FEHR PEERS

TECHNICAL MEMORANDUM

Date: April 20, 2015

To: Steve Kersevan, City of Brentwood

From: Kathrin Tellez and Ben Fuller, Fehr & Peers

Subject: Brentwood Center Transportation Assessment

WC15-3208

This memorandum presents the results of supplemental transportation assessment for the Brentwood Center community college campus (project), currently under construction. The campus is located east of Miwok Avenue adjacent to the Vineyards at Marsh Creek community in Brentwood. Access to the campus would be provided from Miwok Avenue at Vineyards Parkway, which intersects Marsh Creek Road and also connects to Fairview Avenue, as shown on **Figure 1** (all figures attached at the end of this memorandum).

Community concern has been raised regarding the potential for the project to increase travel demand on Vineyards Parkway and Fairview Avenue, and the potential need to signalize the intersections of Fairview Avenue and Baldwin Drive and/or Wolfe Road. Our assessment evaluates the need for traffic signals or other traffic controls at these locations based on existing and projected traffic volumes, as well as assesses the potential need for additional roadway modifications to enhance the campus connection to the regional roadway network.

The following presents the analysis summary, study purpose and analysis parameters, existing conditions, project conditions and 2040 conditions.

ANALYSIS SUMMARY

Fehr & Peers collected daily and peak hour traffic volume and speed information in the project vicinity, evaluated peak hour and daily roadway operations both without and with the project for existing and future conditions, evaluated the pedestrian experience crossing Fairview Avenue at

Wolfe Road/Regent Drive and Baldwin Drive, and evaluated the potential need for intersection modifications or additional traffic controls (i.e. signalization) to accommodate existing and projected travel activities along Fairview Avenue and Marsh Creek Road both without and with the project. The key findings are:

- Installation of traffic signals is not warranted at either the Wolfe Road/Regent Drive or Baldwin Drive intersections with Fairview Avenue based on existing or projected future conditions without or with the project.
- Pedestrians crossing Fairview Avenue at either the Wolfe Road/Regent Drive or Baldwin Drive have a poor experience based on the width of the crossing and vehicle speeds. Additional pedestrian crossing treatments are warranted at the intersections based on existing conditions.
- Deficient operations are projected at the Marsh Creek Road/State Route 4 at Vasco Road intersection in 2040 with build-out of land uses envisioned in the City of Brentwood General Plan and surrounding communities. A grade separated interchange is planned at this location, but a construction schedule has not been identified. Acceptable operations are projected with build-out of the Vineyards at Marsh Creek as well as with full enrollment levels reached at the Brentwood Center, but would degrade with continued growth in Brentwood and surrounding communities.

STUDY PURPOSE AND ANALYSIS PARAMETERS

The environmental impacts of the Brentwood Center community college campus were documented in a Supplemental Environmental Impact Report (SEIR) published in February 2011. The Supplemental EIR was certified and the project approved in 2011. The project is not subject to further environmental review or approvals. Local transportation improvements identified in the SEIR on Marsh Creek Road, Vineyards Parkway and Miwok Avenue have been completed. The project would also contribute to the need for regional roadway improvements, including continued expansion of Highway 4 through the area, including grade separated interchanges at Balfour Road and Marsh Creek Road.

Although the transportation impacts of the project have been identified and mitigation measures implemented, there is community concern regarding the additional traffic from the project along

Fairview Avenue, specifically through the Baldwin Drive and Wolfe Road intersections, as well as increased congestion at the Marsh Creek/State Route 4 intersection that could encourage traffic to travel on Fairview Avenue to avoid congestion on the regional roadway network. This analysis provides additional information about roadway operations for facilities that would directly serve the site to determine if modifications are necessary based on existing or projected traffic conditions.

The study includes an assessment of the following intersections, as shown previously on Figure 1:

1. Fairview Avenue at Baldwin Drive (unsignalized)
2. Fairview Avenue at Wolfe Road/Regent Drive (unsignalized)
3. Vineyards Parkway at Miwok Avenue (signalized)
4. Vineyards Parkway at Marsh Creek Road (signalized)
5. State Route 4/Vasco Road at Marsh Creek Road (signalized)

Daily traffic count information and vehicular travel speed was documented on Fairview Avenue, south of Wolfe Road/Regent Drive and north of Baldwin Drive.

The assessment considers the following scenarios:

- Existing – Existing conditions based on recent traffic counts.
- Existing with Phase 1 – Existing conditions with Phase 1 of the Brentwood Center project.
- 2040 without Project Conditions – Conditions considering build-out of the City of Brentwood as envisioned in the current General Plan, with adjustments to the development assumptions at Cowan Ranch to reflect housing development, as opposed to a second community college campus.
- 2040 with Project Conditions – Intersection volumes from the above scenario, plus traffic generated by phases 1 and 2 of the project.

EXISTING CONDITIONS

This section describes transportation facilities in the project study area, including the surrounding roadway network and transit, pedestrian, and bicycle facilities in the project site vicinity.

Roadway System

State Route 4 (SR 4) is a north-south roadway that connects Hercules in the west to Stockton and beyond in the east. In the project vicinity, SR 4 is a two-lane expressway with a 55-mile per hour (MPH) speed limit and grade separation at Fairview Avenue. Additional lanes are provided at the intersection with Marsh Creek Road, where SR 4 connects to Vasco Road. SR 4 is a designated Route of Regional Significance, as defined by the Contra Costa County Transportation Authority (CCTA).

Vasco Road is a two-lane rural roadway connecting the East County area to Livermore and other elements of the regional freeway system. The posted speed limit on Vasco Road is 45 to 55 MPH.

Marsh Creek Road is an east-west oriented rural roadway connecting far East Contra Costa County (i.e. Discovery Bay) with Central County (i.e. Clayton and Concord). It parallels Balfour Road for much of its length through Brentwood. The roadway currently provides one lane per direction. Marsh Creek Road is a designated Route of Regional Significance.

Vineyards Parkway is the continuation of Fairview Avenue which extends to a signalized intersection with Marsh Creek Road. Vineyards Parkway is a designated minor arterial roadway that provides one traffic lane in each direction, and serves as the main roadway through the Vineyards at Marsh Creek development. The posted speed limit is 35 MPH. Sidewalks and bicycle lanes are provided on Vineyards Parkway.

Fairview Avenue is a two to four lane minor arterial south of Balfour Road to its transition to Vineyards Parkway. The posted speed limit is 35 MPH. Sidewalks and bicycle lanes are provided on Fairview Avenue.

Regent Drive, Wolfe Road and Baldwin Drive are local roadways that serve as gateways to the Summerset active adult community along Fairview Avenue.

Existing Pedestrian and Bicycle Facilities

Pedestrian facilities include sidewalks, crosswalks, and pedestrian signals. Pedestrian facilities are provided on public roadways adjacent to the site on Vineyards Parkway and Miwok Avenue. Sidewalks are also provided on Fairview Avenue, Wolfe Road, the north side of Regent Drive, and the south side of Regent Drive. In the immediate project vicinity, pedestrian crosswalks, push

buttons and signals are provided at the signalized intersections and crosswalks are provided at unsignalized intersections.

Bicycle facilities in Brentwood include the following:

- *Bike paths (Class I)* – Paved trails that are separated from roadways. These facilities are typically shared with pedestrians, although bicycles must yield to pedestrians.
- *Bike lanes (Class II)* – Lanes on roadways designated for use by bicycles through striping, pavement legends, and signs. There may or may not be parking allowed on the roadway.
- *Bike routes (Class III)* – Designated roadways for bicycle use by signs only; may or may not include additional pavement width for cyclists.

Fairview Avenue and Vineyards Parkway have Class II bicycle facilities. The Marsh Creek Class I facility is located to the east of the study area.

Existing Transit Service

Tri Delta Transit provides transit service to the City of Brentwood and surrounding communities. No transit service is provided in the vicinity of the Brentwood Center campus.

Existing Roadway Volumes

Weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak period intersection turning movements counts were conducted at the three signalized study intersections (3, 4 and 5) in February 2015 on a clear-weekday with schools in normal session. Additionally, turning movement counts, including a separate count of pedestrians, bicyclists and golf cart activity, were conducted between 10:00 AM and 6:00 PM at Fairview Avenue/Baldwin Drive and Fairview Avenue/Wolfe Road intersections to capture the range of activity at those two intersections. Existing peak hour traffic volumes are presented on **Figure 2** along with the existing lane configurations and traffic control. Traffic count worksheets are attached.

Daily traffic volumes were also collected along Fairview Avenue over a two day period, as summarized on Figure 2. South of Wolfe Drive, daily traffic volumes are around 3,000 vehicles per day. North of Baldwin Drive, volumes increase to around 5,900 vehicles per day. There was little variation between the two days of data collection. The daily traffic flow profile is shown on **Figure 3**, which indicates peak travel occurs on Fairview Avenue between 11:00 AM and 4:00 PM. In

conjunction with the volume data, a speed survey was conducted which indicates that the 85th percentile speed on Fairview Avenue is between 45 and 48 miles per hour.

Existing Intersection Level of Service

The operations of intersections are described with the term "level of service" (LOS). Intersection LOS is a qualitative description of traffic flow based on the amount of time the average driver is delayed at the intersection. Six levels of service are defined ranging from LOS A (free flow conditions) to LOS F (over capacity conditions). LOS E generally represents operations at capacity. Traffic conditions at signalized and unsignalized intersections are evaluated using methodologies from the *2010 Highway Capacity Manual* (HCM).[1] For signalized intersections, LOS is calculated as the average of all vehicles entering the intersection as a whole. For two-way stop-controlled intersections, LOS is calculated for both the average of all vehicles entering the intersection in addition to the worst side street movement. **Attachment A** provides additional details.

At the intersections along Fairview Avenue, adjustments were made to the *2010 Highway Capacity Manual* methodology for capacity at two-way stop-controlled intersections to better reflect the driver characteristics of active adult communities. Published research indicates that older drivers on average require traffic gaps approximately 10 percent longer than average drivers to turn into and out of major roadways. Adjustments made to the standard analysis parameters are detailed in Attachment A. Incorporating the critical gap adjustments, existing operations of the study intersections were calculated based on the existing lane configurations, traffic control, and volumes. The results are presented in **Table 1**, which indicates that the intersections evaluated for this study operate with minimal levels of delay during the analysis periods.

[1] *2010 Highway Capacity Manual*, Transportation Research Board, 2010.

TABLE 1
EXISTING PEAK HOUR INTERSECTION LEVEL OF SERVICE

	Intersection	Control[1]	Peak Hour[2]	Delay[3]	LOS[4]
1	Fairview Ave at Baldwin Dr	SSSC	Mid PM	3 (13) 2 (11)	A (B) A (B)
2	Fairview Ave at Wolfe Rd/Regent Dr	SSSC	Mid PM	3 (11) 3 (11)	A (B) A (B)
3	Vasco Rd at Marsh Creek Rd	Signal	AM PM	18 24	B C
4	Marsh Creek Rd at Vineyards Pkwy	Signal	AM PM	5 7	A A
5	Vineyards Pkwy at Miwok Ave	Signal	AM PM	0 0	A A

Notes:
1. Signal = Signalized Intersection; SSSC = Side-Street Stop-Controlled Intersection.
2. AM Peak Hour = 7:30 AM; Mid Peak Hour = 1:15 PM, PM Peak Hour = 4:45 PM.
3. Delay presented in seconds per vehicle; for two-way stop-controlled intersections, delay presented in Intersection Average (Worst Movement).
4. LOS = Level of Service.

Accident Review

Over the last five years, there were two reported collisions at the Fairview Avenue at Baldwin Drive intersection, and no collisions reported at Fairview Avenue at Wolfe Road/Regent Drive intersection. The two collisions at the Fairview Avenue at Baldwin Drive intersection occurred in 2013—one was a sideswipe type and the other was a rear-end type. The rear-end collision resulted in an injury.

Crosswalk Assessment

The unsignalized pedestrian crossings of Fairview Avenue at Baldwin Drive and Wolfe Road/Regent Drive were analyzed using a crosswalk treatment selection tool. This tool was developed by Fehr & Peers in consultation with the Institute of Transportation Engineers' (ITE) Pedestrian/Bicycle Council. It combines academic research on crosswalk treatment effectiveness with national best practices and has been peer-reviewed by Fehr & Peers' pedestrian and bicycle experts as well as members of the Institute of Transportation Engineers' Pedestrian and Bicycle

Council executive committee. This tool incorporates data including auto travel speed, pedestrian volume, vehicle volume, crossing distance, and motorist yielding rates.

Results of the assessment indicate that the pedestrian crossing experience of Fairview Avenue at both the Wolfe Road/Regent Drive and Baldwin Drive intersections is poor, primarily due to the crossing distance and vehicle speeds. These locations are both candidates for enhanced crosswalk treatments, including pedestrian hybrid beacons or free standing pedestrian actuated flashers (rectangular rapid flashing beacons {RRFBs}). The beacons would be activated by pedestrian push button, and would increase yield compliance of motorists[2]. This device has been recently installed at other locations in the City of Brentwood.

Traffic Signal Warrants

The community has expressed interest in installing traffic signals at Fairview Avenue/Baldwin Drive and Fairview Avenue/Wolfe Road. To determine if installing a traffic signal is justified at an intersection, it should meet at least one of the traffic signal warrants described in the *Manual on Uniform Traffic Control Devices* (MUTCD).[3] There are eight warrants, five of which are applicable to the study intersections. The applicable warrants are described and analyzed below. Similar to the assessment of intersection operations, a 10 percent factor was applied to account for driver behavior entering/exiting the active adult communities on Fairview Avenue.

Summary of Warrant Analysis

The following summarizes the evaluation criteria for each warrant evaluated for this assessment. Details are provided in **Attachment B**, along with the analysis worksheets. Results of the signal warrant analysis found that neither unsignalized intersection on Fairview Avenue satisfies signal warrants.

Warrant 1, Eight Hour Vehicle Volume: The Eight-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal, and considers an 8-hour period. The intersection has relatively low volumes, particularly on the minor street approach. Warrant 1 is not met.

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[2] Effects of Yellow Rectangular Rapid-Flashing Beacons on Yielding at Multilane Uncontrolled Crosswalks. Publication No. FHWA-HRT-10-043.
[3] *Manual on Uniform Traffic Control Devices*, Federal Highway Administration, December 2009.

Warrant 2, Four Hour Vehicle Volume: The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal, and considers a 4-hour period. The minor volumes at this intersection are substantially below the thresholds set for this warrant. Warrant 2 is not met.

Warrant 3, Peak Hour Vehicle Volume: The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. The minor street delay and volume at this intersection during the highest peak hour are below the threshold, and the total intersection volume also does not meet the threshold. Warrant 3 is not met.

Warrant 4, Pedestrian Volume: The Pedestrian Volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street. Insufficient pedestrian crossings occur at this location in a one hour or four hour period. Warrant 4 is not met.

Warrant 5, School Crossing: The School Crossing signal warrant is intended for application where the fact that school children cross the major street is the principal reason to consider installing a traffic control signal. Warrant 5 does not apply; no further assessment of this warrant was conducted.

Warrant 6, Coordinated Signal System: Progressive movement in a coordinated signal system sometimes necessitates installing traffic control signals at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles. Warrant 6 does not apply; no further assessment of this warrant was conducted.

Warrant 7, Crash Experience: The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reasons to consider installing a traffic control signal. Based on collision records, two collisions were reported within a 5-year period at this intersection. This is below the threshold of five correctable collisions in a 12-month period. Warrant 7 is not met.

Warrant 8, Roadway Network: Installing a traffic control signal at some intersections might be justified to encourage concentration and organization of traffic flow on a roadway network. Warrant 8 does not apply; no further assessment of this warrant was conducted.

PROJECT CHARACTERISTICS

This section provides an overview of the community college and discusses the trip generation, distribution, and assignment characteristics, allowing for an evaluation of the community college on the roadway network. The amount of traffic associated with the land uses was estimated using a three-step process:

1. **Trip Generation** – The *amount* of vehicle traffic entering/exiting the site was estimated.
2. **Trip Distribution** – The *direction* trips would use to approach and depart the site was projected.
3. **Trip Assignment** – Trip were then *assigned* to specific roadway segments and intersection turning movements.

Project Description

The Brentwood Center community college is planned to be constructed in two phases. In each phase, a two-story building with a total of 44,000 square feet that can accommodate 2,500 full time students would be constructed. After completion of Phase 2, the community college campus would provide 88,000 square feet of floor space that would accommodate 5,000 full time students. Phase 2 is expected to be completed 10 to 15 years after Phase 1.

For the purpose of this analysis, existing conditions were assessed with the Phase 1 campus enrollment and the analysis of 2040 conditions considers the enrollment from Phases 1 and 2.

Project Trip Generation

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Estimates are created for the peak one-hour period during the morning and evening commute periods when traffic volumes on the adjacent streets are highest.

In the Brentwood Center Supplemental EIR, trip generation for the new community college was based on a trip generation study of community colleges across California since 2002 as these rates were higher than published trip generation rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual*. To better refine the expected trip generation of the new community college, a trip generation study was also conducted at the Diablo Valley College (DVC)

campus in San Ramon, which opened in 2006 and has a current enrollment of 2,930 students. DVC San Ramon rates are similar to the rates used in the Brentwood Center SEIR analysis, as shown in **Table 2**, and are higher than published ITE rates. Because the new community college is likely to have a similar trip profile to the DVC San Ramon campus, the DVC San Ramon rate was used for this study.

TABLE 2
COMMUNITY COLLEGE TRIP GENERATION RATE COMPARISON

Source	Daily	AM Peak Hour Rate per FTE	PM Peak Hour Rate per FTE
ITE *Trip Generation Manual*, 9th Edition[1]	1.20	0.12	0.12
Brentwood Center Supplemental EIR[2]	N/A	0.18	0.15
DVC - San Ramon Campus[3]	1.71	0.16	0.15

Notes:
1. Average rates for Land Use 540, Junior College, per student.
2. Fehr & Peers trip generation study, 2011.
3. Fehr & Peers trip generation study, 2015.

Table 3 shows the application of these rates to determine peak hour trips with each phase of the project, which is expected to generate approximately 4,300 trips on a daily basis including approximately 400 trips in both the morning and afternoon peak hours.

TABLE 3
PROJECT TRIP GENERATION

Scenario	Students	Daily	AM Peak Hour Trips			PM Peak Hour Trips		
			Total	In	Out	Total	In	Out
DVC – San Ramon Campus Trip Generation Rate per Student	-	*1.71*	*0.16*	*75%*	*25%*	*0.15*	*74%*	*26%*
Phase 1	2,500	4,280	400	300	100	376	278	98
Phase 2	2,500	4,280	400	300	100	376	278	98
Total Build Out	***5,000***	***8,560***	***800***	***600***	***200***	***752***	***556***	***196***

Source: Fehr & Peers, March 2015.

Project Trip Distribution and Assignment

Trip distribution for the new community college was estimated based on enrollment data at the existing Brentwood Center campus on Sand Creek Road, as shown on **Figure 4**. Project trips were assigned to specific roadways, and are shown on **Figure 5** for Phase 1 and **Figure 6** for Phase 2

EXISTING WITH PROJECT PHASE 1

This section evaluates potential traffic conditions under Existing with Project conditions. Because Phase 2 is planned to be constructed 10 to 15 years after Phase 1, the Existing with Project condition includes only Phase 1. This condition does not reflect other planned development from the Vineyards area.

The Project Phase 1 traffic volumes on Figure 5 were added to the existing traffic volumes from Figure 2 to estimate the Existing with Project Phase 1 traffic volumes, as shown on **Figure 7**. The analysis results of the Existing with Project Phase 1 scenario are presented in Table 5, and compared to the results for Existing conditions. The addition of traffic from Phase 1 of the Project would minimally change intersection operations, and all intersections operate at a LOS of C or better.

The Existing with Project Phase 1 traffic signal warrant analysis evaluates Warrants 1, 2, and 3. None would be satisfied with the addition of traffic from the project. Even if all project traffic traveled on Fairview Avenue, which is not expected to occur, signal warrants would not be satisfied.

TABLE 5
EXISTING WITH PROJECT PHASE 1
PEAK HOUR INTERSECTION LEVELS OF SERVICE

	Intersection	Control[1]	Peak Hour[2]	Existing without Project		Existing with Project Phase 1	
				Delay[3]	LOS[4]	Delay[3]	LOS[4]
1	Fairview Ave/Baldwin Dr	SSSC	AM PM	- 2 (11)	- A (B)	- 2 (13)	- A (B)
2	Fairview Ave/Wolfe Rd	SSSC	AM PM	- 3 (11)	- A (B)	- 2 (11)	- A (B)
3	Vasco Rd/Marsh Creek Rd	Signal	AM PM	18 24	B C	23 26	C C
4	Marsh Creek Rd/Vineyards Pkwy	Signal	AM PM	5 7	A A	7 8	B A
5	Vineyards Pkwy/Miwok Ave[5]	Signal	AM PM	0 0	A A	10 11	A B

Notes:
1. Signal = Signalized Intersection; SSSC = Two-Way Stop-Controlled Intersection.
2. AM Peak Hour = 7:30 AM; PM Peak Hour = 4:45 PM.
3. Delay presented in seconds per vehicle; for two-way stop-controlled intersections, delay presented in Intersection Average (Worst Movement).
4. LOS = Level of Service.
5. Intersection analyzed using HCM 2000 methodology; intersection cannot be analyzed using HCM 2010 methodology.

2040 CONDITIONS

This section presents the expected conditions in 2040 without and with the project (Phase 1 plus Phase 2). 2040 conditions are based on the General Plan[4] forecasted traffic volumes for the build-out of the planning area. These volumes represent the long-term (2040) planning horizon.

The 2040 without Project scenario volumes reflects build-out of the Vineyards at Marsh Creek planned development without the community college, and includes development of 350 active adult residences within the Cowan Ranch Property as well as development of the currently agricultural parcel east of Wolfe Road, which is zoned for residential development (no

[4] 2014 Brentwood General Plan Update, Public Draft Environmental Impact Report, City of Brentwood, April 2014.

development is currently proposed or contemplated on this site). The resulting traffic volumes are shown on **Figure 8**. The 2040 with Project scenario volumes are the sum of the 2040 without Project volumes and the Phase 1 plus Phase 2 Project Volumes, and are shown on **Figure 9**.

The analysis results of the 2040 scenarios are presented in **Table 6**. It is expected that the State Route 4/Vasco Road/Marsh Creek Road intersection would operate at LOS F in the PM peak hour in 2040 without the development of the project and the addition of project traffic would worsen deficient conditions. During the morning peak hour, the community college would degrade the intersection to LOS F. This deficiency was identified in the certified SEIR for the project and an interchange is planned at this location.

It is also expected that side-street movements at the Fairview Avenue/Baldwin Drive intersection could experience additional delay when waiting to turn left to Fairview Avenue during the evening peak hour in 2040, and the addition of traffic from the Brentwood Center would further increase delay. However, less than five vehicles during the PM peak hour are subject to the additional delay.

The 2040 with Project traffic signal warrant analysis evaluates Warrants 1, 2 and 3.

Through traffic forecasting and analysis of project volumes, it was found that traffic growth along the minor street approaches of the Fairview Avenue/Baldwin Drive and Fairview Avenue/Wolfe Road intersections is minimal. Since the minor street volumes are the critical factors for meeting traffic signal warrants, Warrant 1B is the critical traffic signal warrant. This warrant requires a minimum of 52 vehicles per hour at a minor street approach for eight hours. Under the 2040 with Project scenario, minor street approach volumes would only exceed 52 vehicles per hour for four hours at both Fairview Avenue/Baldwin Drive and Fairview Avenue/Wolfe Road. Therefore, Warrant 1B is not met for either intersection. Since Warrant 1B is not met, Warrants 1 and 2 are not satisfied for either intersection.

While it is anticipated that traffic signals will not be warranted at either Fairview Avenue/Baldwin Drive or Fairview Avenue/Wolfe Road under 2040 scenarios, land use, traffic patterns, and safety can change over 25 years. If significant changes occur, signals could become warranted in the long-term.

TABLE 6
2040 WITHOUT AND WITH PROJECT
PEAK HOUR INTERSECTION LEVELS OF SERVICE

	Intersection	Control[1]	Peak Hour[2]	2040 without Project		2040 with Project	
				Delay[3]	LOS[4]	Delay[3]	LOS[4]
1	Fairview Ave/Baldwin Dr	SSSC	AM PM	- 1 **(47)**	- A **(E)**	- 1 **(63)**	- A **(F)**
2	Fairview Ave/Wolfe Rd	SSSC	AM PM	- 1 (26)	- A (D)	- 1 (33)	- A (D)
3	Vasco Rd/Marsh Creek Rd	Signal	AM PM	47 **85**	D **F**	**81** **126**	**F** **F**
4	Marsh Creek Rd/Vineyards Pkwy	Signal	AM PM	18 19	B B	18 20	B B
5	Vineyards Pkwy/Miwok Ave[5]	Signal	AM PM	13 16	B B	16 18	B B

Notes: **Bold** text indicates potentially unacceptable intersection operations.
1. Signal = Signalized Intersection; SSSC = Two-Way Stop-Controlled Intersection.
2. AM Peak Hour = 7:30 AM; PM Peak Hour = 4:45 PM.
3. Delay presented in seconds per vehicle; for two-way stop-controlled intersections, delay presented in Intersection Average (Worst Movement).
4. LOS = Level of Service.
5. Intersection analyzed using HCM 2000 methodology; intersection cannot be analyzed using HCM 2010 methodology.

ANALYSIS SUMMARY

Fehr & Peers collected daily and peak hour traffic volume and speed information in the project vicinity, evaluated peak hour and daily roadway operations both without and with the project for existing and future conditions, evaluated the pedestrian experience crossing Fairview Avenue at Wolfe Road/Regent Drive and Baldwin Drive, and evaluated the potential need for intersection modifications or additional traffic controls (i.e. signalization) to accommodate existing and projected travel activities along Fairview Avenue and Marsh Creek Road both without and with the project. The key findings are:

- Installation of traffic signals is not warranted at either the Wolfe Road/Regent Drive or Baldwin Drive intersections with Fairview Avenue based on existing or projected future conditions with the project.

- Pedestrians crossing Fairview Avenue at either the Wolfe Road/Regent Drive or Baldwin Drive have a poor experience based on the width of the crossing and vehicle speeds. Additional pedestrian crossing treatments are warranted at the intersections.

- Deficient operations are projected at the Marsh Creek Road/State Route 4 at Vasco Road intersection in 2040 with build-out of land uses envisioned in the City of Brentwood General Plan and surrounding communities. A grade separated interchange is planned at this location, but a construction schedule has not been identified. Acceptable operations are projected with build-out of the Vineyards at Marsh Creek as well as with full enrollment levels reached at the Brentwood Center, but would degrade with continued growth in Brentwood and surrounding communities.

This completes our assessment of the transportation conditions in the vicinity of the Brentwood Center. Please call Kathrin or Ben with questions.

Attachments:

Figure 1	Project Study Area
Figure 2	Existing Peak Hour Traffic Volumes, Lane Configurations and Traffic Control
Figure 3	Average Daily Traffic Volumes along Fairview Avenue
Figure 4	Project Trip Distribution
Figure 5	Project Phase 1 Trip Assignment
Figure 6	Project Phase 1 Plus Phase 2 Trip Assignment
Figure 7	Existing With Project Phase 1 Peak Hour Traffic Volumes
Figure 8	2040 without Project Peak Hour Traffic Volumes
Figure 9	2040 with Project Peak Hour Traffic Volumes
Attachment A	Intersection Level of Service Analysis Methods
Attachment B	Existing Conditions Signal Warrant Analysis Details
Attachment C	Traffic Count Worksheets
Attachment D	Level of Service Analysis Worksheets

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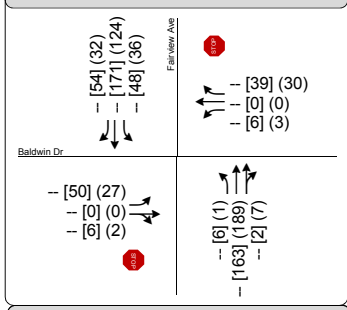
LEGEND

- # Study Intersection
- Project Site
- Daily Traffic Count and Speed Survey Location

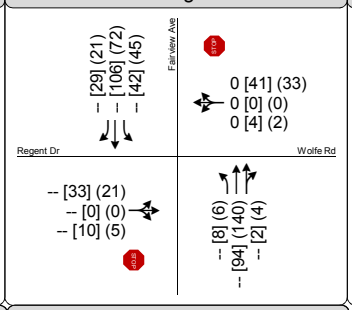
Figure 1

Project Study Area

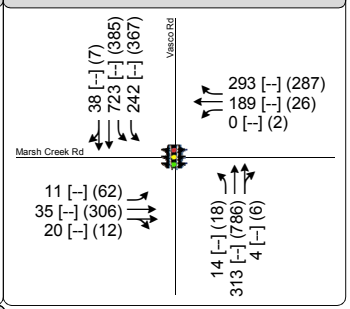
1. Fairview Ave/Baldwin Dr



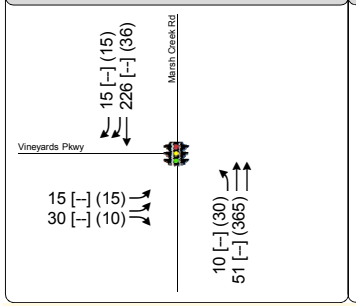
2. Fairview Ave/Regent Dr/Wolfe Rd



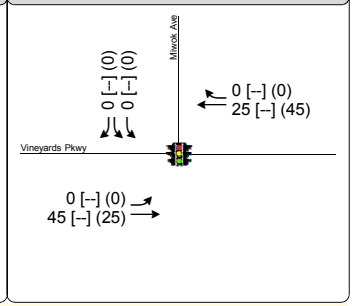
3. Vasco Rd/Marsh Creek Rd



4. Marsh Creek Rd/Vineyards Pkwy

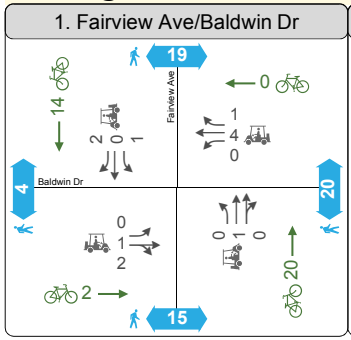


5. Miwok Ave/Vineyards Pkwy

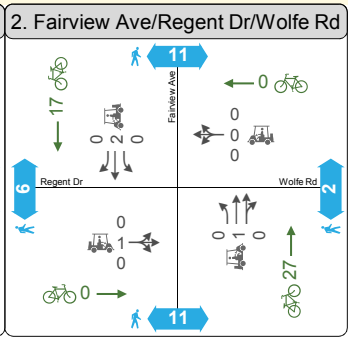


Existing 8-Hour Volumes for Other Modes

1. Fairview Ave/Baldwin Dr



2. Fairview Ave/Regent Dr/Wolfe Rd



LEGEND

XX [YY] (ZZ) AM [Mid-day] (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Study Intersection

Average Daily Traffic Volumes

85th Percentile Speed in Miles per Hour (mph)

8-Hour Pedestrian Volumes

8-Hour Bicycle Volumes

8-Hour Golf Cart Volumes

Figure 2

Existing Peak Hour
Traffic Volumes, Lane Configurations and Traffic Control

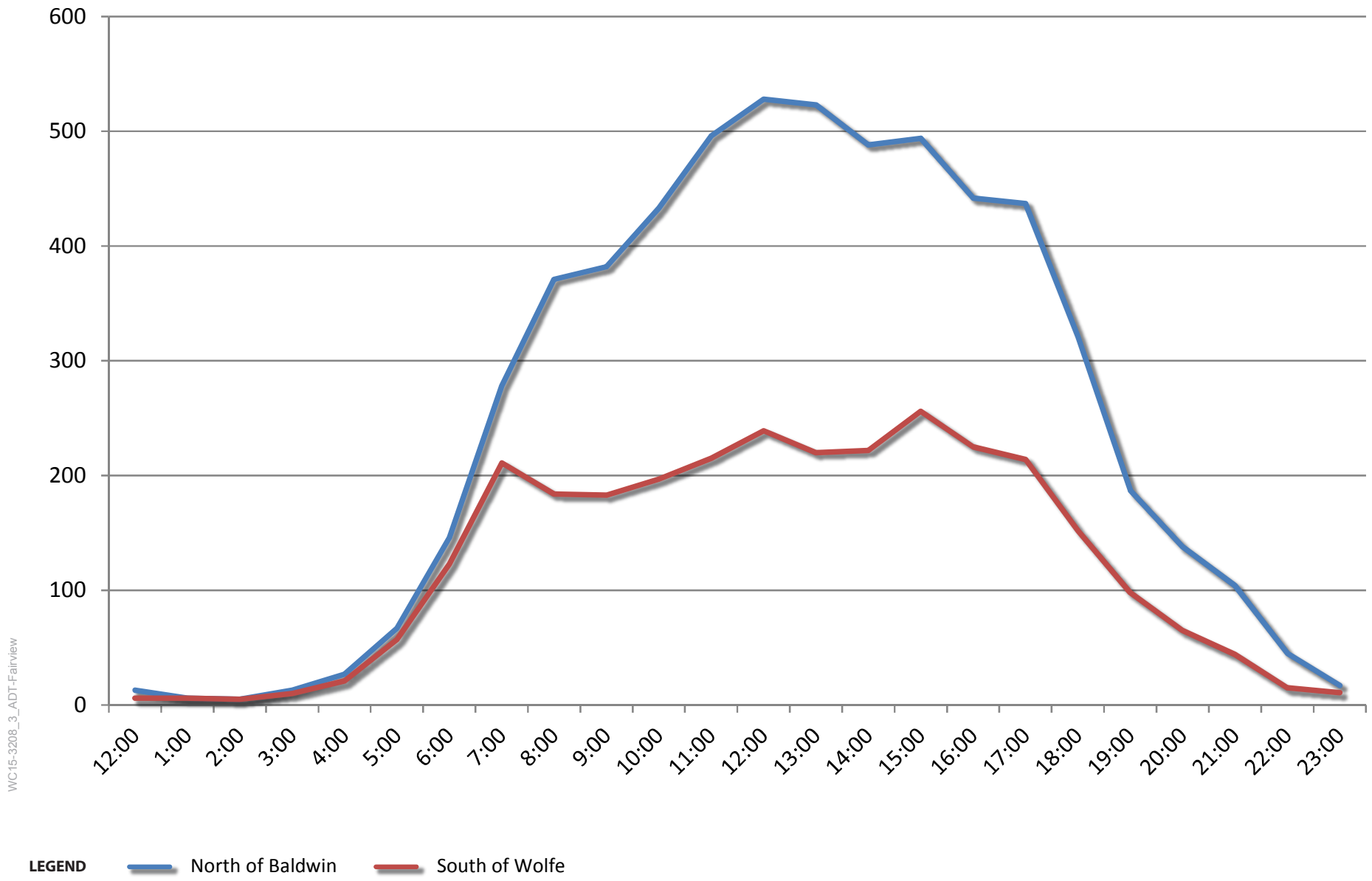
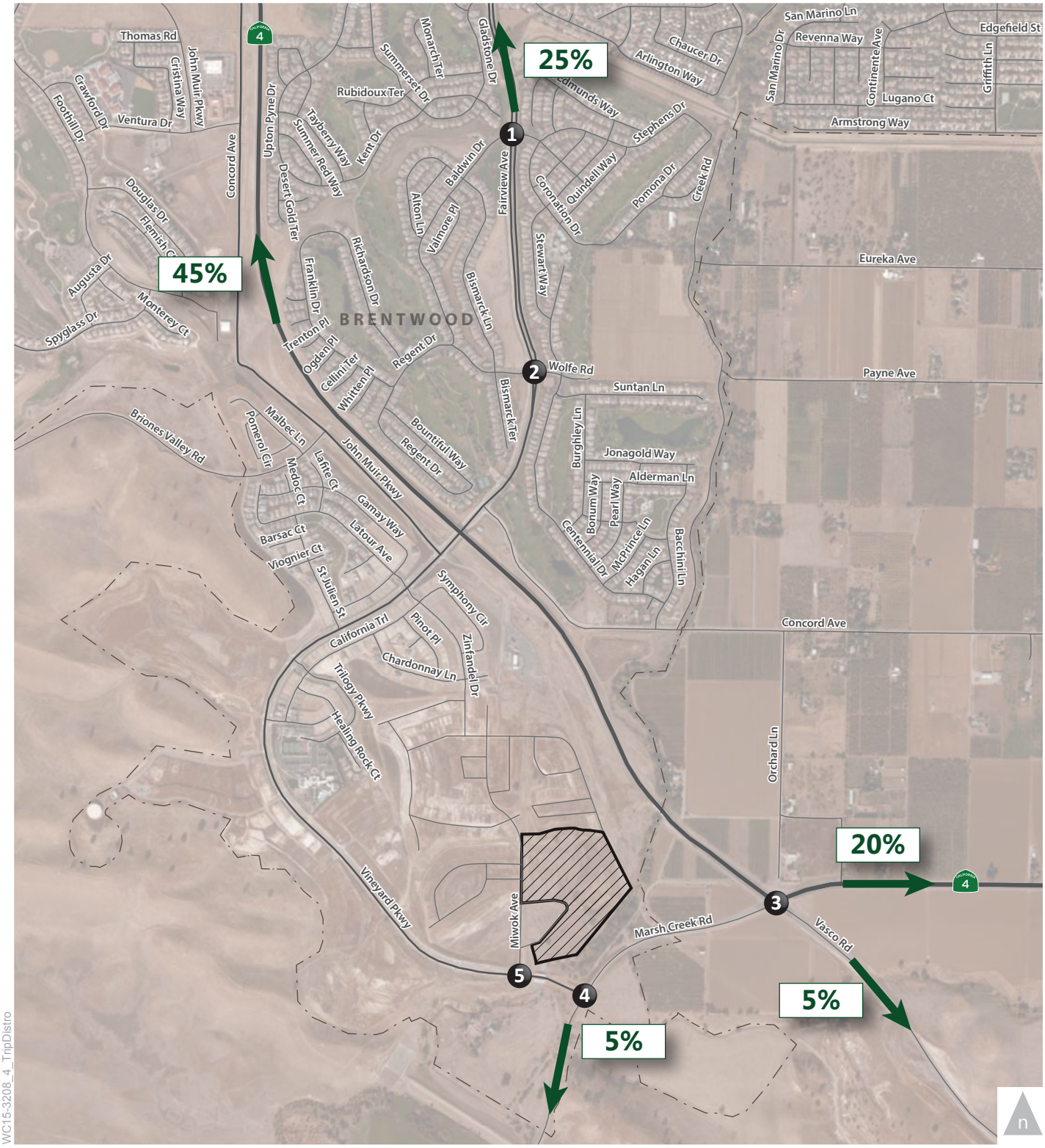


Figure 3

Average Daily Traffic Volumes along Fairview Avenue



LEGEND

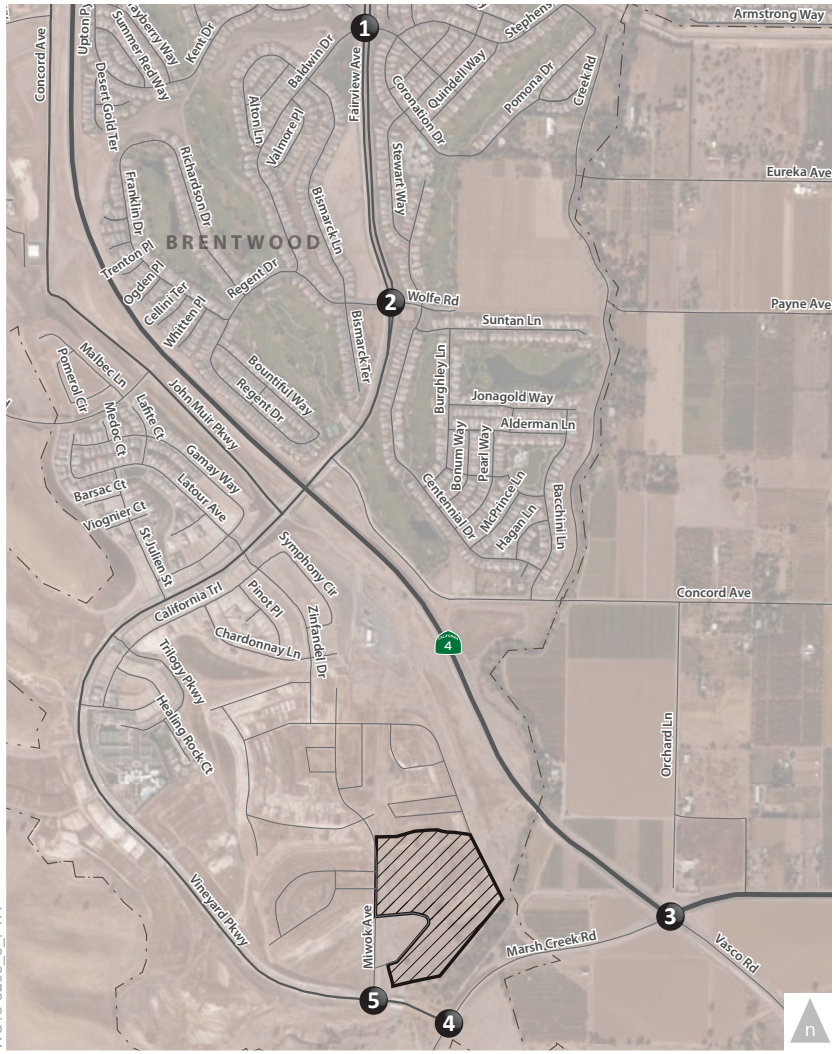
Study Intersection

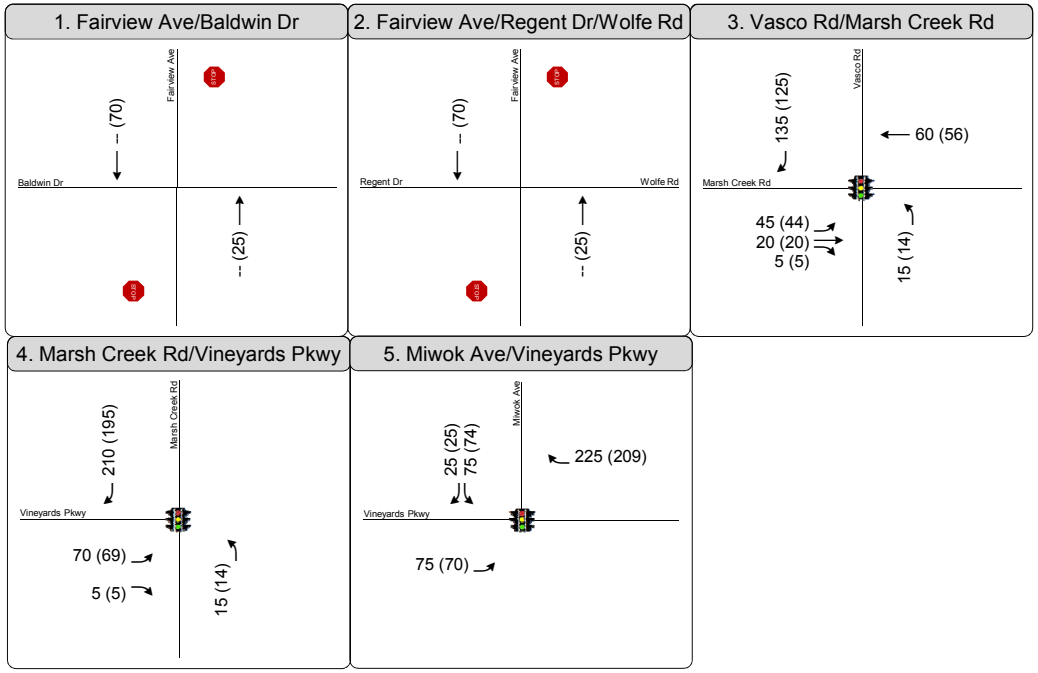
Project Site

X% Community College Trip Distribution

Figure 4

Project Trip Distribution





WC15-3208_5_PTA

LEGEND

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

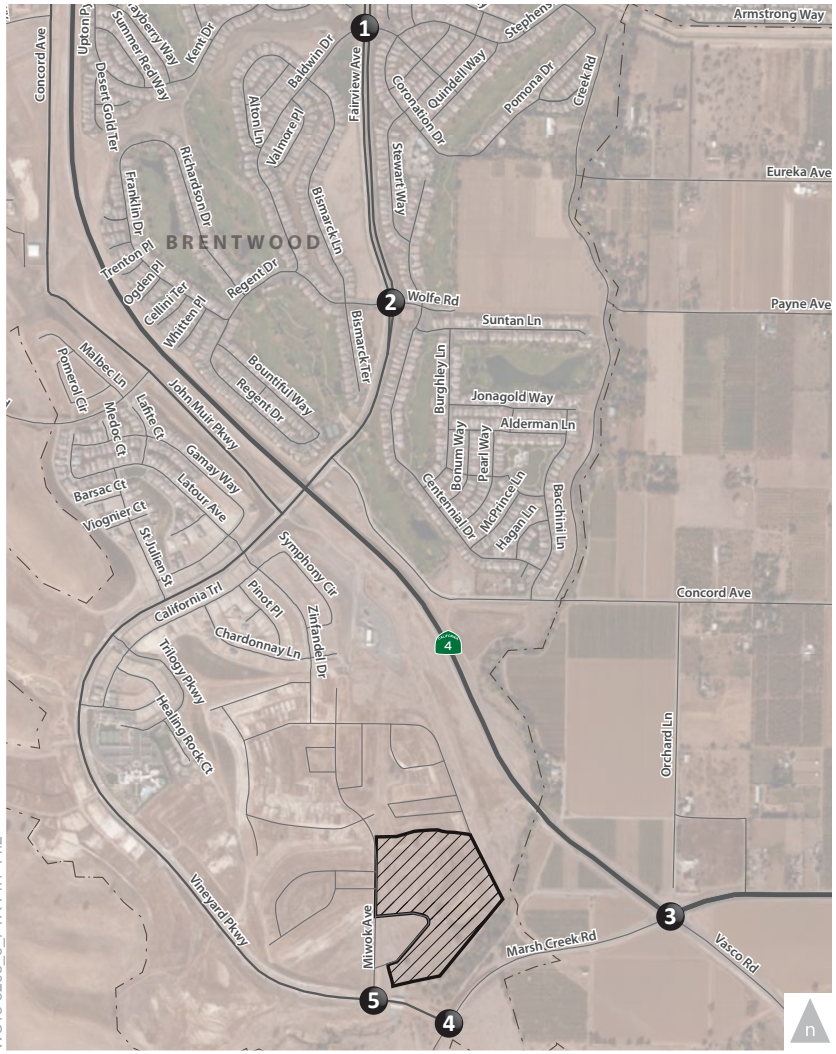
Signalized Intersection

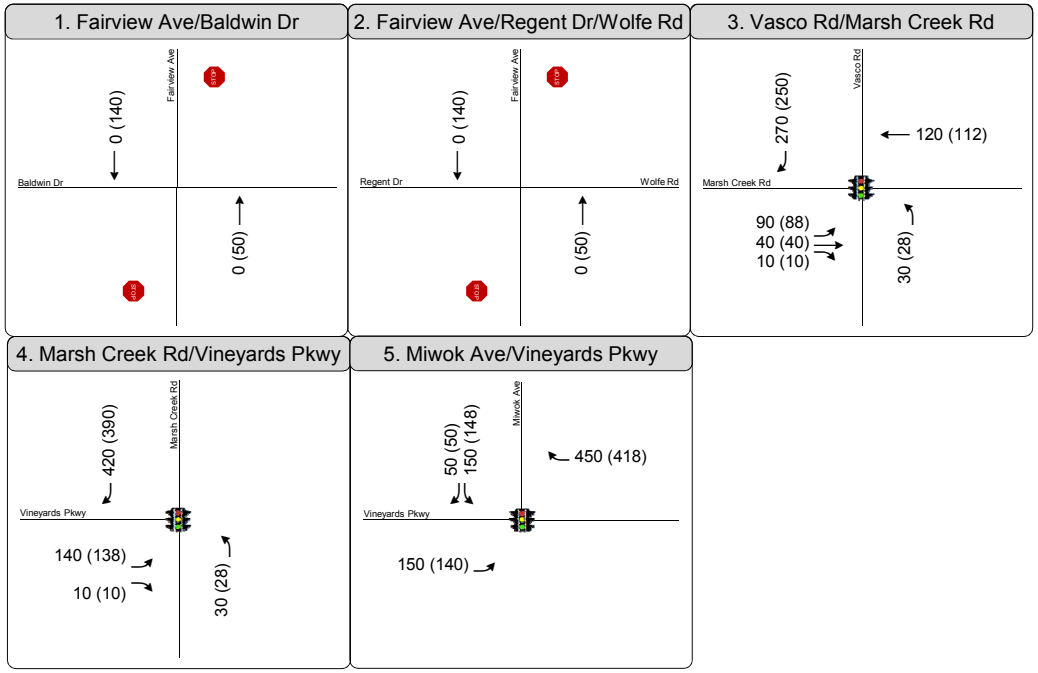
Stop Sign

Study Intersection

Figure 5

Project Phase 1 Trip Assignment





WC15-3208_6_PTA-Ph1+Ph2

LEGEND

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

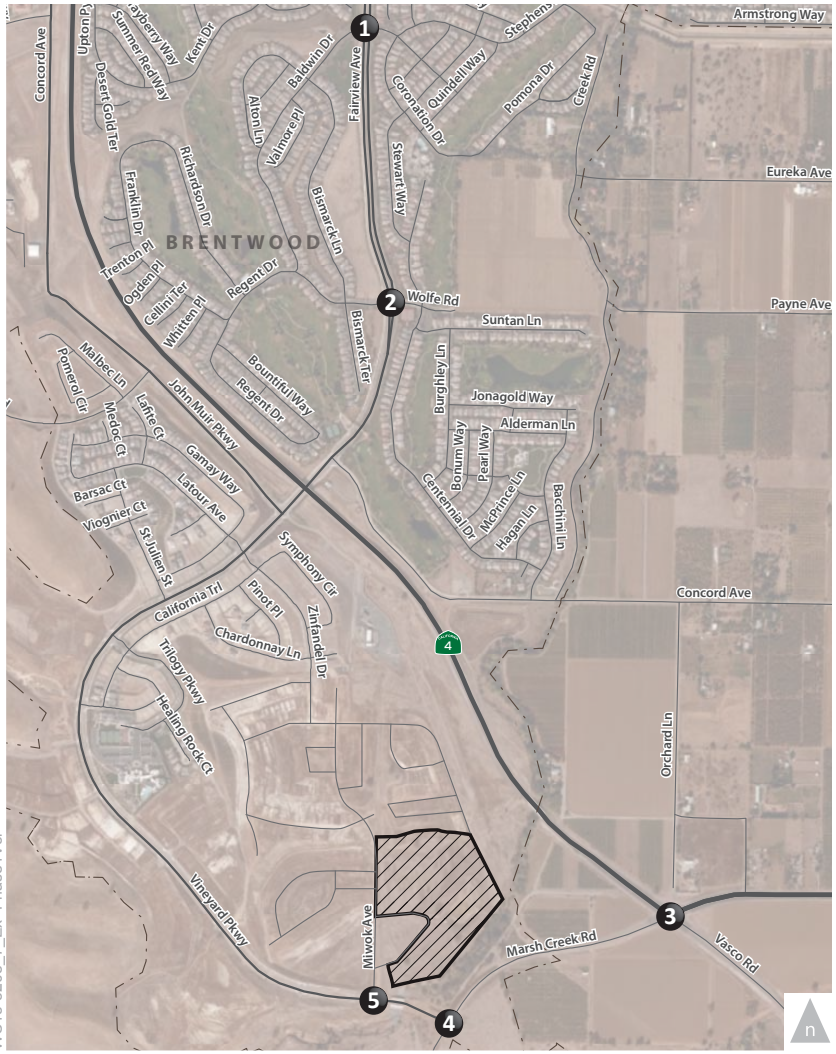
Signalized Intersection

Stop Sign

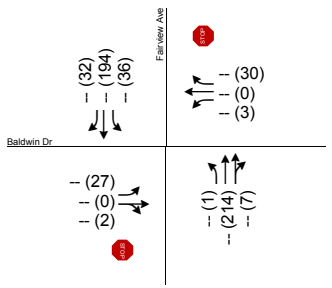
Study Intersection

Figure 6

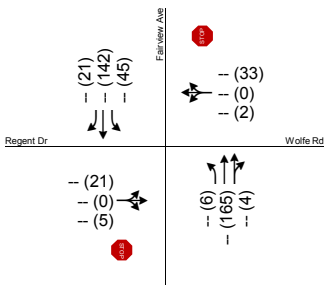
Project Phase 1 Plus Phase 2 Trip Assignment



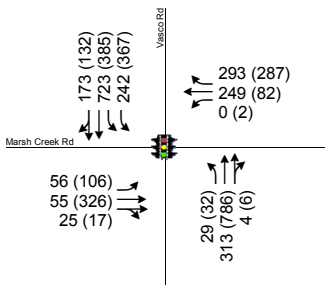
1. Fairview Ave/Baldwin Dr



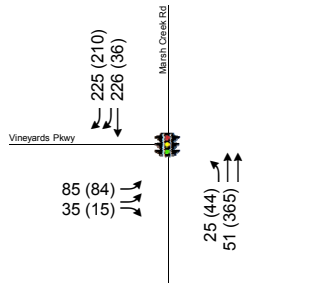
2. Fairview Ave/Regent Dr/Wolfe Rd



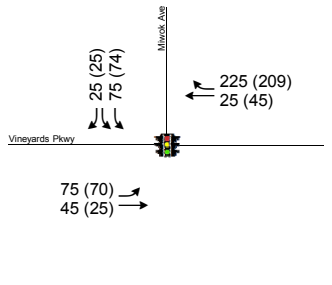
3. Vasco Rd/Marsh Creek Rd



4. Marsh Creek Rd/Vineyards Pkwy



5. Miwok Ave/Vineyards Pkwy



WC15-3208_7_Ex+Phase1Vol

LEGEND

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

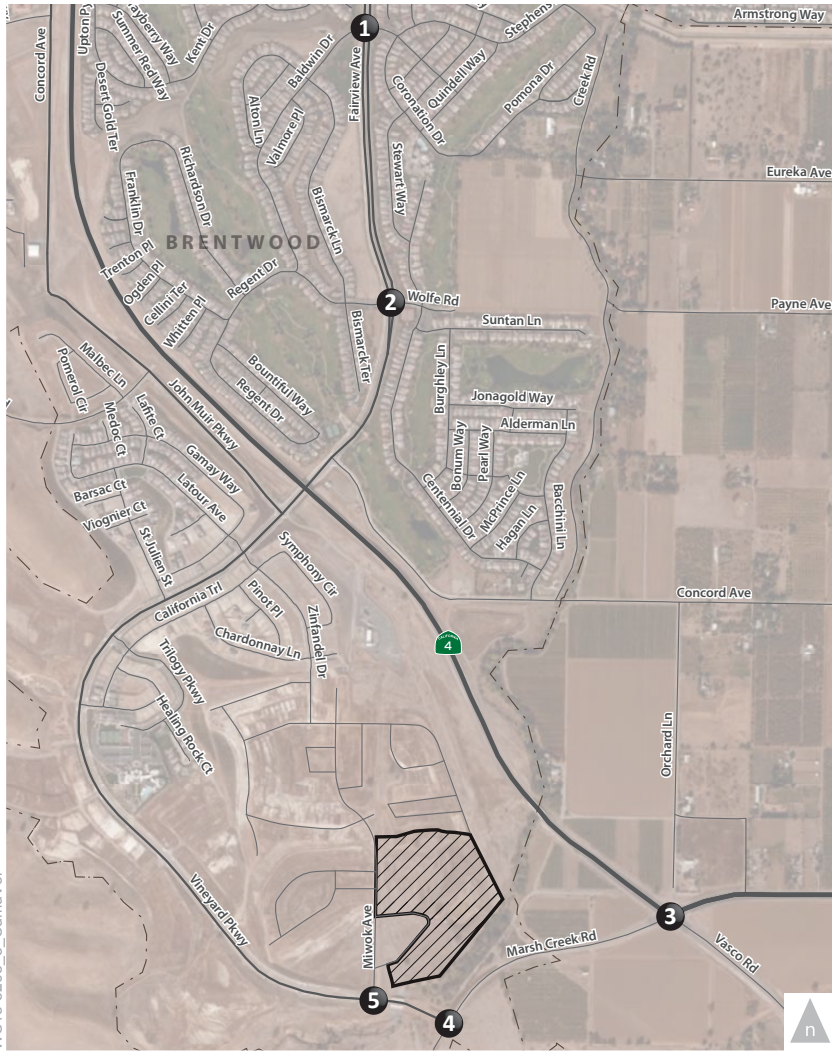
Signalized Intersection

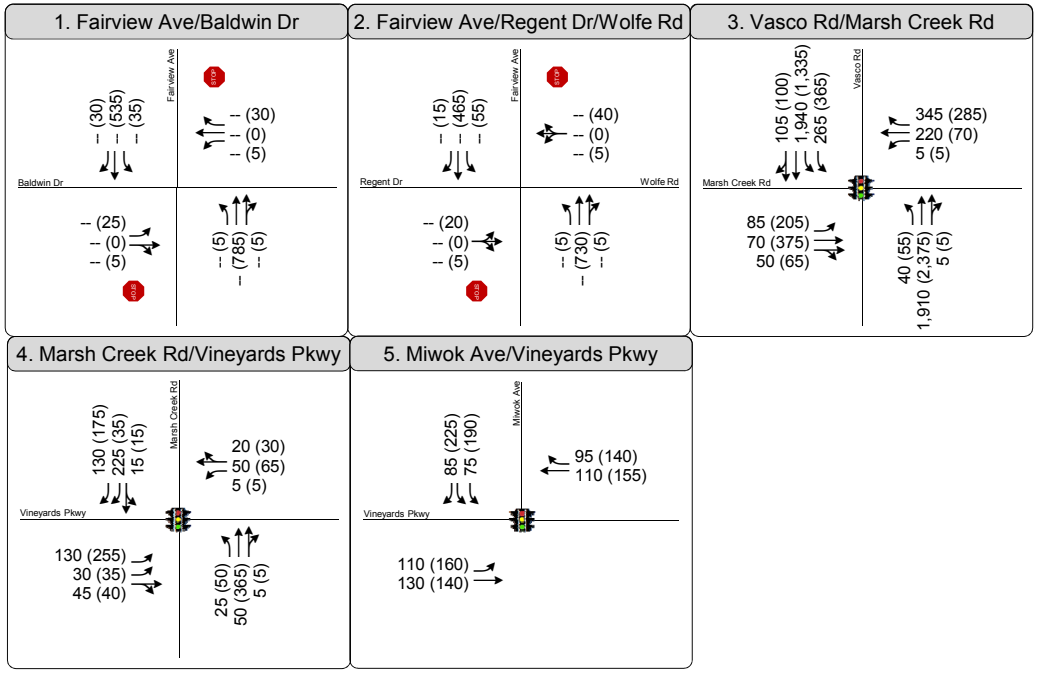
Stop Sign

Study Intersection

Figure 7

Existing with Project Phase 1 Peak Hour Traffic Volumes





WC15-3208_8_CumuVol

LEGEND

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

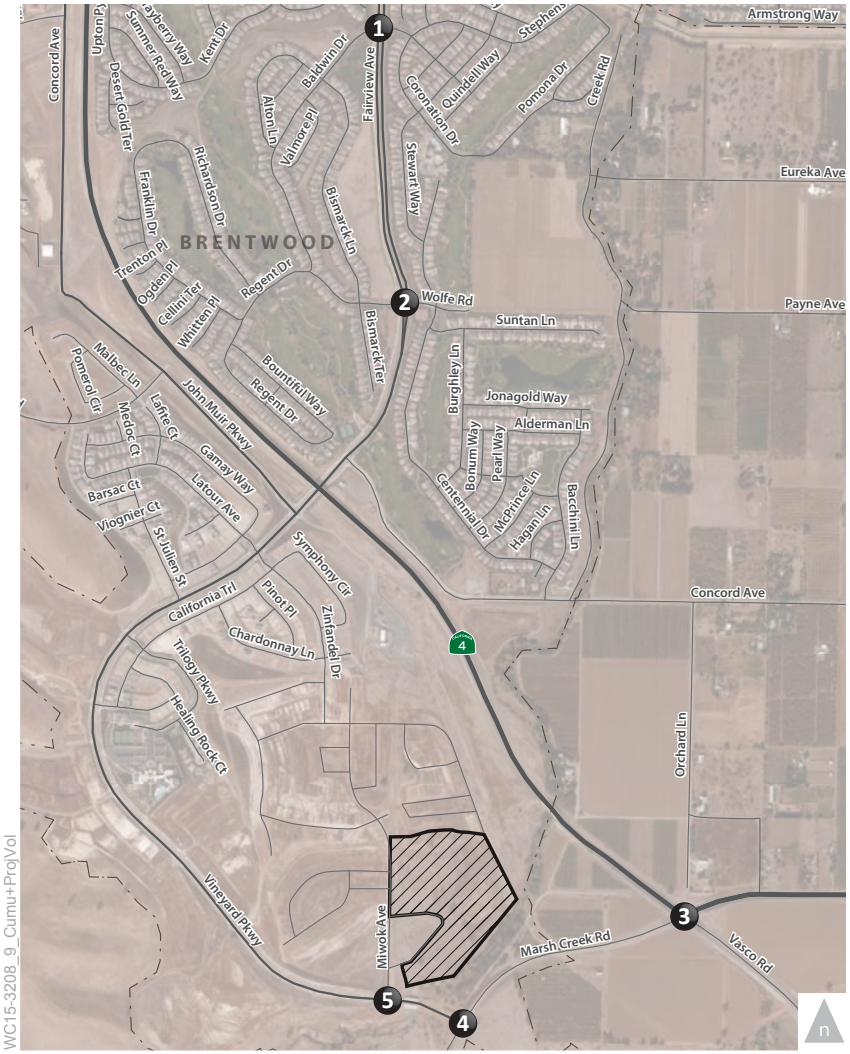
Signalized Intersection

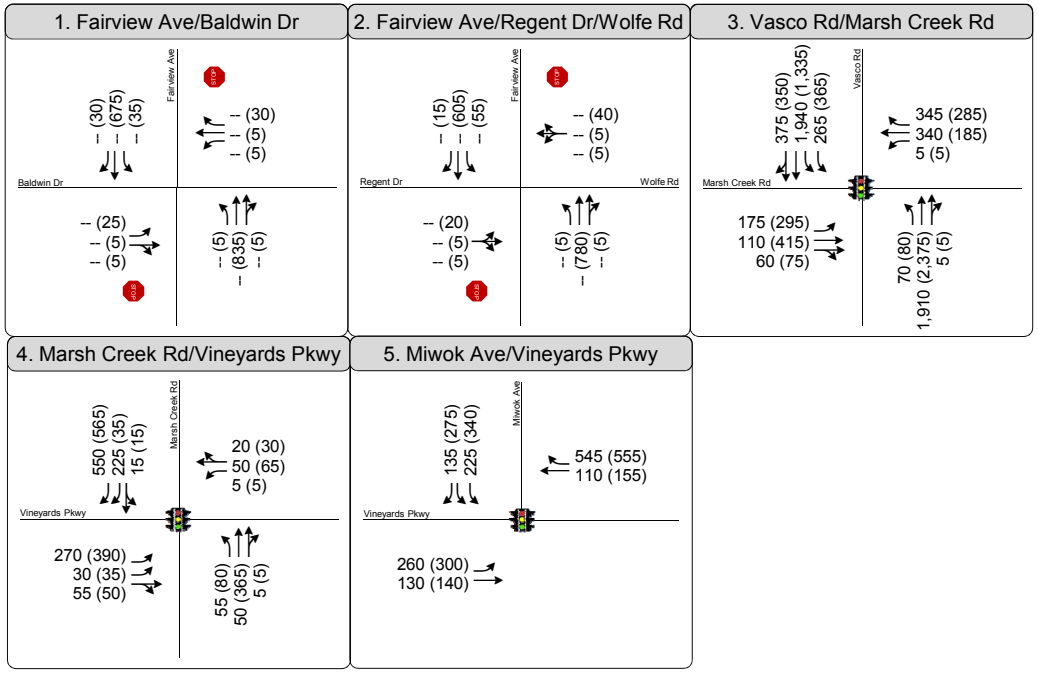
Stop Sign

Study Intersection

Figure 8

2040 without Project Peak Hour Traffic Volumes





WC15-3208_9_Cumu+ProjVol

LEGEND

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

Signalized Intersection

Stop Sign

Study Intersection

Figure 9

2040 with Project Peak Hour Traffic Volumes

FEHR PEERS

ATTACHMENT A – INTERSECTION LEVEL OF SERVICE ANALYSIS METHODS

The operations of roadway facilities are for vehicles described with the term "level of service" (LOS). LOS is a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (i.e., free flow conditions) to LOS F (over capacity conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F. The City of Brentwood strives to maintain LOS D on a peak hour basis.

Signalized Intersections

Traffic conditions at signalized intersections were evaluated using the method from Chapter 16 of the Transportation Research Board's 2010 *Highway Capacity Manual*. This operations analysis method uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the average control delay experienced by motorists traveling through an intersection. Control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table A-1** summarizes the relationship between average delay per vehicle and LOS for signalized intersections.

Unsignalized Intersections

Traffic conditions at unsignalized intersections were evaluated using the method from Chapter 17 of the 2010 *Highway Capacity Manual*. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each movement that must yield the right-of-way. At two-way or side street-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, as well as the left-turn movement from the major street, and the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. The delays for the entire intersection and for the movement or approach with the highest delay are reported. **Table A-2** summarizes the relationship between delay and LOS for unsignalized intersections.

Critical Gap Adjustments

Adjustments made to critical gap factors to account for older drivers are presented in **Table A-3**. Available research shows an approximate 10 percent reduction in capacity.

TABLE A-1
SIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0
E	Operations with long delays indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80.0

Source: *Highway Capacity Manual (*Transportation Research Board, 2010).

TABLE A-2
UNSIGNALIZED INTERSECTION LOS CRITERIA

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delays	≤ 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded	> 50.0

Source: *Highway Capacity Manual* (Transportation Research Board, 2010)

TABLE A-3
CRITICAL GAP FOR TWO-WAY STOP-CONTROLLED INTERSECTIONS ALONG 4 LANE ROADWAYS

Data Set	From Major Street (seconds)	From Minor Street (seconds)		
	Left	Left	Through	Right
2010 Highway Capacity Manual	4.1	7.5	6.5	6.9
Active Adult Research[1]	4.5	8.1	7.1	7.5

Notes:
1. *Driver Age Differences in Day and Night Gap Acceptance Capabilities*, Dissanayake et. al., 2002.

ATTACHMENT B – EXISTING CONDITIONS SIGNAL WARRANT ANALYSIS DETAILS

Warrant 1, Eight-Hour Vehicular Volume

Warrant 1 examines vehicular volumes for the major-street and worst-case minor street approach to determine if a specified minimum volume is met for any eight or more hours of the day. Two conditions are tested: Warrant 1A is applicable where large intersecting volumes exist, and Warrant 1B is applicable where large volumes exist on the major street resulting in excessive delay on the minor street. In addition, Warrant 1C checks if 80 percent of Warrant 1A and 1B have been met. If Warrant 1A, Warrant 1B, or Warrant 1C is met, then Warrant 1 is satisfied.

Warrant 1 Results

The 85th percentile speed along Fairview Avenue is approximately 45 mph. Therefore, Warrants 1A and 1B only need to meet 70 percent of the criteria, and Warrant 1C only needs to meet 56 percent of the 100 percent criteria from Warrants 1A and 1B.

To meet Warrant 1A, traffic volumes would need to exceed 420 vehicles per hour on Fairview Avenue, and traffic volumes on a minor approach would need to exceed 105 vehicles per hour for eight hours of the day. At Baldwin Drive, traffic volumes exceed 420 vehicles per hour on Fairview Avenue for only one hour of the day, and the maximum minor approach volume is 63 vehicles per hour. At Wolfe Road, traffic volumes along Fairview Avenue reach 311 vehicles per hour, and the maximum minor approach volume is 61 vehicles per hour. Therefore, Warrant 1A is not met for either intersection.

To meet Warrant 1B, traffic volumes would need to exceed 630 vehicles per hour on Fairview Avenue, and traffic volumes on a minor approach would need to exceed 52 vehicles per hour for eight hours of the day. At both Baldwin Drive and Wolfe Road, minor approach volumes exceed 52 vehicles per hour for only four hours, and traffic volumes along Fairview Avenue would not meet the threshold for a single hour. Therefore, Warrant 1B is not met for either intersection.

To meet Warrant 1C, for eight hours the intersections would need to exceed 336 vehicles per hour on Fairview Avenue and 84 vehicles per hour on a minor approach (56 percent of Warrant 1A), and 504 vehicles per hour on Fairview Avenue and 42 vehicles per hour on a minor approach (56

percent of Warrant 1B). At Baldwin Drive, for 56 percent of Warrant 1A, Fairview Avenue volumes exceed 336 vehicles per hour for the eight hours, but the minor street volumes never exceed 84 vehicles per hour; for 56 percent of Warrant 1B, Fairview volumes never exceed 504 vehicles per hour, and the minor street volumes exceed 42 vehicles per hour for only five hours. At Wolfe Road, for 56 percent of Warrant 1A, Fairview Avenue volumes never exceed 336 vehicles per hour, and the minor street volumes never exceed 84 vehicles per hour; for 56 percent of Warrant 1B, Fairview volumes never exceed 504 vehicles per hour, and minor street volumes exceed 42 vehicles per hour for only six hours. Therefore, Warrant 1C is not met for either intersection.

Warrant 2, Four-Hour Vehicular Volume

Warrant 2 examines intersecting volumes for the major street and worst-case minor street approach to determine if specified minimum is met for any four or more hours of the day. The warrant is intended where large intersecting volumes exist.

Warrant 2 Results

At Baldwin Drive, Fairview Avenue volumes are between 413 and 449 vehicles per hour for four hours of the day, and the minor approach volumes are between 41 and 63 vehicles per hour. Using the 70 percent factor, at around 400 vehicles per hour for the major street, the minor approach volumes would need to be around 200 vehicles per hour, which is clearly not the case.

At Wolfe Road, Fairview Avenue volumes are between 258 and 311 vehicles per hour for four hours of the day, and the minor approach volumes are between 42 and 60 vehicles per hour. Using the 70 percent factor, at around 300 vehicles per hour for the major street, the minor approach volumes would need to be around 275 vehicles per hour, which is clearly not the case. Therefore, Warrant 2 is not met for either intersection.

Warrant 3, Peak Hour Vehicular Volume

Warrant 3 examines intersection conditions to determine if traffic levels in the area peak such that during one hour of the day the minor street experiences undue delay. It is intended for unusual cases that attract or discharge large number of vehicles over a short time. *While a community college is not considered an unusual case as traffic volumes entering and leaving the site are relatively continuous over the course of a day, Warrant 3 will be analyzed for the purpose of understanding the degree of which a signal is or is not warranted at the Fairview Avenue intersections.*

For Warrant 3, two conditions are tested: Warrant 3A examines minor street volume, stopped time delay, and total intersection volume; and Warrant 3B examines major street and worst-case minor street volumes. If either condition is met, then Warrant 3 is satisfied.

Warrant 3 Results

Existing peak hour delays for the side-streets are far from the 4 vehicle-hours of delay required to satisfy Warrant 3A (0.2 vehicle-hours of delay at Baldwin Drive, and 0.1 vehicle-hours of delay at Wolfe Road). Existing peak hour volumes are also far from the thresholds to satisfy Warrant 3B—to satisfy Warrant 3B, the minor approaches would need around 300 vehicles in the peak hour. Therefore, Warrant 3A and Warrant 3B are not met for either intersection.

Warrant 4, Pedestrian Volume

Warrant 4 is intended for locations where high vehicular volumes result in excessive delay for pedestrians. Warrant 4A examines pedestrian volumes and sets a threshold at 75 pedestrians for any four hours; Warrant 4B sets a threshold at 93 pedestrians for any one hour; and Warrant 4C examines gaps in the traffic stream and sets a threshold at fewer than 60 gaps per hour. Warrant 4 is considered met if either Warrant 4A or Warrant 4B is satisfied along with Warrant 4C.

Warrant 4 Results

The most pedestrians crossing Fairview Avenue during an hour at Baldwin Road is 12, and the most crossing at Wolfe Road is 7. These pedestrian volumes are far from satisfying the thresholds of Warrants 4A and 4B. Therefore, Warrant 4 is not met for either intersection.

Warrant 7, Crash Experience

Warrant 7 is intended for locations where severity and frequency of crashes are the principal reasons for consideration of a signal. Four conditions are tested: Warrant 7A sets a threshold of five or more reported crashes over a 12-month period, the type of which are susceptible to correction by a traffic control signal; Warrant 7B examines 80 percent of Warrant 1A; Warrant 7C examines 80 percent of Warrant 1B; and Warrant 7D examines 80 percent of Warrant 4. If Warrant 7A and one of Warrants 7B, 7C, and 7D are satisfied, then Warrant 7 is met.

Warrant 7 Results

Over the last five years, there were only two reported crashes at Baldwin Drive, and no reported crashes at Wolfe Road. Because Warrant 7A is not satisfied, Warrant 7 is not met for either intersection.

Existing Conditions Traffic Signal Warrant Results

For existing conditions, traffic signals are not warranted at either Fairview Avenue/Baldwin Drive or Fairview Avenue/Wolfe Road because no traffic signal warrants were satisfied. This is largely due to the relatively small traffic volumes on the minor approaches. If traffic volumes were significantly greater for the minor approach at Baldwin Drive, Warrant 1C could be met. At Wolfe Road, even volumes along Fairview Avenue are too low to meet any signal warrants.

BALDWIN DRIVE/FAIRVIEW AVENUE TRAFFIC SIGNAL WARRANTS

Warrant 1A: Minimum Vehicular Volume

The warrant is satisfied when, for each of any 8 hours of an average day, the traffic volumes given in the table below exist on the major street and on the higher-volume minor street approach to the intersection.

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total ofboth approaches)	Vehicles per hour on higher-volume minor-street approach (one direction only)
Major Street	Minor Street		
1	1	500	150
2 or more	1	600	150
2 or more	2 or more	600	200
1	2 or more	500	200

When the 85-percentile speed of major-street exceeds 40 mph in either an urban or rural area, or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the Minimum Vehicular Volume warrant is 70 percent of the requirements above.

Analysis

Major/Minor Info 1

Urban/Rural Info 2

	No of lanes
Major Street	2
Minor Street	1

Time	Major Street: Volume on major street (total of both approaches)	Major Street: Threshhold RURAL	Minor Street: Veh/hour on higher volume minor street (one direction only)	Minor Street: Threshhold RURAL	Warrants MET/NOT
		420		105	
10:00 AM	343		53		NOT MET
11:00 AM	391		54		NOT MET
12:00 PM	438		57		NOT MET
1:00 PM	418		63		NOT MET
2:00 PM	449		41		NOT MET
3:00 PM	413		42		NOT MET
4:00 PM	382		33		NOT MET
5:00 PM	398		34		NOT MET

Number of hours for which warrant met	0
Percentage by which warrant met	0.0%

Warrant	Not Met

80% Warrant

	No of lanes
Major Street	2
Minor Street	1

Time	Major Street: Volume on major street (total of both	Major Street: Threshhold RURAL	Minor Street: Veh/hour on higher volume minor street	Minor Street: Threshhold RURAL	Warrants MET/NOT
		336		84	
10:00 AM	343		53		NOT MET
11:00 AM	391		54		NOT MET
12:00 PM	438		57		NOT MET
1:00 PM	418		63		NOT MET
2:00 PM	449		41		NOT MET
3:00 PM	413		42		NOT MET
4:00 PM	382		33		NOT MET
5:00 PM	398		34		NOT MET

Number of hours for which warrant met	0
Percentage by which warrant met	0.0%

Warrant	Not Met

Warrant 1B: Interruption of Continuous Traffic

The warrant is satisfied when, for each of any 8 hours of an average day, the traffic volumes given in the table below exist on the major street and on the higher-volume minor street approach to the intersection, and signal installation will not seriously disrupt progressive traffic flow.

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total ofboth approaches)	Vehicles per hour on higher-volume minor-street approach (one direction only)
Major Street	Minor Street		
1	1	750	75
2 or more	1	900	75
2 or more	2 or more	900	100
1	2 or more	750	100

The major-street and minor -street volumes are for the same 8 hours. During those 8 hours, the direction of higher volume on the minor street may be on one approach during some hours and on the opposite approach during other hours.

When the 85-percentile speed of major-street exceeds 40 mph in either an urban or rural area, or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the Interruption of Continuous Traffic warrant is 70 percent of the requirements above.

Major/Minor Info 1

Urban/Rural Info 2

Analysis

	No of lanes
Major Street	2
Minor Street	1

Time	Major Street		Minor Street		Warrants MET/NOT
	Volume on major (total of both approaches)	Threshhold RURAL 630	Veh/hour on higher volume minor (one direction only)	Threshhold RURAL 52	
10:00 AM	343		53		NOT MET
11:00 AM	391		54		NOT MET
12:00 PM	438		57		NOT MET
1:00 PM	418		63		NOT MET
2:00 PM	449		41		NOT MET
3:00 PM	413		42		NOT MET
4:00 PM	382		33		NOT MET
5:00 PM	398		34		NOT MET

Number of hours for which warrant met	0
Percentage by which warrant met	0.0%

Warrant	Not Met

80% Warrant

	No of lanes
Major Street	2
Minor Street	1

Time	Major Street		Minor Street		Warrants MET/NOT
	Volume on major street (total of both	Threshhold URBAN 504	Veh/hour on higher volume minor street	Threshhold URBAN 42	
10:00 AM	343		53		NOT MET
11:00 AM	391		54		NOT MET
12:00 PM	438		57		NOT MET
1:00 PM	418		63		NOT MET
2:00 PM	449		41		NOT MET
3:00 PM	413		42		NOT MET
4:00 PM	382		33		NOT MET
5:00 PM	398		34		NOT MET

Number of hours for which warrant met	0
Percentage by which warrant met	0.0%

Warrant	Not Met

Warrant 1C: Combination of Warrants

In exceptional cases, signals occasionally may be justified where no single warrant is satisfied but where Warrants 1A and 1B are satisfied to the extent of 80% or more of the stated values.

Analysis

80% of Warrant 1A Met	NO
80% of Warrant 1B Met	NO

Warrant	**Not Met**

Warrant 2: Four-Hour Vehicular Volumes

The Four Hour Volume Warrant is satisfied when each of any four hours of an average day the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the curve in Figure 4C-1 for the existing combination of approach lanes.

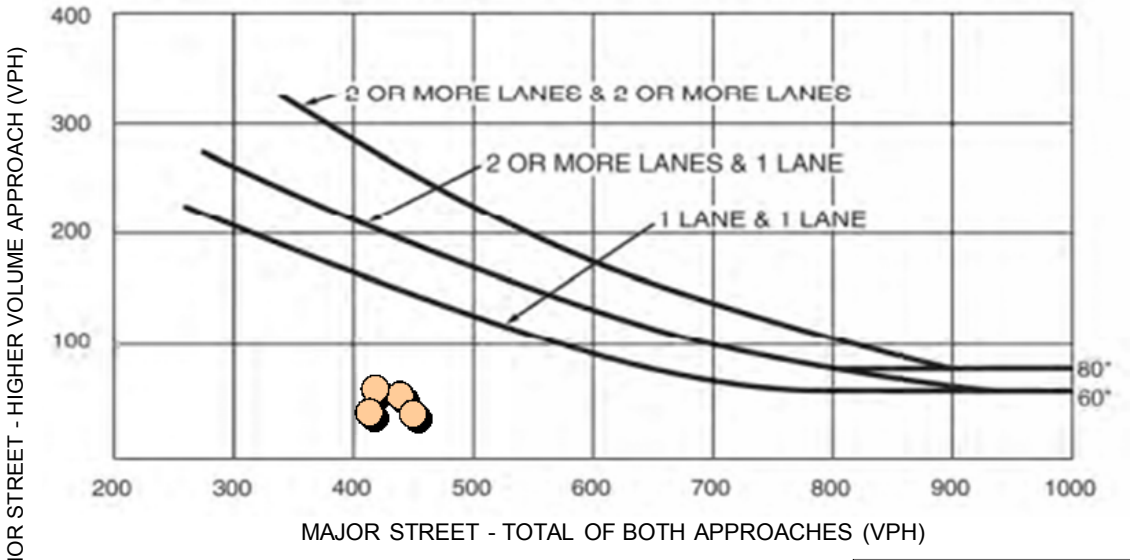
Analysis

	No of lanes
Major Street	2
Minor Street	1

Peak Four Hours

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
12:00 PM	438	57
1:00 PM	418	63
2:00 PM	449	41
3:00 PM	413	42

FIGURE 4C-1. FOUR HOUR VOLUME WARRANT



*Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor street approach with one or lane.

Warrant	Not Met

Warrant 3A: Peak Hour Delay

The peak hour delay warrant is intended for application where traffic conditions are such that for one hour of the day minor street traffic suffers undue delay in entering or crossing the major street. The peak hour delay warrant is satisfied when the conditions given below exist for one hour (any four consecutive 15-minute periods) of an average weekday.

The peak hour delay warrant is met when:

1. The total delay experienced by the traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach, and

2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes, and

3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four (or more) approaches or 650 vph for intersections with three approaches.

Analysis

Minor Street Lanes	1
Total Approaches	4
Time	2:00 PM

	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced for the Intersection (vph)
Existing	0.2	41	516
Limiting Value	4	100	800
Met/ Not Met	Not Met	Not Met	Not Met

Warrant	**Not Met**

Warrant 3B: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

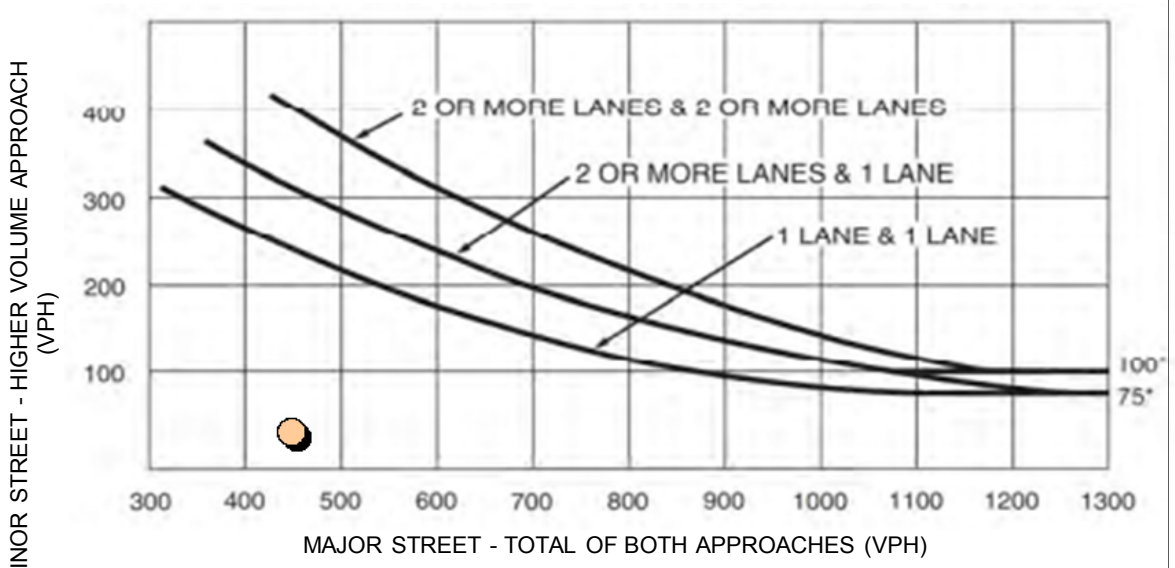
Analysis

	No of lanes
Major Street	2
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
2:00 PM	449	41

FIGURE 4C-3. PEAK HOUR VOLUME WARRANT



*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one or lane.

Warrant	Not Met

Warrant 4: Pedestrian Volumes

The Pedestrian Volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

Standard: The need for a traffic control signal at an intersection or midblock crossing shall be considered if an engineering study finds that both of the following criteria are met:
A. The pedestrian volume crossing the major street at an intersection or midblock location during an average day is 100 or more for each of any 4 hours or 190 or more during any 1 hour; and
B. There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular traffic.

Analysis

Warrant 4A - 4 Hours Pedestrian Volume

	Pedestrian Volume	Greater than 100?
10:00 AM	8	No
11:00 AM	5	No
4:00 PM	8	No
5:00 PM	5	No

Sub-Warrant	Not Met

Warrant 4B - Peak Hour Pedestrian Volume

Hour	Pedestrian Volume	Greater than 190?
3:30 PM	12	No

Sub-Warrant	Not Met

Warrant 4C - Gap Analysis

Hour	Gaps per Hour	Less than 60?
10:00 AM	N/A	N/A
11:00 AM	N/A	N/A
4:00 PM	N/A	N/A
5:00 PM	N/A	N/A

Sub-Warrant	N/A

Warrant	Not Met

Warrant 7: Crash Experience

The Crash Experience signal warrant conditions are intended for application where severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.

Standard:

A. Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occured within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and

B. Warrant 1A or Warrant 1B or 80% of the pedestrian volume warrant is met

Warrant 7A - Five or more reported crashes

	Number	5 or more?
Number of crashes within a 12-month period, of types susceptible to correction by a traffic signal, each involving personal injury or property damage (reportable)	2	N

Plus at least one of the following:	No	No
Warrant 7B - 80% Warrant 1A		
Warrant 1A: 80% threshold met?		X
Warrant 7C - 80% Warrant 1B		
Warrant 1B: 80% threshold met?		X
Warrant 7D - 80% Warrant 4		
Warrant 4: 80% threshold met (152 or more peds for any hour, and 80 or more peds for any 4 hours)?		X

Warrant	Not Met

WOLFE ROAD/FAIRVIEW AVENUE TRAFFIC SIGNAL WARRANTS

Warrant 1A: Minimum Vehicular Volume

The warrant is satisfied when, for each of any 8 hours of an average day, the traffic volumes given in the table below exist on the major street and on the higher-volume minor street approach to the intersection.

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total ofboth approaches)	Vehicles per hour on higher-volume minor-street approach (one direction only)
Major Street	Minor Street		
1	1	500	150
2 or more	1	600	150
2 or more	2 or more	600	200
1	2 or more	500	200

When the 85-percentile speed of major-street exceeds 40 mph in either an urban or rural area, or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the Minimum Vehicular Volume warrant is 70 percent of the requirements above.

Analysis

Major/Minor Info 1

Urban/Rural Info 2

	No of lanes
Major Street	2
Minor Street	1

Time	Major Street: Volume on major street (total of both approaches)	Major Street: Threshhold RURAL	Minor Street: Veh/hour on higher volume minor street (one direction only)	Minor Street: Threshhold RURAL	Warrants MET/NOT
		420		105	
10:00 AM	199		52		NOT MET
11:00 AM	250		61		NOT MET
12:00 PM	284		60		NOT MET
1:00 PM	258		57		NOT MET
2:00 PM	311		45		NOT MET
3:00 PM	295		42		NOT MET
4:00 PM	285		38		NOT MET
5:00 PM	302		35		NOT MET

Number of hours for which warrant met	0
Percentage by which warrant met	0.0%

Warrant	Not Met

80% Warrant

	No of lanes
Major Street	2
Minor Street	1

Time	Major Street: Volume on major street (total of both	Major Street: Threshhold RURAL	Minor Street: Veh/hour on higher volume minor street	Minor Street: Threshhold RURAL	Warrants MET/NOT
		336		84	
10:00 AM	199		52		NOT MET
11:00 AM	250		61		NOT MET
12:00 PM	284		60		NOT MET
1:00 PM	258		57		NOT MET
2:00 PM	311		45		NOT MET
3:00 PM	295		42		NOT MET
4:00 PM	285		38		NOT MET
5:00 PM	302		35		NOT MET

Number of hours for which warrant met	0
Percentage by which warrant met	0.0%

Warrant	Not Met

Warrant 1B: Interruption of Continuous Traffic

The warrant is satisfied when, for each of any 8 hours of an average day, the traffic volumes given in the table below exist on the major street and on the higher-volume minor street approach to the intersection, and signal installation will not seriously disrupt progressive traffic flow.

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total ofboth approaches)	Vehicles per hour on higher-volume minor-street approach (one direction only)
Major Street	Minor Street		
1	1	750	75
2 or more	1	900	75
2 or more	2 or more	900	100
1	2 or more	750	100

The major-street and minor -street volumes are for the same 8 hours. During those 8 hours, the direction of higher volume on the minor street may be on one approach during some hours and on the opposite approach during other hours.

When the 85-percentile speed of major-street exceeds 40 mph in either an urban or rural area, or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the Interruption of Continuous Traffic warrant is 70 percent of the requirements above.

Major/Minor Info 1

Urban/Rural Info 2

Analysis

	No of lanes
Major Street	2
Minor Street	1

Time	Major Street		Minor Street		Warrants MET/NOT
	Volume on major street (total of both approaches)	Threshhold RURAL 504	higher volume minor street (one direction only)	Threshhold RURAL 42	
10:00 AM	199		52		NOT MET
11:00 AM	250		61		NOT MET
12:00 PM	284		60		NOT MET
1:00 PM	258		57		NOT MET
2:00 PM	311		45		NOT MET
3:00 PM	295		42		NOT MET
4:00 PM	285		38		NOT MET
5:00 PM	302		35		NOT MET

Number of hours for which warrant met	0
Percentage by which warrant met	0.0%

Warrant	Not Met

80% Warrant

	No of lanes
Major Street	2
Minor Street	1

Time	Major Street		Minor Street		Warrants MET/NOT
	Volume on major street (total of both	Threshhold URBAN 504	Veh/hour on higher volume minor street	Threshhold URBAN 42	
10:00 AM	199		52		NOT MET
11:00 AM	250		61		NOT MET
12:00 PM	284		60		NOT MET
1:00 PM	258		57		NOT MET
2:00 PM	311		45		NOT MET
3:00 PM	295		42		NOT MET
4:00 PM	285		38		NOT MET
5:00 PM	302		35		NOT MET

Number of hours for which warrant met	0
Percentage by which warrant met	0.0%

Warrant	Not Met

Warrant 1C: Combination of Warrants

In exceptional cases, signals occasionally may be justified where no single warrant is satisfied but where Warrants 1A and 1B are satisfied to the extent of 80% or more of the stated values.

Analysis

80% of Warrant 1A Met	NO
80% of Warrant 1B Met	NO

Warrant	**Not Met**

Warrant 2: Four-Hour Vehicular Volumes

The Four Hour Volume Warrant is satisfied when each of any four hours of an average day the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the curve in Figure 4C-1 for the existing combination of approach lanes.

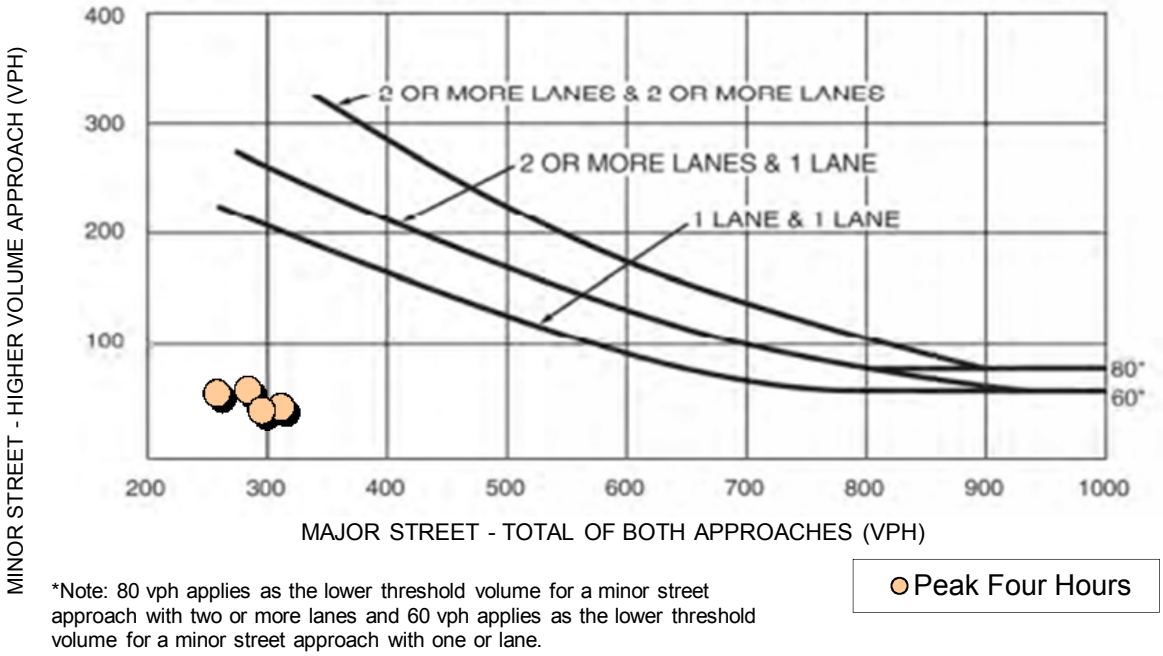
Analysis

	No of lanes
Major Street	2
Minor Street	1

Peak Four Hours

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
12:00 PM	284	60
1:00 PM	258	57
2:00 PM	311	45
3:00 PM	295	42

FIGURE 4C-1. FOUR HOUR VOLUME WARRANT



*Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor street approach with one or lane.

Warrant	Not Met

Warrant 3A: Peak Hour Delay

The peak hour delay warrant is intended for application where traffic conditions are such that for one hour of the day minor street traffic suffers undue delay in entering or crossing the major street. The peak hour delay warrant is satisfied when the conditions given below exist for one hour (any four consecutive 15-minute periods) of an average weekday.

The peak hour delay warrant is met when:

1. The total delay experienced by the traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach, and

2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes, and

3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four (or more) approaches or 650 vph for intersections with three approaches.

Analysis

Minor Street Lanes	1
Total Approaches	4
Time	2:00 PM

	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Serviced for the Intersection (vph)
Existing	0.1	45	382
Limiting Value	4	100	800
Met/ Not Met	Not Met	Not Met	Not Met

Warrant	**Not Met**

Warrant 3B: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

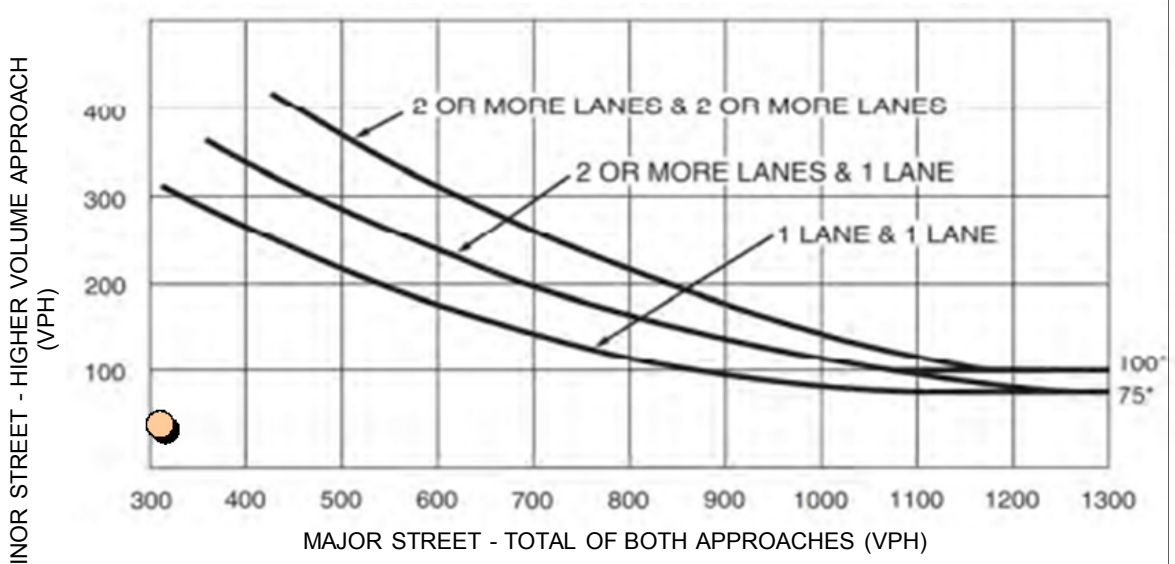
Analysis

	No of lanes
Major Street	2
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
2:00 PM	311	45

FIGURE 4C-3. PEAK HOUR VOLUME WARRANT



*Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor street approach with one or lane.

Warrant	Not Met

Warrant 4: Pedestrian Volumes

The Pedestrian Volume signal warrant is intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

Standard: The need for a traffic control signal at an intersection or midblock crossing shall be considered if an engineering study finds that both of the following criteria are met:
A. The pedestrian volume crossing the major street at an intersection or midblock location during an average day is 100 or more for each of any 4 hours or 190 or more during any 1 hour; and
B. There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular traffic.

Analysis

Warrant 4A - 4 Hours Pedestrian Volume

	Pedestrian Volume	Greater than 100?
10:00 AM	6	No
11:00 AM	2	No
4:00 PM	3	No
5:00 PM	3	No

Sub-Warrant	Not Met

Warrant 4B - Peak Hour Pedestrian Volume

Hour	Pedestrian Volume	Greater than 190?
10:15 AM	7	No

Sub-Warrant	Not Met

Warrant 4C - Gap Analysis

Hour	Gaps per Hour	Less than 60?
10:00 AM	N/A	N/A
11:00 AM	N/A	N/A
4:00 PM	N/A	N/A
5:00 PM	N/A	N/A

Sub-Warrant	N/A

Warrant	Not Met

Warrant 7: Crash Experience

The Crash Experience signal warrant conditions are intended for application where severity and frequency of crashes are the principal reasons to consider installing a traffic control signal.

Standard:

A. Five or more reported crashes, of types susceptible to correction by a traffic control signal, have occured within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; and

B. Warrant 1A or Warrant 1B or 80% of the pedestrian volume warrant is met

Warrant 7A - Five or more reported crashes

	Number	5 or more?
Number of crashes within a 12-month period, of types susceptible to correction by a traffic signal, each involving personal injury or property damage (reportable)	0	N

Plus at least one of the following:	No	No
Warrant 7B - 80% Warrant 1A		
Warrant 1A: 80% threshold met?		X
Warrant 7C - 80% Warrant 1B		
Warrant 1B: 80% threshold met?		X
Warrant 7D - 80% Warrant 4		
Warrant 4: 80% threshold met (152 or more peds for any hour, and 80 or more peds for any 4 hours)?		X

Warrant	Not Met

ATTACHMENT C – TRAFFIC COUNT WORKSHEETS

ALL TRAFFIC DATA

City of Brentwood
(916) 771-8700
orders@atdtraffic.com

All Vehicles on Unshifted
Peds & Bikes on Bank 1
Golf Carts on Bank 2

File Name : 15-7131-001 Fairview Avenue-Baldwin Drive.ppd
Date : 2/19/2015

Unshifted Count = All Vehicles

AM PEAK HOUR	Fairview Avenue Southbound					Baldwin Drive Westbound					Fairview Avenue Northbound					Baldwin Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	14	41	12	1	68	1	3	8	0	12	4	46	4	0	54	9	0	1	0	10	144
12:15	7	40	7	0	54	0	0	12	0	12	1	45	0	0	46	12	0	1	0	13	125
12:30	8	43	8	0	59	1	0	17	0	18	1	34	2	0	37	7	0	0	0	7	121
12:45	19	49	9	1	78	0	0	13	0	13	0	40	1	0	41	11	1	2	0	14	146
Total Volume	48	173	36	2	259	2	3	50	0	55	6	165	7	0	178	39	1	4	0	44	536
% App Total	18.5%	66.8%	13.9%	0.8%		3.6%	5.5%	90.9%	0.0%		3.4%	92.7%	3.9%	0.0%		88.6%	2.3%	9.1%	0.0%		
PHF	.632	.883	.750	.500	.830	.500	.250	.735	.000	.764	.375	.897	.438	.000	.824	.813	.250	.500	.000	.786	.918

NOON PEAK	Fairview Avenue Southbound					Baldwin Drive Westbound					Fairview Avenue Northbound					Baldwin Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 13:15 to 14:15																					
Peak Hour For Entire Intersection Begins at 13:15																					
13:15	10	43	9	0	62	1	0	13	0	14	1	34	0	0	35	13	0	1	0	14	125
13:30	12	32	15	0	59	0	0	6	0	6	1	39	1	0	41	11	0	2	0	13	119
13:45	13	38	17	0	68	3	0	15	0	18	3	40	1	0	44	18	0	1	0	19	149
14:00	13	58	13	0	84	2	0	5	0	7	1	50	0	0	51	8	0	2	0	10	152
Total Volume	48	171	54	0	273	6	0	39	0	45	6	163	2	0	171	50	0	6	0	56	545
% App Total	17.6%	62.6%	19.8%	0.0%		13.3%	0.0%	86.7%	0.0%		3.5%	95.3%	1.2%	0.0%		89.3%	0.0%	10.7%	0.0%		
PHF	.923	.737	.794	.000	.813	.500	.000	.650	.000	.625	.500	.815	.500	.000	.838	.694	.000	.750	.000	.737	.896

PM PEAK HOUR	Fairview Avenue Southbound					Baldwin Drive Westbound					Fairview Avenue Northbound					Baldwin Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 15:15 to 16:15																					
Peak Hour For Entire Intersection Begins at 15:15																					
15:15	12	33	11	0	56	1	0	11	0	12	1	45	2	0	48	8	0	0	0	8	124
15:30	15	28	9	0	52	0	1	11	0	12	0	46	2	0	48	7	1	0	0	8	120
15:45	8	32	11	0	51	0	0	9	0	9	0	48	3	0	51	8	0	1	0	9	120
16:00	8	41	13	2	64	2	0	4	0	6	1	47	0	0	48	7	0	1	0	8	126
Total Volume	43	134	44	2	223	3	1	35	0	39	2	186	7	0	195	30	1	2	0	33	490
% App Total	19.3%	60.1%	19.7%	0.9%		7.7%	2.6%	89.7%	0.0%		1.0%	95.4%	3.6%	0.0%		90.9%	3.0%	6.1%	0.0%		
PHF	.717	.817	.846	.250	.871	.375	.250	.795	.000	.813	.500	.969	.583	.000	.956	.938	.250	.500	.000	.917	.972

ALL TRAFFIC DATA

City of Brentwood
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Golf Carts on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7131-001 Fairview Avenue-Baldwin Drive.ppd
Date : 2/19/2015

Bank 1 Count = Peds & Bikes

AM PEAK HOUR	Fairview Avenue Southbound					Baldwin Drive Westbound					Fairview Avenue Northbound					Baldwin Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.250

NOON PEAK	Fairview Avenue Southbound					Baldwin Drive Westbound					Fairview Avenue Northbound					Baldwin Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 13:15 to 14:15																					
Peak Hour For Entire Intersection Begins at 13:15																					
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

PM PEAK HOUR	Fairview Avenue Southbound					Baldwin Drive Westbound					Fairview Avenue Northbound					Baldwin Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 15:15 to 16:15																					
Peak Hour For Entire Intersection Begins at 15:15																					
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
15:30	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	2	0	0	2	0	0	0	1	0	0	2	0	0	2	0	0	0	1	0	4
16:00	0	1	0	0	1	0	0	0	4	0	0	1	0	0	1	0	0	0	2	0	2
Total Volume	0	3	0	0	3	0	0	0	8	0	0	3	0	0	3	2	0	0	3	2	8
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			100.0%	0.0%	0.0%			
PHF	.000	.375	.000		.375	.000	.000	.000		.000	.000	.375	.000		.375	.250	.000	.000		.250	.500

ALL TRAFFIC DATA

City of Brentwood
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Golf Carts on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7131-001 Fairview Avenue-Baldwin Drive.ppd
Date : 2/19/2015

Bank 2 Count = Golf Carts

AM PEAK HOUR	Fairview Avenue Southbound					Baldwin Drive Westbound					Fairview Avenue Northbound					Baldwin Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

NOON PEAK	Fairview Avenue Southbound					Baldwin Drive Westbound					Fairview Avenue Northbound					Baldwin Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 13:15 to 14:15																					
Peak Hour For Entire Intersection Begins at 13:15																					
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	100.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.250		.250	.250

PM PEAK HOUR	Fairview Avenue Southbound					Baldwin Drive Westbound					Fairview Avenue Northbound					Baldwin Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 15:15 to 16:15																					
Peak Hour For Entire Intersection Begins at 15:15																					
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

ALL TRAFFIC DATA

City of Brentwood
(916) 771-8700
orders@atdtraffic.com

All Vehicles on Unshifted
Peds & Bikes on Bank 1
Golf Carts on Bank 2

File Name : 15-7131-002 Fairview Avenue-Wolfe Road.ppd
Date : 2/19/2015

Unshifted Count = All Vehicles

AM PEAK HOUR	Fairview Avenue Southbound					Wolfe Road Westbound					Fairview Avenue Northbound					Regent Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	17	24	5	0	46	1	1	18	0	20	1	23	2	1	27	10	0	2	0	12	105
12:15	8	27	5	0	40	1	0	11	0	12	2	30	2	0	34	7	1	2	0	10	96
12:30	12	24	7	0	43	0	0	9	0	9	2	17	1	0	20	9	2	1	0	12	84
12:45	19	25	7	0	51	1	0	15	0	16	0	22	0	0	22	7	2	1	0	10	99
Total Volume	56	100	24	0	180	3	1	53	0	57	5	92	5	1	103	33	5	6	0	44	384
% App Total	31.1%	55.6%	13.3%	0.0%		5.3%	1.8%	93.0%	0.0%		4.9%	89.3%	4.9%	1.0%		75.0%	11.4%	13.6%	0.0%		
PHF	.737	.926	.857	.000	.882	.750	.250	.736	.000	.713	.625	.767	.625	.250	.757	.825	.625	.750	.000	.917	.914

NOON PEAK	Fairview Avenue Southbound					Wolfe Road Westbound					Fairview Avenue Northbound					Regent Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 13:45 to 14:45																					
Peak Hour For Entire Intersection Begins at 13:45																					
13:45	7	27	9	1	44	0	0	10	0	10	0	27	2	1	30	10	0	4	0	14	98
14:00	15	30	9	1	55	3	0	4	0	7	5	31	0	0	36	10	0	3	0	13	111
14:15	8	18	4	0	30	1	1	12	0	14	2	36	1	0	39	5	0	1	0	6	89
14:30	9	27	8	0	44	0	1	4	0	5	0	28	2	0	30	5	0	0	0	5	84
Total Volume	39	102	30	2	173	4	2	30	0	36	7	122	5	1	135	30	0	8	0	38	382
% App Total	22.5%	59.0%	17.3%	1.2%		11.1%	5.6%	83.3%	0.0%		5.2%	90.4%	3.7%	0.7%		78.9%	0.0%	21.1%	0.0%		
PHF	.650	.850	.833	.500	.786	.333	.500	.625	.000	.643	.350	.847	.625	.250	.865	.750	.000	.500	.000	.679	.860

PM PEAK HOUR	Fairview Avenue Southbound					Wolfe Road Westbound					Fairview Avenue Northbound					Regent Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 15:15 to 16:15																					
Peak Hour For Entire Intersection Begins at 15:15																					
15:15	9	22	4	0	35	0	0	4	0	4	3	36	3	0	42	5	0	2	0	7	88
15:30	9	14	4	0	27	1	0	8	0	9	3	38	1	0	42	4	0	3	0	7	85
15:45	10	19	2	0	31	1	0	16	0	17	3	33	1	0	37	4	0	0	0	4	89
16:00	12	24	9	0	45	0	0	8	0	8	2	35	0	0	37	2	1	0	0	3	93
Total Volume	40	79	19	0	138	2	0	36	0	38	11	142	5	0	158	15	1	5	0	21	355
% App Total	29.0%	57.2%	13.8%	0.0%		5.3%	0.0%	94.7%	0.0%		7.0%	89.9%	3.2%	0.0%		71.4%	4.8%	23.8%	0.0%		
PHF	.833	.823	.528	.000	.767	.500	.000	.563	.000	.559	.917	.934	.417	.000	.940	.750	.250	.417	.000	.750	.954

ALL TRAFFIC DATA

City of Brentwood
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Golf Carts on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7131-002 Fairview Avenue-Wolfe Road.ppd
Date : 2/19/2015

Bank 1 Count = Peds & Bikes

AM PEAK HOUR	Fairview Avenue Southbound					Wolfe Road Westbound					Fairview Avenue Northbound					Regent Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
12:15	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	2	0	0	1	0	0	1	0	0	0	1	0	1
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.250

NOON PEAK	Fairview Avenue Southbound					Wolfe Road Westbound					Fairview Avenue Northbound					Regent Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 13:45 to 14:45																					
Peak Hour For Entire Intersection Begins at 13:45																					
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

PM PEAK HOUR	Fairview Avenue Southbound					Wolfe Road Westbound					Fairview Avenue Northbound					Regent Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 15:15 to 16:15																					
Peak Hour For Entire Intersection Begins at 15:15																					
15:15	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	3
15:30	0	0	0	0	0	0	0	0	1	0	0	2	0	0	2	0	0	0	0	0	2
15:45	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3
16:00	0	0	0	0	0	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	1
Total Volume	0	2	0	0	2	0	0	0	3	0	0	7	0	0	7	0	0	0	0	0	9
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.250	.000		.250	.000	.000	.000		.000	.000	.583	.000		.583	.000	.000	.000		.000	.750

ALL TRAFFIC DATA

City of Brentwood
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Golf Carts on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7131-002 Fairview Avenue-Wolfe Road.ppd
Date : 2/19/2015

Bank 2 Count = Golf Carts

AM PEAK HOUR	Fairview Avenue Southbound					Wolfe Road Westbound					Fairview Avenue Northbound					Regent Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 12:00 to 13:00																					
Peak Hour For Entire Intersection Begins at 12:00																					
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

NOON PEAK	Fairview Avenue Southbound					Wolfe Road Westbound					Fairview Avenue Northbound					Regent Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 13:45 to 14:45																					
Peak Hour For Entire Intersection Begins at 13:45																					
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

PM PEAK HOUR	Fairview Avenue Southbound					Wolfe Road Westbound					Fairview Avenue Northbound					Regent Drive Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 15:15 to 16:15																					
Peak Hour For Entire Intersection Begins at 15:15																					
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

ALL TRAFFIC DATA

City of Brentwood
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Golf Carts on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7131-003 Vasco Road (SR 4)-Marsh Creek Road.ppd
Date : 2/19/2015

Unshifted Count = All Vehicles

AM PEAK HOUR	Vasco Road (SR 4) Southbound					Marsh Creek Road Westbound					Vasco Road (SR 4) Northbound					Marsh Creek Road Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
07:30	51	172	13	0	236	0	58	76	0	134	1	86	1	0	88	3	8	4	0	15	473
07:45	64	157	11	0	232	0	42	70	0	112	7	73	2	0	82	2	12	4	0	18	444
08:00	64	185	8	0	257	0	50	81	0	131	4	89	0	0	93	3	10	4	0	17	498
08:15	63	209	6	0	278	0	39	66	0	105	2	65	1	0	68	3	5	8	0	16	467
Total Volume	242	723	38	0	1003	0	189	293	0	482	14	313	4	0	331	11	35	20	0	66	1882
% App Total	24.1%	72.1%	3.8%	0.0%		0.0%	39.2%	60.8%	0.0%		4.2%	94.6%	1.2%	0.0%		16.7%	53.0%	30.3%	0.0%		
PHF	.945	.865	.731	.000	.902	.000	.815	.904	.000	.899	.500	.879	.500	.000	.890	.917	.729	.625	.000	.917	.945

PM PEAK HOUR	Vasco Road (SR 4) Southbound					Marsh Creek Road Westbound					Vasco Road (SR 4) Northbound					Marsh Creek Road Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	89	91	0	0	180	0	2	60	0	62	5	197	5	0	207	10	68	2	0	80	529
17:00	90	94	2	0	186	0	8	71	0	79	2	198	0	0	200	19	84	4	0	107	572
17:15	86	101	3	0	190	1	5	74	0	80	8	209	1	0	218	10	58	3	0	71	559
17:30	102	99	2	0	203	1	11	82	0	94	3	182	0	0	185	23	96	3	0	122	604
Total Volume	367	385	7	0	759	2	26	287	0	315	18	786	6	0	810	62	306	12	0	380	2264
% App Total	48.4%	50.7%	0.9%	0.0%		0.6%	8.3%	91.1%	0.0%		2.2%	97.0%	0.7%	0.0%		16.3%	80.5%	3.2%	0.0%		
PHF	.900	.953	.583	.000	.935	.500	.591	.875	.000	.838	.563	.940	.300	.000	.929	.674	.797	.750	.000	.779	.937

ALL TRAFFIC DATA

City of Brentwood
(916) 771-8700
orders@atdtraffic.com

All Vehicles on Unshifted
Peds & Bikes on Bank 1
Golf Carts on Bank 2

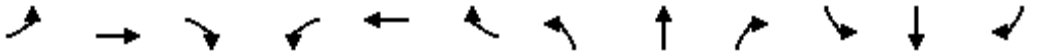
File Name : 15-7131-003 Vasco Road (SR 4)-Marsh Creek Road.ppd
Date : 2/19/2015

Bank 1 Count = Peds & Bikes

AM PEAK HOUR	Vasco Road (SR 4) Southbound					Marsh Creek Road Westbound					Vasco Road (SR 4) Northbound					Marsh Creek Road Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

PM PEAK HOUR	Vasco Road (SR 4) Southbound					Marsh Creek Road Westbound					Vasco Road (SR 4) Northbound					Marsh Creek Road Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 16:45 to 17:45																					
Peak Hour For Entire Intersection Begins at 16:45																					
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000	.000	.000		.000	.000

ATTACHMENT D – LEVEL OF SERVICE ANALYSIS WORKSHEETS



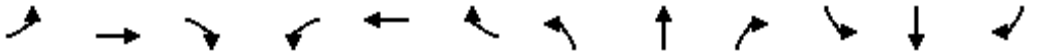
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	11	35	20	0	189	293	14	313	4	242	723	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	12	37	21	0	201	0	15	333	0	257	769	0
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	2	2	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	44	591	309	3	317	269	53	1218	0	442	1567	0
Arrive On Green	0.02	0.26	0.26	0.00	0.17	0.00	0.03	0.34	0.00	0.13	0.43	0.00
Sat Flow, veh/h	1810	2293	1200	1810	1900	1615	1810	3705	0	3510	3705	0
Grp Volume(v), veh/h	12	28	30	0	201	0	15	333	0	257	769	0
Grp Sat Flow(s),veh/h/ln	1810	1805	1688	1810	1900	1615	1810	1805	0	1755	1805	0
Q Serve(g_s), s	0.4	0.7	0.8	0.0	6.2	0.0	0.5	4.2	0.0	4.3	9.6	0.0
Cycle Q Clear(g_c), s	0.4	0.7	0.8	0.0	6.2	0.0	0.5	4.2	0.0	4.3	9.6	0.0
Prop In Lane	1.00		0.71	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	44	465	435	3	317	269	53	1218	0	442	1567	0
V/C Ratio(X)	0.28	0.06	0.07	0.00	0.63	0.00	0.28	0.27	0.00	0.58	0.49	0.00
Avail Cap(c_a), veh/h	340	1739	1627	231	1716	1458	340	3392	0	1722	4485	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.1	17.6	17.6	0.0	24.4	0.0	29.8	15.2	0.0	25.9	12.8	0.0
Incr Delay (d2), s/veh	1.3	0.1	0.1	0.0	3.0	0.0	1.1	0.2	0.0	0.5	0.3	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	0.2	0.4	0.4	0.0	3.5	0.0	0.3	2.1	0.0	2.1	4.8	0.0
LnGrp Delay(d),s/veh	31.4	17.6	17.7	0.0	27.3	0.0	30.9	15.3	0.0	26.3	13.1	0.0
LnGrp LOS	C	B	B		C		C	B		C	B	
Approach Vol, veh/h		70			201			348			1026	
Approach Delay, s/veh		20.0			27.3			16.0			16.4	
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	12.1	28.2	0.0	22.5	6.0	34.3	5.7	16.8
Change Period (Y+Rc), s	* 4.2	7.0	* 4.2	6.3	* 4.2	7.0	* 4.2	6.3
Max Green Setting (Gmax), s	* 31	59.0	* 8	60.5	* 12	78.0	* 12	56.7
Max Q Clear Time (g_c+I1), s	6.3	6.2	0.0	2.8	2.5	11.6	2.4	8.2
Green Ext Time (p_c), s	0.5	15.0	0.0	2.4	0.0	15.6	0.0	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	17.8
HCM 2010 LOS	B

Notes

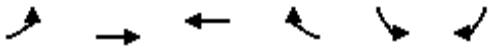
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	0	30	0	0	0	10	51	0	0	226	15
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	1881	0	1881	1900	1900	1900	1881	1863	1900	0	1863	1881
Adj Flow Rate, veh/h	16	0	32	0	0	0	11	54	0	0	240	16
Adj No. of Lanes	2	0	1	1	1	0	1	2	0	0	1	2
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, %	1	0	1	0	0	0	1	2	2	0	2	1
Cap, veh/h	68	0	0	125	3	0	25	2917	0	0	1364	2060
Arrive On Green	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.82	0.00	0.00	0.73	0.73
Sat Flow, veh/h	3476	16		1399	1900	0	1792	3632	0	0	1863	2814
Grp Volume(v), veh/h	16	29.6		0	0	0	11	54	0	0	240	16
Grp Sat Flow(s),veh/h/ln	1738	C		1399	1900	0	1792	1770	0	0	1863	1407
Q Serve(g_s), s	0.3			0.0	0.0	0.0	0.4	0.2	0.0	0.0	2.3	0.1
Cycle Q Clear(g_c), s	0.3			0.0	0.0	0.0	0.4	0.2	0.0	0.0	2.3	0.1
Prop In Lane	1.00			1.00		0.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	68			125	3	0	25	2917	0	0	1364	2060
V/C Ratio(X)	0.23			0.00	0.00	0.00	0.44	0.02	0.00	0.00	0.18	0.01
Avail Cap(c_a), veh/h	452			756	725	0	233	2917	0	0	1364	2060
HCM Platoon Ratio	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	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	27.8			0.0	0.0	0.0	28.2	0.9	0.0	0.0	2.4	2.1
Incr Delay (d2), s/veh	1.7			0.0	0.0	0.0	11.6	0.0	0.0	0.0	0.1	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
%ile BackOfQ(50%),veh/ln	0.1			0.0	0.0	0.0	0.3	0.1	0.0	0.0	1.2	0.0
LnGrp Delay(d),s/veh	29.6			0.0	0.0	0.0	39.7	0.9	0.0	0.0	2.4	2.1
LnGrp LOS	C						D	A			A	A
Approach Vol, veh/h					0			65			256	
Approach Delay, s/veh					0.0			7.5			2.4	
Approach LOS								A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4	5	6		8
Phs Duration (G+Y+Rc), s			5.3	46.7	5.6	0.0		52.0
Change Period (Y+Rc), s			4.5	4.5	4.5	4.0		4.5
Max Green Setting (Gmax), s			7.5	35.5	7.5	22.0		47.5
Max Q Clear Time (g_c+I1), s			2.4	4.3	2.3	0.0		2.2
Green Ext Time (p_c), s			0.0	1.9	0.0	0.0		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	4.7
HCM 2010 LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	45	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0			
Lane Util. Factor		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		1881	1881			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		1881	1881			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	48	27	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	48	27	0	0	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Perm
Protected Phases	5 8	2	6	7	7	
Permitted Phases				6		7
Actuated Green, G (s)		25.7	25.7			
Effective Green, g (s)		25.7	25.7			
Actuated g/C Ratio		1.00	1.00			
Clearance Time (s)		5.0	5.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1881	1881			
v/s Ratio Prot		c0.03	0.01			
v/s Ratio Perm						
v/c Ratio		0.03	0.01			
Uniform Delay, d1		0.0	0.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.0	0.0			
Delay (s)		0.0	0.0			
Level of Service		A	A			
Approach Delay (s)		0.0	0.0		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM 2000 Control Delay	0.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.08		
Actuated Cycle Length (s)	25.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	8.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	50	0	6	6	0	39	6	163	2
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	55	-	-	40	-	65	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	0	0	0	0	0	0
Mvmt Flow	56	0	7	7	0	43	7	181	2

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	401	494	192	496	493	94	190	0	0
Stage 1	297	297	-	196	196	-	-	-	-
Stage 2	104	197	-	300	297	-	-	-	-
Critical Hdwy	7.33	6.53	6.23	7.3	6.5	6.9	4.1	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.5	5.5	-	-	-	-
Critical Hdwy Stg 2	6.53	5.53	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	3.5	4	3.3	2.2	-	-
Pot Cap-1 Maneuver	547	476	849	474	480	951	1396	-	-
Stage 1	711	667	-	793	742	-	-	-	-
Stage 2	891	737	-	713	671	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	504	456	848	454	460	949	1394	-	-
Mov Cap-2 Maneuver	504	456	-	454	460	-	-	-	-
Stage 1	707	642	-	789	738	-	-	-	-
Stage 2	845	733	-	680	646	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	12.6	9.5	0.3
HCM LOS	B	A	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1394	-	-	504	848	454	-	949	1402	-	-
HCM Lane V/C Ratio	0.005	-	-	0.11	0.008	0.015	-	0.046	0.038	-	-
HCM Control Delay (s)	7.6	-	-	13	9.3	13	0	9	7.7	-	-
HCM Lane LOS	A	-	-	B	A	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	48	171	54
Conflicting Peds, #/hr	0	0	2
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	0	-	230
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	90	90	90
Heavy Vehicles, %	0	0	0
Mvmt Flow	53	190	60

Major/Minor	Major2		
Conflicting Flow All	183	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1404	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1402	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	1.3
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	33	0	10	4	0	41	8	94	2
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	170	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	40	0	12	5	0	49	10	113	2

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	305	364	129	369	363	59	128	0	0
Stage 1	229	229	-	134	134	-	-	-	-
Stage 2	76	135	-	235	229	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.3	6.5	6.9	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.5	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-
Pot Cap-1 Maneuver	640	567	926	579	568	1001	1470	-	-
Stage 1	778	718	-	861	789	-	-	-	-
Stage 2	930	789	-	773	718	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	589	544	925	553	545	1000	1469	-	-
Mov Cap-2 Maneuver	589	544	-	553	545	-	-	-	-
Stage 1	773	693	-	855	784	-	-	-	-
Stage 2	877	784	-	736	693	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	11.1	9.1	0.6
HCM LOS	B	A	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1469	-	-	643	933	1477	-	-
HCM Lane V/C Ratio	0.007	-	-	0.081	0.058	0.034	-	-
HCM Control Delay (s)	7.5	-	-	11.1	9.1	7.5	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	42	106	29
Conflicting Peds, #/hr	0	0	1
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	200	-	165
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	83	83	83
Heavy Vehicles, %	1	1	1
Mvmt Flow	51	128	35

Major/Minor	Major2		
Conflicting Flow All	116	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.21	-	-
Pot Cap-1 Maneuver	1478	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1477	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	1.8
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	27	0	2	3	0	30	1	189	7
Conflicting Peds, #/hr	1	0	0	0	0	1	2	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	55	-	-	40	-	65	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1
Mvmt Flow	29	0	2	3	0	32	1	203	8

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	317	426	138	423	422	110	134	0	0
Stage 1	212	212	-	210	210	-	-	-	-
Stage 2	105	214	-	213	212	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.3	6.5	6.9	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.5	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-
Pot Cap-1 Maneuver	628	524	916	532	526	929	1457	-	-
Stage 1	795	731	-	778	732	-	-	-	-
Stage 2	895	729	-	794	731	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	590	508	912	517	510	925	1452	-	-
Mov Cap-2 Maneuver	590	508	-	517	510	-	-	-	-
Stage 1	794	709	-	777	731	-	-	-	-
Stage 2	860	728	-	767	709	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	11.2	9.3	0
HCM LOS	B	A	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1452	-	-	590	912	517	-	925	1358	-	-
HCM Lane V/C Ratio	0.001	-	-	0.049	0.002	0.006	-	0.035	0.029	-	-
HCM Control Delay (s)	7.5	-	-	11.4	9	12	0	9	7.7	-	-
HCM Lane LOS	A	-	-	B	A	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	36	124	32
Conflicting Peds, #/hr	4	0	2
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	0	-	230
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	93	93	93
Heavy Vehicles, %	1	1	1
Mvmt Flow	39	133	34

Major/Minor	Major2		
Conflicting Flow All	212	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.21	-	-
Pot Cap-1 Maneuver	1363	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1358	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	1.4
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	21	0	5	2	0	33	6	140	4
Conflicting Peds, #/hr	1	0	1	1	0	1	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	170	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1
Mvmt Flow	23	0	5	2	0	35	6	151	4

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	264	344	80	345	342	80	78	0	0
Stage 1	175	175	-	167	167	-	-	-	-
Stage 2	89	169	-	178	175	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.3	6.5	6.9	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.5	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-
Pot Cap-1 Maneuver	683	582	986	601	583	971	1527	-	-
Stage 1	832	758	-	824	764	-	-	-	-
Stage 2	914	763	-	828	758	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	638	559	984	579	560	969	1524	-	-
Mov Cap-2 Maneuver	638	559	-	579	560	-	-	-	-
Stage 1	828	732	-	820	760	-	-	-	-
Stage 2	876	759	-	794	732	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	10.5	9	0.3
HCM LOS	B	A	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1524	-	-	684	933	1427	-	-
HCM Lane V/C Ratio	0.004	-	-	0.041	0.04	0.034	-	-
HCM Control Delay (s)	7.4	-	-	10.5	9	7.6	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	45	72	21
Conflicting Peds, #/hr	2	0	2
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	200	-	165
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	93	93	93
Heavy Vehicles, %	1	1	1
Mvmt Flow	48	77	23

Major/Minor	Major2		
Conflicting Flow All	156	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.21	-	-
Pot Cap-1 Maneuver	1429	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1427	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	2.5
HCM LOS	

Minor Lane/Major Mvmt

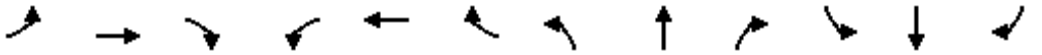
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	62	306	12	2	26	287	18	786	6	367	385	7
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	66	326	13	2	28	0	19	836	0	390	410	0
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	2	2	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	135	666	26	8	224	191	62	1485	0	490	1866	0
Arrive On Green	0.07	0.19	0.19	0.00	0.12	0.00	0.03	0.41	0.00	0.14	0.52	0.00
Sat Flow, veh/h	1810	3539	141	1810	1900	1615	1810	3705	0	3510	3705	0
Grp Volume(v), veh/h	66	166	173	2	28	0	19	836	0	390	410	0
Grp Sat Flow(s),veh/h/ln	1810	1805	1875	1810	1900	1615	1810	1805	0	1755	1805	0
Q Serve(g_s), s	3.0	6.9	7.0	0.1	1.1	0.0	0.9	15.0	0.0	9.1	5.2	0.0
Cycle Q Clear(g_c), s	3.0	6.9	7.0	0.1	1.1	0.0	0.9	15.0	0.0	9.1	5.2	0.0
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	135	340	353	8	224	191	62	1485	0	490	1866	0
V/C Ratio(X)	0.49	0.49	0.49	0.25	0.12	0.00	0.31	0.56	0.00	0.80	0.22	0.00
Avail Cap(c_a), veh/h	359	975	1012	188	846	719	210	2943	0	1443	4009	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	37.6	30.7	30.7	42.0	33.4	0.0	39.9	19.1	0.0	35.2	11.1	0.0
Incr Delay (d2), s/veh	1.0	1.5	1.5	6.2	0.4	0.0	1.0	0.5	0.0	1.1	0.1	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	1.5	3.6	3.8	0.1	0.6	0.0	0.5	7.5	0.0	4.5	2.6	0.0
LnGrp Delay(d),s/veh	38.6	32.2	32.2	48.2	33.8	0.0	40.9	19.6	0.0	36.4	11.2	0.0
LnGrp LOS	D	C	C	D	C		D	B		D	B	
Approach Vol, veh/h		405			30			855			800	
Approach Delay, s/veh		33.3			34.7			20.0			23.5	
Approach LOS		C			C			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	16.0	41.8	4.6	22.2	7.1	50.8	10.5	16.3
Change Period (Y+Rc), s	* 4.2	7.0	* 4.2	6.3	* 4.2	7.0	* 4.2	6.3
Max Green Setting (Gmax), s	* 35	69.0	* 8.8	45.7	* 9.8	94.0	* 17	37.7
Max Q Clear Time (g_c+I1), s	11.1	17.0	2.1	9.0	2.9	7.2	5.0	3.1
Green Ext Time (p_c), s	0.7	17.8	0.0	3.3	0.0	19.6	0.0	3.3

Intersection Summary	
HCM 2010 Ctrl Delay	24.1
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



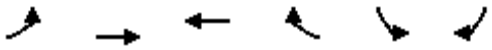
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	0	10	0	0	0	30	365	0	0	36	15
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	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	1881	1881	1900	1900	1900	1900	1881	1863	1900	0	1863	1881
Adj Flow Rate, veh/h	16	0	11	0	0	0	32	388	0	0	38	16
Adj No. of Lanes	2	1	0	1	1	0	1	2	0	0	1	2
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, %	1	0	0	0	0	0	1	2	2	0	2	1
Cap, veh/h	67	0	177	114	39	0	61	2556	0	0	1149	1729
Arrive On Green	0.02	0.00	0.11	0.00	0.00	0.00	0.03	0.72	0.00	0.00	0.62	0.62
Sat Flow, veh/h	3476	0	1595	1426	1900	0	1792	3632	0	0	1863	2803
Grp Volume(v), veh/h	16	0	11	0	0	0	32	388	0	0	38	16
Grp Sat Flow(s),veh/h/ln	1738	0	1595	1426	1900	0	1792	1770	0	0	1863	1401
Q Serve(g_s), s	0.3	0.0	0.4	0.0	0.0	0.0	1.1	2.2	0.0	0.0	0.5	0.1
Cycle Q Clear(g_c), s	0.3	0.0	0.4	0.0	0.0	0.0	1.1	2.2	0.0	0.0	0.5	0.1
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	67	0	177	114	39	0	61	2556	0	0	1149	1729
V/C Ratio(X)	0.24	0.00	0.06	0.00	0.00	0.00	0.52	0.15	0.00	0.00	0.03	0.01
Avail Cap(c_a), veh/h	524	0	861	538	603	0	384	2556	0	0	1149	1729
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	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	0.0	25.1	0.0	0.0	0.0	29.9	2.7	0.0	0.0	4.7	4.7
Incr Delay (d2), s/veh	1.8	0.0	0.1	0.0	0.0	0.0	6.8	0.1	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.2	0.0	0.0	0.0	0.7	1.1	0.0	0.0	0.3	0.1
LnGrp Delay(d),s/veh	32.2	0.0	25.2	0.0	0.0	0.0	36.8	2.9	0.0	0.0	4.7	4.7
LnGrp LOS	C		C				D	A			A	A
Approach Vol, veh/h		27			0			420			54	
Approach Delay, s/veh		29.4			0.0			5.4			4.7	
Approach LOS		C						A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6		8
Phs Duration (G+Y+Rc), s		13.0	6.6	43.4	5.7	7.3		50.0
Change Period (Y+Rc), s		6.0	4.5	4.5	4.5	* 6		4.5
Max Green Setting (Gmax), s		34.0	13.5	27.5	9.5	* 20		45.5
Max Q Clear Time (g_c+I1), s		2.4	3.1	2.5	2.3	0.0		4.2
Green Ext Time (p_c), s		0.0	0.0	2.9	0.0	0.0		3.2

Intersection Summary	
HCM 2010 Ctrl Delay	6.6
HCM 2010 LOS	A

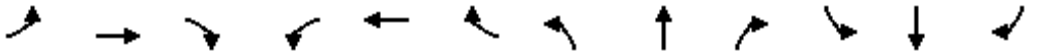
Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	25	45	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0			
Lane Util. Factor		1.00	1.00			
Frpb, ped/bikes		1.00	1.00			
Flpb, ped/bikes		1.00	1.00			
Frt		1.00	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		1881	1881			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		1881	1881			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	27	48	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	27	48	0	0	0
Confl. Peds. (#/hr)	5			5	5	5
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Perm
Protected Phases	5 8	2	6	7	7	
Permitted Phases				6		7
Actuated Green, G (s)		25.7	25.7			
Effective Green, g (s)		25.7	25.7			
Actuated g/C Ratio		1.00	1.00			
Clearance Time (s)		5.0	5.0			
Vehicle Extension (s)		3.0	3.0			
Lane Grp Cap (vph)		1881	1881			
v/s Ratio Prot		0.01	c0.03			
v/s Ratio Perm						
v/c Ratio		0.01	0.03			
Uniform Delay, d1		0.0	0.0			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.0	0.0			
Delay (s)		0.0	0.0			
Level of Service		A	A			
Approach Delay (s)		0.0	0.0		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM 2000 Control Delay	0.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.08		
Actuated Cycle Length (s)	25.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



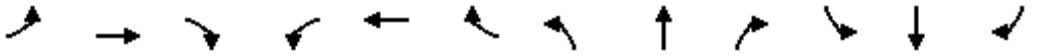
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	67	55	21	0	249	293	17	313	4	242	723	206
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	71	59	22	0	265	0	18	333	0	257	769	0
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	2	2	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	149	880	312	2	377	321	60	1173	0	371	1435	0
Arrive On Green	0.08	0.34	0.34	0.00	0.20	0.00	0.03	0.33	0.00	0.11	0.40	0.00
Sat Flow, veh/h	1810	2615	926	1810	1900	1615	1810	3705	0	3510	3705	0
Grp Volume(v), veh/h	71	40	41	0	265	0	18	333	0	257	769	0
Grp Sat Flow(s),veh/h/ln	1810	1805	1737	1810	1900	1615	1810	1805	0	1755	1805	0
Q Serve(g_s), s	2.8	1.1	1.2	0.0	9.8	0.0	0.7	5.2	0.0	5.3	12.3	0.0
Cycle Q Clear(g_c), s	2.8	1.1	1.2	0.0	9.8	0.0	0.7	5.2	0.0	5.3	12.3	0.0
Prop In Lane	1.00		0.53	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	149	608	584	2	377	321	60	1173	0	371	1435	0
V/C Ratio(X)	0.48	0.07	0.07	0.00	0.70	0.00	0.30	0.28	0.00	0.69	0.54	0.00
Avail Cap(c_a), veh/h	452	1379	1327	192	1179	1002	236	3214	0	1204	3982	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.0	16.9	17.0	0.0	28.1	0.0	35.5	18.9	0.0	32.5	17.4	0.0
Incr Delay (d2), s/veh	0.9	0.1	0.1	0.0	3.4	0.0	1.0	0.2	0.0	0.9	0.4	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	1.4	0.6	0.6	0.0	5.5	0.0	0.4	2.6	0.0	2.6	6.2	0.0
LnGrp Delay(d),s/veh	33.9	17.0	17.0	0.0	31.5	0.0	36.5	19.1	0.0	33.3	17.8	0.0
LnGrp LOS	C	B	B		C		D	B		C	B	
Approach Vol, veh/h		152			265			351			1026	
Approach Delay, s/veh		24.9			31.5			20.0			21.7	
Approach LOS		C			C			B			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	12.2	31.5	0.0	31.6	6.7	36.9	10.4	21.2
Change Period (Y+Rc), s	* 4.2	7.0	* 4.2	6.3	* 4.2	7.0	* 4.2	6.3
Max Green Setting (Gmax), s	* 26	67.0	* 8	57.5	* 9.8	83.0	* 19	46.7
Max Q Clear Time (g_c+I1), s	7.3	7.2	0.0	3.2	2.7	14.3	4.8	11.8
Green Ext Time (p_c), s	0.4	15.3	0.0	3.3	0.0	15.6	0.1	3.2

Intersection Summary	
HCM 2010 Ctrl Delay	23.1
HCM 2010 LOS	C

Notes

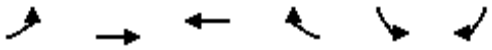
* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	92	0	30	0	0	0	10	51	0	0	226	246
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	1881	0	1881	1900	1900	1900	1881	1863	1900	0	1863	1881
Adj Flow Rate, veh/h	98	0	32	0	0	0	11	54	0	0	240	262
Adj No. of Lanes	2	0	1	1	1	0	1	2	0	0	1	2
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, %	1	0	1	0	0	0	1	2	2	0	2	1
Cap, veh/h	237	0	0	123	3	0	25	2754	0	0	1280	1934
Arrive On Green	0.07	0.00	0.00	0.00	0.00	0.00	0.01	0.78	0.00	0.00	0.69	0.69
Sat Flow, veh/h	3476	98		1399	1900	0	1792	3632	0	0	1863	2814
Grp Volume(v), veh/h	98	27.3		0	0	0	11	54	0	0	240	262
Grp Sat Flow(s),veh/h/ln	1738	C		1399	1900	0	1792	1770	0	0	1863	1407
Q Serve(g_s), s	1.6			0.0	0.0	0.0	0.4	0.2	0.0	0.0	2.7	1.9
Cycle Q Clear(g_c), s	1.6			0.0	0.0	0.0	0.4	0.2	0.0	0.0	2.7	1.9
Prop In Lane	1.00			1.00		0.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	237			123	3	0	25	2754	0	0	1280	1934
V/C Ratio(X)	0.41			0.00	0.00	0.00	0.44	0.02	0.00	0.00	0.19	0.14
Avail Cap(c_a), veh/h	565			745	699	0	230	2754	0	0	1280	1934
HCM Platoon Ratio	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	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	26.1			0.0	0.0	0.0	28.6	1.5	0.0	0.0	3.3	3.2
Incr Delay (d2), s/veh	1.2			0.0	0.0	0.0	11.6	0.0	0.0	0.0	0.1	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
%ile BackOfQ(50%),veh/ln	0.8			0.0	0.0	0.0	0.3	0.1	0.0	0.0	1.4	0.7
LnGrp Delay(d),s/veh	27.3			0.0	0.0	0.0	40.2	1.5	0.0	0.0	3.4	3.2
LnGrp LOS	C						D	A			A	A
Approach Vol, veh/h					0			65			502	
Approach Delay, s/veh					0.0			8.0			3.3	
Approach LOS								A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4	5	6		8
Phs Duration (G+Y+Rc), s			5.3	44.7	8.5	0.0		50.0
Change Period (Y+Rc), s			4.5	4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s			7.5	33.5	9.5	21.5		45.5
Max Q Clear Time (g_c+I1), s			2.4	4.7	3.6	0.0		2.2
Green Ext Time (p_c), s			0.0	3.0	0.1	0.0		3.1

Intersection Summary	
HCM 2010 Ctrl Delay	7.3
HCM 2010 LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	69	45	25	231	77	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	1881	1881	1599	3467	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	1881	1881	1599	3467	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	73	48	27	246	82	24
RTOR Reduction (vph)	0	0	0	149	0	20
Lane Group Flow (vph)	73	48	27	97	82	4
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Perm
Protected Phases	5 8	2	6	7	7	
Permitted Phases				6		7
Actuated Green, G (s)	8.5	16.5	8.6	15.4	6.8	6.8
Effective Green, g (s)	6.5	16.5	8.6	15.4	6.8	6.8
Actuated g/C Ratio	0.17	0.42	0.22	0.40	0.17	0.17
Clearance Time (s)		5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	298	797	415	838	606	279
v/s Ratio Prot	c0.04	0.03	0.01	c0.02	0.02	
v/s Ratio Perm				0.04		0.00
v/c Ratio	0.24	0.06	0.07	0.12	0.14	0.02
Uniform Delay, d1	14.1	6.6	12.0	7.4	13.6	13.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.0	0.1	0.1	0.1	0.0
Delay (s)	14.5	6.7	12.0	7.5	13.7	13.3
Level of Service	B	A	B	A	B	B
Approach Delay (s)		11.4	8.0		13.6	
Approach LOS		B	A		B	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.18		
Actuated Cycle Length (s)	38.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	26.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	27	0	2	3	0	30	1	212	7
Conflicting Peds, #/hr	1	0	0	0	0	1	2	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	55	-	-	40	-	65	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1
Mvmt Flow	29	0	2	3	0	32	1	228	8

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	398	520	207	517	516	123	203	0	0
Stage 1	281	281	-	235	235	-	-	-	-
Stage 2	117	239	-	282	281	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.3	6.5	6.9	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.5	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-
Pot Cap-1 Maneuver	553	463	839	459	466	911	1375	-	-
Stage 1	730	682	-	753	714	-	-	-	-
Stage 2	881	711	-	729	682	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	519	448	836	445	451	907	1370	-	-
Mov Cap-2 Maneuver	519	448	-	445	451	-	-	-	-
Stage 1	729	661	-	752	713	-	-	-	-
Stage 2	846	710	-	703	661	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	12.1	9.5	0
HCM LOS	B	A	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1370	-	-	519	836	445	-	907	1332	-	-
HCM Lane V/C Ratio	0.001	-	-	0.056	0.003	0.007	-	0.036	0.029	-	-
HCM Control Delay (s)	7.6	-	-	12.3	9.3	13.1	0	9.1	7.8	-	-
HCM Lane LOS	A	-	-	B	A	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0	-	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	36	188	32
Conflicting Peds, #/hr	4	0	2
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	0	-	230
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	93	93	93
Heavy Vehicles, %	1	1	1
Mvmt Flow	39	202	34

Major/Minor	Major2		
Conflicting Flow All	236	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.21	-	-
Pot Cap-1 Maneuver	1336	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1332	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	1.1
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	21	0	5	2	0	33	6	163	4
Conflicting Peds, #/hr	1	0	1	1	0	1	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	170	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1
Mvmt Flow	23	0	5	2	0	35	6	175	4

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	346	437	149	438	435	93	147	0	0
Stage 1	244	244	-	191	191	-	-	-	-
Stage 2	102	193	-	247	244	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.3	6.5	6.9	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.5	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-
Pot Cap-1 Maneuver	601	516	903	520	517	952	1441	-	-
Stage 1	764	708	-	798	746	-	-	-	-
Stage 2	899	745	-	761	708	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	560	495	901	500	496	950	1439	-	-
Mov Cap-2 Maneuver	560	495	-	500	496	-	-	-	-
Stage 1	760	683	-	794	742	-	-	-	-
Stage 2	860	741	-	729	683	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	11.2	9.2	0.3
HCM LOS	B	A	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1439	-	-	604	904	1397	-	-
HCM Lane V/C Ratio	0.004	-	-	0.046	0.042	0.035	-	-
HCM Control Delay (s)	7.5	-	-	11.2	9.2	7.7	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	45	136	15
Conflicting Peds, #/hr	2	0	2
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	200	-	165
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	93	93	93
Heavy Vehicles, %	1	1	1
Mvmt Flow	48	146	16

Major/Minor	Major2		
Conflicting Flow All	181	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.21	-	-
Pot Cap-1 Maneuver	1399	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1397	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	1.8
HCM LOS	

Minor Lane/Major Mvmt

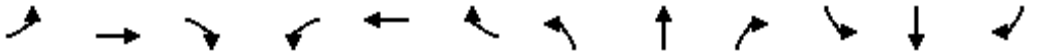
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	117	326	13	2	82	287	21	786	6	367	385	163
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	124	347	14	2	87	0	22	836	0	390	410	0
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	2	2	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	160	708	28	8	221	188	69	1459	0	489	1824	0
Arrive On Green	0.09	0.20	0.20	0.00	0.12	0.00	0.04	0.40	0.00	0.14	0.51	0.00
Sat Flow, veh/h	1810	3538	142	1810	1900	1615	1810	3705	0	3510	3705	0
Grp Volume(v), veh/h	124	177	184	2	87	0	22	836	0	390	410	0
Grp Sat Flow(s),veh/h/ln	1810	1805	1875	1810	1900	1615	1810	1805	0	1755	1805	0
Q Serve(g_s), s	5.8	7.5	7.5	0.1	3.6	0.0	1.0	15.4	0.0	9.3	5.5	0.0
Cycle Q Clear(g_c), s	5.8	7.5	7.5	0.1	3.6	0.0	1.0	15.4	0.0	9.3	5.5	0.0
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	160	361	375	8	221	188	69	1459	0	489	1824	0
V/C Ratio(X)	0.78	0.49	0.49	0.25	0.39	0.00	0.32	0.57	0.00	0.80	0.22	0.00
Avail Cap(c_a), veh/h	522	1085	1127	185	788	670	185	2727	0	1338	3735	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.4	30.5	30.5	42.7	35.2	0.0	40.3	19.9	0.0	35.9	11.9	0.0
Incr Delay (d2), s/veh	3.1	1.5	1.4	6.2	1.6	0.0	1.0	0.5	0.0	1.2	0.1	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	3.0	3.9	4.0	0.1	2.0	0.0	0.5	7.8	0.0	4.6	2.7	0.0
LnGrp Delay(d),s/veh	41.5	32.0	31.9	48.9	36.8	0.0	41.3	20.4	0.0	37.0	12.0	0.0
LnGrp LOS	D	C	C	D	D		D	C		D	B	
Approach Vol, veh/h		485			89			858			800	
Approach Delay, s/veh		34.4			37.1			20.9			24.2	
Approach LOS		C			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	16.2	41.8	4.6	23.5	7.5	50.5	11.8	16.3
Change Period (Y+Rc), s	* 4.2	7.0	* 4.2	6.3	* 4.2	7.0	* 4.2	6.3
Max Green Setting (Gmax), s	* 33	65.0	* 8.8	51.7	* 8.8	89.0	* 25	35.7
Max Q Clear Time (g_c+I1), s	11.3	17.4	2.1	9.5	3.0	7.5	7.8	5.6
Green Ext Time (p_c), s	0.7	17.3	0.0	4.2	0.0	19.4	0.1	4.0

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



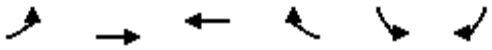
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	91	0	10	0	0	0	30	365	0	0	36	230
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	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	1881	1881	1900	1900	1900	1900	1881	1863	1900	0	1863	1881
Adj Flow Rate, veh/h	97	0	11	0	0	0	32	388	0	0	38	245
Adj No. of Lanes	2	1	0	1	1	0	1	2	0	0	1	2
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, %	1	0	0	0	0	0	1	2	2	0	2	1
Cap, veh/h	230	0	183	118	3	0	61	2524	0	0	1127	1696
Arrive On Green	0.07	0.00	0.11	0.00	0.00	0.00	0.03	0.71	0.00	0.00	0.61	0.61
Sat Flow, veh/h	3476	0	1595	1426	1900	0	1792	3632	0	0	1863	2803
Grp Volume(v), veh/h	97	0	11	0	0	0	32	388	0	0	38	245
Grp Sat Flow(s),veh/h/ln	1738	0	1595	1426	1900	0	1792	1770	0	0	1863	1401
Q Serve(g_s), s	1.6	0.0	0.4	0.0	0.0	0.0	1.1	2.2	0.0	0.0	0.5	2.3
Cycle Q Clear(g_c), s	1.6	0.0	0.4	0.0	0.0	0.0	1.1	2.2	0.0	0.0	0.5	2.3
Prop In Lane	1.00		1.00	1.00		0.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h	230	0	183	118	3	0	61	2524	0	0	1127	1696
V/C Ratio(X)	0.42	0.00	0.06	0.00	0.00	0.00	0.52	0.15	0.00	0.00	0.03	0.14
Avail Cap(c_a), veh/h	598	0	941	645	654	0	279	2524	0	0	1127	1696
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	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	27.4	0.0	24.1	0.0	0.0	0.0	29.0	2.8	0.0	0.0	4.9	5.2
Incr Delay (d2), s/veh	1.2	0.0	0.1	0.0	0.0	0.0	6.7	0.1	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.2	0.0	0.0	0.0	0.6	1.1	0.0	0.0	0.3	0.9
LnGrp Delay(d),s/veh	28.6	0.0	24.2	0.0	0.0	0.0	35.6	2.9	0.0	0.0	4.9	5.3
LnGrp LOS	C		C				D	A			A	A
Approach Vol, veh/h		108			0			420			283	
Approach Delay, s/veh		28.1			0.0			5.4			5.2	
Approach LOS		C						A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4	5	6		8
Phs Duration (G+Y+Rc), s		13.0	6.6	41.4	8.5	4.5		48.0
Change Period (Y+Rc), s		6.0	4.5	4.5	4.5	* 6		4.5
Max Green Setting (Gmax), s		36.0	9.5	29.5	10.5	* 21		43.5
Max Q Clear Time (g_c+I1), s		2.4	3.1	4.3	3.6	0.0		4.2
Green Ext Time (p_c), s		0.0	0.0	3.9	0.1	0.0		4.2

Intersection Summary	
HCM 2010 Ctrl Delay	8.4
HCM 2010 LOS	A

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	64	25	45	215	76	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	1881	1881	1575	3467	1558
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	1881	1881	1575	3467	1558
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	68	27	48	229	81	24
RTOR Reduction (vph)	0	0	0	135	0	20
Lane Group Flow (vph)	68	27	48	94	81	4
Confl. Peds. (#/hr)	5			5	5	5
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Perm
Protected Phases	5 8	2	6	7	7	
Permitted Phases				6		7
Actuated Green, G (s)	8.6	17.4	9.5	16.3	6.8	6.8
Effective Green, g (s)	6.6	17.4	9.5	16.3	6.8	6.8
Actuated g/C Ratio	0.17	0.44	0.24	0.41	0.17	0.17
Clearance Time (s)		5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	295	820	447	840	590	265
v/s Ratio Prot	c0.04	0.01	0.03	c0.02	0.02	
v/s Ratio Perm				0.04		0.00
v/c Ratio	0.23	0.03	0.11	0.11	0.14	0.02
Uniform Delay, d1	14.4	6.4	11.9	7.3	14.1	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.0	0.1	0.1	0.1	0.0
Delay (s)	14.8	6.5	12.0	7.4	14.2	13.8
Level of Service	B	A	B	A	B	B
Approach Delay (s)		12.5	8.2		14.1	
Approach LOS		B	A		B	

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	39.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

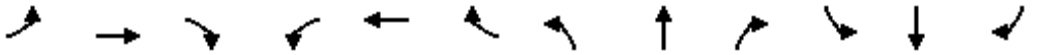
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	85	72	48	2	222	343	40	1911	4	263	1941	105
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	90	77	51	2	236	0	43	2033	0	280	2065	0
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	2	2	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	103	412	252	8	263	223	73	2139	0	309	2312	0
Arrive On Green	0.06	0.19	0.19	0.00	0.14	0.00	0.04	0.59	0.00	0.09	0.64	0.00
Sat Flow, veh/h	1810	2155	1317	1810	1900	1615	1810	3705	0	3510	3705	0
Grp Volume(v), veh/h	90	63	65	2	236	0	43	2033	0	280	2065	0
Grp Sat Flow(s),veh/h/ln	1810	1805	1668	1810	1900	1615	1810	1805	0	1755	1805	0
Q Serve(g_s), s	8.6	5.2	5.7	0.2	21.4	0.0	4.1	91.9	0.0	13.8	84.1	0.0
Cycle Q Clear(g_c), s	8.6	5.2	5.7	0.2	21.4	0.0	4.1	91.9	0.0	13.8	84.1	0.0
Prop In Lane	1.00		0.79	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	103	345	319	8	263	223	73	2139	0	309	2312	0
V/C Ratio(X)	0.87	0.18	0.20	0.26	0.90	0.00	0.59	0.95	0.00	0.91	0.89	0.00
Avail Cap(c_a), veh/h	103	345	319	83	312	265	84	2150	0	309	2312	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	81.8	59.3	59.5	86.8	74.2	0.0	82.6	33.3	0.0	79.1	26.4	0.0
Incr Delay (d2), s/veh	48.5	0.4	0.4	6.5	25.7	0.0	3.7	10.2	0.0	28.0	5.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	2.6	2.7	0.1	13.1	0.0	2.1	48.5	0.0	7.9	43.2	0.0
LnGrp Delay(d),s/veh	130.3	59.7	60.0	93.4	99.8	0.0	86.3	43.5	0.0	107.0	31.5	0.0
LnGrp LOS	F	E	E	F	F		F	D		F	C	
Approach Vol, veh/h		218			238			2076			2345	
Approach Delay, s/veh		88.9			99.8			44.4			40.5	
Approach LOS		F			F			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.6	110.6	4.9	39.8	11.2	119.0	14.2	30.5
Change Period (Y+Rc), s	* 4.2	7.0	* 4.2	6.3	* 4.2	7.0	* 4.2	6.3
Max Green Setting (Gmax), s	* 15	104.2	* 8	30.7	* 8.1	111.5	* 10	28.7
Max Q Clear Time (g_c+I1), s	15.8	93.9	2.2	7.7	6.1	86.1	10.6	23.4
Green Ext Time (p_c), s	0.0	9.7	0.0	3.0	0.0	25.3	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	47.2
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



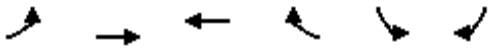
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	132	28	45	3	49	22	25	51	2	13	226	128
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	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	1881	1888	1900	1900	1900	1900	1881	1864	1900	1900	1865	1881
Adj Flow Rate, veh/h	140	30	48	3	52	23	27	54	2	14	240	136
Adj No. of Lanes	2	1	0	1	1	0	1	2	0	0	1	2
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, %	1	0	0	0	0	0	1	2	2	2	2	1
Cap, veh/h	239	95	151	7	100	44	53	2192	81	77	965	1494
Arrive On Green	0.07	0.14	0.14	0.00	0.08	0.08	0.03	0.63	0.63	0.53	0.53	0.53
Sat Flow, veh/h	3476	654	1047	1810	1248	552	1792	3483	128	39	1810	2801
Grp Volume(v), veh/h	140	0	78	3	0	75	27	27	29	254	0	136
Grp Sat Flow(s),veh/h/ln	1738	0	1701	1810	0	1800	1792	1771	1841	1849	0	1401
Q Serve(g_s), s	2.6	0.0	2.8	0.1	0.0	2.7	1.0	0.4	0.4	0.0	0.0	1.6
Cycle Q Clear(g_c), s	2.6	0.0	2.8	0.1	0.0	2.7	1.0	0.4	0.4	5.0	0.0	1.6
Prop In Lane	1.00		0.62	1.00		0.31	1.00		0.07	0.06		1.00
Lane Grp Cap(c), veh/h	239	0	246	7	0	144	53	1114	1158	1042	0	1494
V/C Ratio(X)	0.59	0.00	0.32	0.41	0.00	0.52	0.51	0.02	0.02	0.24	0.00	0.09
Avail Cap(c_a), veh/h	540	0	680	147	0	586	199	1114	1158	1042	0	1494
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	30.5	0.0	25.9	33.6	0.0	29.8	32.3	4.7	4.7	8.5	0.0	7.7
Incr Delay (d2), s/veh	2.3	0.0	0.7	32.7	0.0	2.9	7.5	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	1.4	0.1	0.0	1.4	0.6	0.2	0.2	2.6	0.0	0.6
LnGrp Delay(d),s/veh	32.8	0.0	26.6	66.3	0.0	32.7	39.8	4.8	4.8	8.6	0.0	7.8
LnGrp LOS	C		C	E		C	D	A	A	A		A
Approach Vol, veh/h		218			78			83			390	
Approach Delay, s/veh		30.6			34.0			16.2			8.3	
Approach LOS		C			C			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	4.8	15.8	6.5	40.5	9.1	11.4		47.0
Change Period (Y+Rc), s	4.5	6.0	4.5	4.5	4.5	* 6		4.5
Max Green Setting (Gmax), s	5.5	27.0	7.5	30.5	10.5	* 22		42.5
Max Q Clear Time (g_c+I1), s	2.1	4.8	3.0	7.0	4.6	4.7		2.4
Green Ext Time (p_c), s	0.0	0.8	0.0	2.4	0.2	0.7		2.5

Intersection Summary	
HCM 2010 Ctrl Delay	18.1
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	109	130	109	93	75	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	1881	1881	1568	3467	1557
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	1881	1881	1568	3467	1557
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	116	138	116	99	80	93
RTOR Reduction (vph)	0	0	0	59	0	83
Lane Group Flow (vph)	116	138	116	40	80	10
Confl. Peds. (#/hr)	5			5	5	5
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Perm
Protected Phases	5 8	2	6	7	7	
Permitted Phases				6		7
Actuated Green, G (s)	12.2	22.6	13.3	18.3	5.0	5.0
Effective Green, g (s)	10.2	22.6	13.3	18.3	5.0	5.0
Actuated g/C Ratio	0.22	0.50	0.29	0.40	0.11	0.11
Clearance Time (s)		5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	400	934	549	802	380	171
v/s Ratio Prot	c0.06	0.07	c0.06	0.01	c0.02	
v/s Ratio Perm				0.02		0.01
v/c Ratio	0.29	0.15	0.21	0.05	0.21	0.06
Uniform Delay, d1	14.6	6.2	12.1	8.3	18.5	18.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.2	0.0	0.3	0.1
Delay (s)	15.0	6.3	12.3	8.3	18.7	18.3
Level of Service	B	A	B	A	B	B
Approach Delay (s)		10.3	10.5		18.5	
Approach LOS		B	B		B	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	45.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	26.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	27	0	2	3	0	30	1	785	7
Conflicting Peds, #/hr	1	0	0	0	0	1	2	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	55	-	-	40	-	65	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1
Mvmt Flow	29	0	2	3	0	32	1	844	8

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1077	1507	578	1504	1503	431	574	0	0
Stage 1	652	652	-	851	851	-	-	-	-
Stage 2	425	855	-	653	652	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.3	6.5	6.9	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.5	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-
Pot Cap-1 Maneuver	187	122	519	93	123	578	1004	-	-
Stage 1	460	467	-	325	379	-	-	-	-
Stage 2	583	378	-	460	467	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	169	116	517	89	117	576	1001	-	-
Mov Cap-2 Maneuver	169	116	-	89	117	-	-	-	-
Stage 1	459	443	-	324	378	-	-	-	-
Stage 2	548	377	-	434	443	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	29.4	14.8	0
HCM LOS	D	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1001	-	-	169	517	89	-	576	785	-	-
HCM Lane V/C Ratio	0.001	-	-	0.172	0.004	0.036	-	0.056	0.049	-	-
HCM Control Delay (s)	8.6	-	-	30.7	12	47	0	11.6	9.8	-	-
HCM Lane LOS	A	-	-	D	B	E	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0	0.1	-	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	36	533	32
Conflicting Peds, #/hr	4	0	2
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	0	-	230
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	93	93	93
Heavy Vehicles, %	1	1	1
Mvmt Flow	39	573	34

Major/Minor	Major2		
Conflicting Flow All	853	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.21	-	-
Pot Cap-1 Maneuver	788	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	785	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.6
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	21	0	5	3	0	42	6	730	5
Conflicting Peds, #/hr	1	0	1	1	0	1	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	170	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1
Mvmt Flow	23	0	5	3	0	45	6	785	5

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1031	1429	504	1429	1427	398	502	0	0
Stage 1	625	625	-	802	802	-	-	-	-
Stage 2	406	804	-	627	625	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.3	6.5	6.9	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.5	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-
Pot Cap-1 Maneuver	201	136	572	105	136	607	1068	-	-
Stage 1	476	480	-	348	399	-	-	-	-
Stage 2	598	398	-	475	480	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	174	125	571	98	125	605	1066	-	-
Mov Cap-2 Maneuver	174	125	-	98	125	-	-	-	-
Stage 1	473	444	-	346	396	-	-	-	-
Stage 2	549	395	-	435	444	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	25.8	14	0.1
HCM LOS	D	B	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1066	-	-	201	450	831	-	-
HCM Lane V/C Ratio	0.006	-	-	0.139	0.108	0.074	-	-
HCM Control Delay (s)	8.4	-	-	25.8	14	9.7	-	-
HCM Lane LOS	A	-	-	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.4	0.2	-	-

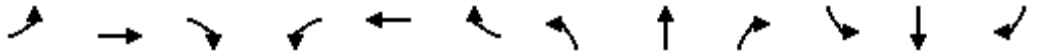
Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	57	466	15
Conflicting Peds, #/hr	2	0	2
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	200	-	165
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	93	93	93
Heavy Vehicles, %	1	1	1
Mvmt Flow	61	501	16

Major/Minor	Major2		
Conflicting Flow All	791	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.21	-	-
Pot Cap-1 Maneuver	832	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	831	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	1
HCM LOS	

Minor Lane/Major Mvmt



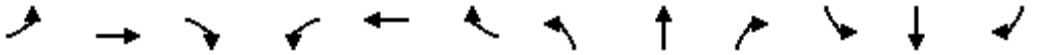
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	206	377	65	4	72	287	54	2375	6	367	1337	102
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	219	401	69	4	77	0	57	2527	0	390	1422	0
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	2	2	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	195	471	80	15	101	86	78	2213	0	358	2426	0
Arrive On Green	0.11	0.15	0.15	0.01	0.05	0.00	0.04	0.61	0.00	0.10	0.67	0.00
Sat Flow, veh/h	1810	3085	527	1810	1900	1615	1810	3705	0	3510	3705	0
Grp Volume(v), veh/h	219	233	237	4	77	0	57	2527	0	390	1422	0
Grp Sat Flow(s),veh/h/ln	1810	1805	1807	1810	1900	1615	1810	1805	0	1755	1805	0
Q Serve(g_s), s	18.8	22.0	22.3	0.4	7.0	0.0	5.4	107.0	0.0	17.8	37.2	0.0
Cycle Q Clear(g_c), s	18.8	22.0	22.3	0.4	7.0	0.0	5.4	107.0	0.0	17.8	37.2	0.0
Prop In Lane	1.00		0.29	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	195	276	276	15	101	86	78	2213	0	358	2426	0
V/C Ratio(X)	1.12	0.85	0.86	0.27	0.76	0.00	0.73	1.14	0.00	1.09	0.59	0.00
Avail Cap(c_a), veh/h	195	276	276	83	160	136	125	2213	0	358	2426	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	77.9	72.0	72.1	86.1	81.6	0.0	82.5	33.8	0.0	78.4	15.5	0.0
Incr Delay (d2), s/veh	101.6	21.6	23.2	3.7	15.5	0.0	4.9	69.9	0.0	73.7	0.4	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	14.9	12.6	13.0	0.2	4.1	0.0	2.8	74.6	0.0	12.3	18.5	0.0
LnGrp Delay(d),s/veh	179.5	93.6	95.3	89.7	97.1	0.0	87.5	103.7	0.0	152.1	15.9	0.0
LnGrp LOS	F	F	F	F	F		F	F		F	B	
Approach Vol, veh/h		689			81			2584			1812	
Approach Delay, s/veh		121.5			96.7			103.3			45.2	
Approach LOS		F			F			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	114.0	5.6	33.0	11.7	124.3	23.0	15.6
Change Period (Y+Rc), s	* 4.2	7.0	* 4.2	6.3	* 4.2	7.0	* 4.2	6.3
Max Green Setting (Gmax), s	* 18	107.0	* 8	25.5	* 12	112.7	* 19	14.7
Max Q Clear Time (g_c+I1), s	19.8	109.0	2.4	24.3	7.4	39.2	20.8	9.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.5	0.0	72.5	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	85.3
HCM 2010 LOS	F

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



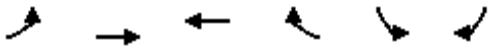
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	253	36	41	4	65	30	52	365	2	16	36	176
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	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	1881	1890	1900	1900	1900	1900	1881	1863	1900	1900	1874	1881
Adj Flow Rate, veh/h	269	38	44	4	69	32	55	388	2	17	38	187
Adj No. of Lanes	2	1	0	1	1	0	1	2	0	0	1	2
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, %	1	0	0	0	0	0	1	2	2	2	2	1
Cap, veh/h	387	162	188	10	119	55	85	2057	11	247	519	1275
Arrive On Green	0.11	0.20	0.20	0.01	0.10	0.10	0.05	0.57	0.57	0.46	0.46	0.46
Sat Flow, veh/h	3476	799	926	1810	1228	569	1792	3611	19	389	1140	2799
Grp Volume(v), veh/h	269	0	82	4	0	101	55	190	200	55	0	187
Grp Sat Flow(s),veh/h/ln	1738	0	1725	1810	0	1797	1792	1770	1860	1529	0	1399
Q Serve(g_s), s	5.0	0.0	2.7	0.1	0.0	3.6	2.0	3.5	3.5	0.0	0.0	2.6
Cycle Q Clear(g_c), s	5.0	0.0	2.7	0.1	0.0	3.6	2.0	3.5	3.5	1.1	0.0	2.6
Prop In Lane	1.00		0.54	1.00		0.32	1.00		0.01	0.31		1.00
Lane Grp Cap(c), veh/h	387	0	350	10	0	174	85	1008	1059	766	0	1275
V/C Ratio(X)	0.69	0.00	0.23	0.41	0.00	0.58	0.64	0.19	0.19	0.07	0.00	0.15
Avail Cap(c_a), veh/h	746	0	791	147	0	585	225	1008	1059	766	0	1275
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	28.9	0.0	22.5	33.5	0.0	29.2	31.6	7.0	7.0	10.3	0.0	10.7
Incr Delay (d2), s/veh	2.2	0.0	0.3	25.7	0.0	3.0	7.9	0.4	0.4	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	1.3	0.1	0.0	1.9	1.2	1.8	1.9	0.6	0.0	1.0
LnGrp Delay(d),s/veh	31.2	0.0	22.9	59.3	0.0	32.2	39.5	7.4	7.4	10.4	0.0	10.8
LnGrp LOS	C		C	E		C	D	A	A	B		B
Approach Vol, veh/h		351			105			445			242	
Approach Delay, s/veh		29.2			33.2			11.4			10.7	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	4.9	19.7	7.7	35.3	12.0	12.6		43.0
Change Period (Y+Rc), s	4.5	6.0	4.5	4.5	4.5	* 6		4.5
Max Green Setting (Gmax), s	5.5	31.0	8.5	25.5	14.5	* 22		38.5
Max Q Clear Time (g_c+I1), s	2.1	4.7	4.0	4.6	7.0	5.6		5.5
Green Ext Time (p_c), s	0.0	1.0	0.0	3.4	0.5	0.9		3.7

Intersection Summary	
HCM 2010 Ctrl Delay	18.7
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	162	139	155	138	191	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	1881	1881	1576	3467	1555
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	1881	1881	1576	3467	1555
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	172	148	165	147	203	237
RTOR Reduction (vph)	0	0	0	93	0	196
Lane Group Flow (vph)	172	148	165	54	203	41
Confl. Peds. (#/hr)	5			5	5	5
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Perm
Protected Phases	5 8	2	6	7	7	
Permitted Phases				6		7
Actuated Green, G (s)	17.3	21.1	10.0	18.9	8.9	8.9
Effective Green, g (s)	15.3	21.1	10.0	18.9	8.9	8.9
Actuated g/C Ratio	0.30	0.41	0.20	0.37	0.17	0.17
Clearance Time (s)		5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	534	775	367	735	602	270
v/s Ratio Prot	c0.10	0.08	c0.09	0.01	c0.06	
v/s Ratio Perm				0.02		0.03
v/c Ratio	0.32	0.19	0.45	0.07	0.34	0.15
Uniform Delay, d1	13.9	9.6	18.2	10.5	18.6	17.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1	0.9	0.0	0.3	0.3
Delay (s)	14.3	9.7	19.1	10.5	18.9	18.2
Level of Service	B	A	B	B	B	B
Approach Delay (s)		12.2	15.0		18.5	
Approach LOS		B	B		B	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	51.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

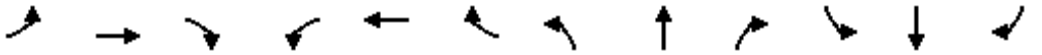
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	197	112	50	2	342	343	46	1911	4	263	1941	441
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	210	119	53	2	364	0	49	2033	0	280	2065	0
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	2	2	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	179	614	260	8	292	249	73	1981	0	273	2116	0
Arrive On Green	0.10	0.25	0.25	0.00	0.15	0.00	0.04	0.55	0.00	0.08	0.59	0.00
Sat Flow, veh/h	1810	2472	1048	1810	1900	1615	1810	3705	0	3510	3705	0
Grp Volume(v), veh/h	210	85	87	2	364	0	49	2033	0	280	2065	0
Grp Sat Flow(s),veh/h/ln	1810	1805	1715	1810	1900	1615	1810	1805	0	1755	1805	0
Q Serve(g_s), s	17.8	6.7	7.2	0.2	27.7	0.0	4.8	98.8	0.0	14.0	99.6	0.0
Cycle Q Clear(g_c), s	17.8	6.7	7.2	0.2	27.7	0.0	4.8	98.8	0.0	14.0	99.6	0.0
Prop In Lane	1.00		0.61	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	179	449	426	8	292	249	73	1981	0	273	2116	0
V/C Ratio(X)	1.17	0.19	0.20	0.26	1.24	0.00	0.67	1.03	0.00	1.03	0.98	0.00
Avail Cap(c_a), veh/h	179	449	426	80	292	249	80	1981	0	273	2116	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	81.1	53.3	53.5	89.3	76.2	0.0	85.1	40.6	0.0	83.0	36.0	0.0
Incr Delay (d2), s/veh	121.7	0.3	0.3	6.5	135.6	0.0	12.7	27.1	0.0	61.2	14.4	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	0.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.9	3.4	3.5	0.1	25.6	0.0	2.7	56.5	0.0	9.1	53.6	0.0
LnGrp Delay(d),s/veh	202.8	53.6	53.9	95.9	211.8	0.0	97.9	67.7	0.0	144.2	50.4	0.0
LnGrp LOS	F	D	D	F	F		F	F		F	D	
Approach Vol, veh/h		382			366			2082			2345	
Approach Delay, s/veh		135.7			211.2			68.5			61.6	
Approach LOS		F			F			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	18.2	105.8	5.0	51.0	11.5	112.5	22.0	34.0
Change Period (Y+Rc), s	* 4.2	7.0	* 4.2	6.3	* 4.2	7.0	* 4.2	6.3
Max Green Setting (Gmax), s	* 14	98.8	* 8	37.5	* 8	104.8	* 18	27.7
Max Q Clear Time (g_c+I1), s	16.0	100.8	2.2	9.2	6.8	101.6	19.8	29.7
Green Ext Time (p_c), s	0.0	0.0	0.0	5.0	0.0	3.2	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	80.4
HCM 2010 LOS	F

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



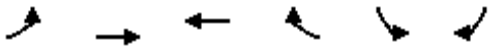
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	286	28	45	3	49	22	25	51	2	13	226	590
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	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	1881	1888	1900	1900	1900	1900	1881	1864	1900	1900	1865	1881
Adj Flow Rate, veh/h	304	30	48	3	52	23	27	54	2	14	240	628
Adj No. of Lanes	2	1	0	1	1	0	1	2	0	0	1	2
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, %	1	0	0	0	0	0	1	2	2	2	2	1
Cap, veh/h	428	130	208	7	100	44	53	1998	74	74	865	1335
Arrive On Green	0.12	0.20	0.20	0.00	0.08	0.08	0.03	0.57	0.57	0.48	0.48	0.48
Sat Flow, veh/h	3476	655	1047	1810	1248	552	1792	3483	128	36	1814	2800
Grp Volume(v), veh/h	304	0	78	3	0	75	27	27	29	254	0	628
Grp Sat Flow(s),veh/h/ln	1738	0	1702	1810	0	1800	1792	1771	1841	1850	0	1400
Q Serve(g_s), s	5.6	0.0	2.6	0.1	0.0	2.7	1.0	0.4	0.5	0.0	0.0	10.2
Cycle Q Clear(g_c), s	5.6	0.0	2.6	0.1	0.0	2.7	1.0	0.4	0.5	5.5	0.0	10.2
Prop In Lane	1.00		0.62	1.00		0.31	1.00		0.07	0.06		1.00
Lane Grp Cap(c), veh/h	428	0	339	7	0	144	53	1016	1056	939	0	1335
V/C Ratio(X)	0.71	0.00	0.23	0.41	0.00	0.52	0.51	0.03	0.03	0.27	0.00	0.47
Avail Cap(c_a), veh/h	802	0	786	148	0	563	173	1016	1056	939	0	1335
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	28.3	0.0	22.6	33.4	0.0	29.7	32.1	6.2	6.2	10.6	0.0	11.8
Incr Delay (d2), s/veh	2.2	0.0	0.3	32.7	0.0	2.9	7.5	0.0	0.0	0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	1.2	0.1	0.0	1.4	0.6	0.2	0.2	2.9	0.0	3.9
LnGrp Delay(d),s/veh	30.5	0.0	22.9	66.1	0.0	32.6	39.6	6.3	6.3	10.8	0.0	12.1
LnGrp LOS	C		C	E		C	D	A	A	B		B
Approach Vol, veh/h		382			78			83			882	
Approach Delay, s/veh		28.9			33.9			17.1			11.7	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	4.8	19.4	6.5	36.5	12.8	11.4		43.0
Change Period (Y+Rc), s	4.5	6.0	4.5	4.5	4.5	* 6		4.5
Max Green Setting (Gmax), s	5.5	31.0	6.5	27.5	15.5	* 21		38.5
Max Q Clear Time (g_c+I1), s	2.1	4.6	3.0	12.2	7.6	4.7		2.5
Green Ext Time (p_c), s	0.0	0.8	0.0	4.2	0.7	0.7		5.1

Intersection Summary	
HCM 2010 Ctrl Delay	17.9
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	247	130	109	555	229	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	1881	1881	1579	3467	1554
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	1881	1881	1579	3467	1554
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	263	138	116	590	244	141
RTOR Reduction (vph)	0	0	0	211	0	112
Lane Group Flow (vph)	263	138	116	379	244	29
Confl. Peds. (#/hr)	5			5	5	5
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Perm
Protected Phases	5 8	2	6	7	7	
Permitted Phases				6		7
Actuated Green, G (s)	20.2	21.0	9.2	20.6	11.4	11.4
Effective Green, g (s)	18.2	21.0	9.2	20.6	11.4	11.4
Actuated g/C Ratio	0.33	0.38	0.16	0.37	0.20	0.20
Clearance Time (s)		5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	582	707	310	724	708	317
v/s Ratio Prot	c0.15	0.07	0.06	c0.11	0.07	
v/s Ratio Perm				0.13		0.02
v/c Ratio	0.45	0.20	0.37	0.52	0.34	0.09
Uniform Delay, d1	14.9	11.7	20.7	13.8	19.0	18.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	0.8	0.7	0.3	0.1
Delay (s)	15.4	11.8	21.5	14.4	19.3	18.1
Level of Service	B	B	C	B	B	B
Approach Delay (s)		14.2	15.6		18.9	
Approach LOS		B	B		B	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	27	0	2	3	0	30	1	831	7
Conflicting Peds, #/hr	1	0	0	0	0	1	2	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	55	-	-	40	-	65	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1
Mvmt Flow	29	0	2	3	0	32	1	894	8

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1239	1693	716	1690	1689	456	712	0	0
Stage 1	789	789	-	900	900	-	-	-	-
Stage 2	450	904	-	790	789	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.3	6.5	6.9	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.5	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-
Pot Cap-1 Maneuver	143	94	434	68	94	557	892	-	-
Stage 1	387	405	-	304	360	-	-	-	-
Stage 2	564	358	-	386	405	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	129	89	432	65	89	555	889	-	-
Mov Cap-2 Maneuver	129	89	-	65	89	-	-	-	-
Stage 1	386	384	-	303	359	-	-	-	-
Stage 2	529	357	-	363	384	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	38.9	16.6	0
HCM LOS	E	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	889	-	-	129	432	65	-	555	753	-	-
HCM Lane V/C Ratio	0.001	-	-	0.225	0.005	0.05	-	0.058	0.051	-	-
HCM Control Delay (s)	9.1	-	-	40.8	13.4	63.3	0	11.9	10	-	-
HCM Lane LOS	A	-	-	E	B	F	A	B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0	0.2	-	0.2	0.2	-	-

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	36	661	32
Conflicting Peds, #/hr	4	0	2
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	0	-	230
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	93	93	93
Heavy Vehicles, %	1	1	1
Mvmt Flow	39	711	34

Major/Minor	Major2		
Conflicting Flow All	902	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.21	-	-
Pot Cap-1 Maneuver	756	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	753	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.5
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	21	0	5	3	0	42	6	776	5
Conflicting Peds, #/hr	1	0	1	1	0	1	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	170	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	1	1	1
Mvmt Flow	23	0	5	3	0	45	6	834	5

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1193	1616	642	1616	1613	423	640	0	0
Stage 1	762	762	-	851	851	-	-	-	-
Stage 2	431	854	-	765	762	-	-	-	-
Critical Hdwy	7.3	6.5	6.2	7.3	6.5	6.9	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.5	5.5	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.209	-	-
Pot Cap-1 Maneuver	155	105	478	77	105	585	949	-	-
Stage 1	400	416	-	325	379	-	-	-	-
Stage 2	578	378	-	399	416	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	134	96	477	71	96	584	947	-	-
Mov Cap-2 Maneuver	134	96	-	71	96	-	-	-	-
Stage 1	397	384	-	323	376	-	-	-	-
Stage 2	529	375	-	364	384	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	33	15.4	0.1
HCM LOS	D	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	947	-	-	156	394	796	-	-
HCM Lane V/C Ratio	0.007	-	-	0.179	0.123	0.077	-	-
HCM Control Delay (s)	8.8	-	-	33	15.4	9.9	-	-
HCM Lane LOS	A	-	-	D	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.4	0.2	-	-

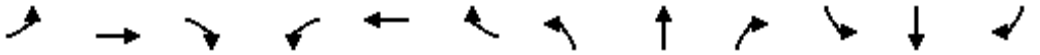
Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	57	594	15
Conflicting Peds, #/hr	2	0	2
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	200	-	165
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	93	93	93
Heavy Vehicles, %	1	1	1
Mvmt Flow	61	639	16

Major/Minor	Major2		
Conflicting Flow All	841	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.21	-	-
Pot Cap-1 Maneuver	797	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	796	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.8
HCM LOS	

Minor Lane/Major Mvmt



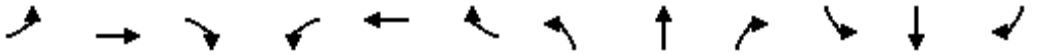
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	316	417	67	4	184	287	60	2375	6	367	1337	414
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	336	444	71	4	196	0	64	2527	0	390	1422	0
Adj No. of Lanes	1	2	0	1	1	1	1	2	0	2	2	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, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	269	712	113	15	166	141	80	1986	0	328	2162	0
Arrive On Green	0.15	0.23	0.23	0.01	0.09	0.00	0.04	0.55	0.00	0.09	0.60	0.00
Sat Flow, veh/h	1810	3121	496	1810	1900	1615	1810	3705	0	3510	3705	0
Grp Volume(v), veh/h	336	256	259	4	196	0	64	2527	0	390	1422	0
Grp Sat Flow(s),veh/h/ln	1810	1805	1812	1810	1900	1615	1810	1805	0	1755	1805	0
Q Serve(g_s), s	26.8	22.9	23.2	0.4	15.7	0.0	6.3	99.0	0.0	16.8	46.9	0.0
Cycle Q Clear(g_c), s	26.8	22.9	23.2	0.4	15.7	0.0	6.3	99.0	0.0	16.8	46.9	0.0
Prop In Lane	1.00		0.27	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	269	412	413	15	166	141	80	1986	0	328	2162	0
V/C Ratio(X)	1.25	0.62	0.63	0.27	1.18	0.00	0.80	1.27	0.00	1.19	0.66	0.00
Avail Cap(c_a), veh/h	269	412	413	80	166	141	97	1986	0	328	2162	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	76.6	62.5	62.6	88.8	82.2	0.0	85.2	40.5	0.0	81.6	23.9	0.0
Incr Delay (d2), s/veh	138.3	3.3	3.5	3.7	127.5	0.0	26.2	126.8	0.0	111.9	0.8	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	23.7	11.8	12.1	0.2	14.1	0.0	3.7	84.1	0.0	13.2	23.6	0.0
LnGrp Delay(d),s/veh	214.9	65.8	66.1	92.5	209.7	0.0	111.4	167.3	0.0	193.5	24.7	0.0
LnGrp LOS	F	E	E	F	F		F	F		F	C	
Approach Vol, veh/h		851			200			2591			1812	
Approach Delay, s/veh		124.8			207.3			165.9			61.0	
Approach LOS		F			F			F			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	21.0	106.0	5.7	47.3	12.2	114.8	31.0	22.0
Change Period (Y+Rc), s	* 4.2	7.0	* 4.2	6.3	* 4.2	7.0	* 4.2	6.3
Max Green Setting (Gmax), s	* 17	99.0	* 8	34.5	* 9.6	106.2	* 27	15.7
Max Q Clear Time (g_c+I1), s	18.8	101.0	2.4	25.2	8.3	48.9	28.8	17.7
Green Ext Time (p_c), s	0.0	0.0	0.0	3.8	0.0	56.7	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	126.2
HCM 2010 LOS	F

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



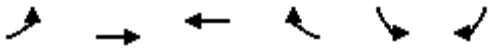
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	405	36	41	4	65	30	52	365	2	16	36	606
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	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	1881	1890	1900	1900	1900	1900	1881	1863	1900	1900	1874	1881
Adj Flow Rate, veh/h	431	38	44	4	69	32	55	388	2	17	38	645
Adj No. of Lanes	2	1	0	1	1	0	1	2	0	0	1	2
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, %	1	0	0	0	0	0	1	2	2	2	2	1
Cap, veh/h	561	201	233	10	117	54	84	1910	10	228	479	1168
Arrive On Green	0.16	0.25	0.25	0.01	0.10	0.10	0.05	0.53	0.53	0.42	0.42	0.42
Sat Flow, veh/h	3476	799	926	1810	1228	569	1792	3611	19	385	1147	2797
Grp Volume(v), veh/h	431	0	82	4	0	101	55	190	200	55	0	645
Grp Sat Flow(s),veh/h/ln	1738	0	1725	1810	0	1797	1792	1770	1860	1532	0	1399
Q Serve(g_s), s	8.3	0.0	2.6	0.2	0.0	3.8	2.1	4.0	4.0	0.0	0.0	12.2
Cycle Q Clear(g_c), s	8.3	0.0	2.6	0.2	0.0	3.8	2.1	4.0	4.0	1.2	0.0	12.2
Prop In Lane	1.00		0.54	1.00		0.32	1.00		0.01	0.31		1.00
Lane Grp Cap(c), veh/h	561	0	433	10	0	171	84	936	984	707	0	1168
V/C Ratio(X)	0.77	0.00	0.19	0.41	0.00	0.59	0.65	0.20	0.20	0.08	0.00	0.55
Avail Cap(c_a), veh/h	879	0	814	129	0	522	179	936	984	707	0	1168
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	28.1	0.0	20.6	34.7	0.0	30.3	32.8	8.7	8.7	12.2	0.0	15.4
Incr Delay (d2), s/veh	2.3	0.0	0.2	25.8	0.0	3.2	8.3	0.5	0.5	0.0	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	1.3	0.1	0.0	2.0	1.2	2.0	2.1	0.7	0.0	4.7
LnGrp Delay(d),s/veh	30.3	0.0	20.8	60.5	0.0	33.5	41.1	9.2	9.2	12.3	0.0	16.0
LnGrp LOS	C		C	E		C	D	A	A	B		B
Approach Vol, veh/h		513			105			445			700	
Approach Delay, s/veh		28.8			34.6			13.1			15.7	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	4.9	23.6	7.8	33.7	15.8	12.7		41.5
Change Period (Y+Rc), s	4.5	6.0	4.5	4.5	4.5	* 6		4.5
Max Green Setting (Gmax), s	5.0	33.0	7.0	25.5	17.7	* 20		37.0
Max Q Clear Time (g_c+I1), s	2.2	4.6	4.1	14.2	10.3	5.8		6.0
Green Ext Time (p_c), s	0.0	1.1	0.0	4.3	1.0	0.8		6.2

Intersection Summary	
HCM 2010 Ctrl Delay	20.0
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	290	139	155	568	343	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	1881	1881	1579	3467	1553
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	1881	1881	1579	3467	1553
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	309	148	165	604	365	286
RTOR Reduction (vph)	0	0	0	169	0	220
Lane Group Flow (vph)	309	148	165	435	365	66
Confl. Peds. (#/hr)	5			5	5	5
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Perm
Protected Phases	5 8	2	6	7	7	
Permitted Phases				6		7
Actuated Green, G (s)	22.0	23.6	11.3	25.7	14.4	14.4
Effective Green, g (s)	20.0	23.6	11.3	25.7	14.4	14.4
Actuated g/C Ratio	0.32	0.38	0.18	0.41	0.23	0.23
Clearance Time (s)		5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	570	708	339	773	796	356
v/s Ratio Prot	c0.17	0.08	0.09	c0.13	0.11	
v/s Ratio Perm				0.15		0.04
v/c Ratio	0.54	0.21	0.49	0.56	0.46	0.18
Uniform Delay, d1	17.6	13.2	23.1	14.2	20.8	19.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.1	1.1	0.9	0.4	0.3
Delay (s)	18.6	13.4	24.2	15.1	21.2	19.7
Level of Service	B	B	C	B	C	B
Approach Delay (s)		16.9	17.1		20.5	
Approach LOS		B	B		C	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	62.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			