	1,700
Lincoln Drive	Scottsdale Road	-		1,016	1,000
McDonald Drive		-	Mockingbird Lane	0	0
McDonald Drive	Mockingbird Lane	-	Scottsdale Road	94	100
McDonald Drive	Scottsdale Road	-		220	200

Roadway	Between		And	Volume from site	
Scottsdale Road		-	Indian Bend Road	1,988	2,000
Scottsdale Road	Indian Bend Road	-	6750 North	2,555	2,600
Scottsdale Road	6750 North	-	Lincoln Drive	4,452	4,500
Scottsdale Road	Lincoln Drive	-	McDowell Road	3,478	3,500
Scottsdale Road	McDowell Road	-		2,474	2,500
Mockingbird Lane		-	Indian Bend Road	432	400
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	492	500
Mockingbird Lane	Lincoln Drive	-	McDowell Road	268	300
Indian Bend Road	Mockingbird Lane	-	Collector A	884	900
Indian Bend Road	Collector A	-	Scottsdale Road	2,242	2,200
Indian Bend Road	Scottsdale Road	-		2,108	2,100
Lincoln Drive	Tatum Road			3,348	3,300
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	3,346	3,300
Lincoln Drive	Quail Run Road	-	Scottsdale Road	3,164	3,200
Lincoln Drive	Scottsdale Road	-		1,556	1,600
McDonald Drive		-	Mockingbird Lane	378	400
McDonald Drive	Mockingbird Lane	-	Scottsdale Road	262	300
McDonald Drive	Scottsdale Road	-		894	900

Roadway	Between		And	Volume from site	
Scottsdale Road		-	Indian Bend Road	1,988	2,000
Scottsdale Road	Indian Bend Road	-	6750 North	2,555	2,600
Scottsdale Road	6750 North	-	Lincoln Drive	4,452	4,500
Scottsdale Road	Lincoln Drive	-	McDowell Road	3,478	3,500
Scottsdale Road	McDowell Road	-		2,474	2,500
Mockingbird Lane		-	Indian Bend Road	432	400
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	492	500
Mockingbird Lane	Lincoln Drive	-	McDowell Road	268	300
Indian Bend Road	Mockingbird Lane	-	Collector A	884	900
Indian Bend Road	Collector A	-	Scottsdale Road	2,242	2,200
Indian Bend Road	Scottsdale Road	-		2,108	2,100
Lincoln Drive	Tatum Road			3,348	3,300
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	3,346	3,300
Lincoln Drive	Quail Run Road	-	Scottsdale Road	3,164	3,200
Lincoln Drive	Scottsdale Road	-		1,556	1,600
McDonald Drive		-	Mockingbird Lane	378	400
McDonald Drive	Mockingbird Lane	-	Scottsdale Road	262	300
McDonald Drive	Scottsdale Road	-		894	900

Roadway	Between		And	2018 w/out Zones	2015 Vol	GR to ->	2018
Scottsdale Road		-	Indian Bend Road	39,700	39100	0.5%	1.0151
Scottsdale Road	Indian Bend Road	-	6750 North	44,200	43500	0.5%	1.0151
Scottsdale Road	6750 North	-	Lincoln Drive	44,200	43500	0.5%	1.0151
Scottsdale Road	Lincoln Drive	-	McDowell Road	43,900	43200	0.5%	1.0151
Scottsdale Road	McDowell Road	-		41,300	40700	0.5%	1.0151
Mockingbird Lane		-	Indian Bend Road				
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	6,100	6000	0.5%	1.0151
Mockingbird Lane	Lincoln Drive	-	McDowell Road				
Indian Bend Road	Mockingbird Lane	-	Collector A				
Indian Bend Road	Collector A	-	Scottsdale Road				
Indian Bend Road	Scottsdale Road	-		16,500	16300	0.5%	1.0151
Lincoln Drive	Tatum Road			22,800	22500	0.5%	1.0151
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	14,100	13900	0.5%	1.0151
Lincoln Drive	Quail Run Road	-	Scottsdale Road	14,100	13900	0.5%	1.0151
Lincoln Drive	Scottsdale Road	-					1
McDonald Drive		-	Mockingbird Lane				
McDonald Drive	Mockingbird Lane	-	Scottsdale Road				
McDonald Drive	Scottsdale Road	-		19,000	18700	0.5%	1.0151

Roadway	Between		And	2023 w/out Zones	2015 Vol	GR to ->	2023
Scottsdale Road		-	Indian Bend Road	40,700	39100	0.5%	1.0407
Scottsdale Road	Indian Bend Road	-	6750 North	45,300	43500	0.5%	1.0407
Scottsdale Road	6750 North	-	Lincoln Drive	45,300	43500	0.5%	1.0407
Scottsdale Road	Lincoln Drive	-	McDowell Road	45,000	43200	0.5%	1.0407
Scottsdale Road	McDowell Road	-		42,400	40700	0.5%	1.0407
Mockingbird Lane		-	Indian Bend Road				
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	6,200	6000	0.5%	1.0407
Mockingbird Lane	Lincoln Drive	-	McDowell Road				
Indian Bend Road	Mockingbird Lane	-	Collector A				
Indian Bend Road	Collector A	-	Scottsdale Road				
Indian Bend Road	Scottsdale Road	-		17,000	16300	0.5%	1.0407
Lincoln Drive	Tatum Road			23,400	22500	0.5%	1.0407
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	14,500	13900	0.5%	1.0407
Lincoln Drive	Quail Run Road	-	Scottsdale Road	14,500	13900	0.5%	1.0407
Lincoln Drive	Scottsdale Road	-					1
McDonald Drive		-	Mockingbird Lane				
McDonald Drive	Mockingbird Lane	-	Scottsdale Road				
McDonald Drive	Scottsdale Road	-		19,500	18700	0.5%	1.0407

Roadway	Between		And	2028 w/out Zones	2015 Vol	GR to ->	2028
Scottsdale Road		-	Indian Bend Road	41,700	39100	0.5%	1.067
Scottsdale Road	Indian Bend Road	-	6750 North	46,400	43500	0.5%	1.067
Scottsdale Road	6750 North	-	Lincoln Drive	46,400	43500	0.5%	1.067
Scottsdale Road	Lincoln Drive	-	McDowell Road	46,100	43200	0.5%	1.067
Scottsdale Road	McDowell Road	-		43,400	40700	0.5%	1.067
Mockingbird Lane		-	Indian Bend Road				
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	6,400	6000	0.5%	1.067
Mockingbird Lane	Lincoln Drive	-	McDowell Road				
Indian Bend Road	Mockingbird Lane	-	Collector A				
Indian Bend Road	Collector A	-	Scottsdale Road				
Indian Bend Road	Scottsdale Road	-		17,400	16300	0.5%	1.067
Lincoln Drive	Tatum Road			24,000	22500	0.5%	1.067
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	14,800	13900	0.5%	1.067
Lincoln Drive	Quail Run Road	-	Scottsdale Road	14,800	13900	0.5%	1.067
Lincoln Drive	Scottsdale Road	-					1
McDonald Drive		-	Mockingbird Lane				
McDonald Drive	Mockingbird Lane	-	Scottsdale Road				
McDonald Drive	Scottsdale Road	-		20,000	18700	0.5%	1.067

Roadway	Between		And	2033 w/out Zones	2015 Vol	GR to ->	2033
Scottsdale Road		-	Indian Bend Road	42,800	39100	0.5%	1.0939
Scottsdale Road	Indian Bend Road	-	6750 North	47,600	43500	0.5%	1.0939
Scottsdale Road	6750 North	-	Lincoln Drive	47,600	43500	0.5%	1.0939
Scottsdale Road	Lincoln Drive	-	McDowell Road	47,300	43200	0.5%	1.0939
Scottsdale Road	McDowell Road	-		44,500	40700	0.5%	1.0939
Mockingbird Lane		-	Indian Bend Road				
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	6,600	6000	0.5%	1.0939
Mockingbird Lane	Lincoln Drive	-	McDowell Road				
Indian Bend Road	Mockingbird Lane	-	Collector A				
Indian Bend Road	Collector A	-	Scottsdale Road				
Indian Bend Road	Scottsdale Road	-		17,800	16300	0.5%	1.0939
Lincoln Drive	Tatum Road			24,600	22500	0.5%	1.0939
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	15,200	13900	0.5%	1.0939
Lincoln Drive	Quail Run Road	-	Scottsdale Road	15,200	13900	0.5%	1.0939
Lincoln Drive	Scottsdale Road	-					1
McDonald Drive		-	Mockingbird Lane				
McDonald Drive	Mockingbird Lane	-	Scottsdale Road				
McDonald Drive	Scottsdale Road	-		20,500	18700	0.5%	1.0939

Roadway	Between		And	Base	Palmeraie	Mountain Shadows	Total	Capacity of C
Scottsdale Road		-	Indian Bend Road	39,700	2,200	300	42,500	59,900
Scottsdale Road	Indian Bend Road	-	6750 North	44,200	3,400	500	49,300	62,900
Scottsdale Road	6750 North	-	Lincoln Drive	44,200	5,000	500	50,900	62,900
Scottsdale Road	Lincoln Drive	-	McDowell Road	43,900	3,500	500	49,000	59,900
Scottsdale Road	McDowell Road	-		41,300	2,600	400	45,200	59,900
Mockingbird Lane		-	Indian Bend Road					14,800
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	6,100	900	200	7,800	14,800
Mockingbird Lane	Lincoln Drive	-	McDowell Road					14,800
Indian Bend Road	Mockingbird Lane	-	Collector A		1,400			14,800
Indian Bend Road	Collector A	-	Scottsdale Road		4,100	500		14,800
Indian Bend Road	Scottsdale Road	-		16,500	2,100	200	19,700	39,800
Lincoln Drive	Tatum Road			22,800	3,400	1,200	30,600	39,800
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	14,100	3,400	700	20,900	39,800
Lincoln Drive	Quail Run Road	-	Scottsdale Road	14,100	2,900	500	19,700	39,800
Lincoln Drive	Scottsdale Road	-			1,300			39,800
McDonald Drive		-	Mockingbird Lane					14,800
McDonald Drive	Mockingbird Lane	-	Scottsdale Road					14,800
McDonald Drive	Scottsdale Road	-		19,000	900	100	20,300	39,800

Roadway	Between		And	Base	Palmeraie	Mountain Shadows	Total	Capacity of C
Scottsdale Road		-	Indian Bend Road	40,700	2,200	300	45,500	59,900
Scottsdale Road	Indian Bend Road	-	6750 North	45,300	3,400	500	52,300	62,900
Scottsdale Road	6750 North	-	Lincoln Drive	45,300	5,000	500	55,800	62,900
Scottsdale Road	Lincoln Drive	-	McDowell Road	45,000	3,500	500	53,000	59,900
Scottsdale Road	McDowell Road	-		42,400	2,600	400	48,300	59,900
Mockingbird Lane		-	Indian Bend Road					14,800
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	6,200	900	200	8,000	14,800
Mockingbird Lane	Lincoln Drive	-	McDowell Road					14,800
Indian Bend Road	Mockingbird Lane	-	Collector A		1,400			14,800
Indian Bend Road	Collector A	-	Scottsdale Road		4,100	500		14,800
Indian Bend Road	Scottsdale Road	-		17,000	2,100	200	21,600	39,800
Lincoln Drive	Tatum Road			23,400	3,400	1,200	32,500	39,800
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	14,500	3,400	700	22,600	39,800
Lincoln Drive	Quail Run Road	-	Scottsdale Road	14,500	2,900	500	21,600	39,800
Lincoln Drive	Scottsdale Road	-			1,300			39,800
McDonald Drive		-	Mockingbird Lane					14,800
McDonald Drive	Mockingbird Lane	-	Scottsdale Road					14,800
McDonald Drive	Scottsdale Road	-		19,500	900	100	21,500	39,800

Roadway	Between		And	Base	Palmeraie	Mountain Shadows	Total	Capacity of C
Scottsdale Road		-	Indian Bend Road	41,700	2,200	300	46,500	59,900
Scottsdale Road	Indian Bend Road	-	6750 North	46,400	3,400	500	53,400	62,900
Scottsdale Road	6750 North	-	Lincoln Drive	46,400	5,000	500	56,900	62,900
Scottsdale Road	Lincoln Drive	-	McDowell Road	46,100	3,500	500	54,100	59,900
Scottsdale Road	McDowell Road	-		43,400	2,600	400	49,300	59,900
Mockingbird Lane		-	Indian Bend Road					14,800
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	6,400	900	200	8,200	14,800
Mockingbird Lane	Lincoln Drive	-	McDowell Road					14,800
Indian Bend Road	Mockingbird Lane	-	Collector A		1,400			14,800
Indian Bend Road	Collector A	-	Scottsdale Road		4,100	500		14,800
Indian Bend Road	Scottsdale Road	-		17,400	2,100	200	22,000	39,800
Lincoln Drive	Tatum Road			24,000	3,400	1,200	33,100	39,800
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	14,800	3,400	700	22,900	39,800
Lincoln Drive	Quail Run Road	-	Scottsdale Road	14,800	2,900	500	21,900	39,800
Lincoln Drive	Scottsdale Road	-			1,300			39,800
McDonald Drive		-	Mockingbird Lane					14,800
McDonald Drive	Mockingbird Lane	-	Scottsdale Road					14,800
McDonald Drive	Scottsdale Road	-		20,000	900	100	22,000	39,800

Roadway	Between		And	Base	Palmeraie	Mountain Shadows	Total	Capacity of C
Scottsdale Road		-	Indian Bend Road	42,800	2,200	300	47,600	59,900
Scottsdale Road	Indian Bend Road	-	6750 North	47,600	3,400	500	54,600	62,900
Scottsdale Road	6750 North	-	Lincoln Drive	47,600	5,000	500	58,100	62,900
Scottsdale Road	Lincoln Drive	-	McDowell Road	47,300	3,500	500	55,300	59,900
Scottsdale Road	McDowell Road	-		44,500	2,600	400	50,400	59,900
Mockingbird Lane		-	Indian Bend Road					14,800
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	6,600	900	200	8,400	14,800
Mockingbird Lane	Lincoln Drive	-	McDowell Road					14,800
Indian Bend Road	Mockingbird Lane	-	Collector A		1,400			14,800
Indian Bend Road	Collector A	-	Scottsdale Road		4,100	500		14,800
Indian Bend Road	Scottsdale Road	-		17,800	2,100	200	22,400	39,800
Lincoln Drive	Tatum Road			24,600	3,400	1,200	33,700	39,800
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	15,200	3,400	700	23,300	39,800
Lincoln Drive	Quail Run Road	-	Scottsdale Road	15,200	2,900	500	22,300	39,800
Lincoln Drive	Scottsdale Road	-			1,300			39,800
McDonald Drive		-	Mockingbird Lane					14,800
McDonald Drive	Mockingbird Lane	-	Scottsdale Road					14,800
McDonald Drive	Scottsdale Road	-		20,500	900	100	22,500	39,800

Roadway	Between		And	2018 Site	2023+ Site	2018 Total	2023 Total	2028 Total	2033 Total	Capacity LOS D	2033 Extra Capacity
Scottsdale Road		-	Indian Bend Road	300	2,000	42,500	45,500	46,500	47,600	59,900	12,300
Scottsdale Road	6750 North	-	Lincoln Drive	700	4,500	50,900	55,800	56,900	58,100	62,900	4,800
Scottsdale Road	Lincoln Drive	-	McDowell Road	600	3,500	49,000	53,000	54,100	55,300	59,900	4,600
Scottsdale Road	McDowell Road	-		500	2,500	45,200	48,300	49,300	50,400	59,900	9,500
Mockingbird Lane	Indian Bend Road	-	Lincoln Drive	400	500	7,800	8,000	8,200	8,400	14,800	6,400
Indian Bend Road	Scottsdale Road	-		700	2,100	19,700	21,600	22,000	22,400	39,800	17,400
Lincoln Drive	Tatum Road			2,000	3,300	30,600	32,500	33,100	33,700	39,800	6,100
Lincoln Drive	Mockingbird Lane	-	Quail Run Road	2,000	3,300	20,900	22,600	22,900	23,300	39,800	16,500
McDonald Drive	Scottsdale Road	-		200	900	20,300	21,500	22,000	22,500	39,800	17,300

APPENDIX P

SIGHT DISTANCE ANALYSIS

Ritz Carlton Resort - Lincoln Drive — Sight Distance Analysis

Assumptions and/or Givens

Elements of Design from AASHTO 2004 — ***AASHTO Ref***

Driver Eye Height			
Passenger Vehicle	3.50	ft	p 127
Truck	7.60	ft	p 127
Object Height			
Stopping Sight Distance	2.00	ft	p 127
Passing Sight Distance	3.50	ft	p 127
Vehicle Height	4.25	ft	p 127
Driver Eye Location			
From Edge of Major Rd Traveled Way	14.50	ft	p 657
Deceleration Rate (a)			
Passenger Vehicle	11.20	ft/sec^2	p 111
Truck	N/A	ft	
Brake reaction time (t)	2.50	sec	p 113

Site Specific Data

Major Street Design Speed (V_{major})		45	MPH		
Grades - Approaching Minor Street from: (— = approaching downhill)					
Left (G_L)		0.00	%		
Right (G_R)		0.00	%		
Approach Grade Adjustment Factor	Left	1.0			p 658
	Right	1.0			
Major Road Through Lanes on Each Approach		2.0			
Median Width (in "Lane Equivalents")		1.2			
Bicycle Lane Width (in "Lane Equivalents")		0.0			
Minor Road Approach Upgrade, if >3%		0.00	%		
Minor Road Access (check restricted)					
	LI	LO/Th	RO		

Stopping Sight Distance = Brake Reaction Distance + Braking Distance

Neglecting Effect of Grade — p 113

$$d=1.47Vt+1.075\frac{V^2}{a}$$

Calculated d= 359.8 ft
Design d= 360 ft

With Effect of Grade — p 114

$$d=1.47Vt+\frac{V^2}{30\left(\left(\frac{a}{32.2}\right)\pm G\right)}$$

Calculated d= 359.1 ft - left
360 ft - right
Design d= 359.1 ft - left
360 ft - right

SSD's do not consider design for truck operations, since better visibility is considered to offset longer braking distance. — p 114

Ritz Carlton Resort - Lincoln Drive — Sight Distance Analysis

Intersection Sight Distances

AASHTO Ref

Case B—Intersections with Stop Control on the Minor Road — p 657

Case B1—Left Turn from the Minor Road — pp 657ff

Design Vehicle	Time Gap (t_g)		
Passenger Car	7.5	sec	p 660
Single-Unit Tuck	9.5	sec	p 660
Combination Truck	11.5	sec	p 660

Time gap adjustments

Add'l lanes to cross (1st is assumed)			
Passenger Car	0.5	sec	p 660
Trucks	0.7	sec	p 660
Minor Approach Upgrade (Per each 1%>3%)	0.2	sec	p 660

Site data

Major Road + Bike Lanes on Left Approach	2.0		p 660
Minor Road Approach Upgrade, if >3%	0	%	p 660

Time Gap based on site data

Design Vehicle Gap+Adj for Approach Grade>3%+Adjs for Add'l Lanes & Median

Passenger Car	8.6	sec
Single-Unit Tuck	11.0	sec
Combination Truck	13.0	sec

ISD to left & right along Major Road — $ISD=1.47V_{major}t_g$ (ft) — p 659

		ISD to Left and Right	
Passenger Car	calculated ISD=	568.9	ft
	design ISD=	570	ft
Single-Unit Tuck	calculated ISD=	730.3	ft
	design ISD=	735	ft
Combination Truck	calculated ISD=	862.6	ft
	design ISD=	865	ft

Intersection Sight Distances (cont'd)

AASHTO Ref

Case B2─Right Turn from the Minor Road — p 663
&
Case B3─Crossing Maneuver from the Minor Road — pp 663ff

Design Vehicle	Time Gap (t_g)	
Passenger Car	6.5 sec	p 664
Single-Unit Tuck	8.5 sec	p 664
Combination Truck	10.5 sec	p 664

Time gap adjustments - Case B-3 Only*		
Add'l lanes to cross (1st is assumed)		
Passenger Car	0.5 sec	p 664
Trucks	0.7 sec	p 664
Minor Approach Upgrade (Per each 1%>3%)	0.1 sec	p 664

Site data		
Major Road + Bike Lanes on Left Approach	2.0	p 664
Minor Road Approach Upgrade, if >3%	0 %	p 664

Time Gap based on site data (sec)
Design Vehicle Gap+Adj for Approach Grade>3%(+Adjs for Add'l Lanes & Median for B3)

	B2 & B3	B3 Only
Passenger Car	7.6	8.1
Single-Unit Tuck	10.0	10.7
Combination Truck	12.0	12.7

ISD to left (B2/B3) & right (B3) along Major Rd ISD=$1.47V_{major}t_g$ (ft) — p 659

		ISD to Left (B2 & B3)	ISD to right (B3 Only)
Passenger Car	calculated ISD=	502.7	535.8
	design ISD=	505	540
Single-Unit Tuck	calculated ISD=	664.1	710.5
	design ISD=	665	715
Combination Truck	calculated ISD=	796.4	842.8
	design ISD=	800	845

*Number of major road lanes is irrelevant in Case B2.

The differences between Case B1 and Cases B2 & B3 are reduced time gaps and time gap adjustment for the minor approach upgrade. — p 663

Intersection Sight Distances (cont'd)

AASHTO Ref

Case F─Left Turns from the Major Road — pp 674ff

Design Vehicle	Time Gap (t_g)	
Passenger Car	5.5 sec	p 674
Single-Unit Tuck	6.5 sec	p 674
Combination Truck	7.5 sec	p 674

Time gap adjustments		
Add'l lanes to cross (1 assumed)		
Passenger Car	0.5 sec	p 674
Trucks	0.7 sec	p 674

Site data
Opposing Lanes (adj'd for x-wide median) 2.2

Time Gap based on site data
Design Vehicle Gap+Adj for Add'l Opposing Lanes

Passenger Car	6.6 sec
Single-Unit Tuck	8.0 sec
Combination Truck	9.0 sec

ISD to front along Major Road ISD=$1.47V_{major}t_g$ (ft) — p 659

Passenger Car	calculated ISD=	436.6 ft
	design ISD=	440 ft
Single-Unit Tuck	calculated ISD=	531.8 ft
	design ISD=	535 ft
Combination Truck	calculated ISD=	598.0 ft
	design ISD=	600 ft

The differences between Case F and Cases B1, B2 & B3 are reduced time gaps and no time gap adjustment for any minor approach upgrade. — p 663

SIGHT DISTANCE SUMMARY

Sight Distance Type	Governing Case	Car	SU Truck	Combo Truck
Stopping				
Without effect of grade		360	N/A	N/A
With effect of grade on left		360	N/A	N/A
With effect of grade on right		360	N/A	N/A
Intersection				
To Right	B1	570	735	865
To Left	B2/B3	505	665	800
On Major Road	F	440	535	600

Assumptions and/or Givens

Elements of Design from AASHTO 2004 — *AASHTO Ref*

Driver Eye Height			
Passenger Vehicle	3.50	ft	p 127
Truck	7.60	ft	p 127
Object Height			
Stopping Sight Distance	2.00	ft	p 127
Passing Sight Distance	3.50	ft	p 127
Vehicle Height	4.25	ft	p 127
Driver Eye Location			
From Edge of Major Rd Traveled Way	14.50	ft	p 657
Deceleration Rate (a)			
Passenger Vehicle	11.20	ft/sec^2	p 111
Truck	N/A	ft	
Brake reaction time (t)	2.50	sec	p 113

Site Specific Data

Major Street Design Speed (V_{major})		35	MPH	
Grades - Approaching Minor Street from: (– = approaching downhill)				
Left (G_L)		0.00	%	
Right (G_R)		0.00	%	
Approach Grade Adjustment Factor	Left	1.0		p 658
	Right	1.0		
Major Road Through Lanes on Each Approach		2.0		
Median Width (in "Lane Equivalents")		1.2		
Bicycle Lane Width (in "Lane Equivalents")		0.0		
Minor Road Approach Upgrade, if >3%		0.00	%	
Minor Road Access (check restricted)	LI	LO/Th	RO	

Stopping Sight Distance = Brake Reaction Distance + Braking Distance

Neglecting Effect of Grade

$$d = 1.47Vt + 1.075\frac{V^2}{a}$$ p 113

Calculated d= 246.2 ft
Design d= 250 ft

With Effect of Grade

$$d = 1.47Vt + \frac{V^2}{30\left(\left(\frac{a}{32.2}\right) \pm G\right)}$$ p 114

Calculated d= 246.4 ft - left
250 ft - right
Design d= 246.4 ft - left
250 ft - right

SSD's do not consider design for truck operations, since better visibility is considered to offset longer braking distance. p 114

Ritz Carlton Resort - Indian Bend Road — Sight Distance Analysis

Intersection Sight Distances

AASHTO Ref

Case B—Intersections with Stop Control on the Minor Road — p 657

Case B1—Left Turn from the Minor Road — pp 657ff

Design Vehicle	Time Gap (t_g)		
Passenger Car	7.5	sec	p 660
Single-Unit Tuck	9.5	sec	p 660
Combination Truck	11.5	sec	p 660
Time gap adjustments			
Add'l lanes to cross (1^{st} is assumed)			
Passenger Car	0.5	sec	p 660
Trucks	0.7	sec	p 660
Minor Approach Upgrade (Per each 1%>3%)	0.2	sec	p 660

Site data

Major Road + Bike Lanes on Left Approach	2.0		p 660
Minor Road Approach Upgrade, if >3%	0	%	p 660

Time Gap based on site data

Design Vehicle Gap+Adj for Approach Grade>3%+Adjs for Add'l Lanes & Median

Passenger Car	8.6	sec
Single-Unit Tuck	11.0	sec
Combination Truck	13.0	sec

ISD to left & right along Major Road $ISD = 1.47V_{major}t_g$ (ft) p 659

		ISD to Left and Right	
Passenger Car	calculated ISD=	442.5	ft
	design ISD=	445	ft
Single-Unit Tuck	calculated ISD=	568.0	ft
	design ISD=	570	ft
Combination Truck	calculated ISD=	670.9	ft
	design ISD=	675	ft

Intersection Sight Distances (cont'd)

AASHTO Ref

Case B2─Right Turn from the Minor Road   p 663
&
Case B3─Crossing Maneuver from the Minor Road   pp 663ff

Design Vehicle	Time Gap (t_g)	
Passenger Car	6.5 sec	p 664
Single-Unit Tuck	8.5 sec	p 664
Combination Truck	10.5 sec	p 664

Time gap adjustments - Case B-3 Only*		
Add'l lanes to cross (1st is assumed)		
Passenger Car	0.5 sec	p 664
Trucks	0.7 sec	p 664
Minor Approach Upgrade (Per each 1%>3%)	0.1 sec	p 664

Site data		
Major Road + Bike Lanes on Left Approach	2.0	p 664
Minor Road Approach Upgrade, if >3%	0 %	p 664

Time Gap based on site data (sec)

Design Vehicle Gap+Adj for Approach Grade>3%(+Adjs for Add'l Lanes & Median for B3)

	B2 & B3	B3 Only
Passenger Car	7.6	8.1
Single-Unit Tuck	10.0	10.7
Combination Truck	12.0	12.7

ISD to left (B2/B3) & right (B3) along Major Rd $ISD=1.47V_{major}t_g$ (ft)   p 659

		ISD to Left (B2 & B3)	ISD to right (B3 Only)
Passenger Car	calculated ISD=	391.0	416.7
	design ISD=	395	420
Single-Unit Tuck	calculated ISD=	516.6	552.6
	design ISD=	520	555
Combination Truck	calculated ISD=	619.5	655.5
	design ISD=	620	660

*Number of major road lanes is irrelevant in Case B2.

The differences between Case B1 and Cases B2 & B3 are reduced time gaps and time gap adjustment for the minor approach upgrade.   p 663

Intersection Sight Distances (cont'd)

AASHTO Ref

Case F─Left Turns from the Major Road   pp 674ff

Design Vehicle	Time Gap (t_g)	
Passenger Car	5.5 sec	p 674
Single-Unit Tuck	6.5 sec	p 674
Combination Truck	7.5 sec	p 674

Time gap adjustments		
Add'l lanes to cross (1 assumed)		
Passenger Car	0.5 sec	p 674
Trucks	0.7 sec	p 674

Site data
Opposing Lanes (adj'd for x-wide median)   2.2

Time Gap based on site data
Design Vehicle Gap+Adj for Add'l Opposing Lanes

Passenger Car	6.6 sec
Single-Unit Tuck	8.0 sec
Combination Truck	9.0 sec

ISD to front along Major Road $ISD=1.47V_{major}t_g$ (ft)   p 659

Passenger Car	calculated ISD=	339.6 ft
	design ISD=	340 ft
Single-Unit Tuck	calculated ISD=	413.7 ft
	design ISD=	415 ft
Combination Truck	calculated ISD=	465.1 ft
	design ISD=	470 ft

The differences between Case F and Cases B1, B2 & B3 are reduced time gaps and no time gap adjustment for any minor approach upgrade.   p 663

SIGHT DISTANCE SUMMARY

Sight Distance Type	Governing Case	Car	SU Truck	Combo Truck
Stopping				
Without effect of grade		250	N/A	N/A
With effect of grade on left		250	N/A	N/A
With effect of grade on right		250	N/A	N/A
Intersection				
To Right	B1	445	570	675
To Left	B2/B3	395	520	620
On Major Road	F	340	415	470

Assumptions and/or Givens

Elements of Design from AASHTO 2004 ***AASHTO Ref***

Driver Eye Height			
Passenger Vehicle	3.50	ft	p 127
Truck	7.60	ft	p 127
Object Height			
Stopping Sight Distance	2.00	ft	p 127
Passing Sight Distance	3.50	ft	p 127
Vehicle Height	4.25	ft	p 127
Driver Eye Location			
From Edge of Major Rd Traveled Way	14.50	ft	p 657
Deceleration Rate (a)			
Passenger Vehicle	11.20	ft/sec^2	p 111
Truck	N/A	ft	
Brake reaction time (t)	2.50	sec	p 113

Site Specific Data

Major Street Design Speed (V_{major})		50	MPH	
Grades - Approaching Minor Street from: (─ = approaching downhill)				
Left (G_L)		0.00	%	
Right (G_R)		0.00	%	
Approach Grade Adjustment Factor	Left	1.0		p 658
	Right	1.0		
Major Road Through Lanes on Each Approach		2.0		
Median Width (in "Lane Equivalents")		1.2		
Bicycle Lane Width (in "Lane Equivalents")		0.0		
Minor Road Approach Upgrade, if >3%		0.00	%	
Minor Road Access (check restricted)	LI	LO/Th	RO	

Stopping Sight Distance = Brake Reaction Distance + Braking Distance

Neglecting Effect of Grade $$d=1.47Vt+1.075\frac{V^2}{a}$$ p 113

Calculated d= 423.8 ft
Design d= 425 ft

With Effect of Grade $$d=1.47Vt+\frac{V^2}{30\left(\left(\frac{a}{32.2}\right)\pm G\right)}$$ p 114

Calculated d= 423.6 ft - left
425 ft - right
Design d= 423.6 ft - left
425 ft - right

SSD's do not consider design for truck operations, since better visibility is considered to offset longer braking distance. p 114

Ritz Carlton Resort - Scottsdale Road **Sight Distance Analysis**

Intersection Sight Distances

AASHTO Ref

Case B─Intersections with Stop Control on the Minor Road p 657

Case B1─Left Turn from the Minor Road pp 657ff

Design Vehicle	Time Gap (t_g)		
Passenger Car	7.5	sec	p 660
Single-Unit Tuck	9.5	sec	p 660
Combination Truck	11.5	sec	p 660

Time gap adjustments

Add'l lanes to cross (1^{st} is assumed)			
Passenger Car	0.5	sec	p 660
Trucks	0.7	sec	p 660
Minor Approach Upgrade (Per each 1%>3%)	0.2	sec	p 660

Site data

Major Road + Bike Lanes on Left Approach	2.0		p 660
Minor Road Approach Upgrade, if >3%	0	%	p 660

Time Gap based on site data

Design Vehicle Gap+Adj for Approach Grade>3%+Adjs for Add'l Lanes & Median

Passenger Car	8.6	sec
Single-Unit Tuck	11.0	sec
Combination Truck	13.0	sec

ISD to left & right along Major Road $ISD=1.47V_{major}t_g$ (ft) p 659

		ISD to Left and Right	
Passenger Car	calculated ISD=	632.1	ft
	design ISD=	635	ft
Single-Unit Tuck	calculated ISD=	811.4	ft
	design ISD=	815	ft
Combination Truck	calculated ISD=	958.4	ft
	design ISD=	960	ft

Intersection Sight Distances (cont'd)

			AASHTO Ref
Case B2─Right Turn from the Minor Road			p 663
&			
Case B3─Crossing Maneuver from the Minor Road			pp 663ff
Design Vehicle	Time Gap (t_g)		
Passenger Car	6.5	sec	p 664
Single-Unit Tuck	8.5	sec	p 664
Combination Truck	10.5	sec	p 664
Time gap adjustments - Case B-3 Only*			
Add'l lanes to cross (1st is assumed)			
Passenger Car	0.5	sec	p 664
Trucks	0.7	sec	p 664
Minor Approach Upgrade (Per each 1%>3%)	0.1	sec	p 664
Site data			
Major Road + Bike Lanes on Left Approach	2.0		p 664
Minor Road Approach Upgrade, if >3%	0	%	p 664

Time Gap based on site data (sec)

Design Vehicle Gap+Adj for Approach Grade>3%(+Adjs for Add'l Lanes & Median for B3)

	B2 & B3	B3 Only
Passenger Car	7.6	8.1
Single-Unit Tuck	10.0	10.7
Combination Truck	12.0	12.7

ISD to left (B2/B3) & right (B3) along Major Rd ISD=$1.47V_{major}t_g$ (ft) p 659

		ISD to Left (B2 & B3)	ISD to right (B3 Only)
Passenger Car	calculated ISD=	558.6	595.4
	design ISD=	560	600
Single-Unit Tuck	calculated ISD=	737.9	789.4
	design ISD=	740	790
Combination Truck	calculated ISD=	884.9	936.4
	design ISD=	885	940

*Number of major road lanes is irrelevant in Case B2.

The differences between Case B1 and Cases B2 & B3 are reduced time gaps and time gap adjustment for the minor approach upgrade. p 663

Intersection Sight Distances (cont'd)

			AASHTO Ref
Case F─Left Turns from the Major Road			pp 674ff
Design Vehicle	Time Gap (t_g)		
Passenger Car	5.5	sec	p 674
Single-Unit Tuck	6.5	sec	p 674
Combination Truck	7.5	sec	p 674
Time gap adjustments			
Add'l lanes to cross (1 assumed)			
Passenger Car	0.5	sec	p 674
Trucks	0.7	sec	p 674
Site data			
Opposing Lanes (adj'd for x-wide median)	2.2		
Time Gap based on site data			
Design Vehicle Gap+Adj for Add'l Opposing Lanes			
Passenger Car	6.6	sec	
Single-Unit Tuck	8.0	sec	
Combination Truck	9.0	sec	

ISD to front along Major Road ISD=$1.47V_{major}t_g$ (ft) p 659

Passenger Car	calculated ISD=	485.1	ft
	design ISD=	490	ft
Single-Unit Tuck	calculated ISD=	590.9	ft
	design ISD=	595	ft
Combination Truck	calculated ISD=	664.4	ft
	design ISD=	665	ft

The differences between Case F and Cases B1, B2 & B3 are reduced time gaps and no time gap adjustment for any minor approach upgrade. p 663

SIGHT DISTANCE SUMMARY

Sight Distance Type	Governing Case	Car	SU Truck	Combo Truck
Stopping				
Without effect of grade		425	N/A	N/A
With effect of grade on left		425	N/A	N/A
With effect of grade on right		425	N/A	N/A
Intersection				
To Right	B1	635	815	960
To Left	B2/B3	560	740	885
On Major Road	F	490	595	665

Action Report

File #: 17-236

TO: Mayor Collins and Town Council Members

FROM: Kevin Burke, Town Manager

DATE: June 8, 2017

DEPARTMENT: Town Manager

AGENDA TITLE:
Discussion of Councilmember Paul Dembow's Nomination for the Arizona Municipal Risk Retention Pool (AMRRP)

RECOMMENDATION:
Discuss Councilmember Dembow's nomination for the Arizona Municipal Risk Retention Pool.

Council Goals or Other Policies / Statutory Requirements:

SUMMARY STATEMENT:

In a May 2017 eNewsletter from the Arizona Municipal Risk Retention Pool (AMRRP), there was a call for nominations to the Board of Trustees. The terms of two existing trustees are expiring in 2017.

Councilmember Paul Dembow expressed a willingness to serve. Therefore a nomination must be submitted by June 24, 2017. A nomination is attached. As this position will be representing the Town of Paradise Valley on a statewide board, it is appropriate to have an action from the Town Council approving and supporting such a nomination.

Nominations are aggregated by the Arizona League of Cities and Towns Nominating Committee and submitted to the designated elector for each member of the pool. The election results are revealed August 22, 2017 at the AMRRP Annual Members meeting held in conjunction with the Arizona League of Cities and Towns annual conference in Tucson.

At the June 8, 2017 Regular Meeting of the Town Council, the Council directed this item to be placed on a study session prior to action.

BUDGETARY IMPACT:
None

ATTACHMENT(S):
Town Councilmember Paul Dembow Nomination

Paul Dembow
pdembow@paradisevalleyaz.gov

Short Version (280 words)
Paul has lived in Paradise Valley since 1991. His personal and professional experience in the cosmetics manufacturing industry spans three decades. As CEO and president of his family-owned business, he oversaw many aspects of the day-to-day operations of the company. After graduating from Arizona State University, Paul started working for the company when it employed eight people. Four years later, under Paul's stewardship, Arizona Natural Resources grew to four hundred employees.

For the past six years, Paul has served as a member of the Town Council, one year as Vice Mayor. He is dedicated to preserving the strong and unique character of Paradise Valley. Some of the major projects that Paul worked on during his tenure include:

1) The redevelopment of Mountain Shadows Resort and Cottonwoods, now the Andaz Resort, were completed this spring, and construction has started on the Ritz-Carlton resort which is expected to open in late 2018 or early 2019.
2) Construction of a new Municipal Court building was completed in 2014.
3) Revisions to the Town's General Plan that was approved by 80% of voters in 2012.
4) Numerous infrastructure improvements for added safety and beautification.
5) Numerous public safety improvements including state of the art technology such as license plate readers, adding more patrol officers, and construction of a facility to house the new police radio system.
6) Implementing new streaming technology of all meetings to add transparency to our Town government.
7) Implementing a fire protection fee offset the cost to the Town.

Paul is an avid hiker, watch collector and world traveler. He is actively involved in the lives of his five adult children, has high energy, and is a leader in his community.

Action Report

File #: 17-240

TO: **Mayor Collins and Town Council**

FROM: Eva Cutro, Community Development Director
Paul Michaud, Senior Planner
George Burton, Planner

DATE: June 22, 2017

CONTACT:

AGENDA TITLE:
Discussion of Statement of Direction for Hillside Code Updates (Article XXII of the Town Zoning Ordinance)

BACKGROUND

History

Hillside related matters can be found throughout the Town Code but are most prevalent in the Zoning Ordinance and Chapter XXII Hillside Development Regulations which is often referred to as the "Hillside Code."

On July 21, 2015, staff presented a list of topics relating to the Hillside Code to the Planning Commission as part of a periodic review and update of the Town Code. In January of 2016, the Town Council identified several Quality of Life Initiatives including an Update to the Hillside Code. Staff worked with then Planning Commissioner Moore in preparing a draft ordinance identifying topics of discussion and potential amendments. The draft ordinance was reviewed by the Planning Commission at the December 20, 2016 and January 3, 2017 work sessions and the January 17, 2017 citizen review work session. In March and May of 2017, the Town Council identified Hillside as one of its five top initiatives for the 2017-2018 term. Along with updating the Hillside Code, other hillside related matters were identified. These included safety concerns, committee structure, hillside disturbances off the applicant property, variance processing and others.

The Town Council also reviewed a draft Statement of Direction at the June 8, 2017 work session. There was discussion about establishing safety standards, hillside assurance/bond criteria, the potential use of stealth solar technology, the need to minimize the impact of cantilevers, and discussion if the La Place du Sommet subdivision is bound by the 1984 hillside code.

Purpose

As a result of previous reviews, staff and the Planning Commission examined nineteen topics pertaining to the Hillside Code. Subsequent review by Councilmembers Moore and Pace added a couple of additional topics. This study session seeks to draft a statement of direction (SOD) to the

Planning Commission focusing their efforts on desired topics and providing policy guidance on the topics selected. The plan is for that SOD to be adopted by Council during the Regular Meeting portion of the agenda.

DISCUSSION/FACTS

During their review, the Commission was generally agreeable with the proposed modifications to the Hillside Code proposed by then Planning Commissioner Scott Moore and staff regarding Material Palette, Demolition on Hillside Properties, Hillside Study Models, Accessory Structures, the 40' Overall Height Measurement, the Process to Remove a Property from the Hillside Designation, and Defining which Hillside Code applies to the La Place du Sommet Subdivision.

Enclosed is the draft Hillside Code amendments that were last reviewed by the Planning Commission on January 17, 2017. The changes incorporated from the December 20th Commission meeting are highlighted in yellow, the changes incorporated from the January 3rd Commission meeting are highlighted in blue, and changes and input form the January 17th Commission meeting are highlighted in green. The green January 17 changes have NOT been in any previous version of this redlined ordinance distributed to Council. They were discussed and agreed upon by the Planning Commission at the January 17, 2017 meeting, but had not yet been incorporated into the working draft until this packet.

The scope of each topic will be summarized and the topics will be grouped into four categories or sections. The first category (in green) identifies the topics that received consensus from Planning Commission. This category identifies the issue of each topic, the decision of the Planning Commission, and references the applicable page number in the attached red-lined draft ordinance. The second category (in red) identifies the topics that did not receive consensus from the Commission or need additional work. For these topics, staff identifies the issue related to each topic, the policy options under discussion and references the applicable page number in the draft ordinance. Staff also does this for the remaining two categories. The third category (in orange) are new topics that were identified in the June 8th Council work session and the fourth category (in blue) identified recommendations from Council Member Moore and Council Member Pace. Their associated language amending the Hillside Code, can be found in the attached second redlined version of Ordinance 2017-09.

The draft Hillside Code addresses the following topics:

1. Retaining Walls and Screen Walls.
2. Material Palette and Light Reflective Value (LRV).
3. Hillside Reviews & Administrative Hillside Chair Review.
4. Disturbed Area Calculation.
5. Demolition on Hillside Properties.
6. Hillside Model.
7. Accessory Structure and Accessory Structure Height Limit (including raised decks/platforms).
8. 40' Overall Height Measurement.
9. Driveway Disturbance Credit.
10. Lighting.
11. Process to Remove a Property from Hillside Designation.

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12. Hillside Assurance/Bond.
13. Define which Hillside Code applies to La Place du Sommet Subdivision.
14. Solar Panels and Hillside Review Process.
15. Cantilever Limitations.
16. On-Site Retention.
17. Pool Barriers and Perimeter Fencing Standards.
18. Administrative Relief on Hillside Lots (Article XXII)
19. Add Safety Section to Hillside Code
20. Eliminate or Reduce Administrative Chair Reviews
21. No Change to Administrative Relief on Hillside Lots

Note item 13 has changed from green to red since June 8, based upon research since the last study session.

The Leadership Team believes it is possible, and most efficient, if Mayor and Council first address the items in green listed above. During the June 22, 2017 study session, staff will ask members of Council if they want to discuss any of the items in green. A review of each green item during the meeting is NOT planned. Think of it as the "consent agenda" portion of the SOD and will only be discussed if pulled by a member. Therefore, please review the action report, the SOD, and the redlined draft ordinance to assure comfort with the green item.

<u>Topics with Planning Commission Consensus</u>

A. ***Material Palette and Light Reflective Values (LRV).*** There are two issues related with this topic: 1) often, applicants choose colors that meet the LRV requirement but do not blend in with the surrounding hillside, and 2) the Hillside Building Committee (HBC) is very limited in approving contrasting colors. Language has been added to the code to emphasize that the color palette for the improvements must blend in with the surrounding hillside. Also, language has been added to the code to give the HBC more latitude in approving contrasting colors when deemed appropriate. This would allow the HBC to determine if accent materials and colors can be placed on the house that is fully screened by the hillside. Please reference page 19 of the draft ordinance regarding this amendment.

B. ***Hillside Reviews and Administrative Hillside Chair Reviews.*** There are two issues related with this topic. First, the code does not clearly identify all four types of hillside reviews. Language has been added to the code to clarify the type and scope of each review. The second issue is to increase the scope of the Hillside Chair review. Currently, the code does not allow the Chair to review projects that result in additional disturbance, additional site walls, increase the height of the house, add more than 1,000 square feet of footprint, or create an adverse visual impact. Often, smaller projects such as adding planters or modifying an existing pool requires the full Committee review due to small increases in disturbance, walls, etc. Language has been added to the code to allow the Chair to review applications with a limited amount of increased disturbance, limited amount of site walls, and a limited amount of solar panels. Please reference pages 8 and 9 of the draft ordinance regarding this amendment. Please note that Councilmember Moore & Pace have expressed disagreement with the current code and proposal. See item U. below.

C. ***Disturbed Area Calculation.*** Livable footprint and garage footprint to do not count as disturbed area under current code. The issue related to this topic is the concern that the code encourages larger homes on the hillside since the footprint is not included in the disturbance calculation. However, it was decided not to modify this section of the code since counting the footprint as disturbance would create many non-conformities by causing existing homes to exceed their allowable disturbance and concerns that this amendment may trigger Prop 207 issues. Please reference pages 6 and 21 of the draft ordinance regarding this amendment.

D. ***Demolition on Hillside Properties.*** The issue regarding this topic is that some contractors exceed the scope of demolition and grade undisturbed areas of the property during demolition. Language has been added to the code to require the existing disturbance boundary to be staked prior to demolition (in an attempt to help ensure the native hillside is not disturbed). Please reference pages 10 and 20 of the draft ordinance regarding this amendment.

E. ***Hillside Model.*** The code requires a physical model. However, model making appears to be a dying art as applicants are having a difficult time finding model makers. Language has been added to the code which allows applicants to submit computer generated models and establishes criteria for the computer models. Please reference page 14 of the draft ordinance regarding this amendment.

F. ***Accessory Structures & Heights.*** The code identifies a 24’ height limit for the house but does not clearly define the height for accessory structures. The decision was made to add language to the code to clarify that accessory structures are limited to a maximum height of 16’ height. Also, the code is unclear regarding structure such as raised pool and raised patio decks. The decision was made to add language to the code to clarify that these structures must meet the same setback requirements as pool and spas. Please reference pages 7, 17, and 19 of the draft ordinance regarding this amendment.

G. ***40’ Overall Height Limit.*** The code identifies that the maximum overall height of a building or structure shall not exceed 40’. However, the code does not clearly identify where the height measurement is taken from. Language will be added to the code to clarify that this measurement is taken from the natural grade of the lowest structure to the top of the tallest structure. Please reference page 17 of the draft ordinance regarding this amendment.

H. ***Process to Remove Property from Hillside.*** The code does not identify the process to remove the hillside designation from a property. Language has been added to the code to identify this process. Please reference page 34 of the draft ordinance regarding this amendment.

I. ***Pool Barriers and Perimeter Fencing Standards.*** The only fences or walls allowed on hillside properties are view pool barrier fences, retaining walls, screen walls, and view guard rails. As a result, many applicants expand their pool barriers in an attempt to create a yard. Language has been added to the code to clarify that the pool barrier must be appropriate for the site and the minimum amount need to secure the pool. Please reference page 26 of the draft ordinance regarding this amendment.

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J. ***Administrative Relief on Hillside Lots.*** Administrative relief is essentially an administrative variance in which an applicant may request a deviation of up to 10% of the development standard. However, administrative relief on hillside properties is limited to solar panels and entry gates. Language has been added to the code to make administrative relief on hillside lots consistent with flat land lots. Please reference page 34 of the draft ordinance regarding this amendment. Again note that Councilmember Moore and Pace have expressed disagreement with this provision. See item V. below.

K. ***Retaining Walls & Screen Walls.*** The code does not clearly identify if retaining walls and screen walls need to meet the setback for fences. Therefore, language has been added to the code to clarify that all walls must meet setbacks, unless needed to access the property (such as driveway retaining walls) or if the walls are needed to prevent erosion or flooding. Also, retaining walls are currently limited to a height of 6" above the material they retain. However, due to safety concerns, staff has received requests to allow driveway retaining walls to extend higher than 6" in order to serve as a vehicle wheel stop. Language has been added to the code to allow driveway retaining walls to extend 18" above the material they retain provided they comply with the 8' maximum retaining wall height limit. Please reference pages 24 - 26 of the draft ordinance regarding this amendment.

Topics without Planning Commission Consensus or Requires Additional Review

L. ***Define which Hillside Code applies to La Place du Sommet.*** The Town has traditionally applied the 1984 Hillside code to the La Place du Sommet subdivision. Staff was proposing to update the code to clarify this; however, additional research is needed to determine which code applies to this subdivision. Please reference page 34 of the draft ordinance regarding this amendment.

M. ***Retaining Walls.*** The International Residential Code (IRC) requires a 36" tall guard rail adjoining walkways that have a fall potential of 30" or more. However, many applicants request a 42" guard rail due to safety concerns and ergonomics (e.g. that a 42" rail is easier to grasp than a 36" guard rail). The Council may specify a maximum guard rail height or provide the HBC the flexibility to determine an appropriate guard rail height for each site. Please reference page 26 of the draft ordinance regarding this amendment.

N. ***Driveway Disturbance Credit.*** The code has different standards for driveways that serve new homes and driveways that serve remodeled homes. Decorative driveways that serve new homes receive a partial credit toward their disturbed area calculation. However, decorative driveways that serve remodeled homes do not count as disturbed area. There is concern that the current code encourages and allows for excessively large driveways on remodeled homes since the decorative drives do not count as disturbed area. During the July 17th meeting, the Commission appeared to favor applying a similar standard to all decorative driveways and tasked Commissioner Campbell to work with staff and update the credit standards for driveways. Does Council agree with this approach? Please reference pages 22 - 23 of the draft ordinance regarding this amendment.

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O. ***Lighting.*** Council recently updated the lighting code for flat land lots. However, no modifications were made to the lighting requirements for hillside lots. Does the Council want to apply some of the flat land lighting code updates to the Hillside Code? Potential updates include the prohibition of rope lights, adding Lux as another measure of light output, allow holiday lights to start on October 15th, and apply Kelvin requirements on lights. Pages 28 - 32 of the draft ordinance address current hillside lighting requirements.

P. ***Hillside Assurance/Bond.*** The hillside bond places the Town in a position to do or contract work necessary to cover, restore, and landscape an unfinished or abandoned hillside project. Currently, the minimum hillside bond is based upon $25 per cubic yard of total cut and fill associated with a project. There is concern that this amount is not sufficient to restore an abandoned or unfished site. During the January 17th meeting, the Commission was looking at increasing the bond amount to $35 per cubic yard of total cut and fill, along with establishing a price index to adjust for inflation. The Commission also examined establishing criteria for a landscape bond (which would allow a Certificate of Occupancy to be issued prior to installation of the landscaping).

Also, during the June 8th meeting, Council discussed this topic and considered options such as increasing the multiplier, placing a lien on the property, identifying when the bond may be used, and requiring the submittal of bids to help determine the assurance amount. Which method of assurance does the Council prefer to collect finances that are of a sufficient amount to restore a site? The Council may direct the Commission to explore multiple alternatives such as increased multipliers, restoration bids, and liens on the property. Please reference pages 10 - 11 of the draft ordinance regarding this amendment.

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Due to the issues noted above, does the Council want to allow solar panels on pitched roofs? The Council may direct the Commission to examine the use of stealth solar technology on hillside lots and establish criteria that would allow the placement of solar panels on pitched roofs. Please reference page 9 and page 19 of the draft ordinance regarding this amendment

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minimize the visual impact of cantilevers. Please reference pages 18 - 19 of the draft ordinance regarding this amendment.

S. ***On-Site Retention.*** Depending upon the scope of improvements, on-site retention is required on hillside properties. The most common form of on-site retention is the use of a retention basins. The retention basins must be designed in accordance with the Town's Storm Drain Design Manual and are included in the disturbed area calculation. However, applicants have expressed concern that the retention basins can use up a large portion of their allowable disturbance. Also, some applicants use retaining walls to create retention areas. The requirement for on-site retention was not intended to increase the amount of retaining walls or increase the amount of disturbance on the hillside. Due to the necessity of on-site retention, does the Council want offer partial credit for retention basins? Design standards can be established to identify which retention basins receive credit (e.g. retention basin that do not use retaining walls and are vegetated with native plants, etc.). Please reference page 21 of the draft ordinance regarding this amendment.

Topics Identified during the June 8th Council Work Session & by Councilmembers Moore and Pace

T. ***Add a Safety Section in the Code.*** During the June 8th work session, the Council discussed the issue of creating a safety section in the Hillside Code. There was discussion on when safety comes into play on the development of a hillside property and the length of construction on hillside properties. The Council may direct the Commission to identify circumstance that trigger additional safety measures and reviews (such as enabling the Town to hire consultants to help review geotechnical reports or examine potential grading and drainage issues). The additional safety measures and reviews may be required at the Town's discretion. The Town may require the applicant to cover the cost of the additional review. Language regarding this can be added to Section 2205.VI. A (page 10) of the draft ordinance.

U. ***Administrative Hillside Chair Review.*** Council Member Moore and Council Member Pace recommend that this section of code be eliminated or reduced. Does the Council want to eliminate or reduce the scope of the Chair review? If the Council decides to eliminate this section of code, virtually all exterior improvements will require Hillside Committee review and approval. If the Council favors a reduced scope of Chair review, the Council may direct the Commission to evaluate the current requirements and determine which standards shall be reduced. Councilmember Moore expressed particular concern with the ability of the Chair to approve up to 1,000 square feet of additional footprint. Based upon Planning Commission review and as drafted in the attached ordinance, the Commission recommends increasing the scope of the Chair review in an attempt to help expedite smaller improvements. The current code enables the Chair to send an application to full Committee for review if the Chair believes the request has an adverse visual impact. If the Council prefers to expand the scope of the Chair review, language can be added to the code requiring the applicant to notify the any neighbors of the improvements that the Chair determines to be potentially affected by the improvement.

V. ***Administrative Relief on Hillside Lots.*** Council Member Moore and Council Member Pace recommend leaving this section of code in its current state and do not favor the expanding the scope of administrative relief on hillside lots. The Council may remove this topic from the code updates, direct the Commission to proceed with the current proposal of making administrative relief on hillside lots consistent with flat land lots, or direct the Commission to re-evaluate this topic.

Statement of Direction

A Statement of Direction (SOD) has been drafted and attached assuming the green items are accepted as drafted and the red, orange and blue items will receive direction from the Mayor and Council during the study session. Blue items were not specifically drafted in the SOD as they are contrary to the Green items and await Council direction.

Directions from the Mayor and Council to the Planning Commission generally come in one of three forms:

1) Identifies the problem and directs the PC to recommend a solution;
2) Identifies the problem and directs the PC to develop a solution consistent with the policy concept written in the SOD; or
3) Identifies the problem and directs the PC to use the specific ordinance language provided for the solution.

Staff will facilitate which of these forms of direction and the associated language Mayor and Council prefers during the study session presentation.

Attachments

- Draft Statement of Direction (SOD)
- Draft Hillside Ordinance with notes through the January 17, 2017 Planning Commission meeting
- Draft Hillside Ordinance with Council Member Moore and Council Member Pace's recommendations
- Power Point Presentation

Legislation Text

File #: 17-240, Version: 1

TO: Mayor Collins and Town Council

FROM: Eva Cutro, Community Development Director
Paul Michaud, Senior Planner
George Burton, Planner

DATE: June 22, 2017

CONTACT:

AGENDA TITLE:
Discussion of Statement of Direction for Hillside Code Updates (Article XXII of the Town Zoning Ordinance)

BACKGROUND

History

Hillside related matters can be found throughout the Town Code but are most prevalent in the Zoning Ordinance and Chapter XXII Hillside Development Regulations which is often referred to as the "Hillside Code."

On July 21, 2015, staff presented a list of topics relating to the Hillside Code to the Planning Commission as part of a periodic review and update of the Town Code. In January of 2016, the Town Council identified several Quality of Life Initiatives including an Update to the Hillside Code. Staff worked with then Planning Commissioner Moore in preparing a draft ordinance identifying topics of discussion and potential amendments. The draft ordinance was reviewed by the Planning Commission at the December 20, 2016 and January 3, 2017 work sessions and the January 17, 2017 citizen review work session. In March and May of 2017, the Town Council identified Hillside as one of its five top initiatives for the 2017-2018 term. Along with updating the Hillside Code, other hillside related matters were identified. These included safety concerns, committee structure, hillside disturbances off the applicant property, variance processing and others.

The Town Council also reviewed a draft Statement of Direction at the June 8, 2017 work session. There was discussion about establishing safety standards, hillside assurance/bond criteria, the potential use of stealth solar technology, the need to minimize the impact of cantilevers, and discussion if the La Place du Sommet subdivision is bound by the 1984 hillside code.

Purpose

As a result of previous reviews, staff and the Planning Commission examined nineteen topics pertaining to the Hillside Code. Subsequent review by Councilmembers Moore and Pace added a couple of additional topics. This study session seeks to draft a statement of direction (SOD) to the Planning Commission focusing their efforts on desired topics and providing policy guidance on the topics selected. The plan is for that SOD to be adopted by Council during the Regular Meeting portion of the agenda.

DISCUSSION/FACTS
During their review, the Commission was generally agreeable with the proposed modifications to the Hillside Code proposed by then Planning Commissioner Scott Moore and staff regarding Material Palette, Demolition on Hillside Properties, Hillside Study Models, Accessory Structures, the 40' Overall Height Measurement, the Process to Remove a Property from the Hillside Designation, and Defining which Hillside Code applies to the La Place du Sommet Subdivision.

Enclosed is the draft Hillside Code amendments that were last reviewed by the Planning Commission on January 17, 2017. The changes incorporated from the December 20th Commission meeting are highlighted in yellow, the changes incorporated from the January 3rd Commission meeting are highlighted in blue, and changes and input form the January 17th Commission meeting are highlighted in green. The green January 17 changes have NOT been in any previous version of this redlined ordinance distributed to Council. They were discussed and agreed upon by the Planning Commission at the January 17, 2017 meeting, but had not yet been incorporated into the working draft until this packet.

The scope of each topic will be summarized and the topics will be grouped into four categories or sections. The first category (in green) identifies the topics that received consensus from Planning Commission. This category identifies the issue of each topic, the decision of the Planning Commission, and references the applicable page number in the attached red-lined draft ordinance. The second category (in red) identifies the topics that did not receive consensus from the Commission or need additional work. For these topics, staff identifies the issue related to each topic, the policy options under discussion and references the applicable page number in the draft ordinance. Staff also does this for the remaining two categories. The third category (in orange) are new topics that were identified in the June 8th Council work session and the fourth category (in blue) identified recommendations from Council Member Moore and Council Member Pace. Their associated language amending the Hillside Code, can be found in the attached second redlined version of Ordinance 2017-09.

The draft Hillside Code addresses the following topics:

1. Retaining Walls and Screen Walls.
2. Material Palette and Light Reflective Value (LRV).
3. Hillside Reviews & Administrative Hillside Chair Review.
4. Disturbed Area Calculation.
5. Demolition on Hillside Properties.
6. Hillside Model.
7. Accessory Structure and Accessory Structure Height Limit (including raised decks/platforms).
8. 40' Overall Height Measurement.
9. Driveway Disturbance Credit.
10. Lighting.
11. Process to Remove a Property from Hillside Designation.
12. Hillside Assurance/Bond.
13. Define which Hillside Code applies to La Place du Sommet Subdivision.
14. Solar Panels and Hillside Review Process.

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15. Cantilever Limitations.
16. On-Site Retention.
17. Pool Barriers and Perimeter Fencing Standards.
18. Administrative Relief on Hillside Lots (Article XXII)
19. Add Safety Section to Hillside Code
20. Eliminate or Reduce Administrative Chair Reviews
21. No Change to Administrative Relief on Hillside Lots

Note item 13 has changed from green to red since June 8, based upon research since the last study session.

The Leadership Team believes it is possible, and most efficient, if Mayor and Council first address the items in green listed above. During the June 22, 2017 study session, staff will ask members of Council if they want to discuss any of the items in green. A review of each green item during the meeting is NOT planned. Think of it as the “consent agenda” portion of the SOD and will only be discussed if pulled by a member. Therefore, please review the action report, the SOD, and the redlined draft ordinance to assure comfort with the green item.

Topics with Planning Commission Consensus

A. Material Palette and Light Reflective Values (LRV). There are two issues related with this topic: 1) often, applicants choose colors that meet the LRV requirement but do not blend in with the surrounding hillside, and 2) the Hillside Building Committee (HBC) is very limited in approving contrasting colors. Language has been added to the code to emphasize that the color palette for the improvements must blend in with the surrounding hillside. Also, language has been added to the code to give the HBC more latitude in approving contrasting colors when deemed appropriate. This would allow the HBC to determine if accent materials and colors can be placed on the house that is fully screened by the hillside. Please reference page 19 of the draft ordinance regarding this amendment.

B. Hillside Reviews and Administrative Hillside Chair Reviews. There are two issues related with this topic. First, the code does not clearly identify all four types of hillside reviews. Language has been added to the code to clarify the type and scope of each review. The second issue is to increase the scope of the Hillside Chair review. Currently, the code does not allow the Chair to review projects that result in additional disturbance, additional site walls, increase the height of the house, add more than 1,000 square feet of footprint, or create an adverse visual impact. Often, smaller projects such as adding planters or modifying an existing pool requires the full Committee review due to small increases in disturbance, walls, etc. Language has been added to the code to allow the Chair to review applications with a limited amount of increased disturbance, limited amount of site walls, and a limited amount of solar panels. Please reference pages 8 and 9 of the draft ordinance regarding this amendment. Please note that Councilmember Moore & Pace have expressed disagreement with the current code and proposal. See item U. below.

C. Disturbed Area Calculation. Livable footprint and garage footprint to do not count as disturbed area under current code. The issue related to this topic is the concern that the code encourages larger homes on the hillside since the footprint is not included in the disturbance calculation. However, it was decided not to modify this section of the code since counting the footprint as disturbance would create many non-conformities by causing existing homes to exceed their allowable disturbance and concerns that this amendment may trigger Prop 207 issues. Please reference pages 6 and 21 of the draft ordinance regarding this amendment.

D. Demolition on Hillside Properties. The issue regarding this topic is that some contractors exceed the scope of demolition and grade undisturbed areas of the property during demolition. Language has been added to the code to require the existing disturbance boundary to be staked prior to demolition (in an attempt to help ensure the native hillside is not disturbed). Please reference pages 10 and 20 of the draft ordinance regarding this amendment.

E. Hillside Model. The code requires a physical model. However, model making appears to be a dying art as applicants are having a difficult time finding model makers. Language has been added to the code which allows applicants to submit computer generated models and establishes criteria for the computer models. Please reference page 14 of the draft ordinance regarding this amendment.

F. Accessory Structures & Heights. The code identifies a 24’ height limit for the house but does not clearly define the height for accessory structures. The decision was made to add language to the code to clarify that accessory structures are limited to a maximum height of 16’ height. Also, the code is unclear regarding structure such as raised pool and raised patio decks. The decision was made to add language to the code to clarify that these structures must meet the same setback requirements as pool and spas. Please reference pages 7, 17, and 19 of the draft ordinance regarding this amendment.

G. 40’ Overall Height Limit. The code identifies that the maximum overall height of a building or structure shall not exceed 40’. However, the code does not clearly identify where the height measurement is taken from. Language will be added to the code to clarify that this measurement is taken from the natural grade of the lowest structure to the top of the tallest structure. Please reference page 17 of the draft ordinance regarding this amendment.

H. Process to Remove Property from Hillside. The code does not identify the process to remove the hillside designation from a property. Language has been added to the code to identify this process. Please reference page 34 of the draft ordinance regarding this amendment.

I. Pool Barriers and Perimeter Fencing Standards. The only fences or walls allowed on hillside properties are view pool barrier fences, retaining walls, screen walls, and view guard rails. As a result, many applicants expand their pool barriers in an attempt to create a yard. Language has been added to the code to clarify that the pool barrier must be appropriate for the site and the minimum amount need to secure the pool. Please reference page 26 of the draft ordinance regarding this amendment.

J. Administrative Relief on Hillside Lots. Administrative relief is essentially an administrative variance in which an applicant may request a deviation of up to 10% of the development standard. However, administrative relief on hillside properties is limited to solar panels and entry gates. Language has been added to the code to make administrative relief on hillside lots consistent with flat land lots. Please reference page 34 of the draft ordinance regarding this amendment. Again note that Councilmember Moore and Pace have expressed

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disagreement with this provision. See item V. below.

K. Retaining Walls & Screen Walls. The code does not clearly identify if retaining walls and screen walls need to meet the setback for fences. Therefore, language has been added to the code to clarify that all walls must meet setbacks, unless needed to access the property (such as driveway retaining walls) or if the walls are needed to prevent erosion or flooding. Also, retaining walls are currently limited to a height of 6” above the material they retain. However, due to safety concerns, staff has received requests to allow driveway retaining walls to extend higher than 6” in order to serve as a vehicle wheel stop. Language has been added to the code to allow driveway retaining walls to extend 18” above the material they retain provided they comply with the 8’ maximum retaining wall height limit. Please reference pages 24 - 26 of the draft ordinance regarding this amendment.

Topics without Planning Commission Consensus or Requires Additional Review

L. Define which Hillside Code applies to La Place du Sommet. The Town has traditionally applied the 1984 Hillside code to the La Place du Sommet subdivision. Staff was proposing to update the code to clarify this; however, additional research is needed to determine which code applies to this subdivision. Please reference page 34 of the draft ordinance regarding this amendment.

M. Retaining Walls. The International Residential Code (IRC) requires a 36” tall guard rail adjoining walkways that have a fall potential of 30” or more. However, many applicants request a 42” guard rail due to safety concerns and ergonomics (e.g. that a 42” rail is easier to grasp than a 36” guard rail). The Council may specify a maximum guard rail height or provide the HBC the flexibility to determine an appropriate guard rail height for each site. Please reference page 26 of the draft ordinance regarding this amendment.

N. Driveway Disturbance Credit. The code has different standards for driveways that serve new homes and driveways that serve remodeled homes. Decorative driveways that serve new homes receive a partial credit toward their disturbed area calculation. However, decorative driveways that serve remodeled homes do not count as disturbed area. There is concern that the current code encourages and allows for excessively large driveways on remodeled homes since the decorative drives do not count as disturbed area. During the July 17th meeting, the Commission appeared to favor applying a similar standard to all decorative driveways and tasked Commissioner Campbell to work with staff and update the credit standards for driveways. Does Council agree with this approach? Please reference pages 22 - 23 of the draft ordinance regarding this amendment.

O. Lighting. Council recently updated the lighting code for flat land lots. However, no modifications were made to the lighting requirements for hillside lots. Does the Council want to apply some of the flat land lighting code updates to the Hillside Code? Potential updates include the prohibition of rope lights, adding Lux as another measure of light output, allow holiday lights to start on October 15th, and apply Kelvin requirements on lights. Pages 28 - 32 of the draft ordinance address current hillside lighting requirements.

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Topics Identified during the June 8th Council Work Session & by Councilmembers Moore and Pace

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Hillside Code Update

-Statement of Direction-
June 22, 2017

The Town of Paradise Valley is preparing an update to the Hillside Code, pertaining to Article XXII of the Town Zoning Ordinance.

A Statement of Direction (SOD) as outlined in the Town Code is not required for code updates. However, based upon multiple discussions regarding how and what to update in the Hillside Code, the Town Council suggested a Statement of Direction. As such, direction to the Planning Commission by the Town Council is beneficial.

As in any Statement of Direction, this direction to the Planning Commission is not a final decision of the Town Council and such matters addressed may differ through the course of the code update process. Therefore, the Town Council issues the following Statement of Direction for the Hillside Code Update:

- The purpose of the Hillside Code is to establish provisions to regulate the intensity of development; preserve and protect the hillside environment; provide for the safety and welfare of the Town and its residents; and to establish rules and procedures for review by the Hillside Building Committee of hillside development, building and construction plans.

- The code amendments outlined in draft Ordinance 2016-09 include, but are not limited to, twenty topics (as defined in the June 22, 2017 staff report). The Town Council finds the following topics as edited in the draft ordinance dated June 16, 2017, to be appropriate and acceptable: Material Palette & Light Reflective Value, Reviews & Administrative Hillside Chair Review, Disturbed Area Calculation, Demolition on Hillside Properties, Hillside Models, Accessory Structures & Accessory Structure Height Limits, the 40' Overall Height Measurement, the Process to Remove a Property from the Hillside Designation, Pool Barriers & Perimeter Fencing Standards, and Administrative Relief on Hillside Lots. Planning Commission is directed not to change the content of those items during subsequent reviews unless its submits a request to the Council for further direction.

- The Planning Commission shall focus their review on the following topics with the following direction related to each topic:

    1. *Retaining Walls.* Establish a maximum height for guard rails placed on top of retaining walls.

    2. *Driveway Disturbance Credit.* The disturbance credit for decorative driveways that service new homes and remodeled homes should be consistent. The Commission must develop consistent standards and credits for driveways that serve new homes and remodeled homes.

3. *Lighting.* Evaluate the hillside lighting standards to address Kelvin requirements, adding Lux as another light measurement, prohibiting rope lights, and extending holiday lighting to October 15th.

4. *Hillside Assurance/Bond.* Update the code to ensure that the hillside bond will be of a sufficient amount to restore the hillside on an abandoned or unfinished project. The Commission shall explore different ways to establish the amount of assurance. Planning Commission should also establish thresholds for when the assurance should be called.

5. *Define which Hillside Code applies to La Place du Sommet Subdivision.* Research and determine if the La Place du Sommet subdivision is governed by the 1984 Hillside Code.

6. *Solar Panels and Hillside Review Process.* The Commission shall explore the use of stealth solar technology on hillside properties and evaluate the placement of solar on pitched roofs.

7. *Cantilever Limitations.* Add language to the code to prohibit driveway cantilevers and establish or revise criteria that minimizes the impact of cantilevers in construction of structures.

8. *On-Site Retention.* Identify that on-site retention shall be in accordance with the Town's Storm Drainage Design Manual and develop standards that will allow retention basins to receive partial disturbance credit.

9. *Add a Safety Section in the Code.* Identify circumstance that trigger additional safety measures and reviews (such as enabling the Town to hire consultants to help review geotechnical reports or examine potential grading and drainage issues). The additional safety measures and reviews may be required at the Town's discretion. The Town may require the applicant to cover the cost of the additional review. Language regarding this can be added to Section 2205.VI. A (page 10) of the draft ordinance.

10.

As per Section 1102.3.C.3.c of the Zoning Ordinance, at any time during the review process, the Planning Commission may request clarification and/or expansion of this Statement of Direction based on additional information that has evolved.

DRAFT

ORDINANCE NUMBER 2016-09

Comment [GB1]:
RED TEXT IS DRAFT LANGUAGE PRESENTED TO PC AT 12/20/16 MEETING.

YELLOW HIGHLIGHTED TEXT IDENTIFIES UPDATED LANGUAGE IN RESPONSE TO INPUT FROM 12/20/16 PC MEETING

BLUE HIGHLIGHTED TEXT IDENTIFIES UPDATED LANGUGE IN RESPONSE TO INPUT FROM 1/3/17 PC MEETING

GREEN HIGHLIGHTED TEXT IDENTIFIES UPDATED LANGUAGE IN RESPONSE TO INPUT FROM 1/17/17 PC MEETING

AN ORDINANCE OF THE TOWN OF PARADISE VALLEY, ARIZONA AMENDING THE PARADISE VALLEY ZONING ORDINANCE, Article XXII, HILLSIDE DEVELOPMENT REGULATIONS

BE IT ORDAINED BY THE MAYOR AND TOWN COUNCIL OF THE TOWN OF PARADISE VALLEY, ARIZONA:

Section 1. Article XXII, Hillside Development Regulations, Section 2200- 2209 are hereby amended (with deletions shown as ~~strikethroughs~~ and additions shown in **bold type**):

Article XXII. HILLSIDE DEVELOPMENT REGULATIONS [110 112 181 193 194 409 425 533 558 654580]

Section 2200. INTRODUCTION

As valuable scenic resources, Camelback Mountain, Mummy Mountain and the Phoenix Mountains provide a permanent visual presence that exemplify what is unique about Paradise Valley. They define the location and character of the Town, shape our sense of place and contribute to the Town's identity. These land forms, their foothills, and other areas over a 10% slope, offer a desirable setting visible to the entire metropolitan area and an intrinsic aesthetic value to the Town; therefore they require unique standards resulting from the characteristics of hillside terrain.

Section 2201. PURPOSE

This article exists to establish provisions to: a) regulate the intensity of development; b) preserve and protect the hillside environment; c) provide for the safety and welfare of the Town and its residents; and d) establish rules and procedures for review by the Hillside Building Committee ~~of~~ for hillside development, building and construction plans through the implementation of the following:

1. Require building massing to adapt to the natural hillside topography thereby reducing the scarring effects of roads, drives, building pads and cut and fill slopes.

2. Encourage all improvements to be designed and constructed in a manner that minimizes the impact of development from viewpoints on the valley floor and adjacent slopes.

3. Prevent unnecessary grading or stripping of vegetation, preserve drainage patterns, protect the public from natural hazards of storm water runoff and erosion, and require re-vegetation in order to maintain the natural landscape environment.

4. Preserve visual open space, unique natural features, wildlife habitats and retain the integrity and natural states of the identified dominant peaks and ridges.

5. Provide development and construction practices and methods to ensure greater fire protection in hillside development areas.

6. Require limited and efficient use of exterior lighting to maintain minimal night-time lighting levels and preservation of the dark sky.

This Article endeavors to enhance design quality so that the resulting development maintains the essential natural characteristic and context of the hillside consistent with the goals and policies of the Town's General Plan.

Section 2202. **IMPLEMENTATION**

The provisions of this Article shall apply to all land within a Hillside Development Area as denoted on **FIGURE 2 – HILLSIDE DEVELOPMENT AREA** and to all lands where the natural terrain under the building pad has a slope of ten percent (10%) or greater (see example below), whether shown in Figure 2 or not. However, a 10% or greater slope, in an area not denoted on Figure 2, created by a natural wash on land that would otherwise not be classified as hillside land, shall be exempt from the hillside regulations. Hillside lands are also subject to special provisions relating to lot split and subdivision development as set forth in the subdivision code. If there is a conflict between the Hillside Development provisions and another section of this Ordinance or the Town Code, these provisions shall prevail.

FIGURE 1 –10% SLOPE

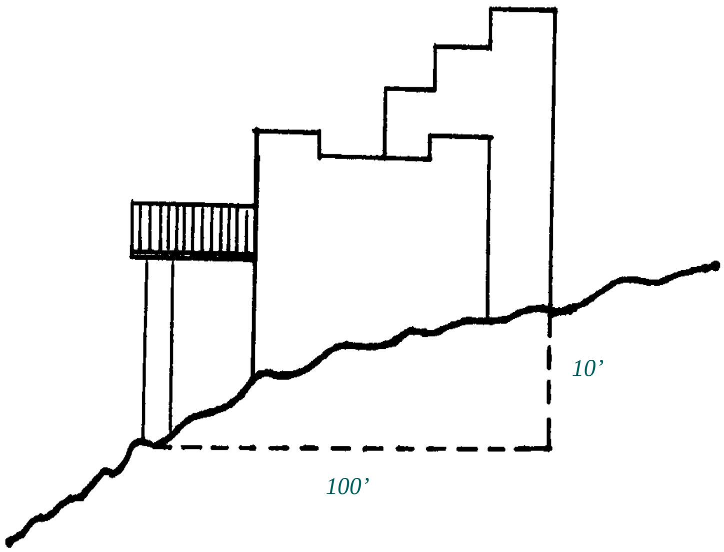

FIGURE 2 – HILLSIDE DEVELOPMENT AREA

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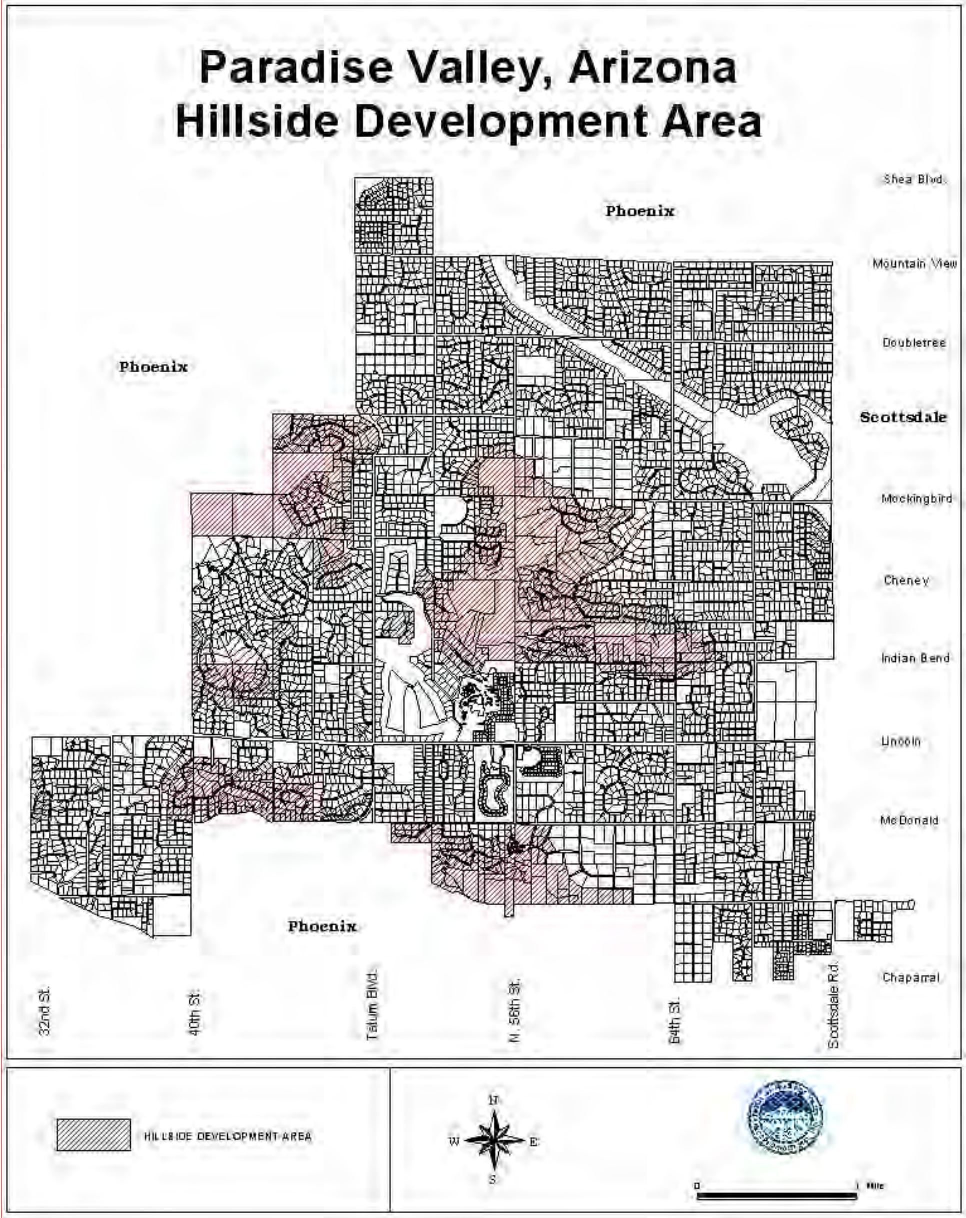
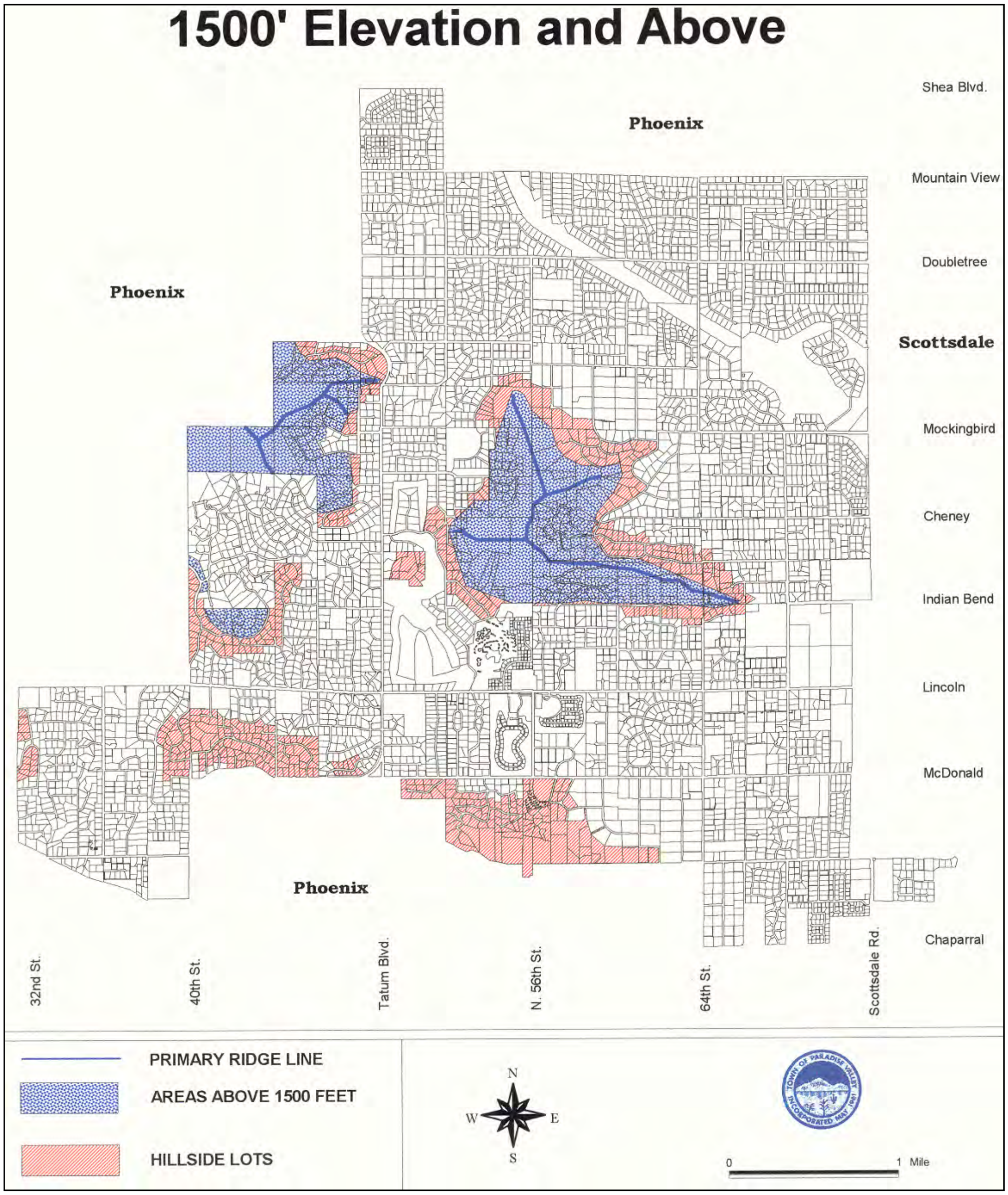


Comment [GB2]: Identify Process to Update Map with any properties removed from Hillside or added to Hillside

FIGURE 3 – PRIMARY RIDGE LINE DESIGNATION


1500' Elevation and Above
Shea Blvd.
Phoenix
Mountain View
Doubletree
Phoenix
Scottsdale
Mockingbird
Cheney
Indian Bend
Lincoln
McDonald
Phoenix
Chaparral
32nd St.
40th St.
Tatum Blvd.
N. 56th St.
64th St.
Scottsdale Rd.
PRIMARY RIDGE LINE
AREAS ABOVE 1500 FEET
HILLSIDE LOTS
N
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1 Mile

Section 2203 **HILLSIDE DEFINITIONS.** Where definitions are not defined in this section, the definitions in Article II shall control. For purposes of this Article, the terms contained in the Article shall have the following meanings:

Acre - 43,560 square feet as measured on the horizontal plane.

Alter the Mountain Top Ridge Line –Any Development on the Primary Ridge Line shown on **FIGURE 3** that disturbs or alters the natural mountain top profile.

Applicant – The person or entity desiring to improve or otherwise engage in any Development of property in the Hillside Development Area, including the owner of the property and any agents acting on behalf of the owner.

Building Pad – The total area under roof of all structures proposed for the property.

Building Pad Slope - The percent of slope measured at right angles to the natural contours along a line passing through the center of the proposed building and terminating at the ends of the disturbed area limits of the building site.

Building Site - That portion of the lot or parcel, excluding driveways, upon which a building and appurtenances are to be placed or are already existing, including but not limited to; adequate areas for parking, turnaround areas not separated by driveways, sewage disposal, clearance, and proper drainage which conforms to the requirements of the provisions of this Article and the ~~Uniform Building~~ Town Code.

Code - The Code of Ordinances of the Town of Paradise Valley, Arizona in effect as of the date of these Regulations and as may be amended.

Commission - The Planning and Zoning Commission of the Town of Paradise Valley.

Committee - The Hillside Building Committee of the Town of Paradise Valley.

Conservation - Retention or acquisition of land for the purpose of preservation in a natural state.

Conservation Easement - A permanent open space easement granted to the Town or to a public land trust to prohibit development of property including roads and utilities and to retain and preserve the land for the scenic enjoyment of the general public.

Council - The Town Council of the Town of Paradise Valley.

Cut - The land surface which is shaped through the removal of soil, rock, or other materials.

Development - Any grading, excavation or construction.

Action Report Topic #4

Disturbed Area - That area of natural ground excluding the footprint of the residence that has been or is proposed to be altered through grading, cut and fill, removal of natural vegetation, placement of material, trenching, or by any means that causes a change in the undisturbed natural surface of the land or natural vegetation.

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Comment [GB3]: Need Planning Commission Input - Should the footprint and garage be included in the disturbance calculation? If so, the definition of "disturbed area" will need to be updated and Table 1 in Section 2207 will also need to be modified and updated in order to not make currently developed properties non-conforming in the amount of disturbance.
Commission Requested Additional Info at the 12/20/16 WS Meeting to help evaluate the potential change.

Fill - The deposit of soil, rock, or other materials placed by man.

Finished Grade - The final grade and elevation of the ground surface after grading is completed.

Footprint - That area of the residence measured from the outside walls (excluding any overhanging portions) which includes indoor uses such as attached garage, carports, utility room, laundry, etc., but excludes outdoor uses such as patios and breezeways.

Grading - Any excavating, or filling or combination thereof, including the conditions resulting from any excavation or fill.

Hillside Development Area - Those areas marked in **FIGURE 2** and to all lands where the natural terrain under the building pad has a slope of ten percent (10%) or greater, whether shown in FIGURE 2 or not. However, a 10% or greater slope, in an area not denoted on Figure 2, created by a natural wash on land that otherwise would not be classified as hillside land shall be exempt from the hillside regulations.

Hillside Wash – Any creek, stream, wash, arroyo, channel or other body of water having ~~historical banks and with~~ a flow rate equal to or greater than 2 cubic feet per second based on a 100-year storm event.

Lot - A legally subdivided parcel of land occupied or intended for occupancy by one main building, together with any accessory buildings including the open spaces required of the Hillside Regulations and having adequate frontage on a public or private street.

~~Natural Features, Significant - Include washes, Significant Vegetation, and Significant Rock Outcroppings provided these features are in their undisturbed natural state.~~

Natural Grade - The undisturbed natural surface of the land, including washes.

Primary Ridge Line - That line running from the highest point along the mountain top downward along a divide to the 1500 foot mean sea level ~~contour line~~elevation as shown on **FIGURE 3**.

Action Report Topic #7

Raised Outdoor Living Area – Uncovered areas such as porches, decks, platforms, and retained areas which extend three (3) feet or more above grade.

Retaining Wall - A wall or terraced combination of walls, including, planters, negative edge pools, used solely to retain more than eighteen inches (18") of material, ~~or~~ water, ~~but not~~ or to support or to provide a foundation or wall for a building.

Raw Spill Slope – An area created by causing or allowing earth or other material to fall, flow or run down the slope, thereby creating a change in the natural appearance and topography.

~~Rock Outcroppings, Significant - Any surface rock or group formation of rocks covering an area of 200 square feet or larger or any surface rock formation with a height greater than ten feet from the surrounding grade.~~

Sheet Flow – A shallow and wide overland flow of water.

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Comment [GB4]: If the code is changed to include the footprint in the disturbance calculation, the definition of footprint will need to be updated. A potential definition is "The livable portion and garage of the main residence and detached accessory buildings."

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Significant Natural Features - Include Hillside Washes, Significant Vegetation, and Significant Rock Outcroppings provided these features are in their undisturbed natural state.

Significant Rock Outcroppings - Any surface rock or group formation of rocks covering an area of 200 square feet or larger or any surface rock formation with a height greater than ten feet from the surrounding grade.

Significant Vegetation - A single tree or cactus having a height greater than 15 feet or three or more trees or cacti, located within a radius of 15 feet, each having a height greater than 12 feet.

Subterranean - That space which lies totally underground, and which cannot be seen from outside the exterior perimeter of the structure on the same horizontal plane which originates at that point where the building intersects the ground.

Town - The Town of Paradise Valley.

~~Vegetation, Significant - A single tree or cactus having a height greater than 15 feet or three or more trees or cacti, located within a radius of 15 feet, each having a height greater than 12 feet.~~

Veneered Rock Slop – A group formation of rocks of similar colors that blend in with the surrounding natural setting.

View Fencing (View Fence) – Fencing that is constructed in such a manner as to achieve ~~8070~~ 80% overall openness.

Section 2204 HILLSIDE BUILDING COMMITTEE.

A. The Hillside Building Committee or Hillside Building Committee Chair as established in Chapter 2 of the Town Code shall review all new applications submitted to the Town for ~~new home~~ Development and related construction within a Hillside Development Area. No building permit shall be issued for such application until approved by the Committee and then such issuance shall only be in accordance with the plans and specifications approved by the Committee.

B. The Hillside Building Committee may review applications for additions to existing structures in accordance with Section 2207 (VII)(A) of this Ordinance.

C. The Hillside Building Committee may review applications for accessory construction (e.g. fences, retaining walls, pools etc.) if the Town ~~Engineer~~ Manager or Designee in consultation with ~~a member of the~~ Hillside Building Committee Chair determines that the proposed construction: (i) creates a significant visual impact; or (ii) proposes an additional disturbance area.

Action Report Topic #3

D. The Hillside Building Committee approval process ~~is a two stages process~~ may consist of the following stages:

1. An Administrative Hillside Chair Review.

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Comment [GB5]: Keep Minimum Openness of 80%

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2. A Combined Hillside Building Committee Review Meeting.
~~1.~~3. A Conceptual Plan Review Meeting.
4. A Formal Hillside Building Committee Review Meeting.
~~2.~~

Section 2205 **REVIEW AND DEVELOPMENT PROCESS.** The Hillside Building Committee shall review Development plans, as outlined in Section 2204, prior to the ~~Community Development Department review and the~~ issuance of a building, grading or other Development permit. The review and development process consists of up to four stages, depending upon the nature and scope of the proposed Development:

Action Report Topic #3 & #14

I. Administrative Hillside Chair Review: The Applicant shall submit a completed application and the required fees to the Town. Proposed accessory structures and additions may be reviewed by the Hillside Building Committee Chair provided the proposed improvements do not: (i) exceed or increase the building height of the main residence; (ii) increase the existing building footprint by more than 1,000 square feet; (iii) create more than 100 square feet of additional disturbed area; (iv) increase the length of walls by more than 25 lineal feet; (v) propose a significant addition of exterior lighting; add more than 1,000 square feet of solar panels, or (vi) create a significant adverse visual impact. The Chair shall review the submittal for compliance with the goals, purposes, and specific criteria of this ordinance.

II. Combined Hillside Committee Review Meeting: The Applicant shall submit all materials outlined in Section 2206 (II) to the Town. The Hillside Building Committee shall then review the submittal for compliance with the goals, purposes, and specific criteria of this ordinance and either approve, approve with stipulations or changes, or deny the submittal. ~~Average~~ Minor remodel/additions, site improvements (such as, but not limited to, pool and spa additions), and solar panel additions over 1,000 square feet in area, may be reviewed as a Combined Hillside Committee Review.

III.

~~I.~~IV. Concept Plan Review Meeting: The Applicant, along with their architect and engineer shall submit a completed application and the required fees, to the Town ~~Engineer~~Manager or designee, at the time they request a concept plan review meeting (pre-hillside meeting) with the Hillside Building Committee. All new single family residence and major remodel/additions require a Concept Plan Review Meeting. The purpose of this meeting is to discuss, review, and give suggestions and guidance to the Applicant regarding the proposed development including: the location of the building pad and accessory uses; how these relate to Significant Natural Features; the preservation of existing vegetation; grading concepts and their adaptation to the natural hillside topography; and how the requirements pursuant to these hillside regulations and purpose statement will guide the proposed Development.

V. Formal Hillside Committee Review Meeting: At this stage, in addition to those materials previously submitted, the Applicant shall submit all materials outlined in Section 2206 (II) to the Town ~~Engineer~~Manager or designee. The Hillside Building Committee shall then review the submittal for compliance with the goals, purposes, and specific criteria of this ordinance and either approve, approve with stipulations or changes, or deny the

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Comment [GB6]: During the January 3rd meeting, the Commission asked that this language be moved to a different location of the code. Staff recommends either keeping this language at this location or removing it since "Applicant" is defined in Section 2203.
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submittal. All new single family residence and major remodel/additions require a Formal Hillside Committee Review Meeting.

~~II.~~

~~III.~~VI. Building Permit Review: The final construction plans submitted to the Town Community Development Department for review and approval shall comply with the final approval of the Hillside Building Committee. Any variation from ~~Chapter 70 of the Uniform Building~~ excavation and grading requirements within the Town Code must be accompanied by a soils engineering report from a testing laboratory or geological engineer approved by the Town Engineer. No site preparation or construction shall commence until the Town has issued a grading, demolition, or building permit.

A. The plans for any Development in the Hillside Development Area, must be approved by the Town and appropriate legal permit(s) issued before any clearing and grubbing, grading, bulldozing, blasting, or movement of earth is commenced. A building permit application must be submitted within twelve months after the date of approval from the Hillside Building Committee or Hillside Building Committee Chair. If a building permit application is not submitted a within twelve the month period, the approval shall be null and void. ~~If Development does not commence within twelve months after securing such approval from the Hillside Building Committee, no construction shall occur until such plans have been resubmitted and re-approved or i~~I If such is appropriate based upon circumstances outside the control of the Applicant, a one-time six (6) month extension may be granted by the Town Manager or designee ~~Engineer~~. Should the applicant allow the permit to expire, at no time after that expiration period does the applicant have any vested prior approval rights.

B. When a building, demolition, or grading permit that involves any cut or fill on a hillside property is required under provisions of these Regulations, the Applicant shall first provide the Town with a form of financial assurance, and a right of entry and temporary construction easement agreement acceptable to the Town Attorney, which places the Town in an assured position to do or to contract to be done the necessary work to cover, restore and landscape exposed fills and cuts to blend with the surrounding natural terrain. Three (3) bids or estimates from a licensed contractor or a licensed professional shall be submitted to the Town identifying the cost to restore and landscape the exposed fill and cuts to blend in with the surrounding natural terrain. The bids shall include, but are not limited to, the cost to regrade the affected area(s), re-landscaping the restored area(s) with native plants, stabling any applicable cut or fill area(s), and applying a desert varnish or stain to any exposed cuts or pad. The Town Staff and Town Engineer shall review the bids and determine the assurance amount. The minimum acceptable assurance shall be in a dollar amount equal to the number of total cubic yards of cut and fill multiplied by 25, or in such greater amount as deemed appropriate by the Town. The amount of the assurance may be adjusted in accordance with the Producer Price Index in order to account for inflation. In the event that construction has not commenced within six months from the date of issuance of the grading or building permit, the plan approval and permit shall expire. Twelve months after the date of the last inspection, such assurance shall be forfeited to the Town in such amount necessary for the purpose of restoration

Action Report Topics #5 and #12

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Comment [GB7]: Chair Strom Recommendation - Instead of trying to get three bids, I would use a $35 multiplier based on 2017 dollars and have it adjusted yearly based on the USA Consumer Price Index. Below is the scenario for $25 in 2004 to today.

Using the Consumer Price Index provided by the United States government;

Equivalent of $25 in 2004

2005	$25.81
2006	$26.70
2007	$27.37
2008	$28.49
2009	$28.52
2010	$29.29
2011	$29.73
2012	$30.61
2013	$31.15
2014	$31.61
2015	$31.85
2016	$32.08

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Comment [GB8]: Commission wants to remove requirement for 3 bids and increase the multiplier from $25 to $35. Commission tasked Commission Campbell and Staff to research this of the construction site to its original condition and all authorized permits shall be revoked and become void. The property owner shall, upon reasonable Notice from the Town, provide access to the propert for the purpose of restoration of the construction site to its original condition.

~~B.~~

~~IV.~~ VI. Issuance of Certificate of Occupancy: Prior to the issuance of any Certificate of Occupancy for any building constructed pursuant to these Regulations, the applicant shall obtain from the ~~Town Engineer and the Town Building Inspector~~Town certification of compliance with this Article. The Certificate of Occupancy may be issued without the installation of the landscaping, based upon the submittal of a landscape assurance and a right of entry and temporary construction easement agreement acceptable to the Town Attorney. Three (3) bids or estimates from a licensed contractor or a licensed professional shall be submitted to the Town identifying the cost to install the landscaping in accordance with the approved landscape plan. The Town Staff and Town Engineer shall review the bids and determine the assurance amount.

Action Report Topic #12

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Comment [GB9]: Need Planning Commission Input - Should a minimum amount be listed?

Comment [GB10]: Remove 3 bids. Hillside assurance can be held by Town from May 15th thru September 15th due to landscaping

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Section 2206 DOCUMENTARY REQUIREMENTS AND CERTIFICATION [558 580]

I. CONCEPT PLAN REVIEW MEETING. The applicant shall submit the following:

A. Notification Letters. At least three (3) weeks prior to the scheduled conceptual Hillside Building Committee meeting the applicant shall submit to the Town a neighbor notification letter complete with address labels, with appropriate postage, for all property owners within 500 feet of the perimeter of the subject property. This notification letter shall include the following information; a) type of proposed development (addition, remodel, new construction), b) the scheduled hearing date and time, c) that the letter is only as a courtesy notification and that their attendance at the meeting is not required. d) the purpose of the meeting, and e) the goals of the meeting.

B. Seven (7) copies of a preliminary site plan that includes, but is not limited to, the building footprint, driveway, swimming pool, and accessory use locations along with topographic information for the Lot.

Action Report Topic #6

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C. A 3-dimensional representation of the general massing of all proposed structures (e.g. a mass model, a 3-D scaled rendering or a scaled computer generated model in relation to topography – not a detail model).

D. A recent aerial photo of the site (less than ~~3~~ 1 year~~s~~ old), with topography, lot lines, and the building footprint superimposed on it, ~~and~~ identification of ~~significant~~ Significant ~~natural~~ Natural ~~features~~ Features, as well as adjacent lots and structures within 100 feet of the perimeter of the subject property (minimum 24”X 36”), and the location of the driveway access in relation to the nearest roadway.

E. Preliminary calculations on land disturbance and cut and fill methods.

II. FORMAL AND COMBINED HILLSIDE COMMITTEE REVIEW MEETING. All plans submitted to the Town for review shall be stamped and sealed by the appropriate registered or licensed professional (e.g. civil engineer, land surveyor, geologist, architect). All plans shall be reviewed by the Hillside Building Committee. In addition, once the plans have been approved by the Committee the applicant shall submit final plans, in accordance with the Hillside Building Committee’s approved plans, to the Community Development Department for ~~building permits~~review. Plan review fees for each such submittal shall be paid at the time of the submittal of such plans in the amount specified in the Town of Paradise Valley fee schedule, as such may be amended from time to time. The following plans and material shall be required:

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A. Notification Letters. At least three (3) weeks prior to the scheduled Formal Hillside Building Committee Meeting the applicant shall submit to the Town a neighbor notification letter complete with address labels, with appropriate postage, for all property owners within 1,500 feet of the perimeter of the subject property. This notification letter shall include the following information; a) type of proposed development (addition, remodel, new construction), b) the scheduled

hearing date and time, c) that the letter is only as a courtesy notification and that their attendance at the meeting is not required, d) the purpose of the meeting, and e) the goals of the meeting.

B. Seismic Refraction Survey. ~~All~~ Unless waived by the Town Manager or desginee, all proposed cuts shall require a seismic refraction survey, performed by a registered geologist. If the geological report or seismic refraction survey indicates fractured or unstable rock, then the proposed location of the building site (or appurtenances) shall be changed to a stable location unless the unstable condition(s) can be mitigated by an engineered design that creates a stable location and complies with the provisions of Article XXII and other Articles of this Zoning Ordinance. The geological report and results of the seismic refraction survey shall be submitted to the Town.

Comment [GB11]: Engineering Department to provide language regarding safety analysis.

C. A detailed site plan (minimum 24” X 36”), sealed by a registered engineer or land surveyor, with topographic information for the entire lot including under the footprint of the building. This site plan shall depict: the limits of disturbance; the building envelope including the building footprint, driveway(s), swimming pools, mechanical equipment, sanitary sewer or septic systems; location, size and type of mechanical screen walls and pool barrier fencing; length and height of retaining walls; all accessory buildings; and ~~significant~~ Significant ~~natural~~ Natural ~~features~~Features.

D. Photographs of the site looking out from the property in all directions and of the property from several different views.

F. A detailed grading and drainage plan (minimum 24” X 36”), sealed by a registered civil engineer, with topographic information for the entire lot. This plan shall show proposed finished contours at 1 foot intervals within a perimeter 20 feet from the building, a maximum 5 foot intervals elsewhere, and shall show existing and proposed contours. This plan shall show limits of excavation and fill; slope of cut and fill; total cubic yards of excavation and fill; method of concealment for each fill or exposed cut; and the calculations for amount of disturbance for the total development. This plan shall show original drainage pattern (natural course) and proposed changes. If any structures or culverts are involved, it will be necessary to include an estimate of peak flows for a 100 year frequency storm to establish drainage facility cross-sections. Sheet flow diverted from its original drainage pattern shall be returned to its natural course before leaving the property.

G. A detailed landscape plan that includes, but is not limited to the following: the building envelope; building footprint; all accessory structures and locations; ~~significant~~ all Significant ~~natural~~ Natural ~~features~~Features; plant materials list with type, quantity and size; plant location; location and species of salvaged plant materials; and methods for re-vegetation of all disturbed areas. Native desert vegetation shall be identified and preserved to the maximum extent reasonably possible ~~in the landscape plan~~. A landscape salvage plan shall be provided.

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Action Report Topic #6

H. Cross sections of new buildings and appurtenances at a scale equal to or greater than the site plan scale at three or more locations perpendicular to the contours through the building site shall be clearly shown on the topographic map and sealed by a registered professional, or as determined by the Town Manager or designee.

I. A detailed outdoor lighting plan indicating the proposed luminaire locations on the building and on the site (if applicable); the type of illuminating devices including; the manufacture's catalog cut sheets and drawings; and photometrics that describe the illuminating devices; the fixtures, lamps, lumens and ~~wattages~~, supports, the ~~aiming~~ beam angles, and other devices.

J. 3 Dimensional Scaled Computer Model or A Scaled Study Model: The applicant shall submit a scaled 3D computer model or a scaled study model for Hillside Building Committee review.

a. 3D Computer Model: A computer generated 3-dimensional model, with accurate points of reference superimposed on it; showing the appearance of the building, lot, landscaping, and skyline. The model must accurately represent the massing of all structures and roof forms as well as the following:

i. All windows, exterior doors and skylights.

ii. A sufficient area of the property to visually relate the proposed structure and accessory uses to the natural terrain.

~~I.~~**b.**

~~J.~~ b. ~~A~~ 3D Study Model: Including all proposed improvements, at not less than (1/16) inch = (1) foot showing the relationship of all proposed improvements to the contours of the lot. The model must accurately represent the massing of all structures and roof forms as well as the following:

1. All windows, exterior doors, and skylights (showing the location of all proposed skylights and their orientation to neighboring properties).

2. The model shall include enough of the property to visually relate the proposed structure and accessory uses to the natural terrain.

3. The Applicant's name, architect's name, builder's name, lot number, scale, and north arrow.

K. An accurate oblique view architectural rendering in color or a computer generated 3-dimensional picture shall be submitted showing the appearance of the building, lot, landscaping, and skyline. The rendering or computer generated picture, and the model may remain in the custody of the Town ~~Engineer~~ until a Certificate of Occupancy is issued or until released by the Town ~~Engineer~~.

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L. Exterior Material Samples: Include samples of all colors, materials, and material specifications mounted on rigid board with all materials identified with the manufacture's name, color, and LRV number where applicable. Material samples or color specifications are required for all exterior materials and finishes including but not limited to:

• Roof	• Wall color and texture (8½" x 11" sample size)
• Metal	• Masonry
• Hardscape	• Glass
• Stone	• Driveway and terrace paving
• View fencing	• Garage doors

• Patio, deck area including second story structures, pool, and breezeways

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M. The Applicant's Engineer or Surveyor shall install a marker to designate the location of the house at the major building corners. The markers should be at least 3 feet in height with a colored ribbon at the top of the marker. The applicant shall install markers at least two (2) weeks prior to the Formal Hillside Committee meeting and remove immediately following the formal committee meeting.

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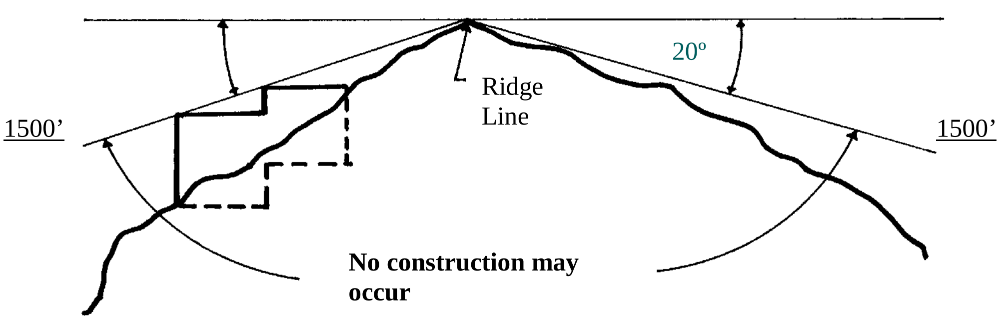
Section 2207 DEVELOPMENT STANDARDS [558 654]

I. MOUNTAIN PROFILE INVIOLATE

A. At and above an elevation of 1500 feet mean sea level, no Development shall occur which will Alter the Mountain Top Ridge Lines as shown on **FIGURE 3** . A model must be submitted pursuant to Section 2206(II)(J) showing compliance with this paragraph together with complete plans showing the appearance of the mountain top profile, as part of the submittal for the Formal Hillside Committee Review. Further, no structure may extend above a plane that originates on the primary ridge line and angles downward from the primary ridge line by twenty degrees (See **FIGURE 4).**

FIGURE 4 – RIDGE LINE TWENTY DEGREE DELINEATION



II. ARCHITECTURAL STANDARDS.

A. For development within the Hillside Development Areas, the height of structures shall be determined by the following four (4) sub-sections and not by the zoning district regulations that apply to lots or parcels outside the Hillside Development Area.

~~A.~~ 1. Primary Building

i. The height of a primary building or primary structure is limited to a twenty-four (24) foot imaginary plane that parallels the existing pre-development natural grade, as measured vertically from any point under the building (see **FIGURE 5**). ~~The subterranean portion of the structure is not included in the total height calculation provided that at least half (½) of the volume of the subterranean portion of the structure is below natural grade.~~

ii. In the case where the natural grade has been cut and is not restored back against the building, no exposed face in any vertical plane shall

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exceed a twenty-four (24') foot height measured from the ~~lowest~~Lowest, ~~finished~~ Finished ~~grade~~Grade. The maximum height of any deck support column shall not exceed twelve (12') feet tall measured from the adjoining grade.

2. Accessory Structures

Action Report Topic #7

i. The height of an accessory building or accessory structure is limited to a sixteen foot (16') imaginary plane that parallels the existing pre-development Natural Grade, as measured vertically from any point under the building.

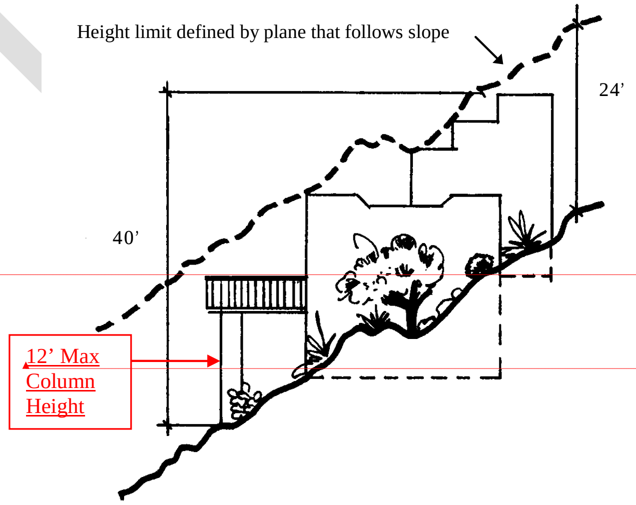
ii. In the case where the natural grade has been cut and is not restored back against the building, no exposed face in any vertical plane shall exceed a sixteen (16') foot height measured from the lowest, Finished Grade. The maximum height of any deck support column shall not exceed twelve (12') feet tall measured from the adjoining grade.

ADD FIGURE ILLUSTRATING 16' HEIGHT LIMIT.

Action Report Topic #8

~~iii.~~3. The maximum overall height of the building or structure, including chimneys and accessory buildings, shall not exceed forty (40) feet from the highest point of ~~the building to natural grade at the lowest point adjacent to the building structure or column~~of a building or structure to the lowest point of Natural Grade at the lowest building or structure (excluding driveway retaining walls) ~~(~~(see **FIGURE 5**).

FIGURE 5 – BUILDING HEIGHT IN HILLSIDE



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Comment [GB12]: Figure 5 to be updated to reflect these edits.

Comment [GB13]: Update Figure 5 to clarify measurement of 40' maximum height limit.

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~~iv.~~ 4.Where a building spans a wash the maximum height of twenty-four (24') feet shall be measured vertically from that point where the visible structure and the side of the wash intersect. See **FIGURE 6.**

FIGURE 6 – BUILDING HEIGHT WITH A WASH CROSS SECTION

B. Cantilevers. The primary residence, accessory buildings, driveways and other structures (such as pool decks) may employ the use of cantilevers, subject to the following limitations:

1. Primary residence and accessory buildings. Cantilevered elements of the building must comply with the applicable setbacks and heights of the building. All of the area underneath the cantilevered element shall be calculated as disturbed area.
2. Driveways. Cantilevered driveways shall not be allowed.
3. All other structures (such as pool decks) employing the use of a cantilever may extend the cantilever a maximum horizontal length of 4 feet and a maximum vertical height of 8 feet. All of the area underneath the cantilevered element shall be calculated as disturbed area. The cantilevered elements of the structure must comply with the applicable setbacks.
4. The area under a cantilever must be finished with colors or materials that match the adjoining structures or blend in with the surrounding natural setting. The materials or colors used shall not have a LRV (Light Reflective Value) greater than thirty-eight (38) percent.

~~B. Structures employing the use of a cantilever may extend the cantilever a horizontal distance twice the height of the support. The maximum vertical height of the support shall be eight (8) feet. One-half the area underneath the cantilevered element shall be calculated as disturbed area.~~ (See **FIGURE 7** below).

Action Report Topic #15

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Comment [GB14]: There was no consensus on the 12/20/16 PC meeting regarding this topic. It was recommended that language be added to identify what the area under a cantilever should look like. Additional review and discussion is needed.

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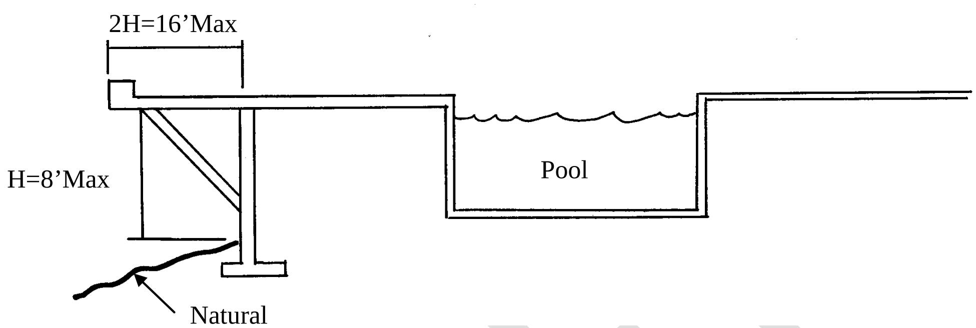
Comment [GB15]: New figures to be added to the code to illustrate these scenarios.

Comment [GB16]: There was no consensus regarding the proposed changes to the limitations on cantilevers at the 1/3/17 PC Meeting. It was recommended that staff research other city codes to see how different communities address cantilevers, provide several pictures of cantilevers for reference, and to include the entire area underneath a cantilever as disturbance.

Comment [GB17]: During the 1/17/17 meeting, there was discussion about: 1) creating different cantilever requirements for a building and a deck, 2) having all of the area under the cantilever count as disturbance and floor area, and 3) making the area under the cantilever applicable to the overall 40' height measurement. Commission directed staff to continue researching cantilever requirements with Commisioner Campbell.

FIGURE 7 - HEIGHT FOR A CANTILEVERED ELEMENT



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5. All of the setback requirements of the underlying zoning district shall apply in the Hillside Development Area (see Article X~~, Section 1001, Table 1001~~).

Comment [GB18]: Remove support from illustration on Figure 7.

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Action Report Topic #7

~~C.~~6. Raised Outdoor Living Areas are subject to the setback requirement of pools and spas and are limited to a maximum height of eight (8') feet tall.

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Action Report Topic #2

~~D.~~7. Materials used for exterior surfaces such as structures, walls, roofs and fences shall blend with the surrounding natural setting and avoid high contrasts. There shall be no paint or material colors used which have a LRV (Light Reflecting Value) greater than thirty-eight (38) percent. Materials and color used for exterior surfaces are subject to Hillside Building Committee review and approval. The applicant must demonstrate how the materials and colors used for the exterior surfaces blend in with the natural surroundings and settings. Limited use of contrasting accent colors (in excess of 38% LRV) for small elements, including, but not limited to items such as doors and window mullions, may be allowed upon explicit approval of the Hillside Building Committee.

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Action Report Topic #14

~~E.~~8. All electrical service equipment and subpanels and all mechanical equipment including, but not limited to, air conditioning, evaporative cooling, and antennas greater than 24" in diameter shall not be allowed on the roof. Solar panels may be allowed if they are integrated into the building design and hidden from view when viewed from the same or a lower elevation and approved by the Hillside Building Committee by a Combined Review or Administrative Hillside Chair Review. Solar panels may be allowed on pitched roofs only when screened by the hillside or hillside cut. All mechanical, electrical, and natural gas equipment along with pool equipment and antennas shall be screened in such a manner that they are not visible from outside the property when viewed from the same or a lower elevation. Vegetation does not constitute a screen.

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Comment [GB19]: Staff to research other solar technology such as solar shingles and potential use on hillside homes.

F. Mirrored surfaces or reflective treatments that changes or enhances ordinary glass into a mirror surface ~~is~~ are prohibited. Permanently reflective metallic surfaces shall be prohibited.

G. The building design should minimize the reflection of daytime glare from glass and the emission of light from within the structure during evening hours.

H. The quantity and orientation of skylights shall be designed to minimize night time emission of light and may be allowed upon approval of the Hillside Building Committee.

~~H.~~I. Shake shingle roofs are prohibited. Existing shake shingle roofs on residential structures may be allowed only until such time that it is determined, during the course of normal maintenance, that a new roof (re-roof) is necessary and/or the extent of maintenance or repair work requires a building permit from the Town.

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III. LAND DISTURBANCE STANDARDS.

Action Report Topic #5

A. The limits of construction, demolition, ~~and~~ or proposed disturbed areas shall be clearly staked in the field, with a minimum barrier of visible roping, prior to and during construction and shall conform to the approved ~~individual site analysis~~ plans. ~~No~~ Both during and after construction, no disturbance shall be permitted beyond the areas designated as the limits of disturbance on the plans ~~both during and after construction~~. If land disturbance in violation of this ordinance occurs, the illegally-disturbed area(s) shall be restored to its natural grade and re-vegetated with plant material of the same species, size, and at a similar density present prior to the illegal disturbance.

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B. All disturbed land that is not otherwise used for approved development shall be restored to the natural grade and re-vegetated with plant material ~~as listed in the Town of Paradise Valley landscape guidelines~~ native to the hillside or pursuant to a landscape plan approved by the Town.

C. All buildings, structures, roads, and drives shall, to the fullest extent practicable, follow and utilize the natural contours of the land to minimize disturbance. The maximum height of any cut used to establish a building site shall not exceed 30 feet.

D. All surplus excavated material shall be removed from the lot prior to the issuance of the Certificate of Occupancy.

E. After final grading, not more than 5% of the lot shall be steeper than the natural grade of the lot.

F. The total disturbed area shall not exceed the allowed percentage of the lot area as shown in **TABLE 1** below.

G. Grading within street rights-of-way or tracts of land for private roads is exempt from the disturbance calculations. Any roadway grading beyond the limits of the

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dedicated rights-of-way or private road tracts shall be placed in slope easements and included within the calculations for land disturbance limitations.

H. A legally pre-existing disturbed area may be excluded from disturbed area calculations when the applicant ~~has committed to comply~~complies with all of the following restoration conditions:

1. ~~the~~ The restored area shall follow original natural contours.

2. ~~the~~ The restoration shall be treated with an aging agent approved by the Town Manager or Designee ~~Engineer~~ and planted with indigenous desert material that is consistent in density with the area surrounding the undisturbed areas abutting the pre-existing disturbed area.

3. ~~the~~ The restoration process shall be sealed by a landscape architect and/or a registered ~~engineer or architect~~professional.

Action Report Topic #16

I. On-site retention may be required. Please reference the Town of Paradise Valley Storm Drain Design Manual for on-site retention requirements.

J. On-site retention shall be counted as Disturbed Area. Retention areas not employing the use of retaining walls and vegetated with native plant material shall count as fifty (50%) percent disturbed area.

Action Report Topic #4

~~I.~~K. The livable portion of the main residence including garage and livable portions of detached accessory buildings shall not be counted as disturbed area provided that all buildings are within the required setbacks and do not exceed the building height limitations as specified in Section 2207 (II) (A) of this Ordinance.

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Comment [GB20]: Commission requested Town Engineer attend next meeting to discuss on-site retention requirements.

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Comment [GB21]: If the code is changed to include the footprint in the disturbance calculation, the definition of footprint will need to be updated.

Comment [GB22]: Keep as is. Do not count footprint as disturbance. Wordsmithing may be needed to add clarity.

TABLE 1 – Slope Category / Lot Disturbance Limitations

Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance
10%	60.0	41%	9.90	72%	6.80
11%	53.66	42%	9.80	73%	6.70
12%	47.94	43%	9.70	74%	6.60
13%	42.81	44%	9.60	75%	6.50
14%	38.21	45%	9.50	76%	6.40
15%	34.11	46%	9.40	77%	6.30
16%	30.48	47%	9.30	78%	6.20
17%	27.27	48%	9.20	79%	6.10
18%	24.46	49%	9.10	80%	6.00
19%	22.01	50%	9.00	81%	5.90
20%	19.88	51%	8.90	82%	5.80
21%	18.04	52%	8.80	83%	5.70
22%	16.48	53%	8.70	84%	5.60
23%	15.16	54%	8.60	85%	5.50

Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance
24%	14.05	55%	8.50	86%	5.40
25%	13.13	56%	8.40	87%	5.30
26%	12.37	57%	8.30	88%	5.20
27%	11.76	58%	8.20	89%	5.10
28%	11.28	59%	8.10	90%	5.00
29%	10.90	60%	8.00	91%	4.90
30%	10.62	61%	7.90	92%	4.80
31%	10.41	62%	7.80	93%	4.70
32%	10.25	63%	7.70	94%	4.60
33%	10.15	64%	7.60	95%	4.50
34%	10.08	65%	7.50	96%	4.40
35%	10.04	66%	7.40	97%	4.30
36%	10.02	67%	7.30	98%	4.20
37%	10.01	68%	7.20	99%	4.10
38%	10.00	69%	7.10	100%	4.00
39%	10.00	70%	7.00		
40%	10.00	71%	6.90		

IV. DRIVEWAYS [558]

Action Report Topic #9

A. Driveways that only serve a new single residence shall be: (1) a minimum of 12 feet wide; (2) surfaced with paving brick, textured integral colored concrete (i.e. stamped or exposed aggregate etc.) or other similar decorative paving materials specifically colored to blend with the existing natural color of the site (asphalt driveways are prohibited); (3) designed with an overall grade that does not exceed 30%; (4) constructed in full conformance with the Fire Code; and (5) developed only as specifically approved by the Hillside Building Committee. The driveway shall be included in the calculations for land disturbance limitations at a ratio of 50% of the total disturbed area of the driveway, if the driveway is constructed at a grade plus or minus (6) inches from natural grade. Driveways with cut and fill in excess of (6) inches and under (18) inches from natural grade shall be charged with 75% of the total disturbed area of driveway surface. The Driveways with cut and fill in excess of (18) inches from natural grade shall be charged with 100% of the total disturbed area of the driveway surface. The entire driveway must be within the natural grade limit to be subject to the disturbance ratios noted above.

B. Driveways that serve an existing home undergoing renovation, remodel, or an addition shall be included in the calculations for land disturbance limitations subject to the following conditions:

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Comment [GB23]: There was no consensus on the 12/20/16 PC meeting regarding this topic. Additional review and discussion is needed.

Comment [GB24]: The general direction was to make the driveway credit consist or the same for driveways that serve new homes and remodeled homes. There was concern that current code may allow for excessively large driveways on remodels due to the credit. Commission tasked Staff and Commissioner Campbell to research this.

1. Existing driveways reconstructed with paving bricks, textured integral colored concrete (e.g. stamped or exposed aggregate etc.) or other similar decorative paving materials, specifically colored to blend with the existing natural color of the site, shall be excluded from the land disturbance calculations.

2. Existing driveways surfaced with paving bricks, textured integral colored concrete (e.g. stamped or exposed aggregate) or other similar decorative paving materials, specifically colored to blend with the existing natural color of the site, shall be excluded from the land disturbance calculations.

3. Existing asphalt or uncolored concrete driveways not reconstructed with paving bricks or textured integral colored concrete (e.g. stamped or exposed aggregate etc.) shall be calculated as disturbed area at a ratio of 150% of the total disturbed area of the driveway.

Action Report Topic #9

4. Any new portions of the driveway beyond the layout of the existing driveway shall be included in the calculations for land disturbance limitations at a ratio of 50% of the total disturbed area of the driveway, if the driveway is constructed at a grade plus or minus (6) inches from natural grade. Driveways with cut and fill in excess of (6) inches and under (18) inches from natural grade shall be charged with 75% of the total disturbed area of driveway surface. The Driveways with cut and fill in excess of (18) inches from natural grade shall be charged with 100% of the total disturbed area of the driveway surface. The entire driveway must be within the natural grade limit to be subject to the disturbance ratios noted above.

~~3.~~

C. The minimum standard turning radius for a driveway is 40 feet; except that a minimum ~~25~~ 35 foot radius may be used provided all structures are protected with an approved fire extinguishing system.

D. Any street or driveway cut greater than 8 feet shall not have a length greater than 100 feet. The applicant must mitigate means of breaking-up the mass of the cut and blending the cut in with the surrounding natural terrain.

E. A twenty (20) foot by thirty (30) foot driveway apron may be required by the Fire Marshall or the Building Official at or near the garage or another location deemed necessary by the Fire Marshal, with no more than a 5% grade, to serve as a staging platform to fight a fire.

F. The maximum height, measured vertically, of any cut used to establish a street or driveway shall not exceed 30 feet.

V. GRADING AND DRAINAGE STANDARDS.

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Comment [GB25]: Commission requested that staff check with the Fire Marshal and identify why a 35' radius is needed.

A. There shall be no clearing, grubbing, grading, importing or stockpiling of fill material on, or to, any site prior to approval of such Development by the Hillside Building Committee and approval of a grading plan by the Town ~~Engineer~~, unless such clearing, grubbing, or grading, is required by the Town for public safety purposes. If applicable, approval of a grading plan and drainage report prepared by a registered Engineer, may be required for Town review and approval.

~~A.~~B. Storm water retention shall be provided to the greatest extent possible in accordance with the Town Code and the Town Storm Drainage Design Manual.

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~~B.~~C. The maximum depth of fill shall not exceed ~~8~~ 7.5 feet except beneath the footprint of the main residence. All exposed disturbed area fill shall be contained behind retaining walls or covered with a natural rock veneer and treated with an aging agent and landscaped with indigenous plant material.

~~C.~~D. ~~Rock veneered spill slopes~~Veneered Rock Slopes may be allowed provided that they are approved by the Hillside Building Committee, and:

1. The vertical height of the Veneered Rock Slope ~~spill slope~~ does not exceed the vertical height of the exposed cut with the base of the Veneered Rock Slope~~spill slope~~ engineered for stability and keyed into the mountain or supported by a retaining wall.

2. The Veneered Rock Slope~~spill slope~~ does not exceed a one to one slope.

3. Retaining walls used to limit the height of the Veneered Rock Slope~~spill slope~~ are color treated or veneered to blend in with the surrounding natural colors.

~~D.~~E. Raw ~~spill~~ Spill ~~slopes~~ Slopes are prohibited. Any violation will be subject to a stop work order until the spill slope is removed, restored to its natural grade, re-vegetated and approved by the Town.

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~~E.~~F. A ~~hillside~~ Hillside ~~wash~~ Wash shall not be diverted, relocated or moved from its present position to another location, however, a ~~hillside~~ Hillside ~~wash~~ Wash may be bridged by a structure so long as such structure does not impede the flow of the hillside wash.

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~~Earth contiguous to the structure shall contact that structure at an angle approximating that of the natural grade.~~

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~~F.~~G. Washes located on a property shall be maintained in accordance with Chapter 5 and Chapter 8 of the Town Code.

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VI. WALLS AND FENCES.[558]

Action Report Topic #1

A. Curbs less ~~than18~~ than 8 inches above finished grade are not considered walls.

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B. No more than 300 total linear feet of wall shall be visible from any point on the property line. All pool barriers shall be view fencing. View fencing is not calculated in the 300 feet maximum allowable wall length.

C. Walls that are otherwise permissible in Article XXIV are prohibited in the Hillside Development Area. Retaining walls, pool barriers, walls used to screen mechanical equipment, driveway columns and entry gates, and tennis/sport court fencing are allowed provided that they are of minimum lengths and heights, as further specified below, and are approved by the Hillside Building Committee.

1. Retaining Walls:

a. The intent of the retaining wall requirements is to mitigate the massing and impact of walls on the hillside and preserve the characteristic of the desert. The objective is to allow only the minimum amount of retaining walls needed to access the property, retain cut and fill, and screen mechanical equipment and windows of interior bathroom areas.

Action Report Topic #1

b. Where retaining walls are provided, they shall meet the setback requirements of Section 2404, Height and Setback Regulations, unless needed to access the property (such as driveway retaining walls) or deemed necessary by the Town Engineer and the Community Development Director to prevent erosion or flooding.

~~a.~~c. The maximum length of any continuous retaining wall shall not be more than 100 linear feet. The maximum height of any retaining wall shall not be more than 8 feet. The height of a retaining wall is measured from the low side of natural grade when retaining fill slopes and from finished grade when retaining cut slopes to the top of the wall; whether the top is retaining earth or not.

~~b.~~d. Retaining walls shall be used for the purpose of containing fill material or for minimizing cut or fill slopes. The retaining wall may only extend six (6) inches above the material it is retaining.

~~c.~~e. A terraced combination of retaining walls shall be measured as a single retaining wall provided the combined walls are: 1) no more than eight (8) feet total vertical height; 2) terraced with a minimum distance between of four (4) feet and a maximum separation of eight (8) feet; and 3) contain appropriate vegetation between the walls so as to soften the visual impact of the combined walls (see **FIGURE 8**). These separation requirements apply to any single lot and do not apply to adjoining walls on neighboring properties.

~~d.~~f. When a safety fence, on top of a retaining wall, is required by code it shall be a view fence and shall be painted to blend with surrounding natural colors.

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~~e.~~g. Where retaining walls are provided they shall be color treated, textured, or veneered to blend in with the surrounding natural colors and textures of the native rock and soils at the site.

Action Report Topic #17

2. Pool Barriers. All pool barriers shall be View Fencing. The pool barrier shall be the minimum amount that is needed to secure the pool and that is appropriate for the site.

~~2. Pool Barriers: Shall be view fencing. Open view fencing is not calculated in the 300 feet maximum allowable wall.~~

3. Screen Walls: These walls may be solid walls provided they are of minimum height and length needed to screen the mechanical equipment, garbage cans, or windows of interior bathroom areas, and shall not exceed six (6) feet in height. Screen walls over 6 feet in height may be allowed, at the discretion of the Hillside Building Committee, to properly screen the mechanical equipment or windows of interior bathroom areas; provided, 1) such walls meet the allowable setbacks and height of an accessory structure, and 2) screening area surrounded by screen walls is calculated as part of the allowable floor area.

4. Tennis/Sport Courts: Fences surrounding a tennis court or sport court shall be~~:~~; (i) no greater than 10 feet in height as measured from the playing surface, (ii) ~~set within the disturbable area of the Lot~~counts as disturbed area, and (iii) View Fencing and colored to blend in with the surrounding area.

5. ~~5.~~ Driveway ~~Columns~~ columns and ~~Entry~~ entry ~~Gates~~ gates may be located ten (10) feet or more from the property line. The columns and gate are limited to six (6) feet in height and the columns may be a maximum size of two (2) feet by two (2) feet. Electrically controlled gates must be equipped with an approved key switch located as far as possible from the right-of-way.

Action Report Topic #1

6. Driveway Retaining Walls. Driveway retaining walls may extend 18 inches above the driving surface provided the retaining wall meets the 8 foot height limit. When a safety fence, on top of a driveway retaining wall, is required by code it shall be a 36 inch view fence and shall be painted to blend with surrounding natural colors. The retaining wall must comply with the 8 foot height limit; however, the view guard is not limited to the 8 foot retaining wall height limit.

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Comment [GB26]: Need Planning Commission input regarding the potential limitation on the amount of pool barrier fencing. Should a limited be added to the code? If so, what is an appropriate limit? Or, should a general statement of "a minimal amount needed to secure the pool area" be kept and let the Hillside Committee determine what is appropriate for the site.

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Comment [GB27]: Add language to clarify that all of the tennis court area is included in the disturbance calculation.

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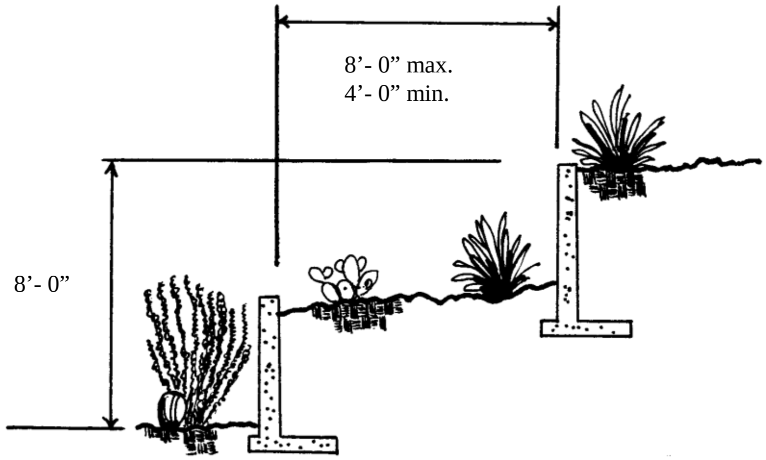
Comment [GB28]: Verify guard rail height with Building Official and determine if guard rail height shall be measured from driveway surface or at bottom of guard rail.

FIGURE 8 –TERRACED VERTICAL RETAINING WALLS

Comment [GB29]: Relocate Figure 8 below the text of 2207.VI.1.e.



VII. ACCESSORY STRUCTURES AND ADDITIONS TO EXISTING STRUCTURES. [558]

~~A. The Hillside Building Committee may review applications for the proposed accessory structures and additions to existing structures if the Town Engineer in consultation with a member of the Hillside Building Committee determines that the proposed accessory structures or addition: (i) exceeds or increases the building height of the main residence; (ii) increases the existing building footprint by more than 1,000 square feet or more than 50% of the original building square footage; (iii) creates an additional disturbance area; (iv) increases site walls; (v) proposes a significant addition of exterior lighting; or (vi) creates a significant adverse visual impact.~~

Comment [GB30]: Moved to Section 2205 and updated criteria.

~~B. The Hillside Building Committee may combine the Concept Plan Review Meeting and the Formal Hillside Committee Review Meeting for applications conforming with the criteria set forth in Subsection VII (A).~~

~~C. If no new disturbed area is required and the proposed accessory structure or addition meets all other hillside requirements including allowable disturbed area, a permit for an accessory structure, or an addition to hillside building may be obtained without requirements for, disturbed area calculations or any other specific requirements as designated by the Town Engineer.~~

~~D.~~A. Any proposed accessory structure or improvements to existing hillside structures which require additional disturbed area shall be accompanied by calculations of prior disturbed area to determine if the entire site is within the allowed limits for hillside construction. When the disturbed area equals that allowed, no further construction involving additional disturbed area will be permitted.

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~~E.~~B. Accessory buildings and structures shall not occupy more than one-half of the total ground area of the main building. No accessory building or structure shall exceed the height specified in Table 1001B or elsewhere in this ordinance.

VIII. SEWERS AND UTILITIES.

A. Grading for septic systems, evapotranspiration systems, and alternative systems shall be included in the calculations for land disturbance limitations unless:

1. The disturbed area is brought back to original natural grade contours, treated with an approved aging agent and planted to blend with surrounding natural growth,

2. Special landscape plans for evapotranspiration systems shall be submitted to the Town Engineer. Plans shall show the appropriate vegetation and supplemental irrigation systems approved by the Town Engineer.

B. Grading for utility lines, including water and sewer lines and lateral lines, electric, gas, telephone and cable services, shall be included within the calculations for land disturbance limitations unless:

1. Trenches are placed under a driveway, under paving or in other areas already counted as disturbed, or

2. Trenches and related disturbed areas are restored to appear as original ground, color treated and planted to blend with surrounding natural growth.

IX. FIRE PROTECTION.

A. Washes must be maintained as easements as described in Section 8-7 of the Town Code and other applicable codes to minimize the risk and spread of fire.

B. Grasses known to be highly flammable, such as fountain grass, *Pennisetum setaceum*, and buffel grass, *Pennisetum ciliare* are not allowed in a Hillside Development Area.

Section 2208 OUTDOOR LIGHTING [558]

A. Purpose: The intent of these lighting requirements is to preserve the low light level conditions that are inherently characteristic of the desert. The objective is to allow only the quantity and level of lighting necessary for safety, security and the enjoyment of outdoor living while protecting against direct glare and excessive lighting; protecting the ability to view the night sky; and preventing light trespass.

Comment [GB31]: Outdoor Lighting - This Section to be Replaced with Lighting Code Updates that are currently under review by Planning Commission. – Action Report Topic #10

Comment [GB32]: Updates to this section of the code were not addressed at the 1/17/17 meeting since Lighting Code Updates were under a separate review at that time.

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B. Definitions: For the purposes of this section, exterior lighting is defined and regulated by the following definitions and categories:

1. Footcandle (fc) - A unit of illuminance of equal to 1 lm/ft² (lumen / sq. ft.) or 10.76 lx (lux).

2. Fully Shielded (Full Cut-Off) - A fixture shielded with an opaque material so that light rays emitted by the fixture are projected only below a horizontal plane running through the lowest point on the fixture where light is emitted.

3. Lumens – The Standard International (SI) unit of luminous flux.

4. Luminaire (Light Fixture) - A complete lighting unit consisting of a lamp or lamps and ballast(s) (when applicable) together with the parts designed to distribute the light, position and protect the lamps, to connect the lamps to the power supply.

5. Opaque - Impervious to the passage of light.

6. Partially Shielded (Partial Cut-Off) - A fixture that allows light rays to be emitted up and down and shielded with an opaque material in such a manner to prevent the bulb from being seen.

7. Safety Lighting - Low-level lighting used to illuminate vehicular and pedestrian circulation.

8. Security Lighting - Lighting that is fully shielded that is intended to provide bright illumination during emergency situations only.

9. Spill Light - The amount of light that illuminates beyond the range or primary area that the fixture is intended to light.

10. Translucent – A material through which light can pass but the light source cannot be seen.

11. Trespass Lighting - Spill light that encroaches onto neighboring properties.

12. Visual Enjoyment Lighting - Lighting intended to illuminate outdoor living areas.

C. Design Standards:

1. All building mounted light fixtures shall be fully shielded. Recessed lights in exterior soffits, eaves, or ceilings shall have a 45°cutoff. At the main entry of the primary structure, a maximum of two (2) translucent fixtures may be permitted as long as the total lumens, per fixture, do not exceed a

maximum of 750 lumens. All other entrances, excluding garage doors, shall be limited to no more than one (1) fixture.

2. All fixtures, unless otherwise allowed, shall be directed downward and properly aimed on the targeted areas to maximize their effectiveness and minimize the total number of lighting fixtures.

3. Building mounted lighting must be directed downward away from adjacent lots, streets, undisturbed areas, and open spaces, and may not be used to light walls or building elements for decorative purposes.

4. There shall be no lighting permitted in areas identified as “undisturbed areas” of the property pursuant to the plans submitted under Section 2207 III.A.

5. The maximum lighting intensity shall not exceed 0.25 footcandle when measured at the property line.

6. A repetitive line up of lights along driveways or walkways accessing public streets shall not be allowed. Some random lighting of driveways or walkways accessing public streets may be allowed by the Hillside Building Committee. Driveway lights must be located on the "downhill" side and aimed toward the "uphill" side, must be fully shielded from below and only light the driveway surface. Driveway and walkway lights shall not exceed a maximum of 0.25fc at any point beyond 10 feet from the fixture.

7. Each lighting or illuminating device shall be set back from the nearest property line a minimum of ten (10) feet or a distance equal to or greater than the height of the device above natural or excavated grade, whichever is greater. As an exception a lighted entry marker may be placed on each side of the driveway entrance. The entry marker shall not be placed within the Town right-of-way or private road areas and the total height of the marker and light shall not exceed four (4) feet above finished grade adjacent to the driveway. The light source shall not exceed the equivalent projected brightness of 250 lumens.

D. <u>Luminaire (Light Fixture)</u> All luminaires shall be subject to the following limitations:

1. Shall not exceed 750 lumens when attached to a structure and confined to the immediate vicinity of a building entrance or outdoor living area of the residence.

2. Shall not exceed 250 lumens for all other uses.

3. Shall not exceed 150 lumens for landscape up-lighting.

4. Motion sensor/detector light fixtures are permitted for security lighting. Security lighting must be controlled separately from all other lighting.

Security lights must be on timers that regulate their operation time to a maximum of 10 minutes and limited to lamps with a maximum of 750 lumens.

5. Rope lighting shall not exceed 3.6 watts per lineal foot for an incandescent rope light.

E. Mounting Exterior fixtures shall be mounted:

1. In the ground or on a post not to exceed 36 inches above the ground. When exterior fixtures are affixed to existing trees, the height of the fixture shall not exceed 8 feet above the finished grade.

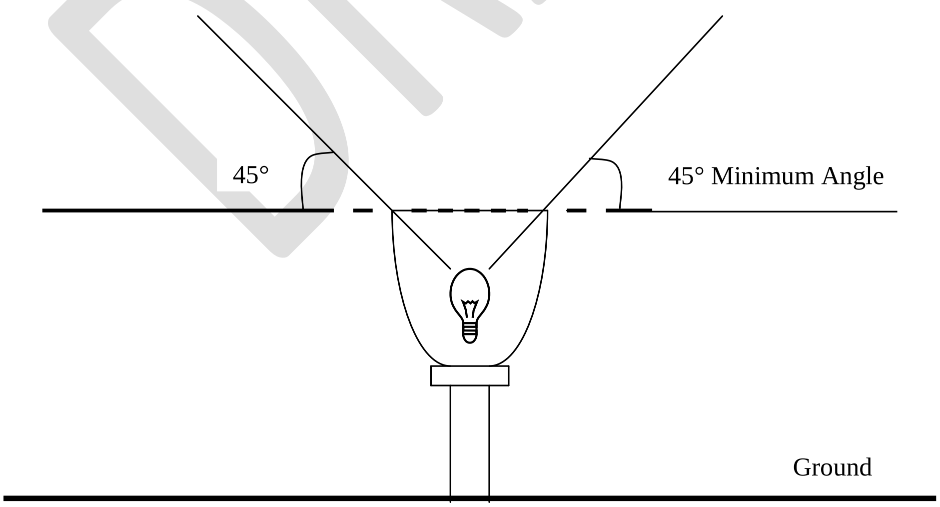
2. In or on a building wall not to exceed 8 feet above finished grade and shielded in such a manner as to avoid creating concentrated light (hot spots) on the structures to which they are mounted. Security lighting may be mounted on the structure to a height of not more than twelve (12) feet.

F. Landscape Up-lighting:

1. The number of fixtures is limited to one fixture per 1000 square feet of allowable disturbed area.

2. The lamp must be recessed to provide a minimum 45° cut-off from the vertical plane.

FIGURE 9 - TYPICAL UPLIGHT WITH 45° CUT-OFF



G. Prohibitions In addition to the limitations noted above, the following lights or lighting effects are strictly prohibited:

1. Colored lamps or bulbs and string and unshielded rope lights; except that temporary holiday lighting shall be permitted between November 15th and January 15th.

2. Tennis court and sport court lighting.

3. Any temporary lighting that violates the provisions of this lighting section.

4. Exterior lights, except security lighting, that illuminate the adjoining mountainside such that the mountainside is visible from off the property between sunset and sunrise.

H. Amendments:

1. Should the applicant desire to substitute outdoor light fixtures or lamps after a permit has been issued, the applicant must submit all changes to the Town Engineer for approval, with adequate information to assure compliance with this ordinance.

Section 2209. DENSITY and SUBDIVISIONS / LOT SPLIT STANDARDS

A. The maximum number of lots into which Hillside Development Area land may be subdivided shall be the sum of the number of lots allowed in each slope category of land as shown by the following **TABLE 2 – Density/Slope Category**.

B. Slope shall be calculated using a minimum of 3 slope lines per acre. The slope lines shall be perpendicular to the slope and at equal distances across the lot.

C. Each of the resulting lots shall meet the minimum lot size requirements based upon the average lot slope shown on **TABLE 2.**

D. Building envelopes shall be conceptually indicated on preliminary plats and accurately shown on final plats.

E. The subdivider shall ~~demonstrate by sketches, engineering drawings, charts or other means~~provide plans and documents by a registered architect, civil engineer, or surveyor demonstrating that roads, public or private, and driveway access and placement of residential structure will conform, for each lot, to current hillside development regulations and without the need for a variance.

F. All subdivision development and lot split applications shall comply with the Hillside Development Requirements as outlined in the Town of Paradise Valley Subdivision Ordinance and Article XXII of this Ordinance.

TABLE 2 – Density / Slope Category

Average Lot Slope %	Min. Lot Size Acres	Min. Lot Size –Sq. Ft.	Average Lot Slope %	Min. Lot Size Acres	Min. Lot Size – Sq. Ft.
10%	1	43,560	41%	6.8	296,208
11%	1.01	43,996	42%	7.6	331,056
12%	1.02	44,431	43%	8.4	365,904
13%	1.04	45,302	44%	9.2	400,752
14%	1.06	46,174	45%	10	435,600
15%	1.08	47,045	46%	11	479,160
16%	1.1	47,916	47%	12	522,720
17%	1.2	52,272	48%	13	566,280
18%	1.3	56,628	49%	14	609,840
19%	1.4	60,984	50%	15	653,400
20%	1.55	67,518	51%	16	696,960
21%	1.6	69,696	52%	17	740,520
22%	1.7	74,052	53%	18	784,080
23%	1.8	78,408	54%	19	827,640
24%	1.9	82,764	55%	20	871,200
25%	2	87,120	56%	21	914,760
26%	2.2	95,832	57%	22	958,320
27%	2.4	104,544	58%	23	1,001,880
28%	2.6	113,256	59%	24	1,045,440
29%	2.8	121,968	60%	25	1,089,000
30%	3	130,680	61%	26	1,132,560
31%	3.2	139,392	62%	27	1,176,120
32%	3.4	148,104	63%	28	1,219,680
33%	3.6	156,816	64%	29	1,263,240
34%	3.8	165,528	65%	30	1,306,800
35%	4	174,240	66%	32	1,393,920
36%	4.4	191,664	67%	34	1,481,040
37%	4.8	209,088	68%	36	1,568,160
38%	5.2	226,512	69%	38	1,655,280
39%	5.6	243,936	70%	40	1,742,400
40%	6	261,360			

Section 2210. REMOVAL OF PROPERTY FROM HILLSIDE

Action Report Topic #11

The Hillside Building Committee and Town Council shall review plans for any request to remove a property from the Hillside Development Area. This process applies to properties that are designated within a Hillside Development Area and have a slope of less than ten percent (10%). If a property owner elects to remove the property from the Hillside Development Area, the following applies:

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Action Report Topic #11

1. The applicant must provide documentation that the property has a building pad slope and site of less than ten percent (10%) in accordance with Section 2202 and Section 2209B.
2. The request will be reviewed by the Hillside Building Committee, which will make a recommendation of approval, approval with stipulations, or denial to remove the property from the Hillside Development Area.
3. The Town Council will either approve, deny, or approve the request with stipulations.

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Action Report Topic #13

Section 2211. LA PLACE DU SOMMET SUDIVISION

The La Place Du Sommet Subdivision is subject to the September 7, 1984 Hillside Ordinance. Any property developed in this subdivision is subject to the 1984 Hillside Ordinance.

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Section 2212 Additional Review Fees

When deemed necessary, the Town may hire an outside firm to assist with or provide a saftey review of an application. The outside safety review includes, but is not limited to, a review of the grading and drainage, geological report, seismic refraction survey, and excavation methods. The fees associated with the outside safety review is an additional application fee and must be paid by the applicant.

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Action Report Topic #18

Administrative Relief. See Attached Section 2-5-3 of the Town Code for proposed amendments.

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FOOTNOTE:

110 Ordinance # 220 – 7/12/84
112 Ordinance #221 – 9/24/84
181 Ordinance # 305 – 11/9/89
193 Ordinance # 320 – 2/28/91
194 Ordinance # 321 – 2/28/91
206 Ordinance # 338 – 3/26/92
382 Ordinance # 382 – 12/01/94
409 Ordinance #409 - 7/13/95
425 Ordinance # 425 – 9/12/96
533 Ordinance # 533 – 10/09/03
558 Ordinance # 558 – 06/09/05
580 Ordinance # 580 – 10/26/2006
654 Ordinance #654 – 03/13/2014

Section 5. If any section, subsection, sentence, clause, phrase or portion of this ordinance or any part of these amendments to the Town Code adopted herein by reference is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

Section 6. This ordinance shall become effective in the manner provided by law.

PASSED AND ADOPTED by the Mayor and Council of the Town of Paradise Valley, Arizona, this _____ day of _______, 2017.

____

Michael Collins, Mayor

SIGNED AND ATTESTED TO THIS ______ DAY OF ____________ 2017

ATTEST:

____
Duncan Miller, Town Clerk

APPROVED AS TO FORM:

____
Andrew M. Miller, Town Attorney

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Section 2-5-3 Board of Adjustment [8 188 583 623 646 654 685]

E Administrative Relief. [583 654]

1. The Community Development Director may authorize administrative relief to a property owner in the Town of Paradise Valley of up to ten (10) percent of any development standard contained in Article X~~, and for solar device installations only,~~ and Article XXII of the Town Zoning Code, unless specifically restricted elsewhere in this ordinance. For gates on hillside properties, administrative relief may be authorized as described in subsection (i) below. Administrative relief shall be subject to the following requirements and limitations:

    a. An application shall be submitted (and the fee set forth in the Town of Paradise Valley Fee Schedule, as such may be amended from time to time, shall be paid) by the property owner requesting administrative relief, on a form prescribed by the Community Development Director for such, identifying the proposed improvement to the property that is subject to the request;

    b. Notice shall be made by first class mail, postmarked at least five (5) days prior to the proposed date of determination by the Community Development Director, to adjacent property owners determined by the Community Development Director as potentially affected by the request for administrative relief;

    c. The proposed improvement requiring relief will not be detrimental to the property requesting relief, any adjacent property, or the Town, as determined by the Community Development Director;

    d. The relief granted is the minimum required to meet the needs of the proposed improvement, as determined by the Community Development Director;

    e. The relief shall not be contrary to the purpose and intent of this ordinance; and

    f. Administrative relief related to a particular property may only be requested once during an eighteen (18) consecutive month period and only twice during the period of ownership by a recorded owner of the property, the term "owner" to be interpreted for purposes of this section to include any person, firm, corporation, partnership, joint venture, trust, or any related persons, parties, firms, corporations, partnerships, joint ventures or trusts, including any successor trusts where the beneficiaries included are the same as any of the persons included as an owner above or as a beneficiary of any preceding trusts.

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g. The relief requested is limited to livable primary and accessory structures and walls, gates, and fences. It is not applicable to:

    i. New home construction, except to request relief related to an inadvertent error,
    ii. Properties that are subject to special use permits,
    iii. Floor area ratio limitations,
    iv. Tennis or other types of sport courts,
    v. Gazebos or other similar structures~~.~~,
    vi. Disturbed Area

h. The Community Development Director may impose reasonable conditions upon any administrative relief granted to ensure that the public health, safety, and general welfare are protected and substantial justice is done.

i. Relief for gates on hillside properties may be allowed. Such relief shall only be granted for the location to allow the gates to be as close as necessary to the property line when the topography of the lot precludes them from meeting the setback. Consideration shall be given to proper stacking of vehicles for public safety. No increase in height or size or other deviations of the code shall be granted.

2. Any relief authorized by the Community Development Director shall be documented with findings consistent with the standards above and filed with the building permit records, subdivision case file, or other department files, as appropriate.

F. Appeals.[583]

All decisions and interpretations by the Community Development Director performed in accordance with Section 2-5-3.E may be appealed to the Board of Adjustment in accordance with the procedures prescribed in Section 2-5-3.C.

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ORDINANCE NUMBER 2016-09

AN ORDINANCE OF THE TOWN OF PARADISE VALLEY, ARIZONA AMENDING THE PARADISE VALLEY ZONING ORDINANCE, Article XXII, HILLSIDE DEVELOPMENT REGULATIONS

BE IT ORDAINED BY THE MAYOR AND TOWN COUNCIL OF THE TOWN OF PARADISE VALLEY, ARIZONA:

Section 1. Article XXII, Hillside Development Regulations, Section 2200- 2209 are hereby amended (with deletions shown as ~~strikethroughs~~ and additions shown in **bold type**):

Article XXII. HILLSIDE DEVELOPMENT REGULATIONS [110 112 181 193 194 409 425 533 558 654580]

Section 2200. INTRODUCTION

As valuable scenic resources, Camelback Mountain, Mummy Mountain and the Phoenix Mountains provide a permanent visual presence that exemplify what is unique about Paradise Valley. They define the location and character of the Town, shape our sense of place and contribute to the Town's identity. These land forms, their foothills, and other areas over a 10% slope, offer a desirable setting visible to the entire metropolitan area and an intrinsic aesthetic value to the Town; therefore they require unique standards resulting from the characteristics of hillside terrain.

Section 2201. PURPOSE

This article exists to establish provisions to: a) regulate the intensity of development; b) preserve and protect the hillside environment; c) provide for the safety and welfare of the Town and its residents; and d) establish rules and procedures for review by the Hillside Building Committee ~~of~~ for hillside development, building and construction plans through the implementation of the following:

1. Require building massing to adapt to the natural hillside topography thereby reducing the scarring effects of roads, drives, building pads and cut and fill slopes.

2. Encourage all improvements to be designed and constructed in a manner that minimizes the impact of development from viewpoints on the valley floor and adjacent slopes.

3. Prevent unnecessary grading or stripping of vegetation, preserve drainage patterns, protect the public from natural hazards of storm water runoff and erosion, and require re-vegetation in order to maintain the natural landscape environment.

Comment [GB1]: RED TEXT IS DRAFT LANGUAGE PRESENTED TO PC AT 12/20/16 MEETING.

YELLOW HIGHLIGHTED TEXT IDENTIFIES UPDATED LANGUAGE IN RESPONSE TO INPUT FROM 12/20/16 PC MEETING

BLUE HIGHLIGHTED TEXT IDENTIFIES UPDATED LANGUGE IN RESPONSE TO INPUT FROM 1/3/17 PC MEETING

4. Preserve visual open space, unique natural features, wildlife habitats and retain the integrity and natural states of the identified dominant peaks and ridges.

5. Provide development and construction practices and methods to ensure greater fire protection in hillside development areas.

6. Require limited and efficient use of exterior lighting to maintain minimal night-time lighting levels and preservation of the dark sky.

This Article endeavors to enhance design quality so that the resulting development maintains the essential natural characteristic and context of the hillside consistent with the goals and policies of the Town's General Plan.

<u>Section 2202</u>. IMPLEMENTATION

The provisions of this Article shall apply to all land within a Hillside Development Area as denoted on **FIGURE 2 – HILLSIDE DEVELOPMENT AREA** and to all lands where the natural terrain under the building pad has a slope of ten percent (10%) or greater (see example below), whether shown in Figure 2 or not. However, a 10% or greater slope, in an area not denoted on Figure 2, created by a natural wash on land that would otherwise not be classified as hillside land, shall be exempt from the hillside regulations. Hillside lands are also subject to special provisions relating to lot split and subdivision development as set forth in the subdivision code. If there is a conflict between the Hillside Development provisions and another section of this Ordinance or the Town Code, these provisions shall prevail.

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FIGURE 1 –10% SLOPE

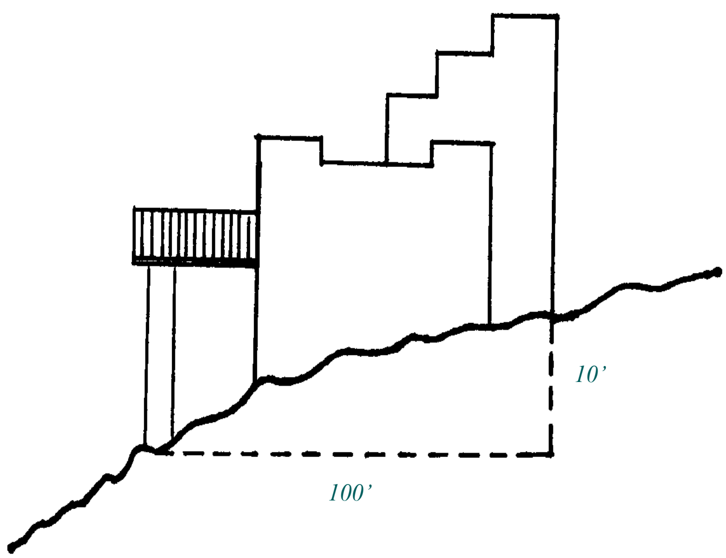

FIGURE 2 – HILLSIDE DEVELOPMENT AREA

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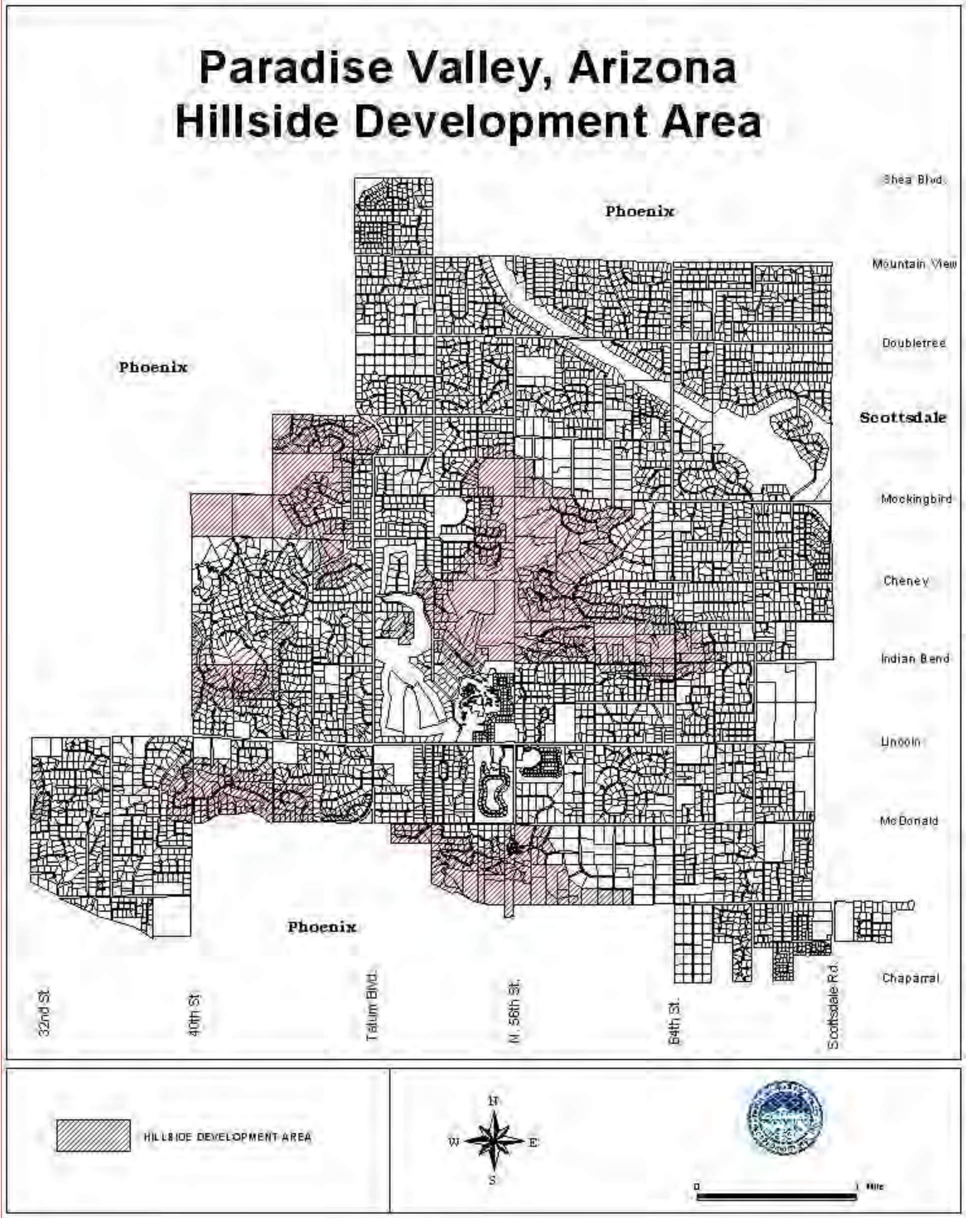
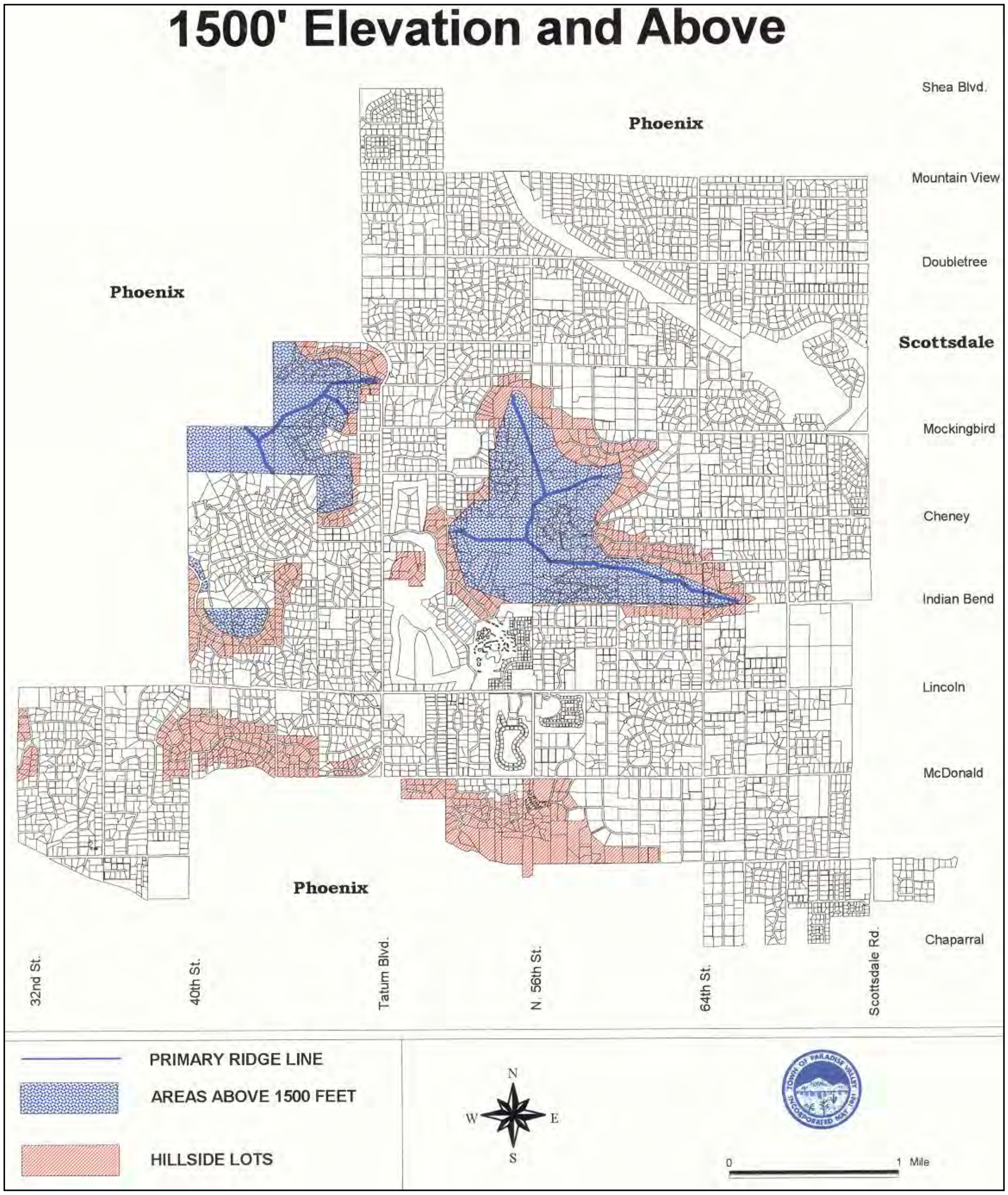


Comment [GB2]: Identify Process to Update Map with any properties removed from Hillside or added to Hillside

FIGURE 3 – PRIMARY RIDGE LINE DESIGNATION


1500' Elevation and Above
Shea Blvd.
Phoenix
Mountain View
Doubletree
Phoenix
Scottsdale
Mockingbird
Cheney
Indian Bend
Lincoln
McDonald
Phoenix
Chaparral
32nd St.
40th St.
Tatum Blvd.
N. 56th St.
64th St.
Scottsdale Rd.
PRIMARY RIDGE LINE
AREAS ABOVE 1500 FEET
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<u>Section 2203</u> **HILLSIDE DEFINITIONS.** Where definitions are not defined in this section, the definitions in Article II shall control. For purposes of this Article, the terms contained in the Article shall have the following meanings:

<u>Acre</u> - 43,560 square feet as measured on the horizontal plane.

<u>Alter the Mountain Top Ridge Line</u> –Any Development on the Primary Ridge Line shown on **FIGURE 3** that disturbs or alters the natural mountain top profile.

<u>Applicant</u> – The person or entity desiring to improve or otherwise engage in any Development of property in the Hillside Development Area, including the owner of the property and any agents acting on behalf of the owner.

<u>Building Pad</u> – The total area under roof of all structures proposed for the property.

<u>Building Pad Slope</u> - The percent of slope measured at right angles to the natural contours along a line passing through the center of the proposed building and terminating at the ends of the disturbed area limits of the building site.

<u>Building Site</u> - That portion of the lot or parcel, excluding driveways, upon which a building and appurtenances are to be placed or are already existing, including but not limited to; adequate areas for parking, turnaround areas not separated by driveways, sewage disposal, clearance, and proper drainage which conforms to the requirements of the provisions of this Article and the ~~Uniform Building~~ Town Code.

<u>Code</u> - The Code of Ordinances of the Town of Paradise Valley, Arizona in effect as of the date of these Regulations and as may be amended.

<u>Commission</u> - The Planning and Zoning Commission of the Town of Paradise Valley.

<u>Committee</u> - The Hillside Building Committee of the Town of Paradise Valley.

<u>Conservation</u> - Retention or acquisition of land for the purpose of preservation in a natural state.

<u>Conservation Easement</u> - A permanent open space easement granted to the Town or to a public land trust to prohibit development of property including roads and utilities and to retain and preserve the land for the scenic enjoyment of the general public.

<u>Council</u> - The Town Council of the Town of Paradise Valley.

<u>Cut</u> - The land surface which is shaped through the removal of soil, rock, or other materials.

<u>Development</u> - Any grading, excavation or construction.

Action Report Topic #4

<u>Disturbed Area</u> - That area of natural ground excluding the footprint of the residence that has been or is proposed to be altered through grading, cut and fill, removal of natural vegetation, placement of material, trenching, or by any means that causes a change in the undisturbed natural surface of the land or natural vegetation.

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Comment [GB3]: Need Planning Commission Input - Should the footprint and garage be included in the disturbance calculation? If so, the definition of "disturbed area" will need to be updated and Table 1 in Section 2207 will also need to be modified and updated in order to not make currently developed properties non-conforming in the amount of disturbance.
Commission Requested Additional Info at the 12/20/16 WS Meeting to help evaluate the potential change.

Fill - The deposit of soil, rock, or other materials placed by man.

Finished Grade - The final grade and elevation of the ground surface after grading is completed.

Footprint - That area of the residence measured from the outside walls (excluding any overhanging portions) which includes indoor uses such as attached garage, carports, utility room, laundry, etc., but excludes outdoor uses such as patios and breezeways.

Comment [GB4]: If the code is changed to include the footprint in the disturbance calculation, the definition of footprint will need to be updated. A potential definition is "The livable portion and garage of the main residence and detached accessory buildings."

Grading - Any excavating, or filling or combination thereof, including the conditions resulting from any excavation or fill.

Hillside Development Area - Those areas marked in **FIGURE 2** and to all lands where the natural terrain under the building pad has a slope of ten percent (10%) or greater, whether shown in FIGURE 2 or not. However, a 10% or greater slope, in an area not denoted on Figure 2, created by a natural wash on land that otherwise would not be classified as hillside land shall be exempt from the hillside regulations.

Hillside Wash – Any creek, stream, wash, arroyo, channel or other body of water having ~~historical banks and with~~ a flow rate equal to or greater than 2 cubic feet per second based on a 100-year storm event.

Lot - A legally subdivided parcel of land occupied or intended for occupancy by one main building, together with any accessory buildings including the open spaces required of the Hillside Regulations and having adequate frontage on a public or private street.

~~Natural Features, Significant - Include washes, Significant Vegetation, and Significant Rock Outcroppings provided these features are in their undisturbed natural state.~~

Natural Grade - The undisturbed natural surface of the land, including washes.

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Primary Ridge Line - That line running from the highest point along the mountain top downward along a divide to the 1500 foot mean sea level ~~contour line~~elevation as shown on **FIGURE 3**.

Action Report Topic #7

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Raised Outdoor Living Area – Uncovered areas such as porches, decks, platforms, and retained areas which extend three (3) feet or more above grade.

Retaining Wall - A wall or terraced combination of walls, including, planters, negative edge pools, used solely to retain more than eighteen inches (18") of material, ~~or~~ water, ~~but not~~ or to support or to provide a foundation or wall for a building.

Raw Spill Slope – An area created by causing or allowing earth or other material to fall, flow or run down the slope, thereby creating a change in the natural appearance and topography.

~~Rock Outcroppings, Significant - Any surface rock or group formation of rocks covering an area of 200 square feet or larger or any surface rock formation with a height greater than ten feet from the surrounding grade.~~

Sheet Flow – A shallow and wide overland flow of water.

Significant Natural Features - Include Hillside Washes, Significant Vegetation, and Significant Rock Outcroppings provided these features are in their undisturbed natural state.

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Significant Rock Outcroppings - Any surface rock or group formation of rocks covering an area of 200 square feet or larger or any surface rock formation with a height greater than ten feet from the surrounding grade.

Significant Vegetation - A single tree or cactus having a height greater than 15 feet or three or more trees or cacti, located within a radius of 15 feet, each having a height greater than 12 feet.

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Subterranean - That space which lies totally underground, and which cannot be seen from outside the exterior perimeter of the structure on the same horizontal plane which originates at that point where the building intersects the ground.

Town - The Town of Paradise Valley.

~~Vegetation, Significant - A single tree or cactus having a height greater than 15 feet or three or more trees or cacti, located within a radius of 15 feet, each having a height greater than 12 feet.~~

Veneered Rock Slop – A group formation of rocks of similar colors that blend in with the surrounding natural setting.

View Fencing (View Fence) – Fencing that is constructed in such a manner as to achieve ~~80~~70% overall openness.

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Section 2204 HILLSIDE BUILDING COMMITTEE.

A. The Hillside Building Committee or Hillside Building Committee Chair as established in Chapter 2 of the Town Code shall review all new applications submitted to the Town for ~~new home~~ Development and related construction within a Hillside Development Area. No building permit shall be issued for such application until approved by the Committee and then such issuance shall only be in accordance with the plans and specifications approved by the Committee.

B. The Hillside Building Committee may review applications for additions to existing structures in accordance with Section 2207 (VII)(A) of this Ordinance.

C. The Hillside Building Committee may review applications for accessory construction (e.g. fences, retaining walls, pools etc.) if the Town ~~Engineer~~ Manager or Designee in consultation with ~~a member of the~~ Hillside Building Committee Chair determines that the proposed construction: (i) creates a significant visual impact; or (ii) proposes an additional disturbance area.

Action Report Topic #3

D. The Hillside Building Committee approval process ~~is a two stages process~~ may consist of the following stages:

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1. An Administrative Hillside Chair Review.

2. A Combined Hillside Building Committee Review Meeting.
~~1.~~3. A Conceptual Plan Review Meeting.
4. A Formal Hillside Building Committee Review Meeting.
~~2.~~

Section 2205 **REVIEW AND DEVELOPMENT PROCESS.** The Hillside Building Committee shall review Development plans, as outlined in Section 2204, prior to the ~~Community Development Department review and the~~ issuance of a building, grading or other Development permit. The review and development process consists of up to four stages, depending upon the nature and scope of the proposed Development:

Action Report Topic #3

I. Administrative Hillside Chair Review: The Applicant shall submit a completed application and the required fees to the Town. Proposed accessory structures and additions may be reviewed by the Hillside Building Committee Chair provided the proposed improvements do not: (i) exceed or increase the building height of the main residence; (ii) increase the existing building footprint by more than 1,000 square feet; (iii) create more than 100 square feet of additional disturbed area; (iv) increase the length of walls by more than 25 lineal feet; (v) proposes a significant addition of exterior lighting; add more than 1,000 square feet of solar panels, or (vi) creates a significant adverse visual impact. The Chair shall review the submittal for compliance with the goals, purposes, and specific criteria of this ordinance.

II. Combined Hillside Committee Review Meeting: The Applicant shall submit all materials outlined in Section 2206 (II) to the Town. The Hillside Building Committee shall then review the submittal for compliance with the goals, purposes, and specific criteria of this ordinance and either approve, approve with stipulations or changes, or deny the submittal. Average remodel/additions, site improvements (such as, but not limited to, pool and spa additions), and solar panel additions over 1,000 square feet in area, may be reviewed as a Combined Hillside Committee Review.

III.

~~I.~~IV. Concept Plan Review Meeting: The Applicant, along with their architect and engineer shall submit a completed application and the required fees, to the Town ~~Engineer~~Manager or designee, at the time they request a concept plan review meeting (pre-hillside meeting) with the Hillside Building Committee. All new single family residence and major remodel/additions require a Concept Plan Review Meeting. The purpose of this meeting is to discuss, review, and give suggestions and guidance to the Applicant regarding the proposed development including: the location of the building pad and accessory uses; how these relate to Significant Natural Features; the preservation of existing vegetation; grading concepts and their adaptation to the natural hillside topography; and how the requirements pursuant to these hillside regulations and purpose statement will guide the proposed Development.

V. Formal Hillside Committee Review Meeting: At this stage, in addition to those materials previously submitted, the Applicant shall submit all materials outlined in Section 2206 (II) to the Town ~~Engineer~~Manager or designee. The Hillside Building Committee shall then review the submittal for compliance with the goals, purposes, and specific criteria of this ordinance and either approve, approve with stipulations or changes, or deny the

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Comment [GB5]: During the January 3rd meeting, the Commission asked that this language be moved to a different location of the code. Staff recommends either keeping this language at this location or removing it since "Applicant" is defined in Section 2203.

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submittal. All new single family residence and major remodel/additions require a Formal Hillside Committee Review Meeting.

~~II.~~

~~III.~~VI. Building Permit Review: The final construction plans submitted to the Town Community Development Department for review and approval shall comply with the final approval of the Hillside Building Committee. Any variation from ~~Chapter 70 of the Uniform Building~~ excavation and grading requirements within the Town Code must be accompanied by a soils engineering report from a testing laboratory or geological engineer approved by the Town Engineer. No site preparation or construction shall commence until the Town has issued a grading, demolition, or building permit.

A. The plans for any Development in the Hillside Development Area, must be approved by the Town and appropriate legal permit(s) issued before any clearing and grubbing, grading, bulldozing, blasting, or movement of earth is commenced. A building permit application must be submitted within twelve months after the date of approval from the Hillside Building Committee or Hillside Building Committee Chair. If a building permit application is not submitted a within twelve the month period, the approval shall be null and void. ~~If Development does not commence within twelve months after securing such approval from the Hillside Building Committee, no construction shall occur until such plans have been resubmitted and re-approved or i~~I If such is appropriate based upon circumstances outside the control of the Applicant, a one-time six (6) month extension may be granted by the Town Manager or designee ~~Engineer~~. Should the applicant allow the permit to expire, at no time after that expiration period does the applicant have any vested prior approval rights.

B. When a building, demolition, or grading permit that involves any cut or fill on a hillside property is required under provisions of these Regulations, the Applicant shall first provide the Town with a form of financial assurance, and a right of entry and temporary construction easement agreement acceptable to the Town Attorney, which places the Town in an assured position to do or to contract to be done the necessary work to cover, restore and landscape exposed fills and cuts to blend with the surrounding natural terrain. Three (3) bids or estimates from a licensed contractor or a licensed professional shall be submitted to the Town identifying the cost to restore and landscape ~~the~~ exposed fill and cuts to blend in with the surrounding natural terrain. The bids shall include, but are not limited to, the cost to regrade the affected area(s), re-landscaping the restored area(s) with native plants, stabling any applicable cut or fill area(s), and applying a desert varnish or stain to any exposed cuts or pad. The Town Staff and Town Engineer shall review the bids and determine the assurance amount. The minimum acceptable assurance shall be in a dollar amount equal to the number of total cubic yards of cut and fill multiplied by 25, or in such greater amount as deemed appropriate by the Town. The amount of the assurance may be adjusted in accordance with the Producer Price Index in order to account for inflation. In the event that construction has not commenced within six months from the date of issuance of the grading or building permit, the plan approval and permit shall expire. Twelve months after the date of the last inspection, such assurance shall be forfeited to the Town in such amount necessary for the purpose of restoration

Action Report Topics #5 and #12

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of the construction site to its original condition and all authorized permits shall be revoked and become void. The property owner shall, upon reasonable Notice from the Town, provide access to the property for the purpose of restoration of the construction site to its original condition.

~~B.~~

~~IV.~~ VI. Issuance of Certificate of Occupancy: Prior to the issuance of any Certificate of Occupancy for any building constructed pursuant to these Regulations, the applicant shall obtain from the ~~Town Engineer and the Town Building Inspector~~Town certification of compliance with this Article. The Certificate of Occupancy may be issued without the installation of the landscaping, based upon the submittal of a landscape assurance and a right of entry and temporary construction easement agreement acceptable to the Town Attorney. Three (3) bids or estimates from a licensed contractor or a licensed professional shall be submitted to the Town identifying the cost to install the landscaping in accordance with the approved landscape plan. The Town Staff and Town Engineer shall review the bids and determine the assurance amount.

Action Report Topic #12

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Comment [GB6]: Need Planning Commi[...] Input - Should a minimum amount be listed?

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Section 2206 DOCUMENTARY REQUIREMENTS AND CERTIFICATION [558 580]

I. CONCEPT PLAN REVIEW MEETING. The applicant shall submit the following:

A. Notification Letters. At least three (3) weeks prior to the scheduled conceptual Hillside Building Committee meeting the applicant shall submit to the Town a neighbor notification letter complete with address labels, with appropriate postage, for all property owners within 500 feet of the perimeter of the subject property. This notification letter shall include the following information; a) type of proposed development (addition, remodel, new construction), b) the scheduled hearing date and time, c) that the letter is only as a courtesy notification and that their attendance at the meeting is not required. d) the purpose of the meeting, and e) the goals of the meeting.

B. Seven (7) copies of a preliminary site plan that includes, but is not limited to, the building footprint, driveway, swimming pool, and accessory use locations along with topographic information for the Lot.

Action Report Topic #6

C. A 3-dimensional representation of the general massing of all proposed structures (e.g. a mass model, a 3-D scaled rendering or a scaled computer generated model in relation to topography – not a detail model).

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D. A recent aerial photo of the site (less than ~~3~~ 1 year~~s~~ old), with topography, lot lines, and the building footprint superimposed on it, ~~and~~ identification of ~~significant~~ Significant ~~natural~~ Natural ~~features~~ Features, as well as adjacent lots and structures within 100 feet of the perimeter of the subject property (minimum 24"X 36"), and the location of the driveway access in relation to the nearest roadway.

E. Preliminary calculations on land disturbance and cut and fill methods.

II. FORMAL AND COMBINED HILLSIDE COMMITTEE REVIEW MEETING. All plans submitted to the Town for review shall be stamped and sealed by the appropriate registered or licensed professional (e.g. civil engineer, land surveyor, geologist, architect). All plans shall be reviewed by the Hillside Building Committee. In addition, once the plans have been approved by the Committee the applicant shall submit final plans, in accordance with the Hillside Building Committee's approved plans, to the Community Development Department for ~~building permits~~review. Plan review fees for each such submittal shall be paid at the time of the submittal of such plans in the amount specified in the Town of Paradise Valley fee schedule, as such may be amended from time to time. The following plans and material shall be required:

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A. Notification Letters. At least three (3) weeks prior to the scheduled Formal Hillside Building Committee Meeting the applicant shall submit to the Town a neighbor notification letter complete with address labels, with appropriate postage, for all property owners within 1,500 feet of the perimeter of the subject property. This notification letter shall include the following information; a) type of proposed development (addition, remodel, new construction), b) the scheduled

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hearing date and time, c) that the letter is only as a courtesy notification and that their attendance at the meeting is not required, d) the purpose of the meeting, and e) the goals of the meeting.

B. Seismic Refraction Survey. ~~All~~ Unless waived by the Town Manager or desginee, all proposed cuts shall require a seismic refraction survey, performed by a registered geologist. If the geological report or seismic refraction survey indicates fractured or unstable rock, then the proposed location of the building site (or appurtenances) shall be changed to a stable location unless the unstable condition(s) can be mitigated by an engineered design that creates a stable location and complies with the provisions of Article XXII and other Articles of this Zoning Ordinance. The geological report and results of the seismic refraction survey shall be submitted to the Town.

Comment [GB7]: Engineering Department to provide language regarding safety analysis

C. A detailed site plan (minimum 24" X 36"), sealed by a registered engineer or land surveyor, with topographic information for the entire lot including under the footprint of the building. This site plan shall depict: the limits of disturbance; the building envelope including the building footprint, driveway(s), swimming pools, mechanical equipment, sanitary sewer or septic systems; location, size and type of mechanical screen walls and pool barrier fencing; length and height of retaining walls; all accessory buildings; and ~~significant~~ Significant ~~natural~~ Natural ~~features~~Features.

D. Photographs of the site looking out from the property in all directions and of the property from several different views.

F. A detailed grading and drainage plan (minimum 24" X 36"), sealed by a registered civil engineer, with topographic information for the entire lot. This plan shall show proposed finished contours at 1 foot intervals within a perimeter 20 feet from the building, a maximum 5 foot intervals elsewhere, and shall show existing and proposed contours. This plan shall show limits of excavation and fill; slope of cut and fill; total cubic yards of excavation and fill; method of concealment for each fill or exposed cut; and the calculations for amount of disturbance for the total development. This plan shall show original drainage pattern (natural course) and proposed changes. If any structures or culverts are involved, it will be necessary to include an estimate of peak flows for a 100 year frequency storm to establish drainage facility cross-sections. Sheet flow diverted from its original drainage pattern shall be returned to its natural course before leaving the property.

G. A detailed landscape plan that includes, but is not limited to the following: the building envelope; building footprint; all accessory structures and locations; ~~significant~~ all Significant ~~natural~~ Natural ~~features~~Features; plant materials list with type, quantity and size; plant location; location and species of salvaged plant materials; and methods for re-vegetation of all disturbed areas. Native desert vegetation shall be identified and preserved to the maximum extent reasonably possible ~~in the landscape plan~~. A landscape salvage plan shall be provided.

Action Report Topic #6

H. Cross sections of new buildings and appurtenances at a scale equal to or greater than the site plan scale at three or more locations perpendicular to the contours through the building site shall be clearly shown on the topographic map and sealed by a registered professional, or as determined by the Town Manager or designee.

I. A detailed outdoor lighting plan indicating the proposed luminaire locations on the building and on the site (if applicable); the type of illuminating devices including; the manufacture's catalog cut sheets and drawings; and photometrics that describe the illuminating devices; the fixtures, lamps, lumens and ~~wattages~~, supports, the ~~aiming~~ beam angles, and other devices.

J. 3 Dimensional Scaled Computer Model or A Scaled Study Model: The applicant shall submit a scaled 3D computer model or a scaled study model for Hillside Building Committee review.

a. 3D Computer Model: A computer generated 3-dimensional model, with accurate points of reference superimposed on it; showing the appearance of the building, lot, landscaping, and skyline. The model must accurately represent the massing of all structures and roof forms as well as the following:

i. All windows, exterior doors and skylights.

ii. A sufficient area of the property to visually relate the proposed structure and accessory uses to the natural terrain.

~~I.~~**b.**

~~J.~~ b. ~~A~~ 3D Study Model: Including all proposed improvements, at not less than (1/16) inch = (1) foot showing the relationship of all proposed improvements to the contours of the lot. The model must accurately represent the massing of all structures and roof forms as well as the following:

1. All windows, exterior doors, and skylights (showing the location of all proposed skylights and their orientation to neighboring properties).

2. The model shall include enough of the property to visually relate the proposed structure and accessory uses to the natural terrain.

3. The Applicant's name, architect's name, builder's name, lot number, scale, and north arrow.

K. An accurate oblique view architectural rendering in color or a computer generated 3-dimensional picture ~~-~~shall be submitted showing the appearance of the building, lot, landscaping, and skyline. The rendering or computer generated picture, and the model may remain in the custody of the Town ~~Engineer~~ until a Certificate of Occupancy is issued or until released by the Town ~~Engineer~~.

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L. Exterior Material Samples: Include samples of all colors, materials, and material specifications mounted on rigid board with all materials identified with the manufacture's name, color, and LRV number where applicable. Material samples or color specifications are required for all exterior materials and finishes including but not limited to:

• Roof	• Wall color and texture (8½" x 11" sample size)
• Metal	• Masonry
• Hardscape	• Glass
• Stone	• Driveway and terrace paving
• View fencing	• Garage doors

• Patio, deck area including second story structures, pool, and breezeways

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M. The Applicant's Engineer or Surveyor shall install a marker to designate the location of the house at the major building corners. The markers should be at least 3 feet in height with a colored ribbon at the top of the marker. The applicant shall install markers at least two (2) weeks prior to the Formal Hillside Committee meeting and remove immediately following the formal committee meeting.

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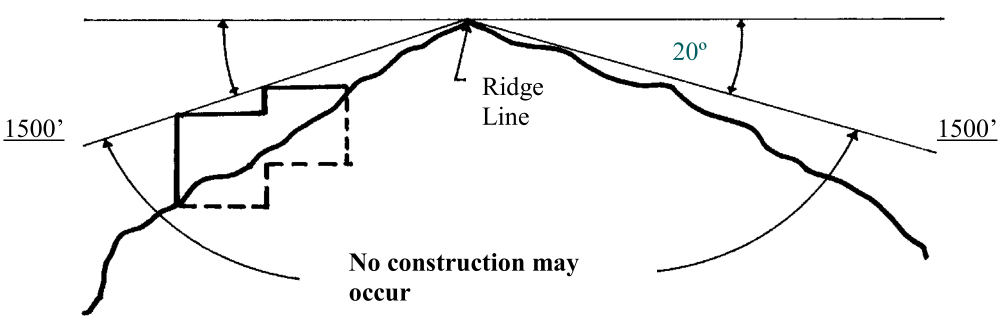
Section 2207 **DEVELOPMENT STANDARDS** [558 654]

I. MOUNTAIN PROFILE INVIOLATE

A. At and above an elevation of 1500 feet mean sea level, no Development shall occur which will Alter the Mountain Top Ridge Lines as shown on **FIGURE 3** . A model must be submitted pursuant to Section 2206(II)(J) showing compliance with this paragraph together with complete plans showing the appearance of the mountain top profile, as part of the submittal for the Formal Hillside Committee Review. Further, no structure may extend above a plane that originates on the primary ridge line and angles downward from the primary ridge line by twenty degrees (See **FIGURE 4).**

FIGURE 4 – RIDGE LINE TWENTY DEGREE DELINEATION



II. ARCHITECTURAL STANDARDS.

A. For development within the Hillside Development Areas, the height of structures shall be determined by the following four (4) sub-sections and not by the zoning district regulations that apply to lots or parcels outside the Hillside Development Area.

~~A.~~ 1. Primary Building

i. The height of a primary building or primary structure is limited to a twenty-four (24) foot imaginary plane that parallels the existing pre-development natural grade, as measured vertically from any point under the building (see **FIGURE 5**). ~~The subterranean portion of the structure is not included in the total height calculation provided that at least half (½) of the volume of the subterranean portion of the structure is below natural grade.~~

ii. In the case where the natural grade has been cut and is not restored back against the building, no exposed face in any vertical plane shall

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exceed a twenty-four (24') foot height measured from the ~~lowest~~Lowest, ~~finished~~ Finished ~~grade~~Grade. The maximum height of any deck support column shall not exceed twelve (12') feet tall measured from the adjoining grade.

2. Accessory Structures

Action Report Topic #7

i. The height of an accessory building or accessory structure is limited to a sixteen foot (16') imaginary plane that parallels the existing pre-development Natural Grade, as measured vertically from any point under the building.

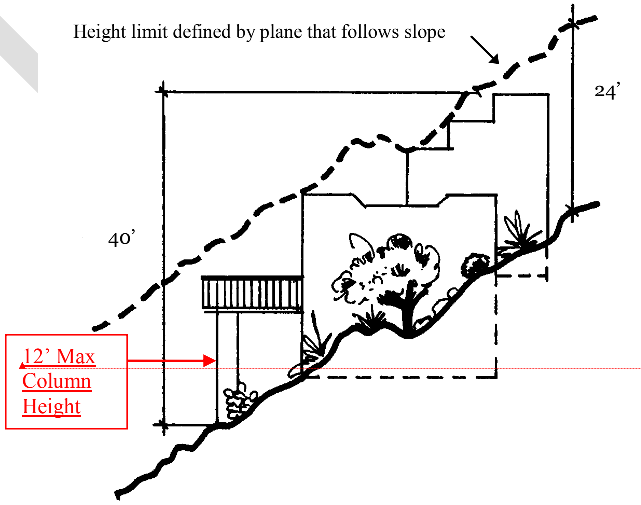
ii. In the case where the natural grade has been cut and is not restored back against the building, no exposed face in any vertical plane shall exceed a sixteen (16') foot height measured from the lowest, Finished Grade. The maximum height of any deck support column shall not exceed twelve (12') feet tall measured from the adjoining grade.

ADD FIGURE ILLUSTRATING 16' HEIGHT LIMIT.

Action Report Topic #8

~~iii.~~3. The maximum overall height of the building or structure, including chimneys and accessory buildings, shall not exceed forty (40) feet from the highest point of ~~the building to natural grade at the lowest point adjacent to the building structure or column~~of a building or structure to the lowest point of Natural Grade at the lowest building or structure (excluding driveway retaining walls) ~~(~~(see **FIGURE 5**).

FIGURE 5 – BUILDING HEIGHT IN HILLSIDE



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Comment [GB8]: Figure 5 to be updated to reflect these edits.

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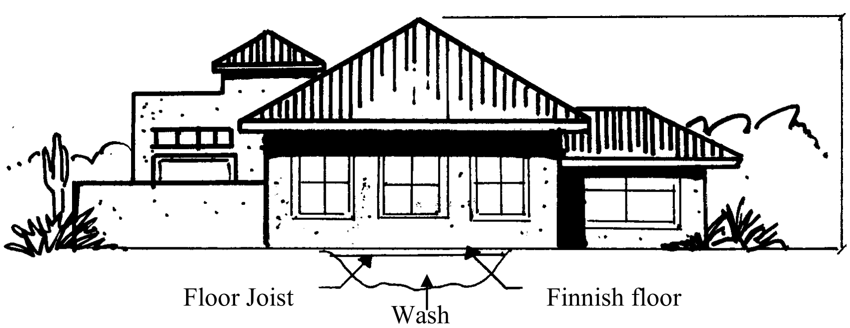
~~iv.~~ 4. Where a building spans a wash the maximum height of twenty-four (24') feet shall be measured vertically from that point where the visible structure and the side of the wash intersect. See **FIGURE 6.**

FIGURE 6 – BUILDING HEIGHT WITH A WASH CROSS SECTION

Wash



B. Cantilevers. The primary residence, accessory buildings, driveways and other structures (such as pool decks) may employ the use of cantilevers, subject to the following limitations:

Action Report Topic #15

1. Primary residence and accessory buildings. Cantilevered elements of the building must comply with the applicable setbacks and heights of the building. All of the area underneath the cantilevered element shall be calculated as disturbed area.
2. Driveways. Cantilevered driveways shall not be allowed.
3. All other structures (such as pool decks) employing the use of a cantilever may extend the cantilever a maximum horizontal length of 4 feet and a maximum vertical height of 8 feet. All of the area underneath the cantilevered element shall be calculated as disturbed area. The cantilevered elements of the structure must comply with the applicable setbacks.
4. The area under a cantilever must be finished with colors or materials that match the adjoining structures or blend in with the surrounding natural setting. The materials or colors used shall not have a LRV (Light Reflective Value) greater than thirty-eight (38) percent.

~~B. Structures employing the use of a cantilever may extend the cantilever a horizontal distance twice the height of the support. The maximum vertical height of the support shall be eight (8) feet. One-half the area underneath the cantilevered element shall be calculated as disturbed area.~~ (See **FIGURE 7** below).

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Comment [GB9]: There was no consensus on the 12/20/16 PC meeting regarding this topic. It was recommended that language be added to identify what the area under a cantilever should look like. Additional review and discussion is needed.

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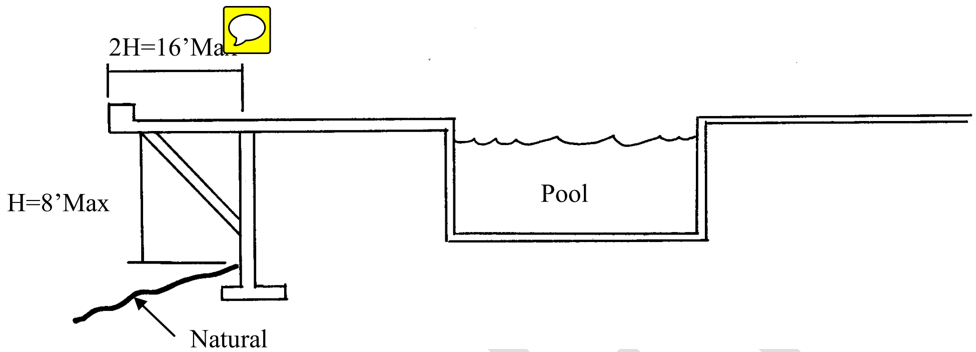
Comment [GB10]: New figures to be added to the code to illustrate these scenarios.

Comment [GB11]: There was no consensus regarding the proposed changes to the limitations on cantilevers at the 1/3/17 PC Meeting. It was recommended that staff research other city codes to see how different communities address cantilevers, provide several pictures of cantilevers for reference, and to include the entire area underneath a cantilever as disturbance.

FIGURE 7 - HEIGHT FOR A CANTILEVERED ELEMENT



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5. All of the setback requirements of the underlying zoning district shall apply in the Hillside Development Area (see Article X~~, Section 1001, Table 1001~~).

Action Report Topic #7

~~C.~~6. Raised Outdoor Living Areas are subject to the setback requirement of pools and spa and are limited to a maximum height of eight (8’) feet tall.

Action Report Topic #2

~~D.~~7. Materials used for exterior surfaces such as structures, walls, roofs and fences shall blend with the surrounding natural setting and avoid high contrasts. There shall be no paint or material colors used which have a LRV (Light Reflecting Value) greater than thirty-eight (38) percent. Materials and color used for exterior surfaces are subject to Hillside Building Committee review and approval. The applicant must demonstrate how the materials and colors used for the exterior surfaces blend in with the natural surroundings and settings. Limited use of contrasting accent colors (in excess of 38% LRV) for small elements, including, but not limited to items such as doors and window mullions, may be allowed upon explicit approval of the Hillside Building Committee.

Action Report Topic #14

~~E.~~8. All electrical service equipment and subpanels and all mechanical equipment including, but not limited to, air conditioning, evaporative cooling, and antennas greater than 24” in diameter shall not be allowed on the roof. Solar panels may be allowed if they are integrated into the building design and hidden from view when viewed from the same or a lower elevation and approved by the Hillside Building Committee by a Combined Review or Administrative Hillside Chair Review. Solar panels may be allowed on pitched roofs only when screened by the hillside or hillside cut. All mechanical, electrical, and natural gas equipment along with pool equipment and antennas shall be screened in such a manner that they are not visible from outside the property when viewed from the same or a lower elevation. Vegetation does not constitute a screen.

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F. Mirrored surfaces or reflective treatments that change~~s~~ or enhance~~s~~ ordinary glass into a mirror surface ~~is~~ are prohibited. Permanently reflective metallic surfaces shall be prohibited.

G. The building design should minimize the reflection of daytime glare from glass and the emission of light from within the structure during evening hours.

H. The quantity and orientation of skylights shall be designed to minimize night time emission of light and may be allowed upon approval of the Hillside Building Committee.

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~~H.~~I. Shake shingle roofs are prohibited. Existing shake shingle roofs on residential structures may be allowed only until such time that it is determined, during the course of normal maintenance, that a new roof (re-roof) is necessary and/or the extent of maintenance or repair work requires a building permit from the Town.

III. LAND DISTURBANCE STANDARDS.

Action Report Topic #5

A. The limits of construction, demolition, ~~and~~ or proposed disturbed areas shall be clearly staked in the field, with a minimum barrier of visible roping, prior to and during construction and shall conform to the approved ~~individual site analysis~~ plans. ~~No~~ Both during and after construction, no disturbance shall be permitted beyond the areas designated as the limits of disturbance on the plans ~~both during and after construction~~. If land disturbance in violation of this ordinance occurs, the illegally-disturbed area(s) shall be restored to its natural grade and re-vegetated with plant material of the same species, size, and at a similar density present prior to the illegal disturbance.

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B. All disturbed land that is not otherwise used for approved development shall be restored to the natural grade and re-vegetated with plant material ~~as listed in the Town of Paradise Valley landscape guidelines~~ native to the hillside or pursuant to a landscape plan approved by the Town.

C. All buildings, structures, roads, and drives shall, to the fullest extent practicable, follow and utilize the natural contours of the land to minimize disturbance. The maximum height of any cut used to establish a building site shall not exceed 30 feet.

D. All surplus excavated material shall be removed from the lot prior to the issuance of the Certificate of Occupancy.

E. After final grading, not more than 5% of the lot shall be steeper than the natural grade of the lot.

F. The total disturbed area shall not exceed the allowed percentage of the lot area as shown in **TABLE 1** below.

G. Grading within street rights-of-way or tracts of land for private roads is exempt from the disturbance calculations. Any roadway grading beyond the limits of the

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dedicated rights-of-way or private road tracts shall be placed in slope easements and included within the calculations for land disturbance limitations.

H. A legally pre-existing disturbed area may be excluded from disturbed area calculations when the applicant ~~has committed to comply~~complies with all of the following restoration conditions:

1. ~~the~~ The restored area shall follow original natural contours.

2. ~~the~~ The restoration shall be treated with an aging agent approved by the Town Manager or Designee ~~Engineer~~ and planted with indigenous desert material that is consistent in density with the area surrounding the undisturbed areas abutting the pre-existing disturbed area.

3. ~~the~~ The restoration process shall be sealed by a landscape architect and/or a registered ~~engineer or architect~~professional.

Action Report Topic #16

I. On-site retention may be required. Please reference the Town of Paradise Valley Storm Drain Design Manual for on-site retention requirements.

J. On-site retention shall be counted as Disturbed Area. Retention areas not employing the use of retaining walls and are re-vegetated with native plant material shall fifty (50%) percent of the area count as disturbance.

Action Report Topic #4

~~I.~~K. The livable portion of the main residence including garage and livable portions of detached accessory buildings shall not be counted as disturbed area provided that all buildings are within the required setbacks and do not exceed the building height limitations as specified in Section 2207 (II) (A) of this Ordinance.

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Comment [GB12]: If the code is changed to include the footprint in the disturbance calculation, the definition of footprint will need to be updated.

TABLE 1 – Slope Category / Lot Disturbance Limitations

Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance
10%	60.0	41%	9.90	72%	6.80
11%	53.66	42%	9.80	73%	6.70
12%	47.94	43%	9.70	74%	6.60
13%	42.81	44%	9.60	75%	6.50
14%	38.21	45%	9.50	76%	6.40
15%	34.11	46%	9.40	77%	6.30
16%	30.48	47%	9.30	78%	6.20
17%	27.27	48%	9.20	79%	6.10
18%	24.46	49%	9.10	80%	6.00
19%	22.01	50%	9.00	81%	5.90
20%	19.88	51%	8.90	82%	5.80
21%	18.04	52%	8.80	83%	5.70
22%	16.48	53%	8.70	84%	5.60
23%	15.16	54%	8.60	85%	5.50

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Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance
24%	14.05	55%	8.50	86%	5.40
25%	13.13	56%	8.40	87%	5.30
26%	12.37	57%	8.30	88%	5.20
27%	11.76	58%	8.20	89%	5.10
28%	11.28	59%	8.10	90%	5.00
29%	10.90	60%	8.00	91%	4.90
30%	10.62	61%	7.90	92%	4.80
31%	10.41	62%	7.80	93%	4.70
32%	10.25	63%	7.70	94%	4.60
33%	10.15	64%	7.60	95%	4.50
34%	10.08	65%	7.50	96%	4.40
35%	10.04	66%	7.40	97%	4.30
36%	10.02	67%	7.30	98%	4.20
37%	10.01	68%	7.20	99%	4.10
38%	10.00	69%	7.10	100%	4.00
39%	10.00	70%	7.00		
40%	10.00	71%	6.90		

IV. DRIVEWAYS [558]

Action Report Topic #9

A. Driveways that only serve a new single residence shall be: (1) a minimum of 12 feet wide; (2) surfaced with paving brick, textured integral colored concrete (i.e. stamped or exposed aggregate etc.) or other similar decorative paving materials specifically colored to blend with the existing natural color of the site (asphalt driveways are prohibited); (3) designed with an overall grade that does not exceed 30%; (4) constructed in full conformance with the Fire Code; and (5) developed only as specifically approved by the Hillside Building Committee. The driveway shall be included in the calculations for land disturbance limitations at a ratio of 50% of the total disturbed area of the driveway, if the driveway is constructed at a grade plus or minus (6) inches from natural grade. Driveways with cut and fill in excess of (6) inches and under (18) inches from natural grade shall be charged with 75% of the total disturbed area of driveway surface. The Driveways with cut and fill in excess of (18) inches from natural grade shall be charged with 100% of the total disturbed area of the driveway surface. The entire driveway must be within the natural grade limit to be subject to the disturbance ratios noted above.

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Comment [GB13]: There was no consensus on the 12/20/16 PC meeting regarding this topic. Additional review and discussion is needed.

B. Driveways that serve an existing home undergoing renovation, remodel, or an addition shall be included in the calculations for land disturbance limitations subject to the following conditions:

1. Existing driveways reconstructed with paving bricks, textured integral colored concrete (e.g. stamped or exposed aggregate etc.) or other similar decorative paving materials, specifically colored to blend with the existing natural color of the site, shall be excluded from the land disturbance calculations.

2. Existing driveways surfaced with paving bricks, textured integral colored concrete (e.g. stamped or exposed aggregate) or other similar decorative paving materials, specifically colored to blend with the existing natural color of the site, shall be excluded from the land disturbance calculations.

3. Existing asphalt or uncolored concrete driveways not reconstructed with paving bricks or textured integral colored concrete (e.g. stamped or exposed aggregate etc.) shall be calculated as disturbed area at a ratio of 150% of the total disturbed area of the driveway.

Action Report Topic #9

4. Any new portions of the driveway beyond the layout of the existing driveway shall be included in the calculations for land disturbance limitations at a ratio of 50% of the total disturbed area of the driveway, if the driveway is constructed at a grade plus or minus (6) inches from natural grade. Driveways with cut and fill in excess of (6) inches and under (18) inches from natural grade shall be charged with 75% of the total disturbed area of driveway surface. The Driveways with cut and fill in excess of (18) inches from natural grade shall be charged with 100% of the total disturbed area of the driveway surface. The entire driveway must be within the natural grade limit to be subject to the disturbance ratios noted above.
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C. The minimum standard turning radius for a driveway is 40 feet; except that a minimum ~~25~~ 35 foot radius may be used provided all structures are protected with an approved fire extinguishing system.

D. Any street or driveway cut greater than 8 feet shall not have a length greater than 100 feet. The applicant must mitigate means of breaking-up the mass of the cut and blending the cut in with the surrounding natural terrain.

E. A twenty (20) foot by thirty (30) foot driveway apron may be required by the Fire Marshall or the Building Official at or near the garage or another location deemed necessary by the Fire Marshal, with no more than a 5% grade, to serve as a staging platform to fight a fire.

F. The maximum height, measured vertically, of any cut used to establish a street or driveway shall not exceed 30 feet.

V. GRADING AND DRAINAGE STANDARDS.

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A. There shall be no clearing, grubbing, grading, importing or stockpiling of fill material on, or to, any site prior to approval of such Development by the Hillside Building Committee and approval of a grading plan by the Town ~~Engineer~~, unless such clearing, grubbing, or grading, is required by the Town for public safety purposes. If applicable, approval of a grading plan and drainage report prepared by a registered Engineer, may be required for Town review and approval.

~~A.~~B. Storm water retention shall be provided to the greatest extent possible in accordance with the Town Code and the Town Storm Drainage Design Manual.

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~~B.~~C. The maximum depth of fill shall not exceed ~~8~~ 7.5 feet except beneath the footprint of the main residence. All exposed disturbed area fill shall be contained behind retaining walls or covered with a natural rock veneer and treated with an aging agent and landscaped with indigenous plant material.

~~C.~~D. ~~Rock veneered spill slopes~~Veneered Rock Slopes may be allowed provided that they are approved by the Hillside Building Committee, and:

1. The vertical height of the Veneered Rock Slope ~~spill slope~~ does not exceed the vertical height of the exposed cut with the base of the Veneered Rock Slope~~spill slope~~ engineered for stability and keyed into the mountain or supported by a retaining wall.

2. The Veneered Rock Slope~~spill slope~~ does not exceed a one to one slope.

3. Retaining walls used to limit the height of the Veneered Rock Slope~~spill slope~~ are color treated or veneered to blend in with the surrounding natural colors.

~~D.~~E. Raw ~~spill~~ Spill ~~slopes~~ Slopes are prohibited. Any violation will be subject to a stop work order until the spill slope is removed, restored to its natural grade, re-vegetated and approved by the Town.

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~~E.~~F. A ~~hillside~~ Hillside ~~wash~~ Wash shall not be diverted, relocated or moved from its present position to another location, however, a ~~hillside~~ Hillside ~~wash~~ Wash may be bridged by a structure so long as such structure does not impede the flow of the hillside wash.

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~~Earth contiguous to the structure shall contact that structure at an angle approximating that of the natural grade.~~

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~~F.~~G. Washes located on a property shall be maintained in accordance with Chapter 5 and Chapter 8 of the Town Code.

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VI. WALLS AND FENCES.[558]

Action Report Topic #1

A. Curbs less ~~than18~~ than 8 inches above finished grade are not considered walls.

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B. No more than 300 total linear feet of wall shall be visible from any point on the property line. All pool barriers shall be view fencing. View fencing is not calculated in the 300 feet maximum allowable wall length.

C. Walls that are otherwise permissible in Article XXIV are prohibited in the Hillside Development Area. Retaining walls, pool barriers, walls used to screen mechanical equipment, driveway columns and entry gates, and tennis/sport court fencing are allowed provided that they are of minimum lengths and heights, as further specified below, and are approved by the Hillside Building Committee.

1. Retaining Walls:

Action Report Topic #1

a. The intent of the retaining wall requirements is to mitigate the massing and impact of walls on the hillside and preserve the characteristic of the desert. The objective is to allow only the minimum amount of retaining walls needed to access the property, retain cut and fill, and screen mechanical equipment and windows of interior bathroom areas.

b. Where retaining walls are provided, they shall meet the setback requirements of Section 2404, Height and Setback Regulations, unless needed to access the property (such as driveway retaining walls) or deemed necessary by the Town Engineer and the Community Development Director to prevent erosion or flooding.

~~a.~~c. The maximum length of any continuous retaining wall shall not be more than 100 linear feet. The maximum height of any retaining wall shall not be more than 8 feet. The height of a retaining wall is measured from the low side of natural grade when retaining fill slopes and from finished grade when retaining cut slopes to the top of the wall; whether the top is retaining earth or not.

~~b.~~d. Retaining walls shall be used for the purpose of containing fill material or for minimizing cut or fill slopes. The retaining wall may only extend six (6) inches above the material it is retaining.

~~c.~~e. A terraced combination of retaining walls shall be measured as a single retaining wall provided the combined walls are: 1) no more than eight (8) feet total vertical height; 2) terraced with a minimum distance between of four (4) feet and a maximum separation of eight (8) feet; and 3) contain appropriate vegetation between the walls so as to soften the visual impact of the combined walls (see **FIGURE 8**). These separation requirements apply to any single lot and do not apply to adjoining walls on neighboring properties.

~~d.~~f. When a safety fence, on top of a retaining wall, is required by code it shall be a view fence and shall be painted to blend with surrounding natural colors.

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~~e.~~g. Where retaining walls are provided they shall be color treated, textured, or veneered to blend in with the surrounding natural colors and textures of the native rock and soils at the site.

Action Report Topic #17

2. Pool Barriers. All pool barriers shall be view fencing. The pool barrier shall be the minimum amount that is needed to secure the pool and that is appropriate for the site.

~~2. Pool Barriers: Shall be view fencing. Open view fencing is not calculated in the 300 feet maximum allowable wall.~~

3. Screen Walls: These walls may be solid walls provided they are of minimum height and length needed to screen the mechanical equipment, garbage cans, or windows of interior bathroom areas, and shall not exceed six (6) feet in height. Screen walls over 6 feet in height may be allowed, at the discretion of the Hillside Building Committee, to properly screen the mechanical equipment or windows of interior bathroom areas; provided, 1) such walls meet the allowable setbacks and height of an accessory structure, and 2) screening area surrounded by screen walls is calculated as part of the allowable floor area.

4. Tenniss/Sport Courts: Fences surrounding a tennis court or sport court shall be~~:~~ : (i) no greater than 10 feet in height as measured from the playing surface, (ii) ~~set within the disturbable area of the Lot~~counts as disturbed area, and (iii) open view fencing and colored to blend in with the surrounding area.

5. ~~5.~~ Driveway ~~Columns~~ columns and ~~Entry~~ entry ~~Gates~~ gates may be located ten (10) feet or more from the property line. The columns and gate are limited to six (6) feet in height and the columns may be a maximum size of two (2) feet by two (2) feet. Electrically controlled gates must be equipped with an approved key switch located as far as possible from the right-of-way.

Action Report Topic #1

6. Driveway Retaining Walls. Driveway retaining walls may extend 18 inches above the driving surface provided the retaining wall meets the 8 foot height limit. When a safety fence, on top of a driveway retaining wall, is required by code it shall be a 36 inch view fence and shall be painted to blend with surrounding natural colors. The retaining wall must comply with the 8 foot height limit; however, the view guard is not limited to the 8 foot retaining wall height limit.

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Comment [GB14]: Need Planning Commission input regarding the potential limitation on the amount of pool barrier fencing. Should a limited be added to the code? If so, what is an appropriate limit? Or, should a general statement of "a minimal amount needed to secure the pool area" be kept and let the Hillside Committee determine what is appropriate for the site.

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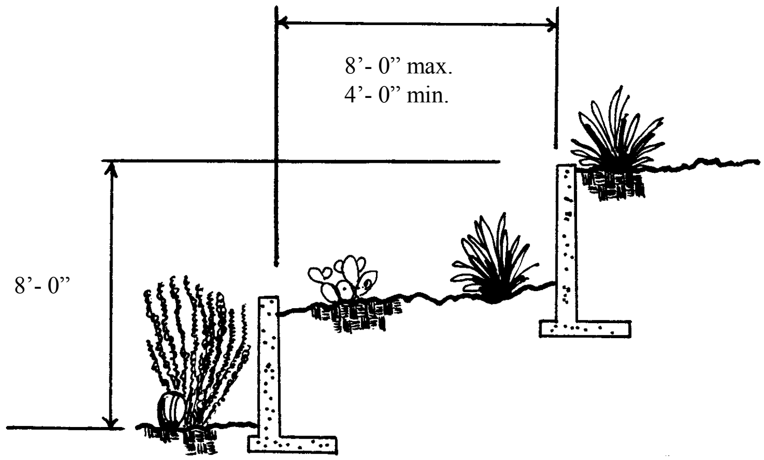
FIGURE 8 –TERRACED VERTICAL RETAINING WALLS

Comment [GB15]: Relocate Figure 8 below the text of 2207.VI.1.e.



VII. ACCESSORY STRUCTURES AND ADDITIONS TO EXISTING STRUCTURES. [558]

~~A. The Hillside Building Committee may review applications for the proposed accessory structures and additions to existing structures if the Town Engineer in consultation with a member of the Hillside Building Committee determines that the proposed accessory structures or addition: (i) exceeds or increases the building height of the main residence; (ii) increases the existing building footprint by more than 1,000 square feet or more than 50% of the original building square footage; (iii) creates an additional disturbance area; (iv) increases site walls; (v) proposes a significant addition of exterior lighting; or (vi) creates a significant adverse visual impact.~~

Comment [GB16]: Moved to Section 2205 and updated criteria.

~~B. The Hillside Building Committee may combine the Concept Plan Review Meeting and the Formal Hillside Committee Review Meeting for applications conforming with the criteria set forth in Subsection VII (A).~~

~~C. If no new disturbed area is required and the proposed accessory structure or addition meets all other hillside requirements including allowable disturbed area, a permit for an accessory structure, or an addition to hillside building may be obtained without requirements for, disturbed area calculations or any other specific requirements as designated by the Town Engineer.~~

~~D.~~A. Any proposed accessory structure or improvements to existing hillside structures which require additional disturbed area shall be accompanied by calculations of prior disturbed area to determine if the entire site is within the allowed limits for hillside construction. When the disturbed area equals that allowed, no further construction involving additional disturbed area will be permitted.

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~~E.~~B. Accessory buildings and structures shall not occupy more than one-half of the total ground area of the main building. No accessory building or structure shall exceed the height specified in Table 1001B or elsewhere in this ordinance.

VIII. SEWERS AND UTILITIES.

A. Grading for septic systems, evapotranspiration systems, and alternative systems shall be included in the calculations for land disturbance limitations unless:

1. The disturbed area is brought back to original natural grade contours, treated with an approved aging agent and planted to blend with surrounding natural growth,

2. Special landscape plans for evapotranspiration systems shall be submitted to the Town Engineer. Plans shall show the appropriate vegetation and supplemental irrigation systems approved by the Town Engineer.

B. Grading for utility lines, including water and sewer lines and lateral lines, electric, gas, telephone and cable services, shall be included within the calculations for land disturbance limitations unless:

1. Trenches are placed under a driveway, under paving or in other areas already counted as disturbed, or

2. Trenches and related disturbed areas are restored to appear as original ground, color treated and planted to blend with surrounding natural growth.

IX. FIRE PROTECTION.

A. Washes must be maintained as easements as described in Section 8-7 of the Town Code and other applicable codes to minimize the risk and spread of fire.

B. Grasses known to be highly flammable, such as fountain grass, *Pennisetum setaceum*, and buffel grass, *Pennisetum ciliare* are not allowed in a Hillside Development Area.

Section 2208 OUTDOOR LIGHTING [558]

A. Purpose: The intent of these lighting requirements is to preserve the low light level conditions that are inherently characteristic of the desert. The objective is to allow only the quantity and level of lighting necessary for safety, security and the enjoyment of outdoor living while protecting against direct glare and excessive lighting; protecting the ability to view the night sky; and preventing light trespass.

Comment [GB17]: Outdoor Lighting - This Section to be Replaced with Lighting Code Updates that are currently under review by Planning Commission. – Action Report Topic #10

B. Definitions: For the purposes of this section, exterior lighting is defined and regulated by the following definitions and categories:

1. Footcandle (fc) - A unit of illuminance of equal to 1 lm/ft² (lumen / sq. ft.) or 10.76 lx (lux).

2. Fully Shielded (Full Cut-Off) - A fixture shielded with an opaque material so that light rays emitted by the fixture are projected only below a horizontal plane running through the lowest point on the fixture where light is emitted.

3. Lumens – The Standard International (SI) unit of luminous flux.

4. Luminaire (Light Fixture) - A complete lighting unit consisting of a lamp or lamps and ballast(s) (when applicable) together with the parts designed to distribute the light, position and protect the lamps, to connect the lamps to the power supply.

5. Opaque - Impervious to the passage of light.

6. Partially Shielded (Partial Cut-Off) - A fixture that allows light rays to be emitted up and down and shielded with an opaque material in such a manner to prevent the bulb from being seen.

7. Safety Lighting - Low-level lighting used to illuminate vehicular and pedestrian circulation.

8. Security Lighting - Lighting that is fully shielded that is intended to provide bright illumination during emergency situations only.

9. Spill Light - The amount of light that illuminates beyond the range or primary area that the fixture is intended to light.

10. Translucent – A material through which light can pass but the light source cannot be seen.

11. Trespass Lighting - Spill light that encroaches onto neighboring properties.

12. Visual Enjoyment Lighting - Lighting intended to illuminate outdoor living areas.

C. Design Standards:

1. All building mounted light fixtures shall be fully shielded. Recessed lights in exterior soffits, eaves, or ceilings shall have a 45°cutoff. At the main entry of the primary structure, a maximum of two (2) translucent fixtures may be permitted as long as the total lumens, per fixture, do not exceed a

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maximum of 750 lumens. All other entrances, excluding garage doors, shall be limited to no more than one (1) fixture.

2. All fixtures, unless otherwise allowed, shall be directed downward and properly aimed on the targeted areas to maximize their effectiveness and minimize the total number of lighting fixtures.

3. Building mounted lighting must be directed downward away from adjacent lots, streets, undisturbed areas, and open spaces, and may not be used to light walls or building elements for decorative purposes.

4. There shall be no lighting permitted in areas identified as “undisturbed areas” of the property pursuant to the plans submitted under Section 2207 III.A.

5. The maximum lighting intensity shall not exceed 0.25 footcandle when measured at the property line.

6. A repetitive line up of lights along driveways or walkways accessing public streets shall not be allowed. Some random lighting of driveways or walkways accessing public streets may be allowed by the Hillside Building Committee. Driveway lights must be located on the "downhill" side and aimed toward the "uphill" side, must be fully shielded from below and only light the driveway surface. Driveway and walkway lights shall not exceed a maximum of 0.25fc at any point beyond 10 feet from the fixture.

7. Each lighting or illuminating device shall be set back from the nearest property line a minimum of ten (10) feet or a distance equal to or greater than the height of the device above natural or excavated grade, whichever is greater. As an exception a lighted entry marker may be placed on each side of the driveway entrance. The entry marker shall not be placed within the Town right-of-way or private road areas and the total height of the marker and light shall not exceed four (4) feet above finished grade adjacent to the driveway. The light source shall not exceed the equivalent projected brightness of 250 lumens.

D. <u>Luminaire (Light Fixture)</u> All luminaires shall be subject to the following limitations:

1. Shall not exceed 750 lumens when attached to a structure and confined to the immediate vicinity of a building entrance or outdoor living area of the residence.

2. Shall not exceed 250 lumens for all other uses.

3. Shall not exceed 150 lumens for landscape up-lighting.
4. Motion sensor/detector light fixtures are permitted for security lighting. Security lighting must be controlled separately from all other lighting.

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Security lights must be on timers that regulate their operation time to a maximum of 10 minutes and limited to lamps with a maximum of 750 lumens.

5. Rope lighting shall not exceed 3.6 watts per lineal foot for an incandescent rope light.

E. Mounting Exterior fixtures shall be mounted:

1. In the ground or on a post not to exceed 36 inches above the ground. When exterior fixtures are affixed to existing trees, the height of the fixture shall not exceed 8 feet above the finished grade.

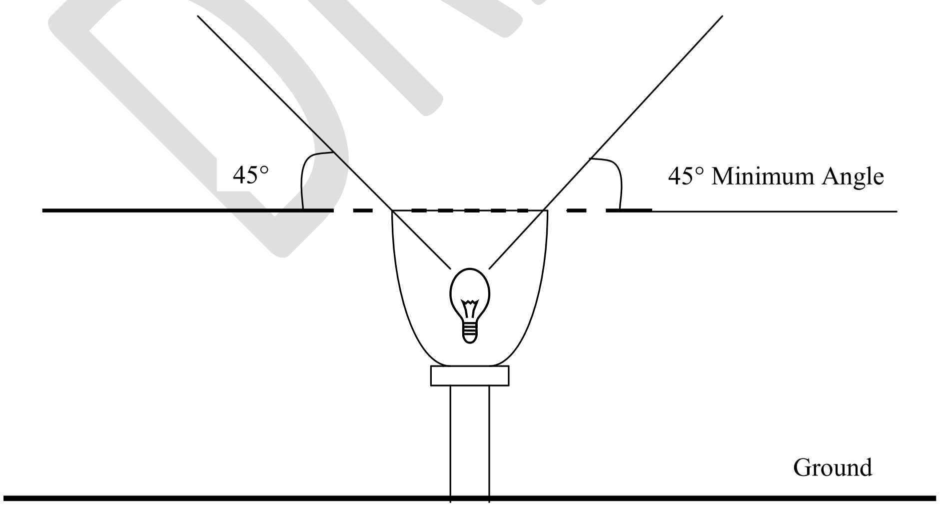
2. In or on a building wall not to exceed 8 feet above finished grade and shielded in such a manner as to avoid creating concentrated light (hot spots) on the structures to which they are mounted. Security lighting may be mounted on the structure to a height of not more than twelve (12) feet.

F. Landscape Up-lighting:

1. The number of fixtures is limited to one fixture per 1000 square feet of allowable disturbed area.

2. The lamp must be recessed to provide a minimum 45° cut-off from the vertical plane.

FIGURE 9 - TYPICAL UPLIGHT WITH 45° CUT-OFF



G. Prohibitions In addition to the limitations noted above, the following lights or lighting effects are strictly prohibited:

1. Colored lamps or bulbs and string and unshielded rope lights; except that temporary holiday lighting shall be permitted between November 15th and January 15th.

2. Tennis court and sport court lighting.

3. Any temporary lighting that violates the provisions of this lighting section.

4. Exterior lights, except security lighting, that illuminate the adjoining mountainside such that the mountainside is visible from off the property between sunset and sunrise.

H. Amendments:

1. Should the applicant desire to substitute outdoor light fixtures or lamps after a permit has been issued, the applicant must submit all changes to the Town Engineer for approval, with adequate information to assure compliance with this ordinance.

Section 2209. DENSITY and SUBDIVISIONS / LOT SPLIT STANDARDS

A. The maximum number of lots into which Hillside Development Area land may be subdivided shall be the sum of the number of lots allowed in each slope category of land as shown by the following **TABLE 2 – Density/Slope Category**.

B. Slope shall be calculated using a minimum of 3 slope lines per acre. The slope lines shall be perpendicular to the slope and at equal distances across the lot.

C. Each of the resulting lots shall meet the minimum lot size requirements based upon the average lot slope shown on **TABLE 2.**

D. Building envelopes shall be conceptually indicated on preliminary plats and accurately shown on final plats.

E. The subdivider shall ~~demonstrate by sketches, engineering drawings, charts or other means~~provide plans and documents by a registered architect, civil engineer, or surveyor demonstrating that roads, public or private, and driveway access and placement of residential structure will conform, for each lot, to current hillside development regulations and without the need for a variance.

F. All subdivision development and lot split applications shall comply with the Hillside Development Requirements as outlined in the Town of Paradise Valley Subdivision Ordinance and Article XXII of this Ordinance.

TABLE 2 – Density / Slope Category

Average Lot Slope %	Min. Lot Size Acres	Min. Lot Size –Sq. Ft.	Average Lot Slope %	Min. Lot Size Acres	Min. Lot Size – Sq. Ft.
10%	1	43,560	41%	6.8	296,208
11%	1.01	43,996	42%	7.6	331,056
12%	1.02	44,431	43%	8.4	365,904
13%	1.04	45,302	44%	9.2	400,752
14%	1.06	46,174	45%	10	435,600
15%	1.08	47,045	46%	11	479,160
16%	1.1	47,916	47%	12	522,720
17%	1.2	52,272	48%	13	566,280
18%	1.3	56,628	49%	14	609,840
19%	1.4	60,984	50%	15	653,400
20%	1.55	67,518	51%	16	696,960
21%	1.6	69,696	52%	17	740,520
22%	1.7	74,052	53%	18	784,080
23%	1.8	78,408	54%	19	827,640
24%	1.9	82,764	55%	20	871,200
25%	2	87,120	56%	21	914,760
26%	2.2	95,832	57%	22	958,320
27%	2.4	104,544	58%	23	1,001,880
28%	2.6	113,256	59%	24	1,045,440
29%	2.8	121,968	60%	25	1,089,000
30%	3	130,680	61%	26	1,132,560
31%	3.2	139,392	62%	27	1,176,120
32%	3.4	148,104	63%	28	1,219,680
33%	3.6	156,816	64%	29	1,263,240
34%	3.8	165,528	65%	30	1,306,800
35%	4	174,240	66%	32	1,393,920
36%	4.4	191,664	67%	34	1,481,040
37%	4.8	209,088	68%	36	1,568,160
38%	5.2	226,512	69%	38	1,655,280
39%	5.6	243,936	70%	40	1,742,400
40%	6	261,360			

Section 2210. REMOVAL OF PROPERTY FROM HILLSIDE

Action Report Topic #11

The Hillside Building Committee and Town Council shall review plans for any request to remove a property from the Hillside Development Area. This process applies to properties that are designated within a Hillside Development Area and have a slope of less than ten percent (10%). If a property owner elects to remove the property from the Hillside Development Area, the following applies:

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Action Report Topic #11

1. The applicant must provide documentation that the property has a building pad slope and site of less than ten percent (10%) in accordance with Section 2202 and Section 2209B.
2. The request will be reviewed by the Hillside Building Committee, which will make a recommendation of approval, approval with stipulations, or denial to remove the property from the Hillside Development Area.
3. The Town Council will either approve, deny, or approve the request with stipulations.

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Action Report Topic #13

Section 2211. LA PLACE DU SOMMET SUDIVISION

The La Place Du Sommet Subdivision is subject to the September 7, 1984 Hillside Ordinance. Any property developed in this subdivision is subject to the 1984 Hillside Ordinance.

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Section 2212 Additional Review Fees

When deemed necessary, the Town may hire an outside firm to assist with or provide a saftey review of an application. The outside safety review includes, but is not limited to, a review of the grading and drainage, geological report, seismic refraction survey and excavation methods. The fees associated with the outside safety review is an additional application fee and must be paid by the applicant.

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Action Report Topic #18

Administrative Relief. See Attached Section 2-5-3 of the Town Code for proposed amendments.

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DRAFT

FOOTNOTE:

110 Ordinance # 220 – 7/12/84
112 Ordinance #221 – 9/24/84
181 Ordinance # 305 – 11/9/89
193 Ordinance # 320 – 2/28/91
194 Ordinance # 321 – 2/28/91
206 Ordinance # 338 – 3/26/92
382 Ordinance # 382 – 12/01/94
409 Ordinance #409 - 7/13/95
425 Ordinance # 425 – 9/12/96
533 Ordinance # 533 – 10/09/03
558 Ordinance # 558 – 06/09/05
580 Ordinance # 580 – 10/26/2006
654 Ordinance #654 – 03/13/2014

Section 5. If any section, subsection, sentence, clause, phrase or portion of this ordinance or any part of these amendments to the Town Code adopted herein by reference is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

Section 6. This ordinance shall become effective in the manner provided by law.

PASSED AND ADOPTED by the Mayor and Council of the Town of Paradise Valley, Arizona, this _____ day of _______, 2017.

____

Michael Collins, Mayor

SIGNED AND ATTESTED TO THIS _______ DAY OF _____________ 2017

ATTEST:

____

Duncan Miller, Town Clerk

APPROVED AS TO FORM:

____

Andrew M. Miller, Town Attorney

Section 2-5-3 Board of Adjustment [8 188 583 623 646 654 685]

E Administrative Relief. [583 654]

1. The Community Development Director may authorize administrative relief to a property owner in the Town of Paradise Valley of up to ten (10) percent of any development standard contained in Article X and Article XXII of the Town Zoning Code, unless specifically restricted elsewhere in this ordinance. For gates on hillside properties, administrative relief may be authorized as described in subsection (i) below. Administrative relief shall be subject to the following requirements and limitations:

   a. An application shall be submitted (and the fee set forth in the Town of Paradise Valley Fee Schedule, as such may be amended from time to time, shall be paid) by the property owner requesting administrative relief, on a form prescribed by the Community Development Director for such, identifying the proposed improvement to the property that is subject to the request;

   b. Notice shall be made by first class mail, postmarked at least five (5) days prior to the proposed date of determination by the Community Development Director, to adjacent property owners determined by the Community Development Director as potentially affected by the request for administrative relief;

   c. The proposed improvement requiring relief will not be detrimental to the property requesting relief, any adjacent property, or the Town, as determined by the Community Development Director;

   d. The relief granted is the minimum required to meet the needs of the proposed improvement, as determined by the Community Development Director;

   e. The relief shall not be contrary to the purpose and intent of this ordinance; and

   f. Administrative relief related to a particular property may only be requested once during an eighteen (18) consecutive month period and only twice during the period of ownership by a recorded owner of the property, the term “owner” to be interpreted for purposes of this section to include any person, firm, corporation, partnership, joint venture, trust, or any related persons, parties, firms, corporations, partnerships, joint ventures or trusts, including any successor trusts where the beneficiaries included are the same as any of the persons included as an owner above or as a beneficiary of any preceding trusts.

g. The relief requested is limited to livable primary and accessory structures and walls, gates, and fences. It is not applicable to:
    i. New home construction, except to request relief related to an inadvertent error,
    ii. Properties that are subject to special use permits,
    iii. Floor area ratio limitations,
    iv. Tennis or other types of sport courts,
    v. Gazebos or other similar structures,
    vi. Disturbed Area

h. The Community Development Director may impose reasonable conditions upon any administrative relief granted to ensure that the public health, safety, and general welfare are protected and substantial justice is done.

i. Relief for gates on hillside properties may be allowed. Such relief shall only be granted for the location to allow the gates to be as close as necessary to the property line when the topography of the lot precludes them from meeting the setback. Consideration shall be given to proper stacking of vehicles for public safety. No increase in height or size or other deviations of the code shall be granted.

2. Any relief authorized by the Community Development Director shall be documented with findings consistent with the standards above and filed with the building permit records, subdivision case file, or other department files, as appropriate.

F. Appeals. [583]

All decisions and interpretations by the Community Development Director performed in accordance with Section 2-5-3.E may be appealed to the Board of Adjustment in accordance with the procedures prescribed in Section 2-5-3.C.

DRAFT

TOWN OF PARADISE VALLEY

Hillside Code Update
Statement of Direction

Town Council Meeting

June 22, 2017

Hillside Code Update

- Purpose: Draft and adopt a Hillside Code Statement of Direction (SOD) to provide the Planning Commission.
  - Revisions to the Hillside Code are just one part of a larger Hillside Council Initiative

- Key Question: What items should be in the SOD and does Mayor & Council have a particular position on each of those items?

Hillside Code Update

- Documents
  - Hillside Code Revisions
    - Original Hillside Code
    - Draft revisions by PC Lead Scott Moore
    - Draft Revisions from PC after their 3 review meetings including January 17
    - Scott and Julie Proposed Version
  - Draft SOD
- SOD can have 3 levels of direction:
  1. Identify problems in code to be worked upon;
  2. Identify Council concept for solution to problem; or
  3. Specify Council preferred language for code update

Hillside Code Update

- 18 Topics Discussed by Commission:
  - Green Topics – PC consensus
  - Red Topics – No PC consensus and/or more work needed

Summary of Topics

1. Retaining Walls and Screen Walls
2. Material Palette
3. Reviews & Admin Chair Review
4. Disturbed Area Calculation
5. Demolition on Hillside Properties
6. Hillside Model
7. Accessory Structure and Accessory Structure Height Limit (including raised decks/platforms)
8. 40’ Overall Height Measurement
9. Driveway Disturbance Credit
10. Lighting
11. Process to Remove a Property from Hillside Designation
12. Hillside Assurance/Bond
13. Define which Hillside Code applies to La Place du Sommet Subdivision
14. Solar Panels and Hillside Review Process
15. Cantilever Limitations
16. On-Site Retention
17. Pool Barriers and Perimeter Fencing Standards
18. Administrative relief on hillside lots (Article XXII)

Hillside Code Update

- Are there any Green category items that Council would like to discuss and offer direction different than what Planning Commission has established?

- Slides 7-17 will only be viewed depending upon the item Council would like to discuss

Material Palette

- Issue:
  1. Colors of materials meet LRV but do not always blend in with surrounding hillside
  2. HBC limited in approving contracting colors
- Decision:
  1. Add language to clarify colors must blend in with surrounding hillside
  2. Give HBC more latitude to approve contracting colors when deemed appropriate
- Reference page 19 of Draft Ordinance

Hillside Reviews & Admin Chair Review

- Issue :
  1. Clarify the 4 types of Hillside Reviews
  2. Increase scope of Chair Review
- Decision:
  1. Add language to clarify the 4 types of Hillside Reviews
  2. Allow Chair Review to include limited amount of site walls, disturbance, and solar panels
- Reference pages 8 and 9 of Draft Ordinance

Disturbed Area Calculation

- Issue :
  1. Footprint does not count as disturbed area. Bigger house can result in less disturbance
  2. Should footprint be counted as disturbance?
- Decision:
  1. Do not count footprint as disturbance. May create too many non-conformities and Prop 207 issues
  2. May need additional language clarifying livable footprint & garage footprint do not count as disturbance
- Reference pages 6 and 21 of Draft Ordinance

Demolition on Hillside Properties

- Issue :
  1. During demo, some contractors go beyond existing disturbance and grade native hillside
  2. Require staking of existing disturbance limit and/or require demo bond?
- Decision:
  1. Require existing disturbance limits to be staked prior to demolition
- Reference pages 10 and 20 of Draft Ordinance

Hillside Model

- Issue :
    1. Code requires physical model and model making is a dying art
- Decision:
    1. Update code to clarify 3D computer models are acceptable with criteria for 3D models (e.g. show contours, scaled, etc.)
- Reference page 14 of Draft Ordinance

Accessory Structures & Heights

- Issue :
  1. Clarify 16’ height limit for accessory structures. Confusion that 24’ height limit for house applies to accessory structures
  2. Codify policy on raised outdoor living areas (e.g. raised pool decks)
- Decision:
  1. Language added to code to clarify 16’ height limit for accessory structures
  2. Language added to code to identify setback requirements for raised outdoor living areas
- Reference pages 7 and 17 of Draft Ordinance

40’ Overall Height Limit

- Issue :
  1. Confusion on how 40’ overall height is measured
- Decision:
  1. Language added to code to clarify how 40’ height limit is measured (from natural grade of lowest structure to the highest point of a structure)
- Reference page 17 of Draft Ordinance

Process to Remove Property from Hillside

- Issue :
  1. Code does not identify process
- Decision:
  1. Codify policy/practice. Language added to code to identify the process to remove a property from Hillside designation (e.g. prove slope of less than 10%, HBC Recommendation and Council action)
- Reference page 34 of Draft Ordinance

Pool Barriers & Perimeter Fencing

- Issue :
  1. Hillside Code prohibits fences with exception of view pool barrier fences, screen walls, retaining walls, and view guard rails
  2. Pool barrier often designed to be a yard or perimeter fence (does not meet intent of code)
- Decision:
  1. Add language to code that clarify barrier must be appropriate to the site and minimum amount needed to secure pool
- Reference page 26 of Draft Ordinance

Admin Relief for Hillside Lots

- Issue :
  1. Admin relief limited to entry gates & solar panels for hillside lots
  2. Make admin relief on hillside lots consistent with flat land lots
- Decision:
  1. Modify language in Chapter 2 of Town Code to make admin relief consistent for hillside and flat land lots
- Reference page 34 of Draft Ordinance & Attachment regarding Chapter 2 of Zoning Code.

Retaining Walls & Screen Walls

- Issue:
  1. Clarify when walls must meet setbacks
  2. Retaining walls limited to 6” height above material they retain. Examine when retaining walls may extend beyond 6” limit
- Options:
  1. Add language to code identifying retaining walls must meet setback unless needed to access property or needed to prevent erosion/flooding
  2. Add language to code to allow driveway retaining walls to extend 18” above material they retain
- Reference pages 24 - 26 of Draft Ordinance

La Place du Sommet & Applicable Code

- Issue :
  1. Practice of applying 1984 code to La Place du Sommet subdivision
- Decision:
  1. Research to determine if La Place du Sommet is bound by 1984 code or if subject to updated code
  2. If applicable, add language to code to clarify La Place du Sommet is governed by 1984 code
- Reference page 34 of Draft Ordinance

Retaining Walls

- Issue:
  1. Does the Council want to specify a maximum guard rail height on top of retaining walls?
  2. 36” guard rail per IRC but architects favor 42”
- Options:
  1. Meet minimum height per IRC (36” inches for residential and 42” inches for commercial), OR
  2. Hillside Committee to decide what height is appropriate for site (e.g. guard rail with max height of 42”)
- Reference page 26 of Draft Ordinance

Driveway Disturbance Credit

- Issue:
  1. Does Council want to apply the same standards to driveways that serve new homes and remodeled homes?
- Options:
  1. Partial disturbance credit for decorative driveways. Establish criteria for credit (e.g. types of driveway surface, proximity to natural grade, etc.)
  2. PC directed staff to research this topic with Commissioner Campbell
- Reference pages 22 - 23 of Draft Ordinance

Lighting

- Issue:
  1. Does Council want to incorporate recent lighting code updates to hillside?
- Options:
  1. Prohibit rope lighting
  2. Add Lux as another measurement of light
  3. Allow holiday lights to start on October 15th
  4. Add Kelvin requirements
- Reference pages 28 - 32 of Draft Ordinance

Hillside Assurance/Bond

- Issue:
  1. Does Council want to explore potential updates and requirements for Hillside Assurance/Bond?
  2. Currently – Bond places Town in position to cover, restore, and landscape cut/fill to blend in with surrounding terrain
- Options:
  1. Update or establish criteria for fees (e.g. increase multiplier, greater slope = greater bond, etc.) and time period when bond can be used to restore site
  2. In event of market condition, place a lean on the property
  3. Criteria for Landscape Bond
  4. Three bids to determine bond amount
- Reference pages 10 - 11 of Draft Ordinance

Solar Panels & Review Process

- Issue:
  1. Does Council want to allow solar panels on pitched roofs?
  2. PC concern if Town can regulate solar
- Options:
  1. Consider allowing stealth solar technology on all pitched roofs (e.g. Tesla solar tiles, etc.) and establish criteria
  2. Allow solar panels on pitched roofs only when screened by hillside
- Reference page 9 and page 19 of Draft Ordinance

Cantilever Limitations

- Issue:
  1. Does Council want to limit cantilevers or change cantilever criteria?
- Options:
  1. Prohibit cantilevered driveways
  2. PC – Create cantilever criteria for house and criteria for pool decks. Directed staff to research this topic with Commissioner Campbell
  3. 8’ max vertical and 4’ max horizontal (Moore & Pace)
  4. Prohibit cantilevered roadways (Moore & Pace)
- Reference pages 18 - 19 of Draft Ordinance

On-Site Retention

- Issue:
  1. Retention counted as disturbed area. Also, applicants occasionally use retaining walls to create retention areas. Does Council want to offer partial credit on retention basins (via specified criteria)?
  2. Identify that on-site retention must comply with Town's Storm Drain Design Manual
- Options:
  1. Keep as is - Retention are counts as 100% disturbance
  2. Incentivize better retention designs - 50% credit for retention areas that do not use retaining walls and vegetated with native plants
  3. Add language to code to reference Storm Drain Design Manual
- Reference pages 21of Draft Ordinance

Questions?



Town of Paradise Valley

6401 E Lincoln Dr
Paradise Valley, AZ 85253

Action Report

File #: 17-233

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6401 E Lincoln Dr
Paradise Valley, AZ 85253

Action Report

File #: 17-238

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6401 E Lincoln Dr
Paradise Valley, AZ 85253

File #: 17-231

Town of Paradise Valley
Action Report

TO: Mayor Collins and Town Council

FROM: Eva Cutro, Community Development Director
Paul Michaud, Senior Planner

DATE: June 22, 2017

CONTACT:

AGENDA TITLE:
Consideration of Paradise Valley Bicycle & Pedestrian Master Plan Statement of Direction

RECOMMENDATION
Approve the Statement of Direction (SOD) for the Paradise Valley Bicycle & Pedestrian Master Plan

UPDATE
The Town Council asked to have more opportunity to review the first draft of the Paradise Valley Bicycle & Pedestrian Master Plan (the "Master Plan") at the Town Council meeting of February 23, 2017. Since the first draft of the Master Plan, the Town Council has received many comments from residents on all sides of this matter. Mayor Collins presented a proposal during the June 8 study session narrowing the locations of bicycle and pedestrian facilities. This met with broad support from the Town Council. Therefore the item was moved to the June 22, 2017 Regular Meeting for action.

STATEMENT OF DIRECTION (SOD)
The staff proposed Statement of Direction for the Bicycle and Pedestrian Master Plan has been edited to reflect the changes agreed upon by the Mayor and Town Council during the June 8 Study Session. A redlined version and clean version are attached for review.

Several residents spoke at the call to the public at the June 8 Regular Meeting with concerns that parts of the edited SOD appear to be one-sided against cyclists. In addition, e-mail comments were submitted after this meeting and are attached to this report. It was suggested by a resident to remove, or if not, reword the "Emphasize Safety and Enforcement" direction to read:

> *"Ensure all improvements meet safety requirements and are subject to enforcement should need be with respect to vehicles, pedestrians, bicyclists, skate boards, dogs, horses, etc."*

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The Town Council edited the direction to read:

> *"Recommend bicycle facilities, policies, and enforcement measures that foster bicyclists following the rules of the road to improve safety and the creation of a non-confrontational environment. Of particular concern is addressing bicyclists that ride more than two abreast, bicyclists not stopping at signed intersections, ~~and~~ speeding, and avoid public urination. Recommend any new traffic rules or laws if ~~as~~ necessary to remedy a material or defect in an existing law."*

Staff would offer an alternative to this bulleted direction to read:

> *"Ensure all improvements meet safety requirements, with policies that address safety, education, and enforcement as a means to foster a mutual respect and understanding between different travel modes and compliance with Arizona Revised Statutes and other laws, thereby creating a safer environment for all. Of particular concern is addressing conflicts where bicyclists ride more than two abreast, where motorists pass bicyclists, when bicyclists and motorists fail to stop at signed intersections, speeding, and addressing public urination. Recommend any new traffic rules or laws, if necessary to remedy a material or defect in an existing law."*

Part of the attached SOD includes a Revised Bicycle Circulation Map that focuses the Town's limited resources on approximately six miles of bike lane/facility improvements away from local neighborhoods, congested motorized traffic routes and hillside areas. As noted at the June 8th study session, designated lanes or routes would not necessarily prohibit persons from the use of other public streets within the Town. The SOD also includes a new concept called the "Resort Loop" that connects central resort activities and focuses on providing safe, shared-use recreational paths for resort guests and residents in the local area.

NEXT STEPS

If the SOD is approved, the Paradise Valley Bicycle & Pedestrian Master Plan will refer back to the Planning Commission for their review and edit before moving onto the Town Council for possible adoption. It is anticipated there will be several Planning Commission work sessions starting up this summer, along with a citizen review session and Planning Commission recommendation this upcoming fall. The Town Council will be updated on the progress, as well as have their own study session(s) and action on the plan. As is typical, the Planning Commission and Town Council meetings are open to the public.

Attachments

1. Draft SOD
2. Comments (05-23-17 to 06-14-17) Prior comments on Town website
3. Presentation

Available documents, including summaries on completed public engagement events, are available at <http://www.paradisevalleyaz.gov/555/Bicycle-Pedestrian-Master-Plan>

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Paradise Valley
Bicycle and Pedestrian Master Plan

-Statement of Direction-
June 22, 2017

The Town of Paradise Valley is preparing a Bicycle and Pedestrian Master Plan that is long-range in nature. This Master Plan will provide policy and guidance related to the topic of bicycles and pedestrians in the Town. This Master Plan will look to build upon the existing goals/polices in the 2012 General Plan, re-examine designated bicycle facilities, and identify pedestrian facilities that work best for the Town.

As in any Statement of Direction, this direction to the Planning Commission is not a final decision of the Town Council and such matters addressed may differ from the actual adopted plan.

Therefore, the Town Council issues the following Statement of Direction for the Paradise Valley Bicycle and Pedestrian Master Plan:

- The General Plan includes an implementation measure to prepare a master plan that carries out the goals and policies of the General Plan related to non-motorized circulation. (General Plan Mobility Implementation Measure 9).

- The Planning Commission shall focus their review on the following:

  - **EMPHASIZE SAFETY AND ENFORCEMENT**: Recommend bicycle facilities, policies, and enforcement measures that foster bicyclists following the rules of the road to improve safety and the creation of a non-confrontational environment. Of particular concern is addressing bicyclists that ride more than two abreast, bicyclists not stopping at signed intersections, ~~and~~ speeding, and avoid public urination. Recommend any new traffic rules or laws if~~as~~ necessary to remedy a material or defect in an existing law.

  - **EMPHASIZE RESORT LOOP**: An emphasis should be placed on providing safe and shared-use pedestrian and bicycle connectivity along the identified "Resort Loop" depicted on the attached Revised Bicycle Circulation Map, Exhibit 'A' dated June 8, 2017. Bicycle connectivity should be provided through shared-use recreational paths or facilities separated from the vehicular travel lane.

  - **FOCUS PEDESTRIAN FACILITIES**: Focus pedestrian facilities on primarily non-local streets in areas that serve resort destination areas adjacent to the designated Development Areas of the General Plan, provide access to nearby trailheads, and/or complete missing gaps.

- **FOCUS BICYCLE FACILITIES**: Focus bicycle facilities on non-local streets as depicted on the attached Revised Bicycle Circulation Map, Exhibit 'A' dated June 8, 2017. Eliminate other previous bike lane and bike route designations. Consider local neighborhood requests to add facilities, mitigation measures such as traffic calming, or signage to their neighborhoods. Do not remove existing, physical bike facilities, but only communicate ~~"advertise"~~ or identify those presented on the attached network.

- **AVOID "URBAN" DESIGN ELEMENTS**: Facilities should be compatible to their street classification and in character with its surroundings. Preference is to avoid more urban elements (such as concrete, pavement, striping and signage) in favor of more rural or less intense facilities to provide safety of pedestrians and avoidance of conflicts with vehicles and bicycles.

- **ADDRESS MITIGATION OF CONFLICTS**: This mitigation includes, and is not limited to, the following:
  - Discouragement of cut-through travel, particularly on local streets.
  - Corridor design that eases unsafe conditions between different modes of travel, particularly where bicyclists share the same space as motorized vehicles. This design should include the use of round-a-bouts and other traffic calming measures, roadway pavement curb options, and other design enhancements.
  - Abatement of unintended nuisances such as noise and designs that could increase crime.
  - Accommodation of storm water passage without negatively impacting nearby development and the functioning of the roadway.
  - Identify role for the Advisory Committee on Public Safety (ACOPS) committee in supporting user group education.

- **AVOID NEW SIGNAGE**: Aim to avoid signage in an effort to maintain the semi-rural character and natural beauty of the Town's streetscapes. Focus shall be on identifying sign guidelines.
  - Signage that may be required should be the minimum amount necessary and in character with the area;
  - Allowable signage may include wayside signs to provide interpretative information that is unique to Paradise Valley, informational signage located in pedestrian-concentrated spots like the Town Hall complex, and regulatory/warning signs necessary for safety; and
  - Signage dimensions, material, and color should blend into the background and be of a high quality; yet, consistent with federal and state regulations where applicable.

- **PAIR THIS EFFORT WITH THE VSC PLAN**: Ensure that the Bicycle and Pedestrian Master Plan and the Visually Significant Corridors Plan complement each other. Further ensure that the Lincoln sidewalk corridor grant is consistent with recommended changes.

- **IDENTIFY ROUGH COSTS AND PHASING**: Identify probable cost estimates for improvements that provide adequate detail to assess the nature of the improvement. Consider identifying these potential improvements over a short, medium, and long-range time frame. Look to phase bicycle and pedestrian facilities with other capital projects, unless there is a critical safety issue.

- **BE CLEAR AND LEGIBLE**: The visuals, such as maps, must be clear and legible. They should also highlight the desired end-result such as the specific material treatment.

- **PRIORITIZE PROJECTS**: Where practicable, prioritization of non-motorized facility projects should first address existing deficiencies with motorized facilities such as traffic congestion and roadway repairs.

- At any time during the review process, the Planning Commission may request clarification and/or expansion of this Statement of Direction based on additional information that has evolved.

If, in the process of addressing the elements of this SOD, the Bicycle and Pedestrian Master Plan becomes inconsistent, contradictory or expansive of the 2012 General Plan, identify the goal, policy, roadway cross-section, and/or map that is at conflict as well as the proposed modification.

Figure 4.9 Non-Motorized Circulation Map

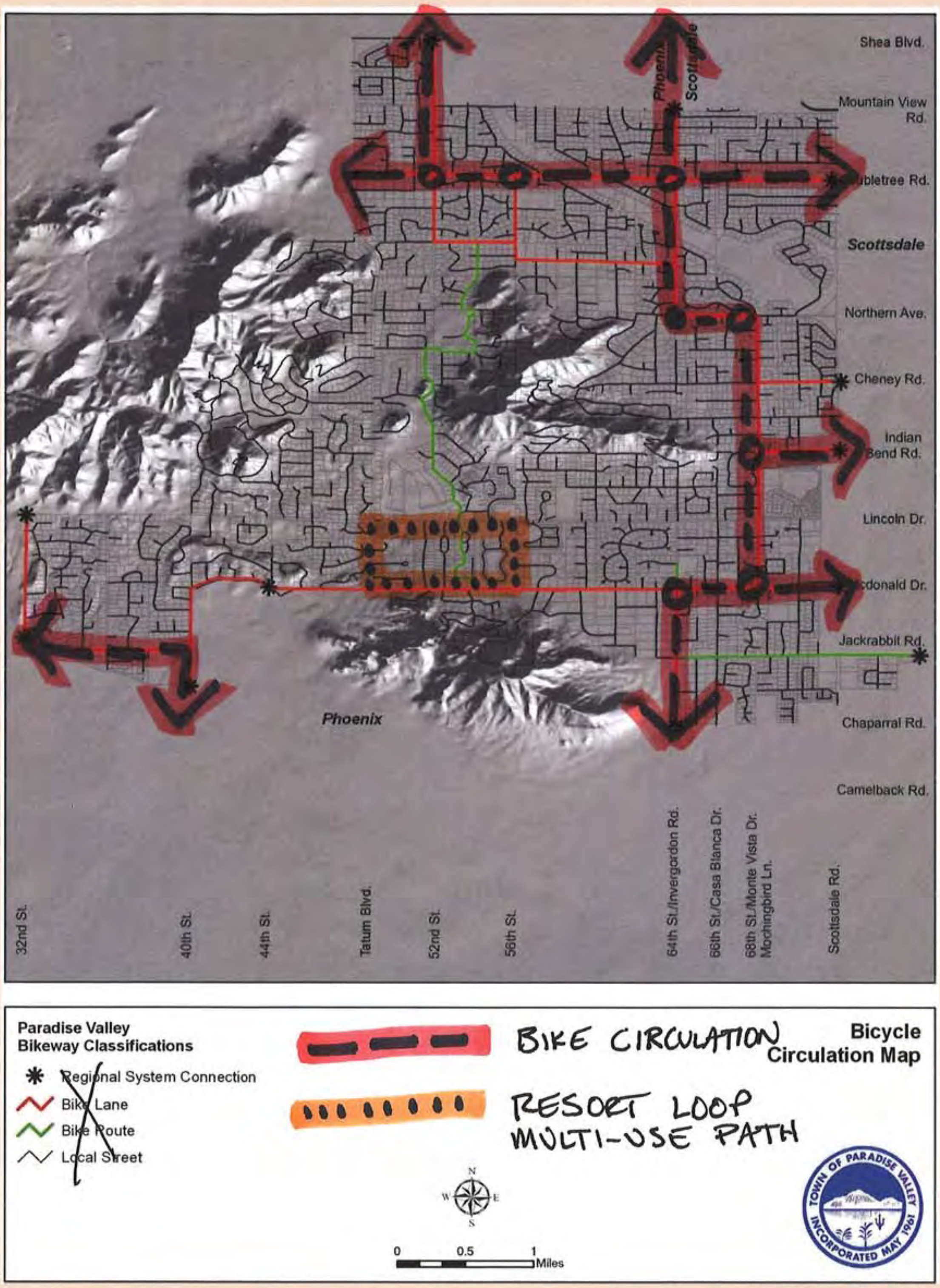
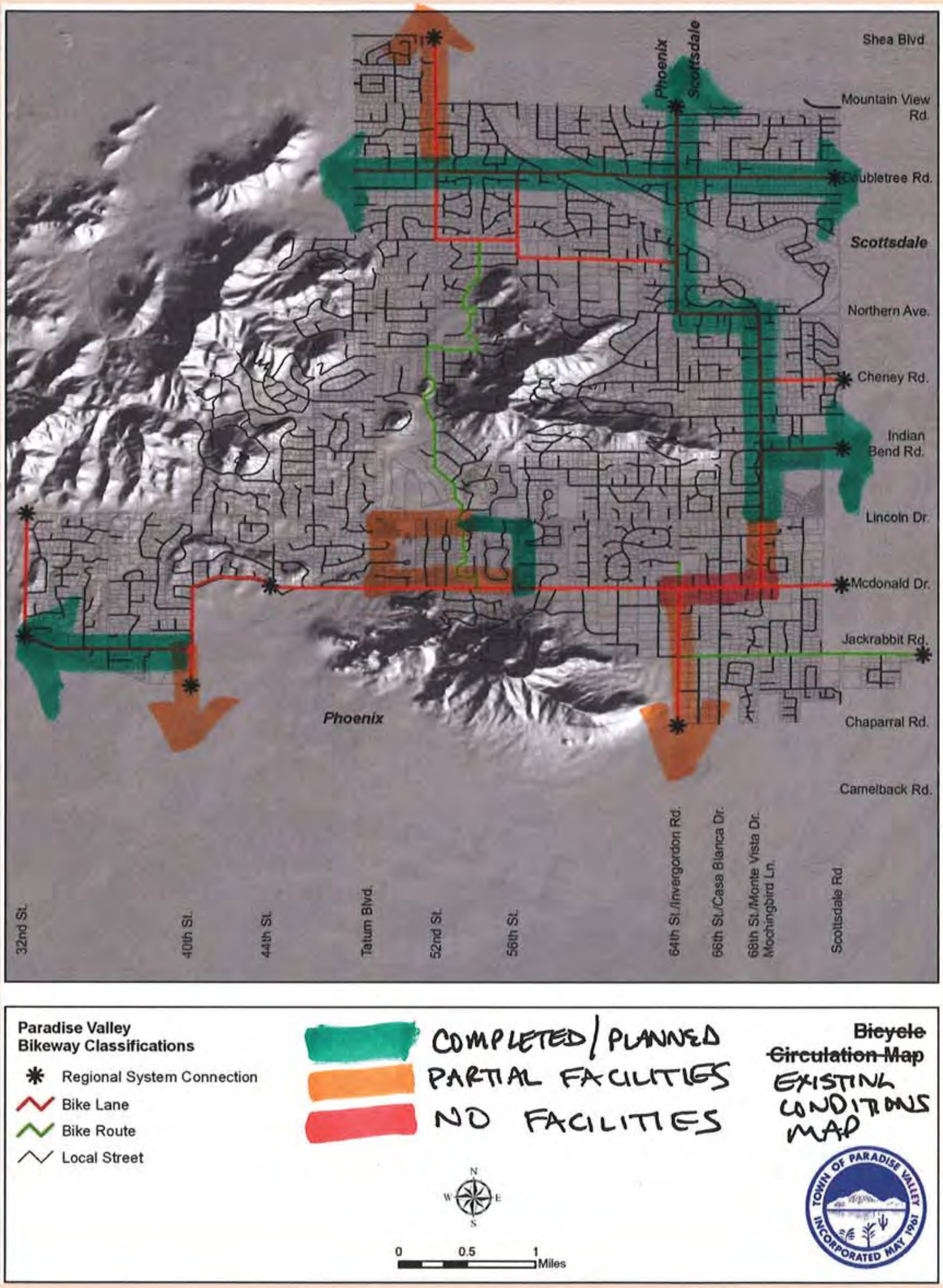


EXHIBIT A, June 8, 2017

Figure 4.9 Non-Motorized Circulation Map



Paul Michaud

From: Bill Johnsen <Bill@nursingsolutions.com>
Sent: Monday, June 12, 2017 6:29 AM
To: Mayor Michael Collins; Council Member David Sherf; Vice Mayor Jerry Bien-Willner; Council Member Scott Moore; Council Member Julie Pace; Council Member Mark Stanton; Kevin Burke; Peter Wingert; Paul Michaud
Subject: Cyclist in PV

All,

I am writing you to express my concerns about some of the things being discussed currently with regards to the town's bike plan. I have been a resident of PV since 1993 and have been riding my bike in the town all of these last 25 years. I am most concern with the idea that the town might try to restrict the roads on which I might be able to ride. I think any such proposal would be contrary to most residents desires, against or in conflict with state law, certain to be legally challenged by residents and cycling advocacy groups and a waste of enforcement dollars. It also opens the door to a long list of issues where a small group of vocal residents could argue for special treatment by the town to protect them from general annoyances that come with being part of a community. If the council is interested, I would happily provide a list of things that occur, pass by, create noise or dust near my home that I wish to be banned from my street. I will agree that not all cyclist behave in a way in which I am proud of, but I see many more problems with the way motorist act in PV and their actions in terms of public safety, create significantly more risk for potential harm to others. Finally, I would ask what would one do if they lived on a street that would not allow bicycles? Would they walk their bike or put their bike in a car and drive to point where they could ride? Before you ban bikes, please address the garbage trucks that seem to pass our house every day of the week.

Sincerely,

Bill Johnsen
5423 E Via Del Cielo

NOTICE: This e-mail (and any attachments) may contain PRIVILEGED OR CONFIDENTIAL information and is intended only for the use of the specific individual(s) to whom it is addressed. It may contain information that is privileged and confidential under state and federal law. This information may be used or disclosed only in accordance with law, and you may be subject to penalties under law for improper use or further disclosure of the information in this e-mail and its attachments. If you have received this e-mail in error, please immediately notify the person named above by reply e-mail, and then delete the original e-mail. Thank you.

Paul Michaud

From:	Brent Donaldson <bdonaldson@me.com>
Sent:	Sunday, June 11, 2017 10:56 AM
To:	Mayor Michael Collins; Council Member David Sherf; Vice Mayor Jerry Bien-Willner; Council Member Scott Moore; Council Member Julie Pace; Council Member Mark Stanton; Kevin Burke; Paul Michaud; Peter Wingert
Subject:	Bike plan 6/8 meeting follow up
Attachments:	Primer for Non-Cyclists.pdf

To the Paradise Valley Town Council; et al:

Re: Reflections on apparent direction of bike plan after the 6/8 Council meeting:

Being a cyclist residing in Paradise Valley, I'd like to provide additional feedback re: the Bike Plan proposals and Council meeting of 6/8/17:

1. A cyclists' perspective on the plan as sketched out by the Mayor/comments made by the Vice Mayor and various council members

2. An attached background "Primer" on road cycling practices and issues in town that you all might find helpful.

Comments on the "Mayors' Revised Plan":

1. Tourist signage and pathway/Additional inexpensive safety elements needed on MacDonald:

Vice Mayor's thoughts are accurate re: Directional Signage/Tourist pathway:
The Vice Mayor's comments that local cyclists don't need directional signage is accurate.

Local cyclists know where they are going. If not, there are plenty of on-line resources to load into bike computers for turn by turn directions.

Tourists can use directions. However, while signage might be helpful, the resorts can and do easily provide handout maps with their bikes.

Most importantly re: Tourist routing: getting Tourists on their cruisers and hybrids up and down Lincoln on their routes to their hotels via an off-street, multi-use path/extra wide sidewalk that is marked as usable by bikes.

Tourists do often ride around Mummy mountain..so this pathway, ideally, should extend from the western-most resorts to 68th, which is the eastern portion on that loop.

2. Additional safety elements and motorist enforcement needed:

Install Safety Signage:
On MacDonald (and to a lesser extent Doubletree and Invegordon/Mockingbird/68th), install multiple and prominent "Share The Road" road signage and, when no bike lane exists, Sharrow markings on the roadway….

Such installations are easily and speedily done at relatively little expense, particularly in comparison to changing roadway configurations.

Generally, everyone gets along on MacDonald, as elsewhere in Paradise Valley. However, the exceptions of motorists illegally passing are dangerous to cyclists' safety on the road.

Enforcement of motorist clearance, endangerment and assault violations are crucial for safety: Importantly, to enhance safety, particularly on MacDonald, focus police enforcement effort re: drivers encroaching dangerously and illegally on cyclists when passing..

Enforcement accompanied by PR (such as an article in the Independent to inform residents of the need to be mindful and of an enforcement presence) would leave only "cut through" traffic that would need to "experience" being pulled over. Its a "twofer"!

Warnings and the inconvenience and notoriety of being pulled over will, in this writers opinion, suffice for a period of time for drivers to adjust, unless the passing is egregiously dangerous or by a repeat offender,

Doubletree, Invegordon, Mockingbird and 68th would benefit from the same enforcement treatment but are not the subject of the same a level of aggressive vehicle actions vis a vis cyclists.

2. Roundabouts are a great long term solution/goal:

Chief Wingert observations are proven fact: Experience and studies have shown the best longterm solution to traffic safety and most efficient intersections are roundabouts. There are any number of sources to confirm this.

Many people who have little experience living with roundabouts find this counter intuitive; Nonetheless, the evidence is in, here in the USA, even in very heavy traffic intersections.

Roundabouts promote safety at intersections for all roadway users and, for the issue at hand as it pertains to cyclists, Idaho Stops and enforcement,

At the same time, it is sensible fiscally to make a roundabout installation recommendation a long term solution/goal.

3. Spending time and/or money on the notion of closing streets to cyclists is less than intelligent:

There are gated communities for those who wish to close their streets. The term "public streets" is... self defining.

Moreover, it will be fiscally imprudent to attempt street closures for cyclists without a large legal budget set aside.

Codifying such proposal will surely be contested. Local, regional and national bicycle advocacy groups with first rate pro bono legal representation will create a costly misdirection of resources for the town.

Last, it is my understanding that ADOT has already informed staff that this is legally impractical.

Street closure to cyclists should emphatically be categorized by the council as a non-starter with no more time or staff resources spent regarding this misguided approach.

4. Please take a few minutes to review the attached "Primer":

You may find the information contained to be informative and helpful in proceeding to bring the bike plan to conclusion, as well as for other matters regarding cyclists in Paradise Valley.

Conclusion:

Effort put into the plan a credit to Council: The time, effort and expense spent on a thoughtful bicycle element in the town is a credit to the Council.

Plan should not be a misdirected effort: However, it is concerning to cyclists that there is an element of misdirection of this effort to infringe on cyclists rather than promote safety for all users, particularly cyclists, given that this is a bike plan.

Please refocus Council's energy: Bike Plan and accompanying directions of the Council should be an enhancement of the safety and usability of the town's roadways for cyclists; not a misdirected effort to infringe upon and penalize cyclists.

Respectfully,

Brent Donaldson

Paradise Valley Resident

Cycling Vocabulary/Primer for Non-Cyclists

Apex: the middle or sharpest point of a curve in the road. Many riders enjoy riding through corners and hills. Being able to pick a line through the apex is part of that enjoyment.

Bike lane: a marked lane that is at least 4" from curb joint to the center of demarcating line between bike lane and roadway or a least 5' if there is no curb pan.

In cases in which the bike lane is less than legally mandated the AZ vehicle code allows (and safety experts suggest) that for the sake of greater safety, and to prevent vehicles passing with less than the required 3' of clearance, cyclists should move into the lane of traffic and take the entire lane.

Even so, riders seldom take the lane unless riding very fast/at or close to the speed limit.

However, even when cyclists are riding on the right side of the roadway, inevitably, there are impatient drivers that pass dangerously close and endanger the cyclists.

MacDonald is particularly prone to this problem as impatient drivers often do not wait the few seconds required to pass on the sections between medians.

Prominently posted "Share the Road" signage and Sharrow marking in such places may help promote safety.

Biker: someone who rides a Harley and dresses the part. A term sometimes also used for cyclists but which can result in obvious confusion.

Blind corner: a turn in the road in which drivers and riders cannot see around the apex due to an embankment, building, etc.

Cyclists need to be very careful as motorists crossing the center line on a blind corner can cause fatal injuries to oncoming cyclists.

Blind driveway: Residents with blind corner driveways should clear brush or install mirrors to provide adequate vision to emerge safely.

It would easy enough for the town to have a traffic safety publicity campaign that, among other things, encourages clearing visual obstructions/brush and the use of blind exit driveway mirrors for residences with blind driveways

Bot: small, slick, colored and/or reflective half hemisphere placed on pavement to direct or warn traffic. Very dangerous to and unsafe for cyclists to ride over as they cause crashes from wheels sliding out from under riders.

Bunch: A group of road bike riders spread across the road; as opposed to riding single or double file in a pace line.

A group ride may legally take the entire lane in a bunch and is not necessarily required to ride on the right side of the roadway unless riding slower than the speed limit/prevailing rate of traffic. The vehicle code (and common sense) only requires cyclists to ride to the right of the roadway if they are riding slower than the lesser of the legal speed limit or rate of traffic.

Bunny hop: rider (while riding) lifting the bike into the air to clear an obstacle, such as a steel construction plate.

Cadence: the rate at which the pedals go around. To start a climb after stopping is difficult as it is challenging to maintain balance at an extremely low cadence and difficult to pedal uphill.

Centerline: the line segregating traffic flow in one direction or the other on a two-way street.

Clearance: Per the AZ code, motorist are required by law to provide 3' of clearance when passing cyclists, who can legally be riding 2 abreast...in the roadway, unless there is a bike lane of legal width.

In fact, 3' of clearance is frequently not given by motorists with resulting endangerment to cyclists...even though it would often require only a second or two of delay before passing with clearance.

This law is to promote safety. However, the Paradise Valley police department has no ongoing effort related to the enforcement of this law. Yet, there has been a significant effort to address enforcement of traffic law upon cyclists, apparently as directed by the council. Cyclists are left to wonder why that is?

Cleat: attaches to the bottom of bike shoe enabling the cyclist to hold foot onto pedal so cyclists can pedal most efficiently. Causes road cyclists to have difficulty walking any but very short distances.

Clip in/out: to engage or disengage the shoe/cleat from the pedal. It is very difficult to clip out or get clipped back in while going up a very steep hill. Also, cyclists prefer not to clip out at stop signs and may do a track stand for a moment unless they must wait longer and put a foot down.

Cruise/Beach Cruiser: A heavy, bike with wide tires, an upright position and single speed for casual short distance riding in street shoes/attire.

Crux: the hardest part of a hill-climb.

Cyclist: rider of bicycles who come in various forms: roadies ride road bikes solo or in groups on paved streets; mountain bikers ride mountain bikes to, from and on trails such as trail 100;

Cruisers and hybrids are ridden both on streets and mixed-use trails by both residents and tourists.

Descend: to go downhill. Because there a few hills in the Phoenix area many riders who are newer are less experienced descenders.

These riders may be more prone to accidents, particularly in off camber corners or one with gravel that can cause a washout.

Thus, providing signage re: dangerous curves or steep hills is a wonderful idea.

Attempting to close off such roads to all cyclists will infringe on those who are capable, result in costly litigation, will most likely be a losing cause both legally and financially for the town and is not advisable.

Dooring: Cyclist being struck by the door of a car parked parallel to the direction of traffic due to the negligence/inattentiveness of the person opening the door of a vehicle. AZ traffic laws specifically address the obligation of motorists to only open doors when safe to do so.

Though typically a problem in more urban and congested areas, streets such as Invegordon near the camelback mtn trail head are prone to this problem. Cyclists should be made aware and motorist warned to be attentive.

Drafting: riding very close to in the slipstream of the rider in front to gain the benefit of reduced air resistance. Common and safe practice among experienced riders. Sometimes the cause of accidents amongst inexperienced riders.

Drops: the lower portion of a road bike handlebar. Riding "in the drops" is most stable and safest when descending...but paradoxically also most "aero" and fastest.

Group or Group ride: several or more road bike riders in a pace line or bunch.

Hoods: the top of the brake levers on a road bike, where riders may place their hands when riding in an upright position. Note, riding on the hoods is not the most stable position in which to descend, particularly through corners. Due to the dearth of hills in the area, many riders are unaware of this potential safety issue.

Idaho Stop: Vehicle code in the state of Idaho, Oregon, etc. allows cyclists to treat stop signs as yields and a red light as a stop sign. Though counter intuitive to non-cyclists, studies show this law reduced accidents, fatalities and injuries: https://en.wikipedia.org/wiki/Idaho_stop

Kicker: short steep up-hill section/climb such as Hummingbird, Starlight, etc.

Loop: A route that ends at its beginning point.

Mashing: need to put all possible pressure on the pedals on the down stroke; Can be an unsafe moment if climbing a steep pitch at low cadence due to having lost momentum on a kicker. Requires maximum exertion and often is a bit sketchy as control diminishes on a hill at extremely low cadence. May require rider to revert to "paperboy" zig zags

Momentum: speed needed on the approach to get up a kicker without losing cadence and having to mash. Riders on a descent that is followed by a kicker will go "full gas" to create momentum, a high cadence and enable the hill to be climbed without mashing and doing the paperboy.

Mountain bike ("MTB"): bike with wide knobby tires used to ride on dirt trails and roads. Goes slower on roads than road bikes.

MTB riders in Paradise Valley often needs to make a "suicide crossing" on Tatum since there is no safe crossing anywhere nearby to reach the trailhead for trail 100, which is a popular MTB destination.

Off-camber corner: A turn in the road in which the roadway is banked in the opposite direction of the turn such that it falls away rather than being banked into the turn.

Dangerous for cyclist at speed who are unprepared and/or have weak handling skills to mind the centerline in an off-camber corner. Moreover, such corners are prone to a rider washing out if there is any sand or gravel on the roadway.

Off the back: riders dropped from and unable to keep up with the group. When fast group rides hit the kickers riders will be off the back in ones and twos. Momentum can help prevent going off the back on short kickers.

Out and Back: a route that retraces itself from its destination on the return portion of the ride

Pace line: Group of cyclists riding in single or double file.

The vehicle code allows for riders to ride double file in the roadway, though that is not always the most intelligent thing to do from a self-preservation standpoint.

When that pace line passes other riders, those riders being passed are not being "added" as an additional line of riders. Thus, though a double file pace line may often appear to be three riders wide; when passing another rider that is a legal "formation", though not always the safest or most intelligent.

Also, as geese when flying, the lead must rotate off the front of a pace line as fatigue sets in. As riders are rotating off the front, and as mentioned above, they will legally add one more line to the width of riders, as they are being passed.

How and where these riders must ride vis a vis the bike lane/shoulder is a matter of the width of the shoulder and if it is a proper bike lane or not....very tricky stuff when out on the road. The best safety measure for cyclists is to stay as far to the right as is safe.

Importantly however, staying to the right does not mean on the rightmost edge of the road. Riding on the extreme right edge of the road is truly unsafe as a hole or obstacle will require the cyclist to swerve left into the road/traffic...best to leave a bit of room on the right/shoulder.

Point of interest policy wise: how the road is marked is controversial in bike safety and traffic management circles that is, which is safer? A lane with a "legally too narrow" shoulder that is marked by a white line or no white line and sharrow markings?

Pack: group of riders riding in a bunch, typically used in a context in which they are racing or riding fast. English synonym for Peloton. "The pack was a short distance behind the small group of leaders who had broken away."

Paperboy: zig zagging to manage to get up a very steep climb. Unsafe on a busy street as it requires the rider to weave from one side of the road to the centerline and back.

Peloton: the pack/main group of riders in a race. In cycling speak bit of a faux pas in a recreational context ("group ride" would be the typical usage or "fast group ride" for something like the Tuesday 5:30 Gainey ride) Nonetheless, Peloton certainly does the job of conveying the image of racers in a pack

Picking a line: planning and anticipating the path to take through a corner or through obstacles on the road. It is particularly important to pick a good line through an off-camber corner to stay to the right of the centerline.

Pinch flat: flat tires caused by an obstruction or hard object that is ridden over. Rocks or steel plates in the road can cause pinch flats if ridden over. Consequently, riders are often forced to bunny hop over such plates or other roadway construction.

Pitch: A short section. "The last pitch before the summit on Hummingbird is a kicker".

Practicable: Capable of being put into practice in the judgement of the practitioner. When going slower than the prevailing speed of traffic, cyclists are required by the vehicle code to ride as close to the right side of the roadway as "practicable"; i.e. as the rider believe is safely possible.

Road bike: Bicycle that has narrow tires, light weight frame and designed for riding on paved roadways.

Roadway: means that portion of a highway that is improved, designed or ordinarily used for vehicular travel, *exclusive of the berm or shoulder.* Cyclists may not ride more than two abreast *on the roadway.* Which isn't to say that riding two or more abreast as legally permitted is the smart or safe thing to do, which really should be the guiding principle.

An excerpt from one handbook on traffic controls includes the following:

In locations where the curbside lane width is less than 11 ft. (3.3m), bicyclists and motor vehicle will usually occupy the same lane width, as the lane is perceived as being insufficiently wide for side-by-side passing. In locations where the lane width is between 11 and 14 ft. (3.3 and 4.3m), the perception of "shareable" width may be ambiguous, and bicyclists may ride to the extreme right of the travel lane to palitely accommodate faster traffic.

This can create two operational and safety problems. First, the bicyclist may be riding in the gutter pan, next to a vertical curb, or near posts and other roadside objects, creating the risk of a fixed-object crash. Second, this can create the misleading impression the remaining unoccupied travel lane width is adequate for an overtaking maneuver, resulting in too-close passing inconsistent with good operating procedure or law, and may result in sideswipe-type crash if the motorist misjudges separation distance. In locations with 11 to 14 ft. (3.3 to 4.3m) lanes, it may be advisable, based on engineering judgement, to install additional devices, such as shared lane marking and BICYCLE S MAY USE FULL LANE (R4-11) signs, or if practicable, reallocate lane widths to reduce the ambiguity.

Sharrow markings: Roadway signage indicating the lane is a shared bike/vehicle lane. Such lane markings may be an added safety measure to inform motorist of the need to accommodate cyclists.

Strafe: the aggressive action by a motorist to swoop/swerve towards cyclist(s) and veer away at the last second. Though occurring less often in Paradise Valley than elsewhere, strafing occurs regularly. It is at a minimum an assault and probably qualifies as an aggravated assault.

Law enforcement seldom, if ever, enforces such Assaults or less egregious Endangerment clearance violations.

However, a few citations and prosecutions that are publicized go a long way to making a statement about acceptable motorists behavior and can be significant.

Importantly making a record of the past behavior of such motorists has been crucial in the few prosecutions that have taken place: http://latimesblogs.latimes.com/lanow/2010/01/cyclist-sentenced.html

Suicide crossing: a place where a street on which cyclists frequently travel may need to cross a very busy major thoroughfare and have to stop sign, traffic light or marked crosswalk for an extended distance in either direction, there by requiring a "suicide crossing" of the busy street. Tatum is one such street for both MTB and road riders.

Track stand: Balancing and standing on the pedals at a full stop without clipping out of the pedals, such as at a stop sign.

Tuck: Riding "in the drops" with lowered back, tucked arms in an aero position. Though riders definitely are in the drops going down hummingbird for stability and safety, seldom are riders descending there in a tuck.

Assault: An assault has been committed merely by "intentionally placing another person in reasonable apprehension of imminent physical injury".

Thus, a motorist that strafes a cyclist has committed an assault and most likely an aggravated assault given the use of a motor vehicle, which is, without a doubt, a dangerous instrument; the qualifier for an aggravated assault.

Aggravated assault: An assault committed with some listed factors; in cases involving a motor vehicle "if the person uses a deadly weapon or dangerous instrument", or if the victim is seriously injured regardless of how.

Also see §13-1201, and §13-1202 which are the crimes of "Endangerment", and "Threatening or intimidating", respectively. These all sort of play together, note the statute numbering: 1201,2,3,4]. They are in rough-order of escalating seriousness:

- §13-1201 Endangerment
- §13-1202 Threatening or intimidating
- §13-1203 Assault
- §13-1204 Aggravated Assault

Also, in case you were wondering:

28-3304. Mandatory revocation of license; definition
A. In addition to the grounds for mandatory revocation provided.. the department shall immediately revoke the license of a driver...

Washout: losing front tire traction and falling. Typically, in an off-camber corner and/or one with sand or gravel; especially if the rider attempts to put on the brakes in the middle of the corner. After monsoon rains it is wonderful that the town puts out the street sweeper to clean up much of the debris as that helps prevent washouts by cyclists in the corners.

Paul Michaud

From: Council Member Julie Pace
Sent: Saturday, June 10, 2017 8:21 PM
To: Kevin Burke; Andrew Miller; Eva Cutro; Paul Michaud
Subject: Fwd: RE: FOLLOW UP TO PARADISE VALLEY INDEPENDENT ARTICLE ("A VICIOUS CYCLE") – 05/16/17

Julie Pace
Council Member
Town of Paradise Valley
6401 E. Lincoln Drive
Paradise Valley, Arizona 85253
jpace@paradisevalleyaz.gov
Work: 480.348.3690
Cell: 480.985.2613

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---------- Forwarded message ----------
From: Council Member Julie Pace <jpace@paradisevalleyaz.gov>
Date: Jun 10, 2017 8:10 PM
Subject: RE: FOLLOW UP TO PARADISE VALLEY INDEPENDENT ARTICLE ("A VICIOUS CYCLE") – 05/16/17
To: rbg@olympiaaz.com
Cc:

> *Hi Brett. Thanks for your email. I was out of town and flew in Tuesday so catching up. My apologies for the delay. I would be happy to talk further about ideas and to deescalate tensions and focus on constructive solutions for all*
>
> *I think it might be helpful to find one or two reasonable bikers to potentially help with education outreach on biker to biker level. Maybe the right temperament of people would want to help with that effort. We obviously would appreciate some volunteer bike patrols to help with safety*
>
> *There are real issues with the bike and pedestrian encounter on our roads. So it would be good to work on solutions. Anger and divided groups on the town is not a good approach so maybe we can develop some constructive solutions. Thx*

> *Julie Pace*

> Council Member
> Town of Paradise Valley
> 6401 E. Lincoln Drive
> Paradise Valley, Arizona 85253
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> On May 23, 2017 4:03 PM, "R. Brett Goett" <rbg@olympiaaz.com> wrote:
>
> Council Member Pace, as you know the meeting on the 25th has been shelved. I am reaching directly out to you (i.e. no others on this thread) to see if you and I could meet to briefly discuss the "Hummingbird hill issues" and thereafter, perhaps armed with a better sense of a voice that has been nonexistent, or misheard, foster a discussion about bicycle safety in that area. It has nothing to do with the Bike Initiative, and I personally believe that until the 2 sides have a sane discussion, the issues and frustration (on both sides) will persist. What is the proper way to facilitate such a discussion with the two of us, and thereafter the neighbors? Your thoughts and assistance would be greatly appreciated.
>
>
> R. Brett Goett, Esq.
>
> Chief Legal Officer/General Counsel
>
> Olympia Group of Companies
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> rbg@olympiaaz.com
>
>
>
> From: R. Brett Goett
> Sent: Thursday, May 18, 2017 5:22 PM

Paul Michaud

From: Council Member Julie Pace
Sent: Saturday, June 10, 2017 8:01 PM
To: Paul Michaud; Kevin Burke
Subject: Fwd: Bile Path

Julie Pace
Council Member
Town of Paradise Valley
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---------- Forwarded message ----------
From: "J. David Hann" <JDavidH@msn.com>
Date: May 31, 2017 10:40 AM
Subject: Bile Path
To: Council Member Julie Pace <jpace@paradisevalleyaz.gov>
Cc:

I would like your support in opposing the proposed bike trail through the town. The trail will benefit only a minority of the Town residents and if implemented will create even more bike traffic. "Build it and they will come." Call me if you have any questions – we live on a street that currently gets considerable bike traffic.

David Hann

Sent from Mail for Windows 10

Paul Michaud

From: Council Member Julie Pace
Sent: Saturday, June 10, 2017 7:31 PM
To: Kevin Burke; Peter Wingert; Paul Michaud; Eva Cutro
Subject: Fwd: Bikers on Hummingbird
Attachments: ATT00001.txt; ATT00002.txt; ATT00003.txt; ATT00004.txt; ATT00005.txt; ATT00006.txt; ATT00007.txt; IMG_0111.PNG; ATT00008.txt; IMG_0112.PNG; ATT00009.txt; IMG_0113.PNG; ATT00010.txt; IMG_0114.PNG; ATT00011.txt; IMG_0115.PNG; ATT00012.txt; IMG_0116.PNG; ATT00013.txt; IMG_0117.PNG; ATT00014.txt; IMG_0118.PNG; ATT00015.txt; IMG_0119.PNG; ATT00016.txt

Fyi

Julie Pace
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---------- Forwarded message ----------
From: Heidi Denton <heidildenton@msn.com>
Date: May 23, 2017 10:04 AM
Subject: Bikers on Hummingbird
To: Council Member Julie Pace <jpace@paradisevalleyaz.gov>
Cc:

Hi Julie

Thought I'd share these posts on the Hummingbird bikers that started After the crash on Saturday. I'm not sure if you are a part of this neighborhood group. Lots of crazy thoughts on all of this

John, I ride Hummingbird at least once a week. We're talking the downhill back to Mockingbird, yes? Is the issue that cyclist ride faster than the posted speed limit? If so, can I assume you don't speed? Or is the issue that cyclist bike on that road at all, and you've almost hit some (maybe because you were not paying attention)? 90% of cyclist break the law? I'm assuming that's an opinion. I'd venture to say that 100% of cyclist break the law: slowly ride through a stop sign, blow through a stop sign, fail to use hand signals, speed, ride three abreast, etc. if that's the case, let's let law enforcement do its job. But to ask cyclists to NOT ride one of the most scenic (and safe) bike routes in the city proper smells like NIMBY.

1 Thank

Jeff Kellum, Piestewa Peak · 1d ago

Tim, you do realize it's safer to stay off the brakes descending then using them, don't you? If I was a betting man, I'd venture to say those who have crashed did so because they did not properly brake. When I ride done Hummingbird, my max speed is usually around 30, and I typically don't touch the brake. Does my going 30 upset you?

ago

Jeff,

You are, as I stated, clueless. Your last comment proves it. One of the most dangerous streets in the city. Your other comments are very off point as well. This is a real danger for everyone, not just cyclists. Your experience of the challenge (the hills) and your excitement (the hills) on Hummingbird is exactly the opposite for all those who have experienced it. I get it, you're a cyclist, what do we know. I've experienced way too much on this route as have every single neighbor who lives on Hummingbird. You should reconsider your position on this. It's factually a very unsafe route.

John

3 Thanks

Jeff Kellum, Piestewa Peak · 1d ago

John, most dangerous street in the city? Let's not over exaggerate. It's obvious you see cyclists as an issue. I'm sorry to hear that, but please don't ask or assume we will stop riding Hummingbird. As I said earlier, let law enforcement do their job. (And if anybody has any crazy ideas about taking the law into your own hands, think twice.)

John, most dangerous street in the city? Let's not over exaggerate. It's obvious you see cyclists as an issue. I'm sorry to hear that, but please don't ask or assume we will stop riding Hummingbird. As I said earlier, let law enforcement do their job. (And if anybody has any crazy ideas about taking the law into your own hands, think twice.)

Robbie Peterson, Santa Fe 2 · 1d ago

My husband rides that area, very close to our house, a lot. He says he's sympathetic to issues on both sides, that speeds are too high, and suggests the only thing that will stop the speeding and injuries will be placing rumble strips on that hill. Closing it to bicyclists would violate a state law, which the town of PV can't do (bicyclists have access to such roads).

2 Thanks

Dwayne Hunter, McCormick Ranch · 1d ago

As someone who rides this area regularly by myself and in the groups, the downhill by Hummingbird is an issue for all. Cyclists with a lack of control of their bike let go and run that stop sign at 20+ mph. Groups sometimes descend too fast knowing that if they tap the

[redacted]

myself and in the groups, the downhill by Hummingbird is an issue for all. Cyclists with a lack of control of their bike let go and run that stop sign at 20+ mph. Groups sometimes descend too fast knowing that if they tap the brakes there will be a pile-up or worse, chastisement from their peers. But drivers also blow through there, barely looking and probably not seeing the cyclist who just decided to blow through as well. A rumble strip is a solution that will work....for most. As far as the other incidents, everyone is guilty - all cyclists and all motorists. The biggest problem is a lack of understanding (or remembering) the laws of the road. Bikes shouldn't be riding three abreast....but in big groups, they feel empowered to do so. Not even those big trucks will stop and confront an angry mob of road cyclists (despite the fact that their walking around like ducks and sporting tiny arms barely capable of opening a jar of pickles). Drivers sometimes feel they have right of way regardless of the situation....yet others wave me through at 4-way stops "to be nice"....which still isn't correct. It's definitely nice but not necessary. If everyone takes responsibility for their actions, we could solve these issues. Cyclists will crash again but let's hope it was because they were dodging a gila monster....because that would be awesome to

Leston Nay, Gainey Ranch · 22h ago
I too ride this area both directions ;-) am a very experienced road cyclist, and I drive so am sympathetic to most perspectives on this issue. I recommend PV request extra police surveillance of the area since that's sounding like what it will take for all parties to respect the law and each other's rights. For what it's worth, I think rumble strips could be dangerous to less experienced cyclists and I know many group riders exhibit dangerous cyclist behaviors.

1 Thank

Bert te Velde, Old Town Scottsdale North · 16h ago
The area around these roads is about the only sanctuary for cyclists. One of the only places one can do some climbing. Where I am from (Europe that is) being able to ride your bike is a sign of quality of life. Any area where you can ride for pleasure, not polluting and not creating much of a safety hazard (it's never the driver in the big car that gets hurt when something happens) should be seen as an opportunity to enhance the quality of the community. Guess what, gravity accelerates a bike. For some, it's the thrill of going down hill. Personally, I prefer the climb. I brake at 30 mph going down. Any cyclist choosing to ride there, acts like many of the motor cycle riders who ride around without helmets; they take a risk. Except cyclist here do not pollute with obnoxious loud engines. But I digress

happens) should be seen as an opportunity to enhance the quality of the community. Guess what, gravity accelerates a bike. For some, it's the thrill of going down hill. Personally, I prefer the climb. I brake at 30 mph going down. Any cyclist choosing to ride there, acts like many of the motor cycle riders who ride around without helmets; they take a risk. Except cyclist here do not pollute with obnoxious loud engines. But I digress.

Chill, relax, it's not like you are behind packs of riders every day, now is it? Try a trip to France or Italy. If you decide to live on a hill, the side effect of your view is that gravity impacts bicycles. And you attract them because climbing is just more fun! Just like you like to see forever, we like to climb or descend. And enjoy that view that we earned with heart rates of 170.

As for breaking the rules, I do so very often. Let me explain. In my experience, a cyclist is safer if (s)he can keep control. I try to cross intersections ahead of the light turning green, not to be obnoxious, but to alert drivers who very often are on their phone, finishing that text or Facebook page (really??) as they pull up. By being out there, I increase the chances of being seen once the drivers are back at driving. There are many situations like these. I wave nervous drivers to pass me (McDonald is a good example). Think of the argument of speeding in your car but "going with the flow of traffic." Very similar.

I recommend that residents try to look at cyclists with this perspective. Of course, example). Think of the argument of speeding in your car but "going with the flow of traffic." Very similar.

I recommend that residents try to look at cyclists with this perspective. Of course, running stop signs is not smart and should not be acceptable. No rider will do so in her/his right mind as the outcome of a collision is always going to hurt.

So, what is the issue here? Maybe residents would like to ban anyone who could potentially irritate? "My heart sinks every time I hear those screams..." That happens every day, week? The impression is pretty strong that residents consider the roads to be their back yard and they do not want the riffraff to enjoy the views and the quiet roads. Unless you get to make your neighborhood one big gated "community", these are public roads. Simple advise: treat the cyclists like you'd treat wildlife; you look out for them when you turn a corner. You may want to drop that cell phone that just about every driver has in their hands. Cyclists are not harming anyone. Most are courteous and in general gentle people. They elect a harmless way to work out. As for the Tour de France wannabees.. well that's Darwinism at work. I do not ride in packs for that reason.

Finally, thank you to the residents of this area who somehow seem to get their roads resurfaced way more often than us mortals in the valley. It makes for smooth riding. Maybe someone should consider letting the potholes sit. Watch how quickly the cyclists disappear.. Thanks for reading. Brevity is not

Mail 9:39 AM nextdoor.com

Crime & Safety Reply

Kimberly Lustig, McCormick Ranch · 11h ago

L

Jerry Andriessen, McCormick Ranch · 3h ago

Cyclists tend to think they are above the law when on streets, cant tell you how many times I almost hit one who was not yielding to traffic signals, or didnt want to break their stride and ran a red light. In my opinion, when you get on a bike you are taking your own risks and if you are not responsible falling off a mountain or turning in to oncoming traffic is not others job to remind you of the risks.

Leston Nay, Gainey Ranch · 1h ago

While accepting personal responsibility is one thing, flaunting the law and placing fear and uncertainty in residents that they'll pull out in front of a speeding bicycle (or any other vehicle) or brace for the trauma they'll hear or witness a crash, is not acceptable. I can get a great workout while respecting traffic rules and neighborhood tranquility.

1 Thank

peter hogan, Piestewa Peak · 16m ago

I'm just crying for these poor residents and all the fear and horror they endure in this cruel, signals, or didnt want to break their stride and ran a red light. In my opinion, when you get on a bike you are taking your own risks and if you are not responsible falling off a mountain or turning in to oncoming traffic is not others job to remind you of the risks.

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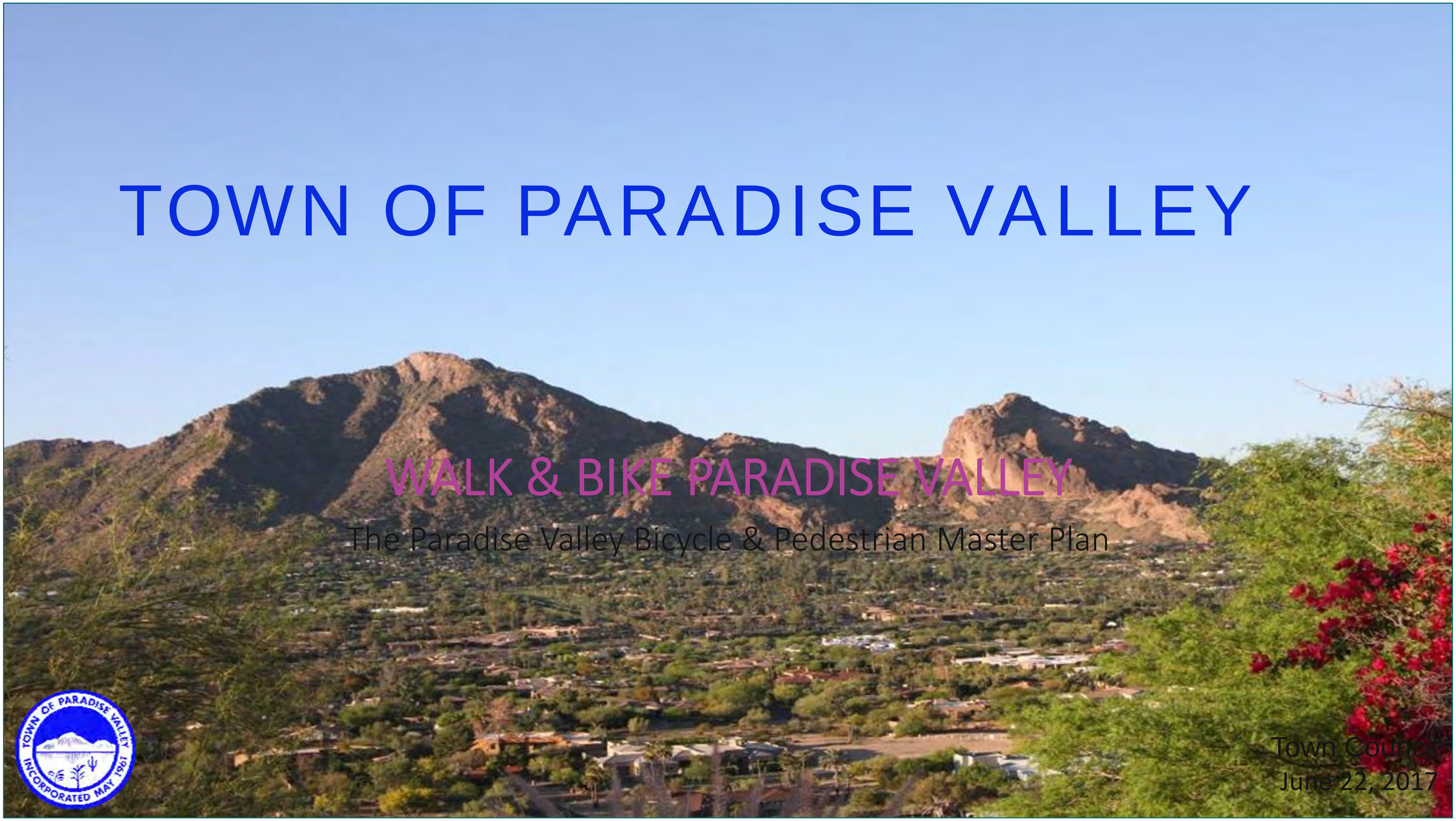
peter hogan, Piestewa Peak · 16m ago

I'm just crying for these poor residents and all the fear and horror they endure in this cruel, pitiless world that treats them so unfairly. Yes, let's certainly divert all available police resources to this threat to the Paradise Valley way of life.


TOWN OF PARADISE VALLEY
WALK & BIKE PARADISE VALLEY
The Paradise Valley Bicycle & Pedestrian Master Plan
Town Council
June 22, 2017

Purpose of Today's Meeting

1. Recap of Prior Meeting
2. Review Draft Statement of Direction
3. Take Action on Statement of Direction

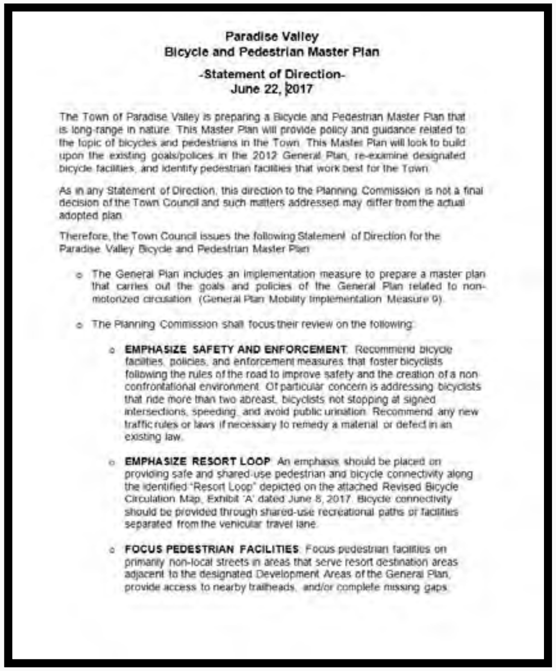
RECAP OF PRIOR MEETING

RECAP – June 8, 2017 Council Study Session

- Reviewed discussions had at the prior Council study sessions and public input to date
- Reviewed Mayor’s proposal on bicycle facility map and resort loop concept
- Suggested edits to draft SOD
- Heard comments at call to the public from residents concerned that parts of the SOD are one-sided against cyclists

SOD

SOD



Paradise Valley
Bicycle and Pedestrian Master Plan

-Statement of Direction-
June 22, 2017

The Town of Paradise Valley is preparing a Bicycle and Pedestrian Master Plan that is long-range in nature. This Master Plan will provide policy and guidance related to the topic of bicycles and pedestrians in the Town. This Master Plan will look to build upon the existing goals/polices in the 2012 General Plan, re-examine designated bicycle facilities, and identify pedestrian facilities that work best for the Town.

As in any Statement of Direction, this direction to the Planning Commission is not a final decision of the Town Council and such matters addressed may differ from the actual adopted plan.

Therefore, the Town Council issues the following Statement of Direction for the Paradise Valley Bicycle and Pedestrian Master Plan:

- The General Plan includes an implementation measure to prepare a master plan that carries out the goals and policies of the General Plan related to non-motorized circulation. (General Plan Mobility Implementation Measure 9).
- The Planning Commission shall focus their review on the following:
  - **EMPHASIZE SAFETY AND ENFORCEMENT**: Recommend bicycle facilities, policies, and enforcement measures that foster bicyclists following the rules of the road to improve safety and the creation of a non confrontational environment. Of particular concern is addressing bicyclists that ride more than two abreast, bicyclists not stopping at signed intersections, speeding, and avoid public urination. Recommend any new traffic rules or laws if necessary to remedy a material or defect in an existing law.
  - **EMPHASIZE RESORT LOOP**: An emphasis should be placed on providing safe and shared-use pedestrian and bicycle connectivity along the identified "Resort Loop" depicted on the attached Revised Bicycle Circulation Map, Exhibit 'A' dated June 8, 2017. Bicycle connectivity should be provided through shared-use recreational paths or facilities separated from the vehicular travel lane.
  - **FOCUS PEDESTRIAN FACILITIES**: Focus pedestrian facilities on primarily non-local streets in areas that serve resort destination areas adjacent to the designated Development Areas of the General Plan, provide access to nearby trailheads, and/or complete missing gaps.

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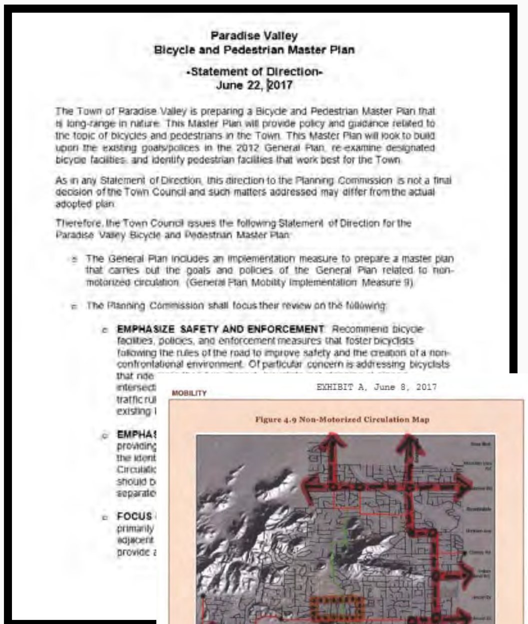
06-08-17 resident suggested text:
Ensure all improvements meet safety requirements and are subject to enforcement should need be with respect to vehicles, pedestrians, bicyclists, skate boards, dogs, horses, etc.

Optional suggested text:
Ensure all improvements meet safety requirements, with policies that address safety, education, and enforcement as a means to foster a mutual respect and understanding between different travel modes and compliance with Arizona Revised Statutes and other laws, thereby creating a safer environment for all. Of particular concern is addressing conflicts where bicyclists ride more than two abreast, where motorists pass bicyclists, when bicyclists and motorists fail to stop at signed intersections, speeding, and addressing public urination. Recommend any new traffic rules or laws, if necessary to remedy a material or defect in an existing law.

SOD



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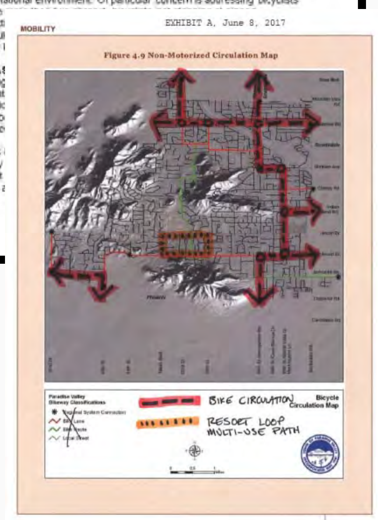
  - **FOCUS …** primarily… adjacent… provide a…



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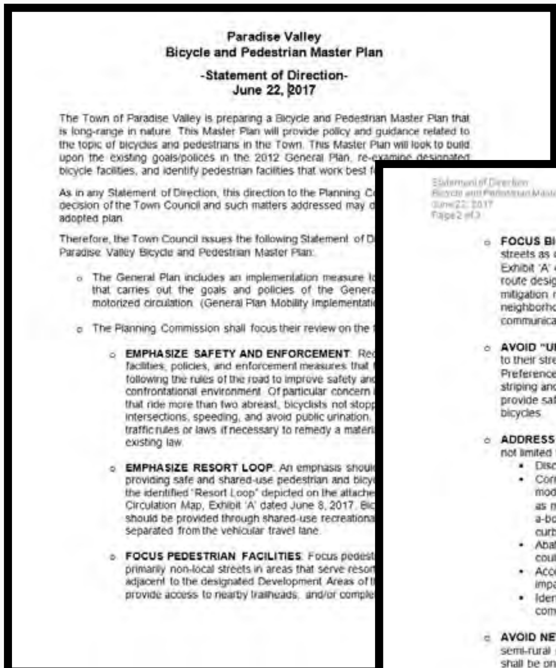
SOD



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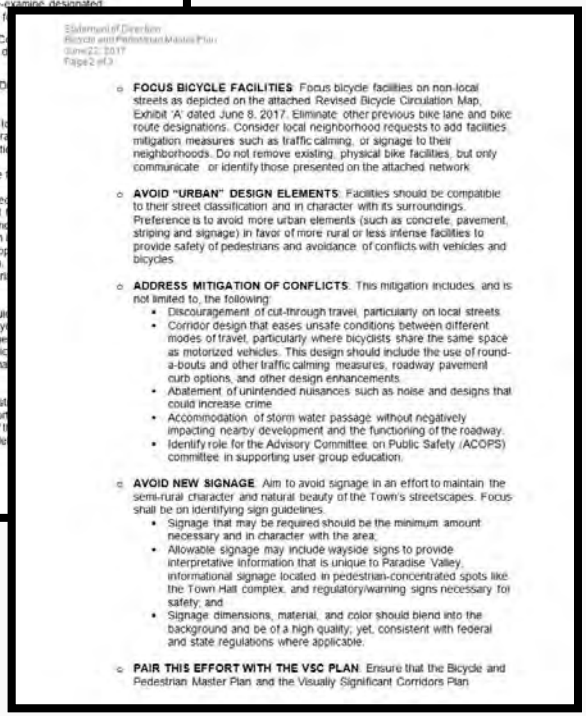

Statement of Direction
Bicycle and Pedestrian Master Plan
June 22, 2017
Page 2 of 3

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- **AVOID "URBAN" DESIGN ELEMENTS**. Facilities should be compatible to their street classification and in character with its surroundings. Preference is to avoid more urban elements (such as concrete, pavement, striping and signage) in favor of more rural or less intense facilities to provide safety of pedestrians and avoidance of conflicts with vehicles and bicycles.
- **ADDRESS MITIGATION OF CONFLICTS**. This mitigation includes, and is not limited to, the following:
  - Discouragement of cut-through travel, particularly on local streets.
  - Corridor design that eases unsafe conditions between different modes of travel, particularly where bicyclists share the same space as motorized vehicles. This design should include the use of round-a-bouts and other traffic calming measures, roadway pavement curb options, and other design enhancements.
  - Abatement of unintended nuisances such as noise and designs that could increase crime.
  - Accommodation of storm water passage without negatively impacting nearby development and the functioning of the roadway.
  - Identify role for the Advisory Committee on Public Safety (ACOPS) committee in supporting user group education.
- **AVOID NEW SIGNAGE**. Aim to avoid signage in an effort to maintain the semi-rural character and natural beauty of the Town's streetscapes. Focus shall be on identifying sign guidelines.
  - Signage that may be required should be the minimum amount necessary and in character with the area;
  - Allowable signage may include wayside signs to provide interpretative information that is unique to Paradise Valley, informational signage located in pedestrian-concentrated spots like the Town Hall complex, and regulatory/warning signs necessary for safety; and
  - Signage dimensions, material, and color should blend into the background and be of a high quality; yet, consistent with federal and state regulations where applicable.
- **PAIR THIS EFFORT WITH THE VSC PLAN**. Ensure that the Bicycle and Pedestrian Master Plan and the Visually Significant Corridors Plan

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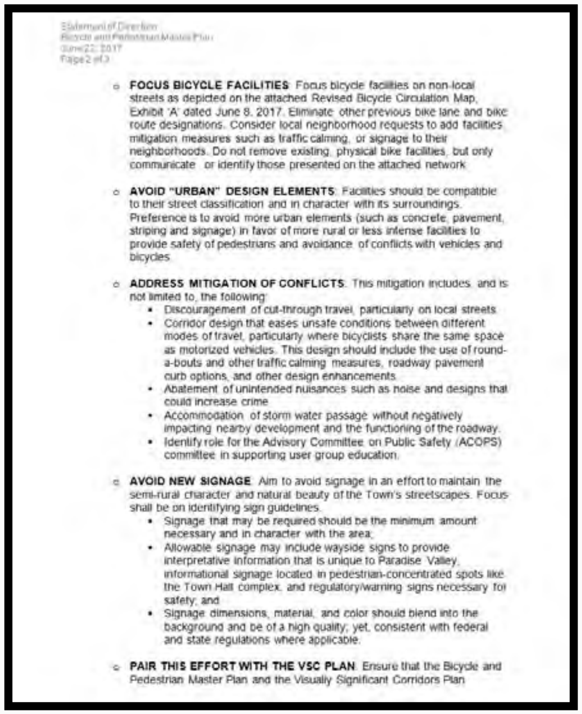

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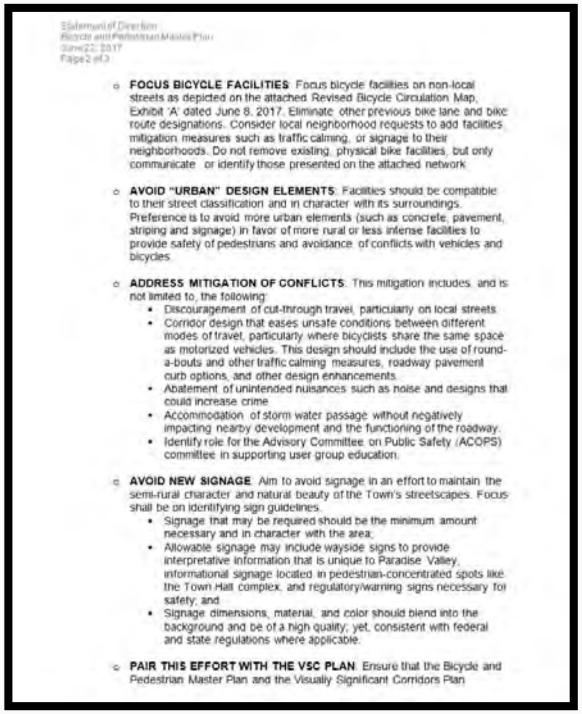

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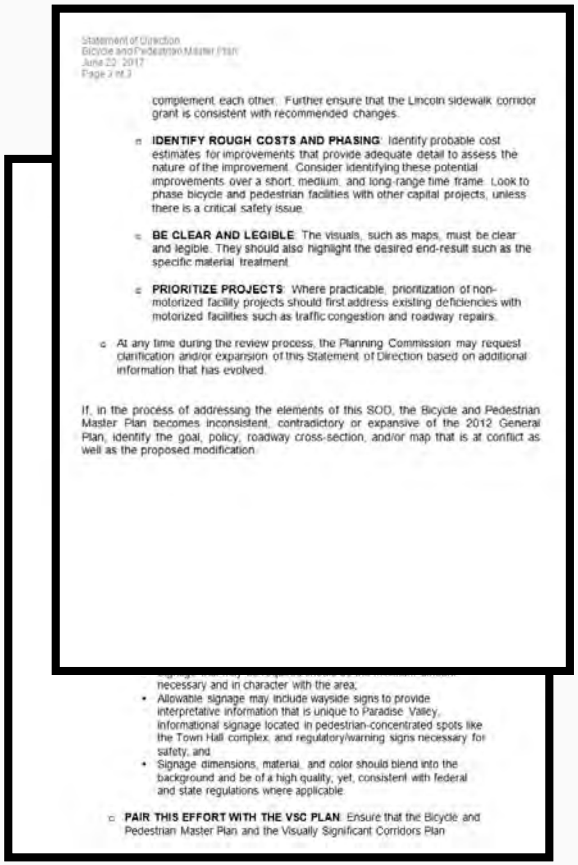


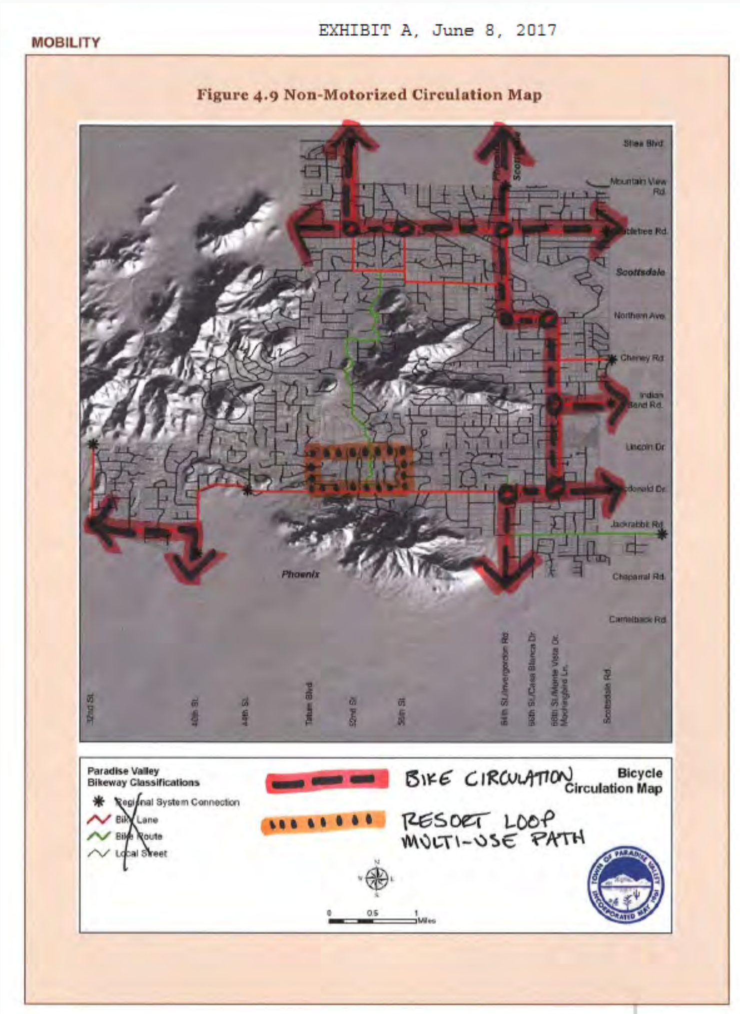
PAIR THIS EFFORT WITH THE VSC PLAN: Ensure that the Bicycle and Pedestrian Master Plan and the Visually Significant Corridors Plan complement each other. Further ensure that the Lincoln sidewalk corridor grant is consistent with recommended changes.

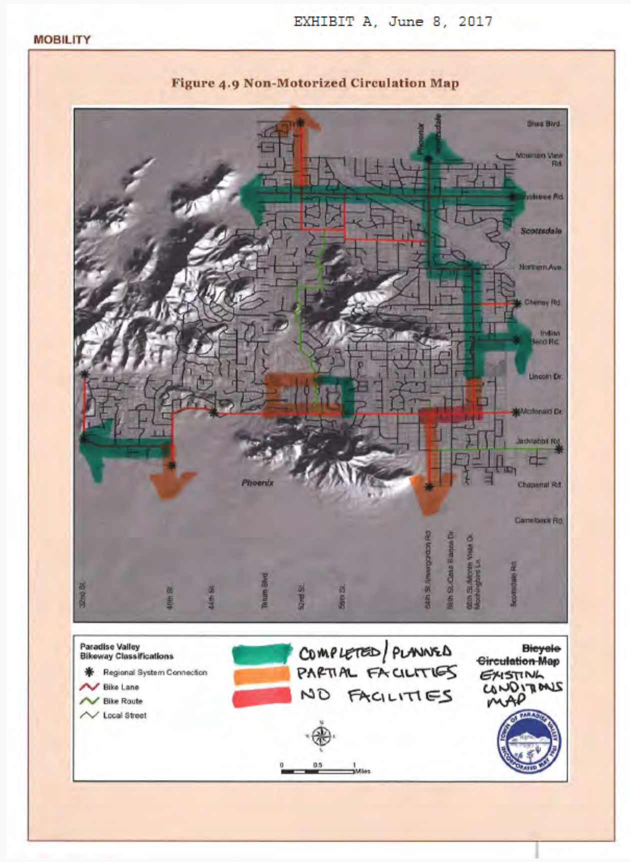
IDENTIFY ROUGH COSTS AND PHASING: Identify probable cost estimates for improvements that provide adequate detail to assess the nature of the improvement. Consider identifying these potential improvements over a short, medium, and long-range time frame. Look to phase bicycle and pedestrian facilities with other capital projects, unless there is a critical safety issue.

BE CLEAR AND LEGIBLE: The visuals, such as maps, must be clear and legible. They should also highlight the desired end-result such as the specific material treatment.

PRIOROITIZE PROJECTS: Where practicable, prioritization of non-motorized facility projects should first address existing deficiencies with motorized facilities such as traffic congestion and roadway repairs.

BIKE FACILITIES – SOD Attachment





- Remove routes
- Remove some bike lanes from map
- Complete gaps with bike lanes or shared use path

ACTION

[Approve] the Statement of Direction (SOD) for the Paradise Valley Bicycle & Pedestrian Master Plan

Paradise Valley
Bicycle and Pedestrian Master Plan

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The Town of Paradise Valley is preparing a Bicycle and Pedestrian Master Plan that is long-range in nature. This Master Plan will provide policy and guidance related to the topic of bicycles and pedestrians in the Town. This Master Plan will look to build upon the existing goals/polices in the 2012 General Plan, re-examine designated bicycle facilities, and identify pedestrian facilities that work best for the Town.

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Therefore, the Town Council issues the following Statement of Direction for the Paradise Valley Bicycle and Pedestrian Master Plan:

- The General Plan includes an implementation measure to prepare a master plan that carries out the goals and policies of the General Plan related to non-motorized circulation. (General Plan Mobility Implementation Measure 9)
- The Planning Commission shall focus their review on the following:
  - **EMPHASIZE SAFETY AND ENFORCEMENT**: Recommend bicycle facilities, policies, and enforcement measures that foster bicyclists following the rules of the road to improve safety and the creation of a non-confrontational environment. Of particular concern is addressing bicyclists that ride more than two abreast, bicyclists not stopping at signed intersections, speeding, and avoid public urination. Recommend any new traffic rules or laws if necessary to remedy a material or defect in an existing law.
  - **EMPHASIZE RESORT LOOP**: An emphasis should be placed on providing safe and shared-use pedestrian and bicycle connectivity along the identified "Resort Loop" depicted on the attached Revised Bicycle Circulation Map, Exhibit 'A' dated June 8, 2017. Bicycle connectivity should be provided through shared-use recreational paths or facilities separated from the vehicular travel lane.
  - **FOCUS PEDESTRIAN FACILITIES**: Focus pedestrian facilities on primarily non-local streets in areas that serve resort destination areas adjacent to the designated Development Areas of the General Plan, provide access to nearby trailheads, and/or complete missing gaps.
  - **FOCUS BICYCLE FACILITIES**: Focus bicycle facilities on non-local streets as depicted on the attached Revised Bicycle Circulation Map, Exhibit 'A' dated June 8, 2017. Eliminate other previous bike lane and bike route designations. Consider local neighborhood requests to add facilities, mitigation measures such as traffic calming, or signage to their neighborhoods. Do not remove existing, physical bike facilities, but only communicate or identify those presented on the attached network.
  - **AVOID "URBAN" DESIGN ELEMENTS**: Facilities should be compatible to their street classification and in character with its surroundings. Preference is to avoid more urban elements (such as concrete, pavement striping and signage) in favor of more rural or less intense facilities to provide safety of pedestrians and avoidance of conflicts with vehicles and bicycles.
  - **ADDRESS MITIGATION OF CONFLICTS**: This mitigation includes, and is not limited to, the following:
    - Discouragement of cut-through travel, particularly on local streets.
    - Corridor design that eases unsafe conditions between different modes of travel, particularly where bicyclists share the same space as motorized vehicles. This design should include the use of round-a-bouts and other traffic calming measures, roadway pavement curb options, and other design enhancements.
    - Abatement of unintended nuisances such as noise and designs that could increase crime.
    - Accommodation of storm water passage without negatively impacting nearby development and the functioning of the roadway.
    - Identify role for the Advisory Committee on Public Safety (ACOPS) committee in supporting user group education.
  - **AVOID NEW SIGNAGE**: Aim to avoid signage in an effort to maintain the semi-rural character and natural beauty of the Town's streetscapes. Focus shall be on identifying sign guidelines.
    - Signage that may be required should be the minimum amount necessary and in character with the area;
    - Allowable signage may include wayside signs to provide interpretative information that is unique to Paradise Valley, informational signage located in pedestrian-concentrated spots like the Town Hall complex, and regulatory/warning signs necessary for safety; and
    - Signage dimensions, material, and color should blend into the background and be of a high quality; yet, consistent with federal and state regulations where applicable.
  - **PAIR THIS EFFORT WITH THE VSC PLAN**: Ensure that the Bicycle and Pedestrian Master Plan and the Visually Significant Corridors Plan complement each other. Further ensure that the Lincoln sidewalk corridor grant is consistent with recommended changes.
  - **IDENTIFY ROUGH COSTS AND PHASING**: Identify probable cost estimates for improvements that provide adequate detail to assess the nature of the improvement. Consider identifying these potential improvements over a short, medium, and long-range time frame. Look to phase bicycle and pedestrian facilities with other capital projects, unless there is a critical safety issue.
  - **BE CLEAR AND LEGIBLE**: The visuals, such as maps, must be clear and legible. They should also highlight the desired end-result such as the specific material treatment.
  - **PRIORITIZE PROJECTS**: Where practicable, prioritization of non-motorized facility projects should first address existing deficiencies with motorized facilities such as traffic congestion and roadway repairs.
- At any time during the review process, the Planning Commission may request clarification and/or expansion of this Statement of Direction based on additional information that has evolved.

If, in the process of addressing the elements of this SOD, the Bicycle and Pedestrian Master Plan becomes inconsistent, contradictory or expansive of the 2012 General Plan, identify the goal, policy, roadway cross-section, and/or map that is at conflict as well as the proposed modification.


QUESTIONS?
WALK & BIKE PARADISE VALLEY
The Paradise Valley Bicycle & Pedestrian Master Plan
TOWN OF PARADISE VALLEY
INCORPORATED MAY 1961

Paradise Valley
Bicycle and Pedestrian Master Plan

-Statement of Direction-
June 22, 2017

The Town of Paradise Valley is preparing a Bicycle and Pedestrian Master Plan that is long-range in nature. This Master Plan will provide policy and guidance related to the topic of bicycles and pedestrians in the Town. This Master Plan will look to build upon the existing goals/polices in the 2012 General Plan, re-examine designated bicycle facilities, and identify pedestrian facilities that work best for the Town.

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- The Planning Commission shall focus their review on the following:

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  - **EMPHASIZE RESORT LOOP**: An emphasis should be placed on providing safe and shared-use pedestrian and bicycle connectivity along the identified "Resort Loop" depicted on the attached Revised Bicycle Circulation Map, Exhibit 'A' dated June 8, 2017. Bicycle connectivity should be provided through shared-use recreational paths or facilities separated from the vehicular travel lane.

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- **FOCUS BICYCLE FACILITIES**: Focus bicycle facilities on non-local streets as depicted on the attached Revised Bicycle Circulation Map, Exhibit ‘A’ dated June 8, 2017. Eliminate other previous bike lane and bike route designations. Consider local neighborhood requests to add facilities, mitigation measures such as traffic calming, or signage to their neighborhoods. Do not remove existing, physical bike facilities, but only communicate or identify those presented on the attached network.

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  - Accommodation of storm water passage without negatively impacting nearby development and the functioning of the roadway.
  - Identify role for the Advisory Committee on Public Safety (ACOPS) committee in supporting user group education.

- **AVOID NEW SIGNAGE**: Aim to avoid signage in an effort to maintain the semi-rural character and natural beauty of the Town’s streetscapes. Focus shall be on identifying sign guidelines.
  - Signage that may be required should be the minimum amount necessary and in character with the area;
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  - Signage dimensions, material, and color should blend into the background and be of a high quality; yet, consistent with federal and state regulations where applicable.

  - **PAIR THIS EFFORT WITH THE VSC PLAN**: Ensure that the Bicycle and Pedestrian Master Plan and the Visually Significant Corridors Plan complement each other. Further ensure that the Lincoln sidewalk corridor grant is consistent with recommended changes.

  - **IDENTIFY ROUGH COSTS AND PHASING**: Identify probable cost estimates for improvements that provide adequate detail to assess the nature of the improvement. Consider identifying these potential improvements over a short, medium, and long-range time frame. Look to phase bicycle and pedestrian facilities with other capital projects, unless there is a critical safety issue.

  - **BE CLEAR AND LEGIBLE**: The visuals, such as maps, must be clear and legible. They should also highlight the desired end-result such as the specific material treatment.

  - **PRIORITIZE PROJECTS**: Where practicable, prioritization of non-motorized facility projects should first address existing deficiencies with motorized facilities such as traffic congestion and roadway repairs.

- At any time during the review process, the Planning Commission may request clarification and/or expansion of this Statement of Direction based on additional information that has evolved.

If, in the process of addressing the elements of this SOD, the Bicycle and Pedestrian Master Plan becomes inconsistent, contradictory or expansive of the 2012 General Plan, identify the goal, policy, roadway cross-section, and/or map that is at conflict as well as the proposed modification.

6401 E Lincoln Dr
Paradise Valley, AZ 85253

Town of Paradise Valley

Action Report

File #: 17-235

TO: Mayor Collins and Town Council Members

FROM: Kevin Burke, Town Manager

DATE: June 8, 2017

DEPARTMENT: Town Manager

AGENDA TITLE:
Approval of Councilmember Paul Dembow's Nomination for the Arizona Municipal Risk Retention Pool (AMRRP)

RECOMMENDATION:
Approve Councilmember Dembow's nomination for the Arizona Municipal Risk Retention Pool.

Council Goals or Other Policies / Statutory Requirements:

SUMMARY STATEMENT:

In a May 2017 eNewsletter from the Arizona Municipal Risk Retention Pool (AMRRP), there was a call for nominations to the Board of Trustees. The terms of two existing trustees are expiring in 2017.

Councilmember Paul Dembow expressed a willingness to serve. Therefore a nomination must be submitted by June 24, 2017. A nomination is attached. As this position will be representing the Town of Paradise Valley on a statewide board, it is appropriate to have an action from the Town Council approving and supporting such a nomination.

Nominations are aggregated by the Arizona League of Cities and Towns Nominating Committee and submitted to the designated elector for each member of the pool. The election results are revealed August 22, 2017 at the AMRRP Annual Members meeting held in conjunction with the Arizona League of Cities and Towns annual conference in Tucson.

BUDGETARY IMPACT:
None

ATTACHMENT(S):
Town Councilmember Paul Dembow Nomination

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Paul Dembow
pdembow@paradisevalleyaz.gov

Short Version (280 words)

Paul has lived in Paradise Valley since 1991. His personal and professional experience in the cosmetics manufacturing industry spans three decades. As CEO and president of his family-owned business, he oversaw many aspects of the day-to-day operations of the company. After graduating from Arizona State University, Paul started working for the company when it employed eight people. Four years later, under Paul's stewardship, Arizona Natural Resources grew to four hundred employees.

For the past six years, Paul has served as a member of the Town Council, one year as Vice Mayor. He is dedicated to preserving the strong and unique character of Paradise Valley. Some of the major projects that Paul worked on during his tenure include:

1) The redevelopment of Mountain Shadows Resort and Cottonwoods, now the Andaz Resort, were completed this spring, and construction has started on the Ritz-Carlton resort which is expected to open in late 2018 or early 2019.
2) Construction of a new Municipal Court building was completed in 2014.
3) Revisions to the Town's General Plan that was approved by 80% of voters in 2012.
4) Numerous infrastructure improvements for added safety and beautification.
5) Numerous public safety improvements including state of the art technology such as license plate readers, adding more patrol officers, and construction of a facility to house the new police radio system.
6) Implementing new streaming technology of all meetings to add transparency to our Town government.
7) Implementing a fire protection fee offset the cost to the Town.

Paul is an avid hiker, watch collector and world traveler. He is actively involved in the lives of his five adult children, has high energy, and is a leader in his community.

6401 E Lincoln Dr
Paradise Valley, AZ 85253

Town of Paradise Valley

Action Report

File #: 17-243

TO: Mayor Collins and Town Council

FROM: Eva Cutro, Community Development Director
Paul Michaud, Senior Planner
George Burton, Planner

DATE: June 22, 2017

CONTACT:

AGENDA TITLE:
Adoption of Statement of Direction for Hillside Code Updates (Article XXII of the Town Zoning Ordinance)

RECOMMENDATION:
Consider the Statement of Direction for Hillside Code Updates (Article XXII of the Town Zoning Ordinance) as Discussed in Study Session.

BACKGROUND
This matter will be discussed in study session also on June 22, 2017. This portion of the agenda will be to take action on a Statement of Direction if one is finalized during the study session. All other material in this agenda item is a duplicate of the study session material.

History
Hillside related matters can be found throughout the Town Code but are most prevalent in the Zoning Ordinance and Chapter XXII Hillside Development Regulations which is often referred to as the "Hillside Code."

On July 21, 2015, staff presented a list of topics relating to the Hillside Code to the Planning Commission as part of a periodic review and update of the Town Code. In January of 2016, the Town Council identified several Quality of Life Initiatives including an Update to the Hillside Code. Staff worked with then Planning Commissioner Moore in preparing a draft ordinance identifying topics of discussion and potential amendments. The draft ordinance was reviewed by the Planning Commission at the December 20, 2016 and January 3, 2017 work sessions and the January 17, 2017 citizen review work session. In March and May of 2017, the Town Council identified Hillside as one of its five top initiatives for the 2017-2018 term. Along with updating the Hillside Code, other hillside related matters were identified. These included safety concerns, committee structure, hillside disturbances off the applicant property, variance processing and others.

The Town Council also reviewed a draft Statement of Direction at the June 8, 2017 work session. There was discussion about establishing safety standards, hillside assurance/bond criteria, the potential use of stealth solar technology, the need to minimize the impact of cantilevers, and discussion if the La Place du Sommet subdivision is bound by the 1984 hillside code.

Purpose

As a result of previous reviews, staff and the Planning Commission examined nineteen topics pertaining to the Hillside Code. Subsequent review by Councilmembers Moore and Pace added a couple of additional topics. This study session seeks to draft a statement of direction (SOD) to the Planning Commission focusing their efforts on desired topics and providing policy guidance on the topics selected. The plan is for that SOD to be adopted by Council during the Regular Meeting portion of the agenda.

DISCUSSION/FACTS

During their review, the Commission was generally agreeable with the proposed modifications to the Hillside Code proposed by then Planning Commissioner Scott Moore and staff regarding Material Palette, Demolition on Hillside Properties, Hillside Study Models, Accessory Structures, the 40' Overall Height Measurement, the Process to Remove a Property from the Hillside Designation, and Defining which Hillside Code applies to the La Place du Sommet Subdivision.

Enclosed is the draft Hillside Code amendments that were last reviewed by the Planning Commission on January 17, 2017. The changes incorporated from the December 20th Commission meeting are highlighted in yellow, the changes incorporated from the January 3rd Commission meeting are highlighted in blue, and changes and input form the January 17th Commission meeting are highlighted in green. The green January 17 changes have NOT been in any previous version of this redlined ordinance distributed to Council. They were discussed and agreed upon by the Planning Commission at the January 17, 2017 meeting, but had not yet been incorporated into the working draft until this packet.

The scope of each topic will be summarized and the topics will be grouped into four categories or sections. The first category (in green) identifies the topics that received consensus from Planning Commission. This category identifies the issue of each topic, the decision of the Planning Commission, and references the applicable page number in the attached red-lined draft ordinance. The second category (in red) identifies the topics that did not receive consensus from the Commission or need additional work. For these topics, staff identifies the issue related to each topic, the policy options under discussion and references the applicable page number in the draft ordinance. Staff also does this for the remaining two categories. The third category (in orange) are new topics that were identified in the June 8th Council work session and the fourth category (in blue) identified recommendations from Council Member Moore and Council Member Pace. Their associated language amending the Hillside Code, can be found in the attached second redlined version of Ordinance 2017-09.

The draft Hillside Code addresses the following topics:

1. Retaining Walls and Screen Walls.
2. Material Palette and Light Reflective Value (LRV).

3. Hillside Reviews & Administrative Hillside Chair Review.
4. Disturbed Area Calculation.
5. Demolition on Hillside Properties.
6. Hillside Model.
7. Accessory Structure and Accessory Structure Height Limit (including raised decks/platforms).
8. 40' Overall Height Measurement.
9. Driveway Disturbance Credit.
10. Lighting.
11. Process to Remove a Property from Hillside Designation.
12. Hillside Assurance/Bond.
13. Define which Hillside Code applies to La Place du Sommet Subdivision.
14. Solar Panels and Hillside Review Process.
15. Cantilever Limitations.
16. On-Site Retention.
17. Pool Barriers and Perimeter Fencing Standards.
18. Administrative Relief on Hillside Lots (Article XXII)
19. Add Safety Section to Hillside Code
20. Eliminate or Reduce Administrative Chair Reviews
21. No Change to Administrative Relief on Hillside Lots

Note item 13 has changed from green to red since June 8, based upon research since the last study session.

The Leadership Team believes it is possible, and most efficient, if Mayor and Council first address the items in green listed above. During the June 22, 2017 study session, staff will ask members of Council if they want to discuss any of the items in green. A review of each green item during the meeting is NOT planned. Think of it as the "consent agenda" portion of the SOD and will only be discussed if pulled by a member. Therefore, please review the action report, the SOD, and the redlined draft ordinance to assure comfort with the green item.

<u>Topics with Planning Commission Consensus</u>

A. Material Palette and Light Reflective Values (LRV). There are two issues related with this topic: 1) often, applicants choose colors that meet the LRV requirement but do not blend in with the surrounding hillside, and 2) the Hillside Building Committee (HBC) is very limited in approving contrasting colors. Language has been added to the code to emphasize that the color palette for the improvements must blend in with the surrounding hillside. Also, language has been added to the code to give the HBC more latitude in approving contrasting colors when deemed appropriate. This would allow the HBC to determine if accent materials and colors can be placed on the house that is fully screened by the hillside. Please reference page 19 of the draft ordinance regarding this amendment.

B. Hillside Reviews and Administrative Hillside Chair Reviews. There are two issues related with this topic. First, the code does not clearly identify all four types of hillside reviews. Language has been added to the code to clarify the type and scope of each review. The second issue is to increase the scope of the Hillside Chair review. Currently, the code does not allow the Chair to review projects that result in additional disturbance, additional site walls, increase the height of the house, add more than 1,000 square feet of footprint, or create an adverse visual impact. Often, smaller projects such as adding planters or modifying an existing pool requires the full Committee review due to small increases in disturbance, walls, etc. Language has been added to the code to allow the Chair to review applications with a limited amount of increased disturbance, limited amount of site walls, and a limited amount of solar panels. Please reference pages 8 and 9 of the draft ordinance regarding this amendment. Please note that Councilmember Moore & Pace have expressed disagreement with the current code and proposal. See item U. below.

C. Disturbed Area Calculation. Livable footprint and garage footprint to do not count as disturbed area under current code. The issue related to this topic is the concern that the code encourages larger homes on the hillside since the footprint is not included in the disturbance calculation. However, it was decided not to modify this section of the code since counting the footprint as disturbance would create many non-conformities by causing existing homes to exceed their allowable disturbance and concerns that this amendment may trigger Prop 207 issues. Please reference pages 6 and 21 of the draft ordinance regarding this amendment.

D. Demolition on Hillside Properties. The issue regarding this topic is that some contractors exceed the scope of demolition and grade undisturbed areas of the property during demolition. Language has been added to the code to require the existing disturbance boundary to be staked prior to demolition (in an attempt to help ensure the native hillside is not disturbed). Please reference pages 10 and 20 of the draft ordinance regarding this amendment.

E. Hillside Model. The code requires a physical model. However, model making appears to be a dying art as applicants are having a difficult time finding model makers. Language has been added to the code which allows applicants to submit computer generated models and establishes criteria for the computer models. Please reference page 14 of the draft ordinance regarding this amendment.

F. Accessory Structures & Heights. The code identifies a 24’ height limit for the house but does not clearly define the height for accessory structures. The decision was made to add language to the code to clarify that accessory structures are limited to a maximum height of 16’ height. Also, the code is unclear regarding structure such as raised pool and raised patio decks. The decision was made to add language to the code to clarify that these structures must meet the same setback requirements as pool and spas. Please reference pages 7, 17, and 19 of the draft ordinance regarding this amendment.

G. 40’ Overall Height Limit. The code identifies that the maximum overall height of a building or structure shall not exceed 40’. However, the code does not clearly identify where the height measurement is taken from. Language will be added to the code to clarify that this measurement is taken from the natural grade of the lowest structure to the top of the tallest structure. Please reference page 17 of the draft ordinance regarding this amendment.

H. Process to Remove Property from Hillside. The code does not identify the process to remove the hillside designation from a property. Language has been added to the code to

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identify this process. Please reference page 34 of the draft ordinance regarding this amendment.

I. Pool Barriers and Perimeter Fencing Standards. The only fences or walls allowed on hillside properties are view pool barrier fences, retaining walls, screen walls, and view guard rails. As a result, many applicants expand their pool barriers in an attempt to create a yard. Language has been added to the code to clarify that the pool barrier must be appropriate for the site and the minimum amount need to secure the pool. Please reference page 26 of the draft ordinance regarding this amendment.

J. Administrative Relief on Hillside Lots. Administrative relief is essentially an administrative variance in which an applicant may request a deviation of up to 10% of the development standard. However, administrative relief on hillside properties is limited to solar panels and entry gates. Language has been added to the code to make administrative relief on hillside lots consistent with flat land lots. Please reference page 34 of the draft ordinance regarding this amendment. Again note that Councilmember Moore and Pace have expressed disagreement with this provision. See item V. below.

K. Retaining Walls & Screen Walls. The code does not clearly identify if retaining walls and screen walls need to meet the setback for fences. Therefore, language has been added to the code to clarify that all walls must meet setbacks, unless needed to access the property (such as driveway retaining walls) or if the walls are needed to prevent erosion or flooding. Also, retaining walls are currently limited to a height of 6” above the material they retain. However, due to safety concerns, staff has received requests to allow driveway retaining walls to extend higher than 6” in order to serve as a vehicle wheel stop. Language has been added to the code to allow driveway retaining walls to extend 18” above the material they retain provided they comply with the 8’ maximum retaining wall height limit. Please reference pages 24 - 26 of the draft ordinance regarding this amendment.

Topics without Planning Commission Consensus or Requires Additional Review

L. Define which Hillside Code applies to La Place du Sommet. The Town has traditionally applied the 1984 Hillside code to the La Place du Sommet subdivision. Staff was proposing to update the code to clarify this; however, additional research is needed to determine which code applies to this subdivision. Please reference page 34 of the draft ordinance regarding this amendment.

M. Retaining Walls. The International Residential Code (IRC) requires a 36” tall guard rail adjoining walkways that have a fall potential of 30” or more. However, many applicants request a 42” guard rail due to safety concerns and ergonomics (e.g. that a 42” rail is easier to grasp than a 36” guard rail). The Council may specify a maximum guard rail height or provide the HBC the flexibility to determine an appropriate guard rail height for each site. Please reference page 26 of the draft ordinance regarding this amendment.

N. Driveway Disturbance Credit. The code has different standards for driveways that serve new homes and driveways that serve remodeled homes. Decorative driveways that serve new homes receive a partial credit toward their disturbed area calculation. However, decorative driveways that serve remodeled homes do not count as disturbed area. There is concern that the current code encourages and allows for excessively large driveways on remodeled homes since the decorative drives do not count as disturbed area. During the July 17th meeting, the Commission appeared to favor applying a similar standard to all decorative driveways and tasked Commissioner Campbell to work with staff and update the credit standards for driveways. Does Council agree with this approach? Please reference pages 22 - 23 of the draft ordinance regarding this amendment.

O. Lighting. Council recently updated the lighting code for flat land lots. However, no modifications were made to the lighting requirements for hillside lots. Does the Council want to apply some of the flat land lighting code updates to the Hillside Code? Potential updates include the prohibition of rope lights, adding Lux as another measure of light output, allow holiday lights to start on October 15th, and apply Kelvin requirements on lights. Pages 28 - 32 of the draft ordinance address current hillside lighting requirements.

P. Hillside Assurance/Bond. The hillside bond places the Town in a position to do or contract work necessary to cover, restore, and landscape an unfinished or abandoned hillside project. Currently, the minimum hillside bond is based upon $25 per cubic yard of total cut and fill associated with a project. There is concern that this amount is not sufficient to restore an abandoned or unfished site. During the January 17th meeting, the Commission was looking at increasing the bond amount to $35 per cubic yard of total cut and fill, along with establishing a price index to adjust for inflation. The Commission also examined establishing criteria for a landscape bond (which would allow a Certificate of Occupancy to be issued prior to installation of the landscaping).

Also, during the June 8th meeting, Council discussed this topic and considered options such as increasing the multiplier, placing a lien on the property, identifying when the bond may be used, and requiring the submittal of bids to help determine the assurance amount. Which method of assurance does the Council prefer to collect finances that are of a sufficient amount to restore a site? The Council may direct the Commission to explore multiple alternatives such as increased multipliers, restoration bids, and liens on the property. Please reference pages 10 - 11 of the draft ordinance regarding this amendment.

Q. Solar Panels & Review Process. Code currently requires solar panels to be integrated into the building design and require the panels to be hidden from view when viewed at the same elevation or lower. Staff has received requests to place solar panels on pitched roofs; however, this does not meet code since the panels must be screened from the same elevation or lower (essentially limiting solar panels to flat roofs or pitched roofs that are fully screened by the surrounding hillside). During their review, the Commission also raised concern if the Town can regulate solar panels.

Due to the issues noted above, does the Council want to allow solar panels on pitched roofs? The Council may direct the Commission to examine the use of stealth solar technology on hillside lots and establish criteria that would allow the placement of solar panels on pitched roofs. Please reference page 9 and page 19 of the draft ordinance regarding this amendment

R. Cantilever Limitations. Currently, code limits the vertical element of a cantilever to a maximum height of 8' tall and the horizontal element to a maximum length of 16' long. Half of the area under the cantilever counts as disturbed area. During the January 17th meeting, the Commission discussed the possibility of creating separate cantilever requirements, one for buildings and another for pool decks. However, the Commission directed staff to work with Commissioner Campbell to research and develop updated cantilever requirements. Does the Council want to update or limit the cantilever requirements? The Council may specify cantilever requirements or direct Commission to research and propose updated standards that minimize the visual impact of cantilevers. Please reference pages 18 - 19 of the draft ordinance regarding this amendment.

S. On-Site Retention. Depending upon the scope of improvements, on-site retention is required on hillside properties. The most common form of on-site retention is the use of a retention basins. The retention basins must be designed in accordance with the Town's Storm Drain Design Manual and are included in the disturbed area calculation. However, applicants have expressed concern that the retention basins can use up a large portion of their allowable disturbance. Also, some applicants use retaining walls to create retention areas. The requirement for on-site retention was not intended to increase the amount of retaining walls or increase the amount of disturbance on the hillside. Due to the necessity of on-site retention, does the Council want offer partial credit for retention basins? Design standards can be established to identify which retention basins receive credit (e.g. retention basin that do not use retaining walls and are vegetated with native plants, etc.). Please reference page 21 of the draft ordinance regarding this amendment.

Topics Identified during the June 8th Council Work Session & by Councilmembers Moore and Pace

T. Add a Safety Section in the Code. During the June 8th work session, the Council discussed the issue of creating a safety section in the Hillside Code. There was discussion on when safety comes into play on the development of a hillside property and the length of construction on hillside properties. The Council may direct the Commission to identify circumstance that trigger additional safety measures and reviews (such as enabling the Town to hire consultants to help review geotechnical reports or examine potential grading and drainage issues). The additional safety measures and reviews may be required at the Town's discretion. The Town may require the applicant to cover the cost of the additional review. Language regarding this can be added to Section 2205.VI. A (page 10) of the draft ordinance.

U. Administrative Hillside Chair Review. Council Member Moore and Council Member Pace recommend that this section of code be eliminated or reduced. Does the Council want to eliminate or reduce the scope of the Chair review? If the Council decides to eliminate this section of code, virtually all exterior improvements will require Hillside Committee review and approval. If the Council favors a reduced scope of Chair review, the Council may direct the Commission to evaluate the current requirements and determine which standards shall be reduced. Councilmember Moore expressed particular concern with the ability of the Chair to approve up to 1,000 square feet of additional footprint. Based upon Planning Commission review and as drafted in the attached ordinance, the Commission recommends increasing the scope of the Chair review in an attempt to help expedite smaller improvements. The current code enables the Chair to send an application to full Committee for review if the Chair believes the request has an adverse visual impact. If the Council prefers to expand the scope of the Chair review, language can be added to the code requiring the applicant to notify the any neighbors of the improvements that the Chair determines to be potentially affected by the improvement.

V. Administrative Relief on Hillside Lots . Council Member Moore and Council Member Pace recommend leaving this section of code in its current state and do not favor the expanding the scope of administrative relief on hillside lots. The Council may remove this topic from the code updates, direct the Commission to proceed with the current proposal of making administrative relief on hillside lots consistent with flat land lots, or direct the Commission to re-evaluate this topic.

Statement of Direction

A Statement of Direction (SOD) has been drafted and attached assuming the green items are accepted as drafted and the red, orange and blue items will receive direction from the Mayor and Council during the study session. Blue items were not specifically drafted in the SOD as they are contrary to the Green items and await Council direction.

Directions from the Mayor and Council to the Planning Commission generally come in one of three forms:

1) Identifies the problem and directs the PC to recommend a solution;
2) Identifies the problem and directs the PC to develop a solution consistent with the policy concept written in the SOD; or
3) Identifies the problem and directs the PC to use the specific ordinance language provided for the solution.

Staff will facilitate which of these forms of direction and the associated language Mayor and Council prefers during the study session presentation.

Attachments

- Draft Statement of Direction (SOD)
- Draft Hillside Ordinance with notes through the January 17, 2017 Planning Commission meeting
- Draft Hillside Ordinance with Council Member Moore and Council Member Pace's recommendations
- Power Point Presentation

TO: Mayor Collins and Town Council

FROM: Eva Cutro, Community Development Director
Paul Michaud, Senior Planner
George Burton, Planner

DATE: June 22, 2017

CONTACT:

AGENDA TITLE:
Adoption of Statement of Direction for Hillside Code Updates (Article XXII of the Town Zoning Ordinance)

RECOMMENDATION:
Consider the Statement of Direction for Hillside Code Updates (Article XXII of the Town Zoning Ordinance) as Discussed in Study Session.

BACKGROUND
<u>This matter will be discussed in study session also on June 22, 2017. This portion of the agenda will be to take action on a Statement of Direction if one is finalized during the study session. All other material in this agenda item is a duplicate of the study session material.</u>

<u>History</u>
Hillside related matters can be found throughout the Town Code but are most prevalent in the Zoning Ordinance and Chapter XXII Hillside Development Regulations which is often referred to as the "Hillside Code."

On July 21, 2015, staff presented a list of topics relating to the Hillside Code to the Planning Commission as part of a periodic review and update of the Town Code. In January of 2016, the Town Council identified several Quality of Life Initiatives including an Update to the Hillside Code. Staff worked with then Planning Commissioner Moore in preparing a draft ordinance identifying topics of discussion and potential amendments. The draft ordinance was reviewed by the Planning Commission at the December 20, 2016 and January 3, 2017 work sessions and the January 17, 2017 citizen review work session. In March and May of 2017, the Town Council identified Hillside as one of its five top initiatives for the 2017-2018 term. Along with updating the Hillside Code, other hillside related matters were identified. These included safety concerns, committee structure, hillside disturbances off the applicant property, variance processing and others.

The Town Council also reviewed a draft Statement of Direction at the June 8, 2017 work session.

There was discussion about establishing safety standards, hillside assurance/bond criteria, the potential use of stealth solar technology, the need to minimize the impact of cantilevers, and discussion if the La Place du Sommet subdivision is bound by the 1984 hillside code.

Purpose
As a result of previous reviews, staff and the Planning Commission examined nineteen topics pertaining to the Hillside Code. Subsequent review by Councilmembers Moore and Pace added a couple of additional topics. This study session seeks to draft a statement of direction (SOD) to the Planning Commission focusing their efforts on desired topics and providing policy guidance on the topics selected. The plan is for that SOD to be adopted by Council during the Regular Meeting portion of the agenda.

DISCUSSION/FACTS
During their review, the Commission was generally agreeable with the proposed modifications to the Hillside Code proposed by then Planning Commissioner Scott Moore and staff regarding Material Palette, Demolition on Hillside Properties, Hillside Study Models, Accessory Structures, the 40' Overall Height Measurement, the Process to Remove a Property from the Hillside Designation, and Defining which Hillside Code applies to the La Place du Sommet Subdivision.

Enclosed is the draft Hillside Code amendments that were last reviewed by the Planning Commission on January 17, 2017. The changes incorporated from the December 20th Commission meeting are highlighted in yellow, the changes incorporated from the January 3rd Commission meeting are highlighted in blue, and changes and input form the January 17th Commission meeting are highlighted in green. The green January 17 changes have NOT been in any previous version of this redlined ordinance distributed to Council. They were discussed and agreed upon by the Planning Commission at the January 17, 2017 meeting, but had not yet been incorporated into the working draft until this packet.

The scope of each topic will be summarized and the topics will be grouped into four categories or sections. The first category (in green) identifies the topics that received consensus from Planning Commission. This category identifies the issue of each topic, the decision of the Planning Commission, and references the applicable page number in the attached red-lined draft ordinance. The second category (in red) identifies the topics that did not receive consensus from the Commission or need additional work. For these topics, staff identifies the issue related to each topic, the policy options under discussion and references the applicable page number in the draft ordinance. Staff also does this for the remaining two categories. The third category (in orange) are new topics that were identified in the June 8th Council work session and the fourth category (in blue) identified recommendations from Council Member Moore and Council Member Pace. Their associated language amending the Hillside Code, can be found in the attached second redlined version of Ordinance 2017-09.

The draft Hillside Code addresses the following topics:

1. Retaining Walls and Screen Walls.
2. Material Palette and Light Reflective Value (LRV).
3. Hillside Reviews & Administrative Hillside Chair Review.
4. Disturbed Area Calculation.
5. Demolition on Hillside Properties.

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6. Hillside Model.
7. Accessory Structure and Accessory Structure Height Limit (including raised decks/platforms).
8. 40' Overall Height Measurement.
9. Driveway Disturbance Credit.
10. Lighting.
11. Process to Remove a Property from Hillside Designation.
12. Hillside Assurance/Bond.
13. Define which Hillside Code applies to La Place du Sommet Subdivision.
14. Solar Panels and Hillside Review Process.
15. Cantilever Limitations.
16. On-Site Retention.
17. Pool Barriers and Perimeter Fencing Standards.
18. Administrative Relief on Hillside Lots (Article XXII)
19. Add Safety Section to Hillside Code
20. Eliminate or Reduce Administrative Chair Reviews
21. No Change to Administrative Relief on Hillside Lots

Note item 13 has changed from green to red since June 8, based upon research since the last study session.

The Leadership Team believes it is possible, and most efficient, if Mayor and Council first address the items in green listed above. During the June 22, 2017 study session, staff will ask members of Council if they want to discuss any of the items in green. A review of each green item during the meeting is NOT planned. Think of it as the "consent agenda" portion of the SOD and will only be discussed if pulled by a member. Therefore, please review the action report, the SOD, and the redlined draft ordinance to assure comfort with the green item.

<u>Topics with Planning Commission Consensus</u>

A. Material Palette and Light Reflective Values (LRV). There are two issues related with this topic: 1) often, applicants choose colors that meet the LRV requirement but do not blend in with the surrounding hillside, and 2) the Hillside Building Committee (HBC) is very limited in approving contrasting colors. Language has been added to the code to emphasize that the color palette for the improvements must blend in with the surrounding hillside. Also, language has been added to the code to give the HBC more latitude in approving contrasting colors when deemed appropriate. This would allow the HBC to determine if accent materials and colors can be placed on the house that is fully screened by the hillside. Please reference page 19 of the draft ordinance regarding this amendment.

B. Hillside Reviews and Administrative Hillside Chair Reviews. There are two issues related with this topic. First, the code does not clearly identify all four types of hillside reviews. Language has been added to the code to clarify the type and scope of each review. The second issue is to increase the scope of the Hillside Chair review. Currently, the code does not allow the Chair to review projects that result in additional disturbance, additional site walls, increase the height of the house, add more than 1,000 square feet of footprint, or create an adverse visual impact. Often, smaller projects such as adding planters or modifying an existing pool requires the full Committee review due to small increases in disturbance, walls, etc. Language has been added to the code to allow the Chair to review applications with a limited amount of increased disturbance, limited amount of site walls, and a limited amount of solar panels. Please reference pages 8 and 9 of the draft ordinance regarding this amendment. Please note that Councilmember Moore & Pace have expressed disagreement with the current code and proposal. See item U. below.

C. Disturbed Area Calculation. Livable footprint and garage footprint to do not count as disturbed area under current code. The issue related to this topic is the concern that the code encourages larger homes on the hillside since the footprint is not included in the disturbance calculation. However, it was decided not to modify this section of the code since counting the footprint as disturbance would create many non-conformities by causing existing homes to exceed their allowable disturbance and concerns that this amendment may trigger Prop 207 issues. Please reference pages 6 and 21 of the draft ordinance regarding this amendment.

D. Demolition on Hillside Properties. The issue regarding this topic is that some contractors exceed the scope of demolition and grade undisturbed areas of the property during demolition. Language has been added to the code to require the existing disturbance boundary to be staked prior to demolition (in an attempt to help ensure the native hillside is not disturbed). Please reference pages 10 and 20 of the draft ordinance regarding this amendment.

E. Hillside Model. The code requires a physical model. However, model making appears to be a dying art as applicants are having a difficult time finding model makers. Language has been added to the code which allows applicants to submit computer generated models and establishes criteria for the computer models. Please reference page 14 of the draft ordinance regarding this amendment.

F. Accessory Structures & Heights. The code identifies a 24’ height limit for the house but does not clearly define the height for accessory structures. The decision was made to add language to the code to clarify that accessory structures are limited to a maximum height of 16’ height. Also, the code is unclear regarding structure such as raised pool and raised patio decks. The decision was made to add language to the code to clarify that these structures must meet the same setback requirements as pool and spas. Please reference pages 7, 17, and 19 of the draft ordinance regarding this amendment.

G. 40’ Overall Height Limit. The code identifies that the maximum overall height of a building or structure shall not exceed 40’. However, the code does not clearly identify where the height measurement is taken from. Language will be added to the code to clarify that this measurement is taken from the natural grade of the lowest structure to the top of the tallest structure. Please reference page 17 of the draft ordinance regarding this amendment.

H. Process to Remove Property from Hillside. The code does not identify the process to remove the hillside designation from a property. Language has been added to the code to identify this process. Please reference page 34 of the draft ordinance regarding this amendment.

I. Pool Barriers and Perimeter Fencing Standards. The only fences or walls allowed on hillside properties are view pool barrier fences, retaining walls, screen walls, and view guard rails. As a result, many applicants expand their pool barriers in an attempt to create a yard. Language has been added to the code to clarify that the pool barrier must be appropriate for the site and the minimum amount need to secure the pool. Please reference page 26 of the draft ordinance regarding this amendment.

J. Administrative Relief on Hillside Lots. Administrative relief is essentially an administrative variance in which an applicant may request a deviation of up to 10% of the development standard. However, administrative relief on hillside properties is limited to solar panels and entry gates. Language has been added to the code to make administrative relief on hillside lots consistent with flat land lots. Please reference page 34 of the draft ordinance regarding this amendment. Again note that Councilmember Moore and Pace have expressed disagreement with this provision. See item V. below.

K. Retaining Walls & Screen Walls. The code does not clearly identify if retaining walls and screen walls need to meet the setback for fences. Therefore, language has been added to the code to clarify that all walls must meet setbacks, unless needed to access the property (such as driveway retaining walls) or if the walls are needed to prevent erosion or flooding. Also, retaining walls are currently limited to a height of 6" above the material they retain. However, due to safety concerns, staff has received requests to allow driveway retaining walls to extend higher than 6" in order to serve as a vehicle wheel stop. Language has been added to the code to allow driveway retaining walls to extend 18" above the material they retain provided they comply with the 8' maximum retaining wall height limit. Please reference pages 24 - 26 of the draft ordinance regarding this amendment.

Topics without Planning Commission Consensus or Requires Additional Review

L. Define which Hillside Code applies to La Place du Sommet. The Town has traditionally applied the 1984 Hillside code to the La Place du Sommet subdivision. Staff was proposing to update the code to clarify this; however, additional research is needed to determine which code applies to this subdivision. Please reference page 34 of the draft ordinance regarding this amendment.

M. Retaining Walls. The International Residential Code (IRC) requires a 36" tall guard rail adjoining walkways that have a fall potential of 30" or more. However, many applicants request a 42" guard rail due to safety concerns and ergonomics (e.g. that a 42" rail is easier to grasp than a 36" guard rail). The Council may specify a maximum guard rail height or provide the HBC the flexibility to determine an appropriate guard rail height for each site. Please reference page 26 of the draft ordinance regarding this amendment.

N. Driveway Disturbance Credit. The code has different standards for driveways that serve new homes and driveways that serve remodeled homes. Decorative driveways that serve new homes receive a partial credit toward their disturbed area calculation. However, decorative driveways that serve remodeled homes do not count as disturbed area. There is concern that the current code encourages and allows for excessively large driveways on remodeled homes since the decorative drives do not count as disturbed area. During the July 17th meeting, the Commission appeared to favor applying a similar standard to all decorative driveways and tasked Commissioner Campbell to work with staff and update the credit standards for driveways. Does Council agree with this approach? Please reference pages 22 - 23 of the draft ordinance regarding this amendment.

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O. Lighting. Council recently updated the lighting code for flat land lots. However, no modifications were made to the lighting requirements for hillside lots. Does the Council want to apply some of the flat land lighting code updates to the Hillside Code? Potential updates include the prohibition of rope lights, adding Lux as another measure of light output, allow holiday lights to start on October 15th, and apply Kelvin requirements on lights. Pages 28 - 32 of the draft ordinance address current hillside lighting requirements.

P. Hillside Assurance/Bond. The hillside bond places the Town in a position to do or contract work necessary to cover, restore, and landscape an unfinished or abandoned hillside project. Currently, the minimum hillside bond is based upon $25 per cubic yard of total cut and fill associated with a project. There is concern that this amount is not sufficient to restore an abandoned or unfished site. During the January 17th meeting, the Commission was looking at increasing the bond amount to $35 per cubic yard of total cut and fill, along with establishing a price index to adjust for inflation. The Commission also examined establishing criteria for a landscape bond (which would allow a Certificate of Occupancy to be issued prior to installation of the landscaping).

Also, during the June 8th meeting, Council discussed this topic and considered options such as increasing the multiplier, placing a lien on the property, identifying when the bond may be used, and requiring the submittal of bids to help determine the assurance amount. Which method of assurance does the Council prefer to collect finances that are of a sufficient amount to restore a site? The Council may direct the Commission to explore multiple alternatives such as increased multipliers, restoration bids, and liens on the property. Please reference pages 10 - 11 of the draft ordinance regarding this amendment.

Q. Solar Panels & Review Process. Code currently requires solar panels to be integrated into the building design and require the panels to be hidden from view when viewed at the same elevation or lower. Staff has received requests to place solar panels on pitched roofs; however, this does not meet code since the panels must be screened from the same elevation or lower (essentially limiting solar panels to flat roofs or pitched roofs that are fully screened by the surrounding hillside). During their review, the Commission also raised concern if the Town can regulate solar panels.

Due to the issues noted above, does the Council want to allow solar panels on pitched roofs? The Council may direct the Commission to examine the use of stealth solar technology on hillside lots and establish criteria that would allow the placement of solar panels on pitched roofs. Please reference page 9 and page 19 of the draft ordinance regarding this amendment

R. Cantilever Limitations. Currently, code limits the vertical element of a cantilever to a maximum height of 8' tall and the horizontal element to a maximum length of 16' long. Half of the area under the cantilever counts as disturbed area. During the January 17th meeting, the Commission discussed the possibility of creating separate cantilever requirements, one for buildings and another for pool decks. However, the Commission directed staff to work with Commissioner Campbell to research and develop updated cantilever requirements. Does the Council want to update or limit the cantilever requirements? The Council may specify cantilever requirements or direct Commission to research and propose updated standards that minimize the visual impact of cantilevers. Please reference pages 18 - 19 of the draft ordinance regarding this amendment.

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S. On-Site Retention. Depending upon the scope of improvements, on-site retention is required on hillside properties. The most common form of on-site retention is the use of a retention basins. The retention basins must be designed in accordance with the Town's Storm Drain Design Manual and are included in the disturbed area calculation. However, applicants have expressed concern that the retention basins can use up a large portion of their allowable disturbance. Also, some applicants use retaining walls to create retention areas. The requirement for on-site retention was not intended to increase the amount of retaining walls or increase the amount of disturbance on the hillside. Due to the necessity of on-site retention, does the Council want offer partial credit for retention basins? Design standards can be established to identify which retention basins receive credit (e.g. retention basin that do not use retaining walls and are vegetated with native plants, etc.). Please reference page 21 of the draft ordinance regarding this amendment.

Topics Identified during the June 8th Council Work Session & by Councilmembers Moore and Pace

T. Add a Safety Section in the Code. During the June 8th work session, the Council discussed the issue of creating a safety section in the Hillside Code. There was discussion on when safety comes into play on the development of a hillside property and the length of construction on hillside properties. The Council may direct the Commission to identify circumstance that trigger additional safety measures and reviews (such as enabling the Town to hire consultants to help review geotechnical reports or examine potential grading and drainage issues). The additional safety measures and reviews may be required at the Town's discretion. The Town may require the applicant to cover the cost of the additional review. Language regarding this can be added to Section 2205.VI. A (page 10) of the draft ordinance.

U. Administrative Hillside Chair Review. Council Member Moore and Council Member Pace recommend that this section of code be eliminated or reduced. Does the Council want to eliminate or reduce the scope of the Chair review? If the Council decides to eliminate this section of code, virtually all exterior improvements will require Hillside Committee review and approval. If the Council favors a reduced scope of Chair review, the Council may direct the Commission to evaluate the current requirements and determine which standards shall be reduced. Councilmember Moore expressed particular concern with the ability of the Chair to approve up to 1,000 square feet of additional footprint. Based upon Planning Commission review and as drafted in the attached ordinance, the Commission recommends increasing the scope of the Chair review in an attempt to help expedite smaller improvements. The current code enables the Chair to send an application to full Committee for review if the Chair believes the request has an adverse visual impact. If the Council prefers to expand the scope of the Chair review, language can be added to the code requiring the applicant to notify the any neighbors of the improvements that the Chair determines to be potentially affected by the improvement.

V. Administrative Relief on Hillside Lots . Council Member Moore and Council Member Pace recommend leaving this section of code in its current state and do not favor the expanding the scope of administrative relief on hillside lots. The Council may remove this topic from the code updates, direct the Commission to proceed with the current proposal of making administrative relief on hillside lots consistent with flat land lots, or direct the Commission to re-evaluate this topic.

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Statement of Direction

A Statement of Direction (SOD) has been drafted and attached assuming the green items are accepted as drafted and the red, orange and blue items will receive direction from the Mayor and Council during the study session. Blue items were not specifically drafted in the SOD as they are contrary to the Green items and await Council direction.

Directions from the Mayor and Council to the Planning Commission generally come in one of three forms:

1) Identifies the problem and directs the PC to recommend a solution;
2) Identifies the problem and directs the PC to develop a solution consistent with the policy concept written in the SOD; or
3) Identifies the problem and directs the PC to use the specific ordinance language provided for the solution.

Staff will facilitate which of these forms of direction and the associated language Mayor and Council prefers during the study session presentation.

Attachments

- Draft Statement of Direction (SOD)
- Draft Hillside Ordinance with notes through the January 17, 2017 Planning Commission meeting
- Draft Hillside Ordinance with Council Member Moore and Council Member Pace's recommendations
- Power Point Presentation

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Hillside Code Update

-Statement of Direction-
June 22, 2017

The Town of Paradise Valley is preparing an update to the Hillside Code, pertaining to Article XXII of the Town Zoning Ordinance.

A Statement of Direction (SOD) as outlined in the Town Code is not required for code updates. However, based upon multiple discussions regarding how and what to update in the Hillside Code, the Town Council suggested a Statement of Direction. As such, direction to the Planning Commission by the Town Council is beneficial.

As in any Statement of Direction, this direction to the Planning Commission is not a final decision of the Town Council and such matters addressed may differ through the course of the code update process. Therefore, the Town Council issues the following Statement of Direction for the Hillside Code Update:

- The purpose of the Hillside Code is to establish provisions to regulate the intensity of development; preserve and protect the hillside environment; provide for the safety and welfare of the Town and its residents; and to establish rules and procedures for review by the Hillside Building Committee of hillside development, building and construction plans.

- The code amendments outlined in draft Ordinance 2016-09 include, but are not limited to, twenty topics (as defined in the June 22, 2017 staff report). The Town Council finds the following topics as edited in the draft ordinance dated June 16, 2017, to be appropriate and acceptable: Material Palette & Light Reflective Value, Reviews & Administrative Hillside Chair Review, Disturbed Area Calculation, Demolition on Hillside Properties, Hillside Models, Accessory Structures & Accessory Structure Height Limits, the 40' Overall Height Measurement, the Process to Remove a Property from the Hillside Designation, Pool Barriers & Perimeter Fencing Standards, and Administrative Relief on Hillside Lots. Planning Commission is directed not to change the content of those items during subsequent reviews unless its submits a request to the Council for further direction.

- The Planning Commission shall focus their review on the following topics with the following direction related to each topic:

    1. *Retaining Walls.* Establish a maximum height for guard rails placed on top of retaining walls.

    2. *Driveway Disturbance Credit.* The disturbance credit for decorative driveways that service new homes and remodeled homes should be consistent. The Commission must develop consistent standards and credits for driveways that serve new homes and remodeled homes.

3. *Lighting.* Evaluate the hillside lighting standards to address Kelvin requirements, adding Lux as another light measurement, prohibiting rope lights, and extending holiday lighting to October 15^{th}.

4. *Hillside Assurance/Bond.* Update the code to ensure that the hillside bond will be of a sufficient amount to restore the hillside on an abandoned or unfinished project. The Commission shall explore different ways to establish the amount of assurance. Planning Commission should also establish thresholds for when the assurance should be called.

5. *Define which Hillside Code applies to La Place du Sommet Subdivision.* Research and determine if the La Place du Sommet subdivision is governed by the 1984 Hillside Code.

6. *Solar Panels and Hillside Review Process.* The Commission shall explore the use of stealth solar technology on hillside properties and evaluate the placement of solar on pitched roofs.

7. *Cantilever Limitations.* Add language to the code to prohibit driveway cantilevers and establish or revise criteria that minimizes the impact of cantilevers in construction of structures.

8. *On-Site Retention.* Identify that on-site retention shall be in accordance with the Town's Storm Drainage Design Manual and develop standards that will allow retention basins to receive partial disturbance credit.

9. *Add a Safety Section in the Code.* Identify circumstance that trigger additional safety measures and reviews (such as enabling the Town to hire consultants to help review geotechnical reports or examine potential grading and drainage issues). The additional safety measures and reviews may be required at the Town's discretion. The Town may require the applicant to cover the cost of the additional review. Language regarding this can be added to Section 2205.VI. A (page 10) of the draft ordinance.

10.

As per Section 1102.3.C.3.c of the Zoning Ordinance, at any time during the review process, the Planning Commission may request clarification and/or expansion of this Statement of Direction based on additional information that has evolved.

DRAFT

ORDINANCE NUMBER 2016-09

AN ORDINANCE OF THE TOWN OF PARADISE VALLEY, ARIZONA AMENDING THE PARADISE VALLEY ZONING ORDINANCE, Article XXII, HILLSIDE DEVELOPMENT REGULATIONS

BE IT ORDAINED BY THE MAYOR AND TOWN COUNCIL OF THE TOWN OF PARADISE VALLEY, ARIZONA:

Section 1. Article XXII, Hillside Development Regulations, Section 2200- 2209 are hereby amended (with deletions shown as ~~strikethroughs~~ and additions shown in **bold type**):

Comment [GB1]: RED TEXT IS DRAFT LANGUAGE PRESENTED TO PC AT 12/20/16 MEETING.

YELLOW HIGHLIGHTED TEXT IDENTIFIES UPDATED LANGUAGE IN RESPONSE TO INPUT FROM 12/20/16 PC MEETING

BLUE HIGHLIGHTED TEXT IDENTIFIES UPDATED LANGUGE IN RESPONSE TO INPUT FROM 1/3/17 PC MEETING

GREEN HIGHLIGHTED TEXT IDENTIFIES UPDATED LANGUAGE IN RESPONSE TO INPUT FROM 1/17/17 PC MEETING

Article XXII. HILLSIDE DEVELOPMENT REGULATIONS [110 112 181 193 194 409 425 533 558 654580]

Section 2200. INTRODUCTION

As valuable scenic resources, Camelback Mountain, Mummy Mountain and the Phoenix Mountains provide a permanent visual presence that exemplify what is unique about Paradise Valley. They define the location and character of the Town, shape our sense of place and contribute to the Town's identity. These land forms, their foothills, and other areas over a 10% slope, offer a desirable setting visible to the entire metropolitan area and an intrinsic aesthetic value to the Town; therefore they require unique standards resulting from the characteristics of hillside terrain.

Section 2201. PURPOSE

This article exists to establish provisions to: a) regulate the intensity of development; b) preserve and protect the hillside environment; c) provide for the safety and welfare of the Town and its residents; and d) establish rules and procedures for review by the Hillside Building Committee ~~of~~ for hillside development, building and construction plans through the implementation of the following:

1. Require building massing to adapt to the natural hillside topography thereby reducing the scarring effects of roads, drives, building pads and cut and fill slopes.

2. Encourage all improvements to be designed and constructed in a manner that minimizes the impact of development from viewpoints on the valley floor and adjacent slopes.

3. Prevent unnecessary grading or stripping of vegetation, preserve drainage patterns, protect the public from natural hazards of storm water runoff and erosion, and require re-vegetation in order to maintain the natural landscape environment.

4. Preserve visual open space, unique natural features, wildlife habitats and retain the integrity and natural states of the identified dominant peaks and ridges.

5. Provide development and construction practices and methods to ensure greater fire protection in hillside development areas.

6. Require limited and efficient use of exterior lighting to maintain minimal night-time lighting levels and preservation of the dark sky.

This Article endeavors to enhance design quality so that the resulting development maintains the essential natural characteristic and context of the hillside consistent with the goals and policies of the Town's General Plan.

<u>Section 2202</u>. IMPLEMENTATION

The provisions of this Article shall apply to all land within a Hillside Development Area as denoted on **FIGURE 2 – HILLSIDE DEVELOPMENT AREA** and to all lands where the natural terrain under the building pad has a slope of ten percent (10%) or greater (see example below), whether shown in Figure 2 or not. However, a 10% or greater slope, in an area not denoted on Figure 2, created by a natural wash on land that would otherwise not be classified as hillside land, shall be exempt from the hillside regulations. Hillside lands are also subject to special provisions relating to lot split and subdivision development as set forth in the subdivision code. If there is a conflict between the Hillside Development provisions and another section of this Ordinance or the Town Code, these provisions shall prevail.

FIGURE 1 –10% SLOPE

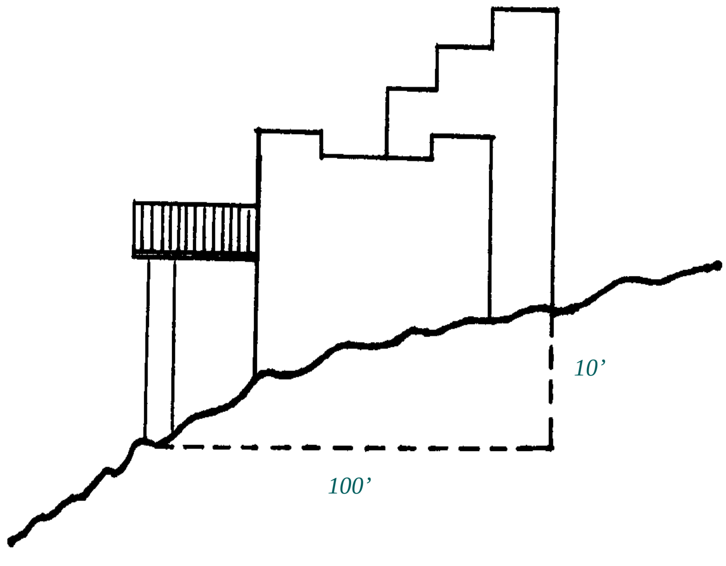
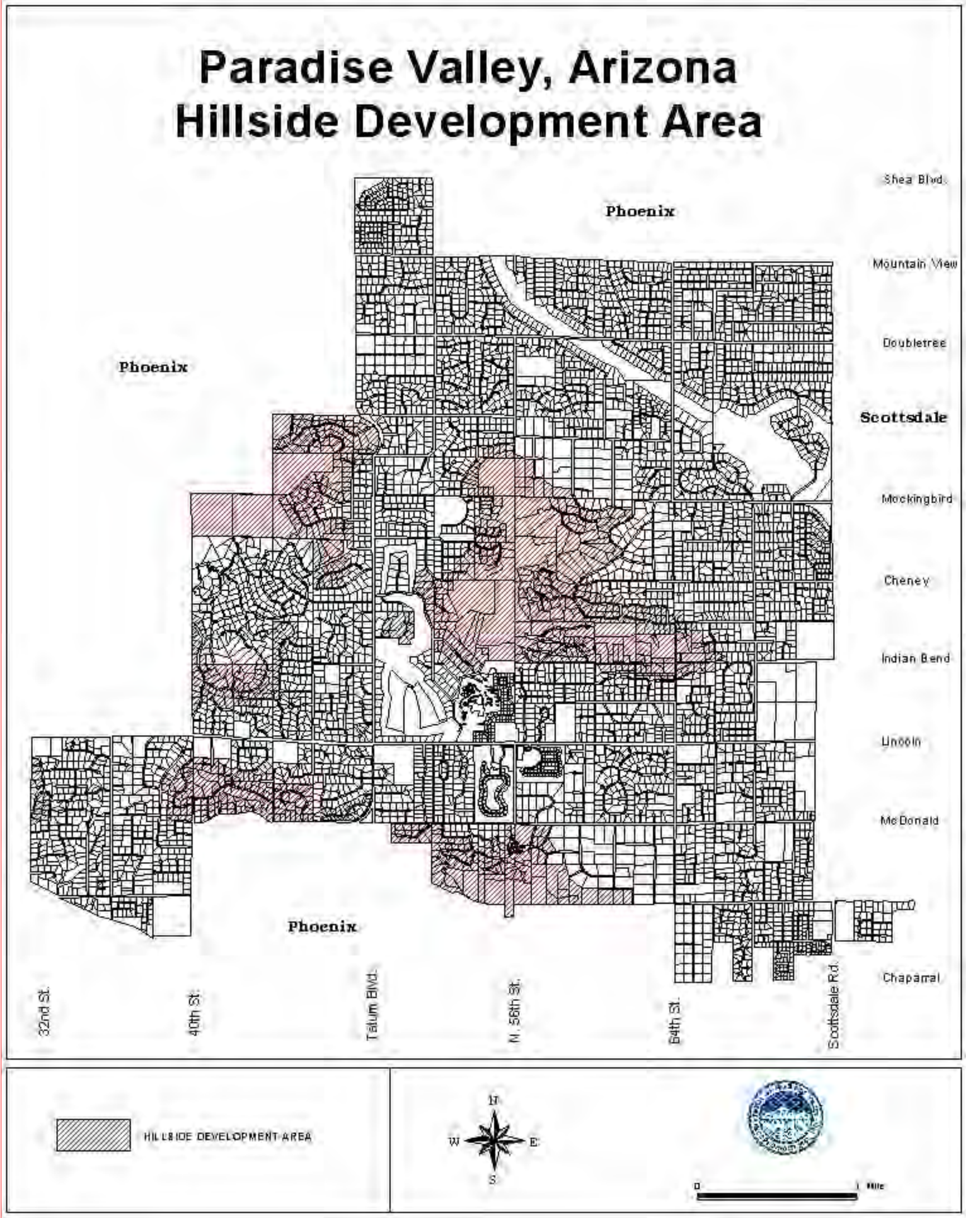


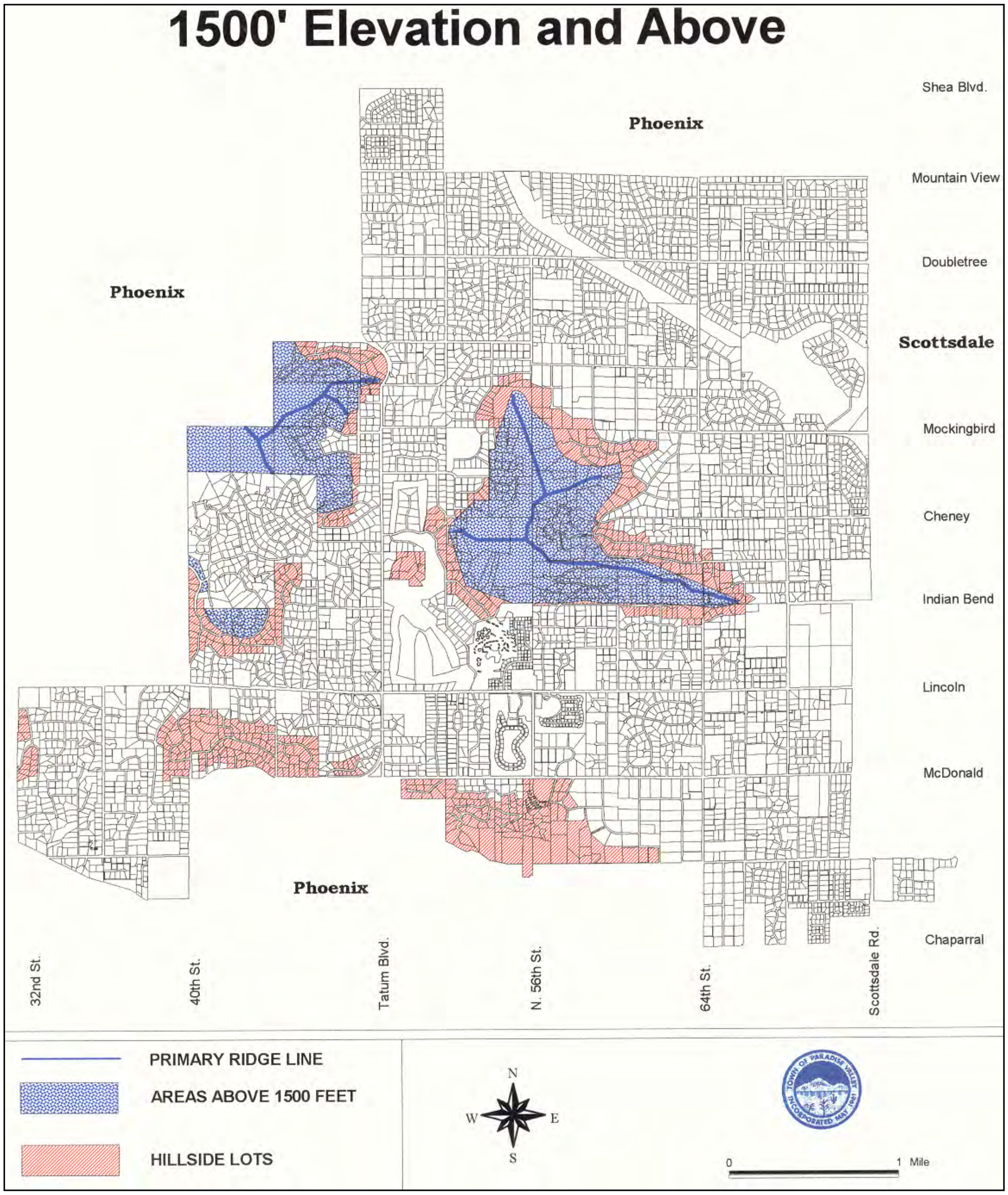
FIGURE 2 – HILLSIDE DEVELOPMENT AREA

DRAFT



Comment [GB2]: Identify Process to Update Map with any properties removed from Hillside or added to Hillside

FIGURE 3 – PRIMARY RIDGE LINE DESIGNATION


1500' Elevation and Above
Shea Blvd.
Phoenix
Mountain View
Doubletree
Phoenix
Scottsdale
Mockingbird
Cheney
Indian Bend
Lincoln
McDonald
Phoenix
Chaparral
32nd St.
40th St.
Tatum Blvd.
N. 56th St.
64th St.
Scottsdale Rd.
PRIMARY RIDGE LINE
AREAS ABOVE 1500 FEET
HILLSIDE LOTS
N
W
E
S
0
1 Mile

<u>Section 2203</u> **HILLSIDE DEFINITIONS.** Where definitions are not defined in this section, the definitions in Article II shall control. For purposes of this Article, the terms contained in the Article shall have the following meanings:

<u>Acre</u> - 43,560 square feet as measured on the horizontal plane.

<u>Alter the Mountain Top Ridge Line</u> –Any Development on the Primary Ridge Line shown on **FIGURE 3** that disturbs or alters the natural mountain top profile.

<u>Applicant</u> – The person or entity desiring to improve or otherwise engage in any Development of property in the Hillside Development Area, including the owner of the property and any agents acting on behalf of the owner.

<u>Building Pad</u> – The total area under roof of all structures proposed for the property.

<u>Building Pad Slope</u> - The percent of slope measured at right angles to the natural contours along a line passing through the center of the proposed building and terminating at the ends of the disturbed area limits of the building site.

<u>Building Site</u> - That portion of the lot or parcel, excluding driveways, upon which a building and appurtenances are to be placed or are already existing, including but not limited to; adequate areas for parking, turnaround areas not separated by driveways, sewage disposal, clearance, and proper drainage which conforms to the requirements of the provisions of this Article and the ~~Uniform Building~~ Town Code.

<u>Code</u> - The Code of Ordinances of the Town of Paradise Valley, Arizona in effect as of the date of these Regulations and as may be amended.

<u>Commission</u> - The Planning and Zoning Commission of the Town of Paradise Valley.

<u>Committee</u> - The Hillside Building Committee of the Town of Paradise Valley.

<u>Conservation</u> - Retention or acquisition of land for the purpose of preservation in a natural state.

<u>Conservation Easement</u> - A permanent open space easement granted to the Town or to a public land trust to prohibit development of property including roads and utilities and to retain and preserve the land for the scenic enjoyment of the general public.

<u>Council</u> - The Town Council of the Town of Paradise Valley.

<u>Cut</u> - The land surface which is shaped through the removal of soil, rock, or other materials.

<u>Development</u> - Any grading, excavation or construction.

Action Report Topic #4

<u>Disturbed Area</u> - That area of natural ground excluding the footprint of the residence that has been or is proposed to be altered through grading, cut and fill, removal of natural vegetation, placement of material, trenching, or by any means that causes a change in the undisturbed natural surface of the land or natural vegetation.

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Comment [GB3]: Need Planning Commission Input - Should the footprint and garage be included in the disturbance calculation? If so, the definition of "disturbed area" will need to be updated and Table 1 in Section 2207 will also need to be modified and updated in order to not make currently developed properties non-conforming in the amount of disturbance.
Commission Requested Additional Info at the 12/20/16 WS Meeting to help evaluate the potential change.

Fill - The deposit of soil, rock, or other materials placed by man.

Finished Grade - The final grade and elevation of the ground surface after grading is completed.

Footprint - That area of the residence measured from the outside walls (excluding any overhanging portions) which includes indoor uses such as attached garage, carports, utility room, laundry, etc., but excludes outdoor uses such as patios and breezeways.

Comment [GB4]: If the code is changed to include the footprint in the disturbance calculation, the definition of footprint will need to be updated. A potential definition is "The livable portion and garage of the main residence and detached accessory buildings."

Grading - Any excavating, or filling or combination thereof, including the conditions resulting from any excavation or fill.

Hillside Development Area - Those areas marked in **FIGURE 2** and to all lands where the natural terrain under the building pad has a slope of ten percent (10%) or greater, whether shown in FIGURE 2 or not. However, a 10% or greater slope, in an area not denoted on Figure 2, created by a natural wash on land that otherwise would not be classified as hillside land shall be exempt from the hillside regulations.

Hillside Wash – Any creek, stream, wash, arroyo, channel or other body of water having ~~historical banks and with~~ a flow rate equal to or greater than 2 cubic feet per second based on a 100-year storm event.

Lot - A legally subdivided parcel of land occupied or intended for occupancy by one main building, together with any accessory buildings including the open spaces required of the Hillside Regulations and having adequate frontage on a public or private street.

~~Natural Features, Significant - Include washes, Significant Vegetation, and Significant Rock Outcroppings provided these features are in their undisturbed natural state.~~

Natural Grade - The undisturbed natural surface of the land, including washes.

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Primary Ridge Line - That line running from the highest point along the mountain top downward along a divide to the 1500 foot mean sea level ~~contour line~~elevation as shown on **FIGURE 3**.

Action Report Topic #7

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Raised Outdoor Living Area – Uncovered areas such as porches, decks, platforms, and retained areas which extend three (3) feet or more above grade.

Retaining Wall - A wall or terraced combination of walls, including, planters, negative edge pools, used solely to retain more than eighteen inches (18") of material, ~~or~~ water, ~~but not~~ or to support or to provide a foundation or wall for a building.

Raw Spill Slope – An area created by causing or allowing earth or other material to fall, flow or run down the slope, thereby creating a change in the natural appearance and topography.

~~Rock Outcroppings, Significant - Any surface rock or group formation of rocks covering an area of 200 square feet or larger or any surface rock formation with a height greater than ten feet from the surrounding grade.~~

Sheet Flow – A shallow and wide overland flow of water.

Significant Natural Features - Include Hillside Washes, Significant Vegetation, and Significant Rock Outcroppings provided these features are in their undisturbed natural state.

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Significant Rock Outcroppings - Any surface rock or group formation of rocks covering an area of 200 square feet or larger or any surface rock formation with a height greater than ten feet from the surrounding grade.

Significant Vegetation - A single tree or cactus having a height greater than 15 feet or three or more trees or cacti, located within a radius of 15 feet, each having a height greater than 12 feet.

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Subterranean - That space which lies totally underground, and which cannot be seen from outside the exterior perimeter of the structure on the same horizontal plane which originates at that point where the building intersects the ground.

Town - The Town of Paradise Valley.

~~Vegetation, Significant - A single tree or cactus having a height greater than 15 feet or three or more trees or cacti, located within a radius of 15 feet, each having a height greater than 12 feet.~~

Veneered Rock Slop – A group formation of rocks of similar colors that blend in with the surrounding natural setting.

View Fencing (View Fence) – Fencing that is constructed in such a manner as to achieve ~~80~~~~70~~ 80% overall openness.

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Comment [GB5]: Keep Minimum Openness of 80%

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Section 2204 HILLSIDE BUILDING COMMITTEE.

A. The Hillside Building Committee or Hillside Building Committee Chair as established in Chapter 2 of the Town Code shall review all new applications submitted to the Town for ~~new home~~ Development and related construction within a Hillside Development Area. No building permit shall be issued for such application until approved by the Committee and then such issuance shall only be in accordance with the plans and specifications approved by the Committee.

B. The Hillside Building Committee may review applications for additions to existing structures in accordance with Section 2207 (VII)(A) of this Ordinance.

C. The Hillside Building Committee may review applications for accessory construction (e.g. fences, retaining walls, pools etc.) if the Town ~~Engineer~~ Manager or Designee in consultation with ~~a member of the~~ Hillside Building Committee Chair determines that the proposed construction: (i) creates a significant visual impact; or (ii) proposes an additional disturbance area.

Action Report Topic #3

D. The Hillside Building Committee approval process ~~is a two stages process~~ may consist of the following stages:

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1. An Administrative Hillside Chair Review.

2. A Combined Hillside Building Committee Review Meeting.
~~1.~~3. A Conceptual Plan Review Meeting.
4. A Formal Hillside Building Committee Review Meeting.
~~2.~~

Section 2205 **REVIEW AND DEVELOPMENT PROCESS.** The Hillside Building Committee shall review Development plans, as outlined in Section 2204, prior to the ~~Community Development Department review and the~~ issuance of a building, grading or other Development permit. The review and development process consists of up to four stages, depending upon the nature and scope of the proposed Development:

Action Report Topic #3 & #14

I. Administrative Hillside Chair Review: The Applicant shall submit a completed application and the required fees to the Town. Proposed accessory structures and additions may be reviewed by the Hillside Building Committee Chair provided the proposed improvements do not: (i) exceed or increase the building height of the main residence; (ii) increase the existing building footprint by more than 1,000 square feet; (iii) create more than 100 square feet of additional disturbed area; (iv) increase the length of walls by more than 25 lineal feet; (v) propose a significant addition of exterior lighting; add more than 1,000 square feet of solar panels, or (vi) create a significant adverse visual impact. The Chair shall review the submittal for compliance with the goals, purposes, and specific criteria of this ordinance.

II. Combined Hillside Committee Review Meeting: The Applicant shall submit all materials outlined in Section 2206 (II) to the Town. The Hillside Building Committee shall then review the submittal for compliance with the goals, purposes, and specific criteria of this ordinance and either approve, approve with stipulations or changes, or deny the submittal. ~~Average~~ Minor remodel/additions, site improvements (such as, but not limited to, pool and spa additions), and solar panel additions over 1,000 square feet in area, may be reviewed as a Combined Hillside Committee Review.

III.
~~I.~~IV. Concept Plan Review Meeting: The Applicant, along with their architect and engineer shall submit a completed application and the required fees, to the Town ~~Engineer~~Manager or designee, at the time they request a concept plan review meeting (pre-hillside meeting) with the Hillside Building Committee. All new single family residence and major remodel/additions require a Concept Plan Review Meeting. The purpose of this meeting is to discuss, review, and give suggestions and guidance to the Applicant regarding the proposed development including: the location of the building pad and accessory uses; how these relate to Significant Natural Features; the preservation of existing vegetation; grading concepts and their adaptation to the natural hillside topography; and how the requirements pursuant to these hillside regulations and purpose statement will guide the proposed Development.

V. Formal Hillside Committee Review Meeting: At this stage, in addition to those materials previously submitted, the Applicant shall submit all materials outlined in Section 2206 (II) to the Town ~~Engineer~~Manager or designee. The Hillside Building Committee shall then review the submittal for compliance with the goals, purposes, and specific criteria of this ordinance and either approve, approve with stipulations or changes, or deny the

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Comment [GB6]: During the January 3rd meeting, the Commission asked that this language be moved to a different location of the code. Staff recommends either keeping this language at this location or removing it since "Applicant" is defined in Section 2203.

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submittal. All new single family residence and major remodel/additions require a Formal Hillside Committee Review Meeting.

~~II.~~

~~III.~~VI. Building Permit Review: The final construction plans submitted to the Town Community Development Department for review and approval shall comply with the final approval of the Hillside Building Committee. Any variation from ~~Chapter 70 of the Uniform Building~~ excavation and grading requirements within the Town Code must be accompanied by a soils engineering report from a testing laboratory or geological engineer approved by the Town Engineer. No site preparation or construction shall commence until the Town has issued a grading, demolition, or building permit.

A. The plans for any Development in the Hillside Development Area, must be approved by the Town and appropriate legal permit(s) issued before any clearing and grubbing, grading, bulldozing, blasting, or movement of earth is commenced. A building permit application must be submitted within twelve months after the date of approval from the Hillside Building Committee or Hillside Building Committee Chair. If a building permit application is not submitted a within twelve the month period, the approval shall be null and void. ~~If Development does not commence within twelve months after securing such approval from the Hillside Building Committee, no construction shall occur until such plans have been resubmitted and re-approved or i~~I If such is appropriate based upon circumstances outside the control of the Applicant, a one-time six (6) month extension may be granted by the Town Manager or designee ~~Engineer~~. Should the applicant allow the permit to expire, at no time after that expiration period does the applicant have any vested prior approval rights.

Action Report Topics #5 and #12

B. When a building, demolition, or grading permit that involves any cut or fill on a hillside property is required under provisions of these Regulations, the Applicant shall first provide the Town with a form of financial assurance, and a right of entry and temporary construction easement agreement acceptable to the Town Attorney, which places the Town in an assured position to do or to contract to be done the necessary work to cover, restore and landscape exposed fills and cuts to blend with the surrounding natural terrain. Three (3) bids or estimates from a licensed contractor or a licensed professional shall be submitted to the Town identifying the cost to restore and landscape the exposed fill and cuts to blend in with the surrounding natural terrain. The bids shall include, but are not limited to, the cost to regrade the affected area(s), re-landscaping the restored area(s) with native plants, stabling any applicable cut or fill area(s), and applying a desert varnish or stain to any exposed cuts or pad. The Town Staff and Town Engineer shall review the bids and determine the assurance amount. The minimum acceptable assurance shall be in a dollar amount equal to the number of total cubic yards of cut and fill multiplied by 25, or in such greater amount as deemed appropriate by the Town. The amount of the assurance may be adjusted in accordance with the Producer Price Index in order to account for inflation. In the event that construction has not commenced within six months from the date of issuance of the grading or building permit, the plan approval and permit shall expire. Twelve months after the date of the last inspection, such assurance shall be forfeited to the Town in such amount necessary for the purpose of restoration

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Comment [GB7]: Chair Strom Recommendation - Instead of trying to get three bids, I would use a $35 multiplier based on 2017 dollars and have it adjusted yearly based on the USA Consumer Price Index. Below is the scenario for $25 in 2004 to today.

Using the Consumer Price Index provided by the United States government;

Equivalent of $25 in 2004

2005	$25.81
2006	$26.70
2007	$27.37
2008	$28.49
2009	$28.52
2010	$29.29
2011	$29.73
2012	$30.61
2013	$31.15
2014	$31.61
2015	$31.85
2016	$32.08

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Comment [GB8]: Commission wants to remove requirement for 3 bids and increase the multiplier from $25 to $35. Commission tasked Commission Campbell and Staff to research this of the construction site to its original condition and all authorized permits shall be revoked and become void. The property owner shall, upon reasonable Notice from the Town, provide access to the propert for the purpose of restoration of the construction site to its original condition.

~~B.~~

~~IV.~~ VI. Issuance of Certificate of Occupancy: Prior to the issuance of any Certificate of Occupancy for any building constructed pursuant to these Regulations, the applicant shall obtain from the ~~Town Engineer and the Town Building Inspector~~Town certification of compliance with this Article. The Certificate of Occupancy may be issued without the installation of the landscaping, based upon the submittal of a landscape assurance and a right of entry and temporary construction easement agreement acceptable to the Town Attorney. Three (3) bids or estimates from a licensed contractor or a licensed professional shall be submitted to the Town identifying the cost to install the landscaping in accordance with the approved landscape plan. The Town Staff and Town Engineer shall review the bids and determine the assurance amount.

Action Report Topic #12

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Comment [GB9]: Need Planning Commission Input - Should a minimum amount be listed?

Comment [GB10]: Remove 3 bids. Hillside assurance can be held by Town from May 15th thru September 15th due to landscaping

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Section 2206 DOCUMENTARY REQUIREMENTS AND CERTIFICATION [558] [580]

I. CONCEPT PLAN REVIEW MEETING. The applicant shall submit the following:

A. Notification Letters. At least three (3) weeks prior to the scheduled conceptual Hillside Building Committee meeting the applicant shall submit to the Town a neighbor notification letter complete with address labels, with appropriate postage, for all property owners within 500 feet of the perimeter of the subject property. This notification letter shall include the following information; a) type of proposed development (addition, remodel, new construction), b) the scheduled hearing date and time, c) that the letter is only as a courtesy notification and that their attendance at the meeting is not required. d) the purpose of the meeting, and e) the goals of the meeting.

B. Seven (7) copies of a preliminary site plan that includes, but is not limited to, the building footprint, driveway, swimming pool, and accessory use locations along with topographic information for the Lot.

Action Report Topic #6

C. A 3-dimensional representation of the general massing of all proposed structures (e.g. a mass model, a 3-D scaled rendering or a scaled computer generated model in relation to topography – not a detail model).

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D. A recent aerial photo of the site (less than ~~3~~ 1 year~~s~~ old), with topography, lot lines, and the building footprint superimposed on it, ~~and~~ identification of ~~significant~~ Significant ~~natural~~ Natural ~~features~~ Features, as well as adjacent lots and structures within 100 feet of the perimeter of the subject property (minimum 24"X 36"), and the location of the driveway access in relation to the nearest roadway.

E. Preliminary calculations on land disturbance and cut and fill methods.

II. FORMAL AND COMBINED HILLSIDE COMMITTEE REVIEW MEETING. All plans submitted to the Town for review shall be stamped and sealed by the appropriate registered or licensed professional (e.g. civil engineer, land surveyor, geologist, architect). All plans shall be reviewed by the Hillside Building Committee. In addition, once the plans have been approved by the Committee the applicant shall submit final plans, in accordance with the Hillside Building Committee's approved plans, to the Community Development Department for ~~building permits~~review. Plan review fees for each such submittal shall be paid at the time of the submittal of such plans in the amount specified in the Town of Paradise Valley fee schedule, as such may be amended from time to time. The following plans and material shall be required:

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A. Notification Letters. At least three (3) weeks prior to the scheduled Formal Hillside Building Committee Meeting the applicant shall submit to the Town a neighbor notification letter complete with address labels, with appropriate postage, for all property owners within 1,500 feet of the perimeter of the subject property. This notification letter shall include the following information; a) type of proposed development (addition, remodel, new construction), b) the scheduled

hearing date and time, c) that the letter is only as a courtesy notification and that their attendance at the meeting is not required, d) the purpose of the meeting, and e) the goals of the meeting.

B. Seismic Refraction Survey. ~~All~~ Unless waived by the Town Manager or desginee, all proposed cuts shall require a seismic refraction survey, performed by a registered geologist. If the geological report or seismic refraction survey indicates fractured or unstable rock, then the proposed location of the building site (or appurtenances) shall be changed to a stable location unless the unstable condition(s) can be mitigated by an engineered design that creates a stable location and complies with the provisions of Article XXII and other Articles of this Zoning Ordinance. The geological report and results of the seismic refraction survey shall be submitted to the Town.

Comment [GB11]: Engineering Department to provide language regarding safety analysis.

C. A detailed site plan (minimum 24” X 36”), sealed by a registered engineer or land surveyor, with topographic information for the entire lot including under the footprint of the building. This site plan shall depict: the limits of disturbance; the building envelope including the building footprint, driveway(s), swimming pools, mechanical equipment, sanitary sewer or septic systems; location, size and type of mechanical screen walls and pool barrier fencing; length and height of retaining walls; all accessory buildings; and ~~significant~~ Significant ~~natural~~ Natural ~~features~~Features.

D. Photographs of the site looking out from the property in all directions and of the property from several different views.

F. A detailed grading and drainage plan (minimum 24” X 36”), sealed by a registered civil engineer, with topographic information for the entire lot. This plan shall show proposed finished contours at 1 foot intervals within a perimeter 20 feet from the building, a maximum 5 foot intervals elsewhere, and shall show existing and proposed contours**.** This plan shall show limits of excavation and fill; slope of cut and fill; total cubic yards of excavation and fill; method of concealment for each fill or exposed cut; and the calculations for amount of disturbance for the total development. This plan shall show original drainage pattern (natural course) and proposed changes. If any structures or culverts are involved, it will be necessary to include an estimate of peak flows for a 100 year frequency storm to establish drainage facility cross-sections. Sheet flow diverted from its original drainage pattern shall be returned to its natural course before leaving the property.

G. A detailed landscape plan that includes, but is not limited to the following: the building envelope; building footprint; all accessory structures and locations; ~~significant~~ all Significant ~~natural~~ Natural ~~features~~Features; plant materials list with type, quantity and size; plant location; location and species of salvaged plant materials; and methods for re-vegetation of all disturbed areas. Native desert vegetation shall be identified and preserved to the maximum extent reasonably possible ~~in the landscape plan~~. A landscape salvage plan shall be provided.

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Action Report Topic #6

H. Cross sections of new buildings and appurtenances at a scale equal to or greater than the site plan scale at three or more locations perpendicular to the contours through the building site shall be clearly shown on the topographic map and sealed by a registered professional, or as determined by the Town Manager or designee.

I. A detailed outdoor lighting plan indicating the proposed luminaire locations on the building and on the site (if applicable); the type of illuminating devices including; the manufacture's catalog cut sheets and drawings; and photometrics that describe the illuminating devices; the fixtures, lamps, lumens and ~~wattages~~, supports, the ~~aiming~~ beam angles, and other devices.

J. 3 Dimensional Scaled Computer Model or A Scaled Study Model: The applicant shall submit a scaled 3D computer model or a scaled study model for Hillside Building Committee review.

a. 3D Computer Model: A computer generated 3-dimensional model, with accurate points of reference superimposed on it; showing the appearance of the building, lot, landscaping, and skyline. The model must accurately represent the massing of all structures and roof forms as well as the following:

i. All windows, exterior doors and skylights.

ii. A sufficient area of the property to visually relate the proposed structure and accessory uses to the natural terrain.

~~I.~~**b.**

~~J.~~ b. ~~A~~ 3D Study Model: Including all proposed improvements, at not less than (1/16) inch = (1) foot showing the relationship of all proposed improvements to the contours of the lot. The model must accurately represent the massing of all structures and roof forms as well as the following:

1. All windows, exterior doors, and skylights (showing the location of all proposed skylights and their orientation to neighboring properties).

2. The model shall include enough of the property to visually relate the proposed structure and accessory uses to the natural terrain.

3. The Applicant's name, architect's name, builder's name, lot number, scale, and north arrow.

K. An accurate oblique view architectural rendering in color or a computer generated 3-dimensional picture -shall be submitted showing the appearance of the building, lot, landscaping, and skyline. The rendering or computer generated picture, and the model may remain in the custody of the Town ~~Engineer~~ until a Certificate of Occupancy is issued or until released by the Town ~~Engineer~~.

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L. Exterior Material Samples: Include samples of all colors, materials, and material specifications mounted on rigid board with all materials identified with the manufacture's name, color, and LRV number where applicable. Material samples or color specifications are required for all exterior materials and finishes including but not limited to:

• Roof	• Wall color and texture (8½" x 11" sample size)
• Metal	• Masonry
• Hardscape	• Glass
• Stone	• Driveway and terrace paving
• View fencing	• Garage doors

• Patio, deck area including second story structures, pool, and breezeways

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M. The Applicant's Engineer or Surveyor shall install a marker to designate the location of the house at the major building corners. The markers should be at least 3 feet in height with a colored ribbon at the top of the marker. The applicant shall install markers at least two (2) weeks prior to the Formal Hillside Committee meeting and remove immediately following the formal committee meeting.

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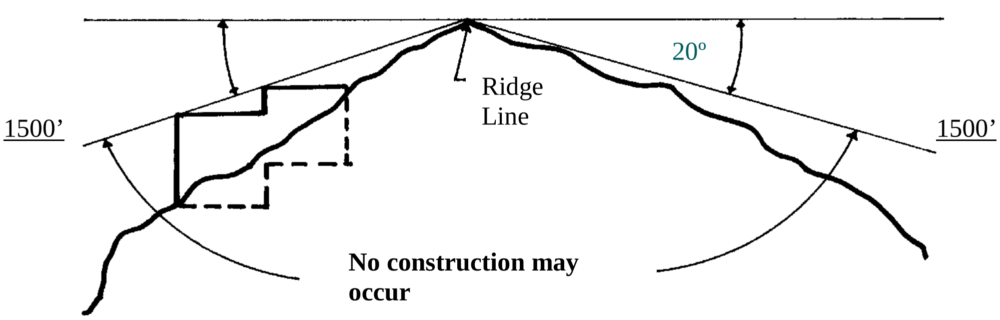
Section 2207 **DEVELOPMENT STANDARDS** [558 654]

I. MOUNTAIN PROFILE INVIOLATE

A. At and above an elevation of 1500 feet mean sea level, no Development shall occur which will Alter the Mountain Top Ridge Lines as shown on **FIGURE 3** . A model must be submitted pursuant to Section 2206(II)(J) showing compliance with this paragraph together with complete plans showing the appearance of the mountain top profile, as part of the submittal for the Formal Hillside Committee Review. Further, no structure may extend above a plane that originates on the primary ridge line and angles downward from the primary ridge line by twenty degrees (See **FIGURE 4).**

FIGURE 4 – RIDGE LINE TWENTY DEGREE DELINEATION



II. ARCHITECTURAL STANDARDS.

A. For development within the Hillside Development Areas, the height of structures shall be determined by the following four (4) sub-sections and not by the zoning district regulations that apply to lots or parcels outside the Hillside Development Area.

~~A.~~ 1. Primary Building

i. The height of a primary building or primary structure is limited to a twenty-four (24) foot imaginary plane that parallels the existing pre-development natural grade, as measured vertically from any point under the building (see **FIGURE 5**). ~~The subterranean portion of the structure is not included in the total height calculation provided that at least half (½) of the volume of the subterranean portion of the structure is below natural grade.~~

ii. In the case where the natural grade has been cut and is not restored back against the building, no exposed face in any vertical plane shall

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exceed a twenty-four (24') foot height measured from the ~~lowest~~Lowest, ~~finished~~ Finished ~~grade~~Grade. The maximum height of any deck support column shall not exceed twelve (12') feet tall measured from the adjoining grade.

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Action Report Topic #7

2. Accessory Structures

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i. The height of an accessory building or accessory structure is limited to a sixteen foot (16') imaginary plane that parallels the existing pre-development Natural Grade, as measured vertically from any point under the building.

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ii. In the case where the natural grade has been cut and is not restored back against the building, no exposed face in any vertical plane shall exceed a sixteen (16') foot height measured from the lowest, Finished Grade. The maximum height of any deck support column shall not exceed twelve (12') feet tall measured from the adjoining grade.

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ADD FIGURE ILLUSTRATING 16' HEIGHT LIMIT.

Action Report Topic #8

~~iii.~~3. The maximum overall height of the building or structure, including chimneys and accessory buildings, shall not exceed forty (40) feet from the highest point of ~~the building to natural grade at the lowest point adjacent to the building structure or column~~of a building or structure to the lowest point of Natural Grade at the lowest building or structure (excluding driveway retaining walls) ~~(~~(see **FIGURE 5**).

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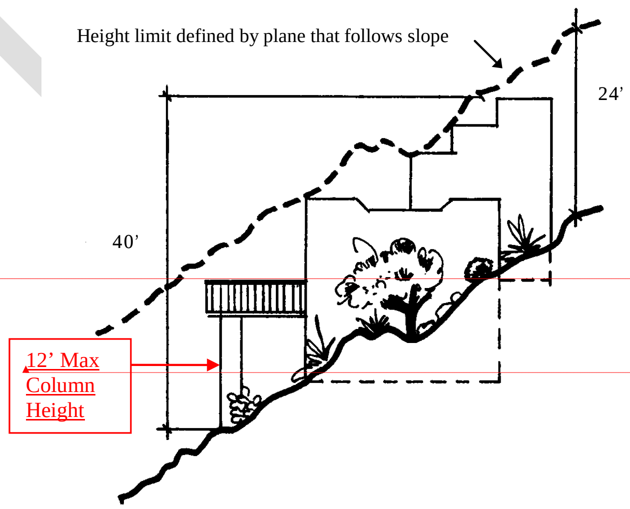
Comment [GB12]: Figure 5 to be updated to reflect these edits.

FIGURE 5 – BUILDING HEIGHT IN HILLSIDE



Comment [GB13]: Update Figure 5 to clarify measurement of 40' maximum height limit.

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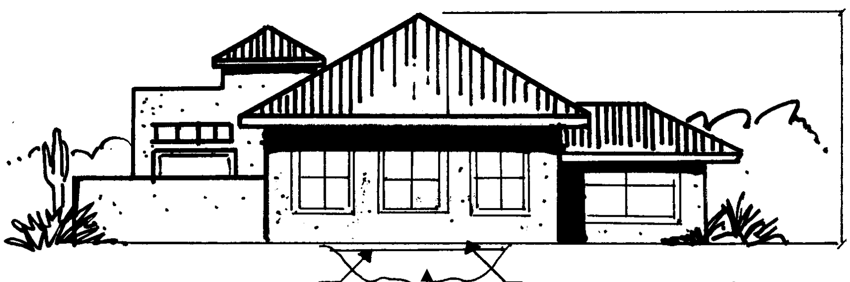
~~iv.~~ 4.Where a building spans a wash the maximum height of twenty-four (24') feet shall be measured vertically from that point where the visible structure and the side of the wash intersect. See **FIGURE 6.**

FIGURE 6 – BUILDING HEIGHT WITH A WASH CROSS SECTION



B. Cantilevers. The primary residence, accessory buildings, driveways and other structures (such as pool decks) may employ the use of cantilevers, subject to the following limitations:

1. Primary residence and accessory buildings. Cantilevered elements of the building must comply with the applicable setbacks and heights of the building. All of the area underneath the cantilevered element shall be calculated as disturbed area.
2. Driveways. Cantilevered driveways shall not be allowed.
3. All other structures (such as pool decks) employing the use of a cantilever may extend the cantilever a maximum horizontal length of 4 feet and a maximum vertical height of 8 feet. All of the area underneath the cantilevered element shall be calculated as disturbed area. The cantilevered elements of the structure must comply with the applicable setbacks.
4. The area under a cantilever must be finished with colors or materials that match the adjoining structures or blend in with the surrounding natural setting. The materials or colors used shall not have a LRV (Light Reflective Value) greater than thirty-eight (38) percent.

~~B. Structures employing the use of a cantilever may extend the cantilever a horizontal distance twice the height of the support. The maximum vertical height of the support shall be eight (8) feet. One-half the area underneath the cantilevered element shall be calculated as disturbed area~~. (See **FIGURE 7** below).

Action Report Topic #15

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Comment [GB14]: There was no consensus on the 12/20/16 PC meeting regarding this topic. It was recommended that language be added to identify what the area under a cantilever should look like. Additional review and discussion is needed.

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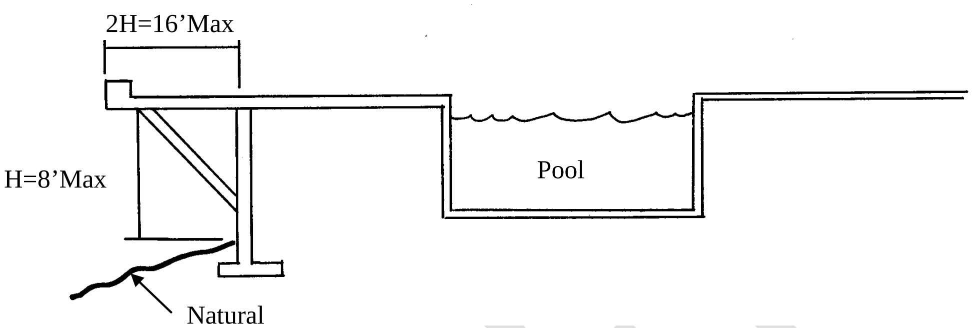
Comment [GB15]: New figures to be added to the code to illustrate these scenarios.

Comment [GB16]: There was no consensus regarding the proposed changes to the limitations on cantilevers at the 1/3/17 PC Meeting. It was recommended that staff research other city codes to see how different communities address cantilevers, provide several pictures of cantilevers for reference, and to include the entire area underneath a cantilever as disturbance.

Comment [GB17]: During the 1/17/17 meeting, there was discussion about: 1) creating different cantilever requirements for a building and a deck, 2) having all of the area under the cantilever count as disturbance and floor area, and 3) making the area under the cantilever applicable to the overall 40' height measurement. Commission directed staff to continue researching cantilever requirements with Commisioner Campbell.

FIGURE 7 - HEIGHT FOR A CANTILEVERED ELEMENT



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5. All of the setback requirements of the underlying zoning district shall apply in the Hillside Development Area (see Article X~~, Section 1001, Table 1001~~).

Action Report Topic #7

~~C.~~6. Raised Outdoor Living Areas are subject to the setback requirement of pools and spas and are limited to a maximum height of eight (8') feet tall.

Action Report Topic #2

~~D.~~7. Materials used for exterior surfaces such as structures, walls, roofs and fences shall blend with the surrounding natural setting and avoid high contrasts. There shall be no paint or material colors used which have a LRV (Light Reflecting Value) greater than thirty-eight (38) percent. Materials and color used for exterior surfaces are subject to Hillside Building Committee review and approval. The applicant must demonstrate how the materials and colors used for the exterior surfaces blend in with the natural surroundings and settings. Limited use of contrasting accent colors (in excess of 38% LRV) for small elements, including, but not limited to items such as doors and window mullions, may be allowed upon explicit approval of the Hillside Building Committee.

Action Report Topic #14

~~E.~~8. All electrical service equipment and subpanels and all mechanical equipment including, but not limited to, air conditioning, evaporative cooling, and antennas greater than 24" in diameter shall not be allowed on the roof. Solar panels may be allowed if they are integrated into the building design and hidden from view when viewed from the same or a lower elevation and approved by the Hillside Building Committee by a Combined Review or Administrative Hillside Chair Review. Solar panels may be allowed on pitched roofs only when screened by the hillside or hillside cut. All mechanical, electrical, and natural gas equipment along with pool equipment and antennas shall be screened in such a manner that they are not visible from outside the property when viewed from the same or a lower elevation. Vegetation does not constitute a screen.

Comment [GB18]: Remove support from illustration on Figure 7.

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Comment [GB19]: Staff to research other solar technology such as solar shingles and potential use on hillside homes.

F. Mirrored surfaces or reflective treatments that change~~s~~ or enhance~~s~~ ordinary glass into a mirror surface ~~is~~ are prohibited. Permanently reflective metallic surfaces shall be prohibited.

G. The building design should minimize the reflection of daytime glare from glass and the emission of light from within the structure during evening hours.

H. The quantity and orientation of skylights shall be designed to minimize night time emission of light and may be allowed upon approval of the Hillside Building Committee.

~~H.~~I. Shake shingle roofs are prohibited. Existing shake shingle roofs on residential structures may be allowed only until such time that it is determined, during the course of normal maintenance, that a new roof (re-roof) is necessary and/or the extent of maintenance or repair work requires a building permit from the Town.

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III. LAND DISTURBANCE STANDARDS.

Action Report Topic #5

A. The limits of construction, demolition, ~~and~~ or proposed disturbed areas shall be clearly staked in the field, with a minimum barrier of visible roping, prior to and during construction and shall conform to the approved ~~individual site analysis~~ plans. ~~No~~ Both during and after construction, no disturbance shall be permitted beyond the areas designated as the limits of disturbance on the plans ~~both during and after construction~~. If land disturbance in violation of this ordinance occurs, the illegally-disturbed area(s) shall be restored to its natural grade and re-vegetated with plant material of the same species, size, and at a similar density present prior to the illegal disturbance.

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B. All disturbed land that is not otherwise used for approved development shall be restored to the natural grade and re-vegetated with plant material ~~as listed in the Town of Paradise Valley landscape guidelines~~ native to the hillside or pursuant to a landscape plan approved by the Town.

C. All buildings, structures, roads, and drives shall, to the fullest extent practicable, follow and utilize the natural contours of the land to minimize disturbance. The maximum height of any cut used to establish a building site shall not exceed 30 feet.

D. All surplus excavated material shall be removed from the lot prior to the issuance of the Certificate of Occupancy.

E. After final grading, not more than 5% of the lot shall be steeper than the natural grade of the lot.

F. The total disturbed area shall not exceed the allowed percentage of the lot area as shown in **TABLE 1** below.

G. Grading within street rights-of-way or tracts of land for private roads is exempt from the disturbance calculations. Any roadway grading beyond the limits of the

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dedicated rights-of-way or private road tracts shall be placed in slope easements and included within the calculations for land disturbance limitations.

H. A legally pre-existing disturbed area may be excluded from disturbed area calculations when the applicant ~~has committed to comply~~complies with all of the following restoration conditions:

1. ~~the~~ The restored area shall follow original natural contours.

2. ~~the~~ The restoration shall be treated with an aging agent approved by the Town Manager or Designee ~~Engineer~~ and planted with indigenous desert material that is consistent in density with the area surrounding the undisturbed areas abutting the pre-existing disturbed area.

3. ~~the~~ The restoration process shall be sealed by a landscape architect and/or a registered ~~engineer or architect~~professional.

Action Report Topic #16

I. On-site retention may be required. Please reference the Town of Paradise Valley Storm Drain Design Manual for on-site retention requirements.

J. On-site retention shall be counted as Disturbed Area. Retention areas not employing the use of retaining walls and vegetated with native plant material shall count as fifty (50%) percent disturbed area.

Action Report Topic #4

~~I.~~K. The livable portion of the main residence including garage and livable portions of detached accessory buildings shall not be counted as disturbed area provided that all buildings are within the required setbacks and do not exceed the building height limitations as specified in Section 2207 (II) (A) of this Ordinance.

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Comment [GB20]: Commission requested Town Engineer attend next meeting to discuss on-site retention requirements.

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Comment [GB21]: If the code is changed to include the footprint in the disturbance calculation, the definition of footprint will need to be updated.

Comment [GB22]: Keep as is. Do not count footprint as disturbance. Wordsmithing may be needed to add clarity.

TABLE 1 – Slope Category / Lot Disturbance Limitations

Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance
10%	60.0	41%	9.90	72%	6.80
11%	53.66	42%	9.80	73%	6.70
12%	47.94	43%	9.70	74%	6.60
13%	42.81	44%	9.60	75%	6.50
14%	38.21	45%	9.50	76%	6.40
15%	34.11	46%	9.40	77%	6.30
16%	30.48	47%	9.30	78%	6.20
17%	27.27	48%	9.20	79%	6.10
18%	24.46	49%	9.10	80%	6.00
19%	22.01	50%	9.00	81%	5.90
20%	19.88	51%	8.90	82%	5.80
21%	18.04	52%	8.80	83%	5.70
22%	16.48	53%	8.70	84%	5.60
23%	15.16	54%	8.60	85%	5.50

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Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance
24%	14.05	55%	8.50	86%	5.40
25%	13.13	56%	8.40	87%	5.30
26%	12.37	57%	8.30	88%	5.20
27%	11.76	58%	8.20	89%	5.10
28%	11.28	59%	8.10	90%	5.00
29%	10.90	60%	8.00	91%	4.90
30%	10.62	61%	7.90	92%	4.80
31%	10.41	62%	7.80	93%	4.70
32%	10.25	63%	7.70	94%	4.60
33%	10.15	64%	7.60	95%	4.50
34%	10.08	65%	7.50	96%	4.40
35%	10.04	66%	7.40	97%	4.30
36%	10.02	67%	7.30	98%	4.20
37%	10.01	68%	7.20	99%	4.10
38%	10.00	69%	7.10	100%	4.00
39%	10.00	70%	7.00		
40%	10.00	71%	6.90		

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IV. DRIVEWAYS[558]

A. Driveways that only serve a new single residence shall be: (1) a minimum of 12 feet wide; (2) surfaced with paving brick, textured integral colored concrete (i.e. stamped or exposed aggregate etc.) or other similar decorative paving materials specifically colored to blend with the existing natural color of the site (asphalt driveways are prohibited); (3) designed with an overall grade that does not exceed 30%; (4) constructed in full conformance with the Fire Code; and (5) developed only as specifically approved by the Hillside Building Committee. The driveway shall be included in the calculations for land disturbance limitations at a ratio of 50% of the total disturbed area of the driveway, if the driveway is constructed at a grade plus or minus (6) inches from natural grade. Driveways with cut and fill in excess of (6) inches and under (18) inches from natural grade shall be charged with 75% of the total disturbed area of driveway surface. The Driveways with cut and fill in excess of (18) inches from natural grade shall be charged with 100% of the total disturbed area of the driveway surface. The entire driveway must be within the natural grade limit to be subject to the disturbance ratios noted above.

Action Report Topic #9

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Comment [GB23]: There was no consensus on the 12/20/16 PC meeting regarding this topic. Additional review and discussion is needed.

Comment [GB24]: The general direction was to make the driveway credit consist or the same for driveways that serve new homes and remodeled homes. There was concern that current code may allow for excessively large driveways on remodels due to the credit. Commission tasked Staff and Commissioner Campbell to research this.

B. Driveways that serve an existing home undergoing renovation, remodel, or an addition shall be included in the calculations for land disturbance limitations subject to the following conditions:

1. Existing driveways reconstructed with paving bricks, textured integral colored concrete (e.g. stamped or exposed aggregate etc.) or other similar decorative paving materials, specifically colored to blend with the existing natural color of the site, shall be excluded from the land disturbance calculations.

2. Existing driveways surfaced with paving bricks, textured integral colored concrete (e.g. stamped or exposed aggregate) or other similar decorative paving materials, specifically colored to blend with the existing natural color of the site, shall be excluded from the land disturbance calculations.

3. Existing asphalt or uncolored concrete driveways not reconstructed with paving bricks or textured integral colored concrete (e.g. stamped or exposed aggregate etc.) shall be calculated as disturbed area at a ratio of 150% of the total disturbed area of the driveway.

Action Report Topic #9

4. Any new portions of the driveway beyond the layout of the existing driveway shall be included in the calculations for land disturbance limitations at a ratio of 50% of the total disturbed area of the driveway, if the driveway is constructed at a grade plus or minus (6) inches from natural grade. Driveways with cut and fill in excess of (6) inches and under (18) inches from natural grade shall be charged with 75% of the total disturbed area of driveway surface. The Driveways with cut and fill in excess of (18) inches from natural grade shall be charged with 100% of the total disturbed area of the driveway surface. The entire driveway must be within the natural grade limit to be subject to the disturbance ratios noted above.
~~3.~~

C. The minimum standard turning radius for a driveway is 40 feet; except that a minimum ~~25~~ 35 foot radius may be used provided all structures are protected with an approved fire extinguishing system.

D. Any street or driveway cut greater than 8 feet shall not have a length greater than 100 feet. The applicant must mitigate means of breaking-up the mass of the cut and blending the cut in with the surrounding natural terrain.

E. A twenty (20) foot by thirty (30) foot driveway apron may be required by the Fire Marshall or the Building Official at or near the garage or another location deemed necessary by the Fire Marshal, with no more than a 5% grade, to serve as a staging platform to fight a fire.

F. The maximum height, measured vertically, of any cut used to establish a street or driveway shall not exceed 30 feet.

V. GRADING AND DRAINAGE STANDARDS.

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Comment [GB25]: Commission requested that staff check with the Fire Marshal and identify why a 35' radius is needed.

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A. There shall be no clearing, grubbing, grading, importing or stockpiling of fill material on, or to, any site prior to approval of such Development by the Hillside Building Committee and approval of a grading plan by the Town ~~Engineer~~, unless such clearing, grubbing, or grading, is required by the Town for public safety purposes. If applicable, approval of a grading plan and drainage report prepared by a registered Engineer, may be required for Town review and approval.

~~A.~~B. Storm water retention shall be provided to the greatest extent possible in accordance with the Town Code and the Town Storm Drainage Design Manual.

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~~B.~~C. The maximum depth of fill shall not exceed ~~8~~ 7.5 feet except beneath the footprint of the main residence. All exposed disturbed area fill shall be contained behind retaining walls or covered with a natural rock veneer and treated with an aging agent and landscaped with indigenous plant material.

~~C.~~D. ~~Rock veneered spill slopes~~Veneered Rock Slopes may be allowed provided that they are approved by the Hillside Building Committee, and:

1. The vertical height of the Veneered Rock Slope ~~spill slope~~ does not exceed the vertical height of the exposed cut with the base of the Veneered Rock Slope~~spill slope~~ engineered for stability and keyed into the mountain or supported by a retaining wall.

2. The Veneered Rock Slope~~spill slope~~ does not exceed a one to one slope.

3. Retaining walls used to limit the height of the Veneered Rock Slope~~spill slope~~ are color treated or veneered to blend in with the surrounding natural colors.

~~D.~~E. Raw ~~spill~~ Spill ~~slopes~~ Slopes are prohibited. Any violation will be subject to a stop work order until the spill slope is removed, restored to its natural grade, re-vegetated and approved by the Town.

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~~E.~~F. A ~~hillside~~ Hillside ~~wash~~ Wash shall not be diverted, relocated or moved from its present position to another location, however, a ~~hillside~~ Hillside ~~wash~~ Wash may be bridged by a structure so long as such structure does not impede the flow of the hillside wash.

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~~Earth contiguous to the structure shall contact that structure at an angle approximating that of the natural grade.~~

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~~F.~~G. Washes located on a property shall be maintained in accordance with Chapter 5 and Chapter 8 of the Town Code.

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VI. WALLS AND FENCES.[558]

Action Report Topic #1

A. Curbs less ~~than18~~ than 8 inches above finished grade are not considered walls.

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B. No more than 300 total linear feet of wall shall be visible from any point on the property line. All pool barriers shall be view fencing. View fencing is not calculated in the 300 feet maximum allowable wall length.

C. Walls that are otherwise permissible in Article XXIV are prohibited in the Hillside Development Area. Retaining walls, pool barriers, walls used to screen mechanical equipment, driveway columns and entry gates, and tennis/sport court fencing are allowed provided that they are of minimum lengths and heights, as further specified below, and are approved by the Hillside Building Committee.

1. Retaining Walls:

a. The intent of the retaining wall requirements is to mitigate the massing and impact of walls on the hillside and preserve the characteristic of the desert. The objective is to allow only the minimum amount of retaining walls needed to access the property, retain cut and fill, and screen mechanical equipment and windows of interior bathroom areas.

Action Report Topic #1

b. Where retaining walls are provided, they shall meet the setback requirements of Section 2404, Height and Setback Regulations, unless needed to access the property (such as driveway retaining walls) or deemed necessary by the Town Engineer and the Community Development Director to prevent erosion or flooding.

~~a.~~c. The maximum length of any continuous retaining wall shall not be more than 100 linear feet. The maximum height of any retaining wall shall not be more than 8 feet. The height of a retaining wall is measured from the low side of natural grade when retaining fill slopes and from finished grade when retaining cut slopes to the top of the wall; whether the top is retaining earth or not.

~~b.~~d. Retaining walls shall be used for the purpose of containing fill material or for minimizing cut or fill slopes. The retaining wall may only extend six (6) inches above the material it is retaining.

~~c.~~e. A terraced combination of retaining walls shall be measured as a single retaining wall provided the combined walls are: 1) no more than eight (8) feet total vertical height; 2) terraced with a minimum distance between of four (4) feet and a maximum separation of eight (8) feet; and 3) contain appropriate vegetation between the walls so as to soften the visual impact of the combined walls (see **FIGURE 8**). These separation requirements apply to any single lot and do not apply to adjoining walls on neighboring properties.

~~d.~~f. When a safety fence, on top of a retaining wall, is required by code it shall be a view fence and shall be painted to blend with surrounding natural colors.

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~~e.~~g. Where retaining walls are provided they shall be color treated, textured, or veneered to blend in with the surrounding natural colors and textures of the native rock and soils at the site.

Action Report Topic #17

2. Pool Barriers. All pool barriers shall be View Fencing. The pool barrier shall be the minimum amount that is needed to secure the pool and that is appropriate for the site.

~~2. Pool Barriers: Shall be view fencing. Open view fencing is not calculated in the 300 feet maximum allowable wall.~~

3. Screen Walls: These walls may be solid walls provided they are of minimum height and length needed to screen the mechanical equipment, garbage cans, or windows of interior bathroom areas, and shall not exceed six (6) feet in height. Screen walls over 6 feet in height may be allowed, at the discretion of the Hillside Building Committee, to properly screen the mechanical equipment or windows of interior bathroom areas; provided, 1) such walls meet the allowable setbacks and height of an accessory structure, and 2) screening area surrounded by screen walls is calculated as part of the allowable floor area.

4. Tennis/Sport Courts: Fences surrounding a tennis court or sport court shall be~~:~~ ; (i) no greater than 10 feet in height as measured from the playing surface, (ii) ~~set within the disturbable area of the Lot~~counts as disturbed area, and (iii) View Fencing and colored to blend in with the surrounding area.

5. ~~5.~~ Driveway ~~Columns~~ columns and ~~Entry~~ entry ~~Gates~~ gates may be located ten (10) feet or more from the property line. The columns and gate are limited to six (6) feet in height and the columns may be a maximum size of two (2) feet by two (2) feet. Electrically controlled gates must be equipped with an approved key switch located as far as possible from the right-of-way.

Action Report Topic #1

6. Driveway Retaining Walls. Driveway retaining walls may extend 18 inches above the driving surface provided the retaining wall meets the 8 foot height limit. When a safety fence, on top of a driveway retaining wall, is required by code it shall be a 36 inch view fence and shall be painted to blend with surrounding natural colors. The retaining wall must comply with the 8 foot height limit; however, the view guard is not limited to the 8 foot retaining wall height limit.

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Comment [GB26]: Need Planning Commission input regarding the potential limitation on the amount of pool barrier fencing. Should a limited be added to the code? If so, what is an appropriate limit? Or, should a general statement of "a minimal amount needed to secure the pool area" be kept and let the Hillside Committee determine what is appropriate for the site.

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Comment [GB27]: Add language to clarify that all of the tennis court area is included in the disturbance calculation.

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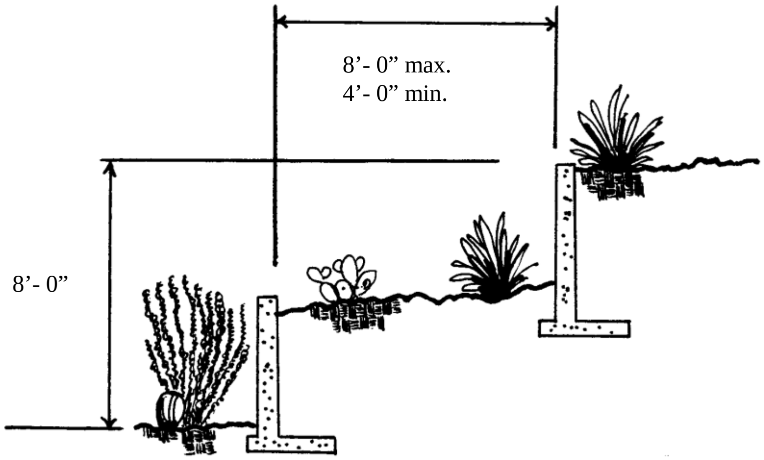
Comment [GB28]: Verify guard rail height with Building Official and determine if guard rail height shall be measured from driveway surface or at bottom of guard rail.

FIGURE 8 –TERRACED VERTICAL RETAINING WALLS



Comment [GB29]: Relocate Figure 8 below the text of 2207.VI.1.e.

VII. ACCESSORY STRUCTURES AND ADDITIONS TO EXISTING STRUCTURES. [558]

~~A. The Hillside Building Committee may review applications for the proposed accessory structures and additions to existing structures if the Town Engineer in consultation with a member of the Hillside Building Committee determines that the proposed accessory structures or addition: (i) exceeds or increases the building height of the main residence; (ii) increases the existing building footprint by more than 1,000 square feet or more than 50% of the original building square footage; (iii) creates an additional disturbance area; (iv) increases site walls; (v) proposes a significant addition of exterior lighting; or (vi) creates a significant adverse visual impact.~~

Comment [GB30]: Moved to Section 2205 and updated criteria.

~~B. The Hillside Building Committee may combine the Concept Plan Review Meeting and the Formal Hillside Committee Review Meeting for applications conforming with the criteria set forth in Subsection VII (A).~~

~~C. If no new disturbed area is required and the proposed accessory structure or addition meets all other hillside requirements including allowable disturbed area, a permit for an accessory structure, or an addition to hillside building may be obtained without requirements for, disturbed area calculations or any other specific requirements as designated by the Town Engineer.~~

~~D.~~A. Any proposed accessory structure or improvements to existing hillside structures which require additional disturbed area shall be accompanied by calculations of prior disturbed area to determine if the entire site is within the allowed limits for hillside construction. When the disturbed area equals that allowed, no further construction involving additional disturbed area will be permitted.

~~E.~~B. Accessory buildings and structures shall not occupy more than one-half of the total ground area of the main building. No accessory building or structure shall exceed the height specified in Table 1001B or elsewhere in this ordinance.

VIII. SEWERS AND UTILITIES.

A. Grading for septic systems, evapotranspiration systems, and alternative systems shall be included in the calculations for land disturbance limitations unless:

1. The disturbed area is brought back to original natural grade contours, treated with an approved aging agent and planted to blend with surrounding natural growth,

2. Special landscape plans for evapotranspiration systems shall be submitted to the Town Engineer. Plans shall show the appropriate vegetation and supplemental irrigation systems approved by the Town Engineer.

B. Grading for utility lines, including water and sewer lines and lateral lines, electric, gas, telephone and cable services, shall be included within the calculations for land disturbance limitations unless:

1. Trenches are placed under a driveway, under paving or in other areas already counted as disturbed, or

2. Trenches and related disturbed areas are restored to appear as original ground, color treated and planted to blend with surrounding natural growth.

IX. FIRE PROTECTION.

A. Washes must be maintained as easements as described in Section 8-7 of the Town Code and other applicable codes to minimize the risk and spread of fire.

B. Grasses known to be highly flammable, such as fountain grass, *Pennisetum setaceum*, and buffel grass, *Pennisetum ciliare* are not allowed in a Hillside Development Area.

Section 2208 OUTDOOR LIGHTING [558]

A. Purpose: The intent of these lighting requirements is to preserve the low light level conditions that are inherently characteristic of the desert. The objective is to allow only the quantity and level of lighting necessary for safety, security and the enjoyment of outdoor living while protecting against direct glare and excessive lighting; protecting the ability to view the night sky; and preventing light trespass.

Comment [GB31]: Outdoor Lighting - This Section to be Replaced with Lighting Code Updates that are currently under review by Planning Commission. – Action Report Topic #10

Comment [GB32]: Updates to this section of the code were not addressed at the 1/17/17 meeting since Lighting Code Updates were under a separate review at that time.

B. Definitions: For the purposes of this section, exterior lighting is defined and regulated by the following definitions and categories:

1. Footcandle (fc) - A unit of illuminance of equal to 1 lm/ft² (lumen / sq. ft.) or 10.76 lx (lux).

2. Fully Shielded (Full Cut-Off) - A fixture shielded with an opaque material so that light rays emitted by the fixture are projected only below a horizontal plane running through the lowest point on the fixture where light is emitted.

3. Lumens – The Standard International (SI) unit of luminous flux.

4. Luminaire (Light Fixture) - A complete lighting unit consisting of a lamp or lamps and ballast(s) (when applicable) together with the parts designed to distribute the light, position and protect the lamps, to connect the lamps to the power supply.

5. Opaque - Impervious to the passage of light.

6. Partially Shielded (Partial Cut-Off) - A fixture that allows light rays to be emitted up and down and shielded with an opaque material in such a manner to prevent the bulb from being seen.

7. Safety Lighting - Low-level lighting used to illuminate vehicular and pedestrian circulation.

8. Security Lighting - Lighting that is fully shielded that is intended to provide bright illumination during emergency situations only.

9. Spill Light - The amount of light that illuminates beyond the range or primary area that the fixture is intended to light.

10. Translucent – A material through which light can pass but the light source cannot be seen.

11. Trespass Lighting - Spill light that encroaches onto neighboring properties.

12. Visual Enjoyment Lighting - Lighting intended to illuminate outdoor living areas.

C. Design Standards:

1. All building mounted light fixtures shall be fully shielded. Recessed lights in exterior soffits, eaves, or ceilings shall have a 45°cutoff. At the main entry of the primary structure, a maximum of two (2) translucent fixtures may be permitted as long as the total lumens, per fixture, do not exceed a

maximum of 750 lumens. All other entrances, excluding garage doors, shall be limited to no more than one (1) fixture.

2. All fixtures, unless otherwise allowed, shall be directed downward and properly aimed on the targeted areas to maximize their effectiveness and minimize the total number of lighting fixtures.

3. Building mounted lighting must be directed downward away from adjacent lots, streets, undisturbed areas, and open spaces, and may not be used to light walls or building elements for decorative purposes.

4. There shall be no lighting permitted in areas identified as "undisturbed areas" of the property pursuant to the plans submitted under Section 2207 III.A.

5. The maximum lighting intensity shall not exceed 0.25 footcandle when measured at the property line.

6. A repetitive line up of lights along driveways or walkways accessing public streets shall not be allowed. Some random lighting of driveways or walkways accessing public streets may be allowed by the Hillside Building Committee. Driveway lights must be located on the "downhill" side and aimed toward the "uphill" side, must be fully shielded from below and only light the driveway surface. Driveway and walkway lights shall not exceed a maximum of 0.25fc at any point beyond 10 feet from the fixture.

7. Each lighting or illuminating device shall be set back from the nearest property line a minimum of ten (10) feet or a distance equal to or greater than the height of the device above natural or excavated grade, whichever is greater. As an exception a lighted entry marker may be placed on each side of the driveway entrance. The entry marker shall not be placed within the Town right-of-way or private road areas and the total height of the marker and light shall not exceed four (4) feet above finished grade adjacent to the driveway. The light source shall not exceed the equivalent projected brightness of 250 lumens.

D. <u>Luminaire (Light Fixture)</u> All luminaires shall be subject to the following limitations:

1. Shall not exceed 750 lumens when attached to a structure and confined to the immediate vicinity of a building entrance or outdoor living area of the residence.

2. Shall not exceed 250 lumens for all other uses.

3. Shall not exceed 150 lumens for landscape up-lighting.
4. Motion sensor/detector light fixtures are permitted for security lighting. Security lighting must be controlled separately from all other lighting.

Security lights must be on timers that regulate their operation time to a maximum of 10 minutes and limited to lamps with a maximum of 750 lumens.

5. Rope lighting shall not exceed 3.6 watts per lineal foot for an incandescent rope light.

E. Mounting Exterior fixtures shall be mounted:

1. In the ground or on a post not to exceed 36 inches above the ground. When exterior fixtures are affixed to existing trees, the height of the fixture shall not exceed 8 feet above the finished grade.

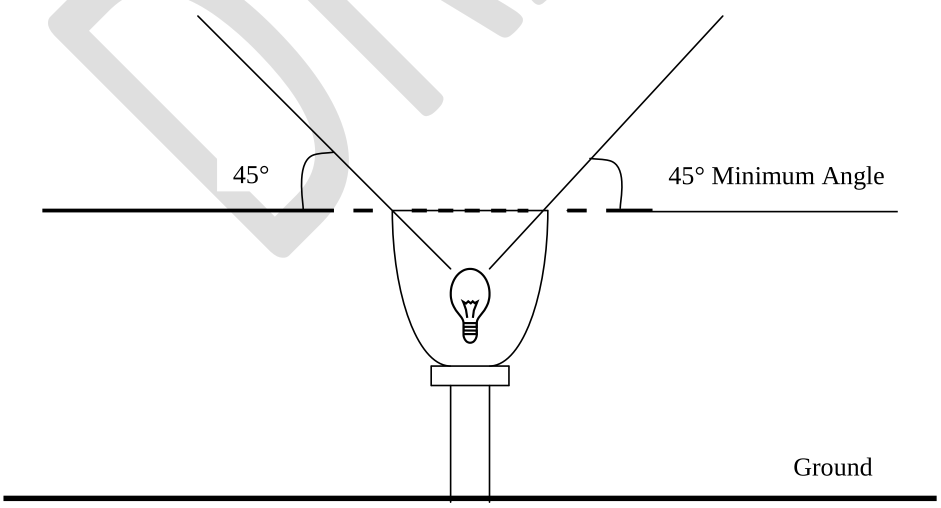
2. In or on a building wall not to exceed 8 feet above finished grade and shielded in such a manner as to avoid creating concentrated light (hot spots) on the structures to which they are mounted. Security lighting may be mounted on the structure to a height of not more than twelve (12) feet.

F. Landscape Up-lighting:

1. The number of fixtures is limited to one fixture per 1000 square feet of allowable disturbed area.

2. The lamp must be recessed to provide a minimum 45° cut-off from the vertical plane.

FIGURE 9 - TYPICAL UPLIGHT WITH 45° CUT-OFF



G. Prohibitions In addition to the limitations noted above, the following lights or lighting effects are strictly prohibited:

1. Colored lamps or bulbs and string and unshielded rope lights; except that temporary holiday lighting shall be permitted between November 15th and January 15th.

2. Tennis court and sport court lighting.

3. Any temporary lighting that violates the provisions of this lighting section.

4. Exterior lights, except security lighting, that illuminate the adjoining mountainside such that the mountainside is visible from off the property between sunset and sunrise.

H. Amendments:

1. Should the applicant desire to substitute outdoor light fixtures or lamps after a permit has been issued, the applicant must submit all changes to the Town Engineer for approval, with adequate information to assure compliance with this ordinance.

Section 2209. DENSITY and SUBDIVISIONS / LOT SPLIT STANDARDS

A. The maximum number of lots into which Hillside Development Area land may be subdivided shall be the sum of the number of lots allowed in each slope category of land as shown by the following **TABLE 2 – Density/Slope Category**.

B. Slope shall be calculated using a minimum of 3 slope lines per acre. The slope lines shall be perpendicular to the slope and at equal distances across the lot.

C. Each of the resulting lots shall meet the minimum lot size requirements based upon the average lot slope shown on **TABLE 2.**

D. Building envelopes shall be conceptually indicated on preliminary plats and accurately shown on final plats.

E. The subdivider shall ~~demonstrate by sketches, engineering drawings, charts or other means~~provide plans and documents by a registered architect, civil engineer, or surveyor demonstrating that roads, public or private, and driveway access and placement of residential structure will conform, for each lot, to current hillside development regulations and without the need for a variance.

F. All subdivision development and lot split applications shall comply with the Hillside Development Requirements as outlined in the Town of Paradise Valley Subdivision Ordinance and Article XXII of this Ordinance.

TABLE 2 – Density / Slope Category

Average Lot Slope %	Min. Lot Size Acres	Min. Lot Size –Sq. Ft.	Average Lot Slope %	Min. Lot Size Acres	Min. Lot Size – Sq. Ft.
10%	1	43,560	41%	6.8	296,208
11%	1.01	43,996	42%	7.6	331,056
12%	1.02	44,431	43%	8.4	365,904
13%	1.04	45,302	44%	9.2	400,752
14%	1.06	46,174	45%	10	435,600
15%	1.08	47,045	46%	11	479,160
16%	1.1	47,916	47%	12	522,720
17%	1.2	52,272	48%	13	566,280
18%	1.3	56,628	49%	14	609,840
19%	1.4	60,984	50%	15	653,400
20%	1.55	67,518	51%	16	696,960
21%	1.6	69,696	52%	17	740,520
22%	1.7	74,052	53%	18	784,080
23%	1.8	78,408	54%	19	827,640
24%	1.9	82,764	55%	20	871,200
25%	2	87,120	56%	21	914,760
26%	2.2	95,832	57%	22	958,320
27%	2.4	104,544	58%	23	1,001,880
28%	2.6	113,256	59%	24	1,045,440
29%	2.8	121,968	60%	25	1,089,000
30%	3	130,680	61%	26	1,132,560
31%	3.2	139,392	62%	27	1,176,120
32%	3.4	148,104	63%	28	1,219,680
33%	3.6	156,816	64%	29	1,263,240
34%	3.8	165,528	65%	30	1,306,800
35%	4	174,240	66%	32	1,393,920
36%	4.4	191,664	67%	34	1,481,040
37%	4.8	209,088	68%	36	1,568,160
38%	5.2	226,512	69%	38	1,655,280
39%	5.6	243,936	70%	40	1,742,400
40%	6	261,360			

Action Report Topic #11

Section 2210. REMOVAL OF PROPERTY FROM HILLSIDE

The Hillside Building Committee and Town Council shall review plans for any request to remove a property from the Hillside Development Area. This process applies to properties that are designated within a Hillside Development Area and have a slope of less than ten percent (10%). If a property owner elects to remove the property from the Hillside Development Area, the following applies:

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Action Report Topic #11

1. The applicant must provide documentation that the property has a building pad slope and site of less than ten percent (10%) in accordance with Section 2202 and Section 2209B.
2. The request will be reviewed by the Hillside Building Committee, which will make a recommendation of approval, approval with stipulations, or denial to remove the property from the Hillside Development Area.
3. The Town Council will either approve, deny, or approve the request with stipulations.

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Section 2211. LA PLACE DU SOMMET SUDIVISION

Action Report Topic #13

The La Place Du Sommet Subdivision is subject to the September 7, 1984 Hillside Ordinance. Any property developed in this subdivision is subject to the 1984 Hillside Ordinance.

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Section 2212 Additional Review Fees

When deemed necessary, the Town may hire an outside firm to assist with or provide a saftey review of an application. The outside safety review includes, but is not limited to, a review of the grading and drainage, geological report, seismic refraction survey, and excavation methods. The fees associated with the outside safety review is an additional application fee and must be paid by the applicant.

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Action Report Topic #18

Administrative Relief. See Attached Section 2-5-3 of the Town Code for proposed amendments.

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FOOTNOTE:

110 Ordinance # 220 – 7/12/84
112 Ordinance #221 – 9/24/84
181 Ordinance # 305 – 11/9/89
193 Ordinance # 320 – 2/28/91
194 Ordinance # 321 – 2/28/91
206 Ordinance # 338 – 3/26/92
382 Ordinance # 382 – 12/01/94
409 Ordinance #409 - 7/13/95
425 Ordinance # 425 – 9/12/96
533 Ordinance # 533 – 10/09/03
558 Ordinance # 558 – 06/09/05
580 Ordinance # 580 – 10/26/2006
654 Ordinance #654 – 03/13/2014

Section 5. If any section, subsection, sentence, clause, phrase or portion of this ordinance or any part of these amendments to the Town Code adopted herein by reference is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

Section 6. This ordinance shall become effective in the manner provided by law.

PASSED AND ADOPTED by the Mayor and Council of the Town of Paradise Valley, Arizona, this _____ day of _______, 2017.

____

Michael Collins, Mayor

SIGNED AND ATTESTED TO THIS ________ DAY OF ____________ 2017

ATTEST:

____

Duncan Miller, Town Clerk

APPROVED AS TO FORM:

____

Andrew M. Miller, Town Attorney

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Section 2-5-3 Board of Adjustment [8 188 583 623 646 654 685]

E Administrative Relief. [583 654]

1. The Community Development Director may authorize administrative relief to a property owner in the Town of Paradise Valley of up to ten (10) percent of any development standard contained in Article X~~, and for solar device installations only,~~ and Article XXII of the Town Zoning Code, unless specifically restricted elsewhere in this ordinance. For gates on hillside properties, administrative relief may be authorized as described in subsection (i) below. Administrative relief shall be subject to the following requirements and limitations:

   a. An application shall be submitted (and the fee set forth in the Town of Paradise Valley Fee Schedule, as such may be amended from time to time, shall be paid) by the property owner requesting administrative relief, on a form prescribed by the Community Development Director for such, identifying the proposed improvement to the property that is subject to the request;

   b. Notice shall be made by first class mail, postmarked at least five (5) days prior to the proposed date of determination by the Community Development Director, to adjacent property owners determined by the Community Development Director as potentially affected by the request for administrative relief;

   c. The proposed improvement requiring relief will not be detrimental to the property requesting relief, any adjacent property, or the Town, as determined by the Community Development Director;

   d. The relief granted is the minimum required to meet the needs of the proposed improvement, as determined by the Community Development Director;

   e. The relief shall not be contrary to the purpose and intent of this ordinance; and

   f. Administrative relief related to a particular property may only be requested once during an eighteen (18) consecutive month period and only twice during the period of ownership by a recorded owner of the property, the term “owner” to be interpreted for purposes of this section to include any person, firm, corporation, partnership, joint venture, trust, or any related persons, parties, firms, corporations, partnerships, joint ventures or trusts, including any successor trusts where the beneficiaries included are the same as any of the persons included as an owner above or as a beneficiary of any preceding trusts.

g. The relief requested is limited to livable primary and accessory structures and walls, gates, and fences. It is not applicable to:

  i. New home construction, except to request relief related to an inadvertent error,
  ii. Properties that are subject to special use permits,
  iii. Floor area ratio limitations,
  iv. Tennis or other types of sport courts,
  v. Gazebos or other similar structures~~.~~,
  vi. Disturbed Area

h. The Community Development Director may impose reasonable conditions upon any administrative relief granted to ensure that the public health, safety, and general welfare are protected and substantial justice is done.

i. Relief for gates on hillside properties may be allowed. Such relief shall only be granted for the location to allow the gates to be as close as necessary to the property line when the topography of the lot precludes them from meeting the setback. Consideration shall be given to proper stacking of vehicles for public safety. No increase in height or size or other deviations of the code shall be granted.

2. Any relief authorized by the Community Development Director shall be documented with findings consistent with the standards above and filed with the building permit records, subdivision case file, or other department files, as appropriate.

F. Appeals. [583]

All decisions and interpretations by the Community Development Director performed in accordance with Section 2-5-3.E may be appealed to the Board of Adjustment in accordance with the procedures prescribed in Section 2-5-3.C.

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ORDINANCE NUMBER 2016-09

AN ORDINANCE OF THE TOWN OF PARADISE VALLEY, ARIZONA AMENDING THE PARADISE VALLEY ZONING ORDINANCE, Article XXII, HILLSIDE DEVELOPMENT REGULATIONS

BE IT ORDAINED BY THE MAYOR AND TOWN COUNCIL OF THE TOWN OF PARADISE VALLEY, ARIZONA:

Section 1. Article XXII, Hillside Development Regulations, Section 2200- 2209 are hereby amended (with deletions shown as ~~strikethroughs~~ and additions shown in **bold type**):

Comment [GB1]: RED TEXT IS DRAFT LANGUAGE PRESENTED TO PC AT 12/20/16 MEETING.

YELLOW HIGHLIGHTED TEXT IDENTIFIES UPDATED LANGUAGE IN RESPONSE TO INPUT FROM 12/20/16 PC MEETING

BLUE HIGHLIGHTED TEXT IDENTIFIES UPDATED LANGUGE IN RESPONSE TO INPUT FROM 1/3/17 PC MEETING

Article XXII. HILLSIDE DEVELOPMENT REGULATIONS [110 112 181 193 194 409 425 533 558 654580]

Section 2200. INTRODUCTION

As valuable scenic resources, Camelback Mountain, Mummy Mountain and the Phoenix Mountains provide a permanent visual presence that exemplify what is unique about Paradise Valley. They define the location and character of the Town, shape our sense of place and contribute to the Town's identity. These land forms, their foothills, and other areas over a 10% slope, offer a desirable setting visible to the entire metropolitan area and an intrinsic aesthetic value to the Town; therefore they require unique standards resulting from the characteristics of hillside terrain.

Section 2201. PURPOSE

This article exists to establish provisions to: a) regulate the intensity of development; b) preserve and protect the hillside environment; c) provide for the safety and welfare of the Town and its residents; and d) establish rules and procedures for review by the Hillside Building Committee ~~of~~ for hillside development, building and construction plans through the implementation of the following:

1. Require building massing to adapt to the natural hillside topography thereby reducing the scarring effects of roads, drives, building pads and cut and fill slopes.

2. Encourage all improvements to be designed and constructed in a manner that minimizes the impact of development from viewpoints on the valley floor and adjacent slopes.

3. Prevent unnecessary grading or stripping of vegetation, preserve drainage patterns, protect the public from natural hazards of storm water runoff and erosion, and require re-vegetation in order to maintain the natural landscape environment.

4. Preserve visual open space, unique natural features, wildlife habitats and retain the integrity and natural states of the identified dominant peaks and ridges.

5. Provide development and construction practices and methods to ensure greater fire protection in hillside development areas.

6. Require limited and efficient use of exterior lighting to maintain minimal night-time lighting levels and preservation of the dark sky.

This Article endeavors to enhance design quality so that the resulting development maintains the essential natural characteristic and context of the hillside consistent with the goals and policies of the Town's General Plan.

<u>Section 2202</u>. IMPLEMENTATION

The provisions of this Article shall apply to all land within a Hillside Development Area as denoted on **FIGURE 2 – HILLSIDE DEVELOPMENT AREA** and to all lands where the natural terrain under the building pad has a slope of ten percent (10%) or greater (see example below), whether shown in Figure 2 or not. However, a 10% or greater slope, in an area not denoted on Figure 2, created by a natural wash on land that would otherwise not be classified as hillside land, shall be exempt from the hillside regulations. Hillside lands are also subject to special provisions relating to lot split and subdivision development as set forth in the subdivision code. If there is a conflict between the Hillside Development provisions and another section of this Ordinance or the Town Code, these provisions shall prevail.

FIGURE 1 –10% SLOPE

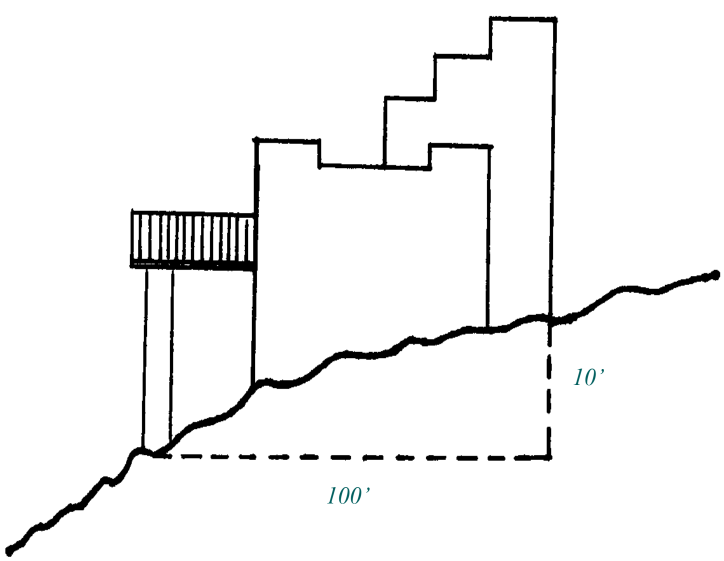

FIGURE 2 – HILLSIDE DEVELOPMENT AREA

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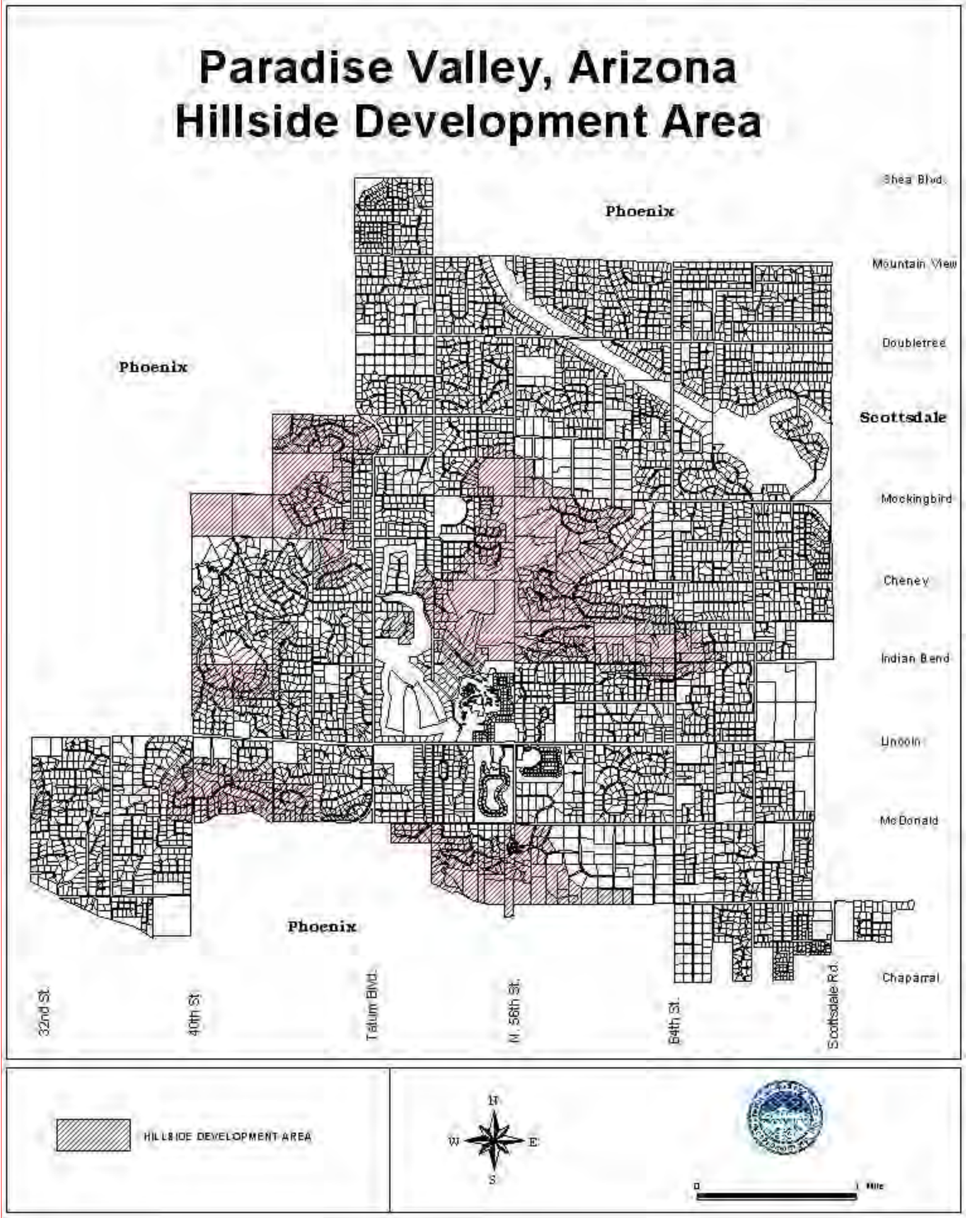
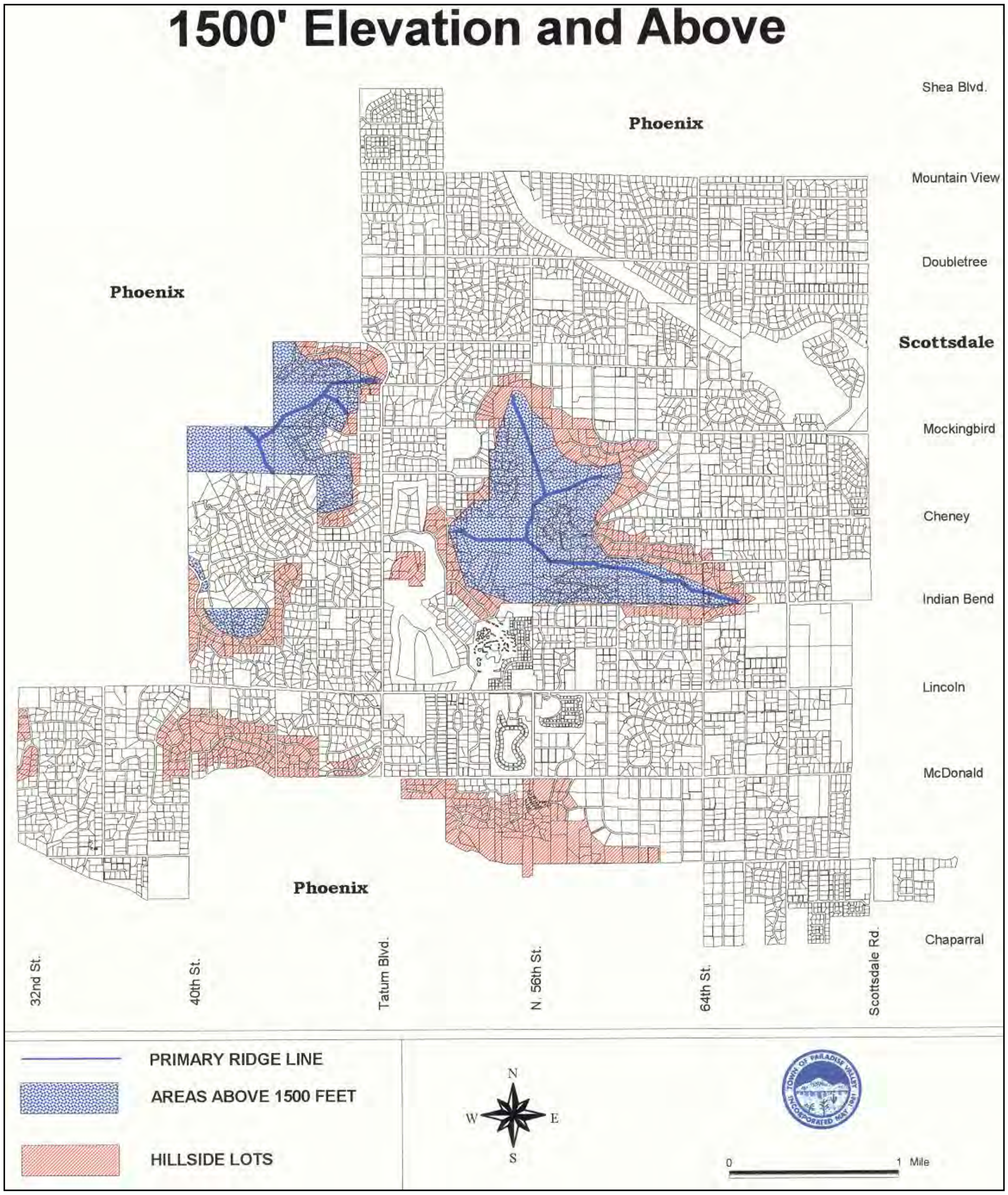


Comment [GB2]: Identify Process to Update Map with any properties removed from Hillside or added to Hillside

FIGURE 3 – PRIMARY RIDGE LINE DESIGNATION


1500' Elevation and Above
Shea Blvd.
Phoenix
Mountain View
Doubletree
Phoenix
Scottsdale
Mockingbird
Cheney
Indian Bend
Lincoln
McDonald
Phoenix
Chaparral
32nd St.
40th St.
Tatum Blvd.
N. 56th St.
64th St.
Scottsdale Rd.
PRIMARY RIDGE LINE
AREAS ABOVE 1500 FEET
HILLSIDE LOTS
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<u>Section 2203</u> **HILLSIDE DEFINITIONS.** Where definitions are not defined in this section, the definitions in Article II shall control. For purposes of this Article, the terms contained in the Article shall have the following meanings:

<u>Acre</u> - 43,560 square feet as measured on the horizontal plane.

<u>Alter the Mountain Top Ridge Line</u> –Any Development on the Primary Ridge Line shown on **FIGURE 3** that disturbs or alters the natural mountain top profile.

<u>Applicant</u> – The person or entity desiring to improve or otherwise engage in any Development of property in the Hillside Development Area, including the owner of the property and any agents acting on behalf of the owner.

<u>Building Pad</u> – The total area under roof of all structures proposed for the property.

<u>Building Pad Slope</u> - The percent of slope measured at right angles to the natural contours along a line passing through the center of the proposed building and terminating at the ends of the disturbed area limits of the building site.

<u>Building Site</u> - That portion of the lot or parcel, excluding driveways, upon which a building and appurtenances are to be placed or are already existing, including but not limited to; adequate areas for parking, turnaround areas not separated by driveways, sewage disposal, clearance, and proper drainage which conforms to the requirements of the provisions of this Article and the ~~Uniform Building~~ Town Code.

<u>Code</u> - The Code of Ordinances of the Town of Paradise Valley, Arizona in effect as of the date of these Regulations and as may be amended.

<u>Commission</u> - The Planning and Zoning Commission of the Town of Paradise Valley.

<u>Committee</u> - The Hillside Building Committee of the Town of Paradise Valley.

<u>Conservation</u> - Retention or acquisition of land for the purpose of preservation in a natural state.

<u>Conservation Easement</u> - A permanent open space easement granted to the Town or to a public land trust to prohibit development of property including roads and utilities and to retain and preserve the land for the scenic enjoyment of the general public.

<u>Council</u> - The Town Council of the Town of Paradise Valley.

<u>Cut</u> - The land surface which is shaped through the removal of soil, rock, or other materials.

<u>Development</u> - Any grading, excavation or construction.

Action Report Topic #4

<u>Disturbed Area</u> - That area of natural ground excluding the footprint of the residence that has been or is proposed to be altered through grading, cut and fill, removal of natural vegetation, placement of material, trenching, or by any means that causes a change in the undisturbed natural surface of the land or natural vegetation.

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Comment [GB3]: Need Planning Commission Input - Should the footprint and garage be included in the disturbance calculation? If so, the definition of "disturbed area" will need to be updated and Table 1 in Section 2207 will also need to be modified and updated in order to not make currently developed properties non-conforming in the amount of disturbance.
Commission Requested Additional Info at the 12/20/16 WS Meeting to help evaluate the potential change.

Fill - The deposit of soil, rock, or other materials placed by man.

Finished Grade - The final grade and elevation of the ground surface after grading is completed.

Footprint - That area of the residence measured from the outside walls (excluding any overhanging portions) which includes indoor uses such as attached garage, carports, utility room, laundry, etc., but excludes outdoor uses such as patios and breezeways.

Comment [GB4]: If the code is changed to include the footprint in the disturbance calculation, the definition of footprint will need to be updated. A potential definition is "The livable portion and garage of the main residence and detached accessory buildings."

Grading - Any excavating, or filling or combination thereof, including the conditions resulting from any excavation or fill.

Hillside Development Area - Those areas marked in **FIGURE 2** and to all lands where the natural terrain under the building pad has a slope of ten percent (10%) or greater, whether shown in FIGURE 2 or not. However, a 10% or greater slope, in an area not denoted on Figure 2, created by a natural wash on land that otherwise would not be classified as hillside land shall be exempt from the hillside regulations.

Hillside Wash – Any creek, stream, wash, arroyo, channel or other body of water having ~~historical banks and with~~ a flow rate equal to or greater than 2 cubic feet per second based on a 100-year storm event.

Lot - A legally subdivided parcel of land occupied or intended for occupancy by one main building, together with any accessory buildings including the open spaces required of the Hillside Regulations and having adequate frontage on a public or private street.

~~Natural Features, Significant - Include washes, Significant Vegetation, and Significant Rock Outcroppings provided these features are in their undisturbed natural state.~~

Natural Grade - The undisturbed natural surface of the land, including washes.

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Primary Ridge Line - That line running from the highest point along the mountain top downward along a divide to the 1500 foot mean sea level ~~contour line~~elevation as shown on **FIGURE 3**.

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Action Report Topic #7

Raised Outdoor Living Area – Uncovered areas such as porches, decks, platforms, and retained areas which extend three (3) feet or more above grade.

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Retaining Wall - A wall or terraced combination of walls, including, planters, negative edge pools, used solely to retain more than eighteen inches (18") of material, ~~or~~ water, ~~but not~~ or to support or to provide a foundation or wall for a building.

Raw Spill Slope – An area created by causing or allowing earth or other material to fall, flow or run down the slope, thereby creating a change in the natural appearance and topography.

~~Rock Outcroppings, Significant - Any surface rock or group formation of rocks covering an area of 200 square feet or larger or any surface rock formation with a height greater than ten feet from the surrounding grade.~~

Sheet Flow – A shallow and wide overland flow of water.

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Significant Natural Features - Include Hillside Washes, Significant Vegetation, and Significant Rock Outcroppings provided these features are in their undisturbed natural state.

Significant Rock Outcroppings - Any surface rock or group formation of rocks covering an area of 200 square feet or larger or any surface rock formation with a height greater than ten feet from the surrounding grade.

Significant Vegetation - A single tree or cactus having a height greater than 15 feet or three or more trees or cacti, located within a radius of 15 feet, each having a height greater than 12 feet.

Subterranean - That space which lies totally underground, and which cannot be seen from outside the exterior perimeter of the structure on the same horizontal plane which originates at that point where the building intersects the ground.

Town - The Town of Paradise Valley.

~~Vegetation, Significant - A single tree or cactus having a height greater than 15 feet or three or more trees or cacti, located within a radius of 15 feet, each having a height greater than 12 feet.~~

Veneered Rock Slop – A group formation of rocks of similar colors that blend in with the surrounding natural setting.

View Fencing (View Fence) – Fencing that is constructed in such a manner as to achieve ~~80~~70% overall openness.

Section 2204 HILLSIDE BUILDING COMMITTEE.

A. The Hillside Building Committee or Hillside Building Committee Chair as established in Chapter 2 of the Town Code shall review all new applications submitted to the Town for ~~new home~~ Development and related construction within a Hillside Development Area. No building permit shall be issued for such application until approved by the Committee and then such issuance shall only be in accordance with the plans and specifications approved by the Committee.

B. The Hillside Building Committee may review applications for additions to existing structures in accordance with Section 2207 (VII)(A) of this Ordinance.

C. The Hillside Building Committee may review applications for accessory construction (e.g. fences, retaining walls, pools etc.) if the Town ~~Engineer~~ Manager or Designee in consultation with ~~a member of the~~ Hillside Building Committee Chair determines that the proposed construction: (i) creates a significant visual impact; or (ii) proposes an additional disturbance area.

Action Report Topic #3

D. The Hillside Building Committee approval process ~~is a two stages process~~ may consist of the following stages:

1. An Administrative Hillside Chair Review.

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2. A Combined Hillside Building Committee Review Meeting.
~~1.~~3. A Conceptual Plan Review Meeting.
4. A Formal Hillside Building Committee Review Meeting.
~~2.~~

Section 2205 **REVIEW AND DEVELOPMENT PROCESS.** The Hillside Building Committee shall review Development plans, as outlined in Section 2204, prior to the ~~Community Development Department review and the~~ issuance of a building, grading or other Development permit. The review and development process consists of up to four stages, depending upon the nature and scope of the proposed Development:

Action Report Topic #3

I. Administrative Hillside Chair Review: The Applicant shall submit a completed application and the required fees to the Town. Proposed accessory structures and additions may be reviewed by the Hillside Building Committee Chair provided the proposed improvements do not: (i) exceed or increase the building height of the main residence; (ii) increase the existing building footprint by more than 1,000 square feet; (iii) create more than 100 square feet of additional disturbed area; (iv) increase the length of walls by more than 25 lineal feet; (v) proposes a significant addition of exterior lighting; add more than 1,000 square feet of solar panels, or (vi) creates a significant adverse visual impact. The Chair shall review the submittal for compliance with the goals, purposes, and specific criteria of this ordinance.

II. Combined Hillside Committee Review Meeting: The Applicant shall submit all materials outlined in Section 2206 (II) to the Town. The Hillside Building Committee shall then review the submittal for compliance with the goals, purposes, and specific criteria of this ordinance and either approve, approve with stipulations or changes, or deny the submittal. Average remodel/additions, site improvements (such as, but not limited to, pool and spa additions), and solar panel additions over 1,000 square feet in area, may be reviewed as a Combined Hillside Committee Review.

III.

~~I.~~IV. Concept Plan Review Meeting: The Applicant, along with their architect and engineer shall submit a completed application and the required fees, to the Town ~~Engineer~~Manager or designee, at the time they request a concept plan review meeting (pre-hillside meeting) with the Hillside Building Committee. All new single family residence and major remodel/additions require a Concept Plan Review Meeting. The purpose of this meeting is to discuss, review, and give suggestions and guidance to the Applicant regarding the proposed development including: the location of the building pad and accessory uses; how these relate to Significant Natural Features; the preservation of existing vegetation; grading concepts and their adaptation to the natural hillside topography; and how the requirements pursuant to these hillside regulations and purpose statement will guide the proposed Development.

V. Formal Hillside Committee Review Meeting: At this stage, in addition to those materials previously submitted, the Applicant shall submit all materials outlined in Section 2206 (II) to the Town ~~Engineer~~Manager or designee. The Hillside Building Committee shall then review the submittal for compliance with the goals, purposes, and specific criteria of this ordinance and either approve, approve with stipulations or changes, or deny the

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Comment [GB5]: During the January 3rd meeting, the Commission asked that this language be moved to a different location of the code. Staff recommends either keeping this language at this location or removing it since "Applicant" is defined in Section 2203.

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submittal. All new single family residence and major remodel/additions require a Formal Hillside Committee Review Meeting.

~~II.~~

~~III.~~VI. Building Permit Review: The final construction plans submitted to the Town Community Development Department for review and approval shall comply with the final approval of the Hillside Building Committee. Any variation from ~~Chapter 70 of the Uniform Building~~ excavation and grading requirements within the Town Code must be accompanied by a soils engineering report from a testing laboratory or geological engineer approved by the Town Engineer. No site preparation or construction shall commence until the Town has issued a grading, demolition, or building permit.

A. The plans for any Development in the Hillside Development Area, must be approved by the Town and appropriate legal permit(s) issued before any clearing and grubbing, grading, bulldozing, blasting, or movement of earth is commenced. A building permit application must be submitted within twelve months after the date of approval from the Hillside Building Committee or Hillside Building Committee Chair. If a building permit application is not submitted a within twelve the month period, the approval shall be null and void. ~~If Development does not commence within twelve months after securing such approval from the Hillside Building Committee, no construction shall occur until such plans have been resubmitted and re-approved or i~~I If such is appropriate based upon circumstances outside the control of the Applicant, a one-time six (6) month extension may be granted by the Town Manager or designee ~~Engineer~~. Should the applicant allow the permit to expire, at no time after that expiration period does the applicant have any vested prior approval rights.

B. When a building, demolition, or grading permit that involves any cut or fill on a hillside property is required under provisions of these Regulations, the Applicant shall first provide the Town with a form of financial assurance, and a right of entry and temporary construction easement agreement acceptable to the Town Attorney, which places the Town in an assured position to do or to contract to be done the necessary work to cover, restore and landscape exposed fills and cuts to blend with the surrounding natural terrain. Three (3) bids or estimates from a licensed contractor or a licensed professional shall be submitted to the Town identifying the cost to restore and landscape the exposed fill and cuts to blend in with the surrounding natural terrain. The bids shall include, but are not limited to, the cost to regrade the affected area(s), re-landscaping the restored area(s) with native plants, stabling any applicable cut or fill area(s), and applying a desert varnish or stain to any exposed cuts or pad. The Town Staff and Town Engineer shall review the bids and determine the assurance amount. The minimum acceptable assurance shall be in a dollar amount equal to the number of total cubic yards of cut and fill multiplied by 25, or in such greater amount as deemed appropriate by the Town. The amount of the assurance may be adjusted in accordance with the Producer Price Index in order to account for inflation. In the event that construction has not commenced within six months from the date of issuance of the grading or building permit, the plan approval and permit shall expire. Twelve months after the date of the last inspection, such assurance shall be forfeited to the Town in such amount necessary for the purpose of restoration

Action Report Topics #5 and #12

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of the construction site to its original condition and all authorized permits shall be revoked and become void. The property owner shall, upon reasonable Notice from the Town, provide access to the property for the purpose of restoration of the construction site to its original condition.

~~B.~~

~~IV.~~ VI. Issuance of Certificate of Occupancy: Prior to the issuance of any Certificate of Occupancy for any building constructed pursuant to these Regulations, the applicant shall obtain from the ~~Town Engineer and the Town Building Inspector~~Town certification of compliance with this Article. The Certificate of Occupancy may be issued without the installation of the landscaping, based upon the submittal of a landscape assurance and a right of entry and temporary construction easement agreement acceptable to the Town Attorney. Three (3) bids or estimates from a licensed contractor or a licensed professional shall be submitted to the Town identifying the cost to install the landscaping in accordance with the approved landscape plan. The Town Staff and Town Engineer shall review the bids and determine the assurance amount.

Action Report Topic #12

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Comment [GB6]: Need Planning Commi[...] Input - Should a minimum amount be listed?

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Section 2206 **DOCUMENTARY REQUIREMENTS AND CERTIFICATION** [558 580]

I. CONCEPT PLAN REVIEW MEETING. The applicant shall submit the following:

A. Notification Letters. At least three (3) weeks prior to the scheduled conceptual Hillside Building Committee meeting the applicant shall submit to the Town a neighbor notification letter complete with address labels, with appropriate postage, for all property owners within 500 feet of the perimeter of the subject property. This notification letter shall include the following information; a) type of proposed development (addition, remodel, new construction), b) the scheduled hearing date and time, c) that the letter is only as a courtesy notification and that their attendance at the meeting is not required. d) the purpose of the meeting, and e) the goals of the meeting.

B. Seven (7) copies of a preliminary site plan that includes, but is not limited to, the building footprint, driveway, swimming pool, and accessory use locations along with topographic information for the Lot.

Action Report Topic #6

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C. A 3-dimensional representation of the general massing of all proposed structures (e.g. a mass model, a 3-D scaled rendering or a scaled computer generated model in relation to topography – not a detail model).

D. A recent aerial photo of the site (less than ~~3~~ 1 year~~s~~ old), with topography, lot lines, and the building footprint superimposed on it, ~~and~~ identification of ~~significant~~ Significant ~~natural~~ Natural ~~features~~ Features, as well as adjacent lots and structures within 100 feet of the perimeter of the subject property (minimum 24"X 36"), and the location of the driveway access in relation to the nearest roadway.

E. Preliminary calculations on land disturbance and cut and fill methods.

II. FORMAL AND COMBINED HILLSIDE COMMITTEE REVIEW MEETING. All plans submitted to the Town for review shall be stamped and sealed by the appropriate registered or licensed professional (e.g. civil engineer, land surveyor, geologist, architect). All plans shall be reviewed by the Hillside Building Committee. In addition, once the plans have been approved by the Committee the applicant shall submit final plans, in accordance with the Hillside Building Committee's approved plans, to the Community Development Department for ~~building permits~~review. Plan review fees for each such submittal shall be paid at the time of the submittal of such plans in the amount specified in the Town of Paradise Valley fee schedule, as such may be amended from time to time. The following plans and material shall be required:

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A. Notification Letters. At least three (3) weeks prior to the scheduled Formal Hillside Building Committee Meeting the applicant shall submit to the Town a neighbor notification letter complete with address labels, with appropriate postage, for all property owners within 1,500 feet of the perimeter of the subject property. This notification letter shall include the following information; a) type of proposed development (addition, remodel, new construction), b) the scheduled

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hearing date and time, c) that the letter is only as a courtesy notification and that their attendance at the meeting is not required, d) the purpose of the meeting, and e) the goals of the meeting.

B. Seismic Refraction Survey. ~~All~~ Unless waived by the Town Manager or desginee, all proposed cuts shall require a seismic refraction survey, performed by a registered geologist. If the geological report or seismic refraction survey indicates fractured or unstable rock, then the proposed location of the building site (or appurtenances) shall be changed to a stable location unless the unstable condition(s) can be mitigated by an engineered design that creates a stable location and complies with the provisions of Article XXII and other Articles of this Zoning Ordinance. The geological report and results of the seismic refraction survey shall be submitted to the Town.

Comment [GB7]: Engineering Department to provide language regarding safety analysis

C. A detailed site plan (minimum 24” X 36”), sealed by a registered engineer or land surveyor, with topographic information for the entire lot including under the footprint of the building. This site plan shall depict: the limits of disturbance; the building envelope including the building footprint, driveway(s), swimming pools, mechanical equipment, sanitary sewer or septic systems; location, size and type of mechanical screen walls and pool barrier fencing; length and height of retaining walls; all accessory buildings; and ~~significant~~ Significant ~~natural~~ Natural ~~features~~Features.

D. Photographs of the site looking out from the property in all directions and of the property from several different views.

F. A detailed grading and drainage plan (minimum 24” X 36”), sealed by a registered civil engineer, with topographic information for the entire lot. This plan shall show proposed finished contours at 1 foot intervals within a perimeter 20 feet from the building, a maximum 5 foot intervals elsewhere, and shall show existing and proposed contours. This plan shall show limits of excavation and fill; slope of cut and fill; total cubic yards of excavation and fill; method of concealment for each fill or exposed cut; and the calculations for amount of disturbance for the total development. This plan shall show original drainage pattern (natural course) and proposed changes. If any structures or culverts are involved, it will be necessary to include an estimate of peak flows for a 100 year frequency storm to establish drainage facility cross-sections. Sheet flow diverted from its original drainage pattern shall be returned to its natural course before leaving the property.

G. A detailed landscape plan that includes, but is not limited to the following: the building envelope; building footprint; all accessory structures and locations; ~~significant~~ all Significant ~~natural~~ Natural ~~features~~Features; plant materials list with type, quantity and size; plant location; location and species of salvaged plant materials; and methods for re-vegetation of all disturbed areas. Native desert vegetation shall be identified and preserved to the maximum extent reasonably possible~~ in the landscape plan~~. A landscape salvage plan shall be provided.

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H. Cross sections of new buildings and appurtenances at a scale equal to or greater than the site plan scale at three or more locations perpendicular to the contours through the building site shall be clearly shown on the topographic map and sealed by a registered professional, or as determined by the Town Manager or designee.

I. A detailed outdoor lighting plan indicating the proposed luminaire locations on the building and on the site (if applicable); the type of illuminating devices including; the manufacture's catalog cut sheets and drawings; and photometrics that describe the illuminating devices; the fixtures, lamps, lumens and ~~wattages~~, supports, the ~~aiming~~ beam angles, and other devices.

Action Report Topic #6

J. 3 Dimensional Scaled Computer Model or A Scaled Study Model: The applicant shall submit a scaled 3D computer model or a scaled study model for Hillside Building Committee review.

a. 3D Computer Model: A computer generated 3-dimensional model, with accurate points of reference superimposed on it; showing the appearance of the building, lot, landscaping, and skyline. The model must accurately represent the massing of all structures and roof forms as well as the following:

i. All windows, exterior doors and skylights.

ii. A sufficient area of the property to visually relate the proposed structure and accessory uses to the natural terrain.

~~I.~~**b.**

~~J.~~ b. ~~A~~ 3D Study Model: Including all proposed improvements, at not less than (1/16) inch = (1) foot showing the relationship of all proposed improvements to the contours of the lot. The model must accurately represent the massing of all structures and roof forms as well as the following:

1. All windows, exterior doors, and skylights (showing the location of all proposed skylights and their orientation to neighboring properties).

2. The model shall include enough of the property to visually relate the proposed structure and accessory uses to the natural terrain.

3. The Applicant's name, architect's name, builder's name, lot number, scale, and north arrow.

K. An accurate oblique view architectural rendering in color or a computer generated 3-dimensional picture ~~-~~shall be submitted showing the appearance of the building, lot, landscaping, and skyline. The rendering or computer generated picture, and the model may remain in the custody of the Town ~~Engineer~~ until a Certificate of Occupancy is issued or until released by the Town ~~Engineer~~.

L. Exterior Material Samples: Include samples of all colors, materials, and material specifications mounted on rigid board with all materials identified with the manufacture's name, color, and LRV number where applicable. Material samples or color specifications are required for all exterior materials and finishes including but not limited to:

- Roof
- Metal
- Hardscape
- Stone
- View fencing
- Wall color and texture (8½" x 11" sample size)
- Masonry
- Glass
- Driveway and terrace paving
- Garage doors
- Patio, deck area including second story structures, pool, and breezeways

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M. The Applicant's Engineer or Surveyor shall install a marker to designate the location of the house at the major building corners. The markers should be at least 3 feet in height with a colored ribbon at the top of the marker. The applicant shall install markers at least two (2) weeks prior to the Formal Hillside Committee meeting and remove immediately following the formal committee meeting.

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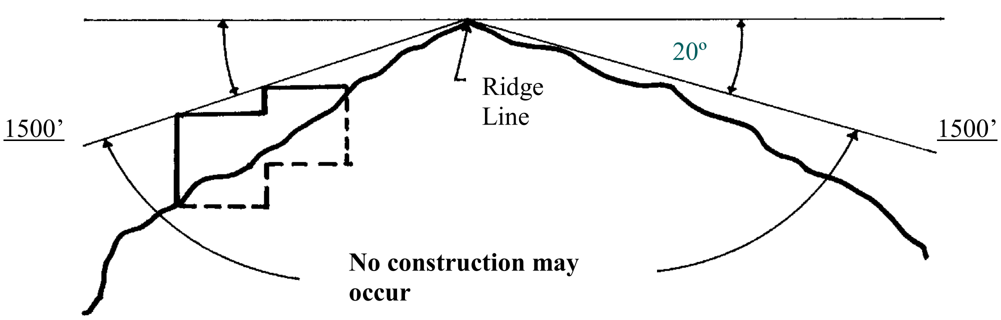
Section 2207 **DEVELOPMENT STANDARDS** [558 654]

I. MOUNTAIN PROFILE INVIOLATE

A. At and above an elevation of 1500 feet mean sea level, no Development shall occur which will Alter the Mountain Top Ridge Lines as shown on **FIGURE 3** . A model must be submitted pursuant to Section 2206(II)(J) showing compliance with this paragraph together with complete plans showing the appearance of the mountain top profile, as part of the submittal for the Formal Hillside Committee Review. Further, no structure may extend above a plane that originates on the primary ridge line and angles downward from the primary ridge line by twenty degrees (See **FIGURE 4).**

FIGURE 4 – RIDGE LINE TWENTY DEGREE DELINEATION



II. ARCHITECTURAL STANDARDS.

A. For development within the Hillside Development Areas, the height of structures shall be determined by the following four (4) sub-sections and not by the zoning district regulations that apply to lots or parcels outside the Hillside Development Area.

~~A.~~ 1. Primary Building

i. The height of a primary building or primary structure is limited to a twenty-four (24) foot imaginary plane that parallels the existing pre-development natural grade, as measured vertically from any point under the building (see **FIGURE 5**). ~~The subterranean portion of the structure is not included in the total height calculation provided that at least half (½) of the volume of the subterranean portion of the structure is below natural grade.~~

ii. In the case where the natural grade has been cut and is not restored back against the building, no exposed face in any vertical plane shall

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exceed a twenty-four (24') foot height measured from the ~~lowest~~Lowest, ~~finished~~ Finished ~~grade~~Grade. The maximum height of any deck support column shall not exceed twelve (12') feet tall measured from the adjoining grade.

2. Accessory Structures

i. The height of an accessory building or accessory structure is limited to a sixteen foot (16') imaginary plane that parallels the existing pre-development Natural Grade, as measured vertically from any point under the building.

ii. In the case where the natural grade has been cut and is not restored back against the building, no exposed face in any vertical plane shall exceed a sixteen (16') foot height measured from the lowest, Finished Grade. The maximum height of any deck support column shall not exceed twelve (12') feet tall measured from the adjoining grade.

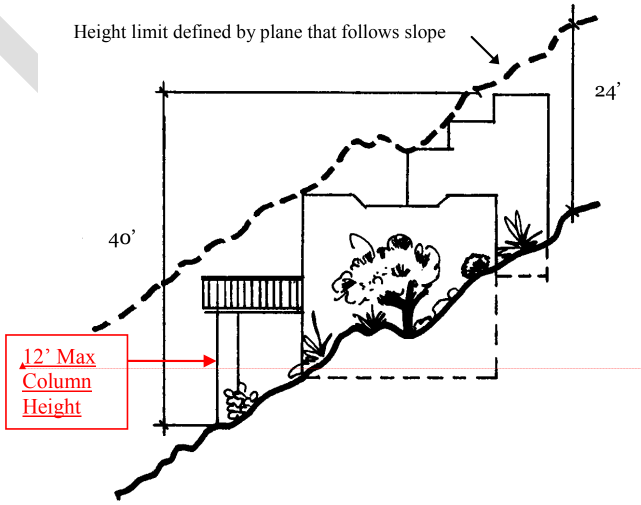
ADD FIGURE ILLUSTRATING 16' HEIGHT LIMIT.

~~iii.~~3. The maximum overall height of the building or structure, including chimneys and accessory buildings, shall not exceed forty (40) feet from the highest point of ~~the building to natural grade at the lowest point adjacent to the building structure or column~~of a building or structure to the lowest point of Natural Grade at the lowest building or structure (excluding driveway retaining walls) ~~(~~(see **FIGURE 5**).

Action Report Topic #7

Action Report Topic #8

FIGURE 5 – BUILDING HEIGHT IN HILLSIDE



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Comment [GB8]: Figure 5 to be updated to reflect these edits.

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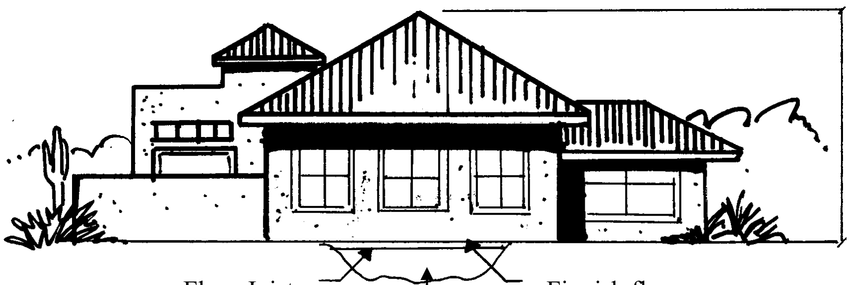
~~iv.~~ 4.Where a building spans a wash the maximum height of twenty-four (24') feet shall be measured vertically from that point where the visible structure and the side of the wash intersect. See-**FIGURE 6.**

FIGURE 6 – BUILDING HEIGHT WITH A WASH CROSS SECTION



Action Report Topic #15

B. Cantilevers. The primary residence, accessory buildings, driveways and other structures (such as pool decks) may employ the use of cantilevers, subject to the following limitations:

1. Primary residence and accessory buildings. Cantilevered elements of the building must comply with the applicable setbacks and heights of the building. All of the area underneath the cantilevered element shall be calculated as disturbed area.
2. Driveways. Cantilevered driveways shall not be allowed.
3. All other structures (such as pool decks) employing the use of a cantilever may extend the cantilever a maximum horizontal length of 4 feet and a maximum vertical height of 8 feet. All of the area underneath the cantilevered element shall be calculated as disturbed area. The cantilevered elements of the structure must comply with the applicable setbacks.
4. The area under a cantilever must be finished with colors or materials that match the adjoining structures or blend in with the surrounding natural setting. The materials or colors used shall not have a LRV (Light Reflective Value) greater than thirty-eight (38) percent.

~~B. Structures employing the use of a cantilever may extend the cantilever a horizontal distance twice the height of the support. The maximum vertical height of the support shall be eight (8) feet. One-half the area underneath the cantilevered element shall be calculated as disturbed area.~~ (See **FIGURE 7** below).

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Comment [GB9]: There was no consensus on the 12/20/16 PC meeting regarding this topic. It was recommended that language be added to identify what the area under a cantilever should look like. Additional review and discussion is needed.

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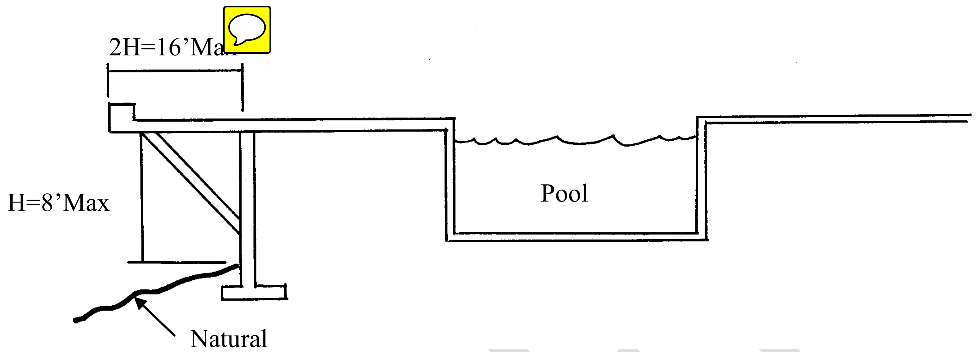
Comment [GB10]: New figures to be added to the code to illustrate these scenarios.

Comment [GB11]: There was no consensus regarding the proposed changes to the limitations on cantilevers at the 1/3/17 PC Meeting. It was recommended that staff research other city codes to see how different communities address cantilevers, provide several pictures of cantilevers for reference, and to include the entire area underneath a cantilever as disturbance.

FIGURE 7 - HEIGHT FOR A CANTILEVERED ELEMENT



Action Report Topic #7

Action Report Topic #2

Action Report Topic #14

5. All of the setback requirements of the underlying zoning district shall apply in the Hillside Development Area (see Article X~~, Section 1001, Table 1001~~).

~~C.~~6. Raised Outdoor Living Areas are subject to the setback requirement of pools and spa and are limited to a maximum height of eight (8') feet tall.

~~D.~~7. Materials used for exterior surfaces such as structures, walls, roofs and fences shall blend with the surrounding natural setting and avoid high contrasts. There shall be no paint or material colors used which have a LRV (Light Reflecting Value) greater than thirty-eight (38) percent. Materials and color used for exterior surfaces are subject to Hillside Building Committee review and approval. The applicant must demonstrate how the materials and colors used for the exterior surfaces blend in with the natural surroundings and settings. Limited use of contrasting accent colors (in excess of 38% LRV) for small elements, including, but not limited to items such as doors and window mullions, may be allowed upon explicit approval of the Hillside Building Committee.

~~E.~~8. All electrical service equipment and subpanels and all mechanical equipment including, but not limited to, air conditioning, evaporative cooling, and antennas greater than 24" in diameter shall not be allowed on the roof. Solar panels may be allowed if they are integrated into the building design and hidden from view when viewed from the same or a lower elevation and approved by the Hillside Building Committee by a Combined Review or Administrative Hillside Chair Review. Solar panels may be allowed on pitched roofs only when screened by the hillside or hillside cut. All mechanical, electrical, and natural gas equipment along with pool equipment and antennas shall be screened in such a manner that they are not visible from outside the property when viewed from the same or a lower elevation. Vegetation does not constitute a screen.

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F. Mirrored surfaces or reflective treatments that ~~changes~~ change or ~~enhances~~ enhance ordinary glass into a mirror surface ~~is~~ are prohibited. Permanently reflective metallic surfaces shall be prohibited.

G. The building design should minimize the reflection of daytime glare from glass and the emission of light from within the structure during evening hours.

H. The quantity and orientation of skylights shall be designed to minimize night time emission of light and may be allowed upon approval of the Hillside Building Committee.

~~H.~~ I. Shake shingle roofs are prohibited. Existing shake shingle roofs on residential structures may be allowed only until such time that it is determined, during the course of normal maintenance, that a new roof (re-roof) is necessary and/or the extent of maintenance or repair work requires a building permit from the Town.

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III. LAND DISTURBANCE STANDARDS.

Action Report Topic #5

A. The limits of construction, demolition, ~~and~~ or proposed disturbed areas shall be clearly staked in the field, with a minimum barrier of visible roping, prior to and during construction and shall conform to the approved ~~individual site analysis~~ plans. ~~No~~ Both during and after construction, no disturbance shall be permitted beyond the areas designated as the limits of disturbance on the plans ~~both during and after construction~~. If land disturbance in violation of this ordinance occurs, the illegally-disturbed area(s) shall be restored to its natural grade and re-vegetated with plant material of the same species, size, and at a similar density present prior to the illegal disturbance.

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B. All disturbed land that is not otherwise used for approved development shall be restored to the natural grade and re-vegetated with plant material ~~as listed in the Town of Paradise Valley landscape guidelines~~ native to the hillside or pursuant to a landscape plan approved by the Town.

C. All buildings, structures, roads, and drives shall, to the fullest extent practicable, follow and utilize the natural contours of the land to minimize disturbance. The maximum height of any cut used to establish a building site shall not exceed 30 feet.

D. All surplus excavated material shall be removed from the lot prior to the issuance of the Certificate of Occupancy.

E. After final grading, not more than 5% of the lot shall be steeper than the natural grade of the lot.

F. The total disturbed area shall not exceed the allowed percentage of the lot area as shown in **TABLE 1** below.

G. Grading within street rights-of-way or tracts of land for private roads is exempt from the disturbance calculations. Any roadway grading beyond the limits of the

dedicated rights-of-way or private road tracts shall be placed in slope easements and included within the calculations for land disturbance limitations.

H. A legally pre-existing disturbed area may be excluded from disturbed area calculations when the applicant ~~has committed to comply~~complies with all of the following restoration conditions:

1. ~~the~~ The restored area shall follow original natural contours.

2. ~~the~~ The restoration shall be treated with an aging agent approved by the Town Manager or Designee ~~Engineer~~ and planted with indigenous desert material that is consistent in density with the area surrounding the undisturbed areas abutting the pre-existing disturbed area.

3. ~~the~~ The restoration process shall be sealed by a landscape architect and/or a registered ~~engineer or architect~~professional.

Action Report Topic #16

I. On-site retention may be required. Please reference the Town of Paradise Valley Storm Drain Design Manual for on-site retention requirements.

J. On-site retention shall be counted as Disturbed Area. Retention areas not employing the use of retaining walls and are re-vegetated with native plant material shall fifty (50%) percent of the area count as disturbance.

Action Report Topic #4

~~I.~~K. The livable portion of the main residence including garage and livable portions of detached accessory buildings shall not be counted as disturbed area provided that all buildings are within the required setbacks and do not exceed the building height limitations as specified in Section 2207 (II) (A) of this Ordinance.

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Comment [GB12]: If the code is changed to include the footprint in the disturbance calculation, the definition of footprint will need to be updated.

TABLE 1 – Slope Category / Lot Disturbance Limitations

Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance
10%	60.0	41%	9.90	72%	6.80
11%	53.66	42%	9.80	73%	6.70
12%	47.94	43%	9.70	74%	6.60
13%	42.81	44%	9.60	75%	6.50
14%	38.21	45%	9.50	76%	6.40
15%	34.11	46%	9.40	77%	6.30
16%	30.48	47%	9.30	78%	6.20
17%	27.27	48%	9.20	79%	6.10
18%	24.46	49%	9.10	80%	6.00
19%	22.01	50%	9.00	81%	5.90
20%	19.88	51%	8.90	82%	5.80
21%	18.04	52%	8.80	83%	5.70
22%	16.48	53%	8.70	84%	5.60
23%	15.16	54%	8.60	85%	5.50

Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance	Bldg. Site Slope	% Allowable Land Disturbance
24%	14.05	55%	8.50	86%	5.40
25%	13.13	56%	8.40	87%	5.30
26%	12.37	57%	8.30	88%	5.20
27%	11.76	58%	8.20	89%	5.10
28%	11.28	59%	8.10	90%	5.00
29%	10.90	60%	8.00	91%	4.90
30%	10.62	61%	7.90	92%	4.80
31%	10.41	62%	7.80	93%	4.70
32%	10.25	63%	7.70	94%	4.60
33%	10.15	64%	7.60	95%	4.50
34%	10.08	65%	7.50	96%	4.40
35%	10.04	66%	7.40	97%	4.30
36%	10.02	67%	7.30	98%	4.20
37%	10.01	68%	7.20	99%	4.10
38%	10.00	69%	7.10	100%	4.00
39%	10.00	70%	7.00		
40%	10.00	71%	6.90		

IV. DRIVEWAYS [558]

Action Report Topic #9

A. Driveways that only serve a new single residence shall be: (1) a minimum of 12 feet wide; (2) surfaced with paving brick, textured integral colored concrete (i.e. stamped or exposed aggregate etc.) or other similar decorative paving materials specifically colored to blend with the existing natural color of the site (asphalt driveways are prohibited); (3) designed with an overall grade that does not exceed 30%; (4) constructed in full conformance with the Fire Code; and (5) developed only as specifically approved by the Hillside Building Committee. The driveway shall be included in the calculations for land disturbance limitations at a ratio of 50% of the total disturbed area of the driveway, if the driveway is constructed at a grade plus or minus (6) inches from natural grade. Driveways with cut and fill in excess of (6) inches and under (18) inches from natural grade shall be charged with 75% of the total disturbed area of driveway surface. The Driveways with cut and fill in excess of (18) inches from natural grade shall be charged with 100% of the total disturbed area of the driveway surface. The entire driveway must be within the natural grade limit to be subject to the disturbance ratios noted above.

B. Driveways that serve an existing home undergoing renovation, remodel, or an addition shall be included in the calculations for land disturbance limitations subject to the following conditions:

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Comment [GB13]: There was no consensus on the 12/20/16 PC meeting regarding this topic. Additional review and discussion is needed.

1. Existing driveways reconstructed with paving bricks, textured integral colored concrete (e.g. stamped or exposed aggregate etc.) or other similar decorative paving materials, specifically colored to blend with the existing natural color of the site, shall be excluded from the land disturbance calculations.

2. Existing driveways surfaced with paving bricks, textured integral colored concrete (e.g. stamped or exposed aggregate) or other similar decorative paving materials, specifically colored to blend with the existing natural color of the site, shall be excluded from the land disturbance calculations.

3. Existing asphalt or uncolored concrete driveways not reconstructed with paving bricks or textured integral colored concrete (e.g. stamped or exposed aggregate etc.) shall be calculated as disturbed area at a ratio of 150% of the total disturbed area of the driveway.

Action Report Topic #9

4. Any new portions of the driveway beyond the layout of the existing driveway shall be included in the calculations for land disturbance limitations at a ratio of 50% of the total disturbed area of the driveway, if the driveway is constructed at a grade plus or minus (6) inches from natural grade. Driveways with cut and fill in excess of (6) inches and under (18) inches from natural grade shall be charged with 75% of the total disturbed area of driveway surface. The Driveways with cut and fill in excess of (18) inches from natural grade shall be charged with 100% of the total disturbed area of the driveway surface. The entire driveway must be within the natural grade limit to be subject to the disturbance ratios noted above.
~~3.~~

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C. The minimum standard turning radius for a driveway is 40 feet; except that a minimum ~~25~~ 35 foot radius may be used provided all structures are protected with an approved fire extinguishing system.

D. Any street or driveway cut greater than 8 feet shall not have a length greater than 100 feet. The applicant must mitigate means of breaking-up the mass of the cut and blending the cut in with the surrounding natural terrain.

E. A twenty (20) foot by thirty (30) foot driveway apron may be required by the Fire Marshall or the Building Official at or near the garage or another location deemed necessary by the Fire Marshal, with no more than a 5% grade, to serve as a staging platform to fight a fire.

F. The maximum height, measured vertically, of any cut used to establish a street or driveway shall not exceed 30 feet.

V. GRADING AND DRAINAGE STANDARDS.

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A. There shall be no clearing, grubbing, grading, importing or stockpiling of fill material on, or to, any site prior to approval of such Development by the Hillside Building Committee and approval of a grading plan by the Town ~~Engineer~~, unless such clearing, grubbing, or grading, is required by the Town for public safety purposes. If applicable, approval of a grading plan and drainage report prepared by a registered Engineer, may be required for Town review and approval.

~~A.~~B. Storm water retention shall be provided to the greatest extent possible in accordance with the Town Code and the Town Storm Drainage Design Manual.

~~B.~~C. The maximum depth of fill shall not exceed ~~8~~ 7.5 feet except beneath the footprint of the main residence. All exposed disturbed area fill shall be contained behind retaining walls or covered with a natural rock veneer and treated with an aging agent and landscaped with indigenous plant material.

~~C.~~D. ~~Rock veneered spill slopes~~Veneered Rock Slopes may be allowed provided that they are approved by the Hillside Building Committee, and:

1. The vertical height of the Veneered Rock Slope ~~spill slope~~ does not exceed the vertical height of the exposed cut with the base of the Veneered Rock Slope~~spill slope~~ engineered for stability and keyed into the mountain or supported by a retaining wall.

2. The Veneered Rock Slope~~spill slope~~ does not exceed a one to one slope.

3. Retaining walls used to limit the height of the Veneered Rock Slope~~spill slope~~ are color treated or veneered to blend in with the surrounding natural colors.

~~D.~~E. Raw ~~spill~~ Spill ~~slopes~~ Slopes are prohibited. Any violation will be subject to a stop work order until the spill slope is removed, restored to its natural grade, re-vegetated and approved by the Town.

~~E.~~F. A ~~hillside~~ Hillside ~~wash~~ Wash shall not be diverted, relocated or moved from its present position to another location, however, a ~~hillside~~ Hillside ~~wash~~ Wash may be bridged by a structure so long as such structure does not impede the flow of the hillside wash.

~~Earth contiguous to the structure shall contact that structure at an angle approximating that of the natural grade.~~

~~F.~~G. Washes located on a property shall be maintained in accordance with Chapter 5 and Chapter 8 of the Town Code.

VI. WALLS AND FENCES.[558]

A. Curbs less ~~than18~~ than 8 inches above finished grade are not considered walls.

Action Report Topic #1

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B. No more than 300 total linear feet of wall shall be visible from any point on the property line. All pool barriers shall be view fencing. View fencing is not calculated in the 300 feet maximum allowable wall length.

C. Walls that are otherwise permissible in Article XXIV are prohibited in the Hillside Development Area. Retaining walls, pool barriers, walls used to screen mechanical equipment, driveway columns and entry gates, and tennis/sport court fencing are allowed provided that they are of minimum lengths and heights, as further specified below, and are approved by the Hillside Building Committee.

1. Retaining Walls:

Action Report Topic #1

a. The intent of the retaining wall requirements is to mitigate the massing and impact of walls on the hillside and preserve the characteristic of the desert. The objective is to allow only the minimum amount of retaining walls needed to access the property, retain cut and fill, and screen mechanical equipment and windows of interior bathroom areas.

b. Where retaining walls are provided, they shall meet the setback requirements of Section 2404, Height and Setback Regulations, unless needed to access the property (such as driveway retaining walls) or deemed necessary by the Town Engineer and the Community Development Director to prevent erosion or flooding.

~~a.~~c. The maximum length of any continuous retaining wall shall not be more than 100 linear feet. The maximum height of any retaining wall shall not be more than 8 feet. The height of a retaining wall is measured from the low side of natural grade when retaining fill slopes and from finished grade when retaining cut slopes to the top of the wall; whether the top is retaining earth or not.

~~b.~~d. Retaining walls shall be used for the purpose of containing fill material or for minimizing cut or fill slopes. The retaining wall may only extend six (6) inches above the material it is retaining.

~~c.~~e. A terraced combination of retaining walls shall be measured as a single retaining wall provided the combined walls are: 1) no more than eight (8) feet total vertical height; 2) terraced with a minimum distance between of four (4) feet and a maximum separation of eight (8) feet; and 3) contain appropriate vegetation between the walls so as to soften the visual impact of the combined walls (see **FIGURE 8**). These separation requirements apply to any single lot and do not apply to adjoining walls on neighboring properties.

~~d.~~f. When a safety fence, on top of a retaining wall, is required by code it shall be a view fence and shall be painted to blend with surrounding natural colors.

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~~e.~~g. Where retaining walls are provided they shall be color treated, textured, or veneered to blend in with the surrounding natural colors and textures of the native rock and soils at the site.

Action Report Topic #17

2. Pool Barriers. All pool barriers shall be view fencing. The pool barrier shall be the minimum amount that is needed to secure the pool and that is appropriate for the site.

~~2. Pool Barriers: Shall be view fencing. Open view fencing is not calculated in the 300 feet maximum allowable wall.~~

3. Screen Walls: These walls may be solid walls provided they are of minimum height and length needed to screen the mechanical equipment, garbage cans, or windows of interior bathroom areas, and shall not exceed six (6) feet in height. Screen walls over 6 feet in height may be allowed, at the discretion of the Hillside Building Committee, to properly screen the mechanical equipment or windows of interior bathroom areas; provided, 1) such walls meet the allowable setbacks and height of an accessory structure, and 2) screening area surrounded by screen walls is calculated as part of the allowable floor area.

4. Tennis/Sport Courts: Fences surrounding a tennis court or sport court shall be~~:~~ : (i) no greater than 10 feet in height as measured from the playing surface, (ii) ~~set within the disturbable area of the Lot~~counts as disturbed area, and (iii) open view fencing and colored to blend in with the surrounding area.

5. ~~5.~~ Driveway ~~Columns~~ columns and ~~Entry~~ entry ~~Gates~~ gates may be located ten (10) feet or more from the property line. The columns and gate are limited to six (6) feet in height and the columns may be a maximum size of two (2) feet by two (2) feet. Electrically controlled gates must be equipped with an approved key switch located as far as possible from the right-of-way.

Action Report Topic #1

6. Driveway Retaining Walls. Driveway retaining walls may extend 18 inches above the driving surface provided the retaining wall meets the 8 foot height limit. When a safety fence, on top of a driveway retaining wall, is required by code it shall be a 36 inch view fence and shall be painted to blend with surrounding natural colors. The retaining wall must comply with the 8 foot height limit; however, the view guard is not limited to the 8 foot retaining wall height limit.

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Comment [GB14]: Need Planning Commission input regarding the potential limitation on the amount of pool barrier fencing. Should a limited be added to the code? If so, what is an appropriate limit? Or, should a general statement of "a minimal amount needed to secure the pool area" be kept and let the Hillside Committee determine what is appropriate for the site.

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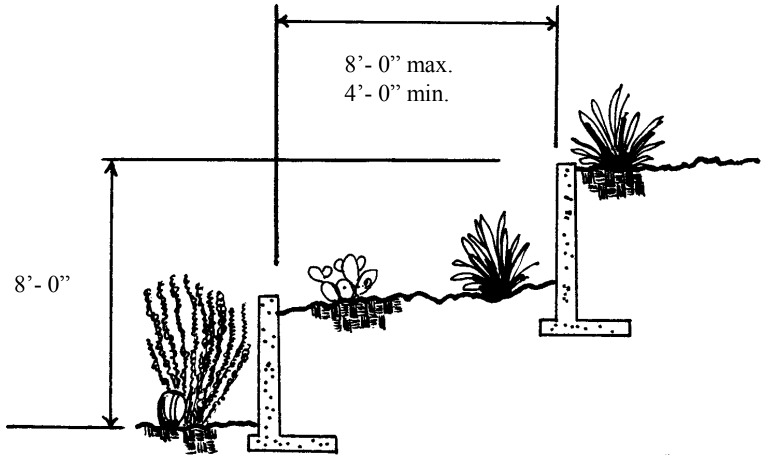
FIGURE 8 –TERRACED VERTICAL RETAINING WALLS



VII. ACCESSORY STRUCTURES AND ADDITIONS TO EXISTING STRUCTURES. [558]

~~A. The Hillside Building Committee may review applications for the proposed accessory structures and additions to existing structures if the Town Engineer in consultation with a member of the Hillside Building Committee determines that the proposed accessory structures or addition: (i) exceeds or increases the building height of the main residence; (ii) increases the existing building footprint by more than 1,000 square feet or more than 50% of the original building square footage; (iii) creates an additional disturbance area; (iv) increases site walls; (v) proposes a significant addition of exterior lighting; or (vi) creates a significant adverse visual impact.~~

~~B. The Hillside Building Committee may combine the Concept Plan Review Meeting and the Formal Hillside Committee Review Meeting for applications conforming with the criteria set forth in Subsection VII (A).~~

~~C. If no new disturbed area is required and the proposed accessory structure or addition meets all other hillside requirements including allowable disturbed area, a permit for an accessory structure, or an addition to hillside building may be obtained without requirements for, disturbed area calculations or any other specific requirements as designated by the Town Engineer.~~

~~D.~~A. Any proposed accessory structure or improvements to existing hillside structures which require additional disturbed area shall be accompanied by calculations of prior disturbed area to determine if the entire site is within the allowed limits for hillside construction. When the disturbed area equals that allowed, no further construction involving additional disturbed area will be permitted.

Comment [GB15]: Relocate Figure 8 below the text of 2207.VI.1.e.

Comment [GB16]: Moved to Section 2205 and updated criteria.

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~~E.~~B. Accessory buildings and structures shall not occupy more than one-half of the total ground area of the main building. No accessory building or structure shall exceed the height specified in Table 1001B or elsewhere in this ordinance.

VIII. SEWERS AND UTILITIES.

A. Grading for septic systems, evapotranspiration systems, and alternative systems shall be included in the calculations for land disturbance limitations unless:

1. The disturbed area is brought back to original natural grade contours, treated with an approved aging agent and planted to blend with surrounding natural growth,

2. Special landscape plans for evapotranspiration systems shall be submitted to the Town Engineer. Plans shall show the appropriate vegetation and supplemental irrigation systems approved by the Town Engineer.

B. Grading for utility lines, including water and sewer lines and lateral lines, electric, gas, telephone and cable services, shall be included within the calculations for land disturbance limitations unless:

1. Trenches are placed under a driveway, under paving or in other areas already counted as disturbed, or

2. Trenches and related disturbed areas are restored to appear as original ground, color treated and planted to blend with surrounding natural growth.

IX. FIRE PROTECTION.

A. Washes must be maintained as easements as described in Section 8-7 of the Town Code and other applicable codes to minimize the risk and spread of fire.

B. Grasses known to be highly flammable, such as fountain grass, *Pennisetum setaceum*, and buffel grass, *Pennisetum ciliare* are not allowed in a Hillside Development Area.

Section 2208 OUTDOOR LIGHTING [558]

Comment [GB17]: Outdoor Lighting - This Section to be Replaced with Lighting Code Updates that are currently under review by Planning Commission. – Action Report Topic #10

A. Purpose: The intent of these lighting requirements is to preserve the low light level conditions that are inherently characteristic of the desert. The objective is to allow only the quantity and level of lighting necessary for safety, security and the enjoyment of outdoor living while protecting against direct glare and excessive lighting; protecting the ability to view the night sky; and preventing light trespass.

B. Definitions: For the purposes of this section, exterior lighting is defined and regulated by the following definitions and categories:

1. Footcandle (fc) - A unit of illuminance of equal to 1 lm/ft² (lumen / sq. ft.) or 10.76 lx (lux).

2. Fully Shielded (Full Cut-Off) - A fixture shielded with an opaque material so that light rays emitted by the fixture are projected only below a horizontal plane running through the lowest point on the fixture where light is emitted.

3. Lumens – The Standard International (SI) unit of luminous flux.

4. Luminaire (Light Fixture) - A complete lighting unit consisting of a lamp or lamps and ballast(s) (when applicable) together with the parts designed to distribute the light, position and protect the lamps, to connect the lamps to the power supply.

5. Opaque - Impervious to the passage of light.

6. Partially Shielded (Partial Cut-Off) - A fixture that allows light rays to be emitted up and down and shielded with an opaque material in such a manner to prevent the bulb from being seen.

7. Safety Lighting - Low-level lighting used to illuminate vehicular and pedestrian circulation.

8. Security Lighting - Lighting that is fully shielded that is intended to provide bright illumination during emergency situations only.

9. Spill Light - The amount of light that illuminates beyond the range or primary area that the fixture is intended to light.

10. Translucent – A material through which light can pass but the light source cannot be seen.

11. Trespass Lighting - Spill light that encroaches onto neighboring properties.

12. Visual Enjoyment Lighting - Lighting intended to illuminate outdoor living areas.

C. Design Standards:

1. All building mounted light fixtures shall be fully shielded. Recessed lights in exterior soffits, eaves, or ceilings shall have a 45°cutoff. At the main entry of the primary structure, a maximum of two (2) translucent fixtures may be permitted as long as the total lumens, per fixture, do not exceed a

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maximum of 750 lumens. All other entrances, excluding garage doors, shall be limited to no more than one (1) fixture.

2. All fixtures, unless otherwise allowed, shall be directed downward and properly aimed on the targeted areas to maximize their effectiveness and minimize the total number of lighting fixtures.

3. Building mounted lighting must be directed downward away from adjacent lots, streets, undisturbed areas, and open spaces, and may not be used to light walls or building elements for decorative purposes.

4. There shall be no lighting permitted in areas identified as “undisturbed areas” of the property pursuant to the plans submitted under Section 2207 III.A.

5. The maximum lighting intensity shall not exceed 0.25 footcandle when measured at the property line.

6. A repetitive line up of lights along driveways or walkways accessing public streets shall not be allowed. Some random lighting of driveways or walkways accessing public streets may be allowed by the Hillside Building Committee. Driveway lights must be located on the "downhill" side and aimed toward the "uphill" side, must be fully shielded from below and only light the driveway surface. Driveway and walkway lights shall not exceed a maximum of 0.25fc at any point beyond 10 feet from the fixture.

7. Each lighting or illuminating device shall be set back from the nearest property line a minimum of ten (10) feet or a distance equal to or greater than the height of the device above natural or excavated grade, whichever is greater. As an exception a lighted entry marker may be placed on each side of the driveway entrance. The entry marker shall not be placed within the Town right-of-way or private road areas and the total height of the marker and light shall not exceed four (4) feet above finished grade adjacent to the driveway. The light source shall not exceed the equivalent projected brightness of 250 lumens.

D. Luminaire (Light Fixture) All luminaires shall be subject to the following limitations:

1. Shall not exceed 750 lumens when attached to a structure and confined to the immediate vicinity of a building entrance or outdoor living area of the residence.

2. Shall not exceed 250 lumens for all other uses.

3. Shall not exceed 150 lumens for landscape up-lighting.
4. Motion sensor/detector light fixtures are permitted for security lighting. Security lighting must be controlled separately from all other lighting.

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Security lights must be on timers that regulate their operation time to a maximum of 10 minutes and limited to lamps with a maximum of 750 lumens.

5. Rope lighting shall not exceed 3.6 watts per lineal foot for an incandescent rope light.

E. Mounting Exterior fixtures shall be mounted:

1. In the ground or on a post not to exceed 36 inches above the ground. When exterior fixtures are affixed to existing trees, the height of the fixture shall not exceed 8 feet above the finished grade.

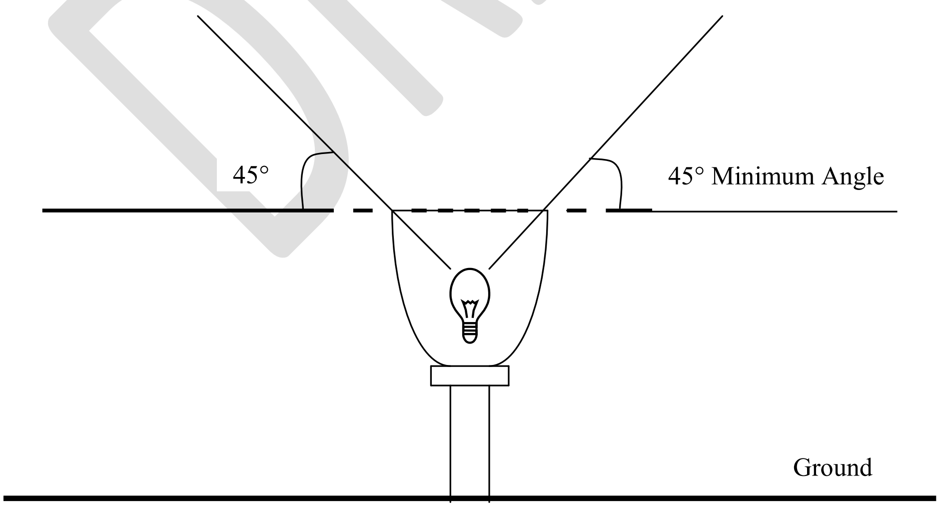
2. In or on a building wall not to exceed 8 feet above finished grade and shielded in such a manner as to avoid creating concentrated light (hot spots) on the structures to which they are mounted. Security lighting may be mounted on the structure to a height of not more than twelve (12) feet.

F. Landscape Up-lighting:

1. The number of fixtures is limited to one fixture per 1000 square feet of allowable disturbed area.

2. The lamp must be recessed to provide a minimum 45° cut-off from the vertical plane.

FIGURE 9 - TYPICAL UPLIGHT WITH 45° CUT-OFF



G. Prohibitions In addition to the limitations noted above, the following lights or lighting effects are strictly prohibited:

1. Colored lamps or bulbs and string and unshielded rope lights; except that temporary holiday lighting shall be permitted between November 15th and January 15th.

2. Tennis court and sport court lighting.

3. Any temporary lighting that violates the provisions of this lighting section.

4. Exterior lights, except security lighting, that illuminate the adjoining mountainside such that the mountainside is visible from off the property between sunset and sunrise.

H. Amendments:

1. Should the applicant desire to substitute outdoor light fixtures or lamps after a permit has been issued, the applicant must submit all changes to the Town Engineer for approval, with adequate information to assure compliance with this ordinance.

Section 2209. DENSITY and SUBDIVISIONS / LOT SPLIT STANDARDS

A. The maximum number of lots into which Hillside Development Area land may be subdivided shall be the sum of the number of lots allowed in each slope category of land as shown by the following **TABLE 2 – Density/Slope Category**.

B. Slope shall be calculated using a minimum of 3 slope lines per acre. The slope lines shall be perpendicular to the slope and at equal distances across the lot.

C. Each of the resulting lots shall meet the minimum lot size requirements based upon the average lot slope shown on **TABLE 2.**

D. Building envelopes shall be conceptually indicated on preliminary plats and accurately shown on final plats.

E. The subdivider shall ~~demonstrate by sketches, engineering drawings, charts or other means~~provide plans and documents by a registered architect, civil engineer, or surveyor demonstrating that roads, public or private, and driveway access and placement of residential structure will conform, for each lot, to current hillside development regulations and without the need for a variance.

F. All subdivision development and lot split applications shall comply with the Hillside Development Requirements as outlined in the Town of Paradise Valley Subdivision Ordinance and Article XXII of this Ordinance.

TABLE 2 – Density / Slope Category

Average Lot Slope %	Min. Lot Size Acres	Min. Lot Size –Sq. Ft.	Average Lot Slope %	Min. Lot Size Acres	Min. Lot Size – Sq. Ft.
10%	1	43,560	41%	6.8	296,208
11%	1.01	43,996	42%	7.6	331,056
12%	1.02	44,431	43%	8.4	365,904
13%	1.04	45,302	44%	9.2	400,752
14%	1.06	46,174	45%	10	435,600
15%	1.08	47,045	46%	11	479,160
16%	1.1	47,916	47%	12	522,720
17%	1.2	52,272	48%	13	566,280
18%	1.3	56,628	49%	14	609,840
19%	1.4	60,984	50%	15	653,400
20%	1.55	67,518	51%	16	696,960
21%	1.6	69,696	52%	17	740,520
22%	1.7	74,052	53%	18	784,080
23%	1.8	78,408	54%	19	827,640
24%	1.9	82,764	55%	20	871,200
25%	2	87,120	56%	21	914,760
26%	2.2	95,832	57%	22	958,320
27%	2.4	104,544	58%	23	1,001,880
28%	2.6	113,256	59%	24	1,045,440
29%	2.8	121,968	60%	25	1,089,000
30%	3	130,680	61%	26	1,132,560
31%	3.2	139,392	62%	27	1,176,120
32%	3.4	148,104	63%	28	1,219,680
33%	3.6	156,816	64%	29	1,263,240
34%	3.8	165,528	65%	30	1,306,800
35%	4	174,240	66%	32	1,393,920
36%	4.4	191,664	67%	34	1,481,040
37%	4.8	209,088	68%	36	1,568,160
38%	5.2	226,512	69%	38	1,655,280
39%	5.6	243,936	70%	40	1,742,400
40%	6	261,360			

Section 2210. REMOVAL OF PROPERTY FROM HILLSIDE

Action Report Topic #11

The Hillside Building Committee and Town Council shall review plans for any request to remove a property from the Hillside Development Area. This process applies to properties that are designated within a Hillside Development Area and have a slope of less than ten percent (10%). If a property owner elects to remove the property from the Hillside Development Area, the following applies:

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Action Report Topic #11

1. The applicant must provide documentation that the property has a building pad slope and site of less than ten percent (10%) in accordance with Section 2202 and Section 2209B.
2. The request will be reviewed by the Hillside Building Committee, which will make a recommendation of approval, approval with stipulations, or denial to remove the property from the Hillside Development Area.
3. The Town Council will either approve, deny, or approve the request with stipulations.

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Section 2211. LA PLACE DU SOMMET SUDIVISION

Action Report Topic #13

The La Place Du Sommet Subdivision is subject to the September 7, 1984 Hillside Ordinance. Any property developed in this subdivision is subject to the 1984 Hillside Ordinance.

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Section 2212 Additional Review Fees

When deemed necessary, the Town may hire an outside firm to assist with or provide a saftey review of an application. The outside safety review includes, but is not limited to, a review of the grading and drainage, geological report, seismic refraction survey and excavation methods. The fees associated with the outside safety review is an additional application fee and must be paid by the applicant.

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Action Report Topic #18

Administrative Relief. See Attached Section 2-5-3 of the Town Code for proposed amendments.

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FOOTNOTE:

110 Ordinance # 220 – 7/12/84
112 Ordinance #221 – 9/24/84
181 Ordinance # 305 – 11/9/89
193 Ordinance # 320 – 2/28/91
194 Ordinance # 321 – 2/28/91
206 Ordinance # 338 – 3/26/92
382 Ordinance # 382 – 12/01/94
409 Ordinance #409 - 7/13/95
425 Ordinance # 425 – 9/12/96
533 Ordinance # 533 – 10/09/03
558 Ordinance # 558 – 06/09/05
580 Ordinance # 580 – 10/26/2006
654 Ordinance #654 – 03/13/2014

Section 5. If any section, subsection, sentence, clause, phrase or portion of this ordinance or any part of these amendments to the Town Code adopted herein by reference is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

Section 6. This ordinance shall become effective in the manner provided by law.

PASSED AND ADOPTED by the Mayor and Council of the Town of Paradise Valley, Arizona, this _____ day of _______, 2017.

____

Michael Collins, Mayor

SIGNED AND ATTESTED TO THIS _______ DAY OF _______________ 2017

ATTEST:

____

Duncan Miller, Town Clerk

APPROVED AS TO FORM:

____

Andrew M. Miller, Town Attorney

DRAFT

Section 2-5-3 Board of Adjustment [8] [188 583 623 646 654 685]

E Administrative Relief. [583 654]

1. The Community Development Director may authorize administrative relief to a property owner in the Town of Paradise Valley of up to ten (10) percent of any development standard contained in Article X and Article XXII of the Town Zoning Code, unless specifically restricted elsewhere in this ordinance. For gates on hillside properties, administrative relief may be authorized as described in subsection (i) below. Administrative relief shall be subject to the following requirements and limitations:

    a. An application shall be submitted (and the fee set forth in the Town of Paradise Valley Fee Schedule, as such may be amended from time to time, shall be paid) by the property owner requesting administrative relief, on a form prescribed by the Community Development Director for such, identifying the proposed improvement to the property that is subject to the request;

    b. Notice shall be made by first class mail, postmarked at least five (5) days prior to the proposed date of determination by the Community Development Director, to adjacent property owners determined by the Community Development Director as potentially affected by the request for administrative relief;

    c. The proposed improvement requiring relief will not be detrimental to the property requesting relief, any adjacent property, or the Town, as determined by the Community Development Director;

    d. The relief granted is the minimum required to meet the needs of the proposed improvement, as determined by the Community Development Director;

    e. The relief shall not be contrary to the purpose and intent of this ordinance; and

    f. Administrative relief related to a particular property may only be requested once during an eighteen (18) consecutive month period and only twice during the period of ownership by a recorded owner of the property, the term “owner” to be interpreted for purposes of this section to include any person, firm, corporation, partnership, joint venture, trust, or any related persons, parties, firms, corporations, partnerships, joint ventures or trusts, including any successor trusts where the beneficiaries included are the same as any of the persons included as an owner above or as a beneficiary of any preceding trusts.

DRAFT

g. The relief requested is limited to livable primary and accessory structures and walls, gates, and fences. It is not applicable to:
   i. New home construction, except to request relief related to an inadvertent error,
   ii. Properties that are subject to special use permits,
   iii. Floor area ratio limitations,
   iv. Tennis or other types of sport courts,
   v. Gazebos or other similar structures,
   vi. Disturbed Area

h. The Community Development Director may impose reasonable conditions upon any administrative relief granted to ensure that the public health, safety, and general welfare are protected and substantial justice is done.

i. Relief for gates on hillside properties may be allowed. Such relief shall only be granted for the location to allow the gates to be as close as necessary to the property line when the topography of the lot precludes them from meeting the setback. Consideration shall be given to proper stacking of vehicles for public safety. No increase in height or size or other deviations of the code shall be granted.

2. Any relief authorized by the Community Development Director shall be documented with findings consistent with the standards above and filed with the building permit records, subdivision case file, or other department files, as appropriate.

F. Appeals. [583]

All decisions and interpretations by the Community Development Director performed in accordance with Section 2-5-3.E may be appealed to the Board of Adjustment in accordance with the procedures prescribed in Section 2-5-3.C.

DRAFT

TOWN OF PARADISE VALLEY

Hillside Code Update
Statement of Direction

Town Council Meeting
June 22, 2017

Hillside Code Update

- Purpose: Draft and adopt a Hillside Code Statement of Direction (SOD) to provide the Planning Commission.
  - Revisions to the Hillside Code are just one part of a larger Hillside Council Initiative

- Key Question: What items should be in the SOD and does Mayor & Council have a particular position on each of those items?

Hillside Code Update

- Documents
  - Hillside Code Revisions
    - Original Hillside Code
    - Draft revisions by PC Lead Scott Moore
    - Draft Revisions from PC after their 3 review meetings including January 17
    - Scott and Julie Proposed Version
  - Draft SOD
- SOD can have 3 levels of direction:
  1. Identify problems in code to be worked upon;
  2. Identify Council concept for solution to problem; or
  3. Specify Council preferred language for code update

Hillside Code Update

- 18 Topics Discussed by Commission:
  - Green Topics – PC consensus
  - Red Topics – No PC consensus and/or more work needed

Summary of Topics

1. Retaining Walls and Screen Walls
2. Material Palette
3. Reviews & Admin Chair Review
4. Disturbed Area Calculation
5. Demolition on Hillside Properties
6. Hillside Model
7. Accessory Structure and Accessory Structure Height Limit (including raised decks/platforms)
8. 40’ Overall Height Measurement
9. Driveway Disturbance Credit
10. Lighting
11. Process to Remove a Property from Hillside Designation
12. Hillside Assurance/Bond
13. Define which Hillside Code applies to La Place du Sommet Subdivision
14. Solar Panels and Hillside Review Process
15. Cantilever Limitations
16. On-Site Retention
17. Pool Barriers and Perimeter Fencing Standards
18. Administrative relief on hillside lots (Article XXII)

Hillside Code Update

- Are there any Green category items that Council would like to discuss and offer direction different than what Planning Commission has established?

- Slides 7-17 will only be viewed depending upon the item Council would like to discuss

Material Palette

- Issue:
  1. Colors of materials meet LRV but do not always blend in with surrounding hillside
  2. HBC limited in approving contracting colors
- Decision:
  1. Add language to clarify colors must blend in with surrounding hillside
  2. Give HBC more latitude to approve contracting colors when deemed appropriate
- Reference page 19 of Draft Ordinance

Hillside Reviews & Admin Chair Review

- Issue :
  1. Clarify the 4 types of Hillside Reviews
  2. Increase scope of Chair Review
- Decision:
  1. Add language to clarify the 4 types of Hillside Reviews
  2. Allow Chair Review to include limited amount of site walls, disturbance, and solar panels
- Reference pages 8 and 9 of Draft Ordinance

Disturbed Area Calculation

- Issue :
  1. Footprint does not count as disturbed area. Bigger house can result in less disturbance
  2. Should footprint be counted as disturbance?
- Decision:
  1. Do not count footprint as disturbance. May create too many non-conformities and Prop 207 issues
  2. May need additional language clarifying livable footprint & garage footprint do not count as disturbance
- Reference pages 6 and 21 of Draft Ordinance

Demolition on Hillside Properties

- Issue :
  1. During demo, some contractors go beyond existing disturbance and grade native hillside
  2. Require staking of existing disturbance limit and/or require demo bond?
- Decision:
  1. Require existing disturbance limits to be staked prior to demolition
- Reference pages 10 and 20 of Draft Ordinance

Hillside Model

- Issue :
  1. Code requires physical model and model making is a dying art
- Decision:
  1. Update code to clarify 3D computer models are acceptable with criteria for 3D models (e.g. show contours, scaled, etc.)
- Reference page 14 of Draft Ordinance

Accessory Structures & Heights

- Issue :
  1. Clarify 16’ height limit for accessory structures. Confusion that 24’ height limit for house applies to accessory structures
  2. Codify policy on raised outdoor living areas (e.g. raised pool decks)
- Decision:
  1. Language added to code to clarify 16’ height limit for accessory structures
  2. Language added to code to identify setback requirements for raised outdoor living areas
- Reference pages 7 and 17 of Draft Ordinance

40’ Overall Height Limit

- Issue :
  1. Confusion on how 40’ overall height is measured
- Decision:
  1. Language added to code to clarify how 40’ height limit is measured (from natural grade of lowest structure to the highest point of a structure)
- Reference page 17 of Draft Ordinance

Process to Remove Property from Hillside

- Issue :
  1. Code does not identify process
- Decision:
  1. Codify policy/practice. Language added to code to identify the process to remove a property from Hillside designation (e.g. prove slope of less than 10%, HBC Recommendation and Council action)
- Reference page 34 of Draft Ordinance

Pool Barriers & Perimeter Fencing

- Issue :
  1. Hillside Code prohibits fences with exception of view pool barrier fences, screen walls, retaining walls, and view guard rails
  2. Pool barrier often designed to be a yard or perimeter fence (does not meet intent of code)
- Decision:
  1. Add language to code that clarify barrier must be appropriate to the site and minimum amount needed to secure pool
- Reference page 26 of Draft Ordinance

Admin Relief for Hillside Lots

- Issue :
  1. Admin relief limited to entry gates & solar panels for hillside lots
  2. Make admin relief on hillside lots consistent with flat land lots
- Decision:
  1. Modify language in Chapter 2 of Town Code to make admin relief consistent for hillside and flat land lots
- Reference page 34 of Draft Ordinance & Attachment regarding Chapter 2 of Zoning Code.

Retaining Walls & Screen Walls

- Issue:
  1. Clarify when walls must meet setbacks
  2. Retaining walls limited to 6" height above material they retain. Examine when retaining walls may extend beyond 6" limit
- Options:
  1. Add language to code identifying retaining walls must meet setback unless needed to access property or needed to prevent erosion/flooding
  2. Add language to code to allow driveway retaining walls to extend 18" above material they retain
- Reference pages 24 - 26 of Draft Ordinance

La Place du Sommet & Applicable Code

- Issue :
  1. Practice of applying 1984 code to La Place du Sommet subdivision
- Decision:
  1. Research to determine if La Place du Sommet is bound by 1984 code or if subject to updated code
  2. If applicable, add language to code to clarify La Place du Sommet is governed by 1984 code
- Reference page 34 of Draft Ordinance

Retaining Walls

- Issue:
  1. Does the Council want to specify a maximum guard rail height on top of retaining walls?
  2. 36” guard rail per IRC but architects favor 42”
- Options:
  1. Meet minimum height per IRC (36” inches for residential and 42” inches for commercial), OR
  2. Hillside Committee to decide what height is appropriate for site (e.g. guard rail with max height of 42”)
- Reference page 26 of Draft Ordinance

Driveway Disturbance Credit

- Issue:
  1. Does Council want to apply the same standards to driveways that serve new homes and remodeled homes?
- Options:
  1. Partial disturbance credit for decorative driveways. Establish criteria for credit (e.g. types of driveway surface, proximity to natural grade, etc.)
  2. PC directed staff to research this topic with Commissioner Campbell
- Reference pages 22 - 23 of Draft Ordinance

Lighting

- Issue:
  1. Does Council want to incorporate recent lighting code updates to hillside?
- Options:
  1. Prohibit rope lighting
  2. Add Lux as another measurement of light
  3. Allow holiday lights to start on October 15th
  4. Add Kelvin requirements
- Reference pages 28 - 32 of Draft Ordinance

Hillside Assurance/Bond

- Issue:
  1. Does Council want to explore potential updates and requirements for Hillside Assurance/Bond?
  2. Currently – Bond places Town in position to cover, restore, and landscape cut/fill to blend in with surrounding terrain
- Options:
  1. Update or establish criteria for fees (e.g. increase multiplier, greater slope = greater bond, etc.) and time period when bond can be used to restore site
  2. In event of market condition, place a lean on the property
  3. Criteria for Landscape Bond
  4. Three bids to determine bond amount
- Reference pages 10 - 11 of Draft Ordinance

Solar Panels & Review Process

- Issue:
  1. Does Council want to allow solar panels on pitched roofs?
  2. PC concern if Town can regulate solar
- Options:
  1. Consider allowing stealth solar technology on all pitched roofs (e.g. Tesla solar tiles, etc.) and establish criteria
  2. Allow solar panels on pitched roofs only when screened by hillside
- Reference page 9 and page 19 of Draft Ordinance

Cantilever Limitations

- Issue:
  1. Does Council want to limit cantilevers or change cantilever criteria?
- Options:
  1. Prohibit cantilevered driveways
  2. PC – Create cantilever criteria for house and criteria for pool decks. Directed staff to research this topic with Commissioner Campbell
  3. 8’ max vertical and 4’ max horizontal (Moore & Pace)
  4. Prohibit cantilevered roadways (Moore & Pace)
- Reference pages 18 - 19 of Draft Ordinance

On-Site Retention

- Issue:
  1. Retention counted as disturbed area. Also, applicants occasionally use retaining walls to create retention areas. Does Council want to offer partial credit on retention basins (via specified criteria)?
  2. Identify that on-site retention must comply with Town's Storm Drain Design Manual
- Options:
  1. Keep as is - Retention are counts as 100% disturbance
  2. Incentivize better retention designs - 50% credit for retention areas that do not use retaining walls and vegetated with native plants
  3. Add language to code to reference Storm Drain Design Manual
- Reference pages 21of Draft Ordinance

Questions?



Town of Paradise Valley

6401 E Lincoln Dr
Paradise Valley, AZ 85253

Action Report

File #: 17-234

TO: Mayor Collins and Town Council Members

FROM: Kevin Burke, Town Manager
Duncan Miller, Town Clerk

DEPARTMENT: Town Manager

AGENDA TITLE:
Consideration of Requests for Future Agenda Items

Council Goals or Other Policies / Statutory Requirements:
Resolution Number 1250: Town Council Rules of Procedure

RECOMMENDATION:
Review the current list of pending agenda topics.

SUMMARY STATEMENT:
Attached is the most recent Town Council Study Session Topic Schedule. Pursuant to the Council's Rules and Procedures as adopted by Resolution Number 1250, any member of the Council may move to have the Town Manager add a new agenda item to a future agenda. Upon concurrence of three or more Members, which may include the Mayor, the item will be added to the list of future agenda items and placed on a meeting agenda within sixty days. Reminder is provided that any discussion on the motion to add a future agenda item shall be limited to the propriety of placing such item on a future agenda and shall not include discussion on the merits of the topic itself.

BUDGETARY IMPACT:
None

ATTACHMENT(S):
Future agenda topics schedule

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TOWN COUNCIL STUDY SESSION TOPIC SCHEDULE
June 16, 2017

August TBD	09/14	09/28	10/12
	4 PM STUDY SESSION • Storm Drainage Design Manual • Alarm Monitoring Service RFP • Short-Term Rental Ordinance **EXECUTIVE SESSION** Judge Reappointments **PRESENTATION** **CONSENT** **PUBLIC HEARING** **ACTION ITEMS** **STUDY SESSION CONTINUED** • Council Goals TBD	**4 PM STUDY SESSION** • Governance Discussion • Single Hauler Trash RFP **EXECUTIVE SESSION** **PRESENTATION** **CONSENT** **PUBLIC HEARING** **ACTION ITEMS** • Judge reappointments **STUDY SESSION CONTINUED** • Council Goals TBD	**4 PM STUDY SESSION** **EXECUTIVE SESSION** **PRESENTATION** **CONSENT** **PUBLIC HEARING** **ACTION ITEMS** **STUDY SESSION CONTINUED** • Council Goals TBD

10/26	11/02	11/16	12/07
4 PM STUDY SESSION **EXECUTIVE SESSION** **PRESENTATION** **CONSENT** **PUBLIC HEARING** **ACTION ITEMS** **STUDY SESSION CONTINUED** • Council Goals TBD	**4 PM STUDY SESSION** **EXECUTIVE SESSION** **PRESENTATION** **CONSENT** **PUBLIC HEARING** **ACTION ITEMS** **STUDY SESSION CONTINUED** • Council Goals TBD	**4 PM STUDY SESSION** **EXECUTIVE SESSION** **PRESENTATION** **CONSENT** **PUBLIC HEARING** **ACTION ITEMS** **STUDY SESSION CONTINUED** • Council Goals TBD	**4 PM STUDY SESSION** **EXECUTIVE SESSION** **PRESENTATION** **CONSENT** **PUBLIC HEARING** **ACTION ITEMS** **STUDY SESSION CONTINUED** • Council Goals TBD

Items to be scheduled

1. Visually Significant Corridors Master Plan
2. Hillside Code Updates
3. Bicycle / Pedestrian Master Plan
4. Town Triangle Development
5. Code Update – reimbursement for outside review of certain plan submittals
6. Emergency Planning
7. Ritz Carlton Area C Final Plat
8. Committee Updates