CivTech

July 3, 2017

Ms. Michele Hammond, Principal Planner
Berry Riddell LLC
6750 East Camelback Road, Suite 100
Scottsdale, Arizona 85251

Registered Professional Engineer (Civil)
CERTIFICATE NO.
35879
DAWN D.
CARTIER
Date Signed 7.3.17
ARIZONA, U.S.A.
Expires 3-31-2019

Subject: Jones Gordon School

Dear Ms. Hammond:

CivTech understands that a variance to the Special Use Permit (SUP) Stipulation Checklist (1995: Tesseract School) is required to allow Jones Gordon School (JGS) to extend its upper grade limit from 8th to 12th.

The Town of Paradise Valley requested that the applicant retain a registered engineer to address the traffic and parking on the site at full enrollment and including students through the 12th grade. At your request, we have worked with JGS, town staff, the planning commission, and residents in the area to evaluate and address these and other concerns. This letter and its attachments summarize our observations and findings.

Trip Generation

Since JGS is not requesting an enrollment number higher that what Tesseract had, CivTech anticipates no change in the potential number of trips generated by the site. As shown in Table 1, at maximum enrollment (340 students) the school would generate 844 trips per day, with 276 in the morning peak hour and 58 in the evening peak hour. At the anticipated enrollment (160 students), the school would generate 398 daily trips, including 130 in the morning peak hour and 28 in the evening peak hour. Since the number of high school drivers has been limited to 20, the reduction in trips for high school students will be minor and have not been considered herein to maintain a conservative approach to estimating traffic impacts and queueing needs.

Table 1 – JGS Trip Generation

Land Use	ITE LUC	Size		Weekday Generated Trips						
				Daily	AM Peak Hour			PM Peak Hour		
		Quantity	Units	Total	Enter	Exit	Total	Enter	Exit	Total
Private School (K-12)	536	160	Students	398	79	51	130	12	16	28
Private School (K-12)	536	340	Students	844	168	108	276	25	33	58

Trip Distribution and Roadway Capacity

As reflected in Attachment B, CivTech developed a distribution of traffic consisting of 35% to/from the north on Tatum Boulevard, 25% to/from the south on Tatum Boulevard, and 40% to/from the east on Doubletree Ranch Road. Both Tatum Boulevard and Doubletree Ranch Road have significant unused roadway capacity and can easily accommodate the daily school traffic. The traffic anticipated from the JGS should be similar to that already experienced when the Tesseract School was open and operational. Traffic in excess of that experienced with the Tesseract School is not anticipated. **Exhibit C** displays the total roadway capacity, the capacity utilized by other vehicles and the capacity utilized by Jones Gordon School.

On-Site Pick-up/Drop-off Queuing

As shown in Attachments C and D, CivTech evaluated two on-site queuing operational plans for the maximum number of allowable students which yielded the following available storage lengths:

- Single Lane Queue 585 feet
- Dual Lane Queue 745 feet

The maximum queue storage length needed to accommodate 340 students in 575-feet. If less students are enrolled then the queue storage need reduces. These lengths consider the staggered drop-off and pick-up times associated with JGS. They also consider the length required if ½ of the students anticipated with a later start time arrive early. It is unlikely that more than a few students associated with a later stagger would arrive early thus estimating a conservative value for internal queue required to avoid cars backing on to Doubletree Ranch Road. These lengths were calculated by applying a 0.15 vehicle-per-student queuing rate (developed by CivTech in conjunction with several Phoenix-area jurisdictions) and assuming a 22-foot headway distance per vehicle. A reduction of the parallel parking stalls on the east side of the property would be required to implement the dual queue lane option. Should this occur, student parking should be reduced on site so that guests may still be accommodated. Vehicle queueing lengths and recommended circulation is depicted in **Exhibits A and B**.

In the event that queues spillback into Doubletree Ranch Road, the school understands that right- and/or left-turn lanes from Doubletree Ranch Road may be required. It is requested that the taper and queue be shortened to allow all construction for the turn lane along the frontage of JGS without extending past the neighboring property line.

Parking

Attachment D provides a summary of the layout of proposed parking on the site: visitor, staff, and student. A total of 91 spaces are provided.

Typical Day Parking Requirements. For the maximum enrollment of 340 students, the SUP requires 1 space per classroom and one space for each 300 square feet of administrative office area. With 36 classrooms and 1,500 square feet of administrative

offices, a total of 41 parking spaces are required. With 91 spaces available, this leaves 20 spaces for student parking and 30 spaces for visitor parking. This is further summarized in Attachment F.

Event Day Parking Requirements. As summarized in Attachment G, the maximum required parking for a 160-student enrollment would be 71-94 spaces and the maximum required for a 340-student enrollment would be 150-175 spaces. These calculations are based on a CivTech performed event parking study at Phoenix Country Day School. The JGS site cannot accommodate these numbers of spaces and has proposed that event parking be provided at:

- Onsite 91 spaces
- Offsite 100+ spaces (The Clubhouse)

JGS also has opportunities for off-site agreements with Chaparral Christian Church and Congregation Beth Israel.

Parents parking offsite will be shuttled to JGS during events. JGS has three vans that can be utilized for this effort. Given the distance between The Clubhouse and JGS, it is estimated that a van could arrive at The Clubhouse every 7-minutes to pick up additional passengers.

There was some discussion with the neighbors about van parking at JGS. Two of the vans will be driven to and from school by teachers. These teachers also pick up a number of students along the way to provide a car-pooling service. This service was not included in the trip generation mentioned above and would further reduce the number of trips anticipated to the school. Since these vans are a part of the carpool program, they will be taken home in the evening and not left at the school. One van will remain on the premises overnight. It is recommended that this van be parked on the north side of the school in the westernmost parking stalls.

Student Age Drivers

The addition of student age drivers should not have a significant impact on traffic operations. Student parking on the JGS campus will be a privilege, not a right, and will be limited to 20 students. CivTech recommends that each student planning to park sign an agreement with JGS that outlines the required driving rules/behaviors on site and the surrounding neighborhood.

CivTech observed pick-up and drop-off operations at the existing JGS in Scottsdale. No adverse student age driving was seen.

Neighborhood Traffic

Concerns were expressed that parents, students, and staff may drive through the neighborhood to arrive at or depart the JGS site. A concern was also expressed that traffic not destined to the school might cut through the neighborhoods to avoid congestion at school drop-off and pick-up times. To better understand the potential for cut through traffic, CivTech conducted morning and afternoon travel time studies. The results are included in Attachments H and I. It takes 26% to 70% more time to travel through the neighborhood than it does to travel via Tatum and Doubletree Ranch Road. Possible congestion due to school related traffic was considered in the travel time along each of the roadways.

Additional concerns expressed by the neighbors include parking by student drivers in their neighborhood and parking in the neighborhood by parents during an event. It is recommended that all parents and students attending JGS sign an agreement specifically disallowing the use of neighborhood streets for parking of any kind. There should be consequences established for breaking the rules governing the JGS parent parking agreement up to and including student expulsion.

If you have any other questions or concerns, please contact me.

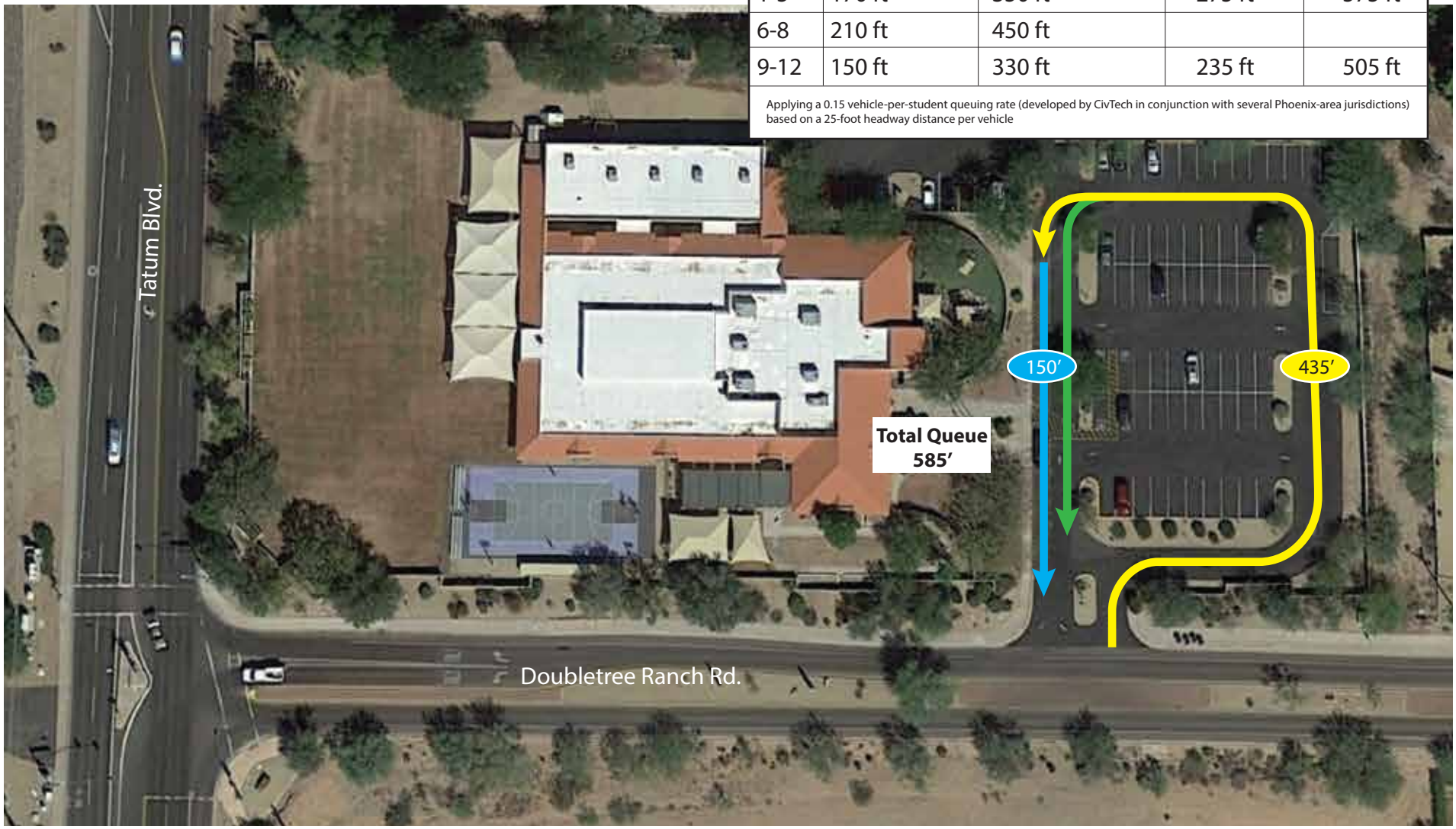
Sincerely,

CIVTECH INC.

Dawn Cartier, PE, PTOE
Principal

Queue Per Grade			Queue with Overlap	
Grade	160 Students	340 Students	Target	Max
1-5	170 ft	350 ft	275 ft	575 ft
6-8	210 ft	450 ft		
9-12	150 ft	330 ft	235 ft	505 ft

Applying a 0.15 vehicle-per-student queuing rate (developed by CivTech in conjunction with several Phoenix-area jurisdictions) based on a 25-foot headway distance per vehicle

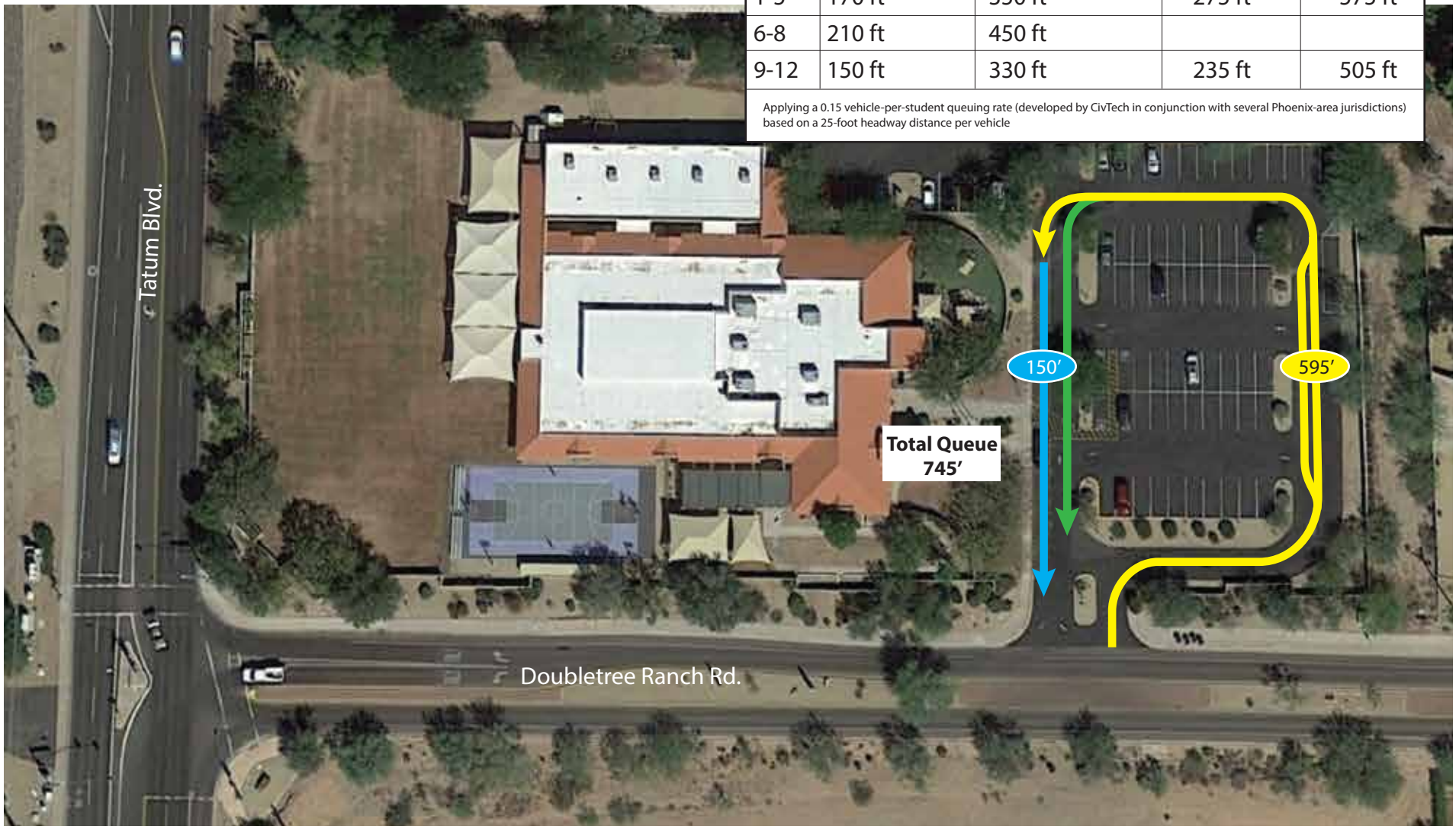


Source: CivTech 2017

Exhibit A: Option I Circulation Plan

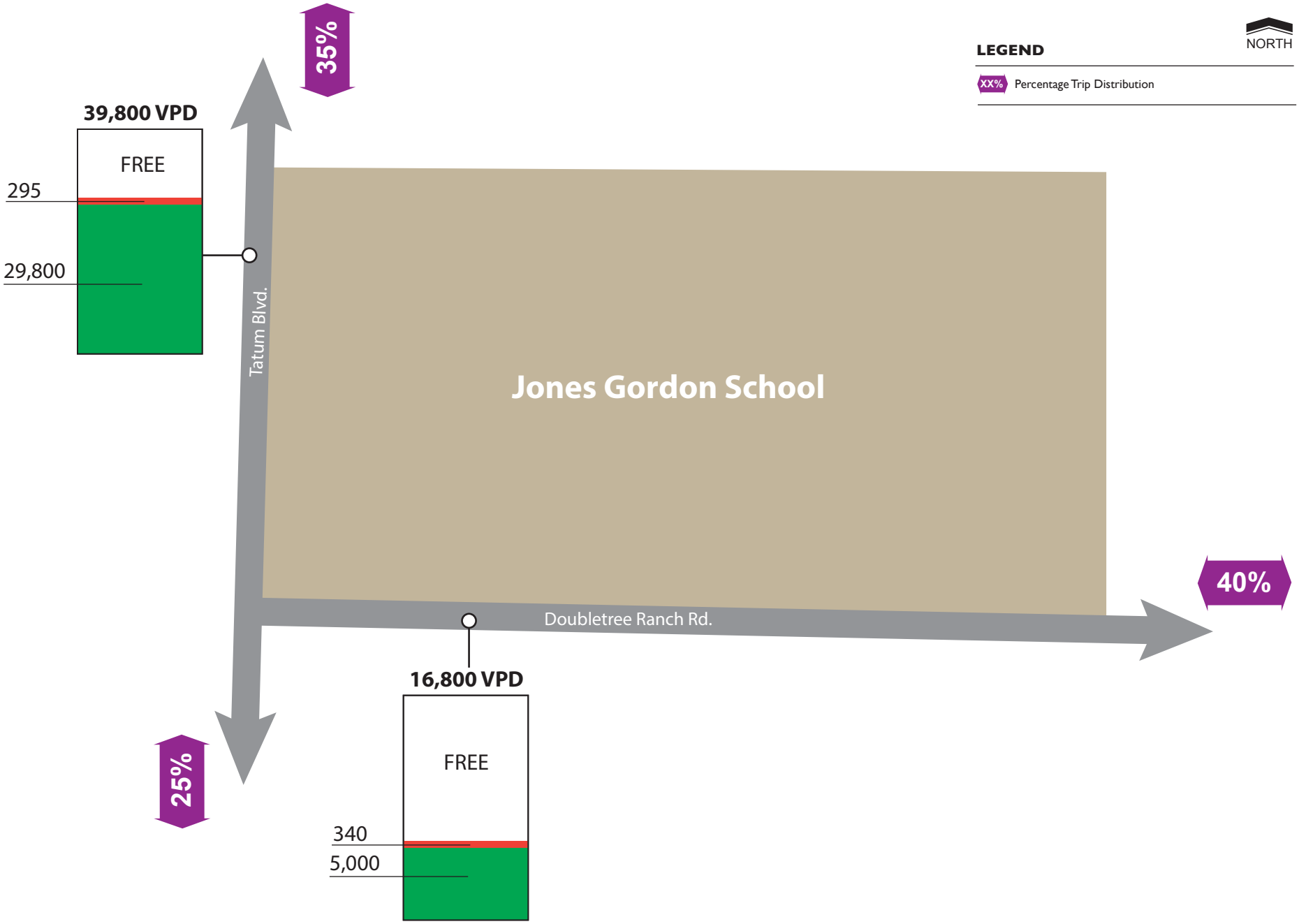
Queue Per Grade			Queue with Overlap	
Grade	160 Students	340 Students	Target	Max
1-5	170 ft	350 ft	275 ft	575 ft
6-8	210 ft	450 ft		
9-12	150 ft	330 ft	235 ft	505 ft

Applying a 0.15 vehicle-per-student queuing rate (developed by CivTech in conjunction with several Phoenix-area jurisdictions) based on a 25-foot headway distance per vehicle



Source: CivTech 2017

Exhibit B: Option 2 Circulation Plan



Source: CivTech 2017

Exhibit C: Surrounding Roadway Capacity

NORTH

Visitor Parking (30 Spaces) Staff Parking (41 Spaces) Student Parking (20 Spaces)

Exhibit D: Available Parking

Source: CivTech 2017

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