TWIN PEAKS ROAD

Study of Traffic

POWAY, CA

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1 INTRODUCTION

The following Study of Traffic has been prepared to evaluate the traffic operations along Twin Peaks Road to consider improvements at the intersections, roadways, and school pick-up/drop-off areas.

1.1 STUDY AREA

This Study of Traffic focuses on a 1.2 mile-long stretch of Twin Peaks Road which extends from Midland Road to Espola Road and a 2 mile-long stretch of Espola Road which extends from Titan Way to Poway Road. The project vicinity is shown in **Figure 1**.

Twin Peaks Road is a heavily utilized east-west Major Arterial in Poway, California. To the west of the city boundary, Twin Peaks Road turns into Camino Del Norte and connects to Interstate 15 (I-15). To the east, Twin Peaks Road terminates approximately half a mile east of Espola Road. There are generally two lanes in each direction with a two-way left-turn lane median and a speed limit of 45 MPH throughout the study corridor. A Class II bike lane exists on both sides of the roadway.

The study area also includes Espola Road, a north-south Collector providing connections to Poway Road and State Route 67 (SR-67) to the south and Rancho Bernardo Road to the north. Twin Peaks Road and Espola Road provide important regional and local connections, including access to Twin Peaks Middle School, Tierra Bonita Elementary School, and Poway High School within the study area.

1.2 PROJECT NEED & OBJECTIVES

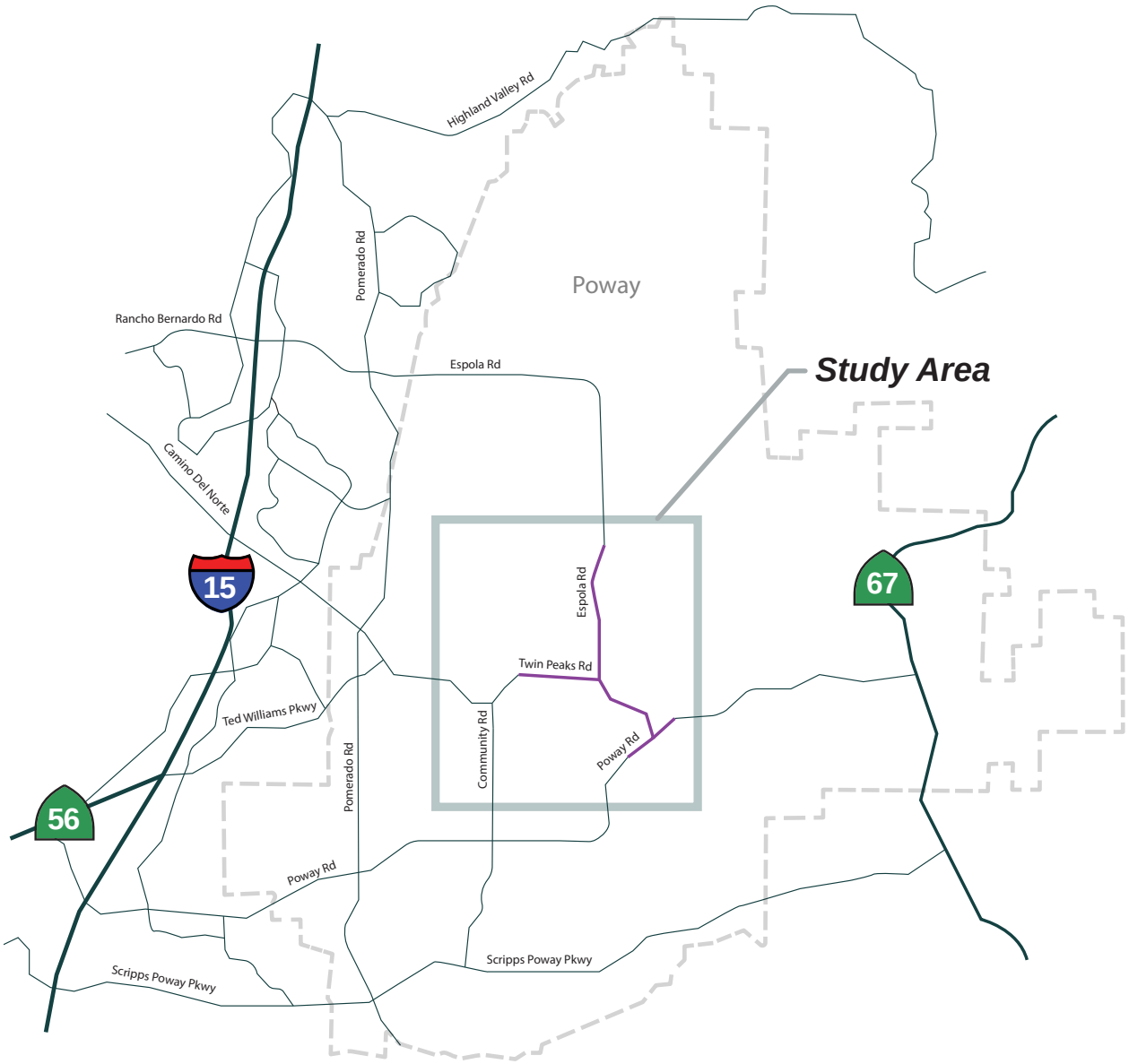
Twin Peaks Road and Espola Road experience heavy traffic during morning and evening commute hours and in the afternoon when the schools get out. Additionally, Twin Peaks Middle School and Tierra Bonita Elementary School are located at the northwest corner of the intersection of Twin Peaks Road and Tierra Bonita Road. Twin Peaks Road is used by students walking and biking to and from school as well as school bus and family pick-up and drop-off. Poway High School is located approximately 1.3 miles north of Twin Peaks Road at the intersection of Espola Road and Titan Way and generates traffic directly before and after school hours.

The areas adjacent to the study corridor are largely low-density residential neighborhoods. Community residents have expressed concern about the potential for new development projects to further exacerbate existing traffic congestion, cut-through traffic, and increase delays and travel time.

The following set of goals and associated baseline challenges were identified for the study corridor:

- Reduce congestion along Twin Peaks Road and Espola Road and improve traffic operations;
- Identify cut-through and midblock U-turn patterns
- Improve pick-up/drop-off operations at Poway High School, Tierra Bonita Elementary School, and Twin Peaks Middle School; and
- Recommend cost-effective solutions that would not result in major environmental impacts, acquisition of private land, or would substantially diminish the character of the study corridor.

FIGURE 1 - Project Vicinity



NOT TO SCALE

1.3 PROJECT METHODOLOGY

Data collection and field review of the study corridor was conducted to observe and document the Existing Conditions. The Existing Conditions were then analyzed to determine the potential areas of improvement. Based on the technical analysis and field review, improvement recommendations were then developed.

1.3.1 STUDY FACILITIES

Study facilities were determined based on existing traffic congestion, adjacent land-use, and guidance from City of Poway staff and illustrated in **Figure 2**.

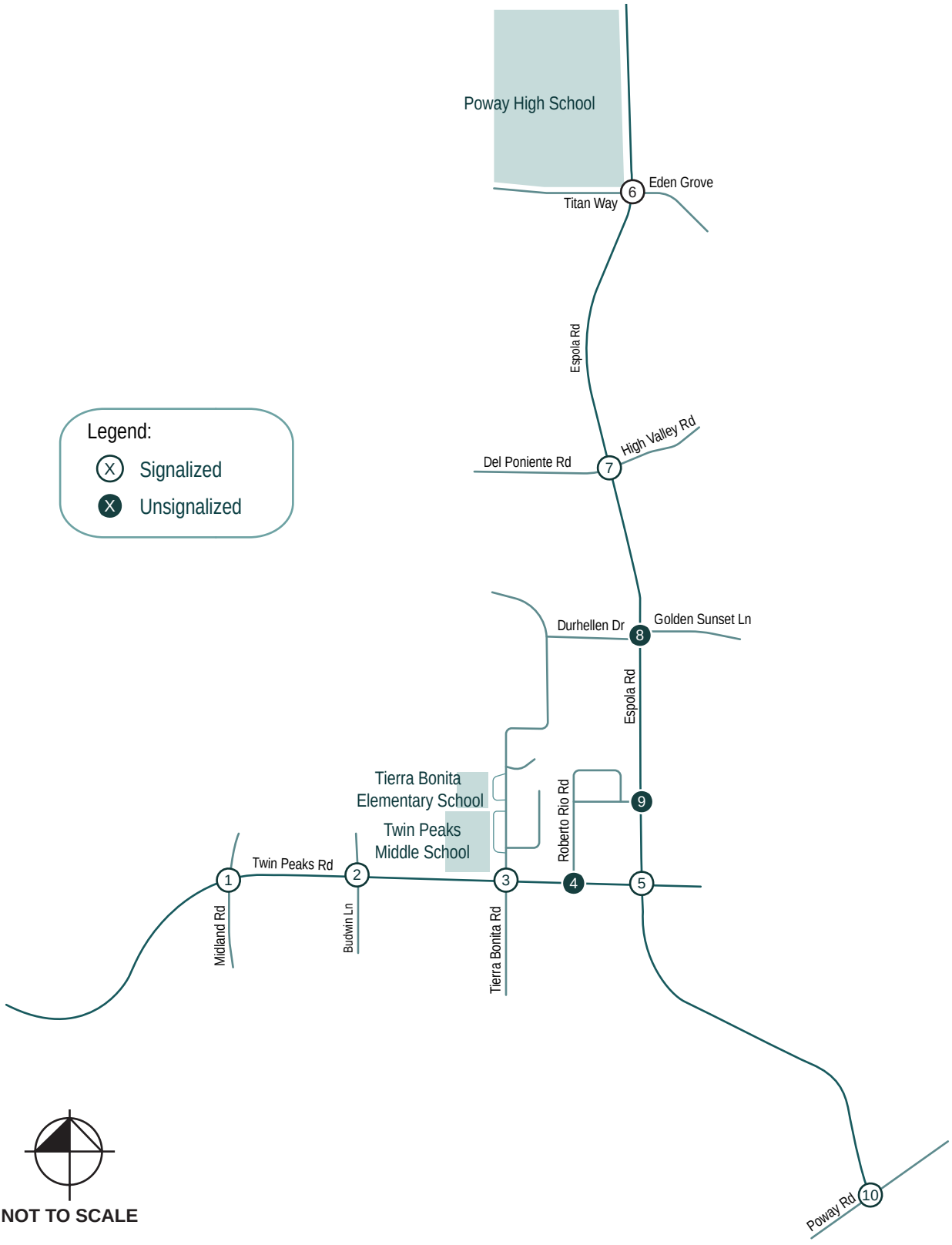
The intersections identified for evaluation are included in **Table 1**.

Table 1 Study Intersections

	Intersection	Traffic Control (a)
1	Twin Peaks Road at Midland Road	Signal
2	Twin Peaks Road at Budwin Lane	Signal
3	Twin Peaks Road at Tierra Bonita Road	Signal
4	Twin Peaks Road at Roberto Rio Road	SSSC
5	Twin Peaks Road at Espola Road	Signal
6	Espola Road at Titan Way/ Eden Grove	Signal
7	Espola Road at Del Poniente Road/ High Valley Road	Signal
8	Espola Road at Durhullen Drive	SSSC
9	Espola Road at Los Nietos Avenue	SSSC
10	Espola Road at Poway Road	Signal

(a) Signal = Traffic Signal; SSSC = Side Street Stop Control

FIGURE 2 - Study Area



1.3.2 DATA COLLECTION

Data collection was conducted by National Data and Surveying Services (NDS) along the study corridor on Thursday, December 1st 2016. This represented a typical weekday when all nearby schools were in session. Multiple types of data collection were conducted to capture traffic patterns along the study corridor.

Peak Hour Traffic Counts

Intersection turning movement counts were collected from 7:00 a.m. - 9:00 a.m. and 1:30 - 6:00 p.m. at all study intersections (listed in Table 1).

Origin & Destination Counts

During the same time frame, license plate recognition data was collected at the following intersections to determine the magnitude of cut-through traffic:

Twin Peaks Road at Tierra Bonita Road	⟷	Espola Road at Durhullen Drive
Twin Peaks Road at Roberto Rio Road	⟷	Espola Road at Los Nietos Avenue

Video Footage

Video was also collected during the same timeframe at the following locations to document parking usage and U-turns:

- Twin Peaks Road near Kalapana Street
- Tierra Bonita Road near Country Creek Road

All written data collection results are included in **Appendix A**. Video footage can be provided if requested.

1.3.3 TRAFFIC ANALYSIS

Traffic analysis for the study corridor was performed for Existing Conditions. Existing Conditions were analyzed for peak hours during the morning (7-9 a.m.), mid-day (1:30-4 p.m.), and evening (4-6 p.m.). The mid-day period from 1:30-4 p.m. was selected to reflect activity generated by school-related traffic.

Traffic analysis was quantified using the Synchro traffic analysis software package. To analyze the operations of both signalized and unsignalized intersections, Synchro 9 (Trafficware), using the methodologies outlined in the *2010 Highway Capacity Manual (HCM),* was used for the analysis.

The following list contains the assumptions used for the intersection analyses:

- Existing peak-hour factors (PHF) were used for all scenarios.
- A percent of heavy vehicle (PHV) of two percent was used for all scenarios.
- Existing signal timing provided by City of Poway staff was used.

The 2010 *HCM* published by the Transportation Research Board (TRB) establishes procedures to evaluate highway facilities and rate their ability to process traffic volumes. The terminology "level of service" is used to provide a qualitative evaluation based on certain quantitative calculations, which are related to empirical values.

Level of service (LOS) for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and loss of travel time. Specifically, LOS criteria are stated in terms of the average control delay per vehicle for the peak 15-minute period over the hour analyzed. The average control delay includes initial deceleration delay, queue move-up time, and final acceleration time in addition to the stop delay. The LOS for unsignalized intersections is determined by the computed or measured control delay and is defined for each minor movement. At a one-way or two-way stop controlled intersection, the reported delay represents the worst movement, which are typically associated with movements from the side street.

The criteria for the various levels of service designations are given in **Table 2**. Per the City of Poway's guidelines, all signalized and unsignalized intersections are expected to operate at LOS D or better. It is important to note that the LOS is developed for an hour interval based on HCM procedures, actual operations for intervals less than an hour are not typically reported based on current standard engineering practice.

Table 2 LOS Criteria for Intersections

	Control Delay (sec/veh)		
LOS	**Signalized Intersections (a)**	**Unsignalized Intersections (b)**	**Description**
A	≤10.0	≤10.0	Operations with very low delay and most vehicles do not stop.
B	>10.0 and ≤20.0	>10.0 and ≤15.0	Operations with good progression but with some restricted movement.
C	>20.0 and ≤35.0	>15.0 and ≤25.0	Operations where a significant number of vehicles are stopping with some backup and light congestion.
D	>35.0 and ≤55.0	>25.0 and ≤35.0	Operations where congestion is noticeable, longer delays occur, and many vehicles stop. The proportion of vehicles not stopping declines.
E	>55.0 and ≤80.0	>35.0 and ≤50.0	Operations where there is significant delay, extensive queuing, and poor progression.
F	>80.0	>50.0	Operations that are unacceptable to most drivers, when the arrival rates exceed the capacity of the intersection.

Notes:
(a) 2010 Highway Capacity Manual, Chapter 18, Page 6, Exhibit 18-4
(b) 2010 Highway Capacity Manual, Chapter 19, Page 2, Exhibit 19-1

2 EXISTING CONDITIONS

The following section summarizes the Existing Conditions of the Twin Peaks Road study corridor, adjacent school pick-up/drop-off operations, and operations at the study intersections.

2.1 TRAFFIC CIRCULATION

Twin Peaks Road is classified as a four-lane east-west Major Arterial with a speed limit of 45 MPH. Between Midland Road and Espola Road, Twin Peaks Road has a two-way left-turn lane. On-street parking is permitted on the north side of the roadway between Budwin Lane and Roberto Rio Road. A Class II bike lane exists on both sides of the roadway throughout the study corridor.

Espola Road is classified as a three-lane north-south Collector from Titan Way to Poway Road with a speed limit of 45 MPH. Between Del Poniente Road and Ezra Lane, Espola Road has a two-way left-turn lane. On-street parking is generally not permitted. A Class II bike lane exists on both sides of the roadway between Titan Way and Ezra Lane. **Figure 3** displays the existing conditions intersection geometry and traffic control.

Peak-Hour intersection turning movement counts were collected by NDS at the study facilities in December 2016. Based on the count data, the network morning, afternoon school, and evening peak hours were found to be from 7:00 a.m. to 8:00 a.m., 2:30 p.m. to 3:30 p.m., and 4:30 p.m. to 5:30 p.m., respectively.

Figures 4-5 displays the existing peak hour turning movement volumes. **Appendix A** contains the existing traffic volume data.

2.2 INTERSECTION ANALYSIS

Table 3 displays the LOS analysis results for the study intersections under Existing Conditions. Midday peak hour volume data was not collected for the intersection Twin Peaks Road at Midland Road, therefore only a.m. and p.m. intersection analysis results are reported for those intersections. As shown in the table, all intersections currently operate at LOS D or better during all peak periods with the exception of the intersection of Espola Road at Durhullen Drive (a.m. peak). **Appendix C** contains the intersections LOS calculation worksheets.

FIGURE 3 - Existing Intersection Geometry and Traffic Control

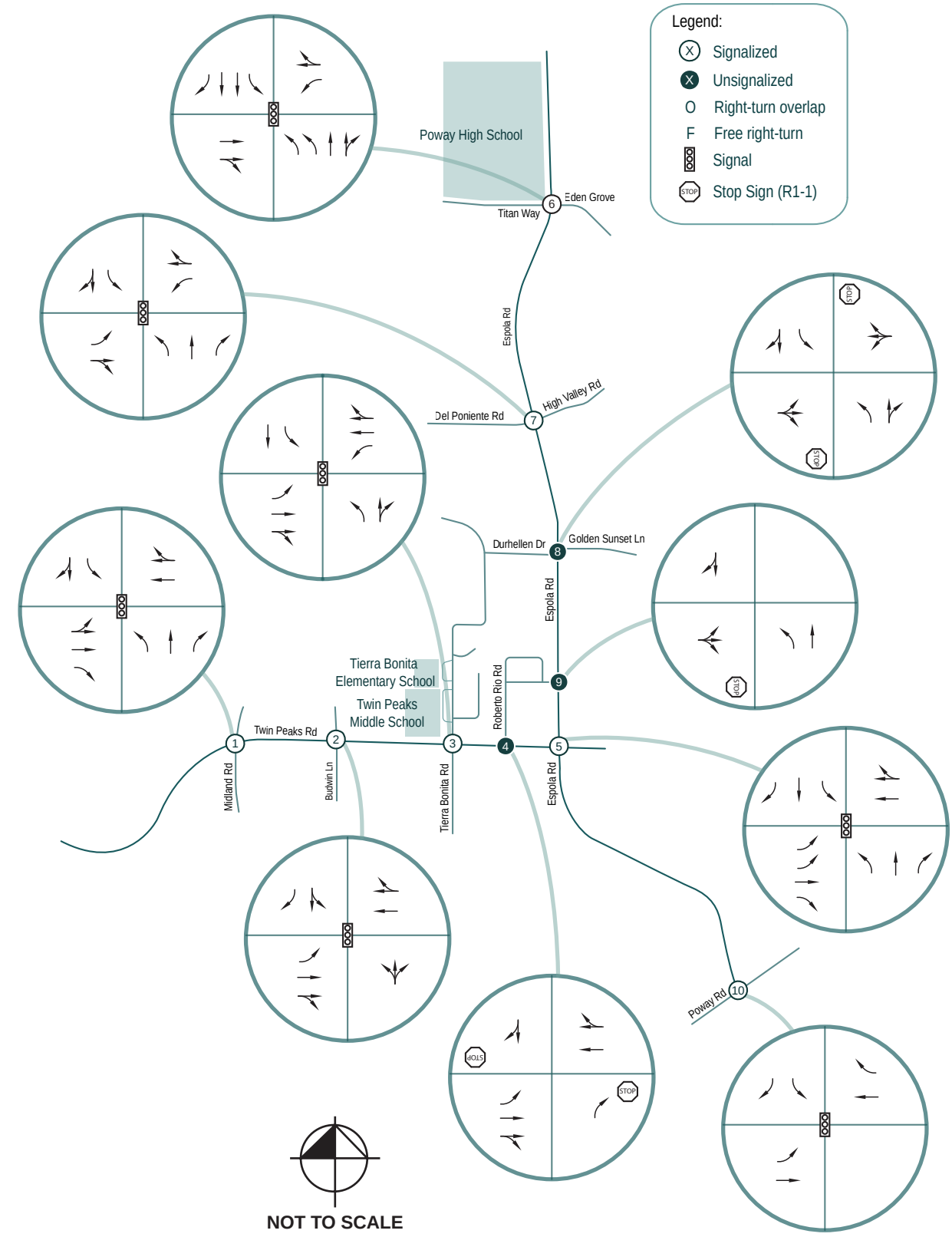


FIGURE 4 - Existing AM & PM Peak Hour Volumes

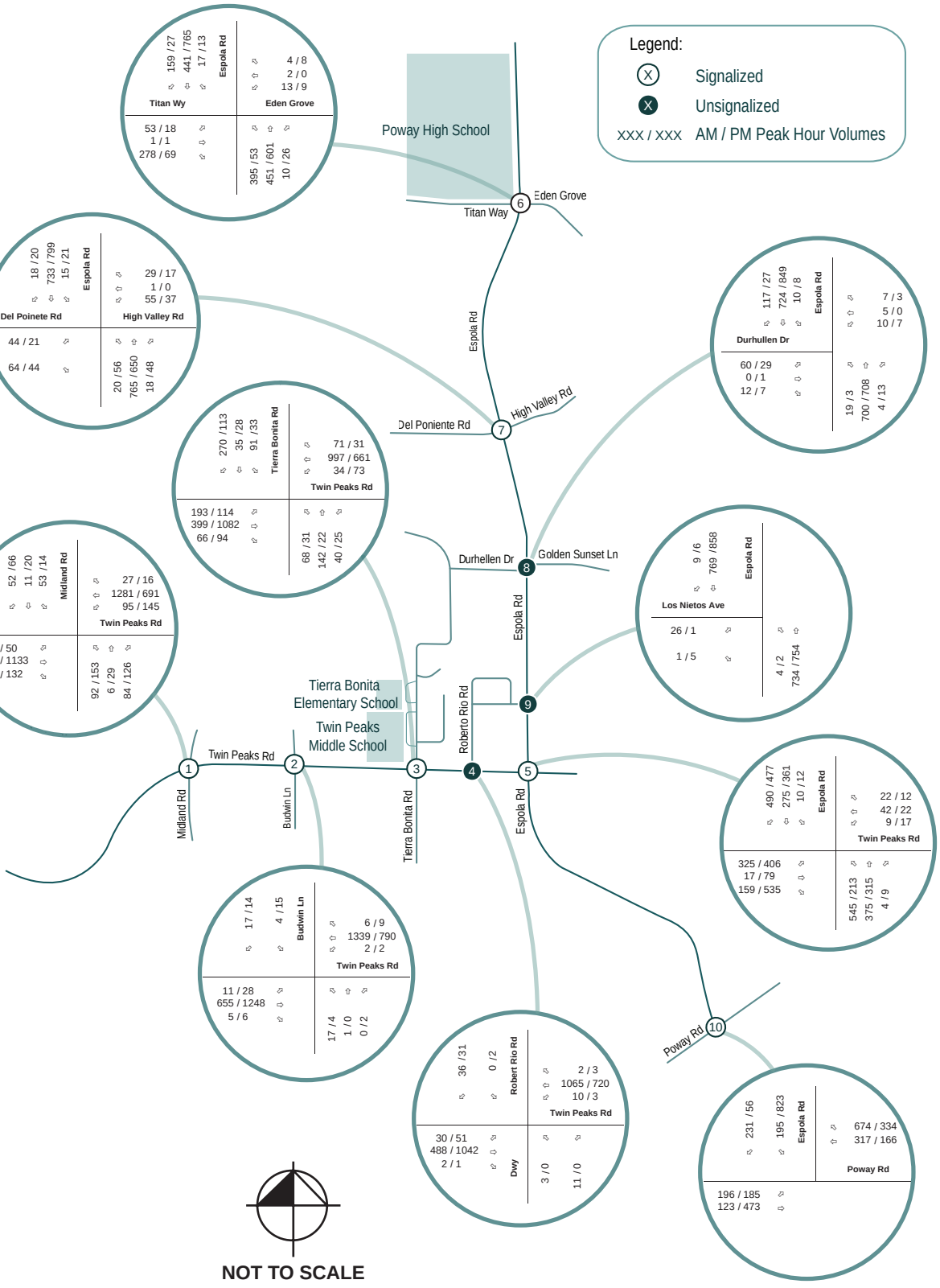


FIGURE 5 - Existing Midday Peak Hour Volumes

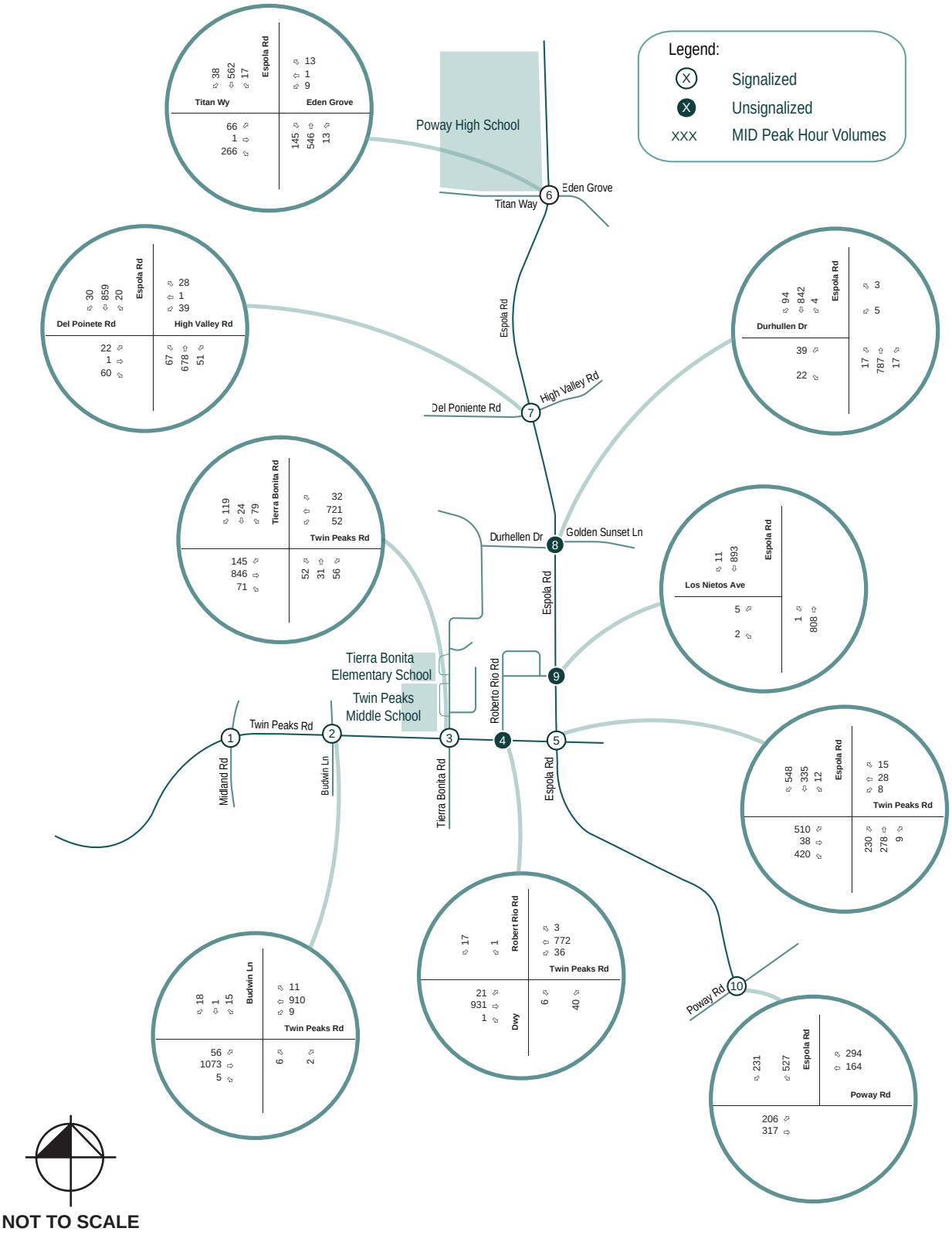


Table 3 Existing Baseline Conditions Intersection LOS Summary

Intersection		Traffic Control	Peak Hour	Existing	
				Delay (a)	LOS (b)
1	Twin Peaks Rd at Midland Rd	Signal	AM	21.5	C
			PM	30.5	C
2	Twin Peaks Rd at Budwin Ln	Signal	AM	5.4	A
			MID	6.5	A
			PM	4.7	A
3	Twin Peaks Rd at Tierra Bonita Rd	Signal	AM	33.8	C
			MID	28.6	C
			PM	17.1	B
4	Twin Peaks Rd at Roberto Rio Rd	SSSC	AM	18.5 (NBLTR)	C
			MID	20.5 (NBLTR)	C
			PM	13.3 (SBLTR)	B
5	Twin Peaks Rd at Espola Rd	Signal	AM	44.1	D
			MID	36.7	D
			PM	36.8	D
6	Espola Rd at Titan Wy	Signal	AM	33.4	C
			MID	18.7	B
			PM	10.1	B
7	Espola Rd at Del Poniente Rd	Signal	AM	24.6	C
			MID	26.2	C
			PM	16.1	B
8	Espola Rd at Durhullen Dr	SSSC	AM	35.7 (EBLR)	**E**
			MID	26.8 (EBLR)	D
			PM	22.0 (EBLR)	C
9	Espola Rd at Los Nietos Ave	SSSC	AM	31.5 (EBLR)	D
			MID	22.7 (EBLR)	C
			PM	16.6 (EBLR)	C
10	Espola Rd at Poway Rd	Signal	AM	16.3	B
			MID	18.5	B
			PM	47.1	D

Signal = Traffic Signal; SSSC = Side Street Stop Control

(a) Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle. At SSSC intersections, delay refers to the worst movement.

(b) LOS calculations are based on the methodology outlined in the 2010 Highway Capacity Manual and performed using Synchro 9.

2.3 FIELD REVIEW

Field reviews of the study corridor were conducted on December 1st, 2016 and January 26th, 2017. General observations along Twin Peaks Road between Midland Road and Espola Road, along Tierra Bonita Road at the elementary and middle schools, and along Espola Road at the high school were conducted between 7:00 a.m. - 9:00 a.m. and 1:30 - 6:00 p.m. Detailed notes of observations are included in **Appendix B.**

2.3.1 MORNING PEAK

In the morning peak (between 7:00 a.m. and 9:00 a.m.), Twin Peaks Road was observed to be heavily utilized between Tierra Bonita Road and Espola Road with both school and general commuter traffic. Traffic was observed to be heavy in both the eastbound and westbound directions. While heavy traffic was observed, the traffic signals along Twin Peaks Road throughout the study area were coordinated and observed to do a good job of platooning the eastbound and westbound movements. Espola Road was observed to be heavily congested between Del Poniente Road and Twin Peaks Road between 7:00 a.m. and 7:30 a.m. Traffic was observed to be heavy in the northbound direction.

Twin Peaks Road at Tierra Bonita Road

This intersection provides the main access to Tierra Bonita Elementary School and Twin Peaks Middle School. There is a loading zone on Twin Peaks Road in the westbound direction west of the intersection for middle school pick-up/drop-off operations. There is also a crossing guard at the intersection between 7:15 a.m. and 8:30 a.m. to help pedestrians cross the intersection.

Morning congestion was observed to start as early as 7:00 a.m. The westbound through movement was observed to conflict heavily with the eastbound left-turn movement. However, the busiest time at the intersection was observed to be between 8:10 a.m. and 8:25 a.m. when drop-off operations at Twin Peaks Middle School were occurring. During this time, the loading zone along Twin Peaks Road was full with both buses and cars. Additionally, many eastbound vehicles were observed making U-turns on Twin Peaks Road to drop-off in the loading zone before the intersection to avoid the heavy queues turning onto Tierra Bonita Road. The southbound approach was also queued with vehicles leaving the schools. Morning congestion at this intersection was observed to end by 8:30 a.m.

Twin Peaks Road at Espola Road

As stated previously, this intersection provides connections to Poway Road and SR-67 to the south, and Poway High School and Rancho Bernardo Road to the north. Morning congestion was observed to start as early as 7:00 a.m. The southbound right-turn and eastbound left-turn were observed to be the heaviest movements at this intersection. In attempt to avoid this congestion, cut-through traffic was observed from eastbound Twin Peaks Road to northbound Espola Road and from southbound Espola Road to westbound Twin Peaks Road via Roberto Rio Road. Northbound traffic on Espola Road between Del Poniente Road and Twin Peaks Road was observed to be very congested, northbound queues were observed to be backed up to Twin Peaks Road. Morning congestion at this intersection was observed to end by 8:15 a.m.

Espola Road at Del Poniente Road

This intersection is the only signalized intersection on Espola Road between Titan Way (entrance to Poway High School) and Twin Peaks Road. Morning congestion was observed to start as early as 7:00 a.m. The northbound through movement was observed to be the heaviest at this intersection. Between 7:00 a.m. and 7:30 a.m. whenever the northbound approach was given a red light, the queues would back up to the

intersection of Espola Road and Twin Peaks Road. Morning congestion at this intersection was observed to end by 7:45 a.m.

Espola Road at Titan Way

This intersection provides the main access to Poway High School. Morning congestion was observed to start at 7:00 a.m. The northbound left-turn movement was observed to be the heaviest movement. Student drop-off was observed to back up on Titan Way, causing vehicles to queue to the intersection of Titan Way and Espola Road. Morning congestion at this intersection was observed to end by 7:30 a.m., coinciding with the start of school.

2.3.2 MID-DAY PEAK

In the midday peak (between 1:30 p.m. and 4:00 p.m.), general traffic on Twin Peaks Road and Espola Road was observed to be light. Traffic increased between 3:00 p.m. and 3:30 p.m. during pick-up operations at Twin Peaks Middle School. Traffic on Espola Road increased between 2:15 p.m. and 2:45 p.m. when pick-up operations and student departures at Poway High School were occurring. Pick-up operations observations are included in a proceeding section.

2.3.3 EVENING PEAK

In the evening peak (between 4:00 p.m. and 6:00 pm), Twin Peaks Road was observed to be heavily utilized, specifically in the eastbound direction. Back-up from the eastbound right turn movement at Espola Road was observed to extend from Espola Road to Midland Road.

Espola Road at Poway Road

This intersection is approximately 0.75 miles south of Twin Peaks Road and provides connections to SR-67. Heavy evening congestion was observed for the southbound left-turn movement at this intersection. The eastbound and westbound movements on Poway Road were observed to be light during the evening peak. The green time for the southbound approach was not adequate to clear the movement, causing over two miles of back-up extending back to the intersection of Twin Peaks Road at Midland Road.

Twin Peaks Road at Espola Road

As, stated above, the eastbound right-turn movement at this intersection was observed to be heavily congested during the evening peak. In attempt to avoid this congestion, cut-through traffic was observed from eastbound Twin Peaks Road to southbound Espola Road via Range Park Road. U-turns on the east leg of Twin Peaks Road were observed to be mostly drivers leaving the strip mall at the southwest corner of the intersection who were unable to make it into the eastbound left-turn lane due to the right-turn queue and inadequate gaps in traffic.

2.3.4 PICK-UP AND DROP-OFF OPERATIONS

Twin Peaks Middle School and Tierra Bonita Elementary School are located at the northwest corner of the intersection of Twin Peaks Road and Tierra Bonita Road. The main entrances to both schools are along Tierra Bonita Road. Both Twin Peaks Road and Tierra Bonita Road are used by students walking and biking to and from school as well as school bus and vehicle pick-up/ drop-off. Tierra Bonita Road is one-lane in each direction with parallel parking and sidewalks on both sides. Tierra Bonita Road provides access the two the schools as well as to residential neighborhoods to the north and east. Pedestrian access to the

schools from the residential area to the south is provided at the signalized intersection of Twin Peaks Road and Tierra Bonita Road with assistance from a crossing guard. **Figure 6** displays the pick-up and drop-off operations at Tierra Bonita Elementary School and Twin Peaks Middle School.

Poway High School is located at the intersection of Espola Road and Titan Way. The main entrance to the school is along Espola Road. Espola Road and Titan Way are used by students walking and biking to and from school and vehicle pick-up/drop-off. **Figure 7** displays the pick-up and drop-off operations at Poway High School.

Tierra Bonita Elementary School

Curbside pick-up/ drop-off is provided by a one-way loop through the parking lot in front of the school. This location provides approximately 450 feet of curb space for pick-up/drop-off operations. The entrance of the parking lot is located at the intersection of Tierra Bonita Road and Tierra Bonita Court. There are marked school crossings across the north and east legs. It is important to note that parking spaces in the parking lot are for faculty only. Visitors were observed using the on-street parking along Tierra Bonita Road and within the residential neighborhoods.

In the morning, drop-off operations were observed to start around 7:20 a.m. and end around 7:40 a.m. During this time, a faculty member was situated at the entrance of the parking lot to direct vehicles into the curbside pick-up/ drop-off area. Faculty members and student volunteers were also situated at all legs of the intersection of Tierra Bonita Road and Tierra Bonita Court to guard traffic and direct students to cross the street. In general, the crossing guard at the parking lot entrance did a good job of progressing traffic through the curbside drop-off area, however queues did form and cause backup on Tierra Bonita Road due to the overall vehicle demand.

Several parents were observed parking on the street along Tierra Bonita Road and walking their kids to school. By 7:35 a.m. all on-street parking spaces along Tierra Bonita Road were observed to be occupied. The majority of vehicles using Tierra Bonita Road were observed to come from Twin Peaks Road (traveling northbound on Tierra Bonita Road). Throughout the morning drop-off time, there was a heavy queue of northbound vehicles waiting to turn left into the school curbside pick-up/drop-off area. With the large northbound left-turn queue and full on-street parking on Tierra Bonita Road, any traffic traveling north on Tierra Bonita Road was backed up, causing larger queues on Tierra Bonita Road. The northbound queue was observed to back up into the Twin Peaks Road intersection multiple times.

In the afternoon, pick-up operations were observed to start around 2:00 p.m. and end around 2:15 p.m. Faculty members and student crossing guards were situated in the same places as the morning. In general, afternoon pick-up operations were observed to operate smoothly. The crossing guard at the parking lot entrance did a good job of progressing traffic through the curbside pick-up/drop-off area. Small queues were observed along Tierra Bonita Road as cars waited to turn into the parking lot. However, during pick-up operations, there was very little background traffic on Tierra Bonita Road.

FIGURE 6 - Pick-Up/Drop-Off Operations - Tierra Bonita Elementary School & Twin Peaks Middle School

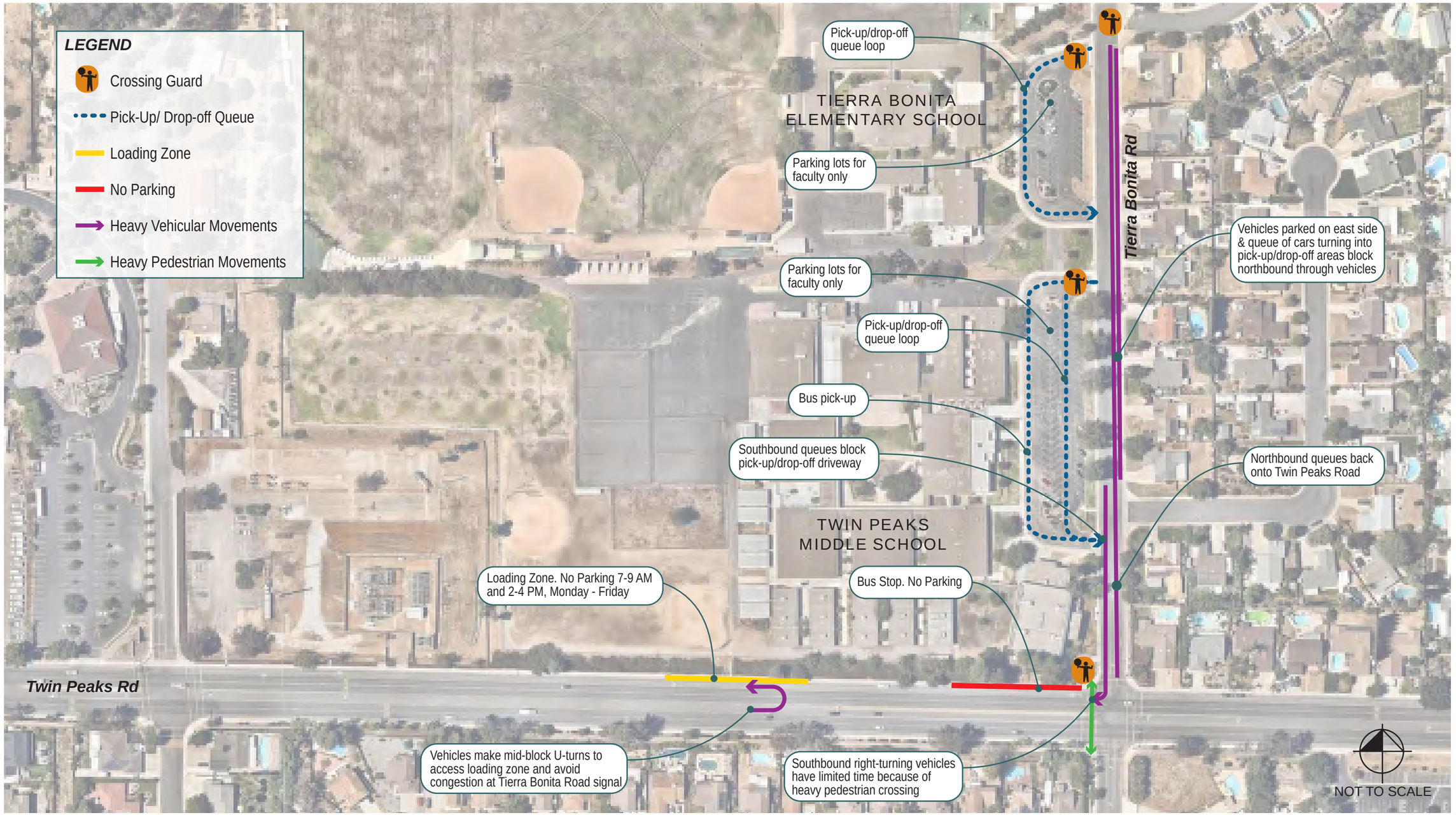
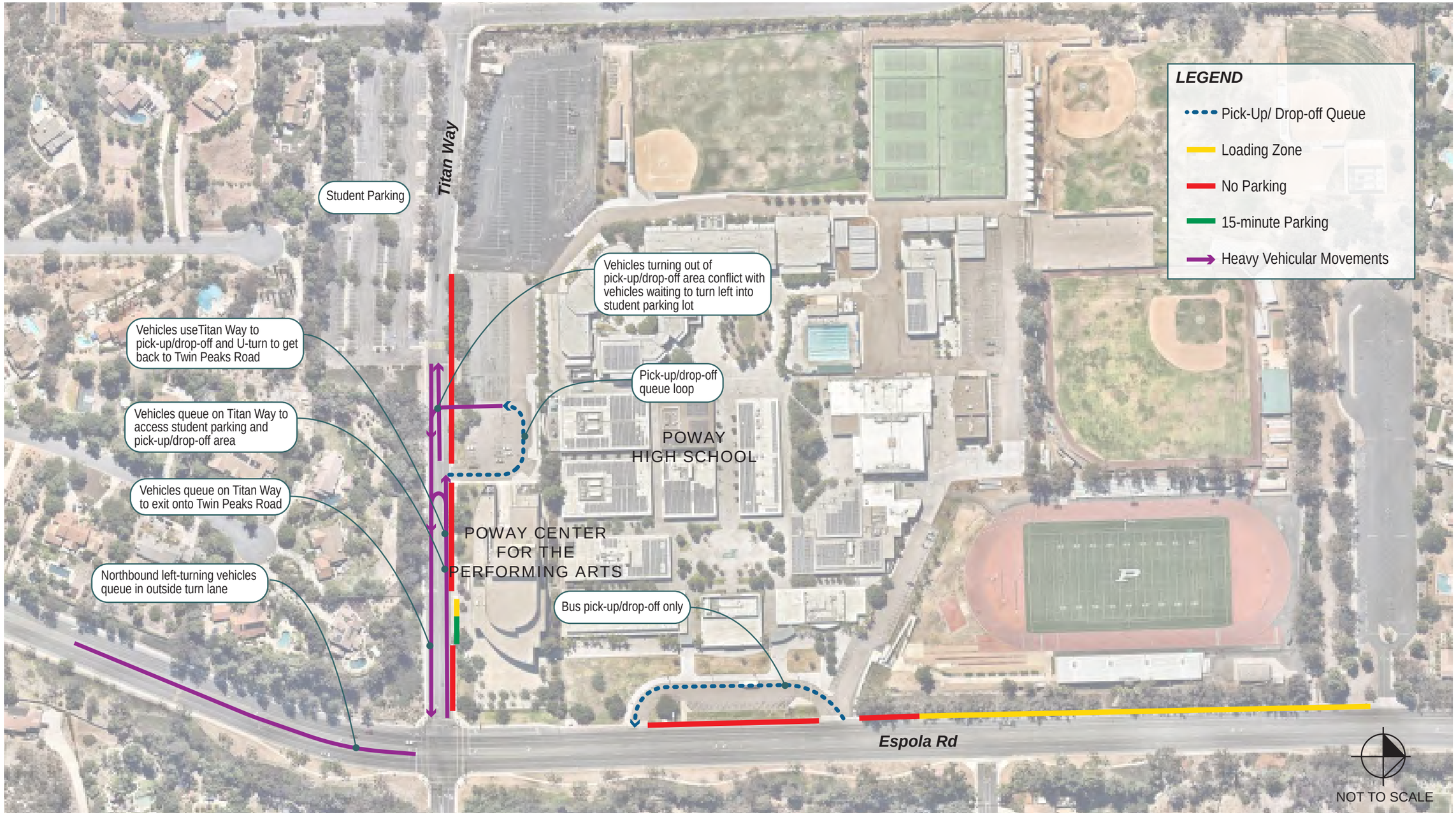


FIGURE 7 - Pick-Up/Drop-Off Operations - Poway High School



Twin Peaks Middle School

Pick-up/ drop-off is provided by a one-way loop through the parking lot in front of the school. There are two lanes available in the parking lot for pick-up/drop-off operations. This configuration provides approximately 1,000 feet space for pick-up/ drop-off operations. There are no marked crossings along Tierra Bonita Road adjacent to Twin Peaks Middle School. It is important to note that parking spaces in the parking lot are for faculty only.

In the morning, drop-off operations were observed to start at 8:00 a.m. and end at 8:30 a.m. This provided a 20-minute window between when the elementary school drop-off operations ended and the middle school operations began.

A faculty member was situated at the entrance of the parking lot to direct vehicles through the drop-off area. The faculty member was observed only allowing vehicles to use one lane for drop-off, heavy northbound queues on Tierra Bonita Road were observed to spill into the intersection of Tierra Bonita Road and Twin Peaks Road. The northbound queue prevented vehicles from being able to turn off Twin Peaks Road.

In the afternoon, pick-up operations were observed to start around 3:00 p.m. and end around 3:30 p.m. For pick-up operations, buses utilized the inside lane of the parking lot and parents queued up in the outside lane. Southbound queues on Tierra Bonita Road at Twin Peaks Road were observed to back up and block the school driveways.

Poway High School

Curbside pick-up/ drop-off is provided within the parking lot of Poway Center for the Performing Arts off of Titan Way. This location provides approximately 100 feet of curb space for pick-up/drop-off operations. There is also a loading zone along the west side of Espola Road north of the High School main entrance. This provides approximately 800 feet of additional curb space for pick-up/ drop-off operations. The main student parking is provided with the parking lot located on the south side of Titan Way.

In the morning, drop-off operations were observed to start around 7:00 a.m. and end around 7:30 a.m. During this time, Titan Way was backed up to Espola Road with vehicles waiting to drop-off in the parking lot of the Poway Center for the Performing Arts and vehicles waiting to turn into the student parking lot. Only about 40 feet of curb space within the Poway Center for the Performing Arts parking lot was observed to be utilized during drop-off operations. Many parents were observed dropping students off on Titan Way and U-turning on Titan Way prior to the parking lot entrance to return to Espola Road. These movements disrupted to overall traffic operations on Titan Way.

The majority of vehicles using Titan Way were observed to come from the south. Throughout the morning drop-off time, there was a heavy queue of northbound vehicles waiting to turn left onto Titan Way.

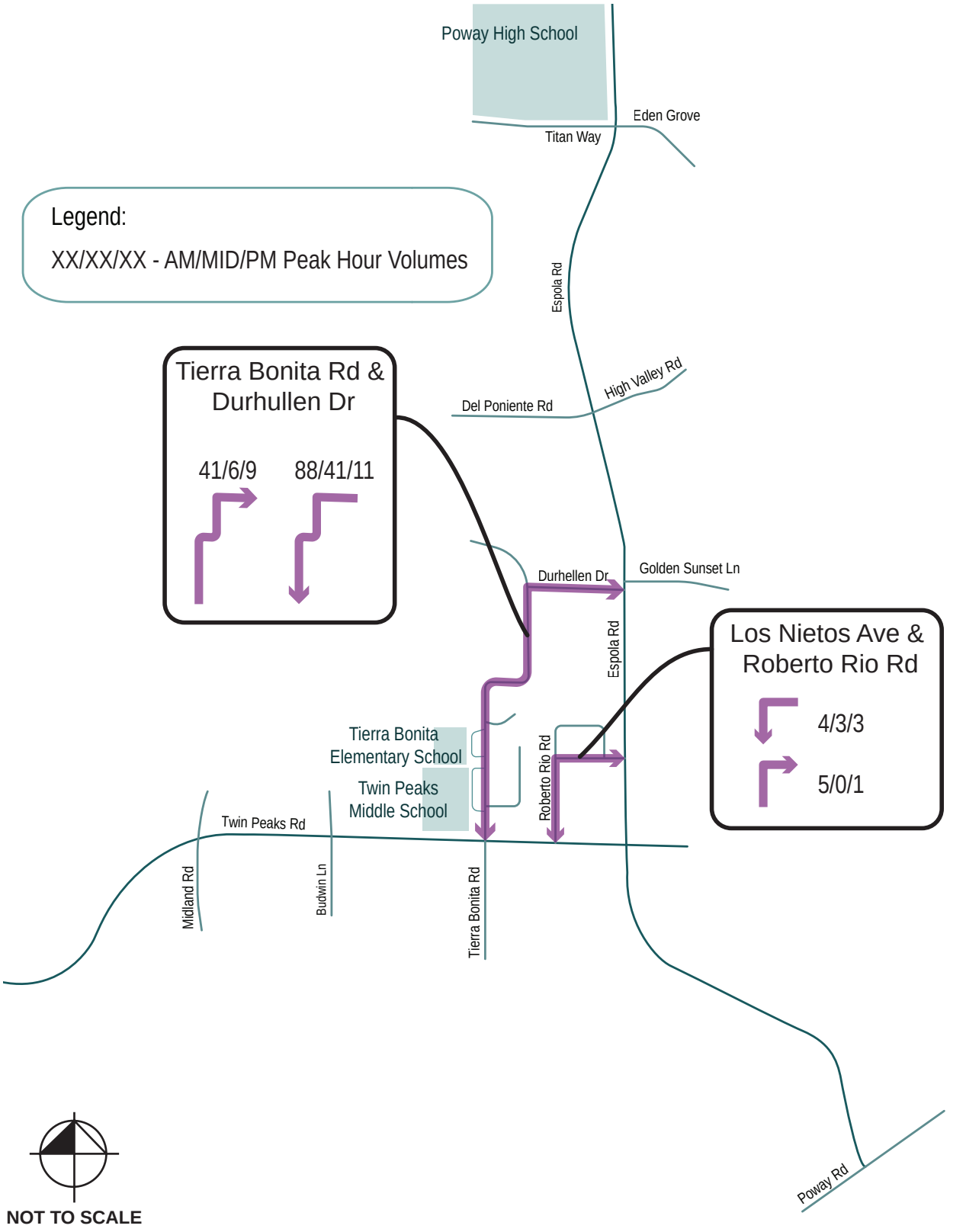
In the afternoon, pick-up operations were observed to start around 2:00 p.m. and end around 2:45 p.m. Large queues were observed along Titan Way as cars waited to turn onto Espola Road. However, during pick-up operations, there was very little additional traffic on Espola Road.

2.4 CUT-THROUGH TRAFFIC

In attempt to avoid congestion along the Twin Peaks Road study corridor, cut-through traffic was observed along Los Nietos Avenue to Robert Rio Road and along Durhullen Road to Tierra Bonita Road. License plate recognition data was collected by NDS in December 2016. **Appendix A** contains the existing origin destination study.

Figure 8 displays the total cut-through traffic during the morning, afternoon, and evening peak hours. As shown in the figure, Durhullen Road to Tierra Bonita Road was used heavily during the morning and afternoon peak periods.

FIGURE 8 - Existing Cut-Through Traffic



3 RECOMMENDED IMPROVEMENTS

Improvement recommendations were developed based on the Existing Conditions analysis and field review. Improvements that would result in potential environmental impacts (i.e. widening), acquisition of private land, or would substantially diminish the character of the roadways were not considered. Recommended signal timing changes to increase capacity and striping and signage changes to improve circulation were considered. **Appendix D** contains the recommended signal timing sheets.

As stated previously, all study intersections currently operate at acceptable conditions during all peak periods with the exception of two intersections. Preliminary improvements are recommended below to improve traffic flow and school pick-up/ drop-off operations.

Twin Peaks Road at Tierra Bonita Road

Based on field review and the LOS results, this intersection currently operates at acceptable conditions during morning, midday, and evening peak periods. While heavy utilization was observed during the morning and evening peak periods, the traffic signal timing along Twin Peaks Road allows for platooning of through vehicles in the eastbound and westbound directions. Improvements at the intersection, along Tierra Bonita Road and at Tierra Bonita Elementary School and Twin Peaks Middle School are recommended to improve operations during school peak periods.

Figure 9 displays the recommended improvements on Twin Peaks Road. As shown in the figure, it is recommended to install vertical delineators along Twin Peaks Road to restrict U-turns. This would force vehicles to use the signal at Tierra Bonita Road and is intended to improve safety. Signal timing adjustments would need to accommodate for increased left-turns and U-turns at this signal. Cones can be used as a temporary improvement to restrict U-turns and to understand its effects on the intersection of Twin Peaks Road and Tierra Bonita Road. It is also recommended to extend the maximum green time for the southbound movement at the intersection to give southbound right-turning vehicles time after the pedestrian crossing interval to maneuver through the intersection. These two improvements can be implemented by City of Poway staff in a short amount of time with minimal costs.

Figure 10 displays the recommended improvements on Tierra Bonita Road and at the elementary and middle schools. As shown in the figure, it is recommended to remove the on street parking on the east side of the street and restripe Tierra Bonita Road between Tierra Bonita Court and Evening Star Drive to include a two-way left-turn lane to provide space for queued drop-off/pick-up vehicles. Recommended improvements also include the installation of curb bulbouts at the intersection of Tierra Bonita Road and Tierra Bonita Court to provide pedestrian improvements and slow vehicle speeds down through the intersection. It is also recommended to add striping to the curb side drop-off/pick-up areas to delineate two 13 foot lanes to allow for additional queue space when needed. These two improvements would affect traffic operations and parking along Tierra Bonita Road and requires input from the schools and residents before design and implementation. These improvements are also more timely and costly to implement then the ones shown in Figure 9.

FIGURE 9 - Preliminary Improvements along Twin Peaks Road

NOT TO SCALE

FIGURE 10 - Preliminary Improvements along Tierra Bonita Road

Espola Road at Del Poniente Road

Based on the LOS results, this intersection currently operates at acceptable conditions during morning, midday, and evening peak periods. However, between 7:00 a.m. and 7:30 a.m. northbound queues were observed to back up into the intersection of Espola Road and Twin Peaks Road. Similarly, between 2:15 p.m. and 2:45 p.m. southbound queues were observed to back up into the intersection of Espola Road and Titan Way. Signal timing changes are recommended at this intersection to improve operations along Espola Road during school peak periods. **Figure 11** displays the recommended improvements along Espola Road. As shown in the figure, it is recommended to extend the maximum green times for the critical movements at the intersections of Espola Road at Del Poniente Road and Espola Road at Titan Way to improve traffic flow. These signal timing improvements can be implemented by City of Poway staff in a short amount of time with minimal costs.

Espola Road at Titan Way

Based on field review and the LOS results, this intersection currently operates at acceptable conditions during morning, midday, and evening peak periods. Heavy congestion was observed during school peak periods. Signal timing changes are recommended at this intersection during the midday peak period to improve pick-up operations along Titan Way and Espola Road (see Figure 11). Improvements to the parking lot of Poway Center for the Performing Arts are also recommended to improve pick-up and drop-off operations. **Figure 12** displays the recommended improvements at Poway High School. These improvements would require input from the school before design and implementation.

Espola Road at Poway Road

Based on the LOS results, this intersection currently operates at acceptable conditions during morning, midday, and evening peak periods. However, during the evening peak period southbound left queues were observed to back up into the intersection of Espola Road and Twin Peaks Road and along Twin Peaks Road. It is recommended to extend the maximum green time for the southbound left-turn movement to improve operations along Espola Road during the evening peak period. This signal timing improvement can be implemented by City of Poway staff in a short amount of time with minimal costs.

Twin Peaks Road at Espola Road

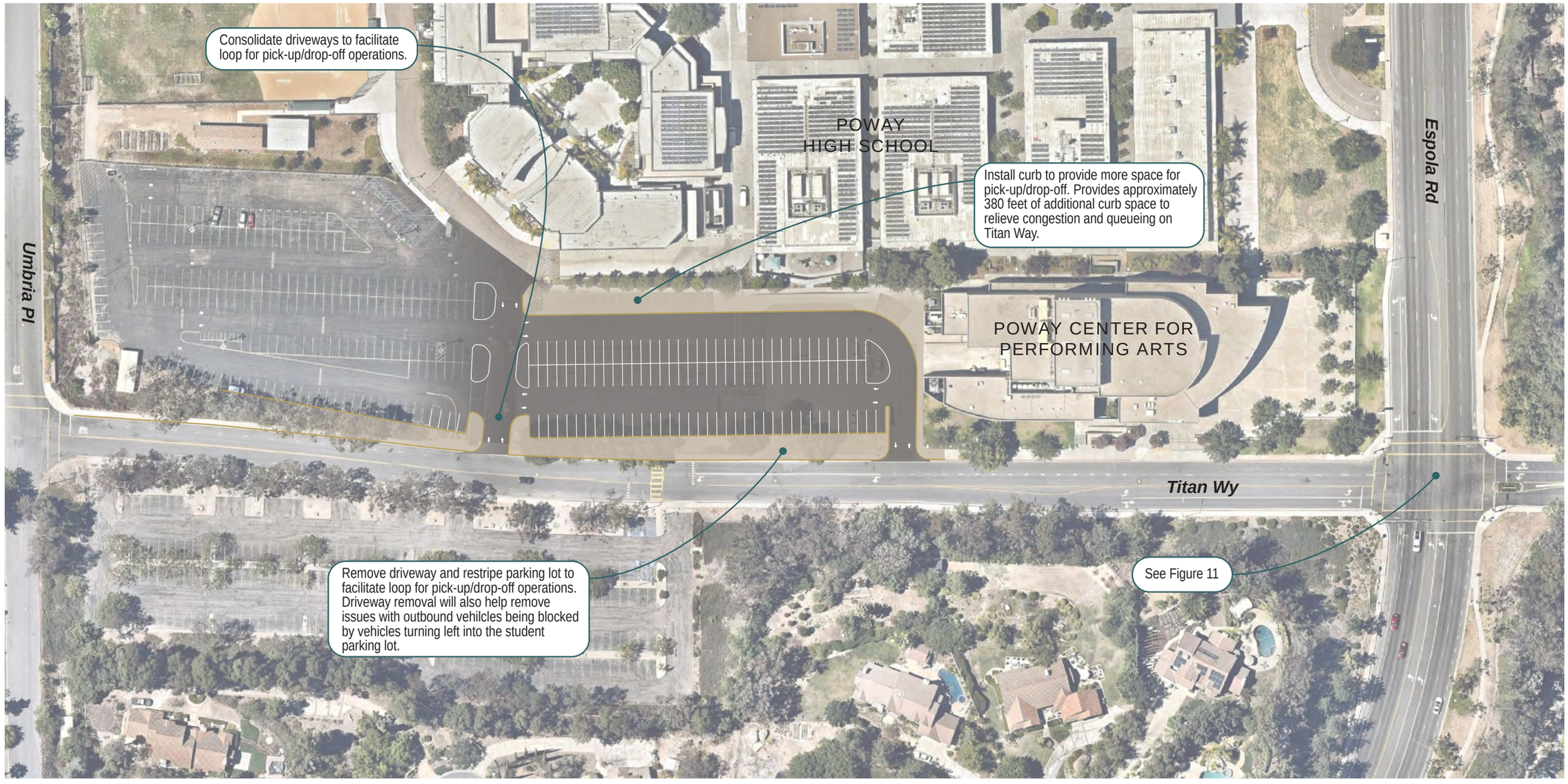
The geometry at the intersection of Twin Peaks Road at Espola Road is heavily constrained by the width of Espola Road, specifically the north leg of the intersection. Between Titan Way and Twin Peaks Road, Espola Road has one travel lane in each direction, bike lanes on both sides, and no parking. Increasing the vehicular capacity of the roadway would require widening Espola Road which would result in major environmental impacts and the acquisition of private land. Additionally, the widening of Espola Road was recently rejected by City Council. Therefore, no geometric improvements are recommended for the intersection or cross-section of Espola Road.

Based on the LOS results, this intersection currently operates at acceptable conditions during morning, midday, and evening peak periods. While heavy congestion was observed during the morning and evening peak periods, the majority of congestion was observed to be caused by upstream and downstream signals on Espola Road. During the morning peak period, improvements to the signal timing at the intersection of Espola Road and Del Poniente Road are expected to improve traffic flow and queues at the intersection of Twin Peaks Road and Espola Road. During the evening peak period, improvements to the signal timing at the intersection of Espola Road and Poway Road are expected to improve traffic flow and queues at the intersection.

FIGURE 11 - Preliminary Improvements along Espola Road

NOT TO SCALE

FIGURE 12 - Preliminary Improvements at Poway High School



4 CONCLUSIONS

Twin Peaks Road and Espola Road are important regional and local connections within the City of Poway. Both roadways experience heavy traffic during morning and evening commute hours as well as in the afternoon when school gets out.

Morning Traffic

CURRENT CONDITIONS: During the morning peak period (between 7:00 a.m. and 9:00 a.m.), Twin Peaks Road is heavily utilized with both school and general commuter traffic. The coordinated traffic signals along Twin Peaks Road do a good job of platooning the eastbound and westbound movements and operate at acceptable levels. On Espola Road, congestion is heavy between Del Poniente Road and Twin Peaks Road between 7:00 a.m. and 7:30 a.m. This heavy congestion causes recurrent queues and additional delay at the intersection of Twin Peaks Road and Espola Road.

RECOMMENDATION: The intersection of Espola Road and Del Poniente Road experiences heavy northbound traffic and very little traffic at the other approaches during the morning peak hour. By extending the maximum green time in the northbound and southbound directions at this intersection, more through vehicles will be able to navigate through the intersection each cycle. This operational change is intended to relieve the congestion observed between 7:00 a.m. and 7:30 a.m. and help operations at the intersection of Espola Road and Twin Peaks Road.

Evening Traffic

CURRENT CONDITIONS: During the evening peak (between 4:00 p.m. and 6:00 pm), the coordinated traffic signals along Twin Peaks Road do a good job of progressing traffic through the study corridor and operate at acceptable levels. On Espola Road, congestion is heavy between Poway Road and Twin Peaks Road. This congestion was observed to be caused by the southbound left-turn movement at the intersection of Espola Road and Poway Road, causing over a two mile queue from the intersection of Espola Road and Poway Road extending to Twin Peaks Road at Midland Road.

RECOMMENDATION: The intersection of Espola Road and Poway road experiences heavy traffic in the southbound direction and very little traffic at the other approaches during the evening peak period. By extending the maximum green time in the southbound direction, more vehicles (southbound left-turns) will be able to navigate through the intersection, which is intended to relieve the queues observed along Espola Road and Twin Peaks Road.

Poway High School

CURRENT CONDITIONS: Poway High School is located at the northwest corner of the intersection of Espola Road and Titan Way. The intersection of Espola Road and Titan Way experiences large queues at the northbound left-turn movement and eastbound approach between 7:00 a.m. and 7:30 a.m. and 2:15 p.m. and 2:45 p.m. when drop-off and pick-up operations are heaviest. The majority of pick-up/drop-off operations and student parking occur off of Titan Way causing congestion and back-up along the roadway during these times.

RECOMMENDATION: Curbside pick-up/ drop-off at the high school is provided within the parking lot of Poway Center for the Performing Arts off of Titan Way. Currently, there is approximately 100 feet of curb space for these operations. By reconfiguring the parking lot to facilitate a longer pick-up/drop-off loop, an additional 380 feet of curb space can be utilized for pick-up/drop-off operations. This change is intended to provide more space for vehicles to queue within the parking lot to relieve congestion and improve operations along Titan Way. Extending the maximum green times for the northbound left-turn movement and eastbound approach will also improve operations along Titan Way and relieve queues at the intersection.

Tierra Bonita Elementary School & Twin Peaks Middle School

CURRENT CONDITIONS: Twin Peaks Middle School and Tierra Bonita Elementary School are located at the northwest corner of the intersection of Twin Peaks Road and Tierra Bonita Road. This intersection experiences large queues at the eastbound left-turn movement and southbound approach between 7:20 a.m. and 8:30 a.m. and 3:00 p.m. and 3:30 p.m. when drop-off and pick-up operations are heaviest. Drop-off operations occur along Tierra Bonita Road and Twin Peaks Road causing congestion and back-up along Tierra Bonita Road and atypical operations along the north side of Twin Peaks Road.

RECOMMENDATION: Curbside pick-up/ drop-off at both schools is provided utilizing one-way loops through their parking lots. Currently, both schools facilitate one line of vehicles through the curbside pick-up/drop-off area at a time. By delineating two 13 foot lanes inside the parking lot, additional queue space is provided when needed. To further improve operations along Tierra Bonita Road, the roadway between Tierra Bonita Court and Evening Star Drive can be restriped to provide a two-way left-turn lane to give more space for vehicles to queue in the northbound or southbound directions (either waiting to enter the pick-up/ drop-off area or waiting at the signal at Twin Peaks Road). This improvement will require the removal of parking along the stretch of roadway. As part of the improvement, it is also recommended to consider installing curb bulbouts at the intersection of Tierra Bonita Road and Tierra Bonita Court to provide more space for pedestrians, reduce crossing distance and exposure to vehicles, and reduce vehicular speeds through the intersection.

A pick-up/drop-off area is also provided along the north side of Twin Peaks Road. It is recommended to consider installing vertical delineators along Twin Peaks Road to restrict U-turns. This modification would force vehicles to use the signal at Tierra Bonita Road and is intended to improve safety. This, coupled with signal timing changes at the intersection of Tierra Bonita Road and Twin Peaks Road during the midday peak, is intended to relieve queues on Tierra Bonita Road and the Twin Peak Road approaches.

Final Recommendations

In summary, Twin Peaks Road and Espola Road currently operate at acceptable conditions but have specific locations and peak intervals that feel congested. The following improvements are recommended to improve operations along the corridor by increasing the flow of traffic for the critical movements during the peak hours and providing more space for school pick-up/drop-off vehicles to queue to remove them from the main traffic flow. Improvements include both signal timing changes that can be implemented by City of Poway Staff in a short amount of time, and more extensive geometric changes that will require input from residents and the schools before design and implementation. Improvements that would result in potential environmental impacts (i.e. widening), acquisition of private land, or would substantially diminish the character of the roadways were not considered.

The following improvements are recommended along the Twin Peaks Road study corridor.

Improvements that can be implemented by City of Poway staff

- Signal timing changes at Espola Road and Titan Way
- Signal timing changes at Espola Road and Del Poniente Road
- Signal timing changes at Espola Road and Poway Road
- Signal timing changes at Twin Peaks Road and Tierra Bonita Road
- Installation of vertical delineators on Twin Peaks Road – Recommend trying interim improvement before final installation.

Improvements that require additional coordination and design

- Restriping of Tierra Bonita Road
- Installation of corner bulbouts at Tierra Bonita Road and Tierra Bonita Court
- Restriping of drop-off/pick-up area at Tierra Bonita Elementary School
- Restriping of drop-off/pick-up area at Twin Peaks Middle School
- Reconfiguration of Poway Center for the Performing Arts parking lot

APPENDICES

APPENDIX A

EXISTING TRAFFIC COUNTS

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-002

Day: Thursday

City: Poway

Date: 12/1/2016

AM

NS/EW Streets:	Midland Rd			Midland Rd			Twin Peaks Rd			Twin Peaks Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	1	0	1	2	0	1	2	0	
7:00 AM	18	1	31	11	3	13	0	181	14	23	337	5	637
7:15 AM	25	0	20	18	3	8	2	136	22	23	327	6	590
7:30 AM	37	4	11	22	2	21	14	131	31	21	315	9	618
7:45 AM	12	1	22	2	3	10	6	106	42	28	302	7	541
8:00 AM	12	2	42	4	0	9	16	156	22	30	266	10	569
8:15 AM	16	0	26	3	6	18	20	119	19	38	314	7	586
8:30 AM	8	0	15	6	7	11	19	85	27	19	230	7	434
8:45 AM	12	1	17	3	3	5	24	123	22	17	190	5	422
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	140	9	184	69	27	95	101	1037	199	199	2281	56	4397
APPROACH %'s :	42.04%	2.70%	55.26%	36.13%	14.14%	49.74%	7.55%	77.56%	14.88%	7.85%	89.94%	2.21%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	92	6	84	53	11	52	22	554	109	95	1281	27	2386
PEAK HR FACTOR :		0.875			0.644			0.878			0.961		0.936

UTURNS

NB	SB	EB	WB
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-002

Day: Thursday

City: Poway

Date: 12/1/2016

PM

NS/EW Streets:	Midland Rd			Midland Rd			Twin Peaks Rd			Twin Peaks Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	1	0	1	2	0	1	2	0	
4:00 PM	22	7	30	3	5	10	28	248	46	22	149	7	577
4:15 PM	25	5	30	1	3	8	23	251	33	19	143	8	549
4:30 PM	26	6	40	2	5	15	17	269	33	28	147	4	592
4:45 PM	37	10	37	5	6	21	8	296	35	44	190	5	694
5:00 PM	54	10	22	5	5	16	14	312	28	33	181	2	682
5:15 PM	36	3	27	2	4	14	11	256	36	40	173	5	607
5:30 PM	37	8	31	3	4	11	9	244	41	29	165	5	587
5:45 PM	19	3	30	2	5	6	13	245	39	22	135	1	520
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	256	52	247	23	37	101	123	2121	291	237	1283	37	4808
APPROACH %'s :	46.13%	9.37%	44.50%	14.29%	22.98%	62.73%	4.85%	83.67%	11.48%	15.22%	82.40%	2.38%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	153	29	126	14	20	66	50	1133	132	145	691	16	2575
PEAK HR FACTOR :		0.895			0.781			0.929			0.891		0.928

UTURNS

NB	SB	EB	WB
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-003

Day: Thursday

City: Poway

Date: 12/1/2016

AM

NS/EW Streets:	Budwin Ln			Budwin Ln			Twin Peaks Rd			Twin Peaks Rd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	0	1	0	0.5	0.5	1	1	2	0	1	2	0					
7:00 AM	2	0	0	0	0	4	2	211	0	0	329	0	548	0	0	0	0
7:15 AM	2	1	0	1	0	2	4	168	2	0	363	0	543	0	0	2	0
7:30 AM	4	0	0	1	0	7	4	153	2	1	331	4	507	0	0	2	1
7:45 AM	9	0	0	2	0	4	1	123	1	1	316	2	459	0	0	0	2
8:00 AM	1	0	0	2	0	7	12	155	3	5	276	4	465	0	0	2	5
8:15 AM	2	0	1	0	0	0	5	142	0	12	350	9	521	0	0	1	10
8:30 AM	0	0	2	5	0	2	4	102	2	1	226	5	349	0	0	0	1
8:45 AM	1	0	0	2	0	4	15	120	4	0	213	11	370	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	21	1	3	13	0	30	47	1174	14	20	2404	35	3762	0	0	7	19
APPROACH %'s :	84.00%	4.00%	12.00%	30.23%	0.00%	69.77%	3.81%	95.06%	1.13%	0.81%	97.76%	1.42%					
PEAK HR START TIME :	700 AM												TOTAL				
PEAK HR VOL :	17	1	0	4	0	17	11	655	5	2	1339	6	2057				
PEAK HR FACTOR :		0.500			0.656			0.788			0.928		0.938				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-004

Day: Thursday

City: Poway

Date: 12/1/2016

AM

NS/EW Streets:	Tierra Bonita Rd			Tierra Bonita Rd			Twin Peaks Rd			Twin Peaks Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	1	1	0	1	2	0	1	2	0	
7:00 AM	21	16	23	6	2	39	38	174	7	9	270	11	616
7:15 AM	11	45	8	15	8	60	59	94	11	11	296	26	644
7:30 AM	21	59	4	38	11	90	59	61	42	11	214	18	628
7:45 AM	15	22	5	32	14	81	37	70	6	3	217	16	518
8:00 AM	30	43	10	32	20	58	46	82	11	5	181	15	533
8:15 AM	32	17	8	54	15	72	50	108	13	8	238	18	633
8:30 AM	11	1	5	15	4	30	14	89	6	5	196	6	382
8:45 AM	8	0	1	5	0	10	10	98	6	4	211	0	353
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	149	203	64	197	74	440	313	776	102	56	1823	110	4307
APPROACH %'s :	35.82%	48.80%	15.38%	27.71%	10.41%	61.88%	26.28%	65.16%	8.56%	2.82%	91.65%	5.53%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	68	142	40	91	35	270	193	399	66	34	997	71	2406
PEAK HR FACTOR :		0.744			0.712			0.751			0.827		0.934

UTURNS	NB	SB	EB	WB
	0	0	0	0
	0	0	0	0
	0	0	3	0
	0	0	3	0
	0	0	19	0
	0	0	12	0
	0	0	0	0
	0	0	1	0
	NB	SB	EB	WB
	0	0	38	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-004

Day: Thursday

City: Poway

Date: 12/1/2016

PM

NS/EW Streets:	Tierra Bonita Rd			Tierra Bonita Rd			Twin Peaks Rd			Twin Peaks Rd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	1	0	1	1	0	1	2	0	1	2	0					
1:30 PM	14	3	8	4	3	14	13	120	8	5	123	7	322	0	0	0	0
1:45 PM	8	11	2	6	2	16	44	129	6	3	111	9	347	0	0	0	0
2:00 PM	1	6	7	30	10	43	39	142	6	0	107	7	398	0	0	1	0
2:15 PM	8	1	10	14	3	42	18	182	10	10	159	6	463	0	0	2	0
2:30 PM	9	7	11	3	3	19	16	214	8	16	231	3	540	0	0	2	0
2:45 PM	6	5	13	6	1	20	32	202	10	12	210	10	527	0	0	4	0
3:00 PM	8	10	11	15	6	31	53	204	31	6	131	12	518	0	0	9	0
3:15 PM	29	9	21	55	14	49	44	226	22	18	149	7	643	0	0	15	2
3:30 PM	10	3	12	29	7	56	41	243	12	7	157	9	586	0	0	1	1
3:45 PM	10	5	7	13	1	22	23	231	14	8	145	6	485	0	0	1	0
4:00 PM	6	4	5	12	8	20	22	234	8	2	138	1	460	0	0	1	0
4:15 PM	7	3	13	8	5	26	18	247	15	9	128	4	483	0	0	0	0
4:30 PM	8	7	5	2	2	15	27	274	17	18	145	9	529	0	0	1	0
4:45 PM	5	5	10	8	10	39	33	265	19	16	177	7	594	0	0	0	1
5:00 PM	8	3	6	13	6	34	26	275	28	20	161	10	590	0	0	0	0
5:15 PM	10	7	4	10	10	25	28	268	30	19	178	5	594	0	0	2	1
5:30 PM	8	4	4	6	4	21	30	219	28	27	160	5	516	0	0	0	3
5:45 PM	9	1	5	2	2	16	13	239	14	15	129	2	447	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	164	94	154	236	97	508	520	3914	286	211	2739	119	9042	0	0	39	8
APPROACH %'s :	39.81%	22.82%	37.38%	28.06%	11.53%	60.40%	11.02%	82.92%	6.06%	6.88%	89.25%	3.88%					
PEAK HR START TIME :	430 PM												TOTAL				
PEAK HR VOL :	31	22	25	33	28	113	114	1082	94	73	661	31	2307				
PEAK HR FACTOR :		0.929			0.763			0.980			0.947		0.971				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-005

Day: Thursday

City: Poway

Date: 12/1/2016

AM

NS/EW Streets:	Roberto Rio Rd			Roberto Rio Rd			Twin Peaks Rd			Twin Peaks Rd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	0	0	1	0	1	0	1	2	0	1	2	0					
7:00 AM	2	0	7	0	0	13	15	186	2	6	286	1	518	0	0	0	0
7:15 AM	0	0	3	0	0	7	6	105	0	3	337	0	461	0	0	0	0
7:30 AM	1	0	1	0	0	10	5	93	0	0	227	1	338	0	0	2	0
7:45 AM	0	0	0	0	0	6	4	104	0	1	215	0	330	0	0	0	0
8:00 AM	1	0	2	0	0	6	3	128	0	0	212	0	352	0	0	1	0
8:15 AM	0	0	0	2	0	12	5	159	1	0	230	0	409	0	0	1	0
8:30 AM	1	0	0	0	0	2	1	103	0	0	189	0	296	0	0	0	0
8:45 AM	0	0	0	0	0	6	0	105	2	2	202	0	317	0	0	0	2
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	5	0	13	2	0	62	39	983	5	12	1898	2	3021	0	0	4	2
APPROACH %'s :	27.78%	0.00%	72.22%	3.13%	0.00%	96.88%	3.80%	95.72%	0.49%	0.63%	99.27%	0.10%					
PEAK HR START TIME :	700 AM												TOTAL				
PEAK HR VOL :	3	0	11	0	0	36	30	488	2	10	1065	2	1647				
PEAK HR FACTOR :		0.389			0.692			0.640			0.792		0.795				

CONTROL : 1-Way Stop(SB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-005

Day: Thursday

City: Poway

Date: 12/1/2016

PM

NS/EW Streets:	Roberto Rio Rd			Roberto Rio Rd			Twin Peaks Rd			Twin Peaks Rd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	0	0	1	0	1	0	1	2	0	1	2	0					
1:30 PM	0	0	0	1	0	7	7	133	0	0	131	1	280	0	0	0	0
1:45 PM	0	0	1	1	0	9	3	127	0	1	115	0	257	0	0	0	0
2:00 PM	0	0	0	3	0	4	5	171	0	1	111	0	295	0	0	0	1
2:15 PM	0	0	1	1	0	3	3	202	0	0	188	0	398	0	0	0	0
2:30 PM	0	0	0	0	0	3	4	217	0	1	252	1	478	0	0	1	1
2:45 PM	0	0	1	0	0	6	5	223	0	6	213	0	454	0	0	2	0
3:00 PM	1	0	1	1	0	3	10	201	1	18	156	1	393	0	0	1	0
3:15 PM	5	0	38	0	0	5	2	290	0	11	151	1	503	0	0	0	1
3:30 PM	1	0	3	0	0	2	5	282	0	3	165	0	461	0	0	0	0
3:45 PM	0	0	0	0	0	3	6	245	0	1	155	0	410	0	0	0	1
4:00 PM	0	0	0	0	0	0	10	241	0	0	126	1	378	0	0	1	0
4:15 PM	0	0	2	0	0	6	7	284	0	2	149	1	451	0	0	1	2
4:30 PM	0	0	0	0	0	5	6	252	1	0	166	0	430	0	0	0	0
4:45 PM	0	0	0	0	0	12	12	269	0	3	181	0	477	0	0	0	2
5:00 PM	0	0	0	1	0	4	18	271	0	0	189	1	484	0	0	3	0
5:15 PM	0	0	0	1	0	10	15	250	0	0	184	2	462	0	0	0	0
5:30 PM	0	0	0	0	0	5	8	229	0	1	180	1	424	0	0	2	1
5:45 PM	0	0	0	1	0	3	13	235	0	0	135	0	387	0	0	4	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	7	0	47	10	0	90	139	4122	2	48	2947	10	7422	0	0	15	9
APPROACH %'s :	12.96%	0.00%	87.04%	10.00%	0.00%	90.00%	3.26%	96.69%	0.05%	1.60%	98.07%	0.33%					

PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	0	0	0	2	0	31	51	1042	1	3	720	3	1853
PEAK HR FACTOR :	0.000			0.688			0.946			0.955			0.957

CONTROL : 1-Way Stop(SB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-006

Day: Thursday

City: Poway

Date: 12/1/2016

AM

NS/EW Streets:	Espola Road			Espola Road			Twin Peaks Rd			Twin Peaks Rd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 1	NR 1	SL 1	ST 1	SR 1	EL 2	ET 1	ER 1	WL 1	WT 1	WR 0	TOTAL
7:00 AM	129	135	0	2	67	165	147	4	37	2	15	9	712
7:15 AM	159	93	0	1	78	154	66	5	29	4	10	6	605
7:30 AM	124	66	2	3	75	99	57	4	48	1	10	6	495
7:45 AM	133	81	2	4	55	72	55	4	45	2	7	1	461
8:00 AM	134	85	1	0	43	76	59	8	52	3	9	3	473
8:15 AM	122	89	2	0	47	79	118	6	51	2	9	4	529
8:30 AM	118	76	1	2	42	65	59	3	35	2	9	2	414
8:45 AM	109	59	0	0	56	93	55	2	51	2	10	4	441
TOTAL VOLUMES :	1028	684	8	12	463	803	616	36	348	18	79	35	4130
APPROACH %'s :	59.77%	39.77%	0.47%	0.94%	36.23%	62.83%	61.60%	3.60%	34.80%	13.64%	59.85%	26.52%	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	545	375	4	10	275	490	325	17	159	9	42	22	2273
PEAK HR FACTOR :		0.875			0.828			0.666			0.702		0.798

UTURNS	NB	SB	EB	WB
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
TOTAL	0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-006 — Day: Thursday

City: Poway — Date: 12/1/2016

PM

NS/EW Streets:	Espola Road			Espola Road			Twin Peaks Rd			Twin Peaks Rd				NB	SB	EB	WB
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND				UTURNS			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	2	1	1	1	1	1	2	1	1	1	1	0					
1:30 PM	56	49	4	1	46	65	64	10	56	3	8	2	364	0	0	0	0
1:45 PM	50	37	2	1	28	57	67	7	54	2	4	5	314	0	0	0	0
2:00 PM	57	72	2	3	38	58	103	16	60	3	5	3	420	0	0	0	0
2:15 PM	47	68	4	5	89	137	121	8	66	5	4	3	557	0	0	0	0
2:30 PM	55	65	3	3	98	191	140	7	86	4	8	3	663	0	0	0	0
2:45 PM	72	76	1	4	85	137	111	9	89	3	4	5	596	0	0	0	0
3:00 PM	55	68	1	3	62	116	102	11	96	0	9	3	526	0	0	0	0
3:15 PM	48	69	4	2	90	104	157	11	149	1	7	4	646	0	0	0	0
3:30 PM	44	64	2	3	101	112	140	5	128	2	9	2	612	0	0	0	0
3:45 PM	48	66	1	6	91	105	94	14	137	2	7	4	575	0	0	0	0
4:00 PM	40	77	6	1	93	75	94	14	133	2	13	4	552	0	0	0	0
4:15 PM	46	70	4	0	97	93	94	22	174	4	6	1	611	0	0	0	0
4:30 PM	47	86	2	4	97	117	101	8	138	3	3	2	608	0	0	0	0
4:45 PM	47	81	2	0	90	132	117	19	135	1	6	1	631	0	0	0	0
5:00 PM	73	73	4	5	89	118	94	20	144	3	5	4	632	0	0	0	0
5:15 PM	46	75	1	3	85	110	94	32	118	10	8	5	587	0	0	0	0
5:30 PM	51	72	2	1	73	109	79	24	116	9	16	2	554	0	0	0	0
5:45 PM	49	53	3	4	74	76	104	13	101	4	13	2	496	0	0	0	0

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	931	1221	48	49	1426	1912	1876	250	1980	61	135	55	9944	0	0	0	0
APPROACH %'s :	42.32%	55.50%	2.18%	1.45%	42.10%	56.45%	45.69%	6.09%	48.22%	24.30%	53.78%	21.91%					

PEAK HR START TIME :	415 PM												TOTAL
PEAK HR VOL :	213	310	12	9	373	460	406	69	591	11	20	8	2482
PEAK HR FACTOR :		0.892			0.948			0.919			0.813		0.982

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-007

Day: Thursday

City: Poway

Date: 12/1/2016

AM

NS/EW Streets:	Espola Road			Espola Road			Titan Way			Titan Way				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	2	2	0	1	2	1	1	0.5	0.5	1	0.5	0.5					
7:00 AM	177	113	2	3	98	71	16	1	109	3	1	0	594	0	2	0	0
7:15 AM	203	111	2	14	138	74	25	0	129	2	1	0	699	0	13	0	0
7:30 AM	13	117	2	0	107	10	9	0	34	5	0	1	298	0	0	0	0
7:45 AM	2	110	4	0	98	4	3	0	6	3	0	3	233	0	0	0	0
8:00 AM	4	119	3	1	135	4	3	0	9	1	0	6	285	0	0	0	0
8:15 AM	10	206	6	4	126	3	0	0	6	2	0	2	365	0	0	0	0
8:30 AM	7	141	0	2	72	2	1	0	4	2	0	5	236	1	0	0	0
8:45 AM	6	115	1	2	107	3	2	0	7	3	0	4	250	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	422	1032	20	26	881	171	59	1	304	21	2	21	2960	1	15	0	0
APPROACH %'s :	28.63%	70.01%	1.36%	2.41%	81.73%	15.86%	16.21%	0.27%	83.52%	47.73%	4.55%	47.73%					
PEAK HR START TIME :	700 AM												TOTAL				
PEAK HR VOL :	395	451	10	17	441	159	53	1	278	13	2	4	1824				
PEAK HR FACTOR :		0.677			0.683			0.539			0.792		0.652				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-007

Day: Thursday

City: Poway

Date: 12/1/2016

PM

NS/EW Streets:	Espola Road			Espola Road			Titan Way			Titan Way				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	2	2	0	1	2	1	1	0.5	0.5	1	0.5	0.5					
1:30 PM	9	85	2	0	92	5	3	0	13	4	0	2	215	0	0	0	0
1:45 PM	17	73	1	1	50	3	3	1	11	5	0	2	167	0	0	0	0
2:00 PM	46	100	3	2	82	7	2	0	8	2	0	2	254	0	0	0	0
2:15 PM	45	125	2	1	145	15	20	0	129	4	0	4	490	0	0	0	0
2:30 PM	55	111	1	5	141	19	21	1	130	1	0	4	489	0	2	0	0
2:45 PM	42	150	3	5	138	8	20	0	58	1	0	3	428	1	2	0	0
3:00 PM	26	116	5	5	147	4	11	0	43	2	1	3	363	0	1	0	0
3:15 PM	22	169	4	2	136	7	14	0	35	5	0	3	397	0	0	0	0
3:30 PM	34	179	6	1	185	7	12	1	41	5	1	0	472	0	0	0	0
3:45 PM	20	121	6	1	147	8	11	0	16	1	0	2	333	0	0	0	0
4:00 PM	12	142	1	0	140	1	11	0	23	2	0	1	333	0	0	0	0
4:15 PM	10	118	3	0	153	4	6	0	10	3	0	4	311	0	0	0	0
4:30 PM	13	149	7	2	208	9	4	1	14	2	0	0	409	0	0	0	0
4:45 PM	10	156	6	4	202	9	5	0	15	4	0	1	412	0	1	0	0
5:00 PM	19	150	7	6	191	6	9	0	30	3	0	3	424	0	1	0	0
5:15 PM	11	146	6	1	164	3	0	0	10	0	0	4	345	0	0	0	0
5:30 PM	13	112	2	2	141	7	5	0	12	5	0	0	299	0	0	0	0
5:45 PM	7	107	4	1	117	5	4	0	9	2	0	1	257	0	1	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	411	2309	69	39	2579	127	161	4	607	51	2	39	6398	1	8	0	0
APPROACH %'s :	14.74%	82.79%	2.47%	1.42%	93.95%	4.63%	20.85%	0.52%	78.63%	55.43%	2.17%	42.39%					
PEAK HR START TIME :	215 PM												TOTAL				
PEAK HR VOL :	168	502	11	16	571	46	72	1	360	8	1	14	1770				
PEAK HR FACTOR :	0.873			0.959			0.712			0.719			0.903				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-008

Day: Thursday

City: Poway

Date: 12/1/2016

AM

NS/EW Streets:	Espola Road			Espola Road			High Valley Rd/ Del Poniente Rd			High Valley Rd/ Del Poniente Rd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	1	1	1	1	0	1	1	0	1	1	0					
7:00 AM	3	289	1	2	210	4	13	0	13	10	1	10	556	0	2	0	0
7:15 AM	5	255	3	7	253	6	22	0	14	14	0	12	591	0	0	0	0
7:30 AM	7	111	6	3	163	4	7	0	27	19	0	3	350	0	0	0	0
7:45 AM	5	110	8	3	107	4	2	0	10	12	0	4	265	0	0	0	0
8:00 AM	6	127	4	2	140	2	2	0	18	12	0	2	315	0	0	0	0
8:15 AM	13	207	13	7	134	2	8	0	23	18	0	5	430	0	0	0	0
8:30 AM	14	133	4	5	81	0	8	0	10	11	0	8	274	0	1	0	0
8:45 AM	6	111	5	4	103	7	8	0	21	12	0	3	280	0	1	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	59	1343	44	33	1191	29	70	0	136	108	1	47	3061	0	4	0	0
APPROACH %'s :	4.08%	92.88%	3.04%	2.63%	95.05%	2.31%	33.98%	0.00%	66.02%	69.23%	0.64%	30.13%					
PEAK HR START TIME :	700 AM												TOTAL				
PEAK HR VOL :	20	765	18	15	733	18	44	0	64	55	1	29	1762				
PEAK HR FACTOR :		0.685			0.720			0.750			0.817		0.745				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-008

Day: Thursday

City: Poway

Date: 12/1/2016

PM

NS/EW Streets:	Espola Road			Espola Road			High Valley Rd/ Del Poniente Rd			High Valley Rd/ Del Poniente Rd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	1	1	1	1	0	1	1	0	1	1	0					
1:30 PM	13	96	8	7	92	5	5	0	7	5	0	3	241	0	0	0	0
1:45 PM	10	83	12	1	78	2	5	0	10	10	0	10	221	0	0	0	0
2:00 PM	13	139	9	2	80	0	3	0	17	15	1	4	283	0	0	0	0
2:15 PM	16	175	14	5	233	3	6	0	9	7	0	4	472	0	0	0	0
2:30 PM	22	159	9	11	276	11	9	0	17	6	1	10	531	0	0	0	0
2:45 PM	13	178	11	3	219	5	6	0	12	10	0	8	465	0	0	0	0
3:00 PM	14	139	13	4	189	9	4	0	17	9	0	6	404	0	0	0	0
3:15 PM	18	202	18	2	175	5	3	1	14	14	0	4	456	0	0	0	0
3:30 PM	19	209	10	9	210	5	6	0	8	11	0	2	489	0	0	0	0
3:45 PM	16	139	10	3	158	4	3	1	20	9	0	3	366	0	0	0	0
4:00 PM	13	145	13	5	158	2	4	0	12	7	0	3	362	0	1	0	0
4:15 PM	17	128	15	2	167	5	6	0	15	8	1	4	368	0	0	0	0
4:30 PM	10	166	14	6	202	4	4	0	8	14	0	2	430	0	0	0	0
4:45 PM	12	166	11	7	208	6	8	0	11	7	0	7	443	0	0	0	0
5:00 PM	18	157	14	6	208	6	7	0	11	8	0	5	440	0	0	0	0
5:15 PM	16	161	9	2	181	4	2	0	14	8	0	3	400	0	1	0	0
5:30 PM	14	117	8	3	156	4	6	0	20	5	0	6	339	0	0	0	0
5:45 PM	19	117	15	5	125	8	3	0	7	12	0	1	312	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	273	2676	213	83	3115	88	90	2	229	165	3	85	7022	0	2	0	0
APPROACH %'s :	8.63%	84.63%	6.74%	2.53%	94.80%	2.68%	28.04%	0.62%	71.34%	65.22%	1.19%	33.60%					
PEAK HR START TIME :	215 PM												TOTAL				
PEAK HR VOL :	65	651	47	23	917	28	25	0	55	32	1	28	1872				
PEAK HR FACTOR :		0.930			0.812			0.769			0.847		0.881				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-009 | Day: Thursday

City: Poway | Date: 12/1/2016

AM

NS/EW Streets:	Espola Road			Espola Road			Durhullen Dr			Durhullen Dr				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	1	0	1	2	0	0	1	0	0	0	0					
7:00 AM	1	278	0	0	217	15	23	0	0	1	0	2	537	0	0	0	0
7:15 AM	5	185	2	3	245	48	29	0	3	2	1	3	526	0	0	0	0
7:30 AM	11	119	0	4	142	40	2	0	4	5	4	0	331	0	0	0	0
7:45 AM	2	118	2	3	120	14	6	0	5	2	0	2	274	0	0	0	0
8:00 AM	17	135	0	1	104	74	15	0	6	5	1	0	358	2	0	0	0
8:15 AM	14	206	1	1	118	49	27	0	11	1	0	1	429	1	0	0	0
8:30 AM	1	130	0	1	99	3	2	0	0	3	0	2	241	1	0	0	0
8:45 AM	0	125	2	0	140	2	2	0	3	6	0	1	281	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	51	1296	7	13	1185	245	106	0	32	25	6	11	2977	4	0	0	0
APPROACH %'s :	3.77%	95.72%	0.52%	0.90%	82.12%	16.98%	76.81%	0.00%	23.19%	59.52%	14.29%	26.19%					
PEAK HR START TIME :	700 AM												TOTAL				
PEAK HR VOL :	19	700	4	10	724	117	60	0	12	10	5	7	1668				
PEAK HR FACTOR :		0.648			0.719			0.563			0.611		0.777				

CONTROL : 2-Way Stop(EB/WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-009

Day: Thursday

City: Poway

Date: 12/1/2016

PM

NS/EW Streets:	Espola Road			Espola Road			Durhullen Dr			Durhullen Dr				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	1	0	1	2	0	0	1	0	0	0	0					
1:30 PM	3	118	1	0	112	2	3	0	0	4	0	0	243	0	0	0	0
1:45 PM	4	106	1	2	75	12	1	0	0	2	1	1	205	0	1	0	0
2:00 PM	2	169	2	1	111	12	11	0	5	4	0	1	318	0	0	0	0
2:15 PM	6	183	3	1	258	10	8	0	3	2	0	3	477	2	0	0	0
2:30 PM	5	199	2	1	285	10	1	0	2	2	0	2	509	1	0	0	0
2:45 PM	5	195	5	2	207	20	2	0	3	0	0	0	439	0	0	0	0
3:00 PM	3	158	6	0	187	32	9	0	3	1	0	1	400	0	0	0	0
3:15 PM	4	235	4	1	163	32	27	0	14	2	0	0	482	0	0	0	0
3:30 PM	0	204	5	1	225	9	19	0	1	2	0	6	472	0	0	0	0
3:45 PM	1	153	8	1	178	4	2	0	0	0	0	1	348	0	1	0	0
4:00 PM	1	157	3	0	179	6	6	0	1	2	0	5	360	0	0	0	0
4:15 PM	4	162	2	3	173	6	4	0	0	4	0	2	360	0	0	0	0
4:30 PM	1	183	3	2	225	6	4	0	3	3	0	1	431	0	0	0	0
4:45 PM	0	197	2	1	219	9	11	0	4	3	0	0	446	0	0	0	0
5:00 PM	2	157	4	2	221	7	9	1	0	1	0	2	406	0	0	0	0
5:15 PM	0	171	4	3	184	5	5	0	0	0	0	0	372	0	0	0	0
5:30 PM	1	149	1	1	177	7	4	0	0	3	0	3	346	0	0	0	0
5:45 PM	2	140	9	0	135	4	3	0	2	8	0	0	303	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	44	3036	65	22	3314	193	129	1	41	43	1	28	6917	3	2	0	0
APPROACH %'s :	1.40%	96.53%	2.07%	0.62%	93.91%	5.47%	75.44%	0.58%	23.98%	59.72%	1.39%	38.89%					
PEAK HR START TIME :	230 PM												TOTAL				
PEAK HR VOL :	17	787	17	4	842	94	39	0	22	5	0	3	1830				
PEAK HR FACTOR :		0.845			0.794			0.372			0.500		0.899				

CONTROL : 2-Way Stop(EB/WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-010

Day: Thursday

City: Poway

Date: 12/1/2016

AM

NS/EW Streets:	Espola Road			Espola Road			Los Nietos Ave			Los Nietos Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	0	1	0	0	1	0	0	0	0	
7:00 AM	3	296	0	0	233	1	17	0	0	0	0	0	550
7:15 AM	1	173	0	0	227	6	8	0	0	0	0	0	415
7:30 AM	0	131	0	0	179	0	1	0	0	0	0	0	311
7:45 AM	0	134	0	0	130	2	0	0	1	0	0	0	267
8:00 AM	0	144	0	0	116	0	1	0	0	0	0	0	261
8:15 AM	0	208	0	0	130	1	1	0	1	0	0	0	341
8:30 AM	1	140	0	0	105	0	1	0	0	0	0	0	247
8:45 AM	0	120	0	0	147	0	0	0	1	0	0	0	268
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	5	1346	0	0	1267	10	29	0	3	0	0	0	2660
APPROACH %'s :	0.37%	99.63%	0.00%	0.00%	99.22%	0.78%	90.63%	0.00%	9.38%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	700 AM												TOTAL
PEAK HR VOL :	4	734	0	0	769	9	26	0	1	0	0	0	1543
PEAK HR FACTOR :		0.617			0.831			0.397			0.000		0.701

UTURNS

NB	SB	EB	WB
1	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
NB	SB	EB	WB
1	0	0	0

CONTROL : 1-Way Stop(EB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-010

Day: Thursday

City: Poway

Date: 12/1/2016

PM

NS/EW Streets:	Espola Road			Espola Road			Los Nietos Ave			Los Nietos Ave				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	1	0	0	1	0	0	1	0	0	0	0					
1:30 PM	0	118	0	1	110	1	4	0	0	0	0	0	234	0	1	0	0
1:45 PM	3	109	0	1	86	1	2	0	0	0	0	0	202	1	1	0	0
2:00 PM	1	167	0	0	104	1	0	0	0	0	0	0	273	0	0	0	0
2:15 PM	2	202	0	0	230	3	1	0	0	0	0	0	438	0	0	0	0
2:30 PM	0	202	0	0	293	6	1	0	0	0	0	0	502	0	0	0	0
2:45 PM	0	197	0	0	226	2	2	0	0	0	0	0	427	0	0	0	0
3:00 PM	0	167	0	0	188	1	2	0	1	0	0	0	359	0	0	0	0
3:15 PM	1	242	0	0	186	2	0	0	1	0	0	0	432	0	0	0	0
3:30 PM	0	209	0	0	214	1	1	0	2	0	0	0	427	0	0	0	0
3:45 PM	1	165	0	0	204	1	0	0	2	0	0	0	373	0	0	0	0
4:00 PM	1	174	0	0	173	1	1	0	2	0	0	0	352	0	0	0	0
4:15 PM	1	147	0	0	186	1	1	0	0	0	0	0	336	0	0	0	0
4:30 PM	0	201	0	0	220	1	0	0	1	0	0	0	423	0	0	0	0
4:45 PM	0	191	0	0	231	2	0	0	0	0	0	0	424	0	0	0	0
5:00 PM	1	184	0	0	203	2	1	0	2	0	0	0	393	1	0	0	0
5:15 PM	1	178	0	0	204	1	0	0	2	0	0	0	386	0	0	0	0
5:30 PM	1	147	0	0	174	3	0	0	1	0	0	0	326	0	0	0	0
5:45 PM	4	167	0	0	150	0	1	0	1	0	0	0	323	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	17	3167	0	2	3382	30	17	0	15	0	0	0	6630	2	2	0	0
APPROACH %'s :	0.53%	99.47%	0.00%	0.06%	99.06%	0.88%	53.13%	0.00%	46.88%	#DIV/0!	#DIV/0!	#DIV/0!					
PEAK HR START TIME :	215 PM												TOTAL				
PEAK HR VOL :	2	768	0	0	937	12	6	0	1	0	0	0	1726				
PEAK HR FACTOR :		0.944			0.793			0.583			0.000		0.860				

CONTROL : 1-Way Stop(EB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-011

Day: Thursday

City: Poway

Date: 12/1/2016

AM

NS/EW Streets:	Espola Road			Espola Road			Poway Rd			Poway Rd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	0	0	0	1	0	1	1	2	0	0	1	1					
7:00 AM	0	0	0	46	0	54	82	24	0	0	63	170	439	0	0	0	0
7:15 AM	0	0	0	35	0	64	41	32	0	0	86	172	430	0	0	0	0
7:30 AM	0	0	0	61	0	62	26	31	0	0	89	163	432	0	0	0	0
7:45 AM	0	0	0	53	0	51	47	36	0	0	79	169	435	0	0	0	0
8:00 AM	0	0	0	50	0	38	46	23	0	0	88	179	424	0	0	0	0
8:15 AM	0	0	0	59	0	50	36	29	0	0	71	192	437	0	0	0	0
8:30 AM	0	0	0	53	0	32	22	42	0	0	83	149	381	0	0	0	0
8:45 AM	0	0	0	65	0	34	19	25	0	0	79	146	368	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	0	0	0	422	0	385	319	242	0	0	638	1340	3346	0	0	0	0
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	52.29%	0.00%	47.71%	56.86%	43.14%	0.00%	0.00%	32.25%	67.75%					
PEAK HR START TIME :	700 AM												TOTAL				
PEAK HR VOL :	0	0	0	195	0	231	196	123	0	0	317	674	1736				
PEAK HR FACTOR :		0.000			0.866			0.752			0.960		0.989				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-4356-011

Day: Thursday

City: Poway

Date: 12/1/2016

PM

NS/EW Streets:	Espola Road			Espola Road			Poway Rd			Poway Rd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	0	0	0	1	0	1	1	2	0	0	1	1					
1:30 PM	0	0	0	56	0	27	28	59	0	0	44	76	290	0	0	0	0
1:45 PM	0	0	0	69	0	28	34	64	0	0	37	55	287	0	0	0	0
2:00 PM	0	0	0	71	0	31	54	74	0	0	47	69	346	0	0	0	0
2:15 PM	0	0	0	82	0	54	50	53	0	0	54	74	367	0	0	0	0
2:30 PM	0	0	0	121	0	67	54	72	0	0	47	63	424	0	0	0	0
2:45 PM	0	0	0	121	0	64	56	72	0	0	37	83	433	0	0	0	0
3:00 PM	0	0	0	132	0	33	46	81	0	0	36	68	396	0	0	0	0
3:15 PM	0	0	0	153	0	67	50	92	0	0	44	80	486	0	0	0	0
3:30 PM	0	0	0	173	0	56	40	94	0	0	32	61	456	0	0	0	0
3:45 PM	0	0	0	195	0	32	43	70	0	0	42	84	466	0	0	0	0
4:00 PM	0	0	0	187	0	32	42	114	0	0	47	70	492	0	0	0	0
4:15 PM	0	0	0	200	0	22	45	109	0	0	55	78	509	0	0	0	0
4:30 PM	0	0	0	189	0	20	53	98	0	0	48	75	483	0	0	0	0
4:45 PM	0	0	0	244	0	7	40	98	0	0	38	87	514	0	0	0	0
5:00 PM	0	0	0	200	0	16	55	156	0	0	36	92	555	0	0	0	0
5:15 PM	0	0	0	190	0	13	37	121	0	0	44	80	485	0	0	0	0
5:30 PM	0	0	0	176	0	9	40	171	0	0	45	71	512	0	0	0	0
5:45 PM	0	0	0	166	0	17	34	127	0	0	38	53	435	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	0	0	0	2725	0	595	801	1725	0	0	771	1319	7936	0	0	0	0
APPROACH %'s :	#DIV/0!	#DIV/0!	#DIV/0!	82.08%	0.00%	17.92%	31.71%	68.29%	0.00%	0.00%	36.89%	63.11%					
PEAK HR START TIME :	445 PM												TOTAL				
PEAK HR VOL :	0	0	0	810	0	45	172	546	0	0	163	330	2066				
PEAK HR FACTOR :	0.000			0.852			0.851			0.963			0.931				

CONTROL : Signalized

Prepared by National Data and Surveying Services

Origin Destination Study

Location: Poway Neighbourhood
City: Poway

Date: 12/1/2016
Day: Thursday

From	WB Los Nietos Ave	NB Roberto Rio Rd	NB Tierra Bonita Rd	WB Durhullen Rd	Totals
To	SB Roberto Rio Rd	EB Los Nietos Ave	EB Durhullen Rd	SB Tierra Bonita Rd	
7:00		1	1	5	7
7:05	1		7	1	9
7:10	1		6	1	8
7:15	1	3	13	3	20
7:20		1	8	10	19
7:25			1	17	18
7:30			2	24	26
7:35			2	10	12
7:40			1	5	6
7:45				4	4
7:50	1			1	2
7:55				7	7
8:00			1	7	8
8:05			1	15	16
8:10			2	10	12
8:15				26	26
8:20			1	7	8
8:25			2	5	7
8:30		1		2	3
8:35				1	1
8:40				1	1
8:45				1	1
8:50					0
8:55					0
Total	4	6	48	163	221

Prepared by National Data and Surveying Services

Origin Destination Study

Location: Poway Neighbourhood
City: Poway

Date: 12/1/2016
Day: Thursday

From	WB Los Nietos Ave	SB Roberto Rio Rd	NB Tierra Bonita Rd	WB Durhullen Rd	Totals
To	SB Roberto Rio Rd	EB Los Nietos Ave	EB Durhullen Rd	SB Tierra Bonita Rd	
13:30					0
13:35			1		1
13:40					0
13:45					0
13:50				1	1
13:55				1	1
14:00				9	9
14:05			1	3	4
14:10				3	3
14:15				2	2
14:20	1				1
14:25					0
14:30	1			2	3
14:35	1			4	5
14:40					0
14:45	1			1	2
14:50				3	3
14:55					0
15:00			3		3
15:05				2	2
15:10				5	5
15:15			1	10	11
15:20				10	10
15:25			2	4	6
15:30			3	1	4
15:35				1	1
15:40					0
15:45			1	2	3
15:50			1	1	2
15:55				1	1
16:00				1	1
16:05			1	2	3
16:10				1	1
16:15	1		1		2
16:20				1	1
16:25					0
16:30			1		1
16:35				1	1
16:40				2	2
16:45			3	2	5
16:50	1		2	1	4
16:55				1	1
17:00	1	1	3	1	6
17:05	1				1
17:10				2	2
17:15					0
17:20				1	1
17:25					0
17:30			1		1
17:35	1				1
17:40			1	1	2
17:45					0
17:50					0
17:55					0
Total	9	1	26	83	119

APPENDIX B

FIELD REVIEW OBSERVATIONS

Kimley»Horn

MEMORANDUM

To: Jon Collins

From: Kimley-Horn and Associates, Inc.

Date: 12/06/216

Subject: Twin Peaks Study of Traffic - *Initial Recommendations*

The following memo has been prepared to summarize the data collection efforts associated with the Twin Peaks Study of Traffic Project and present initial recommendations.

DATA COLLECTION

Data collection was conducted on Thursday, December 1st 2016. This represented a typical weekday when all nearby schools were in session.

Peak Hour Traffic Counts

Peak hour (7:00 a.m. - 9:00 a.m. and 1:30 - 6:00 p.m.) intersection turning movement counts were collected at the following locations:

- Twin Peaks Road and Community Road
- Twin Peaks Road and Midland Road
- Twin Peaks Road and Budwin Lane
- Twin Peaks Road and Tierra Bonita Road
- Twin Peaks Road and Roberto Rio Road
- Twin Peaks Road and Espola Road
- Espola Road at Titan Way
- Espola Road and High Valley Road/ Del Poniente Road
- Espola Road and Durhullen Drive
- Espola Road and Los Nietos Avenue
- Espola Road at Poway Road

During the same time frame, license plate recognition data was collected at the following intersections to determine the magnitude of cut-through traffic:

- Twin Peaks Road and Tierra Bonita Road
- Twin Peaks Road and Roberto Rio Road
- Espola Road and Durhullen Drive
- Espola Road and Los Nietos Avenue

Additional video was also collected at the same time in the following locations to document parking usage and u-turns:

- Twin Peaks Road near Kalapana Street
- Tierra Bonita Road near Country Creek Road

Peak Hour Observations

General observations along Twin Peaks Road between Community Road and Espola Road and along Tierra Bonita Road at the elementary and middle Schools were conducted between 7:00 a.m. - 9:00 a.m. and 1:30 - 6:00 p.m.

Twin Peaks Road at Tierra Bonita Road

General

- Loading zone has parking restrictions 7 – 9 AM and 2 – 4 PM, Monday – Friday.
- Odd sign just north of intersection: “No Parking, Bike Lane” – room for both
- Parking allowed on north side of roadway. Not heavily used. Cars parked south of intersection block some people that want to turn right onto Tierra Bonita.
- There is a trail on the south side of street separate from the sidewalk, used by horses and pedestrians
- Cars make U-turns all along Twin Peaks to avoid signals and access loading zone
- No bus ever comes to bus stops

7:00 am – 9:00 am

- 7:00 heavy westbound traffic queues at Tierra Bonita (~16 cars), but clears with green; good platooning for eastbound movements
- 7:15 lefts into Tierra Bonita backing up but clear with green
- 7:25 Tierra Bonita backing up; right turns northbound have limited time as crossing guard protects kids crossing.
- 7:25 Heavy westbound through constantly, conflicting with eastbound left into Tierra Bonita
- 7:30 eastbound left queues fill turn pocket, plus some (~21 cars) – cars begin to not be able to turn onto Tierra Bonita due to congestion back up from school
- 7:35 northbound through caught in intersection due to school congestion
- 7:35 loading zone used by a few cars for drop-off
- 7:45 inbound school traffic gone; outbound school traffic still heavy
- 8:00 bus dropped off near bus stop, loading zone being used for drop offs
- 8:00 U-turns at signal then drop off kids at loading zone
- 8:10 Busy. Kids biking on s/w;
- 8:10 Busy. Not many eastbound lefts get through on a green light due to U-turn movements being slow; eastbound through seems lighter
- 8:15 full curb of cars dropping off on Twin Peaks, U-turns happening everywhere (illegally)
- 8:15 left turn lane full (21+ cars)
- 8:20 heavy eastbound through again, some queuing from Budwin
- 8:25 school bell, traffic volumes drop off
- 8:30 empty streets..
- There is a crossing guard between 7:15 and 8:30 serving the crossings on the north side and west side, helps kids cross, puts up STOP sign for potential conflicting cars (such as right turns)
- Signal had pedestrian lead interval.

1:30 pm – 6:00 pm

- 1:40 – 2:40 not busy
- 2:50 parking near loading zone starting to fill up
- 3:00 parking near school, in drive aisles within school parking lot, and on Twin Peaks all full; also parking in neighborhoods south of Twin Peaks adjacent to Tierra Bonita
- 3:10 school out – mass exit
- 3:10 cars U-turn mid-block on Twin Peaks between Tierra Bonita and Budwin, both directions
- 3:10 "airport merge" to pick up kids along Twin Peaks – no double parking was observed
- 3:30 loading zone, Tierra Bonita south of Twin Peaks, Twin peaks traffic all normal; still traffic on school side of Tierra Bonita
- 3:50 not busy
- 5:00 getting busy eastbound through but good progression; Espola Road intersection backing up (right turns) and biggest cause of traffic along Twin Peaks in this area

Twin Peaks Road at Espola Road

General

- Multiple Cut-throughs being used around intersection. In AM, from EB Twin Peaks to NB Espola via Roberto Rio Road and from SB Espola to WB Twin Peaks via Roberto Rio Road. In the PM, Twin Peaks to SB Espola Road via Range Park Road.
- U-turns on east leg of Twin Peaks road observed to be drivers leaving nearby strip mall who were unable to make left turn onto WB Twin Peaks.
- Difficult for trucks to make right turn onto southbound Espola Road.

7:00 am – 9:00 am

- 7:00 Heavy EB left-turn volume. 11 cars do not make it through signal. Queue building due to merge time on NB Espola
- 7:10 Heavy SB RT movement. NB Espola queue building to lane merge.
- 7:20 NB Espola queued to Twin Peaks. Cars unable to get through intersection at start of cycle. Long SB Right Turn queue, multiple cut throughs going SB to WB.
- 7:30 NB Espola queue cleared past Los Nietos Ave.
- 8:010 Issue with EB Truck not able to make right turn onto SB Espola. Causes backup on EB Twin Peaks

1:30 pm – 6:00 pm

- 1:30-2:20 not busy
- 2:20 School buses cause backup in EB Left turn lane.
- 2:40 Issue with truck unable to make right turn onto SB Espola.
- 3:30 Heavy volumes on EB Twin Peaks. EB Left turn queue past storage length of pocket. Queue clears but causes NB Espola to back to intersection. Heavy EB right-turn volumes starting.
- 3:30-4:30 Consistently heavy EB right turn volumes. Generally 10+ car queue.
- 4:40 SB Espola backed up to Twin Peaks Road. 12 vehicles on SB Espola Traffic blocked from crossing Twin Peaks.
- 4:30-5:30 Continued backup on SB Espola. Multiple U-turns to go NB on Espola and try another route.

Tierra Bonita – School Drop Off and Pick Up operations

General

- No crosswalks along Tierra Bonita Road at school driveways
- Both schools have one-way drop off loops (2 lanes)
- Parking lots used for faculty only
- Parking allowed on both sides of Tierra Bonita Road

7:00 am – 9:00 am

- 7:00 Parking on Tierra Bonita Road is empty
- 7.15 Elementary school parents use on-street parking to park and walk kids into school
- 7:21 Crossing guards at elementary school driveway and Tierra Bonita Ct
- 7:25 Majority of cars coming from the south (Twin Peaks intersection)
- 7:26 Cars parked on the northbound side of Tierra Bonita block northbound thru cars from being able to get around left-turning cars; causes larger queues on Tierra Bonita Road
- 7:30 Very little pedestrian activity – no J walking
- 7:32 Northbound queues at school driveway cause back up into Twin Peaks
- 7:35 Parking on Tierra Bonita north of elementary school is full
- 7:40 Northbound queues at school driveway cause back up into Twin Peaks
- 7:40 Crossing guards at elementary school stop
- 7:45 10 cars parked on Tierra Bonita between elementary school and Twin Peaks
- Crossing guard at elementary school does a good job progressing traffic through drop off, however, only one lane is used - second lane could be opened when queue starts to back up onto Tierra Bonita Road
- 8:00 Crossing guards at Twin Peaks Road
- 8:00 Faculty monitoring the middle school drop off
- 8:06 Some J walking along Tierra Bonita
- 8:10 Northbound queues at school driveway cause back up into Twin Peaks, faculty only lets parents use one lane for drop off – need to open second lane to relieve queues on Tierra Bonita and Twin Peaks
- 8:20 Parents using elementary school parking lot to drop off middle schoolers
- 8:22 Northbound queues at school driveway cause back up into Twin Peaks

1:30 pm – 6:00 pm

- 1:50 Parents lined up at parking spaces along Tierra Bonita and adjacent neighborhood streets ready to pick up
- 2:00 Elementary school crossing guards at same locations as am
- 2:05 Preschool gets out ~ 20 minutes before the rest of the elementary school
- 2:10 Cars line up in 1 lane in drop off/pick up area
- 2:14 Crossing guards leave
- Smooth pick up operations at Tierra Bonita Elementary School
- 3:03 Buses begin to line up in outside lane of pick up area
- 3:05 Cars wait at elementary school to pick up middle school kids;
- 3:12 Faculty tell bikers to “walk bike to the corner” of Tierra Bonita Road and Twin Peaks Road
- 3:17 Southbound queues at Twin Peaks back up into school driveways

- 3:20 All cars stopped to let buses leave school

INITIAL RECOMMENDATIONS

Based on the observations conducted on Thursday, December 1st 2016 and summarized above, the following initial recommendations have been developed.

In general, traffic progression along Twin Peaks Road during both peak periods was observed to be good. School traffic and queues on Espola Road cause congestion along Twin Peaks Road. Recommendations are more aimed to improve operations along Espola Road and improve safety during pick up and drop off operations along Twin Peaks Road and Tierra Bonita Road.

- Restripe and retime the intersection of Twin Peaks Road and Espola Road; possible split phasing and shared lanes
- Retime the signal at the intersection of Espola Road and Poway Road during the am and pm peak periods. Specifically, max green for northbound left-turn needs to be increased in pm peak
- Retime the signals between Titan Way and Twin Peaks road to be better coordinated during peak periods
- Restripe Espola Road between Twin Peaks Road and Poway Road
- Restripe Tierra Bonita Road between Tierra Bonita Court and Twin Peaks Road, possibly restrict parking to allow for left-turn lane
- Install delineators in the median of Twin Peaks Road west of Tierra Bonita Road to restrict illegal U-turn movements

Kimley»Horn

MEMORANDUM

To: Jon Collins

From: Kimley-Horn and Associates, Inc.

Date: 01/27/2017

Subject: Twin Peaks Study of Traffic – *Additional Observations*

The following memo has been prepared to summarize the additional observation efforts associated with the Twin Peaks Study of Traffic Project.

OBSERVATIONS

General observations along Espola Road between Titan Way and Poway Road and at Poway High School were conducted between 7:00 a.m. - 8:00 a.m. and 2:00 - 3:00 p.m.

Espola Road at Titan Way

General

- Loading zone north of bus drop off on Espola Road
- Parking not allowed on Titan Way
- Student pick-up/drop-off at Performing Arts Center
- No parent drop-off in parking lot off Espola Road while buses present
- No crossing guards or faculty members outside

7:00 am – 8:00 am

- 7:00 – No backups
- 7:05 – Minor northbound left-turn backup
    - Drivers favor outside left turn lane
- 7:10 –U-turn by "The Grove" community entrance for student drop-off
    - Titan Way backup waiting for student drop-off in Performing Arts
- 7:15 – Parents using pull out for student drop-off
- 7:20 – Northbound left-turn backed up beyond storage length
    - Backup cleared with 1 cycle
- 7:25 – Titan Way backed up to Espola Road.
    - Student drop-off along red curb on Titan Way
    - Parents Uturn after drop-off
    - Left-turns out of parking lot backed up due to student parking lot left turns
- 7:30 – Titan Way clear & Espola Road clear
- Approximately 10 buses. Lasts from 7:10-7:20.

2:00 pm – 3:00 pm

- 2:00 - Parents line up in loading zone on Espola Road
- 2:19 – Bell rings

- 2:25 – Large queue on Titan Way at signal
- 2:30 – Southbound queue on Espola Road backs up into Titan Way intersection
- 3:00 – Titan Way and Espola Road clear

Recommendations

- Extend green time for eastbound movement in pm
- Change configuration of Performing Arts Center drop-off to allow for more curb space to queue up inside the parking lot
- Close driveway to eliminate conflict between vehicles exiting the parking lot and vehicles turning left into the student parking area

Espola Road at Del Poniente Road

General

- Protected lefts all directions
- Crosswalks on all legs
- 1 pedestrian observed the whole time, using the east leg crossing Del Poniente from bus stop
- No bikes observed
- Estimated cycle to be about 95 seconds; 70 seconds of NBT and then 25 second of red for side street/SBL

7:00 am – 9:00 am

- 6:55
    - Bus full of students headed to high school
    - Busy on Espola Road but flowing
    - Side street has long wait
    - Very few breaks in northbound traffic (right turn on red from westbound Del Poniente Road can't happen because there are no breaks in traffic)
    - SB traffic has occasional breaks, seems to be metered from upstream (Titan Way)
- 7:00
    - Constant northbound through traffic
    - Steady southbound with occasional breaks
- 7:10
    - Talked with teacher headed to school
        - Most kids come from the south
        - Bad traffic from Twin Peaks Road to Del Poniente Road
        - Titan Way only parking connection to school
    - Not heavy on side street traffic but every car served every cycle
    - Northbound throughs backs up at signal, clears north of signal
- 7:15
    - Constant northbound through backup to Twin Peaks Road when signal turns red

    - No queues observed from Titan Way
    - ~25 seconds of red experienced by NBT for side street and SBL movements
- 7:20
    - Heavier southbound through but still gaps
    - Constant northbound through traffic
    - ~25 seconds of red per cycle for northbound through
- 7:28
    - Gaps in northbound through!
    - Much lighter traffic
    - Northbound through demand way down
    - Southbound through heavy now
- 7:30
    - Southbound through queue not clearing with cycles
    - Northbound through light
- 7:35
    - Southbound through queue clears
    - Traffic all directions very low
    - Normal signal operations doing well

Recommendations

- Increase Northbound though green time to keep traffic flowing towards high school. This will cause longer delays in side street traffic, but low volumes.

Espola Road at Twin Peaks

7:00 am – 8:00 am

- 7:10 – Northbound queues – some northbound through and eastbound lefts don't make it through the signal
- 7:15 – 7:20 Northbound queues
- 7:28 – Northbound congestion starts to clear, all vehicles get through the intersection

Recommendations

- No recommendations for the intersection specifically. Alignment of the intersection makes it hard to change any approach geometry.

- Signal timing changes at Del Poniente Road should help intersection

Espola Road at Poway Road

7:00 am – 8:00 am

- 7:30 – Signal timing doing a good job of progressing traffic, no large queues or back up

APPENDIX C

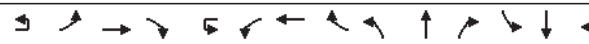
INTERSECTION ANALYSIS SYNCHRO RESULTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	554	109	95	1281	27	92	6	84	53	11	52
Future Volume (veh/h)	22	554	109	95	1281	27	92	6	84	53	11	52
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1863	1863	1863	1900
Adj Flow Rate, veh/h	23	589	116	101	1363	29	98	6	89	56	12	55
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	29	1990	391	123	2577	55	119	155	132	72	16	75
Arrive On Green	0.02	0.67	0.67	0.07	0.73	0.73	0.07	0.08	0.08	0.04	0.06	0.06
Sat Flow, veh/h	1774	2950	580	1774	3544	75	1774	1863	1583	1774	291	1336
Grp Volume(v), veh/h	23	353	352	101	680	712	98	6	89	56	0	67
Grp Sat Flow(s),veh/h/ln	1774	1770	1760	1774	1770	1849	1774	1863	1583	1774	0	1627
Q Serve(g_s), s	1.9	12.2	12.2	8.4	25.5	25.6	8.2	0.4	8.2	4.7	0.0	6.1
Cycle Q Clear(g_c), s	1.9	12.2	12.2	8.4	25.5	25.6	8.2	0.4	8.2	4.7	0.0	6.1
Prop In Lane	1.00		0.33	1.00		0.04	1.00		1.00	1.00		0.82
Lane Grp Cap(c), veh/h	29	1194	1187	123	1287	1345	119	155	132	72	0	92
V/C Ratio(X)	0.79	0.30	0.30	0.82	0.53	0.53	0.82	0.04	0.68	0.78	0.00	0.73
Avail Cap(c_a), veh/h	142	1194	1187	402	1287	1345	231	453	385	195	0	374
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)	0.95	0.95	0.95	0.88	0.88	0.88	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	73.5	9.9	9.9	68.9	9.1	9.1	69.1	63.2	66.8	71.3	0.0	69.6
Incr Delay (d2), s/veh	15.1	0.6	0.6	4.5	1.4	1.3	5.3	0.0	2.3	6.7	0.0	4.1
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	6.1	6.1	4.3	12.8	13.5	4.2	0.2	3.7	2.4	0.0	2.8
LnGrp Delay(d),s/veh	88.6	10.5	10.5	73.4	10.4	10.4	74.3	63.3	69.1	78.0	0.0	73.7
LnGrp LOS	F	B	B	E	B	B	E	E	E	E		E
Approach Vol, veh/h		728			1493			193			123	
Approach Delay, s/veh		13.0			14.7			71.6			75.7	
Approach LOS		B			B			E			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	14.9	107.7	13.6	13.9	7.0	115.6	9.6	17.9
Change Period (Y+Rc), s	4.5	6.5	3.5	* 5.4	4.5	6.5	3.5	5.4
Max Green Setting (Gmax), s	10.4	101.2	10.1	* 8.5	2.5	109.1	6.1	12.5
Max Q Clear Time (g_c+I1), s	10.4	14.2	10.2	8.1	3.9	27.6	6.7	10.2
Green Ext Time (p_c), s	0.1	18.8	0.1	0.4	0.0	22.3	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	21.5
HCM 2010 LOS	C

Notes



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	4	11	655	5	3	2	1339	6	17	1	0	4	0	17
Future Volume (veh/h)	4	11	655	5	3	2	1339	6	17	1	0	4	0	17
Number		5	2	12		1	6	16	3	8	18	7	4	14
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		12	697	5		2	1424	6	18	1	0	4	0	18
Adj No. of Lanes		1	2	0		1	2	0	0	1	0	0	1	1
Peak Hour Factor		0.94	0.94	0.94		0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2	2	2
Cap, veh/h		22	2450	18		4	2422	10	172	2	0	187	0	54
Arrive On Green		0.01	0.68	0.68		0.00	0.67	0.67	0.03	0.03	0.00	0.03	0.00	0.03
Sat Flow, veh/h		1774	3602	26		1774	3614	15	1248	69	0	1575	0	1583
Grp Volume(v), veh/h		12	342	360		2	697	733	19	0	0	4	0	18
Grp Sat Flow(s),veh/h/ln		1774	1770	1858		1774	1770	1860	1318	0	0	1575	0	1583
Q Serve(g_s), s		0.4	4.1	4.1		0.1	11.6	11.6	0.7	0.0	0.0	0.0	0.0	0.6
Cycle Q Clear(g_c), s		0.4	4.1	4.1		0.1	11.6	11.6	0.8	0.0	0.0	0.1	0.0	0.6
Prop In Lane		1.00		0.01		1.00		0.01	0.95		0.00	1.00		1.00
Lane Grp Cap(c), veh/h		22	1203	1264		4	1186	1246	175	0	0	187	0	54
V/C Ratio(X)		0.55	0.28	0.28		0.51	0.59	0.59	0.11	0.00	0.00	0.02	0.00	0.33
Avail Cap(c_a), veh/h		987	1641	1723		493	1641	1725	1093	0	0	1107	0	1086
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		26.5	3.4	3.4		26.9	4.8	4.8	25.6	0.0	0.0	25.2	0.0	25.4
Incr Delay (d2), s/veh		8.0	0.2	0.1		34.1	0.6	0.5	0.1	0.0	0.0	0.0	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		0.2	2.0	2.1		0.1	5.6	5.9	0.3	0.0	0.0	0.1	0.0	0.3
LnGrp Delay(d),s/veh		34.5	3.6	3.6		61.0	5.4	5.4	25.7	0.0	0.0	25.2	0.0	26.8
LnGrp LOS		C	A	A		E	A	A	C			C		C
Approach Vol, veh/h			714				1432			19			22	
Approach Delay, s/veh			4.1				5.5			25.7			26.5	
Approach LOS			A				A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.6	43.0		6.3	5.2	42.4		6.3
Change Period (Y+Rc), s	4.5	6.3		4.5	4.5	6.3		4.5
Max Green Setting (Gmax), s	15.6	50.0		37.0	30.0	50.0		37.0
Max Q Clear Time (g_c+I1), s	2.1	6.1		2.6	2.4	13.6		2.8
Green Ext Time (p_c), s	0.0	25.2		0.1	0.0	22.6		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	5.4
HCM 2010 LOS	A

Notes

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (veh/h)	6	193	399	66	34	997	71	68	142	40	91	35	270
Future Volume (veh/h)	6	193	399	66	34	997	71	68	142	40	91	35	270
Number		5	2	12	1	6	16	3	8	18	7	4	14
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		208	429	71	37	1072	76	73	153	43	98	38	290
Adj No. of Lanes		1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor		0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %		2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h		241	1508	248	67	1333	94	94	302	85	132	44	338
Arrive On Green		0.14	0.50	0.50	0.04	0.40	0.40	0.05	0.22	0.22	0.07	0.24	0.24
Sat Flow, veh/h		1774	3044	500	1774	3353	238	1774	1400	393	1774	187	1425
Grp Volume(v), veh/h		208	248	252	37	566	582	73	0	196	98	0	328
Grp Sat Flow(s),veh/h/ln		1774	1770	1774	1774	1770	1821	1774	0	1793	1774	0	1611
Q Serve(g_s), s		12.1	8.7	8.8	2.2	29.8	29.9	4.3	0.0	10.1	5.7	0.0	20.5
Cycle Q Clear(g_c), s		12.1	8.7	8.8	2.2	29.8	29.9	4.3	0.0	10.1	5.7	0.0	20.5
Prop In Lane		1.00		0.28	1.00		0.13	1.00		0.22	1.00		0.88
Lane Grp Cap(c), veh/h		241	877	879	67	704	724	94	0	387	132	0	382
V/C Ratio(X)		0.86	0.28	0.29	0.55	0.80	0.80	0.78	0.00	0.51	0.74	0.00	0.86
Avail Cap(c_a), veh/h		505	877	879	253	840	864	337	0	698	589	0	917
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		44.6	15.6	15.6	49.8	28.1	28.1	49.3	0.0	36.4	47.8	0.0	38.5
Incr Delay (d2), s/veh		3.6	0.2	0.2	2.6	5.1	5.0	5.1	0.0	0.4	3.1	0.0	2.2
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		6.2	4.3	4.3	1.1	15.5	15.9	2.2	0.0	5.0	2.9	0.0	9.3
LnGrp Delay(d),s/veh		48.2	15.8	15.8	52.5	33.2	33.1	54.3	0.0	36.7	50.9	0.0	40.7
LnGrp LOS		D	B	B	D	C	C	D		D	D		D
Approach Vol, veh/h			708			1185			269			426	
Approach Delay, s/veh			25.3			33.8			41.5			43.1	
Approach LOS			C			C			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	7.6	58.3	9.2	30.3	17.9	48.0	11.4	28.1
Change Period (Y+Rc), s	3.6	6.1	3.6	* 5.3	3.6	6.1	3.6	* 5.3
Max Green Setting (Gmax), s	4.0	50.0	20.0	* 60	30.0	50.0	35.0	* 41
Max Q Clear Time (g_c+I1), s	14.2	10.8	6.3	22.5	14.1	31.9	7.7	12.1
Green Ext Time (p_c), s	0.0	16.5	0.1	2.4	0.2	10.0	0.1	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	33.8
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	0.8

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	2	30	488	2	10	1065	2	3	0	11	0	0	36
Future Vol, veh/h	2	30	488	2	10	1065	2	3	0	11	0	0	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	115	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	38	610	3	13	1331	3	4	0	14	0	0	45

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	973	1334	0	0	613	0	0	1382	2050	306	1742	2050	667
Stage 1	-	-	-	-	-	-	-	691	691	-	1358	1358	-
Stage 2	-	-	-	-	-	-	-	691	1359	-	384	692	-
Critical Hdwy	6.44	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.52	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	346	513	-	-	962	-	-	103	55	690	55	55	401
Stage 1	-	-	-	-	-	-	-	401	444	-	157	215	-
Stage 2	-	-	-	-	-	-	-	401	215	-	611	443	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	496	496	-	-	962	-	-	90	54	690	53	54	401
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	90	54	-	53	54	-
Stage 1	-	-	-	-	-	-	-	401	444	-	157	212	-
Stage 2	-	-	-	-	-	-	-	351	212	-	599	443	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.1	18.5	15.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	284	496	-	-	962	-	-	401
HCM Lane V/C Ratio	0.062	0.08	-	-	0.013	-	-	0.112
HCM Control Delay (s)	18.5	12.9	-	-	8.8	-	-	15.1
HCM Lane LOS	C	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	0.3	-	-	0	-	-	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	325	17	159	9	42	22	545	375	4	10	275	490
Future Volume (veh/h)	325	17	159	9	42	22	545	375	4	10	275	490
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	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	406	21	199	11	52	28	681	469	5	12	344	612
Adj No. of Lanes	2	1	1	1	1	0	2	1	1	1	1	1
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	472	376	665	18	76	41	752	1135	965	15	744	632
Arrive On Green	0.14	0.20	0.20	0.01	0.07	0.07	0.22	0.61	0.61	0.01	0.40	0.40
Sat Flow, veh/h	3442	1863	1583	1774	1140	614	3442	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	406	21	199	11	0	80	681	469	5	12	344	612
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	0	1754	1721	1863	1583	1774	1863	1583
Q Serve(g_s), s	14.3	1.1	10.3	0.8	0.0	5.5	23.9	16.3	0.2	0.8	16.8	46.9
Cycle Q Clear(g_c), s	14.3	1.1	10.3	0.8	0.0	5.5	23.9	16.3	0.2	0.8	16.8	46.9
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	472	376	665	18	0	117	752	1135	965	15	744	632
V/C Ratio(X)	0.86	0.06	0.30	0.61	0.00	0.69	0.91	0.41	0.01	0.83	0.46	0.97
Avail Cap(c_a), veh/h	1112	752	985	215	0	489	1112	1135	965	215	752	639
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.2	39.9	23.8	61.0	0.0	56.5	47.1	12.6	9.5	61.3	27.4	36.4
Incr Delay (d2), s/veh	1.8	0.1	0.3	11.7	0.0	2.7	5.8	0.3	0.0	33.1	0.5	27.6
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	6.9	0.6	4.6	0.4	0.0	2.8	12.0	8.4	0.1	0.5	8.8	25.3
LnGrp Delay(d),s/veh	54.1	40.0	24.1	72.7	0.0	59.2	53.0	12.9	9.5	94.4	27.9	64.0
LnGrp LOS	D	D	C	E		E	D	B	A	F	C	E
Approach Vol, veh/h		626			91			1155			968	
Approach Delay, s/veh		44.1			60.8			36.5			51.6	
Approach LOS		D			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	5.5	82.1	4.8	31.5	31.5	56.0	21.5	14.7
Change Period (Y+Rc), s	4.5	6.6	3.5	6.5	4.5	6.6	4.5	* 6.5
Max Green Setting (Gmax), s	15.0	50.0	15.0	50.0	40.0	50.0	40.0	* 35
Max Q Clear Time (g_c+I1), s	2.8	18.3	2.8	12.3	25.9	48.9	16.3	7.5
Green Ext Time (p_c), s	0.0	10.6	0.0	1.3	1.2	0.6	0.7	1.3

Intersection Summary	
HCM 2010 Ctrl Delay	44.1
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (veh/h)	53	1	278	13	2	4	395	451	10	15	17	441	159
Future Volume (veh/h)	53	1	278	13	2	4	395	451	10	15	17	441	159
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	1863	1863	1900		1863	1863	1863
Adj Flow Rate, veh/h	82	2	428	20	3	6	608	694	15		26	678	245
Adj No. of Lanes	1	1	0	1	1	0	2	2	0		1	2	1
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65		0.65	0.65	0.65
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2		2	2	2
Cap, veh/h	106	2	475	30	144	287	690	1703	37		36	1063	475
Arrive On Green	0.06	0.30	0.30	0.02	0.26	0.26	0.20	0.48	0.48		0.02	0.30	0.30
Sat Flow, veh/h	1774	7	1577	1774	556	1111	3442	3542	77		1774	3539	1583
Grp Volume(v), veh/h	82	0	430	20	0	9	608	347	362		26	678	245
Grp Sat Flow(s),veh/h/ln	1774	0	1584	1774	0	1667	1721	1770	1849		1774	1770	1583
Q Serve(g_s), s	4.9	0.0	27.9	1.2	0.0	0.4	18.4	13.5	13.6		1.6	17.8	13.7
Cycle Q Clear(g_c), s	4.9	0.0	27.9	1.2	0.0	0.4	18.4	13.5	13.6		1.6	17.8	13.7
Prop In Lane	1.00		1.00	1.00		0.67	1.00		0.04		1.00		1.00
Lane Grp Cap(c), veh/h	106	0	477	30	0	431	690	851	889		36	1063	475
V/C Ratio(X)	0.78	0.00	0.90	0.67	0.00	0.02	0.88	0.41	0.41		0.73	0.64	0.52
Avail Cap(c_a), veh/h	828	0	1035	248	0	560	1607	851	889		248	1652	739
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Uniform Delay (d), s/veh	49.7	0.0	35.9	52.4	0.0	29.6	41.6	18.0	18.0		52.2	32.4	31.0
Incr Delay (d2), s/veh	4.5	0.0	2.6	9.4	0.0	0.0	1.5	0.4	0.4		10.0	0.8	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	2.5	0.0	12.5	0.7	0.0	0.2	8.8	6.7	7.0		0.9	8.8	6.1
LnGrp Delay(d),s/veh	54.2	0.0	38.5	61.8	0.0	29.6	43.1	18.3	18.3		62.2	33.2	32.1
LnGrp LOS	D		D	E		C	D	B	B		E	C	C
Approach Vol, veh/h		512			29			1317				949	
Approach Delay, s/veh		41.0			51.8			29.8				33.7	
Approach LOS		D			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	6.7	58.4	5.3	36.8	26.0	39.1	9.9	32.2
Change Period (Y+Rc), s	4.5	* 6.9	3.5	4.5	4.5	6.9	3.5	4.5
Max Green Setting (Gmax), s	15.0	* 50	15.0	70.0	50.0	50.0	50.0	36.0
Max Q Clear Time (g_c+I1), s	3.6	15.6	3.2	29.9	20.4	19.8	6.9	2.4
Green Ext Time (p_c), s	0.0	14.3	0.0	2.4	1.1	12.4	0.1	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	33.4
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (veh/h)	44	0	64	55	1	29	20	765	18	2	15	733	18
Future Volume (veh/h)	44	0	64	55	1	29	20	765	18	2	15	733	18
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	1863	1863	1863		1863	1863	1900
Adj Flow Rate, veh/h	59	0	86	74	1	39	27	1034	24		20	991	24
Adj No. of Lanes	1	1	0	1	1	0	1	1	1		1	1	0
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74		0.74	0.74	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2		2	2	2
Cap, veh/h	76	0	127	96	4	141	39	1153	980		31	1114	27
Arrive On Green	0.04	0.00	0.08	0.05	0.09	0.09	0.02	0.62	0.62		0.02	0.61	0.61
Sat Flow, veh/h	1774	0	1583	1774	40	1550	1774	1863	1583		1774	1811	44
Grp Volume(v), veh/h	59	0	86	74	0	40	27	1034	24		20	0	1015
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	0	1589	1774	1863	1583		1774	0	1855
Q Serve(g_s), s	2.9	0.0	4.6	3.6	0.0	2.0	1.3	41.3	0.5		1.0	0.0	40.4
Cycle Q Clear(g_c), s	2.9	0.0	4.6	3.6	0.0	2.0	1.3	41.3	0.5		1.0	0.0	40.4
Prop In Lane	1.00		1.00	1.00		0.98	1.00		1.00		1.00		0.02
Lane Grp Cap(c), veh/h	76	0	127	96	0	145	39	1153	980		31	0	1141
V/C Ratio(X)	0.78	0.00	0.68	0.77	0.00	0.28	0.69	0.90	0.02		0.64	0.00	0.89
Avail Cap(c_a), veh/h	409	0	565	306	0	586	613	1502	1276		306	0	1141
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00		1.00	0.00	1.00
Uniform Delay (d), s/veh	41.1	0.0	38.9	40.6	0.0	36.8	42.2	14.1	6.4		42.4	0.0	14.2
Incr Delay (d2), s/veh	6.2	0.0	2.4	4.9	0.0	0.4	7.8	6.4	0.0		7.8	0.0	9.0
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	1.5	0.0	2.1	1.9	0.0	0.9	0.7	23.0	0.2		0.5	0.0	23.2
LnGrp Delay(d),s/veh	47.3	0.0	41.2	45.5	0.0	37.2	50.0	20.6	6.4		50.2	0.0	23.3
LnGrp LOS	D		D	D		D	D	C	A		D		C
Approach Vol, veh/h		145			114			1085				1035	
Approach Delay, s/veh		43.7			42.6			21.0				23.8	
Approach LOS		D			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	6.0	60.4	8.2	12.3	6.4	60.0	7.2	13.2
Change Period (Y+Rc), s	4.5	6.6	3.5	* 5.3	4.5	6.6	3.5	* 5.3
Max Green Setting (Gmax), s	15.0	70.0	15.0	* 31	30.0	40.0	20.0	* 32
Max Q Clear Time (g_c+I1), s	3.0	43.3	5.6	6.6	3.3	42.4	4.9	4.0
Green Ext Time (p_c), s	0.0	10.5	0.0	0.4	0.0	0.0	0.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	24.6
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	60	12	19	700	724	117
Future Vol, veh/h	60	12	19	700	724	117
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	-	65	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	15	24	897	928	150

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1949	1003	1078	0	-	0
Stage 1	1003	-	-	-	-	-
Stage 2	946	-	-	-	-	-
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	~ 71	294	647	-	-	-
Stage 1	355	-	-	-	-	-
Stage 2	377	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 68	294	647	-	-	-
Mov Cap-2 Maneuver	195	-	-	-	-	-
Stage 1	355	-	-	-	-	-
Stage 2	363	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	35.7	0.3	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR
Capacity (veh/h)	647	- 207	-	-
HCM Lane V/C Ratio	0.038	- 0.446	-	-
HCM Control Delay (s)	10.8	- 35.7	-	-
HCM Lane LOS	B	- E	-	-
HCM 95th %tile Q(veh)	0.1	- 2.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.6

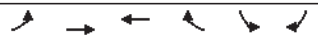
Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	26	1	1	4	734	769	9
Future Vol, veh/h	26	1	1	4	734	769	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	-	65	-	-	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	70	70	92	70	70	70	70
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	37	1	1	6	1049	1099	13

Major/Minor	Minor2	Major1				Major2	
Conflicting Flow All	2165	1105	-	1111	0	-	0
Stage 1	1105	-	-	-	-	-	-
Stage 2	1060	-	-	-	-	-	-
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	52	256	-	629	-	-	-
Stage 1	317	-	-	-	-	-	-
Stage 2	333	-	-	-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	52	256	~ -6	~ -6	-	-	-
Mov Cap-2 Maneuver	172	-	-	-	-	-	-
Stage 1	317	-	-	-	-	-	-
Stage 2	333	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31.5		0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	+	-	174	-	-
HCM Lane V/C Ratio	-	-	0.222	-	-
HCM Control Delay (s)	-	-	31.5	-	-
HCM Lane LOS	-	-	D	-	-
HCM 95th %tile Q(veh)	-	-	0.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

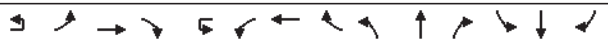


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	196	123	317	674	195	231
Future Volume (veh/h)	196	123	317	674	195	231
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	198	124	320	681	197	233
Adj No. of Lanes	1	2	1	1	1	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	243	2164	768	983	371	547
Arrive On Green	0.14	0.61	0.41	0.41	0.21	0.21
Sat Flow, veh/h	1774	3632	1863	1583	1774	1583
Grp Volume(v), veh/h	198	124	320	681	197	233
Grp Sat Flow(s),veh/h/ln	1774	1770	1863	1583	1774	1583
Q Serve(g_s), s	7.8	1.0	8.8	20.5	7.1	8.1
Cycle Q Clear(g_c), s	7.8	1.0	8.8	20.5	7.1	8.1
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	243	2164	768	983	371	547
V/C Ratio(X)	0.82	0.06	0.42	0.69	0.53	0.43
Avail Cap(c_a), veh/h	741	2464	1297	1433	988	1098
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	30.1	5.6	15.0	9.1	25.3	18.0
Incr Delay (d2), s/veh	2.6	0.0	0.4	1.1	1.2	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.5	4.5	13.5	3.6	7.7
LnGrp Delay(d),s/veh	32.7	5.6	15.4	10.1	26.5	18.6
LnGrp LOS	C	A	B	B	C	B
Approach Vol, veh/h		322	1001		430	
Approach Delay, s/veh		22.3	11.8		22.2	
Approach LOS		C	B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		50.8		21.0	14.3	36.5		
Change Period (Y+Rc), s		* 6.9		6.0	4.5	6.9		
Max Green Setting (Gmax), s		* 50		40.0	30.0	50.0		
Max Q Clear Time (g_c+I1), s		3.0		10.1	9.8	22.5		
Green Ext Time (p_c), s		7.7		1.4	0.2	7.0		

Intersection Summary		
HCM 2010 Ctrl Delay		16.3
HCM 2010 LOS		B

Notes

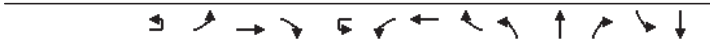


Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	28	56	1073	5	8	9	910	11	6	0	2	15	1	18
Future Volume (veh/h)	28	56	1073	5	8	9	910	11	6	0	2	15	1	18
Number		5	2	12		1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0	0	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		68	1309	6		11	1110	13	7	0	2	18	1	22
Adj No. of Lanes		1	2	0		1	2	0	0	1	0	0	1	1
Peak Hour Factor		0.82	0.82	0.82		0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2	2	2
Cap, veh/h		87	2491	11		20	2335	27	140	0	9	177	3	60
Arrive On Green		0.05	0.69	0.69		0.01	0.65	0.65	0.04	0.00	0.04	0.04	0.04	0.04
Sat Flow, veh/h		1774	3613	17		1774	3583	42	804	0	230	1497	83	1583
Grp Volume(v), veh/h		68	641	674		11	548	575	9	0	0	19	0	22
Grp Sat Flow(s),veh/h/ln		1774	1770	1860		1774	1770	1855	1034	0	0	1581	0	1583
Q Serve(g_s), s		2.2	10.3	10.3		0.4	9.2	9.2	0.4	0.0	0.0	0.0	0.0	0.8
Cycle Q Clear(g_c), s		2.2	10.3	10.3		0.4	9.2	9.2	1.0	0.0	0.0	0.6	0.0	0.8
Prop In Lane		1.00		0.01		1.00		0.02	0.78		0.22	0.95		1.00
Lane Grp Cap(c), veh/h		87	1220	1282		20	1153	1209	149	0	0	180	0	60
V/C Ratio(X)		0.78	0.53	0.53		0.55	0.48	0.48	0.06	0.00	0.00	0.11	0.00	0.37
Avail Cap(c_a), veh/h		909	1511	1588		454	1511	1584	993	0	0	1027	0	1000
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	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		27.5	4.4	4.4		28.8	5.1	5.1	27.9	0.0	0.0	27.4	0.0	27.5
Incr Delay (d2), s/veh		5.7	0.4	0.4		8.7	0.4	0.4	0.1	0.0	0.0	0.1	0.0	1.4
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		1.2	5.0	5.2		0.2	4.5	4.7	0.1	0.0	0.0	0.3	0.0	0.4
LnGrp Delay(d),s/veh		33.2	4.9	4.8		37.5	5.5	5.5	27.9	0.0	0.0	27.5	0.0	28.9
LnGrp LOS		C	A	A		D	A	A	C			C		C
Approach Vol, veh/h			1383				1134			9			41	
Approach Delay, s/veh			6.2				5.8			27.9			28.2	
Approach LOS			A				A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.2	46.7		6.7	7.4	44.5		6.7
Change Period (Y+Rc), s	4.5	6.3		4.5	4.5	6.3		4.5
Max Green Setting (Gmax), s	5.0	50.0		37.0	30.0	50.0		37.0
Max Q Clear Time (g_c+I1), s	2.4	12.3		2.8	4.2	11.2		3.0
Green Ext Time (p_c), s	0.0	26.4		0.1	0.1	27.0		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	6.5
HCM 2010 LOS	A

Notes



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	30	145	846	71	2	52	721	32	52	31	56	79	24	119
Future Volume (veh/h)	30	145	846	71	2	52	721	32	52	31	56	79	24	119
Number		5	2	12		1	6	16	3	8	18	7	4	14
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		167	972	82		60	829	37	60	36	64	91	28	137
Adj No. of Lanes		1	2	0		1	2	0	1	1	0	1	1	0
Peak Hour Factor		0.87	0.87	0.87		0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2	2	2
Cap, veh/h		190	2215	187		76	2092	93	77	60	107	112	33	161
Arrive On Green		0.11	0.67	0.67		0.04	0.61	0.61	0.04	0.10	0.10	0.06	0.12	0.12
Sat Flow, veh/h		1774	3304	279		1774	3451	154	1774	603	1071	1774	276	1349
Grp Volume(v), veh/h		167	520	534		60	425	441	60	0	100	91	0	165
Grp Sat Flow(s),veh/h/ln		1774	1770	1814		1774	1770	1836	1774	0	1674	1774	0	1625
Q Serve(g_s), s		13.9	20.6	20.6		5.0	18.7	18.7	5.0	0.0	8.6	7.6	0.0	14.9
Cycle Q Clear(g_c), s		13.9	20.6	20.6		5.0	18.7	18.7	5.0	0.0	8.6	7.6	0.0	14.9
Prop In Lane		1.00		0.15		1.00		0.08	1.00		0.64	1.00		0.83
Lane Grp Cap(c), veh/h		190	1186	1215		76	1072	1112	77	0	167	112	0	194
V/C Ratio(X)		0.88	0.44	0.44		0.78	0.40	0.40	0.78	0.00	0.60	0.81	0.00	0.85
Avail Cap(c_a), veh/h		407	1186	1215		147	1072	1112	164	0	295	259	0	383
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)		0.86	0.86	0.86		1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		66.0	11.6	11.6		71.1	15.3	15.3	71.1	0.0	64.7	69.4	0.0	64.7
Incr Delay (d2), s/veh		4.3	1.0	1.0		6.5	1.1	1.1	6.4	0.0	1.3	5.3	0.0	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		7.0	10.3	10.6		2.6	9.4	9.8	2.6	0.0	4.0	3.9	0.0	6.9
LnGrp Delay(d),s/veh		70.3	12.6	12.5		77.5	16.4	16.4	77.5	0.0	65.9	74.7	0.0	68.7
LnGrp LOS		E	B	B		E	B	B	E		E	E		E
Approach Vol, veh/h			1221				926			160			256	
Approach Delay, s/veh			20.5				20.4			70.3			70.8	
Approach LOS			C				C			E			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	10.1	106.6	10.1	23.2	19.7	97.0	13.1	20.2
Change Period (Y+Rc), s	3.6	6.1	3.6	* 5.3	3.6	6.1	3.6	* 5.3
Max Green Setting (Gmax), s	12.4	70.4	13.9	* 35	34.4	48.4	21.9	* 26
Max Q Clear Time (g_c+I1), s	7.0	22.6	7.0	16.9	15.9	20.7	9.6	10.6
Green Ext Time (p_c), s	0.0	21.8	0.0	1.0	0.2	16.5	0.1	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	28.6
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	1

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	4	21	931	1	2	36	772	3	6	0	40	1	0	17
Future Vol, veh/h	4	21	931	1	2	36	772	3	6	0	40	1	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	115	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	91	91	91	92	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	23	1023	1	2	40	848	3	7	0	44	1	0	19

Major/Minor	Major1				Major2				Minor1			Minor2		
Conflicting Flow All	621	852	0	0	748	1024	0	0	1586	2013	512	1499	2012	426
Stage 1	-	-	-	-	-	-	-	-	1078	1078	-	933	933	-
Stage 2	-	-	-	-	-	-	-	-	508	935	-	566	1079	-
Critical Hdwy	6.44	4.14	-	-	6.44	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.52	2.22	-	-	2.52	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	580	783	-	-	481	674	-	-	73	58	507	84	58	577
Stage 1	-	-	-	-	-	-	-	-	233	293	-	286	343	-
Stage 2	-	-	-	-	-	-	-	-	516	342	-	476	293	-
Platoon blocked, %			-	-			-	-						
Mov Cap-1 Maneuver	737	737	-	-	656	656	-	-	71	58	507	77	58	577
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	71	58	-	77	58	-
Stage 1	-	-	-	-	-	-	-	-	233	293	-	286	343	-
Stage 2	-	-	-	-	-	-	-	-	499	342	-	435	293	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.5	20.5	13.9
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	282	737	-	-	656	-	-	424
HCM Lane V/C Ratio	0.179	0.037	-	-	0.064	-	-	0.047
HCM Control Delay (s)	20.5	10.1	-	-	10.9	-	-	13.9
HCM Lane LOS	C	B	-	-	B	-	-	B
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0.2	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	510	38	420	8	28	15	230	278	9	12	335	548
Future Volume (veh/h)	510	38	420	8	28	15	230	278	9	12	335	548
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	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	554	41	457	9	30	16	250	302	10	13	364	596
Adj No. of Lanes	2	1	1	1	1	0	2	1	1	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	634	542	609	16	122	65	322	923	784	16	765	651
Arrive On Green	0.18	0.29	0.29	0.01	0.11	0.11	0.09	0.50	0.50	0.01	0.41	0.41
Sat Flow, veh/h	3442	1863	1583	1774	1145	610	3442	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	554	41	457	9	0	46	250	302	10	13	364	596
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	0	1755	1721	1863	1583	1774	1863	1583
Q Serve(g_s), s	16.9	1.7	26.9	0.5	0.0	2.6	7.7	10.5	0.3	0.8	15.4	38.3
Cycle Q Clear(g_c), s	16.9	1.7	26.9	0.5	0.0	2.6	7.7	10.5	0.3	0.8	15.4	38.3
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	634	542	609	16	0	187	322	923	784	16	765	651
V/C Ratio(X)	0.87	0.08	0.75	0.58	0.00	0.25	0.78	0.33	0.01	0.82	0.48	0.92
Avail Cap(c_a), veh/h	1277	864	882	247	0	562	1277	923	784	247	864	734
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	27.7	28.7	53.2	0.0	44.2	47.8	16.4	13.8	53.3	23.3	30.0
Incr Delay (d2), s/veh	1.5	0.1	2.5	12.0	0.0	0.3	1.5	0.2	0.0	29.7	0.6	15.5
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	8.1	0.9	12.1	0.3	0.0	1.3	3.7	5.4	0.2	0.5	8.0	19.4
LnGrp Delay(d),s/veh	44.3	27.8	31.2	65.2	0.0	44.4	49.3	16.6	13.8	83.0	23.8	45.5
LnGrp LOS	D	C	C	E		D	D	B	B	F	C	D
Approach Vol, veh/h		1052			55			562			973	
Approach Delay, s/veh		38.0			47.8			31.1			37.9	
Approach LOS		D			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	5.5	60.0	4.4	37.9	14.6	50.9	24.4	18.0
Change Period (Y+Rc), s	4.5	6.6	3.5	6.5	4.5	6.6	4.5	* 6.5
Max Green Setting (Gmax), s	15.0	50.0	15.0	50.0	40.0	50.0	40.0	* 35
Max Q Clear Time (g_c+I1), s	2.8	12.5	2.5	28.9	9.7	40.3	18.9	4.6
Green Ext Time (p_c), s	0.0	9.1	0.0	2.5	0.4	4.0	1.0	2.6

Intersection Summary	
HCM 2010 Ctrl Delay	36.7
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	1	266	9	1	13	145	546	13	17	562	38
Future Volume (veh/h)	66	1	266	9	1	13	145	546	13	17	562	38
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	1863	1863	1900	1863	1863	1863
Adj Flow Rate, veh/h	77	1	309	10	1	15	169	635	15	20	653	44
Adj No. of Lanes	1	1	0	1	1	0	2	2	0	1	2	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	100	1	382	18	20	293	272	1506	36	33	1295	579
Arrive On Green	0.06	0.24	0.24	0.01	0.20	0.20	0.08	0.43	0.43	0.02	0.37	0.37
Sat Flow, veh/h	1774	5	1579	1774	100	1498	3442	3534	83	1774	3539	1583
Grp Volume(v), veh/h	77	0	310	10	0	16	169	318	332	20	653	44
Grp Sat Flow(s),veh/h/ln	1774	0	1584	1774	0	1598	1721	1770	1848	1774	1770	1583
Q Serve(g_s), s	2.7	0.0	11.8	0.4	0.0	0.5	3.0	8.0	8.1	0.7	9.2	1.2
Cycle Q Clear(g_c), s	2.7	0.0	11.8	0.4	0.0	0.5	3.0	8.0	8.1	0.7	9.2	1.2
Prop In Lane	1.00		1.00	1.00		0.94	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	100	0	383	18	0	313	272	754	788	33	1295	579
V/C Ratio(X)	0.77	0.00	0.81	0.55	0.00	0.05	0.62	0.42	0.42	0.60	0.50	0.08
Avail Cap(c_a), veh/h	1385	0	1732	416	0	899	2687	1382	1443	416	2763	1236
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	0.0	22.9	31.5	0.0	20.9	28.6	12.8	12.9	31.2	15.8	13.2
Incr Delay (d2), s/veh	4.6	0.0	1.6	9.5	0.0	0.0	0.9	0.5	0.4	6.4	0.4	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	1.5	0.0	5.3	0.2	0.0	0.2	1.5	4.0	4.2	0.4	4.5	0.5
LnGrp Delay(d),s/veh	34.4	0.0	24.4	41.0	0.0	20.9	29.4	13.3	13.3	37.6	16.2	13.3
LnGrp LOS	C		C	D		C	C	B	B	D	B	B
Approach Vol, veh/h		387			26			819			717	
Approach Delay, s/veh		26.4			28.7			16.6			16.6	
Approach LOS		C			C			B			B	

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	5.7	34.2	4.2	20.0	9.6	30.3	7.1	17.0
Change Period (Y+Rc), s	4.5	* 6.9	3.5	4.5	4.5	6.9	3.5	4.5
Max Green Setting (Gmax), s	15.0	* 50	15.0	70.0	50.0	50.0	50.0	36.0
Max Q Clear Time (g_c+I1), s	2.7	10.1	2.4	13.8	5.0	11.2	4.7	2.5
Green Ext Time (p_c), s	0.0	12.3	0.0	1.7	0.3	12.2	0.1	1.6

Intersection Summary	
HCM 2010 Ctrl Delay	18.7
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	22	1	60	39	1	28	1	67	678	51	5	20	859	30
Future Volume (veh/h)	22	1	60	39	1	28	1	67	678	51	5	20	859	30
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		1863	1863	1863		1863	1863	1900
Adj Flow Rate, veh/h	25	1	69	45	1	32		77	779	59		23	987	34
Adj No. of Lanes	1	1	0	1	1	0		1	1	1		1	1	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87		0.87	0.87	0.87		0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2		2	2	2		2	2	2
Cap, veh/h	38	2	117	58	4	132		100	1128	959		36	1020	35
Arrive On Green	0.02	0.07	0.07	0.03	0.09	0.09		0.06	0.61	0.61		0.02	0.57	0.57
Sat Flow, veh/h	1774	23	1564	1774	48	1542		1774	1863	1583		1774	1790	62
Grp Volume(v), veh/h	25	0	70	45	0	33		77	779	59		23	0	1021
Grp Sat Flow(s),veh/h/ln	1774	0	1587	1774	0	1591		1774	1863	1583		1774	0	1852
Q Serve(g_s), s	1.0	0.0	3.2	1.9	0.0	1.4		3.2	21.1	1.1		1.0	0.0	39.5
Cycle Q Clear(g_c), s	1.0	0.0	3.2	1.9	0.0	1.4		3.2	21.1	1.1		1.0	0.0	39.5
Prop In Lane	1.00		0.99	1.00		0.97		1.00		1.00		1.00		0.03
Lane Grp Cap(c), veh/h	38	0	119	58	0	136		100	1128	959		36	0	1055
V/C Ratio(X)	0.65	0.00	0.59	0.78	0.00	0.24		0.77	0.69	0.06		0.64	0.00	0.97
Avail Cap(c_a), veh/h	475	0	659	357	0	682		1189	1747	1485		357	0	1055
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	0.00	1.00	1.00	0.00	1.00		1.00	1.00	1.00		1.00	0.00	1.00
Uniform Delay (d), s/veh	36.2	0.0	33.4	35.8	0.0	31.9		34.7	10.0	6.0		36.3	0.0	15.4
Incr Delay (d2), s/veh	6.7	0.0	1.7	8.2	0.0	0.3		4.6	0.9	0.0		6.8	0.0	20.4
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	0.6	0.0	1.5	1.0	0.0	0.6		1.7	10.9	0.5		0.5	0.0	25.8
LnGrp Delay(d),s/veh	42.9	0.0	35.2	44.0	0.0	32.2		39.3	10.9	6.1		43.1	0.0	35.8
LnGrp LOS	D		D	D		C		D	B	A		D		D
Approach Vol, veh/h		95			78				915				1044	
Approach Delay, s/veh		37.2			39.0				13.0				35.9	
Approach LOS		D			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	6.0	51.8	5.9	10.9	8.7	49.1	5.1	11.7
Change Period (Y+Rc), s	4.5	6.6	3.5	* 5.3	4.5	6.6	3.5	* 5.3
Max Green Setting (Gmax), s	15.0	70.0	15.0	* 31	50.0	40.0	20.0	* 32
Max Q Clear Time (g_c+I1), s	3.0	23.1	3.9	5.2	5.2	41.5	3.0	3.4
Green Ext Time (p_c), s	0.0	22.1	0.0	0.4	0.1	0.0	0.0	0.4

Intersection Summary	
HCM 2010 Ctrl Delay	26.2
HCM 2010 LOS	C

Notes

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	39	22	1	17	787	842	94
Future Vol, veh/h	39	22	1	17	787	842	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	-	65	-	-	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	90	90	92	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	43	24	1	19	874	936	104

Major/Minor	Minor2		Major1			Major2	
Conflicting Flow All	1900	988	-	1040	0	-	0
Stage 1	988	-	-	-	-	-	-
Stage 2	912	-	-	-	-	-	-
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	76	300	-	669	-	-	-
Stage 1	361	-	-	-	-	-	-
Stage 2	392	-	-	-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	76	300	~ -19	~ -19	-	-	-
Mov Cap-2 Maneuver	206	-	-	-	-	-	-
Stage 1	361	-	-	-	-	-	-
Stage 2	392	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.8		0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	+	-	232	-	-
HCM Lane V/C Ratio	-	-	0.292	-	-
HCM Control Delay (s)	-	-	26.8	-	-
HCM Lane LOS	-	-	D	-	-
HCM 95th %tile Q(veh)	-	-	1.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	2	1	808	893	11
Future Vol, veh/h	5	2	1	808	893	11
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	-	65	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	2	1	940	1038	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1987	1045	1051	0	-	0
Stage 1	1045	-	-	-	-	-
Stage 2	942	-	-	-	-	-
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	67	278	662	-	-	-
Stage 1	339	-	-	-	-	-
Stage 2	379	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	67	278	662	-	-	-
Mov Cap-2 Maneuver	194	-	-	-	-	-
Stage 1	339	-	-	-	-	-
Stage 2	378	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	662	-	212	-	-
HCM Lane V/C Ratio	0.002	-	0.038	-	-
HCM Control Delay (s)	10.4	-	22.7	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	206	317	164	294	527	231
Future Volume (veh/h)	206	317	164	294	527	231
Number	5	2	6	16	7	14
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	229	352	182	327	586	257
Adj No. of Lanes	1	2	1	1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	277	1547	403	939	668	843
Arrive On Green	0.16	0.44	0.22	0.22	0.38	0.38
Sat Flow, veh/h	1774	3632	1863	1583	1774	1583
Grp Volume(v), veh/h	229	352	182	327	586	257
Grp Sat Flow(s),veh/h/ln	1774	1770	1863	1583	1774	1583
Q Serve(g_s), s	8.7	4.3	5.9	7.3	21.3	6.3
Cycle Q Clear(g_c), s	8.7	4.3	5.9	7.3	21.3	6.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	277	1547	403	939	668	843
V/C Ratio(X)	0.83	0.23	0.45	0.35	0.88	0.30
Avail Cap(c_a), veh/h	768	2554	1344	1739	1024	1161
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	28.3	12.2	23.6	7.2	20.1	9.0
Incr Delay (d2), s/veh	2.4	0.1	1.0	0.3	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	4.4	2.1	3.1	6.2	11.5	7.3
LnGrp Delay(d),s/veh	30.8	12.3	24.5	7.5	25.8	9.2
LnGrp LOS	C	B	C	A	C	A
Approach Vol, veh/h		581	509		843	
Approach Delay, s/veh		19.6	13.6		20.8	
Approach LOS		B	B		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		37.2		32.1	15.3	21.9		
Change Period (Y+Rc), s		* 6.9		6.0	4.5	6.9		
Max Green Setting (Gmax), s		* 50		40.0	30.0	50.0		
Max Q Clear Time (g_c+I1), s		6.3		23.3	10.7	9.3		
Green Ext Time (p_c), s		5.7		2.8	0.3	5.6		

Intersection Summary	
HCM 2010 Ctrl Delay	18.5
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	1133	132	145	691	16	153	29	126	14	20	66
Future Volume (veh/h)	50	1133	132	145	691	16	153	29	126	14	20	66
Number	5	2	12	1	6	16	3	8	18	7	4	14
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	1863	1863	1863	1900
Adj Flow Rate, veh/h	54	1218	142	156	743	17	165	31	135	15	22	71
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	1877	218	179	2296	53	188	311	264	22	28	92
Arrive On Green	0.04	0.59	0.59	0.10	0.65	0.65	0.11	0.17	0.17	0.01	0.07	0.07
Sat Flow, veh/h	1774	3195	371	1774	3537	81	1774	1863	1583	1774	388	1253
Grp Volume(v), veh/h	54	673	687	156	372	388	165	31	135	15	0	93
Grp Sat Flow(s),veh/h/ln	1774	1770	1797	1774	1770	1848	1774	1863	1583	1774	0	1642
Q Serve(g_s), s	4.5	38.0	38.3	13.0	14.0	14.0	13.8	2.1	11.6	1.3	0.0	8.3
Cycle Q Clear(g_c), s	4.5	38.0	38.3	13.0	14.0	14.0	13.8	2.1	11.6	1.3	0.0	8.3
Prop In Lane	1.00		0.21	1.00		0.04	1.00		1.00	1.00		0.76
Lane Grp Cap(c), veh/h	69	1039	1055	179	1149	1200	188	311	264	22	0	120
V/C Ratio(X)	0.78	0.65	0.65	0.87	0.32	0.32	0.88	0.10	0.51	0.68	0.00	0.77
Avail Cap(c_a), veh/h	213	1039	1055	355	1149	1200	278	478	406	231	0	389
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)	0.29	0.29	0.29	0.96	0.96	0.96	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	71.4	20.6	20.7	66.5	11.7	11.7	66.1	53.0	56.9	73.8	0.0	68.3
Incr Delay (d2), s/veh	2.1	0.9	0.9	4.8	0.7	0.7	14.0	0.1	0.6	12.9	0.0	3.9
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	2.3	18.8	19.2	6.6	7.0	7.3	7.5	1.1	5.1	0.7	0.0	3.9
LnGrp Delay(d),s/veh	73.5	21.5	21.6	71.3	12.4	12.4	80.1	53.0	57.5	86.7	0.0	72.2
LnGrp LOS	E	C	C	E	B	B	F	D	E	F		E
Approach Vol, veh/h		1414			916			331			108	
Approach Delay, s/veh		23.5			22.4			68.4			74.2	
Approach LOS		C			C			E			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	9.6	94.6	19.4	16.4	10.4	103.9	5.4	30.4
Change Period (Y+Rc), s	4.5	6.5	3.5	* 5.4	4.5	6.5	3.5	5.4
Max Green Setting (Gmax), s	5.0	41.5	23.5	* 36	18.0	53.5	19.5	38.5
Max Q Clear Time (g_c+I1), s	15.0	40.3	15.8	10.3	6.5	16.0	3.3	13.6
Green Ext Time (p_c), s	0.2	1.1	0.1	0.7	0.0	22.8	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	30.5
HCM 2010 LOS	C

Notes

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	1	28	1248	6	1	2	790	9	4	0	2	15	0	14
Future Volume (veh/h)	1	28	1248	6	1	2	790	9	4	0	2	15	0	14
Number		5	2	12		1	6	16	3	8	18	7	4	14
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		30	1342	6		2	849	10	4	0	2	16	0	15
Adj No. of Lanes		1	2	0		1	2	0	0	1	0	0	1	1
Peak Hour Factor		0.93	0.93	0.93		0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2	2	2
Cap, veh/h		39	2988	13		4	2891	34	73	1	9	108	0	40
Arrive On Green		0.02	0.83	0.83		0.00	0.81	0.81	0.03	0.00	0.03	0.03	0.00	0.03
Sat Flow, veh/h		1774	3613	16		1774	3583	42	626	50	338	1578	0	1583
Grp Volume(v), veh/h		30	657	691		2	419	440	6	0	0	16	0	15
Grp Sat Flow(s),veh/h/ln		1774	1770	1860		1774	1770	1855	1015	0	0	1578	0	1583
Q Serve(g_s), s		1.8	10.7	10.7		0.1	6.3	6.3	0.3	0.0	0.0	0.0	0.0	1.0
Cycle Q Clear(g_c), s		1.8	10.7	10.7		0.1	6.3	6.3	1.2	0.0	0.0	0.9	0.0	1.0
Prop In Lane		1.00		0.01		1.00		0.02	0.67		0.33	1.00		1.00
Lane Grp Cap(c), veh/h		39	1463	1538		4	1428	1497	83	0	0	108	0	40
V/C Ratio(X)		0.76	0.45	0.45		0.52	0.29	0.29	0.07	0.00	0.00	0.15	0.00	0.38
Avail Cap(c_a), veh/h		346	1463	1538		194	1428	1497	581	0	0	592	0	584
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)		0.70	0.70	0.70		0.88	0.88	0.88	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		51.1	2.5	2.5		52.3	2.6	2.6	50.6	0.0	0.0	50.3	0.0	50.4
Incr Delay (d2), s/veh		7.6	0.7	0.7		31.6	0.5	0.4	0.1	0.0	0.0	0.2	0.0	2.2
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		1.0	5.4	5.7		0.1	3.2	3.4	0.2	0.0	0.0	0.5	0.0	0.5
LnGrp Delay(d),s/veh		58.7	3.2	3.2		83.9	3.0	3.0	50.8	0.0	0.0	50.6	0.0	52.5
LnGrp LOS		E	A	A		F	A	A	D			D		D
Approach Vol, veh/h			1378				861			6			31	
Approach Delay, s/veh			4.4				3.2			50.8			51.5	
Approach LOS			A				A			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	4.7	93.1		7.1	6.8	91.0		7.1
Change Period (Y+Rc), s	4.5	6.3		4.5	4.5	6.3		4.5
Max Green Setting (Gmax), s	10.5	39.5		38.7	20.5	30.5		38.7
Max Q Clear Time (g_c+I1), s	12.1	12.7		3.0	3.8	8.3		3.2
Green Ext Time (p_c), s	0.0	18.8		0.1	0.0	16.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	4.7
HCM 2010 LOS	A

Notes

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Volume (veh/h)	3	114	1082	94	2	73	661	31	31	22	25	33	28	113
Future Volume (veh/h)	3	114	1082	94	2	73	661	31	31	22	25	33	28	113
Number		5	2	12		1	6	16	3	8	18	7	4	14
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		118	1115	97		75	681	32	32	23	26	34	29	116
Adj No. of Lanes		1	2	0		1	2	0	1	1	0	1	1	0
Peak Hour Factor		0.97	0.97	0.97		0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2	2	2
Cap, veh/h		152	1702	148		114	1705	80	70	97	110	73	40	161
Arrive On Green		0.09	0.52	0.52		0.06	0.50	0.50	0.04	0.12	0.12	0.04	0.12	0.12
Sat Flow, veh/h		1774	3295	286		1774	3442	162	1774	799	904	1774	326	1306
Grp Volume(v), veh/h		118	598	614		75	350	363	32	0	49	34	0	145
Grp Sat Flow(s),veh/h/ln		1774	1770	1812		1774	1770	1834	1774	0	1703	1774	0	1632
Q Serve(g_s), s		4.7	17.9	18.0		3.0	9.0	9.0	1.3	0.0	1.9	1.4	0.0	6.2
Cycle Q Clear(g_c), s		4.7	17.9	18.0		3.0	9.0	9.0	1.3	0.0	1.9	1.4	0.0	6.2
Prop In Lane		1.00		0.16		1.00		0.09	1.00		0.53	1.00		0.80
Lane Grp Cap(c), veh/h		152	914	936		114	876	908	70	0	208	73	0	202
V/C Ratio(X)		0.78	0.65	0.66		0.66	0.40	0.40	0.46	0.00	0.24	0.47	0.00	0.72
Avail Cap(c_a), veh/h		733	1218	1247		366	1218	1263	488	0	961	855	0	1348
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	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		32.5	12.8	12.8		33.2	11.5	11.5	34.1	0.0	28.8	34.1	0.0	30.6
Incr Delay (d2), s/veh		3.2	1.0	0.9		2.4	0.4	0.3	1.7	0.0	0.2	1.7	0.0	1.8
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		2.5	8.9	9.1		1.5	4.5	4.6	0.7	0.0	0.9	0.7	0.0	2.9
LnGrp Delay(d),s/veh		35.7	13.8	13.8		35.6	11.9	11.9	35.9	0.0	29.0	35.8	0.0	32.4
LnGrp LOS		D	B	B		D	B	B	D		C	D		C
Approach Vol, veh/h			1330				788			81			179	
Approach Delay, s/veh			15.7				14.1			31.7			33.1	
Approach LOS			B				B			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	8.3	43.6	6.5	14.3	9.8	42.1	6.6	14.2
Change Period (Y+Rc), s	3.6	6.1	3.6	* 5.3	3.6	6.1	3.6	* 5.3
Max Green Setting (Gmax), s	15.0	50.0	20.0	* 60	30.0	50.0	35.0	* 41
Max Q Clear Time (g_c+I1), s	5.0	20.0	3.3	8.2	6.7	11.0	3.4	3.9
Green Ext Time (p_c), s	0.0	17.5	0.0	0.9	0.1	20.2	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	0.6

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	3	51	1042	1	2	3	720	3	0	0	0	2	0	31
Future Vol, veh/h	3	51	1042	1	2	3	720	3	0	0	0	2	0	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	115	-	-	-	120	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	96	96	96	92	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	53	1085	1	2	3	750	3	0	0	0	2	0	32

Major/Minor	Major1			Major2					Minor1			Minor2		
Conflicting Flow All	550	753	0	0	793	1086	0	0	1585	1963	543	1417	1961	377
Stage 1	-	-	-	-	-	-	-	-	1199	1199	-	762	762	-
Stage 2	-	-	-	-	-	-	-	-	386	764	-	655	1199	-
Critical Hdwy	6.44	4.14	-	-	6.44	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.52	2.22	-	-	2.52	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	643	853	-	-	451	638	-	-	73	62	484	97	63	621
Stage 1	-	-	-	-	-	-	-	-	197	257	-	363	412	-
Stage 2	-	-	-	-	-	-	-	-	609	411	-	421	257	-
Platoon blocked, %				-	-			-	-					
Mov Cap-1 Maneuver	834	834	-	-	545	545	-	-	69	62	484	97	63	621
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	69	62	-	97	63	-
Stage 1	-	-	-	-	-	-	-	-	197	257	-	363	412	-
Stage 2	-	-	-	-	-	-	-	-	577	411	-	421	257	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.1	0	13.3
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	834	-	-	545	-	-	468
HCM Lane V/C Ratio	-	0.068	-	-	0.01	-	-	0.073
HCM Control Delay (s)	0	9.6	-	-	11.7	-	-	13.3
HCM Lane LOS	A	A	-	-	B	-	-	B
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	406	79	535	17	22	12	213	315	9	12	361	477
Future Volume (veh/h)	406	79	535	17	22	12	213	315	9	12	361	477
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	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	419	81	552	18	23	12	220	325	9	12	372	492
Adj No. of Lanes	2	1	1	1	1	0	2	1	1	1	1	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	493	648	684	27	243	127	288	817	694	15	676	575
Arrive On Green	0.14	0.35	0.35	0.02	0.21	0.21	0.08	0.44	0.44	0.01	0.36	0.36
Sat Flow, veh/h	3442	1863	1583	1774	1154	602	3442	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	419	81	552	18	0	35	220	325	9	12	372	492
Grp Sat Flow(s),veh/h/ln	1721	1863	1583	1774	0	1756	1721	1863	1583	1774	1863	1583
Q Serve(g_s), s	13.2	3.3	33.8	1.1	0.0	1.8	7.0	13.2	0.4	0.8	17.7	31.9
Cycle Q Clear(g_c), s	13.2	3.3	33.8	1.1	0.0	1.8	7.0	13.2	0.4	0.8	17.7	31.9
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	493	648	684	27	0	370	288	817	694	15	676	575
V/C Ratio(X)	0.85	0.12	0.81	0.66	0.00	0.09	0.76	0.40	0.01	0.81	0.55	0.86
Avail Cap(c_a), veh/h	1239	838	845	240	0	545	1239	838	713	240	838	713
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	24.7	27.5	54.4	0.0	35.3	49.8	21.2	17.6	55.0	28.2	32.7
Incr Delay (d2), s/veh	1.6	0.1	5.1	9.7	0.0	0.0	1.6	0.4	0.0	30.5	0.8	8.9
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	6.4	1.7	15.7	0.6	0.0	0.9	3.4	6.9	0.2	0.5	9.3	15.3
LnGrp Delay(d),s/veh	48.0	24.8	32.6	64.1	0.0	35.3	51.4	21.6	17.6	85.5	29.0	41.6
LnGrp LOS	D	C	C	E		D	D	C	B	F	C	D
Approach Vol, veh/h		1052			53			554			876	
Approach Delay, s/veh		38.2			45.1			33.4			36.8	
Approach LOS		D			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	5.4	55.3	5.2	45.1	13.8	46.9	20.4	29.9
Change Period (Y+Rc), s	4.5	6.6	3.5	6.5	4.5	6.6	4.5	* 6.5
Max Green Setting (Gmax), s	15.0	50.0	15.0	50.0	40.0	50.0	40.0	* 35
Max Q Clear Time (g_c+I1), s	2.8	15.2	3.1	35.8	9.0	33.9	15.2	3.8
Green Ext Time (p_c), s	0.0	8.4	0.0	2.9	0.4	6.4	0.7	3.5

Intersection Summary	
HCM 2010 Ctrl Delay	36.8
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (veh/h)	18	1	69	9	0	8	53	601	26	2	13	765	27
Future Volume (veh/h)	18	1	69	9	0	8	53	601	26	2	13	765	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	1900	1863	1863	1900	1863	1863	1900		1863	1863	1863
Adj Flow Rate, veh/h	19	1	73	10	0	9	56	639	28		14	814	29
Adj No. of Lanes	1	1	0	1	1	0	2	2	0		1	2	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94		0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2		2	2	2
Cap, veh/h	33	2	110	18	0	99	149	1788	78		25	1729	774
Arrive On Green	0.02	0.07	0.07	0.01	0.00	0.06	0.04	0.52	0.52		0.01	0.49	0.49
Sat Flow, veh/h	1774	21	1565	1774	0	1583	3442	3454	151		1774	3539	1583
Grp Volume(v), veh/h	19	0	74	10	0	9	56	327	340		14	814	29
Grp Sat Flow(s),veh/h/ln	1774	0	1587	1774	0	1583	1721	1770	1836		1774	1770	1583
Q Serve(g_s), s	0.5	0.0	2.3	0.3	0.0	0.3	0.8	5.5	5.5		0.4	7.7	0.5
Cycle Q Clear(g_c), s	0.5	0.0	2.3	0.3	0.0	0.3	0.8	5.5	5.5		0.4	7.7	0.5
Prop In Lane	1.00		0.99	1.00		1.00	1.00		0.08		1.00		1.00
Lane Grp Cap(c), veh/h	33	0	112	18	0	99	149	916	950		25	1729	774
V/C Ratio(X)	0.58	0.00	0.66	0.54	0.00	0.09	0.38	0.36	0.36		0.56	0.47	0.04
Avail Cap(c_a), veh/h	1770	0	2217	531	0	1138	3435	1766	1832		531	3532	1580
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Uniform Delay (d), s/veh	24.4	0.0	22.7	24.7	0.0	22.1	23.3	7.1	7.2		24.5	8.5	6.7
Incr Delay (d2), s/veh	5.8	0.0	2.5	9.0	0.0	0.1	0.6	0.3	0.3		7.0	0.2	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	0.3	0.0	1.1	0.2	0.0	0.1	0.4	2.7	2.8		0.2	3.8	0.2
LnGrp Delay(d),s/veh	30.2	0.0	25.2	33.6	0.0	22.3	23.9	7.4	7.4		31.6	8.7	6.7
LnGrp LOS	C		C	C		C	C	A	A		C	A	A
Approach Vol, veh/h		93			19			723				857	
Approach Delay, s/veh		26.2			28.3			8.7				9.1	
Approach LOS		C			C			A				A	

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	5.2	32.8	4.0	8.0	6.7	31.4	4.4	7.6
Change Period (Y+Rc), s	4.5	* 6.9	3.5	4.5	4.5	6.9	3.5	4.5
Max Green Setting (Gmax), s	15.0	* 50	15.0	70.0	50.0	50.0	50.0	36.0
Max Q Clear Time (g_c+I1), s	2.4	7.5	2.3	4.3	2.8	9.7	2.5	2.3
Green Ext Time (p_c), s	0.0	15.1	0.0	0.4	0.1	14.8	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (veh/h)	21	0	44	37	0	17	56	650	48	1	21	799	20
Future Volume (veh/h)	21	0	44	37	0	17	56	650	48	1	21	799	20
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	1863	1863	1863		1863	1863	1900
Adj Flow Rate, veh/h	22	0	45	38	0	18	58	670	49		22	824	21
Adj No. of Lanes	1	1	0	1	1	0	1	1	1		1	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97		0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2		2	2	2
Cap, veh/h	34	0	101	51	0	115	74	1192	1013		34	1117	28
Arrive On Green	0.02	0.00	0.06	0.03	0.00	0.07	0.04	0.64	0.64		0.02	0.62	0.62
Sat Flow, veh/h	1774	0	1583	1774	0	1583	1774	1863	1583		1774	1809	46
Grp Volume(v), veh/h	22	0	45	38	0	18	58	670	49		22	0	845
Grp Sat Flow(s),veh/h/ln	1774	0	1583	1774	0	1583	1774	1863	1583		1774	0	1855
Q Serve(g_s), s	1.0	0.0	2.2	1.7	0.0	0.9	2.6	16.2	0.9		1.0	0.0	25.6
Cycle Q Clear(g_c), s	1.0	0.0	2.2	1.7	0.0	0.9	2.6	16.2	0.9		1.0	0.0	25.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00		1.00		0.02
Lane Grp Cap(c), veh/h	34	0	101	51	0	115	74	1192	1013		34	0	1145
V/C Ratio(X)	0.64	0.00	0.45	0.75	0.00	0.16	0.78	0.56	0.05		0.64	0.00	0.74
Avail Cap(c_a), veh/h	186	0	445	186	0	445	206	1192	1013		193	0	1145
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00		1.00	0.00	1.00
Uniform Delay (d), s/veh	39.0	0.0	36.1	38.6	0.0	34.8	38.0	8.1	5.4		39.0	0.0	10.8
Incr Delay (d2), s/veh	7.2	0.0	1.2	8.0	0.0	0.2	6.6	1.9	0.1		7.2	0.0	4.3
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	0.6	0.0	1.0	0.9	0.0	0.4	1.4	8.8	0.4		0.6	0.0	14.3
LnGrp Delay(d),s/veh	46.2	0.0	37.2	46.6	0.0	35.0	44.6	10.0	5.4		46.2	0.0	15.0
LnGrp LOS	D		D	D		D	D	B	A		D		B
Approach Vol, veh/h		67			56			777				867	
Approach Delay, s/veh		40.2			42.9			12.3				15.8	
Approach LOS		D			D			B				B	

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	6.0	57.8	5.8	10.4	7.8	56.0	5.0	11.1
Change Period (Y+Rc), s	4.5	6.6	3.5	* 5.3	4.5	6.6	3.5	* 5.3
Max Green Setting (Gmax), s	8.7	20.5	8.4	* 23	9.3	19.9	8.4	* 23
Max Q Clear Time (g_c+I1), s	3.0	18.2	3.7	4.2	4.6	27.6	3.0	2.9
Green Ext Time (p_c), s	0.0	1.9	0.0	0.2	0.0	0.0	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

Notes

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	7	3	708	849	27
Future Vol, veh/h	29	7	3	708	849	27
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	-	65	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	8	3	761	913	29

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1695	927	942	0	-	0
Stage 1	927	-	-	-	-	-
Stage 2	768	-	-	-	-	-
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	102	325	728	-	-	-
Stage 1	385	-	-	-	-	-
Stage 2	458	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	102	325	728	-	-	-
Mov Cap-2 Maneuver	237	-	-	-	-	-
Stage 1	385	-	-	-	-	-
Stage 2	456	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	728	-	250	-	-
HCM Lane V/C Ratio	0.004	-	0.155	-	-
HCM Control Delay (s)	10	-	22	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	1	5	1	2	754	858	6
Future Vol, veh/h	1	5	1	2	754	858	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	-	65	-	-	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	96	96	92	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	1	5	1	2	785	894	6

Major/Minor	Minor2		Major1			Major2	
Conflicting Flow All	1687	897	-	900	0	-	0
Stage 1	897	-	-	-	-	-	-
Stage 2	790	-	-	-	-	-	-
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	103	339	-	755	-	-	-
Stage 1	398	-	-	-	-	-	-
Stage 2	447	-	-	-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	103	339	~ -3	~ -3	-	-	-
Mov Cap-2 Maneuver	239	-	-	-	-	-	-
Stage 1	398	-	-	-	-	-	-
Stage 2	447	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.6		0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	+	-	317	-	-
HCM Lane V/C Ratio	-	-	0.02	-	-
HCM Control Delay (s)	-	-	16.6	-	-
HCM Lane LOS	-	-	C	-	-
HCM 95th %tile Q(veh)	-	-	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	185	473	166	334	823	56
Future Volume (veh/h)	185	473	166	334	823	56
Number	5	2	6	16	7	14
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	201	514	180	363	895	61
Adj No. of Lanes	1	2	1	1	1	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	1397	388	1054	812	938
Arrive On Green	0.13	0.39	0.21	0.21	0.46	0.46
Sat Flow, veh/h	1774	3632	1863	1583	1774	1583
Grp Volume(v), veh/h	201	514	180	363	895	61
Grp Sat Flow(s),veh/h/ln	1774	1770	1863	1583	1774	1583
Q Serve(g_s), s	9.7	9.0	7.4	8.7	40.0	1.4
Cycle Q Clear(g_c), s	9.7	9.0	7.4	8.7	40.0	1.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	239	1397	388	1054	812	938
V/C Ratio(X)	0.84	0.37	0.46	0.34	1.10	0.07
Avail Cap(c_a), veh/h	609	2025	1066	1630	812	938
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	36.9	18.7	30.3	6.3	23.7	7.5
Incr Delay (d2), s/veh	3.0	0.2	1.0	0.2	63.4	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	4.9	4.4	3.9	8.7	33.7	2.1
LnGrp Delay(d),s/veh	39.9	18.9	31.4	6.6	87.1	7.6
LnGrp LOS	D	B	C	A	F	A
Approach Vol, veh/h		715	543		956	
Approach Delay, s/veh		24.8	14.8		82.0	
Approach LOS		C	B		F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		41.4		46.0	16.3	25.1		
Change Period (Y+Rc), s		* 6.9		6.0	4.5	6.9		
Max Green Setting (Gmax), s		* 50		40.0	30.0	50.0		
Max Q Clear Time (g_c+I1), s		11.0		42.0	11.7	10.7		
Green Ext Time (p_c), s		7.5		0.0	0.2	7.5		

Intersection Summary	
HCM 2010 Ctrl Delay	47.1
HCM 2010 LOS	D

Notes

APPENDIX D

RECOMMENDED SIGNAL TIMING SHEETS

INTERSECTION: 110 Twin Peaks @ Tierra Bonita

Coord Extra
1 = Programmed WALK Time for Sync Phases
2 = Always Terminate Sync Phase Peds

Row	Column Numbers --->	Plan 1	2	3	4	5	6	7	8	9	Row
	Plan Name --->										
0	Cycle Length	0	150	0	0	0	105	0	0	0	0
1	Phase 1 - ForceOff	0	76	0	0	0	60	0	0	0	1
2	Phase 2 - ForceOff	0	0	0	0	0	0	0	0	0	2
3	Phase 3 - ForceOff	0	~~20~~ 18	0	0	0	19	0	0	0	3
4	Phase 4 - ForceOff	0	~~59~~ 105	0	0	0	23	0	0	0	4
5	Phase 5 - ForceOff	0	98	0	0	0	70	0	0	0	5
6	Phase 6 - ForceOff	0	0	0	0	0	0	0	0	0	6
7	Phase 7 - ForceOff	0	~~28~~ 32	0	0	0	19	0	0	0	7
8	Phase 8 - ForceOff	0	58	0	0	0	42	0	0	0	8
9	Ring Offset	0	0	0	0	0	0	0	0	0	9
A	Offset 1	0	43	0	0	0	86	0	0	0	A
B	Offset 2	0	0	0	0	0	0	0	0	0	B
C	Offset 3	0	0	0	0	0	0	0	0	0	C
D	Perm 1 - End	15	15	15	15	15	15	15	15	15	D
E	Hold Release	255	255	255	255	255	255	255	255	255	E
F	Zone Offset	0	0	0	0	0	0	0	0	0	F

Coordination - Bank 1 <C+0+C=1>

Row		E	Row
0			0
1	Plan 1 - Sync	2 6	1
2	Plan 2 - Sync	2 6	2
3	Plan 3 - Sync	2 6	3
4	Plan 4 - Sync	2 6	4
5	Plan 5 - Sync	2 6	5
6	Plan 6 - Sync	2 6	6
7	Plan 7 - Sync	2 6	7
8	Plan 8 - Sync	2 6	8
9	Plan 9 - Sync	2 6	9
A	NEMA Sync		A
B	NEMA Hold		B
C			C
D			D
E	Coord Extra		E
F			F

Sync Phases <C+0+C=1>

Row		1	2	3	4	5	6	7	8	9	Row
0	Ped Adjustment	0	12	0	0	0	12	0	0	0	0
1	Perm 2 - Start	0	0	0	0	0	0	0	0	0	1
2	Perm 2 - End	0	0	0	0	0	0	0	0	0	2
3	Perm 3 - Start	0	0	0	0	0	0	0	0	0	3
4	Perm 3 - End	0	0	0	0	0	0	0	0	0	4
5	Reservice Time	0	0	0	0	0	0	0	0	0	5
6	Reservice Phases										6
7											7
8	Pretimed Phases										8
9	Max Recall										9
A	Perm 1 Veh Phase	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	A
B	Perm 1 Ped Phase	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	12345678	B
C	Perm 2 Veh Phase										C
D	Perm 2 Ped Phase										D
E	Perm 3 Veh Phase										E
F	Perm 3 Ped Phase										F

Coordination - Bank 2 <C+0+C=2>

Row		F	Row
0	Free Lag	2 4 6 8	0
1	Plan 1 - Lag	2 4 6 8	1
2	Plan 2 - Lag	2 4 6 8	2
3	Plan 3 - Lag	2 4 6 8	3
4	Plan 4 - Lag	2 4 6 8	4
5	Plan 5 - Lag	2 4 6 8	5
6	Plan 6 - Lag	2 4 6 8	6
7	Plan 7 - Lag	2 4 6 8	7
8	Plan 8 - Lag	2 4 6 8	8
9	Plan 9 - Lag	2 4 6 8	9
A	External Lag		A
B			B
C			C
D			D
E			E
F			F

Lag Phases <C+0+C=1>

2/2/17

INTERSECTION: 113 Titan Way @ Espola

Group Assignment: **NONE**
Field Master Assignment: **NONE**
System Reference Number: **32**

N/S Street Name: **Espola Road**
E/W Street Name: **Titan Way**

Last Database Change: **10/29/2015 12:53**

Change Record					
Change	By	Date	Change	By	Date

Notes:

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Drop Number	13	<C/0+0+0>
Zone Number	13	<C/0+0+1>
Area Number	0	<C/0+0+2>
Area Address	112	<C/0+0+3>
QuicNet Channel	COM102:	(QuicNet)

Communication Addresses

Manual Plan		<C/0+A+1>
Manual Offset		<C/0+B+1>

Manual Selection

Flash Start	0	<F/1+0+E>
Red Revert	2.0	<F/1+0+F>
All Red Start	5.0	<F/1+C+0>

Start / Revert Times

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase
(Outputs specified in Assignable Outputs at E/127+A+E & F)

Row	Column Numbers ----> / Phase Names ---->	Phase 1	2	3	4	5	6	7	8
0	Ped Walk	0	12	0	12	0	12	0	12
1	Ped FDW	0	16	0	25	0	14	0	24
2	Min Green	4	10	4	4	4	10	4	4
3	Type 3 Disconnect	0	0	0	0	0	0	0	0
4	Added per Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	Veh Extension	2.0	3.5	2.0	2.0	2.0	3.5	2.0	2.0
6	Max Gap	2.0	5.0	2.0	2.0	2.0	5.0	2.0	2.0
7	Min Gap	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
8	Max Limit	15	50	15	70	50	50	50	15
9	Max Limit 2	15	50	15	50	50	50	50	15
A	Adv. / Delay Walk	0	0	0	0	0	0	0	0
B	PE Min Ped FDW	7	7	7	7	7	7	7	7
C	Cond Serv Check	10	10	10	10	10	10	10	10
D	Reduce Every	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
E	Yellow Change	3.5	4.6	3.0	3.0	3.5	4.9	3.0	3.0
F	Red Clear	1.0	2.0	0.5	1.5	1.0	2.0	0.5	1.5

Phase Timing - Bank 1 <C+0+F=1>

	9	A	B	C	D
	---	---	---	---	---
Phase 1	0	0	0	0	0.0
Phase 2	20	0	0	0	0.0
Phase 3	0	0	0	0	0.0
Phase 4	20	0	0	0	0.0
Phase 5	0	0	0	0	0.0
Phase 6	20	0	0	0	0.0
Phase 7	0	0	0	0	0.0
Phase 8	20	0	0	0	0.0

Max Initial
Alternate Walk
Alternate FDW
Alternate Initial
Alternate Extension

Alternate Timing <C+0+F=1>

	E
RR-1 Delay	2
RR-1 Clear	0
EV-A Delay	0
EV-A Clear	10
EV-B Delay	0
EV-B Clear	10
EV-C Delay	0
EV-C Clear	10
EV-D Delay	0
EV-D Clear	10
RR-2 Delay	0
RR-2 Clear	0
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing

Row		F
0	Permit	12345678
1	Red Lock	
2	Yellow Lock	3
3	Min Recall	2 6
4	Ped Recall	
5	*View Set Peds*	-----
6	Rest In Walk	
7	Red Rest	
8	Dual Entry	4 8
9	Max Recall	
A	Soft Recall	
B	Max 2	
C	Cond. Service	
D	Man Cntrl Calls	
E	Yellow Start	4 8
F	First Phases	2 6

Phase Functions <C+0+F=1>

60 seconds 2/2/17
for both
Tom M.

INTERSECTION: 018 Poway @ Espola Road

Group Assignment: **NONE**
Field Master Assignment: **NONE**
System Reference Number: **18**

N/S Street Name: **Espola Road**
E/W Street Name: **Poway Road**

Last Database Change: **11/13/2014 11:19**

Change Record					
Change	By	Date	Change	By	Date

Notes:

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Drop Number	18	<C/0+0+0>
Zone Number	18	<C/0+0+1>
Area Number	0	<C/0+0+2>
Area Address	17	<C/0+0+3>
QuicNet Channel	COM101:	(QuicNet)

Communication Addresses

Manual Plan		<C/0+A+1>
Manual Offset		<C/0+B+1>

Manual Selection

Flash Start	0	<F/1+0+E>
Red Revert	2.0	<F/1+0+F>
All Red Start	5.0	<F/1+C+0>

Start / Revert Times

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase
(Outputs specified in Assignable Outputs at E/127+A+E & F)

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Row	Column Numbers ----> / Phase Names ---->	Phase 1	2	3	4	5	6	7	8
0	Ped Walk	0	4	0	4	0	4	0	4
1	Ped FDW	0	0	0	23	0	25	0	0
2	Min Green	4	10	4	15	8	10	4	4
3	Type 3 Disconnect	0	0	0	20	0	0	0	20
4	Added per Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0
5	Veh Extension	2.0	3.5	2.0	3.0	2.0	3.5	2.0	2.5
6	Max Gap	3.0	5.0	3.0	3.0	2.0	5.0	3.0	3.0
7	Min Gap	0.5	2.0	0.5	3.0	2.0	2.0	0.5	1.5
8	Max Limit	20	50	20	50	30	50	20	25
9	Max Limit 2	30	50	30	40	20	50	30	40
A	Adv. / Delay Walk	0	0	0	0	0	0	0	0
B	PE Min Ped FDW	7	7	7	7	7	7	7	7
C	Cond Serv Check	10	10	10	10	10	10	10	10
D	Reduce Every	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
E	Yellow Change	3.0	4.8	3.0	4.5	3.5	4.9	3.0	3.0
F	Red Clear	1.0	2.0	1.0	1.5	1.0	2.0	1.0	1.0

Phase Timing - Bank 1 <C+0+F=1>

	9	A	B	C	D
	---	---	---	---	---
Phase 1	0	0	0	0	0.0
Phase 2	20	0	0	0	0.0
Phase 3	0	0	0	0	0.0
Phase 4	20	0	0	0	0.0
Phase 5	0	0	0	0	0.0
Phase 6	20	0	0	0	0.0
Phase 7	0	0	0	0	0.0
Phase 8	20	0	0	0	0.0
Max Initial					
Alternate Walk					
Alternate FDW					
Alternate Initial					
Alternate Extension					

Alternate Timing <C+0+F=1>

E	
RR-1 Delay	2
RR-1 Clear	0
EV-A Delay	0
EV-A Clear	10
EV-B Delay	0
EV-B Clear	10
EV-C Delay	0
EV-C Clear	10
EV-D Delay	0
EV-D Clear	10
RR-2 Delay	0
RR-2 Clear	10
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing

Row	F
0	Permit: 2 456
1	Red Lock:
2	Yellow Lock:
3	Min Recall: 2 6
4	Ped Recall:
5	*View Set Peds*: - - - - -
6	Rest In Walk:
7	Red Rest:
8	Dual Entry:
9	Max Recall:
A	Soft Recall:
B	Max 2:
C	Cond. Service:
D	Man Cntrl Calls:
E	Yellow Start: 4
F	First Phases: 2 6

Phase Functions <C+0+F=1>

TO 1/17/2017

for MJ

INTERSECTION: 112 Del Poniente @ Espola

Group Assignment: **NONE**
Field Master Assignment: **NONE**
System Reference Number: **31**

N/S Street Name: **Espola Road**
E/W Street Name: **Del Poniente Road**

Last Database Change: **6/27/2007 10:07**

Notes: #2 P to 6 sec

Change Record					
Change	By	Date	Change	By	Date

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Drop Number	12	<C/0+0+0>
Zone Number	12	<C/0+0+1>
Area Number	0	<C/0+0+2>
Area Address	111	<C/0+0+3>
QuicNet Channel	DIGI-2:	(QuicNet)

Communication Addresses

Manual Plan		<C/0+A+1>
Manual Offset		<C/0+B+1>

Manual Selection

Flash Start	0	<F/1+0+E>
Red Revert	2.0	<F/1+0+F>
All Red Start	5.0	<F/1+C+0>

Start / Revert Times

Exclusive Walk	0	<F/1+0+0>
Exclusive FDW	0	<F/1+0+1>
All Red Clear	0.0	<F/1+0+2>

Exclusive Ped Phase
(Outputs specified in Assignable Outputs at E/127+A+E & F)

Row	Column Numbers → / Phase Names →	Phase 1	2	3	4	5	6	7	8
0	Ped Walk	0	7	0	7	0	7	0	7
1	Ped FDW	0	16	0	24	0	16	0	25
2	Min Green	4	10	4	6	4	10	4	6
3	Type 3 Disconnect	0	0	0	0	0	0	0	0
4	Added per Vehicle	0.0	1.2	0.0	0.0	0.0	1.2	2.0	0.0
5	Veh Extension	2.0	3.5	2.0	2.0	2.0	3.5	2.0	2.0
6	Max Gap	2.0	5.0	2.0	2.0	2.0	5.0	2.0	2.0
7	Min Gap	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
8	Max Limit	15	70	15	20	20	70	20	20
9	Max Limit 2	15	70	15	20	20	70	20	20
A	Adv. / Delay Walk	0	0	0	0	0	0	0	0
B	PE Min Ped FDW	7	7	7	7	7	7	7	7
C	Cond Serv Check	10	10	10	10	10	10	10	10
D	Reduce Every	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
E	Yellow Change	3.5	4.6	3.0	3.8	3.5	4.6	3.0	3.2
F	Red Clear	1.0	2.0	0.5	1.5	1.0	2.0	0.5	1.5

Phase Timing - Bank 1 <C+0+F=1>

	9	A	B	C	D
	---	---	---	---	---
Phase 1	0	0	0	0	0.0
Phase 2	20	0	0	0	0.0
Phase 3	0	0	0	0	0.0
Phase 4	20	0	0	0	0.0
Phase 5	0	0	0	0	0.0
Phase 6	20	0	0	0	0.0
Phase 7	0	0	0	0	0.0
Phase 8	20	0	0	0	0.0

Max Initial
Alternate Walk
Alternate FDW
Alternate Initial
Alternate Extension

Alternate Timing <C+0+F=1>

E	
RR-1 Delay	2
RR-1 Clear	10
EV-A Delay	0
EV-A Clear	10
EV-B Delay	0
EV-B Clear	10
EV-C Delay	0
EV-C Clear	10
EV-D Delay	0
EV-D Clear	10
RR-2 Delay	0
RR-2 Clear	0
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing

F		Row
Permit	12345678	0
Red Lock		1
Yellow Lock	1	2
Min Recall	_2___6__	3
Ped Recall		4
View Set Peds	-----	5
Rest In Walk		6
Red Rest		7
Dual Entry	___4___8	8
Max Recall		9
Soft Recall		A
Max 2		B
Cond. Service		C
Man Cntrl Calls		D
Yellow Start	___4___8	E
First Phases	_2___6__	F

Phase Functions <C+0+F=1>

90 seconds for both

90 seconds for both

2/2/17