CivTech

March 15, 2017

Mr. Michael Surguine
Sanctuary on Camelback Mountain Resort & Spa
5700 East McDonald Drive
Paradise Valley, Arizona 85253

RE: **The Views Ballroom Expansion and Interstitial Bungalows –**
Partial Response to Statement of Direction from Town Council

Dear Mr. Surguine:

The letter is in response to items discussed by Paradise Valley's Town Council in study sessions on February 9 and 23, 2017 and subsequently included in a Statement of Direction (SOD), a draft of which was reviewed by the Council at the former session, and approved at the latter session. The subject of the discussion was, of course, recent improvements proposed for the Sanctuary on Camelback Mountain Resort & Spa.

BACKGROUND

This is not CivTech's first involvement with improvements proposed for The Sanctuary. CivTech completed the *Sanctuary Resort Parking Analysis* in February 2012, the *Jade Bar at Sanctuary Camelback Mountain Parking Analysis* on February 25, 2013 and a formal amendment to the Jade Bar analysis in was completed at the end of August 2014. Amendment No. 2, completed in January 2017 and another component of the current submittal package, provides additional details regarding the original study and Amendment No. 1.

PROPOSED IMPROVEMENTS

The proposed improvements now before Council include a 2,189-square foot (SF) expansion of The Views Ballroom and up to 45 new rental units, known as "interstitial bungalows," within the existing Casitas area, an area of the resort in which all of the units are rental units. The architect indicated to CivTech that, per the International Building Code (an industry reference), the ballroom expansion would accommodate 146 additional guests at 15 SF per person.

ISSUES

The SOD provides a list of five issues to be discussed. As many as three may be linked to traffic engineering and parking: the other two are in regard to the locations of utilities and architectural renderings. The primary one that will be addressed below is that "Traffic and circulation shall be studied." In addition, in order to make certain that all of the councilmembers traffic-related concerns are addressed herein, CivTech reviewed the Town's archived video footage of the two sessions. Before addressing the primary issue, in order to demonstrate that CivTech did consider all of the potential issues, CivTech will briefly address the other two, which are only remotely related to traffic engineering and on-site parking.

Item 1. "The applicant must identify the location of on-site retention basins and how this may affect parking and circulation." The video footage showed that the councilmember was concerned

how additional run off from any new impervious surfaces (parking areas, etc.) would affect cart paths, how the patterns of run off might be affected, etc.

Response: As traffic engineers, CivTech's specialty is not expert in the area of drainage, a specific discipline within the broader category of civil engineering. CivTech presumes that a drainage engineer will provide the necessary calculations required by the Council. CivTech does suggest another, quick way to look at the issue. The existing lot coverage documented in the SOD is 19.1 percent. It will increase to 20.5 percent, an increase of 1.4 percentage points. Since 1.4 percent is 7.3 percent of the base lot coverage of 19.1 percent, it can be estimated that runoff across the property would average 7.3 percent (or 1/14th) higher wherever there is runoff. If the runoff is 1 inch, it would increase to 1.07 inches, not an appreciably noticeable difference to motorized vehicles or pedestrians.

Item 2. "The hours of operation of the snack bar and pool area shall be reviewed."

Response: The snack bar and pool are non-trip and parking-space generating amenities for residents and guests. Therefore, neither affects the previous parking analysis.

Other Issues. In the videos of the study sessions, CivTech heard councilmembers specifically express concerns about these other following issues, which will be addressed in the discussion that follows on traffic, parking, and circulation:

- How the improvements will affect "parking and circulation."
- The improvements' impacts on the sole site access at McDonald Drive (which is more-accurately described as the Town's intersection of Superstition Lane, which is a public street south to Starlight Way, and McDonald Drive) the impact of additional site traffic along McDonald Drive.
- The staff parking seems to one councilmember to be always full now. Will the new interstitial bungalows require more staff and, if so, where will those new staff members park?
- How do ride-sourcing services such as Uber, Lyft, and Sidecar (the three largest of such services) affect trip generation?

TRAFFIC, PARKING, AND CIRCULATION

In order to respond to several of the issues raised above, a first step would be to estimate the number of trips generated by the improvements. Before doing so, it should be noted that the trip generation data used by CivTech were published in 2012. These are published in the 9th Edition of the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*. This was before the cell phone-facilitated phenomenon known as "ride-sourcing services" operated by "transportation network companies" (TNCs) had manifested itself to the degree it has since in American society.

Uber, founded in 2009, is the only one of the largest three companies operating such services (the others are Sidecar, founded in 2011, and Lyft, founded in 2012) to have been around long enough to have had any possible effect on the traffic data recorded for and submitted to the ITE for inclusion in the 2012 manual that CivTech uses. And, CivTech would point out, this effect would be minimal since new data is simply aggregated with long-standing data recorded before such services, some of which could have been recorded decades before. Therefore, before the trips generated are calculated, CivTech will begin by addressing the council-identified issue of what has been dubbed the "Uber effect."

Uber Effect

To understand the Uber effect, CivTech first conducted some on-line research to determine if there have been any studies that have measured the Uber effect. (The details of the technology, how it works, etc., are not important here.) Per a 2015 Masters' Thesis, demand for ride-sourcing services "has spread rapidly and become more important in urban transport [because] Companies such as Uber and Lyft may provide better service with less waiting time and higher vehicle occupancy when compared to traditional transportation services such as private auto, public transit and taxis." (Chen, Zhen, *Impact of Ride-Sourcing Services on Travel Habits and Transportation Planning*, University of Pittsburgh, 2015.) In fact, another degree candidate, in her thesis, "predict[ed] that at current conditions, TNCs such as Uber and Lyft will overtake taxi services. Thus, the taxi industry must focus on increasing TNC regulation, creating innovative technology, and modifying its service to appeal to consumers." (Wang, Alice, *The Economic Impact of Transportation Network Companies on the Taxi Industry*, Scripps College, April 2015.)

But has the so-called Uber effect been measured yet? The authors of *Factors Affecting Passenger Travel Demand In The United States: A White Paper from the National Center for Sustainable Transportation*, a study published in draft form in November 2015, indicate on page 6 that "new *shared mobility* options, such as…on-demand ride services (e.g. Uber) may also impact the current trends…However, new mobility options are a recent phenomenon: most of their impacts on travel demand and mode choice are expected to happen in future years" [Circella, et al., 2015. Emphasis in original.]

Although each of these studies cites several other studies, the focus of such studies tend away from asking the specific questions to which the councilmembers would like answers. Rather than focusing on how trips to a resort might be affected by use of these services, the rsearch topics are much larger: will total vehicle miles traveled (VMT) each day in a particular urban area be reduced by the use of such services, will they affect the use of public transit, etc.

The consensus in early 2017 seems to be that ride-sourcing services have not yet reached peak usage and that they could eventually replace taxi services if taxi service providers do not become more competitive, convenient, etc. And, even as ride-sourcing increases the effect could be that it simply replaces taxi rides among a certain, generally-younger tech-savvy segment of the population, growing in use as that population grows.

For The Sanctuary, as long as the percentage of out-of-area guests not renting vehicles remains essentially the same as it is now, there would be little or no net effect on trip generation since these ride-sourcing services such as Uber, Lyft, and Sidecar operate similarly to taxi cabs with each ride to or from the site requiring two trips (one in, one out) and no permanent parking spaces required. Vehicles rented by guests arriving at an airport result in only half as many trips while requiring a parking space: one trip in upon arriving, a parking space while the vehicles is on-site, and one trip out when leaving the site (for a meal, sightseeing, or after checkout).

Parking

As noted, CivTech prepared Amendment No. 2 to address the increase in the number of parking spaces warranted by the 45 new guest units. CivTech reviewed its other previous studies and did not find the expansion of The Views to be accounted for in any of those previous documents. Nor was CivTech directed to revise/update Amendment No. 2 to include the extra ballroom floor area, only to prepare a report to address the concerns of the Town Council expressed in the February

study sessions and conveyed via the SOD. Given that, CivTech elected to address the issue as briefly as possible here.

Attachment 1 is an updated version of Attachment 2 to Amendment No. 2. The conference floor area has been increased by 2,189 from 6,211 SF to 8,400 SF. The net effect of this expansion is to warrant 39 more parking spaces overall (from 113 to 152) or 31 additional shared spaces during the busiest time of the weekend evening (from 8:00-9:00 PM, when eighty percent of them would be needed) to a total of 371 shared parking spaces required as compared to the prior total of 340. Amendment No. 2 indicates that there would be a total of 391 parking spaces available on-site after all of the improvements are made with the interstitial bungalows. Therefore, the peak shared-parking usage (371 spaces) from 8:00-9:00 PM on a weekend evening remains below the number of spaces to be provided on-site (391 spaces) and no additional parking is warranted to accommodate The Views ballroom expansion.

Employee Parking. The comment regarding employee parking originated with a councilmember who lives in the area and frequently walks along McDonald Drive past the site. The councilmember noted that the lot often appears to be full and wondered out loud if it could accommodate additional employee vehicles. CivTech concurs that an additional 45 rooms would likely require the hiring of additional staff to clean the rooms and serve in various capacities the additional guests. CivTech is not equipped to address this issue and must defer to the property owner/manager in regard to the availability of sufficient employee parking.

Traffic

With respect to the traffic effects of the proposed improvements, the ITE *Trip Generation Manual* provides sufficient data to estimate the number of trips per day and per peak hour generated by the 45 new guest units. However, the increase in floor area of the ballroom is not specifically addressed, as ballrooms are ancillary to the hotel. Hence, the trip generation table is a hybrid that calculates trips generated by the rooms and estimates trips for the additional ballroom based on the additional parking spaces required to accommodate the additional 146 guests, which, as indicated above, is 39* spaces. It is possible for two (or more, potentially) separate events, events that require the entire ballroom, to be scheduled in that ballroom in a day, so CivTech estimated trips for two events, an all-day corporate-type event and an evening affair. In this way, the PM peak hour could have trips both leaving arriving and arriving, the most conservative of all potential trips generation scenarios for the ballroom. In addition, there is no weekday trip generation rate for resort hotel rooms, so an estimated rate was used to calculate the average daily total (ADT) only. **Table 1** is the detailed trip generation for the proposed improvements.

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* *The total of 39 assumes ten percent of those attending events in the ballroom/conference area are resort guests. While the number of spaces required for just the expansion area calculates to more than 43, when aggregated with the existing conference area, the actual increase is just 43, ninety percent of which is 39 spaces.*

Table 1 – Trip Generation

Land Use	ITE LUC	ITE Land Use Name	Quantity Units	AM Distribution In	AM Distribution Out	PM Distribution In	PM Distribution Out
Interstitial Bungalows	330	Resort Hotel	34 Rooms	72%	28%	43%	57%
The Views Ballroom Expansion	n/a	n/a	2.189† KSF*	100%	0%	50%	50%

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
Interstitial Bungalows	8.00‡	360	0.52+	17	7	24	0.42	8	11	19
The Views Ballroom Expansion		78		39	0	39		39	39	78
Totals		438		56	7	63		47	50	97

* KSF = 1,000 Square Feet
† Floor area shown is gross floor area of ballroom expansion only.
‡ Daily rate not published; value is estimated

+Note: Average rates were calculated by generating trips using equations for and dividing by total number of dwelling units. (See below.)

CALCULATIONS (Equations shown only where available)			
Land Use [Units]	***Daily***	***AM Peak Hour***	***PM Peak Hour***
Resort Hotel	Not available.	T_{AM} = 45 x 0.35 + 7.42 = 24	Not available.

A review of the trip generation detailed in **Table 1** reveals that the proposed 45 interstitial bungalows and the 2,189-SF expansion of The Views ballroom are expected to generate fewer than 450 trips per day with 63 occurring during the AM peak hour (56 in/7 out) and 97 occurring during the PM peak hour (47 in/50 out).

Impact of Site Traffic on Superstition Lane/McDonald Drive Intersection and on McDonald Drive. Since The Sanctuary has but one site access, councilmembers expressed concern about the impact of these additional trips on the intersection of the site driveway with McDonald Drive. The related impact of the additional trips on McDonald drive in general were also questioned. First the issue of the classification of McDonald Drive needs to be addressed.

Classification of McDonald Drive. During a council study sessions, one of the councilmembers was heard to remark that McDonald Drive is a "residential street." Unfortunately, that is not the case in terms of how it functions. In chapter 4 of the ITE book, *Transportation and Land Development*, the authors describe how "Local streets serve to provide land access…Movement on local streets is incidental and involves traveling to or from a collector facility. Therefore, the trip length on the local street is short." A collector facility "provides both land access and movement within residential…areas. Collectors penetrate, but should not have continuity through, residential areas." The ITE's *Guidelines for Residential Subdivision Street Design*, adds that "*Collector* streets have the primary purpose of intercepting traffic from intersecting local streets and carrying this movement to the nearest major streets. A secondary function is service to abutting land use." [All emphasis in the original.] The *Guidelines* also add for local streets that "morning peak hour traffic [is] about 7 percent to 8 percent and afternoon peak hour traffic about 10 percent of ADT [Average Daily Traffic]." The Maricopa County Department of Transportation *MCDOT Roadway Design Manual* indicates that Major Collector roadways (collector roadways longer than one-half mile) can be expected to carry up to 8,500 vehicles per day (vpd) with just a single through lane in each direction. (It should be noted that the presence of a continuous two-way left turn lane and/or raised medians, both of which can be found along McDonald Drive, tends to allow some additional capacity as left-turning vehicles have a refuge in which they can safely wait to turn, thus not delaying vehicles traveling through and increasing the capacity in this manner.) Therefore, because McDonald Drive is longer than one-half mile and it carries traffic from the several residential streets intersecting it to major streets on either end (Scottsdale Road, Tatum Boulevard), McDonald Drive functions not only as a collector road, it should be considered

to be a Major Collector roadway. The next section addresses existing traffic volumes on McDonald Drive.

Existing McDonald Drive Traffic Volumes. As noted above, as a Major Collector street, McDonald Drive could be expected to carry traffic volumes of 8,500 vpd. The Town recorded peak hour turning movements during three peak periods (AM, midday, and PM) at several intersections in early 2014 and made those available on-line. One of those intersections was Tatum Boulevard at McDonald Drive. In 2015, in conjunction with its traffic study for the new Ritz-Carlton resort ow under construction at Mockingbird Land and McDonald Drive, CivTech recorded AM and PM peak hour turning movement counts on McDonald Drive at Scottsdale Road and at Mockingbird Lane. The total eastbound and westbound movements approaching and/or departing these intersections are summarized in **Table 2**. Daily volumes can be estimated from the AM and Pm peak hour counts by dividing the hourly segment volume by the percentage-of-daily factors cited above, 8 percent for AM and 10 percent for PM. Copies of the traffic counts can be found as **Attachment 2**.

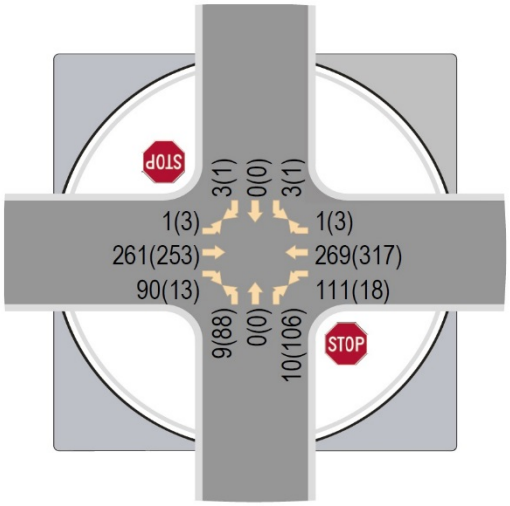
Table 2 – Traffic Volumes

Intersection *McDonald Drive at:*	**Peak Period (Factor)**	**Volume East of Intersection EB/WB/Total (vph)**	**Volume West of Intersection EB/WB/Total (vph)**	**Estimated 2-Way ADT (vpd)**
Scottsdale Road	AM (8%)	---	379 / 445 / 824	10,300
	PM (10%)	---	315 / 330 / 645	6,450
Mockingbird Lane	AM (8%)	---	271 / 338 / 609	7,615
	AM (8%)	296 / 319 / 615	---	7,690
	PM (10%)	---	261 / 333 / 594	5,940
	PM (10%)	256 / 329 / 585	---	5,850
Tatum Boulevard	AM (8%)	254 / 229 / 483	---	6,040
	PM (10%)	266 / 263 / 529	---	5,290

Since the Town did not report any roadway segment volumes, that is, volumes recorded over the course of a day or more, CivTech added a column to **Table 2**. The column is an estimate of daily volumes (ADTs) based on segment volumes during the peak hours and are calculated by dividing the hourly volume by either eight percent (AM) or ten percent (PM). A review of these results tends to show that the weekday volumes along McDonald Drive may be between 5,300 vpd and 7,700 vpd between Tatum Boulevard and Mockingbird Lane. (Please note that the substantially higher volumes immediately west of Scottsdale Road can be ascribed to the high-trip generating retail and office uses on both western corners of the intersection. To provide the capacity necessary for these trips, the City of Scottsdale has added several more lanes on the eastbound McDonald Drive approach to Scottsdale Road.) If the existing volumes on McDonald Drive are between 6,000 and 8,000 vpd as estimated, there is sufficient capacity to accommodate the additional weekday trips anticipated from the proposed expansion of The Sanctuary.

Impact on Superstition Lane/McDonald Drive Intersection. CivTech was not able to record turning movement volumes at intersection of Superstition Lane at McDonald Drive in the time allotted to prepare this study. In order to keep the approval process moving forward, for purposes of this study CivTech used eastbound and westbound traffic volumes on McDonald Drive from **Table 2** to simulate McDonald Drive approach volumes, volumes that include existing site driveway traffic as well as trips generated by some of The Sanctuary's neighbors to the east and the Nauni Valley

neighborhood on the north side of McDonald Drive. (Nauni Valley Drive, a private road that serves the neighborhood, intersects McDonald Drive across from Superstition Lane.) The volumes were "balanced," that is, adjusted to show the number of vehicles entering intersection as the number leaving the intersection. The balancing added trips to several of the through movements; none of the recorded through movements was reduced, resulting in a conservative analysis.



Superstition Ln/Nauni Vly Dr @ McDonald Dr

Figure 1 – Estimated AM (PM) Turning Movements

CivTech estimated the number of site trips generated by The Sanctuary's existing facilities and added to these estimates the trips anticipated during peak hours. For the ballroom, for example, since all of the new total of 152 parking spaces (113 existing, all of which would be in the existing traffic volumes on McDonald Drive, plus 39 new) would be needed just before an all-day event that begins at 9 AM, 152 trips would be considered as entering from 8-9 AM, just as those same 152 trips would be considered to be exiting from 5-6 PM after the event. Trips for the new total of 174 guest units were estimated using the same trip generation rates or equations as found in **Table 1**.

Table 3 – Intersection Level of Service Criteria

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

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

** In addition, any movement that operates with a volume-to-capacity ratio greater than 1 (V:C>1), is considered to be operating at LOS F, no matter the control delay.*

Figure 1 shows CivTech's estimated future AM and PM peak hour turning movement volumes at the intersection of Superstition Lane/Nauni Valley Drive and McDonald Drive. CivTech conducted a (very) preliminary intersection level-of-service analysis for the intersection. The concept of level of service (LOS) uses qualitative measures that characterize operational conditions within the traffic stream. The analysis considers factors that include speed, travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. At intersections, levels of service are defined within ranges of "average control delay per vehicle," that is, the number of seconds a vehicle can expect to wait due to the presence of a traffic control device. For reference, **Table 3** lists the level of service criteria for signalized and unsignalized intersections: LOS A represents the best operating conditions and LOS F the worst. Please note that levels of service are not calculated for uncontrolled and/or unopposed movements, such as through movements and right turns. Levels of service are calculated for left turn movements because they are opposed and a driver could be delayed by opposing through traffic.

Table 4 summarizes the preliminary intersection level-of-service analysis for the intersection using the volumes in **Figure 1**. **Attachment 3** contains both printouts from the Synchro traffic analysis software, which uses the analysis methodology outlined in the latest (2010) edition of the *Highway Capacity Manual* for a two-way stop-controlled (TWSC) intersection. A review of the

results summarized in **Table 3**, reveals that, with conservative estimated turning movement volumes, the intersection stop-controlled northbound Superstition Lane and southbound Nauni Valley Drive approaches to McDonald Drive should operate at acceptable levels of service of not less than LOS C with an average control delay of not more than 17.1 seconds per vehicle.

Table 4 – TWSC LOS Analysis Summary
Superstition Lane & McDonald Drive

Movement	AM LOS (delay)	PM LOS (delay)
NB Shared (Stop)	C (15.1 sec)	C (17.1 sec)
SB Shared (Stop)	B (14.9 sec)	B (14.0 sec)
EB Left	A (7.8 sec)	A (8.0 sec)
WB Left	A (8.4 sec)	A (7.9 sec)

Circulation

The final issue to be addressed is on-site circulation. CivTech does not anticipate any on-site circulation issues with the addition of perhaps 100 total trips in either peak hour for several reasons. These trips represent, on average, fewer than one new trip per minute in either direction of the internal roadway network, trips that are further diluted as they travel via various routes to different destinations on-site. Also, CivTech previously documented that, if necessary, The Sanctuary would employ valets to park vehicles. The use of valets not only allows a greater density of parking, it provides a greater consistency of travel throughout the site as the valets are generally more familiar with the site than infrequent guests and with each other's driving habits. The few neighbors that live along Starlight Way that may use Superstition Lane, if they are aware of large events at The Sanctuary, have alternate routes to McDonald Drive (Dragoon Lane and Cameldale Way) and, therefore, should not be inconvenienced by traffic for such an event.

CONCLUSIONS AND RECOMMENDATIONS

An addition of 45 interstitial bungalows and a 2,189-SF expansion of The Views ballroom are being proposed for The Sanctuary on Camelback Mountain Resort & Spa. This study has been prepared to address issues raised by the Town Council regarding traffic, parking, and circulation not address in previous studies or amendments to those studies.

From the foregoing, the following can be concluded:

- For The Sanctuary, as long as the percentage of out-of-area guests not renting vehicles remains essentially the same as it is now, there would be little or no net effect on trip generation since ride-sourcing services such as Uber, Lyft, and Sidecar operate similarly to taxi cabs.
- The peak shared-parking usage (371 spaces) from 8:00-9:00 PM on a weekend evening remains below the number of spaces to be provided on-site (391 spaces) and no additional parking is warranted to accommodate The Views ballroom expansion.
- The proposed 45 interstitial bungalows and the 2,189-SF expansion of The Views ballroom are expected to generate fewer than 450 trips per day with 63 occurring during the AM peak hour (56 in/7 out) and 97 occurring during the PM peak hour (47 in/50 out).
- If the existing volumes on McDonald Drive are between 5,300 and 7,700 vpd as estimated, there is sufficient capacity to accommodate the additional weekday trips anticipated from the proposed expansion of The Sanctuary.
- With conservative estimated turning movement volumes, the intersection stop-controlled northbound Superstition Lane and southbound Nauni Valley Drive approaches to McDonald Drive should operate at acceptable levels of service of not less than LOS C with an average control delay of not more than 17.1 seconds per vehicle..

- CivTech does not anticipate any on-site circulation issues with the addition of perhaps 100 total trips in either peak hour for several reasons documented in the study.

Thank you. If you have any questions or comments, please contact me at (480) 659-4250.

Sincerely,

Joseph F. Spadafino, P.E., PTOE, PTP
Project Manager/Senior Traffic Engineer

Attachments (3)

Ultimate
(Spa Expansion with Bungalows)

WEEKEND

APPENDIX D
PEAK USE SHARED PARKING CALCULATIONS
WEEKEND

Land Use	Sanctuary														SHARED PARKING DEMAND
	Resort Guest Rooms		Resort Employees		Restaurant		Conference		Spa		Retail		Residential		
Gross Size	174~~125~~ Rooms		3,529 SF		6,349 SF		8,400~~6,411~~ SF		10,247 SF		640 SF		0 Units		
Percent Adjustment	None		None		None		None		None		None		None		
Net Size	174 Rooms		3,529 SF		6,349 SF		8,400 SF		10,247 SF		640 SF		48 Units		
Parking Rate	1.2 /Room		1 /300 SF		1 /50 SF		1 /50 SF		1 /300 SF		1 /300 SF		1.2 /Unit		
Req-d Spaces	210		15		45		152		19		2		0		
Adjustments	None		None		w/ 75% Non guest		w/ 90% Non-guest (ballroom) & 90% Non-guest (Lawn)		w/ 60% Non-guest		w/ 60% Non-guest		None		
Time of Day	**% OF PEAK**	**# OF SPC**	**% OF PEAK**	**# OF SPC**	**% OF PEAK**	**# OF SPC**	**% OF PEAK**	**# OF SPC**	**% OF PEAK**	**# OF SPC**	**% OF PEAK**	**# OF SPC**	**% OF PEAK**	**# OF SPC**	**TOTAL SPACES**
6:00 AM	100%	210	60%	9	20%	9	0%	0	5%	1	0%	0	0%	0	229
7:00 AM	100%	210	70%	11	20%	9	0%	0	10%	2	3%	1	0%	0	233
8:00 AM	100%	210	100%	15	20%	9	50%	76	40%	8	10%	1	0%	0	319
9:00 AM	70%	147	100%	15	20%	9	100%	152	55%	11	30%	1	0%	0	335
10:00 AM	65%	137	100%	15	20%	9	100%	152	75%	15	45%	1	0%	0	329
11:00 AM	65%	137	100%	15	30%	14	100%	152	90%	18	70%	2	0%	0	338
12:00 PM	65%	137	100%	15	30%	14	100%	152	100%	19	85%	2	0%	0	339
1:00 PM	65%	137	100%	15	45%	21	100%	152	100%	19	95%	2	0%	0	346
2:00 PM	65%	137	100%	15	45%	21	100%	152	100%	19	100%	2	0%	0	346
3:00 PM	65%	137	100%	15	45%	21	100%	152	100%	19	100%	2	0%	0	346
4:00 PM	70%	147	100%	15	45%	21	100%	152	85%	17	90%	2	0%	0	354
5:00 PM	75%	158	100%	15	60%	27	80%	122	65%	13	75%	2	0%	0	337
6:00 PM	80%	168	85%	13	90%	41	80%	122	35%	7	65%	2	0%	0	353
7:00 PM	90%	189	80%	12	95%	43	80%	122	15%	3	10%	1	0%	0	370
8:00 PM	90%	189	75%	12	100%	45	80%	122	10%	2	10%	1	0%	0	371
9:00 PM	90%	189	70%	11	100%	45	80%	122	5%	1	10%	1	0%	0	369
10:00 PM	90%	189	60%	9	40%	18	80%	122	0%	0	0%	0	0%	0	338
11:00 PM	100%	210	50%	8	20%	9	80%	122	0%	0	0%	0	0%	0	349
MIDNIGHT	100%	210	50%	8	0%	0	80%	122	0%	0	0%	0	0%	0	340
Number of Parking Spaces With Shared Parking for Sanctuary															**371**
Number of Non-Shared Parking Spaces Required by City Code for Sanctuary															**443**

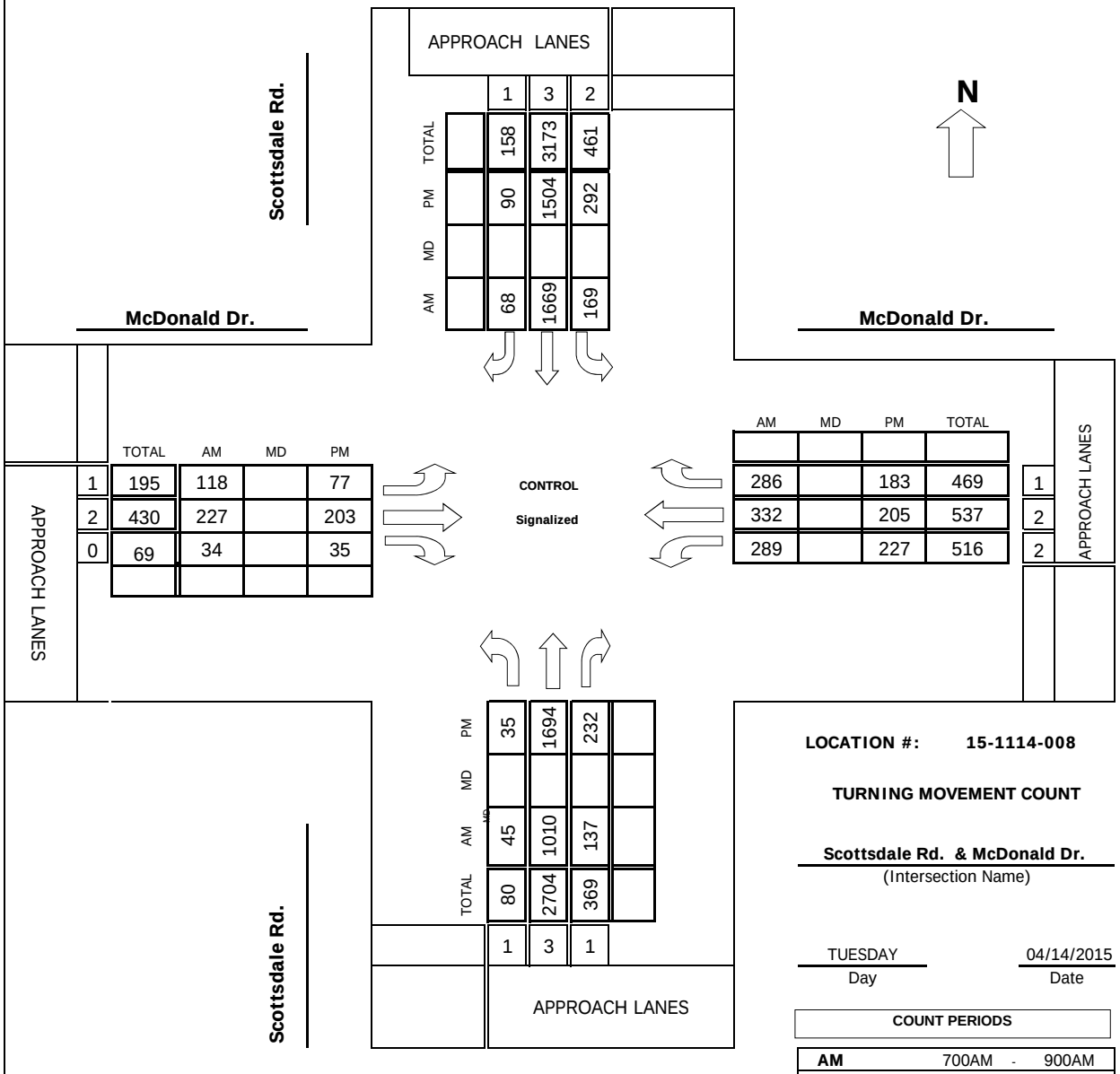
Attachment 1

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.



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

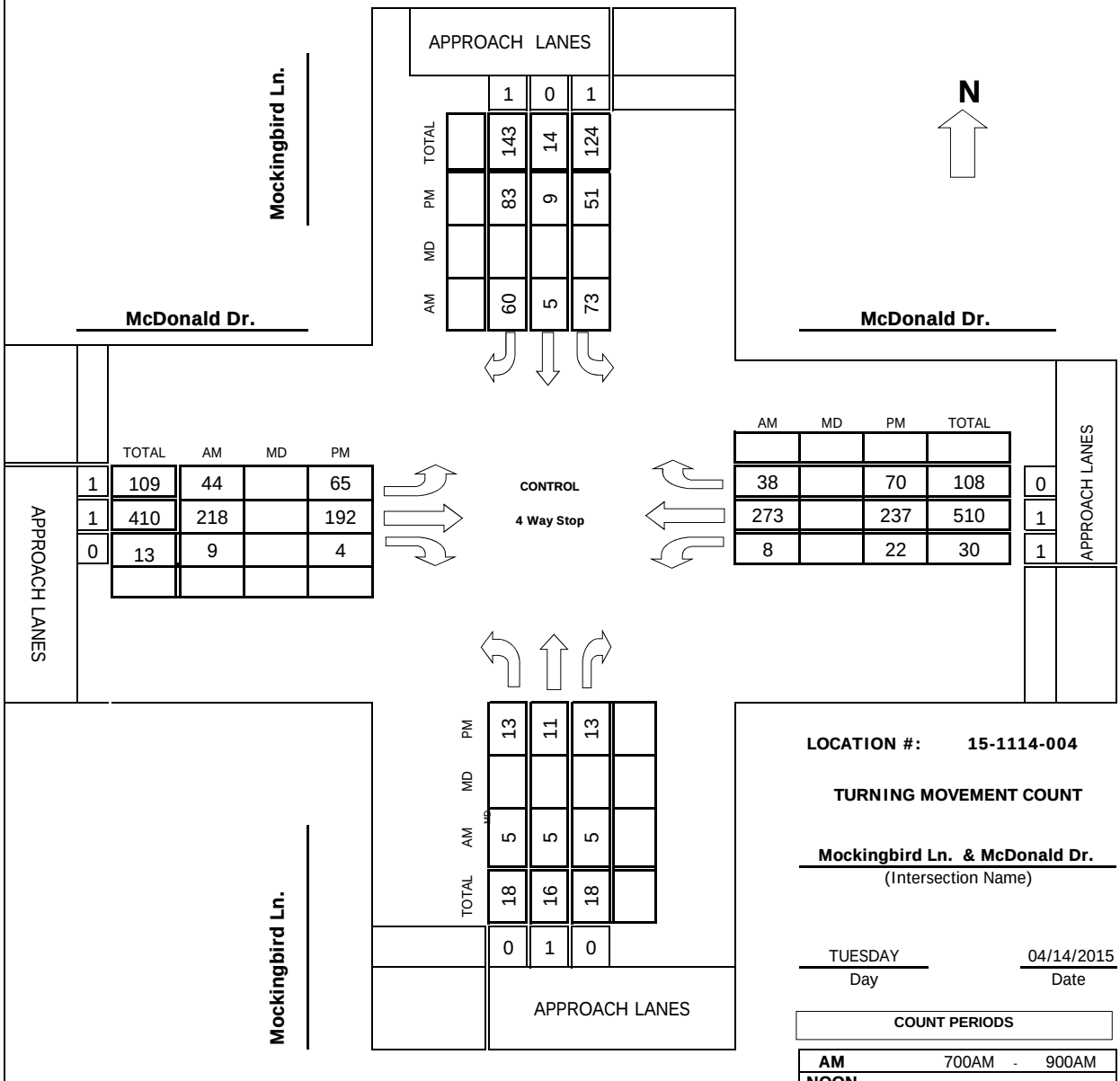
PM PEAK HOUR 445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 15-1114-004

TMC SUMMARY OF Mockingbird Ln. & McDonald Dr.



LOCATION #: 15-1114-004

TURNING MOVEMENT COUNT

Mockingbird Ln. & McDonald Dr.
(Intersection Name)

TUESDAY (Day) 04/14/2015 (Date)

COUNT PERIODS

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

AM PEAK HOUR 800 AM

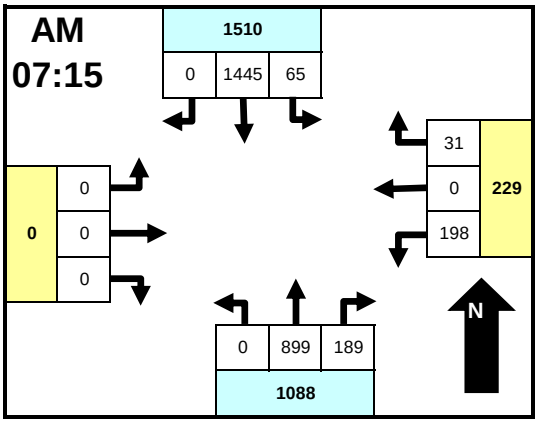
NOON PEAK HOUR

PM PEAK HOUR 500 PM

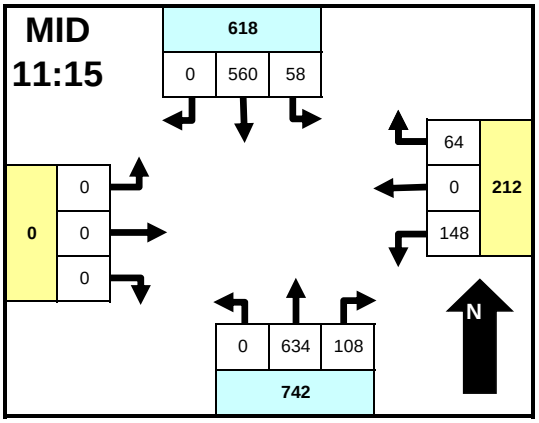
TRAFFIC RESEARCH & ANALYSIS, INC.
Specializing in Traffic Data Collection

Traffic Research & Analysis, Inc.
3844 East Indian School Road
Phoenix, AZ 85018
(602) 840-1500

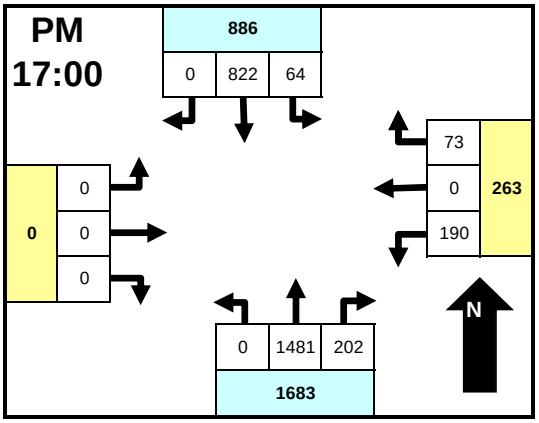
Intersection TMC: 1400028
Count Date: 01/28/2014



	From North				From East				From South				From West				INTSEC
	TATUM BLVD				MCDONALD RD				TATUM BLVD				NONE				
Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
7:00	12	219	0	0	23	0	10	0	0	139	22	0	0	0	0	0	425
7:15	16	375	0	0	50	0	4	0	0	189	41	0	0	0	0	0	675
7:30	12	359	0	0	66	0	9	0	0	253	53	0	0	0	0	0	752
7:45	13	344	0	0	48	0	9	0	0	242	60	0	0	0	0	0	716
8:00	24	367	0	0	34	0	9	0	0	215	35	0	0	0	0	0	684
8:15	17	324	0	0	38	0	9	0	0	193	36	0	0	0	0	0	617
8:30	23	313	0	0	36	0	13	0	0	193	32	0	0	0	0	0	610
8:45	22	218	0	0	34	0	8	0	0	210	33	0	0	0	0	0	525
Total	139	2519	0	0	329	0	71	0	0	1634	312	0	0	0	0	0	5004
Peak	65	1445	0	0	198	0	31	0	0	899	189	0	0	0	0	0	2827



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
11:00	19	135	0	0	32	0	16	0	0	134	39	0	0	0	0	0	375
11:15	14	146	0	0	39	0	17	0	0	142	29	0	0	0	0	0	387
11:30	11	145	0	0	41	0	13	0	0	169	21	0	0	0	0	0	400
11:45	18	135	0	0	29	0	12	0	0	168	28	0	0	0	0	0	390
12:00	15	134	0	0	39	0	22	0	0	155	30	0	0	0	0	0	395
12:15	11	172	0	0	18	0	5	0	0	133	18	0	0	0	0	0	357
12:30	15	134	0	0	24	0	23	0	0	151	28	0	0	0	0	0	375
12:45	13	158	0	0	33	0	22	0	0	166	42	0	0	0	0	0	434
Total	116	1159	0	0	255	0	130	0	0	1218	235	0	0	0	0	0	3113
Peak	58	560	0	0	148	0	64	0	0	634	108	0	0	0	0	0	1572



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
16:00	15	177	0	0	47	0	19	0	0	251	39	0	0	0	0	0	548
16:15	16	158	0	0	40	0	28	0	0	304	47	0	0	0	0	0	593
16:30	8	232	0	0	42	0	26	0	0	305	42	0	0	0	0	0	655
16:45	20	183	0	0	49	0	16	0	0	309	43	0	0	0	0	0	620
17:00	19	209	0	0	53	0	18	0	0	377	60	0	0	0	0	0	736
17:15	10	220	0	0	29	0	8	0	0	379	48	0	0	0	0	0	694
17:30	15	202	0	0	65	0	24	0	0	363	49	0	0	0	0	0	718
17:45	20	191	0	0	43	0	23	0	0	362	45	0	0	0	0	0	684
Total	123	1572	0	0	368	0	162	0	0	2650	373	0	0	0	0	0	5248
Peak	64	822	0	0	190	0	73	0	0	1481	202	0	0	0	0	0	2832

Intersection Statistics

Per	Peak Hour	Pk Hr Vol	Peak Intvl	Pk Intv Vol
AM	7:15 AM	2827	7:30 AM	752
MID	11:15 AM	1572	12:45 PM	434
PM	5:00 PM	2832	5:00 PM	736

Approach Statistics

Per	Peak Hour	Pk Hr Vol	Peak Hour	Pk Hr Vol	Peak Hour	Pk Hr Vol	Peak Hour	Pk Hr Vol
AM	7:15 AM	1510	7:15 AM	229	7:15 AM	1088		
MID	12:00 PM	652	11:15 AM	212	11:15 AM	742		
PM	4:30 PM	901	4:15 PM	272	5:00 PM	1683		

Comments

Approach & Departure Volumes (No Peds)

Per	Approach	Depart	Approach	Depart	Approach	Depart	Approach	Depart
AM	2658	1705	400	451	1946	2848	0	0
MID	1275	1348	385	351	1453	1414	0	0
PM	1695	2812	530	496	3023	1940	0	0

Attachment 2

Intersection													
Int Delay, s/veh	1.8												
Movement	EBL	EBT	EBR		WBL	WBT	WBR		NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	1	261	90		111	269	1		9	0	10	3	0	3
Future Vol, veh/h	1	261	90		111	269	1		9	0	10	3	0	3
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	575	-	-		575	-	-		-	-	-	-	-	-
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	1	284	98		121	292	1		10	0	11	3	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	293	0	0	382	0	0	871	870	333	874	918	293
Stage 1	-	-	-	-	-	-	335	335	-	534	534	-
Stage 2	-	-	-	-	-	-	536	535	-	340	384	-
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	1269	-	-	1176	-	-	271	290	709	270	272	746
Stage 1	-	-	-	-	-	-	679	643	-	530	524	-
Stage 2	-	-	-	-	-	-	529	524	-	675	611	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1269	-	-	1176	-	-	248	260	709	245	244	746
Mov Cap-2 Maneuver	-	-	-	-	-	-	248	260	-	245	244	-
Stage 1	-	-	-	-	-	-	678	642	-	530	470	-
Stage 2	-	-	-	-	-	-	472	470	-	664	611	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.5	15.1	14.9
HCM LOS			C	B

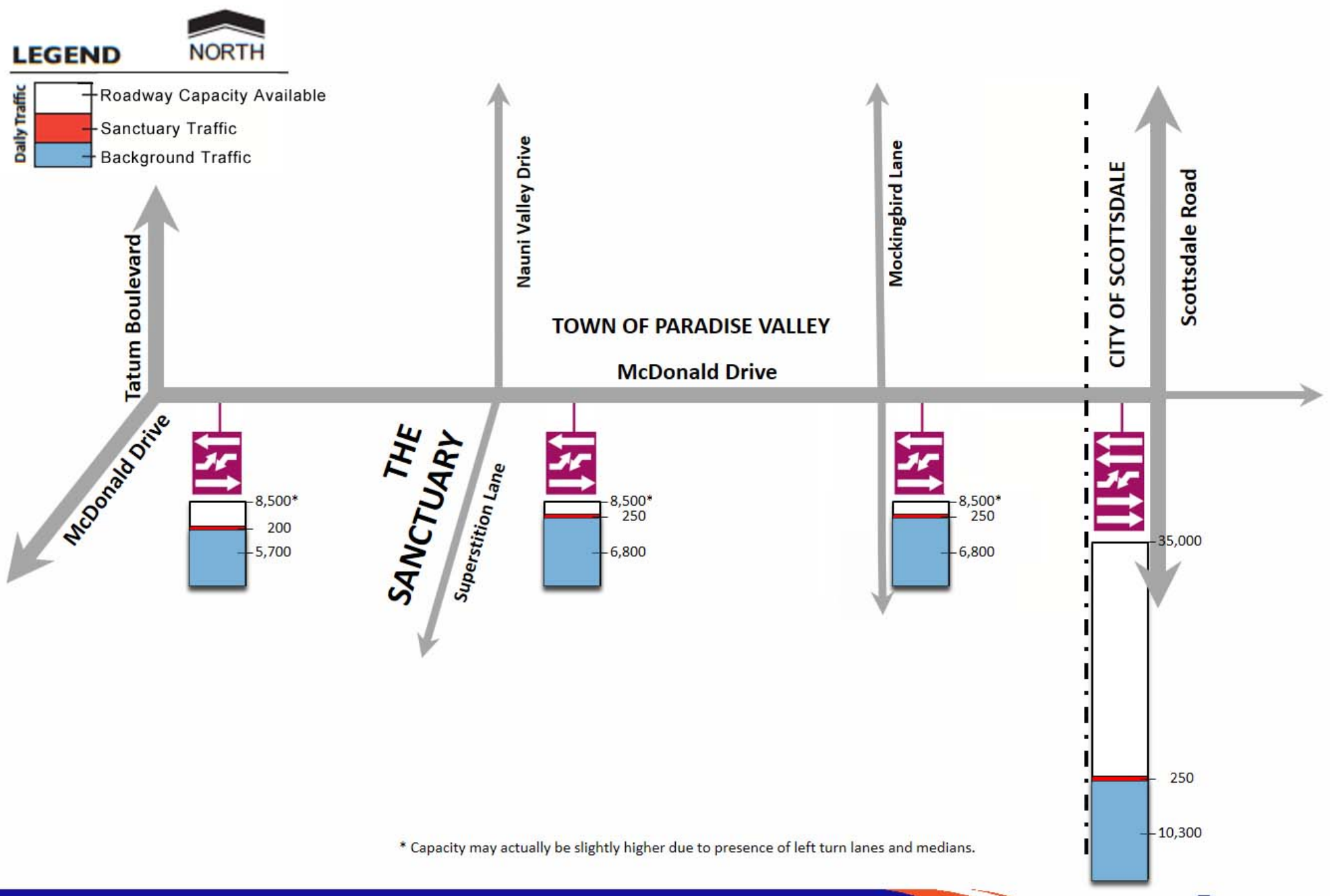
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	377	1269	-	-	1176	-	-	369
HCM Lane V/C Ratio	0.055	0.001	-	-	0.103	-	-	0.018
HCM Control Delay (s)	15.1	7.8	-	-	8.4	-	-	14.9
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.3	-	-	0.1

Intersection													
Int Delay, s/veh	4.4												
Movement	EBL	EBT	EBR		WBL	WBT	WBR		NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	3	253	13		18	317	3		88	0	106	1	0	1
Future Vol, veh/h	3	253	13		18	317	3		88	0	106	1	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	575	-	-		575	-	-		-	-	-	-	-	-
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	3	275	14		20	345	3		96	0	115	1	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	348	0	0	289	0	0	675	676	282	731	681	346
Stage 1	-	-	-	-	-	-	289	289	-	385	385	-
Stage 2	-	-	-	-	-	-	386	387	-	346	296	-
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	1211	-	-	1273	-	-	368	375	757	337	373	697
Stage 1	-	-	-	-	-	-	719	673	-	638	611	-
Stage 2	-	-	-	-	-	-	637	610	-	670	668	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1211	-	-	1273	-	-	362	368	757	282	366	697
Mov Cap-2 Maneuver	-	-	-	-	-	-	362	368	-	282	366	-
Stage 1	-	-	-	-	-	-	717	671	-	636	601	-
Stage 2	-	-	-	-	-	-	626	600	-	567	666	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	17.1	14
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	506	1211	-	-	1273	-	-	402
HCM Lane V/C Ratio	0.417	0.003	-	-	0.015	-	-	0.005
HCM Control Delay (s)	17.1	8	-	-	7.9	-	-	14
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	2	0	-	-	0	-	-	0



* Capacity may actually be slightly higher due to presence of left turn lanes and medians.