FEHR PEERS

MEMORANDUM

Date: May 26, 2015

To: Crescentia Brown, ESA

From: Sam Tabibnia

Subject: Oakland City Center Development (T5/6) – Transportation Impact Analysis

OK14-0013

This memorandum summarizes the transportation impact analysis for the proposed project which consists of Block T5/6 of the Oakland City Center. The impacts of the project were previously analyzed in the *Oakland City Center Project Environmental Impact Report* (EIR) certified in 2000 and subsequent Addenda. Based on the application of City of Oakland's CEQA Thresholds of Significance Guidelines, the proposed Modified T5/6 Project would cause one significant and unavoidable impact at the Brush Street/12th Street/I-980 Westbound Off-Ramp intersection. This impact is consistent with the certified 2000 EIR, which also identified the impact as significant and unavoidable. The proposed Modified T5/6 Project would not result in any other transportation related significant impacts.

In addition to assessing the impacts of the project on intersection operations, this memorandum also evaluates potential impacts of the proposed Modified T5/6 Project on safety and parking, and provides recommendations to improve transportation circulation and safety. Our analysis assumptions and results are detailed below.

INTRODUCTION

Figure 1 shows the location of the project within the local and regional street system. This analysis evaluates the transportation-related impacts of the project during the weekday morning and evening peak hours. The analysis complies with City of Oakland's *Transportation Impact Study Guidelines*. The following four scenarios are included in the analysis:

- ***Existing*** – Represents existing conditions based on data obtained from recently published *Broadway Valdez District Specific Plan Draft EIR* (September 2013) and *Lake Merritt Station Area Plan Draft EIR* (November 2013).
- ***Existing Plus Project*** – Existing conditions plus traffic generated by the proposed project
- ***2035 No Project*** – Future conditions with planned population and employment growth and planned transportation system changes for the year 2035, but without the proposed Modified T5/6 Project.
- ***2035 Plus Project***– 2035 conditions plus traffic generated by the proposed Modified T5/6 Project.

EXISTING SETTING

Study Area

The study evaluates traffic operations at the following five intersections in the vicinity of the project site:

1. Broadway/West Grand Avenue
2. Brush Street/12th Street/I-980 Westbound Off-Ramp
3. Broadway/12th Street
4. Broadway/11th Street
5. Broadway/5th Street/I-880 Southbound On-Ramp

In general, study intersections consist of signalized intersections that were identified as operating at or near LOS F in the 2000 EIR or other recent environmental documents and where the project would add substantial amount of traffic (generally 50 or more peak hour trips at signalized intersections operating at LOS E or better, or 25 or more peak hour trips at signalized intersections operating at LOS F per recent environmental documents) to the intersection.

Existing Traffic Conditions

Traffic data, consisting of automobile turning movement, as well as pedestrian and bicycle counts for all study intersections is based on data collected for and published in the B*roadway Valdez District Specific Plan Draft EIR* (September 2013) and *Lake Merritt Station Area Plan Draft EIR* (November 2013). **Figure 2** presents existing intersection lane configurations, traffic control devices, and peak hour traffic volumes at the study intersections.

Based on the volumes and roadway configurations presented in Figures 2, Fehr & Peers calculated the Level of Service (LOS)[1] at the study intersections using the 2000 *Highway Capacity Manual* (HCM) methodologies. City of Oakland considers LOS E as the threshold of significance for intersections located within Downtown area or that provide direct access to Downtown[2], and LOS D for all other intersections. All study intersections are located within the Downtown where the threshold of significance is LOS E.

Table 1 summarizes the existing intersection analysis results. The technical appendix provides the detailed LOS calculation sheets. All study intersections currently operate at LOS D or better during both weekday AM and PM peak hours.

PROJECT DESCRIPTION

The proposed project would consist of Block T5/6 of the Oakland City Center. The original project proposed in 2000 consisted of 580,000 square feet of office. The currently proposed Modified T5/6 Project would consist of the following on the currently vacant site:

- ***Site A***, on the east side of Clay Street between 11th and 12th Streets would be a 14-level building with up to 262 residential units and about 4,850 square feet of ground level retail space.
- ***Site B***, on the north side of 11th Street between Broadway and Clay Street, would be a 10 to 14-level building developed with one of the following options:
    - *Option 1* –300-room hotel
    - *Option 2* – 262 residential units
    - *Option 3* – 205,800 square feet of office

---

[1] The operations of roadway facilities are typically described with the term level of service (LOS), a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, which reflects free-flow conditions where there is very little interaction between vehicles, to LOS F, where the vehicle demand exceeds the capacity and high levels of vehicle delay result. LOS E represents "at-capacity" operations. When traffic volumes exceed the intersection capacity, stop-and-go conditions result and a vehicle may wait through multiple signal cycles before passing through the intersection; these operations are designated as LOS F.

[2] Intersections that provide direct access to downtown are generally defined as principal arterials within two miles of Downtown and minor arterials within one mile of Downtown, provided that the street connects directly to Downtown.

TABLE 1
INTERSECTION LOS SUMMARY
EXISTING CONDITIONS

Intersection	Traffic Control[3]	Peak Hour	Delay [4] (seconds)	LOS
1. Broadway/West Grand Avenue[1]	Signal	AM	18.2	B
		PM	18.4	B
2. Brush Street/12th Street/I-980 Westbound Off-Ramp [2]	Signal	AM	37.8	D
		PM	21.4	C
3. Broadway/12th Street[2]	Signal	AM	20.4	C
		PM	21.6	C
4. Broadway/12th Street[2]	Signal	AM	15.1	B
		PM	19.3	B
5. Broadway/5th Street/I-880 Southbound On-Ramp[1]	Signal	AM	28.6	C
		PM	39.4	D

1. Based on intersection volume data presented in *Broadway Valdez District Specific Plan Draft EIR* (September 2013).
2. Based on intersection volume data presented in *Lake Merritt Station Area Plan Draft EIR* (November 2013)
3. Signal = intersection is controlled by a traffic signal
4. For signalized intersections, average intersection delay and LOS based on the 2000 HCM method is shown.

Source: Fehr & Peers, 2015.

All three options at Site B would also include about 5,000 to 8,000 square feet of ground level retail.

Both buildings would provide their own parking facility with inbound and outbound access through the existing City Center Garage driveway on 11th Street. The Site A building has the option to either provide no on-site parking and utilize up to 200 parking spaces in the nearby City Center West Garage and/or provide between 150 and 180 parking spaces in up to three below-grade levels in a combination of standard spaces and stackers.

The proposed project would eliminate the existing exit-only driveway for City Center Garage on Clay Street. Based on data collected in January 2015, the driveway is currently used by about five vehicles during the weekday AM peak hour and 106 vehicles during the weekday PM peak hour.

TRIP GENERATION

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the local roadway network. **Tables 2** through **4** present the trip generation estimate for the three options discussed above and compare to the trip generation estimated in the 2000 EIR for the project site. Trip generation data published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual (Ninth Edition)* was used as a starting point to estimate the project vehicle trip generation.

TABLE 2
OAKLAND CITY CENTER DEVELOPMENT (T5/6)
AUTOMOBILE TRIP GENERATION SUMMARY – OPTION 1 (RESIDENTIAL/HOTEL)

Land Use	Units[1]	ITE Code	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Residential	262 DU	220 [2]	1,711	26	106	132	105	57	162
Hotel	300 Rooms	310 [3]	2,451	94	65	159	92	88	180
Subtotal			*4,162*	*120*	*171*	*291*	*197*	*145*	*342*
Non-Auto Reduction (-43%)[4]			-1,790	-52	-74	-126	-85	-62	-147
Net New Project Trips			**2,372**	**68**	**97**	**165**	**112**	**83**	**195**
Approved Project[5]			2,292	311	42	353	90	438	528
Net Difference			80	-243	55	-188	22	-355	-333

1. DU = Dwelling Units.
2. ITE Trip *Generation (9th Edition)* land use category 220 (Apartment):
   Daily: T = 6.06*X + 123.56
   AM Peak Hour: T = 0.49*(X) + 3.73 (20% in, 80% out)
   PM Peak Hour: T = 0.55*(X) + 17.65 (65% in, 35% out)
3. ITE *Trip Generation (9th Edition)* land use category 310 (Hotel):
   Daily: T = 8.17*(X)
   AM Peak Hour: T = 0.53*(X) (59% in, 41% out)
   PM Peak Hour: T = 0.60*(X) (51% in, 49% out)
4. Reduction of 43.0% assumed. Based on City of Oakland *Transportation Impact Study Guidelines* using BATS 2000 data for development in an urban environment within 0.5 miles of a BART Station.
5. *Oakland City Center Project Draft EIR*, January 2000.

Source: Fehr & Peers, 2015.

TABLE 3
OAKLAND CITY CENTER DEVELOPMENT (T5/6)
AUTOMOBILE TRIP GENERATION SUMMARY – OPTION 2 (RESIDENTIAL/RESIDENTIAL)

Land Use	Units[1]	ITE Code	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Residential	524 DU	220 [2]	3,299	52	208	260	199	107	306
Non-Auto Reduction (-43%)[3]			-1,419	-22	-89	-111	-86	-46	-132
Net New Project Trips			**1,880**	**30**	**119**	**149**	**113**	**61**	**174**
Approved Project[4]			2,292	311	42	353	90	438	528
Net Difference			-412	-281	77	-204	23	-377	-354

1. DU = Dwelling Units,
2. ITE Trip *Generation (9th Edition)* land use category 220 (Apartment):
   Daily: T = 6.06*X + 123.56
   AM Peak Hour: T = 0.49*(X) + 3.73 (20% in, 80% out)
   PM Peak Hour: T = 0.55*(X) + 17.65 (65% in, 35% out)
3. Reduction of 43.0% assumed. Based on City of Oakland *Transportation Impact Study Guidelines* using BATS 2000 data for development in an urban environment within 0.5 miles of a BART Station.
4. *Oakland City Center Project Draft EIR*, January 2000.

Source: Fehr & Peers, 2015.

Both Sites A and B would include ground level commercial space. The commercial space is not included in the trip generation estimates because of its small size and the expected type of uses, which would be primarily local-serving retail and food-related uses and would primarily attract residents, workers, and visitors, who are already in the area, especially during the peak hours.

The ITE data is based on data collected at mostly single-use suburban sites where the automobile is often the only travel mode. However, the project site is in a mixed-use urban environment where many trips are walk, bike, or transit trips. Since the proposed project is within one block of the 12th Street BART Station, this analysis reduces the ITE based trip generation by 43 percent to account for the non-automobile trips. This reduction is consistent with City of Oakland *Transportation Impact Study Guidelines* and is based on the Bay Area Travel Survey (BATS) 2000 which shows that the non-automobile mode share within one-half mile of a BART Station in Alameda County is about 43 percent. A 2011 research study shows reducing ITE based trip generation using BATS data results in a more accurate estimation of trip generation for mixed use developments than just using ITE based trip generation.[3]

[3] *Evaluation of the Operation and Accuracy of Five Available Smart Growth Trip Generation Methodologies.*

TABLE 4
OAKLAND CITY CENTER DEVELOPMENT (T5/6)
AUTOMOBILE TRIP GENERATION SUMMARY – OPTION 3 (RESIDENTIAL/OFFICE)

Land Use	Units[1]	ITE Code	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Residential	262 DU	220 [2]	1,711	26	106	132	105	57	162
Office	205.8 KSF	710 [3]	2,272	300	41	341	53	256	309
Subtotal			*3,983*	*326*	*147*	*473*	*158*	*313*	*471*
Non-Auto Reduction (-43%)[4]			-1,713	-140	-63	-203	-68	-135	-203
Net New Project Trips			**2,270**	**186**	**84**	**270**	**90**	**178**	**268**
Approved Project[5]			2,292	311	42	353	90	438	528
Net Difference			-22	-125	42	-83	0	-260	-260

1. DU = Dwelling Units, KSF = 1,000 square feet.
2. ITE Trip *Generation (9th Edition)* land use category 220 (Apartment):
   Daily: T = 6.06*X + 123.56
   AM Peak Hour: T = 0.49*(X) + 3.73 (20% in, 80% out)
   PM Peak Hour: T = 0.55*(X) + 17.65 (65% in, 35% out)
3. ITE *Trip Generation (9th Edition)* land use category 710 (Office Building):
   Daily: Ln(T) = 0.76*Ln(X) + 3.68
   AM Peak Hour: Ln(T) = 0.80*Ln(X) + 1.57 (88% in, 12% out)
   PM Peak Hour: T = 1.12*(X) + 78.45 (17% in, 83% out)
4. Reduction of 43.0% assumed. Based on City of Oakland *Transportation Impact Study Guidelines* using BATS 2000 data for development in an urban environment within 0.5 miles of a BART Station.
5. *Oakland City Center Project Draft EIR*, January 2000.

Source: Fehr & Peers, 2015.

This reduction is somewhat conservative considering that the 2011 American Community Survey shows that 55 percent of residents and 64 percent of workers in Downtown Oakland travel to work by non-automobile modes.

As shown in Tables 1 through 3, all three project options would generate fewer automobile trips that the previously approved project analyzed in the 2000 EIR. Option 3, which would generate about 2,270 daily, 270 AM, and 268 PM peak hour trips would have a higher trip generation than Options 1 or 2. Therefore, the rest of this memorandum focuses on Option 3.

Institute of Transportation Studies, UC Davis, 2011.

Trip Generation for Non-Auto Travel Modes

Consistent with City of Oakland *Transportation Impact Study Guidelines,* **Table 5** presents the estimates of project trip generation for all travel modes for Option 3, which has the highest trip generation.

TABLE 5
TRIP GENERATION BY TRAVEL MODE

Mode	Mode Share Adjustment Factors[1]	Daily	AM Peak Hour	PM Peak Hour
Automobile	57.0%	2,270	270	268
Transit	30.4%	1,211	144	143
Bike	3.9%	155	18	18
Walk	23.0%	916	109	108
Total Trips		**4,552**	**541**	**537**

1. Based on *City of Oakland Transportation Impact Study Guidelines* assuming project site is in an urban environment within 0.5 miles of a BART Station.

Sources: Fehr & Peers, 2015.

TRIP DISTRIBUTION AND ASSIGNMENT

The trip distribution and assignment process estimates how the vehicle trips generated by a project site would distribute across the roadway network. **Figure 3** shows the trip distribution for the project, which is generally based on the trip distribution documented in the 2000 EIR, modified to account for the project location.

Trips generated by Option 3, as shown in Table 1, were assigned to the roadway network according to the trip distribution shown on Figure 2. **Figures 4A** and **4B** show the resulting trip assignment by roadway segment for the weekday AM and PM peak hours.

Figures 4A and 4B also indicate if intersections along the primary corridors that would be used by project generated traffic would operate at LOS E and better or LOS F (the established traffic operations criterion for intersections in Downtown Oakland) under existing and/or future (2035) conditions according to the following recently published documents:

- *1800 San Pablo Avenue Project Supplemental Draft EIR* (July 2012)

- *Broadway Valdez District Specific Plan Draft EIR* (September 2013)
- *Lake Merritt Station Area Plan Draft EIR* (November 2013)
- *Jack London Square Redevelopment Project Addendum* (May 2014)
- *19th and Broadway* Mixed Use Project CEQA Exemption (to be published)

Figure 5 shows the trip assignment at the study intersections. Figure 4 also reflects the diversion of the traffic that currently uses the City Center Garage Driveway on Clay Street when the driveway is eliminated. This analysis conservatively assumes that all diverted City Center Garage traffic would use the existing 11th Street driveway, travel east on 11th Street and use northbound Broadway and westbound 12th Street to travel to the freeway on-ramps; although it is likely that a large portion of the diverted traffic would use either the City Center Garage driveway on 14th Street or use the 11th Street driveway and use southbound Broadway and westbound 10th Street.

The 2000 EIR analyzed the impacts of the entire City Center Project at 24 intersections. **Table 6** summarizes the intersection operations at these 24 intersections under Existing and Cumulative Plus Project conditions as reported in the 2000 EIR and provides a comparison to results from more recent documents where available. The more recent documents show that most of the intersections analyzed in the 2000 EIR are expected to continue to operate at acceptable LOS E or better under Cumulative Plus Project conditions.

The 2000 EIR identified the following three intersections as operating at deficient LOS F under Cumulative Plus Project conditions:

- 12th Street/Broadway
- 12th Street/Brush Street
- Grand Avenue/Broadway

The recently published documents identify two of three intersections as continuing to operate at LOS F; however, they show that traffic operations at the 12th Street/Broadway would improve to LOS D or better due to improvements implemented at the intersection. In addition to the 12th Street/Brush Street and Grand Avenue/Broadway intersections, the documents listed above identify significant impacts at the following intersections that the 2000 EIR did not identify as having a significant impact:

TABLE 6
INTERSECTION LOS COMPARISON

Intersection	2000 EIR[1]				Recent Documents[2]			
	Existing		Cumulative Plus Project		Existing		Cumulative Plus Project	
	AM	PM	AM	PM	AM	PM	AM	PM
1. 11th Street/Broadway	B	B	B	D	B[3]	B[3]	C[3]	C[3]
2. 11th Street/Clay Street	B	B	B	B	N/A	N/A	N/A	N/A
3. 11th Street/Jefferson Street	B	B	B	B	N/A	N/A	N/A	N/A
4. 11th Street/MLK Way	B	B	B	B	N/A	N/A	N/A	N/A
5. 12th Street/Broadway	B	B	B	**F**	C[3]	C[3]	C[3]	D[3]
6. 12th Street/Clay Street	B	B	B	B	N/A	N/A	N/A	N/A
7. 12th Street/Jefferson Street	B	B	B	C	N/A	N/A	N/A	N/A
8. 12th Street/MLK Way	B	B	B	B	N/A	N/A	N/A	N/A
9. 14th Street/Jefferson Street	B	B	B	B	N/A	N/A	N/A	N/A
10. 14th Street/MLK Way	B	B	B	B	N/A	N/A	N/A	N/A
11. 5th Street/Broadway	B	D	C	E	C[4]	D[4]	C[4]	**F**[4]
12. 6th Street/Broadway	B	B	B	B	N/A	A[4]	N/A	B[4]
13. 7th Street/Harrison Street	B	B	B	C	B[5]	B[5]	C[5]	C[5]
14. 7th Street/Jackson Street	B	B	C	B	B[3]	B[3]	C[3]	**F**[3]
15. 18th Street/Brush Street	A	C	A	B	A[6]	A[4]	**F**[6]	D[4]
16. 17th Street/Brush Street	A	C	A	B	E[6]	B[6]	**F**[6]	**F**[6]
17. 12th Street/Brush Street	C	B	**F**	C	D[3]	C[3]	**F**[3]	D[3]
18. 11th Street/Brush Street	A	B	A	B	N/A	N/A	N/A	N/A
19. 17th Street/Castro Street	B	B	B	C	C[6]	C[6]	**F**[6]	**F**[6]
20. 18th Street/Castro Street	B	B	B	B	A[6]	A[6]	B[6]	**F**[6]
21. 11th Street/Castro Street	B	B	B	B	C[3]	C[3]	C[3]	D[3]
22. 12th Street/Castro Street	B	B	B	B	C[5]	B[5]	C[5]	B[5]
23. 14th Street/Broadway	B	B	B	B	B[5]	B[5]	B[5]	B[5]
24. Grand Avenue/Broadway	B	C	C	**F**	B[4]	B[4]	D[4]	**F**[4]

1. Based on Table IV.B-11 in the 2000 EIR. Existing Conditions LOS is based on data collected in 1999 and Cumulative Plus Project represents 2010 Plus Project conditions.
2. Based on sources as noted in the table. Cumulative Plus Project represents 2035 Plus Project conditions. For intersections analyzed in multiple documents, the worst LOS is reported.
3. Source: *Lake Merritt Station Area Plan Draft EIR* (November 2013).
4. Source: *Broadway Valdez District Specific Plan Draft EIR* (September 2013).
5. Source: *Jack London Square Redevelopment Project Addendum* (May 2014).
6. Source: *1800 San Pablo Avenue Project Supplemental Draft EIR* (July 2012).

Source: Fehr & Peers, 2015.

- 7th Street/Jackson Street
- 18th Street/Brush Street
- 17th Street/Brush Street
- 17th Street/Castro Street
- 18th Street/Castro Street

The Modified T5/T6 Project is not expected to cause a significant impact at these five intersections because, as shown on Figures 4A and 4B, the proposed project would add fewer than 10 peak hour trips to these intersections. Therefore, the Modified T5/T6 Project is not expected to cause a significant impact at these locations and their analysis is not necessary.

This analysis assesses the potential impacts of the proposed project at the following intersections that the 2000 EIR and/or more recent documents identify as operating at LOS F and the proposed project would substantially increase the traffic volume (The estimated peak hour trips added by the project are shown in parenthesis):

1. Broadway/West Grand Avenue (13 AM and 14 PM peak hour trips added)
2. Brush Street/12th Street/I-980 Westbound Off-Ramp (77 AM and 37 PM peak hour trips added)
3. Broadway/12th Street (83 AM and 192 PM peak hour trips added)
4. Broadway/11th Street (90 AM and 288 PM peak hour trips added)
5. Broadway/5th Street/I-880 Southbound On-Ramp (15 AM and 32 PM peak hour trips added)

The recently published documents listed above did not analyze the following intersections which were analyzed in the 2000 EIR and the Modified T5/T6 Project would add more than 25 peak hour trips to:

- 11th Street/Clay Street
- 11th Street/Jefferson Street
- 11th Street/MLK Way
- 11th Street/Brush Street
- 12th Street/Clay Street
- 12th Street/Jefferson Street
- 12th Street/MLK Way

Considering that the 2000 EIR shows these seven intersections operating at LOS C or better under Cumulative Plus Project conditions, and that our recent observations in Downtown Oakland show that these intersections currently operate at acceptable conditions similar to the documented conditions in the 2000 EIR, these intersections are expected to continue operating at acceptable conditions in the future. Therefore, the proposed project is unlikely to cause a significant impact at these locations and their analysis is not necessary.

SIGNIFICANCE CRITERIA

This analysis uses City of Oakland's CEQA Thresholds of Significance Guidelines to determine if the proposed Project would cause significant impact. The Project would have a significant impact on the environment if it were to:

Traffic Load and Capacity Thresholds

1. At a study, signalized intersection which is located **outside the Downtown**[4] **area and that does not provide direct access to Downtown**, the project would cause the motor vehicle level of service (LOS) to degrade to worse than LOS D (i.e., LOS E or LOS F) and cause the total intersection average vehicle delay to increase by four (4) or more seconds;

2. At a study, signalized intersection which is located **within the Downtown area or that provides direct access to Downtown**, the project would cause the motor vehicle LOS to degrade to worse than LOS E (i.e., LOS F) and cause the total intersection average vehicle delay to increase by four (4) or more seconds;

3. At a study, signalized intersection **outside the Downtown area and that does not provide direct access to Downtown** where the motor vehicle level of service is LOS E, the project would cause the total intersection average vehicle delay to increase by four (4) or more seconds;

4. At a study, signalized intersection **outside the Downtown area and that does not provide direct access to Downtown** where the motor vehicle level of service is LOS E, the project would cause an increase in the average delay for any of the critical movements of six (6) seconds or more;

5. At a study, signalized intersection for all areas where the motor vehicle level of service is LOS F, the project would cause (a) the overall volume-to-capacity ("V/C") ratio to increase 0.03 or more or (b) the critical movement V/C ratio to increase 0.05 or more;

6. At a study, unsignalized intersection the project would add ten (10) or more vehicles to the critical movement, and after project completion, satisfy the California Manual on Uniform Traffic Control Devices (MUTCD) peak-hour volume traffic signal warrant;

7. For a roadway segment of the Congestion Management Program (CMP) Network, the project would cause (a) the LOS to degrade from LOS E or better to LOS F or (b) the V/C

[4] The Downtown area is defined in the Land Use and Transportation Element of the General Plan (page 67) as the area generally bounded by the West Grand Avenue to the north, Lake Merritt and Channel Park to the east, the Oakland Estuary to the south, and I-980/Brush Street to the west. Intersections that provide direct access to downtown are generally defined as principal arterials within two (2) miles of Downtown and minor arterials within one (1) mile of Downtown, provided that the street connects directly to Downtown.

ratio to increase 0.03 or more for a roadway segment that would operate at LOS F without the project;[5]

8. Cause congestion of regional significance on a roadway segment on the Metropolitan Transportation System (MTS) evaluated per the requirements of the Land Use Analysis Program of the CMP;[6]

9. Result in substantially increased travel times for AC Transit buses;

Traffic Safety Thresholds

10. Directly or indirectly cause or expose roadway users (e.g., motorists, pedestrians, bus riders, bicyclists) to a permanent and substantial transportation hazard due to a new or existing physical design feature or incompatible uses;

11. Directly or indirectly result in a permanent substantial decrease in pedestrian safety;

12. Directly or indirectly result in a permanent substantial decrease in bicyclist safety;

13. Directly or indirectly result in a permanent substantial decrease in bus rider safety

14. Generate substantial multi-modal traffic traveling across at-grade railroad crossings that cause or expose roadway users (e.g., motorists, pedestrians, bus riders, bicyclists) to a permanent and substantial transportation hazard.

Other Thresholds

15. Fundamentally conflict with adopted City policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities adopted for the purpose of avoiding or mitigating an environmental effect and actually result in a physical change in the environment;

16. Result in a substantial, though temporary, adverse effect on the circulation system during construction of the project; or

17. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

---

[5] Refer to the ACTC Congestion Management Program for a description of the CMP Network. In Oakland, the CMP Network includes all state highways plus the following streets: portions of Martin Luther King Jr. Way, Webster/Posey Tubes, 23rd Avenue, 29th Avenue, and Hegenberger Road.

[6] Refer to ACTC's Congestion Management Program for a description of the MTS and the Land Use Analysis Program. The ACTC identified the roadway segments of the MTS that require evaluation in its letter commenting on the Notice of Preparation (NOP) issued by the City for the project. Note that the City is required to send NOPs and notices of proposed general plan amendments to ACTC under the Land Use Analysis Program regardless of how many project-related trips are expected to be generated.

Cumulative Impacts

18. A project's contribution to cumulative impacts is considered "considerable" (i.e., significant) when the project exceeds at least one of the thresholds listed above in a future year scenario.

TRAFFIC LOAD AND CAPACITY ANALYSIS

This section discusses the impacts of the proposed Project on traffic operations under Existing and 2035 conditions based on the City of Oakland's Thresholds of Significance described above.

Existing Plus Project Intersection Analysis

This section presents the extent of Project impacts relative to existing conditions based on application of Significance Thresholds #1 through #6 as listed on page 10 of this memorandum. **Figure 6** shows traffic volumes under Existing Plus Project conditions, which consists of Existing traffic volumes (shown on Figure 2) plus added traffic volumes generated by the Project (shown on Figure 5).

Table 7 summarizes the intersection operations results for the Existing No Project and Existing Plus Project conditions. All study intersections would continue to operate at an acceptable LOS. The proposed Project would not cause a significant impact at the study intersections under Existing Plus Project conditions.

2035 Intersection Analysis

Project impacts at intersections under 2035 conditions is based on direct application of Significance Threshold #18, which references Significance Thresholds #1 through #6.

TABLE 7
INTERSECTION LOS SUMMARY
EXISTING PLUS PROJECT

Intersection	Control[1]	Peak Hour	Existing No Project		Existing Plus Project		Signif. Impact?
			Delay[2] (sec)	LOS	Delay[2] (sec)	LOS	
1. Broadway/West Grand Avenue	Signal	AM	18.2	B	18.1	B	No
		PM	18.4	B	18.3	B	No
2. Brush Street/12th Street/I-980 Westbound Off-Ramp	Signal	AM	37.8	D	43.1	D	No
		PM	21.4	C	21.7	C	No
3. Broadway/12th Street	Signal	AM	20.4	C	21.1	C	No
		PM	21.6	C	44.7	D	No
4. Broadway/11th Street	Signal	AM	15.1	B	15.1	B	No
		PM	19.3	B	18.8	B	No
5. Broadway/5th Street/I-880 Southbound On-Ramp	Signal	AM	28.6	C	28.7	C	No
		PM	39.4	D	39.9	D	No

1. Signal = intersection is controlled by a traffic signal
2. For signalized intersections, average intersection delay and LOS based on the 2000 HCM method is shown.

Source: Fehr & Peers, 2015.

Traffic Forecasts

Year 2035 traffic forecasts for all study intersections are from the environmental documents previously discussed. These forecasts are based on the version of Alameda County Transportation Commission Travel Demand Model released in June 2011, which uses land use data consistent with Association of Bay Area Government (ABAG) *Projection 2009,* which were modified to better reflect expected development in the City of Oakland. Although these forecasts reflect future development at the project site, this analysis conservatively uses the 2035 Plus Project forecasts as published in these documents at the 2035 No Project forecasts for this analysis.[7] **Figure 7** shows the traffic volumes under 2035 No Project conditions.

[7] In general, the 2035 intersection volume forecasts presented in the recent environmental documents are consistent with each other as they are based on the same version of the ACTC Model. At intersections analyzed in more than one environmental document, the higher forecasts were used for this assessment to present a conservative analysis.

Figure 8 shows traffic volumes under 2035 Plus Project conditions, which consists of 2035 No Project traffic volumes (shown on Figure 7) plus added traffic volumes generated by the Project (shown on Figure 5).

2035 Roadway Network

The 2035 No Project and the 2035 Plus Project conditions reflect the following planned roadway network changes:

- Completion of the East Bay Bus Rapid Transit (BRT) project which would generally designate a bus only lane along 11th and 12th Streets in the study area and result in the following changes at study intersections:
    - Broadway/12th Street (Intersection #3): Reconfigure the westbound 12th Street approach from three through lanes to one exclusive right-turn lane, and two through lanes.
    - Broadway/11th Street (Intersection #4): Reconfigure the eastbound 11th Street approach from four through lanes to one exclave left-turn lane, two through lanes, and one exclusive right-turn lane.

2035 Intersection Operations

Table 8 summarizes intersection LOS calculations for 2035 No Project and 2035 Plus Project conditions. The following intersections would operate at LOS F regardless of the project during both AM and PM peak hours:

- Broadway/West Grand Avenue (Intersection #1) during the PM peak hour
- Brush Street/12th Street/ I-980 Westbound Off-Ramp (Intersection #2) during the AM peak hour
- Broadway/5th Street/I-880 Southbound On-Ramp (Intersection #5) during the PM peak hour

Although these study intersections would operate at LOS F, the project would not cause a significant impact at two of these intersections because it would not trigger any of the significant thresholds previously described. The project would cause a significant impact at the Brush Street/ 12th Street/I-980 Westbound Off-Ramp intersection during the AM peak hour.

TABLE 8
INTERSECTION LOS SUMMARY
2035 CONDITIONS

Intersection	Control[1]	Peak Hour	2035 No Project Delay[2] (sec)	2035 No Project LOS[3]	2035 Plus Project Delay[2] (sec)	2035 Plus Project LOS[3]	Signif. Impact?
1. Broadway/West Grand Avenue	Signal	AM	38.7	D	38.7	D	No
		PM	**>120 (v/c=1.88)**	**F**	**>120 (v/c=1.90)**	**F**	No
2. Brush Street/12th Street/ I-980 Westbound Off-Ramp	Signal	AM	**91.2 (v/c=1.02)**	**F**	**102.1 (v/c=1.05)**	**F**	Yes[4]
		PM	40.4	D	44.1	D	No
3. Broadway/12th Street	Signal	AM	25.7	C	29.3	C	No
		PM	26.0	C	51.7	D	No
4. Broadway/11th Street	Signal	AM	26.3	C	25.9	C	No
		PM	20.3	C	21.0	C	No
5. Broadway/5th Street/ I-880 Southbound On-Ramp	Signal	AM	29.0	C	29.0	C	No
		PM	**117.9 (v/c=1.36)**	**F**	**120.1 (v/c=1.37)**	**F**	No

1. Signal = intersection is controlled by a traffic signal
2. For signalized intersections, average intersection delay, LOS, and volume-to-capacity ratio (v/c) for intersections operating at LOS F based on the 2000 HCM method is shown.
3. Intersections operating at unacceptable levels are shown in bold.
4. The proposed project would cause an impact at this intersection because it would increase the overall intersection v/c ratio by 0.03 or more and a critical movement v/c ratio by 0.05 or more at an intersection already operating at LOS F.

Source: Fehr & Peers, 2015.

Impact TRA-1: Traffic generated by the proposed project would increase the total intersection v/c ratio by 0.03 or more and increase the v/c ratio for a critical movement by 0.05 or more (Significant Threshold #5) at an intersection operating at LOS F regardless of the project during the weekday AM peak hour at the Brush Street/12th Street/I-980 Westbound Off-Ramp intersection (Intersection #2) under 2035 conditions.

Mitigation Measure TRA-1: No feasible mitigation measures are available that would mitigate the Project impacts at this intersection. Traffic operations at the intersection can be improved by providing additional automobile travel lanes, such as a third lane on the I-980 Westbound Off-Ramp. However, these modifications cannot be accommodated within the existing automobile right-of-way and would require additional right-of-way, and is considered to be infeasible. Furthermore, the intersection is under the jurisdiction of Caltrans and City of Oakland, as lead

agency, does not have jurisdiction at this intersection, and the mitigation would need to be approved and implemented by Caltrans. Therefore, the impact would remain significant and unavoidable.

Significance after Mitigation: Significant and Unavoidable.

This finding is consistent with the *Oakland City Center Draft EIR* (January 2000), which also identified a significant and unavoidable impact at the Brush Street/12th Street/I-980 Westbound Off-Ramp intersection. The 2000 EIR proposed signal timing improvements and/or additional lanes on the off-ramp as potential mitigation measures at this intersection. The 2000 EIR identified the impact as significant and unavoidable because the proposed mitigations may not be feasible, intersection is under jurisdiction of Caltrans, and if the mitigation were feasible, it may not mitigate the impact and potentially cause secondary impacts. The mitigation measures proposed in the 2000 EIR are currently considered infeasible for the following reasons:

- City of Oakland no longer considers optimizing signal timing parameters as mitigation measure because they are assumed to occur as part of the City's routine maintenance of signal systems.
- Increasing the signal cycle length at the intersection may increase the queue length on the off-ramp, further extending the queues on the mainline freeway and causing safety issues.
- Providing additional travel lanes on the off-ramp or other intersection approaches cannot be accommodated within the current automobile right-of-way and would require additional automobile right-of-way which may require acquisition of additional right-of-way, eliminating pedestrian facilities, and/or reconstructing the freeway overcrossing, which can be costly.
- If addition of travel lanes were feasible, they would not be desirable because they may result in longer pedestrian crossings at the intersection, degrade pedestrian and bicycle safety by exposing crossing pedestrians and cyclists to additional automobile lanes, and be in conflict with the City's Public Transit and Alternative Modes Policy and Complete Streets Policy which state a strong preference for encouraging the use of non-automobile transportation modes.

Furthermore, the intersection continues to be under the jurisdiction of Caltrans and City of Oakland, as lead agency, does not have jurisdiction at this intersection, and the mitigation

measure would need to be approved and implemented by Caltrans. Therefore, no feasible mitigation measures are available at this intersection and the impact would remain significant and unavoidable.

SITE PLAN REVIEW

This section evaluates access, circulation, and safety for all travel modes, based on the site plan dated January 23, 2015, for Site A. **Figure 9** shows the ground level site plan for Site A. No detailed site plan for Site B is currently available and therefore not included in this assessment.

Automobile Access and Safety

All motorized access to and from the project site would be through the existing left-in/left-out City Center Garage Driveway on 11th Street. The Site A building may provide up to three levels of below-grade parking for building residents only. Auto access for the Site A garage would be just south of the City Center Garage Driveway gates. Based on the current site plan, the Site A building driveway would provide adequate sight distance between vehicles exiting the Site A garage and vehicles entering and exiting the City Center Garage. However, the existing center-median at the City Center Garage entrance may interfere with the travel path for vehicles entering the Site A Garage.

> **Recommendation TRA-1:** While not required to address a CEQA impact, the following should be considered as part of the final design for the project if Site A building would provide on-site parking:
>
> - Ensure that the project driveway would provide adequate sight distance between motorists exiting the driveway and vehicles entering and exiting the City Center Garage.
> - Ensure that the travel path for vehicles entering the Site A garage would not interfere with the existing center aisle at the City Center Garage entrance. If necessary, modify the existing center aisle at the City Center Garage entrance.

The Site A building would also provide a loading area in the southeast corner of the building with access on the City Center Garage Driveway just north of 11th Street. Trucks would access the loading area by turning into the City Center Garage Driveway, and backing into the loading area. Considering the proximity of the loading area to 11th Street, there may not be adequate sight distance between trucks backing into the loading area and vehicles turning from 11th Street onto

the City Center Garage Driveway. The loading area would primarily be used by resident move-ins and move-out, and is not expected to be frequently used after the initial move-in period when building is completed.

> **Recommendation TRA-2:** While not required to address a CEQA impact, one or more of the following should be considered as part of the final design for the project:
>
> - Explore moving the project loading area further from 11th Street to reduce potential conflicts between trucks backing into the loading space and other vehicles entering and exiting the driveway on 11th Street.
> - Alternatively, consider eliminating the loading area and designate on-street parking spaces on either 11th and/or 12th Streets adjacent to the building as a loading zone for part or all of the day to serve the commercial component of the project, and/or designate an area within the project parking garage for residents. Eliminating the loading area would require a variance.
> - If the loading area is maintained at the currently proposed location, provide flaggers when trucks are backing into the loading dock to minimize potential conflicts between trucks and other vehicles, and/or restrict its use during peak commute periods (7:00 to 9:00 AM and 4:00 to 6:00 PM).

In addition, the proposed project would eliminate the existing right-out only City Center Garage Driveway on Clay Street. The driveway is currently used by motorists who mostly turn left on 12th Street to travel to the I-980 On-Ramps. As previously described, the elimination of this driveway would result in circuitous and longer travel routes; however, it would not significantly affect traffic operations at intersections in the project vicinity.

Pedestrian Access and Safety

Primary pedestrian access to the residential component of the project would be through a main lobby mid-block on Clay Street. A secondary access would also be provided on 11th Street. The commercial components of the project would be in the northwest and southwest corners of the building with access from both adjacent streets. Although the main lobby is located mid-block, the project is not expected to generate many mid-block pedestrian crossings due to the uses and location of primary pedestrian access points across Clay Street. It is expected that majority of pedestrians would use the signals on Clay Street at 11th and 12th Streets to cross Clay Street.

The proposed Site A building would provide set-backs along the three building frontages and widen the sidewalks adjacent to the building, which would enhance the pedestrian experience. Currently, the two intersections adjacent to the Site A building on Clay Street at 11th and 12th Streets provide only one curb ramp per corner.

> **Recommendation TRA-3:** While not required to address a CEQA impact, the following should be considered as part of the final design for the project:
>
> - Explore the feasibility of installing directional curb ramps at the southeast corner of the Clay Street/12th Street intersection and northeast corner of the Clay Street/11th Street intersection. Considering that fire hydrants and signal poles are present at both locations, construction of curb extensions (bulbouts) may also be required.

The proposed project would increase automobile traffic using the existing garage driveway on 11th Street and increase pedestrian crossings on the 11th Street sidewalk at the driveway.

> **Recommendation TRA-4:** While not required to address a CEQA impact, the following should be considered as part of the final design for the project:
>
> - Modify the sidewalk on the north side of 11th Street crossing the existing driveway so that the through passage zone on the sidewalk is level and at the same grade as the adjacent sidewalk. Additionally, consider using different paving material, texture, and/or paint for the segment of sidewalk crossing the driveway to alert both motorists and pedestrians.

Transit Access

Transit service providers in the project vicinity include Bay Area Rapid Transit (BART) and AC Transit.

BART provides regional rail service throughout the East Bay and across the Bay. The nearest BART station to the project site is the 12th Street BART Station, about one block east. The proposed project would not modify access between the project site and the BART Station.

AC Transit is the primary bus service provider in the City of Oakland. AC Transit operates multiple major routes in the vicinity of the project. The nearest stops to the project site are:

- On the east side of Clay Street, adjacent to the City Center Garage Driveway and the proposed Site A Building. Currently, no amenities are provided at this stop. No amenities are recommended at this stop because it is only used by Route 800, which is only operates during late nights and has minimal usage
- On the south side of 11th Street, about 100 feet east of Clay Street. This stop can be accessed from the Site A building by crossing the signalized Clay Street/11th Street intersection. Currently, no amenities are provided at this stop. Typical amenities, such as shelters and stops, cannot be installed at this location due to the narrow width of the sidewalk.
- On the north side of 12th Street, just west of Clay Street. This stop can be accessed from the Site A building by crossing the signalized Clay Street/12th Street intersection. Currently, no amenities are provided at this stop. Typical amenities, such as shelters and stops, cannot be installed at this location due to the narrow width of the sidewalk.

Additional buses, including the Oakland Free Broadway shuttle ("Free B"), operate along Broadway with the nearest stops near 11th and 12th Streets, about 650 feet east of the Site A building.

The proposed project would not modify access between the project site and bus stops in the vicinity of the project.

Recommendation TRA-5: While not required to address a CEQA impact, the following should be considered as part of the final design for the project:

- Explore the feasibility of widening the sidewalk on south side of 11th Street east of Clay Street at the location of the existing bus stop to provide a bus bulb with adequate space to accommodate a bus shelter and other amenities at the existing bus stop. Constructing the bus bulb would require elimination of parking and/or a travel lane, which may be feasible with the proposed reconfiguration of 11th Street at Broadway to accommodate BRT.

CONSISTENCY WITH ADOPTED POLICIES, PLANS OR PROGRAMS SUPPORTING ALTERNATIVE TRANSPORTATION

The discussion of consistency with adopted policies, plans or programs supporting alternative transportation is based on application of Significance Threshold #15. A discussion of applicable

policies and plans is provided below. In general, the proposed project is consistent with these policies, plans and programs, and would not cause a significant impact by conflicting with adopted policies, plans, or programs supporting public transit, bicycle, or pedestrian.

The City of Oakland General Plan LUTE, as well as the City's Public Transit and Alternative Mode and Complete Streets Policies, states a strong preference for encouraging the use of non-automobile transportation modes, such as transit, bicycling, and walking. The proposed project would encourage the use of non-automobile transportation modes by providing residential and commercial uses in a dense walkable urban environment that is well-served by local and regional transit.

The proposed Project is consistent with both the City's *Pedestrian Master Plan* (PMP) and *Bicycle Master Plan* by not making major modifications to existing pedestrian or bicycle facilities in the surrounding areas and would not adversely affect installation of future facilities.

Consistent with the City of Oakland's Standard Conditions of Approval (SCA), the Project would implement a Transportation Demand Management (TDM) Plan because the Project is estimated to generate more than 50 peak hour trips. The TDM Plan and potential strategies that can be implemented are described below.

The Modified T5/T6 Project would not conflict with adopted City policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities. This is a less than significant impact, and no mitigation measures are required.

Transportation Demand Management

Since the proposed project would generate more than 50 net new PM peak hour trips, The City's SCA, which requires the preparation of a TDM plan as described below, is applicable.

> ***SCA TRA-1: Parking and Transportation Demand Management.*** *Prior to issuance of a final inspection of the building permit.*
>
> The project applicant shall submit a Transportation and Parking Demand Management (TDM) plan for review and approval by the City. The intent of the TDM plan shall be to reduce vehicle traffic and parking demand generated by the project to the maximum extent practicable consistent with the potential traffic and parking impacts of the project.
>
> The goal of the TDM shall be to achieve the following project vehicle trip reductions (VTR):

- Projects generating 50 to 99 net new AM or PM peak hour vehicle trips: 10 percent VTR
- Projects generating 100 or more net new AM or PM peak hour vehicle trips: 20 percent VTR

The TDM plan shall include strategies to increase pedestrian, bicycle, transit, and carpool use, and reduce parking demand. All four modes of travel shall be considered, as appropriate. VTR strategies to consider include, but are not limited to, the following:

a) Inclusion of additional long term and short term bicycle parking that meets the design standards set forth in chapter five of the Bicycle Master Plan, and Bicycle Parking Ordinance (chapter 17.117 of the Oakland Planning Code), and shower and locker facilities in commercial developments that exceed the requirement.

b) Construction of and/or access to bikeways per the Bicycle Master Plan; construction of priority Bikeway Projects, on-site signage and bike lane striping.

c) Installation of safety elements per the Pedestrian Master Plan (such as cross walk striping, curb ramps, count-down signals, bulb outs, etc.) to encourage convenient and safe crossing at arterials, in addition to safety elements required to address safety impacts of the project.

d) Installation of amenities such as lighting, street trees, trash receptacles per the Pedestrian Master Plan and any applicable streetscape plan.

e) Construction and development of transit stops/shelters, pedestrian access, way finding signage, and lighting around transit stops per transit agency plans or negotiated improvements.

f) Direct on-site sales of transit passes purchased and sold at a bulk group rate (through programs such as AC Transit Easy Pass or a similar program through another transit agency).

g) Provision of a transit subsidy to employees or residents, determined by the project sponsor and subject to review by the City, if the employees or residents use transit or commute by other alternative modes.

h) Provision of an ongoing contribution to AC Transit service to the area between the development and nearest mass transit station prioritized as follows: 1) Contribution to AC Transit bus service; 2) Contribution to an existing area shuttle or streetcar service; and 3) Establishment of new shuttle or streetcar service. The amount of contribution (for any of the above scenarios) would be based upon the cost of establishing new shuttle service (Scenario3).

i) Guaranteed ride home program for employees, either through 511.org or through separate program.

j) Pre-tax commuter benefits (commuter checks) for employees.

k) Free designated parking spaces for on-site car-sharing program (such as City Car Share, Zip Car, etc.) and/or car-share membership for employees or tenants.

l) Onsite carpooling and/or vanpooling program that includes preferential (discounted or free) parking for carpools and vanpools.

m) Distribution of information concerning alternative transportation options.

n) Parking spaces sold/leased separately for residential units. Charge employees for parking, or provide a cash incentive or transit pass alternative to a free parking space in commercial properties.

o) Parking management strategies; including attendant/valet parking and shared parking spaces.

p) Requiring tenants to provide opportunities and the ability to work off-site.

q) Allow employees or residents to adjust their work schedule in order to complete the basic work requirement of five eight-hour workdays by adjusting their schedule to reduce vehicle trips to the worksite (e.g., working four, ten-hour days; allowing employees to work from home two days per week).

r) Provide or require tenants to provide employees with staggered work hours involving a shift in the set work hours of all employees at the workplace or flexible work hours involving individually determined work hours.

The TDM Plan shall indicate the estimated VTR for each strategy proposed based on published research or guidelines. For TDM Plans containing ongoing operational VTR strategies, the Plan shall include an ongoing monitoring and enforcement program to ensure the Plan is implemented on an ongoing basis during project operation. If an annual compliance report is required, as explained below, the TDM Plan shall also specify the topics to be addressed in the annual report.

The project applicant shall implement the approved TDM Plan on an ongoing basis. For projects that generate 100 or more net new AM or PM peak hour vehicle trips and contain ongoing operational VTR strategies, the project applicant shall submit an annual compliance report for the first five years following completion of the project (or completion of each phase for phased projects) for review and approval by the City. The annual report shall document the status and effectiveness of the TDM program, including the actual VTR. If deemed necessary, the City may elect to have a peer review consultant, paid for by the project applicant, review the annual report. If timely reports are not submitted and/or the annual reports indicate that the project applicant has failed to implement the TDM Plan, the project will be considered in violation of the Conditions of Approval and the City may initiate enforcement action as provided for in these Conditions of Approval. The project shall not be considered in violation of this Condition if the TDM Plan is implemented but the VTR goal is not achieved.

Recommendation TRA-6: Consistent with the City of Oakland's requirements, consider including the following strategies as part of the required TDM program for the proposed Site A project:

- Implement Recommendations TRA-3 through TRA-5 to improve pedestrian and bus rider environment in the project vicinity.
- Unbundle the cost of parking from the cost of housing where residents pay separately for their parking spaces.
- Designate dedicated on-site parking spaces for car-sharing.
- Provide long-term and short-term bicycle parking beyond the minimum required by City of Oakland Planning Code.
- Cooperate with City of Oakland and/or other regional agencies to allow installation of a potential bike share station along the project frontage.
- Designate a TDM coordinator for the project.
- Provide all new residents and employees with information on the various transportation options available.
    - Provide residents and/or employees with free or partially subsidized transit passes, which may include providing Clipper Cards with pre-loaded value, enrolling in AC Transit EasyPass program, etc.

In addition, the project applicant shall prepare and submit a TDM program for the Site B Project based on the specific uses proposed for the building.

PARKING CONSIDERATIONS

Although parking does not relate to environmental impacts required for evaluation under CEQA, this section discusses parking supply and demand for automobiles and bicycles.

Parking Supply

Based on a project site plan dated January 23, 2015, the Site A building would utilize up to 200 parking spaces in the City Center West Garage through a license agreement, and/or provide between 150 and 180 parking spaces on-site in up to three below-grade levels in a combination of standard spaces and lift parking.

The Site A building would provide long-term bicycle parking for 61 bicycles in a secure room which can be accessed from the main residential lobby on Clay Streets or from 11th Street.

Auto Parking Demand

Table 9 summarizes parking demand for the Project.[8] Based on 2012 American Community Survey (ACS) data, average automobile ownership in Downtown Oakland is about 0.52 vehicles per unit, which corresponds to peak parking demand of about 130 vehicles, which can be accommodated by either plan to either designate up to 200 parking spaces in the City Center Garage or provide 150 to 180 parking spaces in the project building.

TABLE 9
PROJECT PARKING SUPPLY AND DEMAND

Use	Units[1]	Parking Demand Rate	Parking Demand
Residential Parking Demand	262 DU	0.52 [2]	136
Parking Supply[3]			150-200
Parking Surplus			**14-64**

1. DU = dwelling unit
2. Average automobile ownership per residential unit in Downtown Oakland based on 2012 ACS.
3. Based on a project site plan dated March 6, 2015, project would provide up to 200 parking spaces in the City Center West Garage and/or provide between 150 and 180 parking space within the building.

Source: Fehr & Peers, 2015.

Parking demand presented in Table 9 does not include parking demand generated by the commercial component of the project or visitors to the residential component of the project. Similar to trip generation, this analysis assumes that the commercial component of the project would generate very little parking demand because of its small size and the expected type of uses, which would be primarily local-serving retail and food-related uses and would primarily attract residents and visitors who are already in the area. The parking demand for the residential visitors is expected to peak during evenings and nights, and is expected to be accommodated on-street or within the City Center Garage or other nearby parking facilities.

[8] Based on the site plan dated March 6, 2015, the Site A building would provide 250 residential units, which is smaller than the 262 units used in the traffic impact section of this memorandum. The parking analysis is based on 262 residential units to be consistent with the rest of analysis presented in this memorandum.

City Code Automobile Parking Requirements

Table 10 presents the off-street automobile parking requirement for the project. Based on City of Oakland Municipal Code requirements, the project would need to provide one parking space per unit for the residential component and no parking spaces for the commercial component of the project. Thus, the project would need to provide 262 parking spaces to meet code requirement. Thus, the current parking options under consideration would provide 62 to 112 fewer spaces than required by the Code. The project has submitted a Conditional Use permit application and can submit a combination of on-site and off-site parking spaces to meet the Code requirement. Either option for parking (providing 200 parking spaces in the City Center West Garage or providing 150 and 180 parking spaces on-site) is expected to meet the estimated demand for the project.

TABLE 10
AUTOMOBILE PARKING CODE REQUIREMENTS

Use	Units[1]	Code Requirement	Parking Demand
Residential	262 DU	1 space per unit[2]	262
Commercial	4.54 KSF	none [3]	0
Total Parking Required			262
Parking Supply[3]			150-200
Parking Deficit			**-62 to -112**

1. DU = dwelling unit; KSF = 1,000 square feet
2. City Municipal Code Section 17.116.060.A for multi-family dwellings in Zone CBD-C.
3. City Municipal Code Section 17.116.070 for commercial uses in Zone CBD-C.

Source: Fehr & Peers, 2015.

City Code Bicycle Parking Requirements

Chapter 17.117 of the Oakland Municipal Code requires long-term and short-term bicycle parking for new buildings. Long-term bicycle parking includes lockers or locked enclosures and short-term bicycle parking includes bicycle racks. The Code requires one long-term space for every four multi-family dwelling units and one short-term space for every 20 multi-family dwelling units. The Code requires the minimum level of bicycle parking, two long and short-term spaces, for the commercial component of the Project.

Table 11 presents the bicycle parking requirement for Site A building. Site A is required to provide 68 long-term parking spaces and 15 short-term spaces. The Project site plan identifies long-term bicycle parking for 64 bicycles on the ground level adjacent to the residential building lobby, with direct access from both Clay and 11th Streets. However, it is expected that the long-term bicycle parking facility would accommodate bicycle parking for 68 or more bicycles. The site plan identifies 16 short-term bicycle parking spaces along the sidewalks. Thus, the Site A building would satisfy the City's bicycle parking requirements.

TABLE 11
BICYCLE PARKING REQUIREMENTS

Land Use	Size[1]	Long-Term		Short-Term	
		Spaces per Unit	Spaces	Spaces per Unit	Spaces
Residential	262 DU	1:4 DU	66	1:20 DU	13
Commercial	4.52 KSF	Min.	2	Min.	2
Total Required Bicycle Spaces			68		15
Total Bicycle Parking Provided			64		16
Bicycle Parking Surplus			**0** [3]		**+1**

1. DU = dwelling unit; KSF = 1,000 square feet
2. Based on Oakland Municipal Code Sections 17.117.090 and 17.117.110
3. The current site plan identifies 64 long-term bicycle spaces. The long-term bicycle parking facility would accommodate 68 or more bicycles. Therefore, this analysis does not identify a deficit.

Source: Fehr & Peers, 2015.

Loading Requirements

City Municipal Code Section 17.116.140 requires off-street loading facilities for residential and commercial uses. The requirement for residential facilities that have between 150,000 and 299,999 square feet of floor area is two off-street loading berths. The Code does not require loading berths for commercial uses with less than 10,000 square feet of floor area. Based on City Code, Site A building must provide two off-street loading berths for the residential uses. Based on the site plan, the Site A building would provide two loading spaces that can be accessed from the existing City Center driveway on 11th Street. Thus, the Site A building would satisfy the City's loading requirements. However, if the loading spaces are eliminated per Recommendation TRA-2, the building would not satisfy the City's loading requirement and would require a variance.

COMPARISONS OF IMPACT AND MITIGATION MEASURES TO THE 2000 EIR

The significant impacts and mitigation measures identified in the 2000 EIR for the Original Project are listed below and compared to the Modified T5/6 Project:

- Mitigation Measure B.1a at the Brush Street/12th Street/I-980 Westbound Off-Ramp intersection consisted of coordinating with Caltrans to consider improvement options at this intersection, such as adjusting signal timings and/or providing additional lanes on the off-ramp. The 2000 EIR identified this as a Significant and Unavoidable impact. As previously presented and consistent with the 2000 EIR, the analysis for the Modified T5/6 Project identifies the mitigation measure as infeasible and the impact remains significant and unavoidable.
- Mitigation Measure B.1b at the Broadway/12th Street intersection consisted of adjusting signal timings and providing a protected left-turn phase for the northbound Broadway approach. The 2000 EIR identified this as a Significant and Unavoidable impact. The provision for protected left-turn phase for the northbound Broadway approach has already been implemented. As previously presented, the Modified T5/6 Project would not cause an impact at this intersection. Therefore, Mitigation Measure B.1b is no longer applicable.
- Mitigation Measure B.4 identified various measures such as construction of additional parking and implementing various TDM strategies, to mitigate to a less than significant level the project's significant impact on parking. Although parking is no longer considered for evaluation under CEQA, the parking assessment presented above shows that Building A would provide adequate parking supply to meet the generated parking demand. Recommendation TRA-6 (TDM Plan) is consistent with Mitigation Measure B.4 in the 2000 EIR. Therefore, other components of Mitigation Measure B.4 are no longer applicable.
- Mitigation Measure B.5 identified the need for further observation and study of exit fare gates at the 11th Street exit of the 12th Street BART Station during the AM peak period to ensure that the maximum passenger wait would not exceed two minutes through the fare gates. The mitigation measure also required the addition of one or more new fare gates at the 11th Street exit to the station. The mitigation measure continues to be applicable. Considering that Site A would be a residential development and would not generate substantial inbound BART trips during the AM peak period, it would not have a

noticeable effect on passenger wait times at the exit fare gate. Therefore, the study required by this mitigation measure should be completed prior to development of Site B based on the specific development proposed at Site B.

Please contact Sam with questions or comments.

Attachments:

Figures:

Figure 1	Project Site Location
Figure 2	Existing Lane Configurations, Traffic Controls, and Peak Hour Traffic Volumes
Figure 3	Project Trip Distribution
Figure 4	Project Trip Assignment
Figure 5	Peak Hour Project Trip Assignment at Study Intersections
Figure 6	Existing Plus Project Lane Configurations, Traffic Controls, and Peak Hour Traffic Volumes
Figure 7	2035 No Project Lane Configurations, Traffic Controls, and Peak Hour Traffic Volumes
Figure 8	2035 Plus Project Lane Configurations, Traffic Controls, and Peak Hour Traffic Volumes
Figure 9	Site A Ground Level Site Plan

Appendix:

Appendix A	Intersection LOS Calculation Sheets

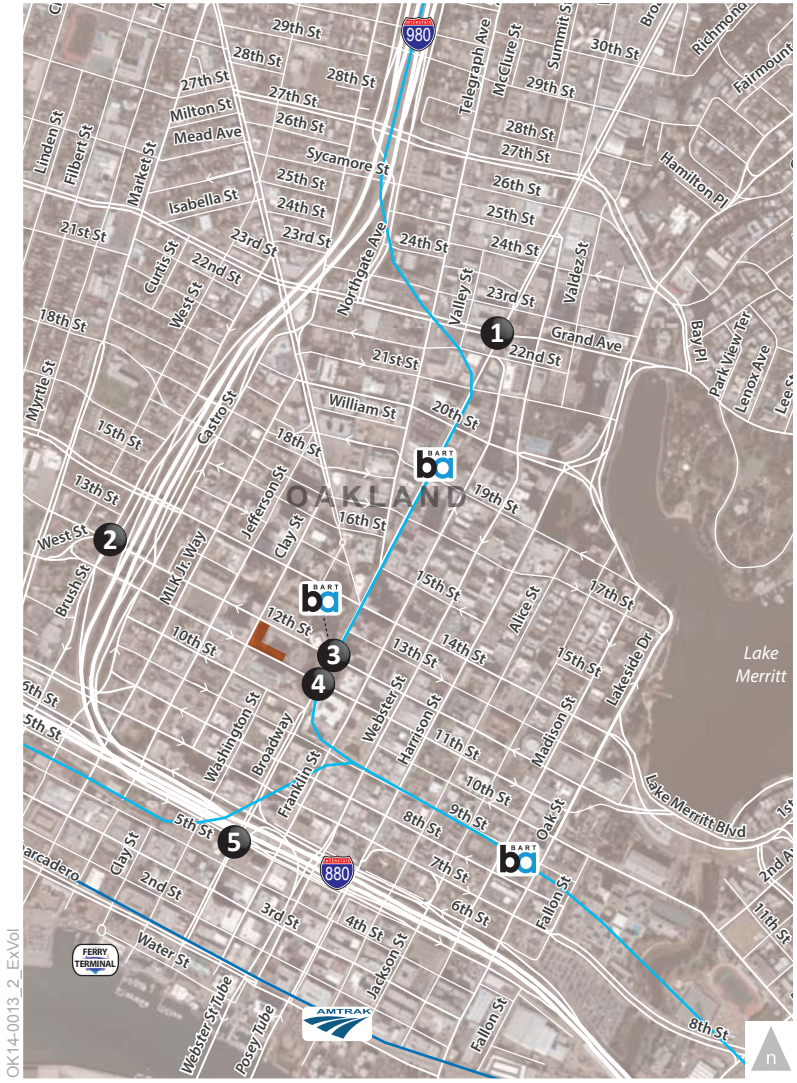
OK14-0013_1_SiteLoc

LEGEND

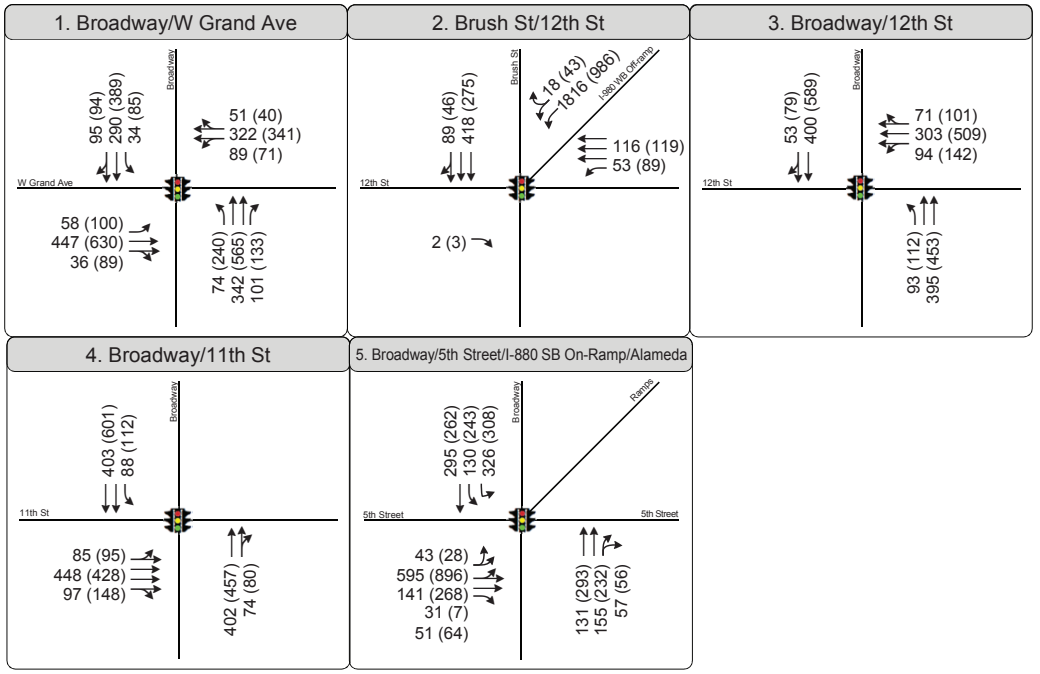
Project Site

Figure 1

Project Site Location



OK14-0013_2_ExVol



LEGEND

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

Signalized Intersection

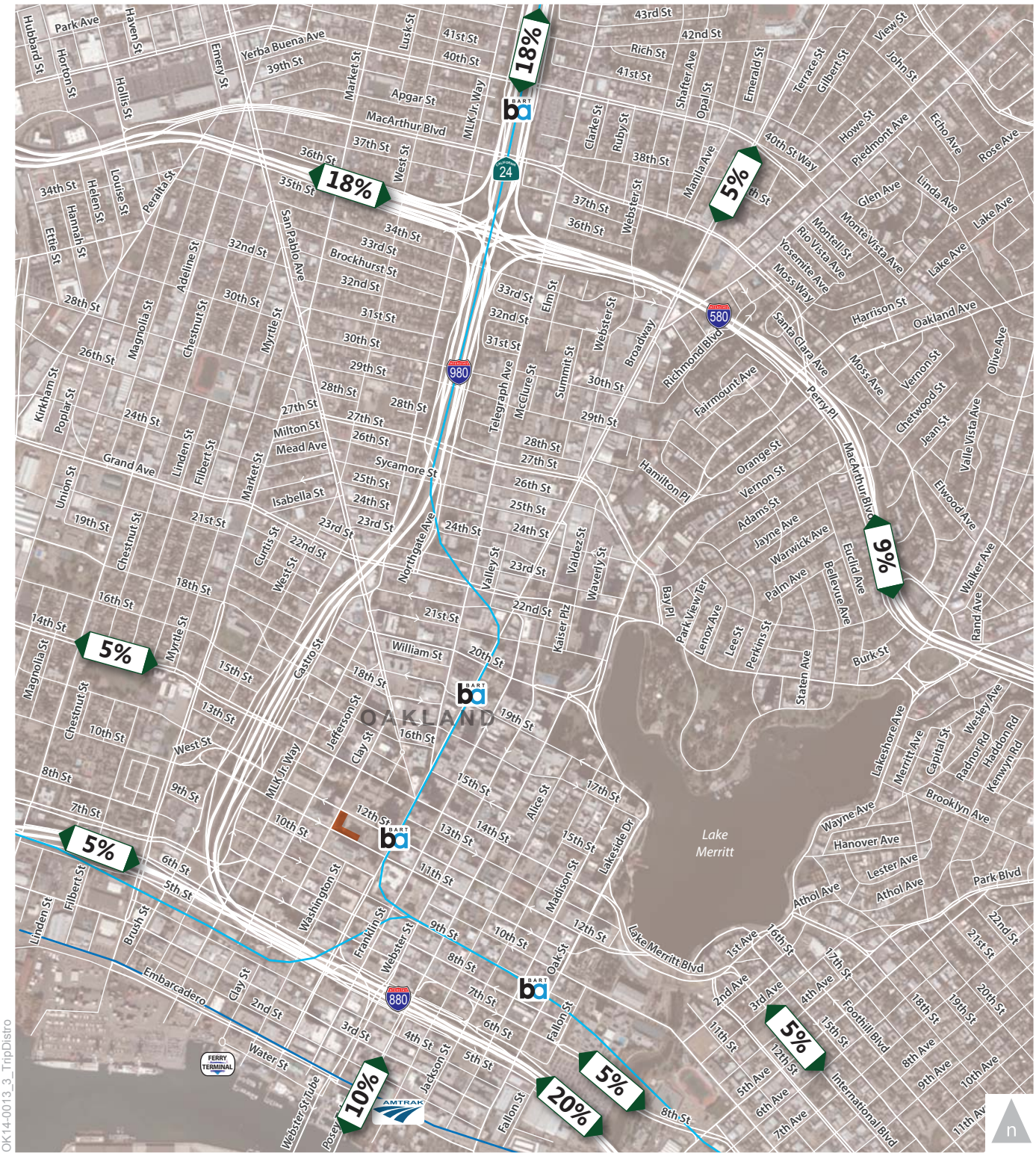
Stop Sign

Study Intersection

Project Site

Figure 2

Existing Lane Configurations, Traffic Control and Peak Hour Traffic Volumes



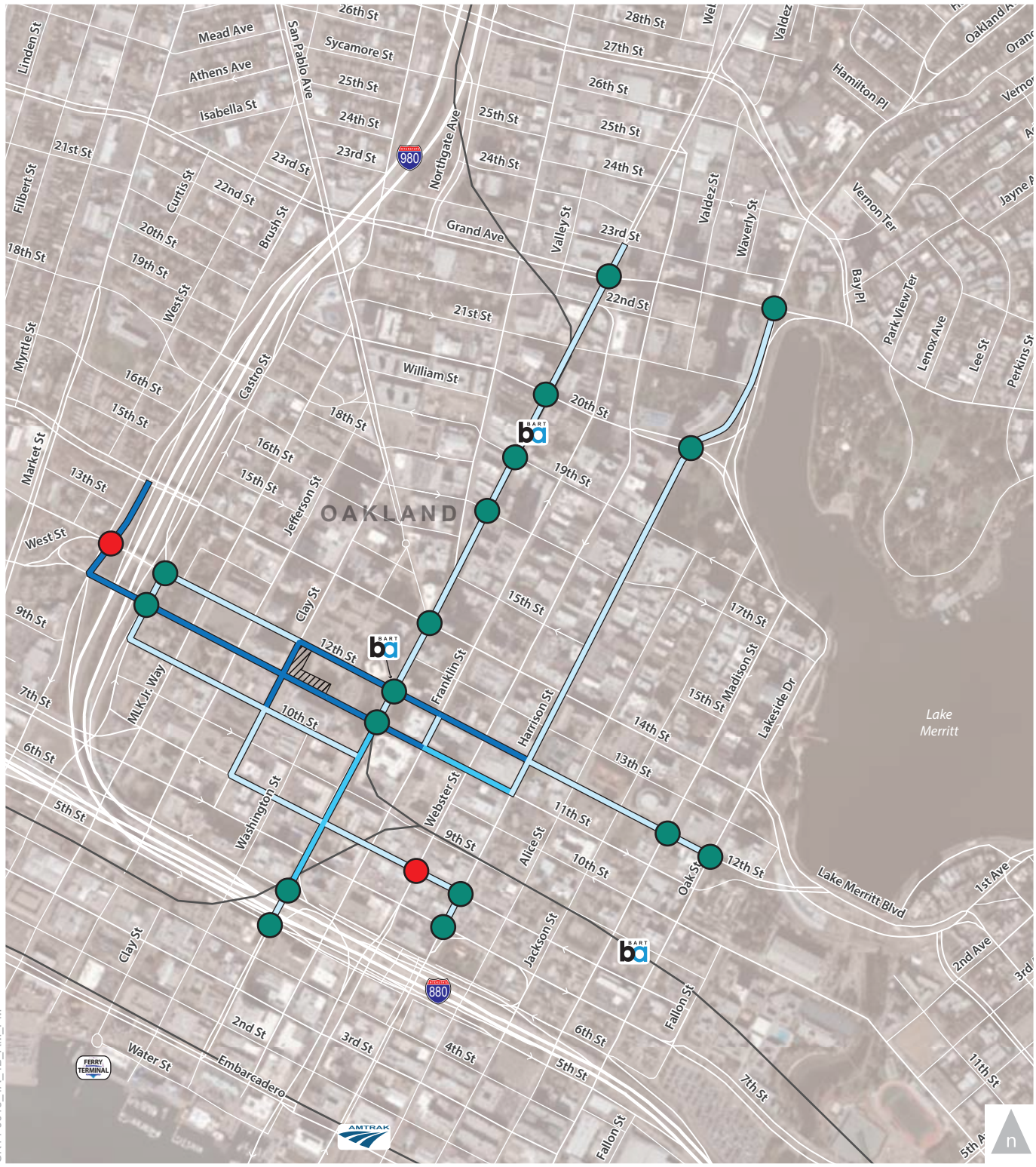
LEGEND

Project Site

XX% Project Trip Distribution

Figure 3

Project Trip Distribution



OK14-0013_4A_4B_AM_PM

LEGEND

Project Site

Project Trip Assignment

- Greater than 50
- 25 to 50
- 10 to 25

- Intersection Operating at LOS E or Better under Current or Future Conditions
- Intersection Operating at LOS F under Current and/or Future Conditions

Figure 4A

AM Peak Hour Project Trip Assignment

LEGEND

Project Site

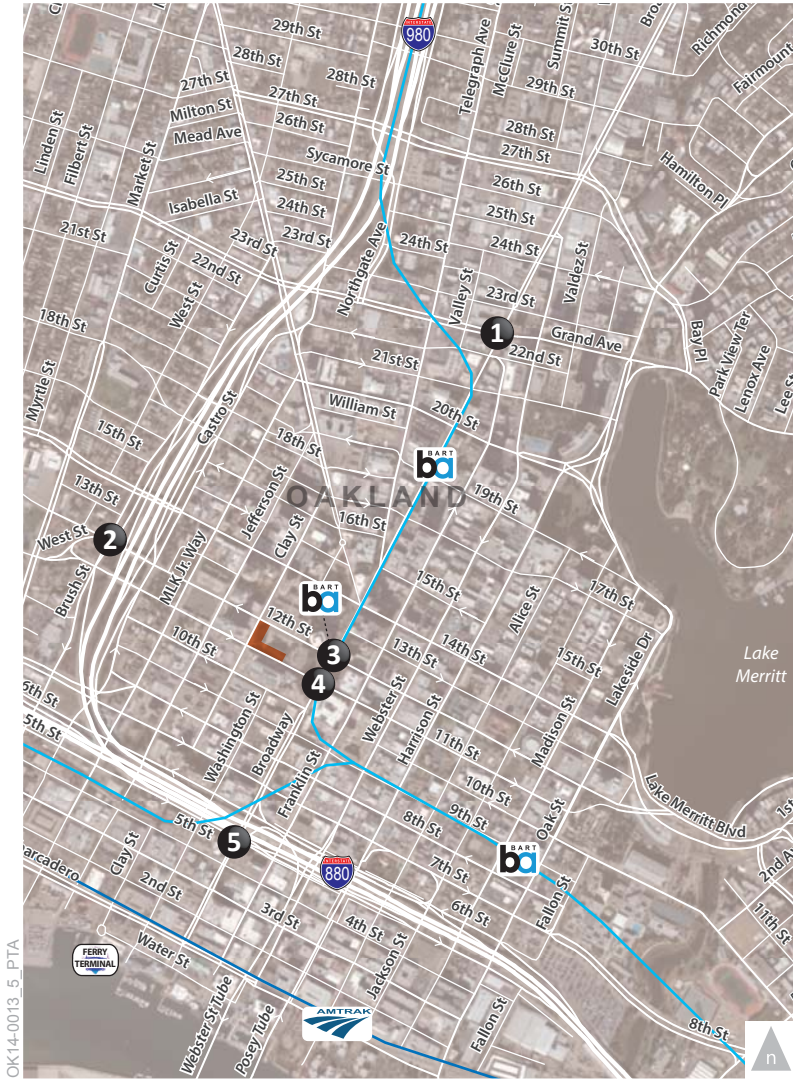
Project Trip Assignment

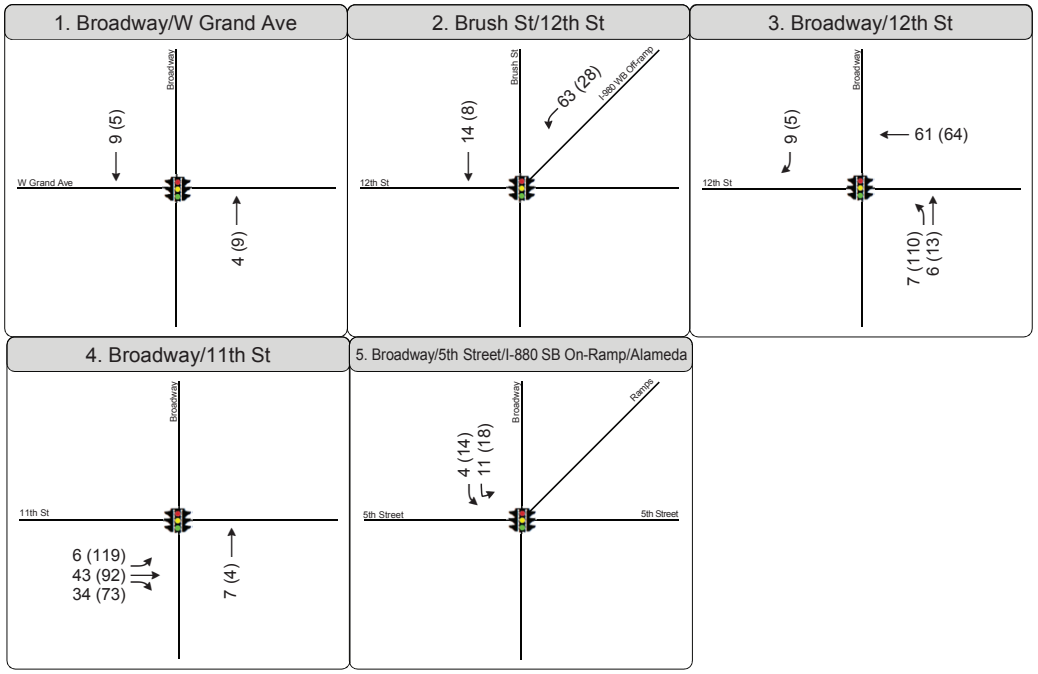
- Greater than 50
- 25 to 50
- 10 to 25

- Intersection Operating at LOS E or Better under Current or Future Conditions
- Intersection Operating at LOS F under Current and/or Future Conditions

Figure 4B

PM Peak Hour Project Trip Assignment





OK14-0013_5_PTA

LEGEND

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

Signalized Intersection

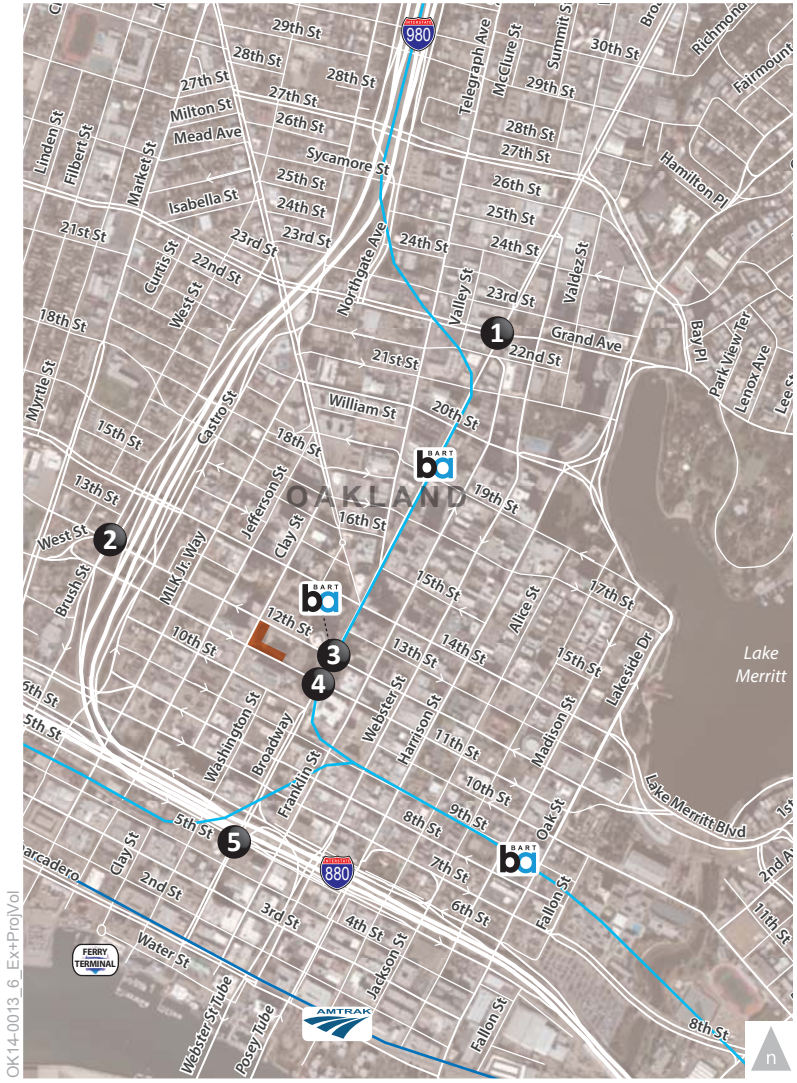
Stop Sign

Study Intersection

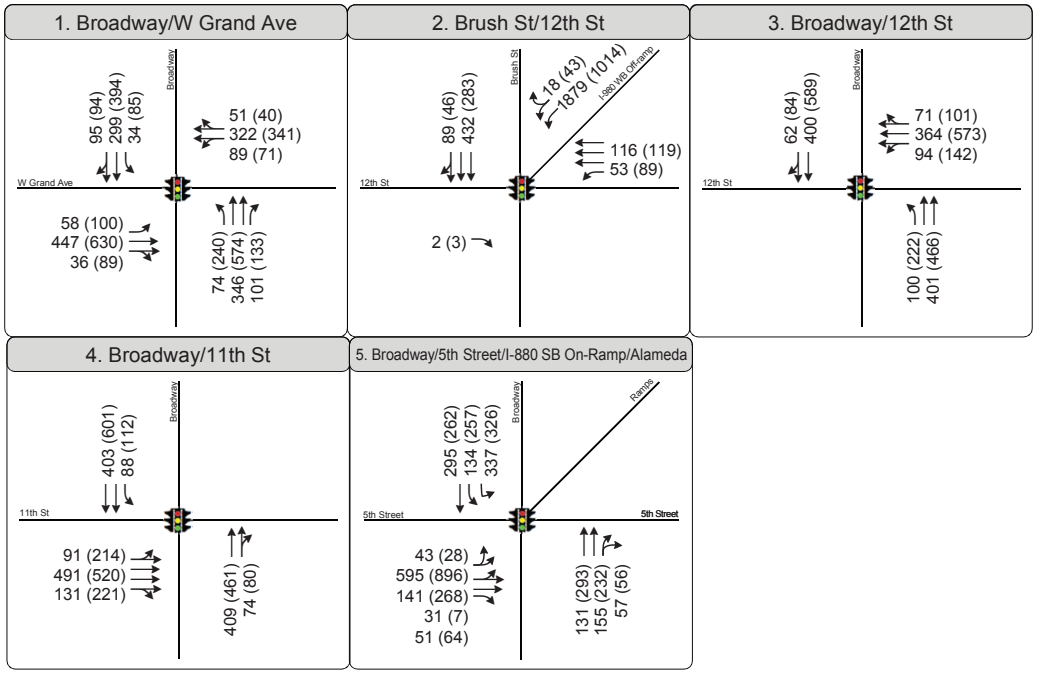
Project Site

Figure 5

Project Trip Assignment



OK14-0013_6_Ex+ProjVol



LEGEND

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

Signalized Intersection

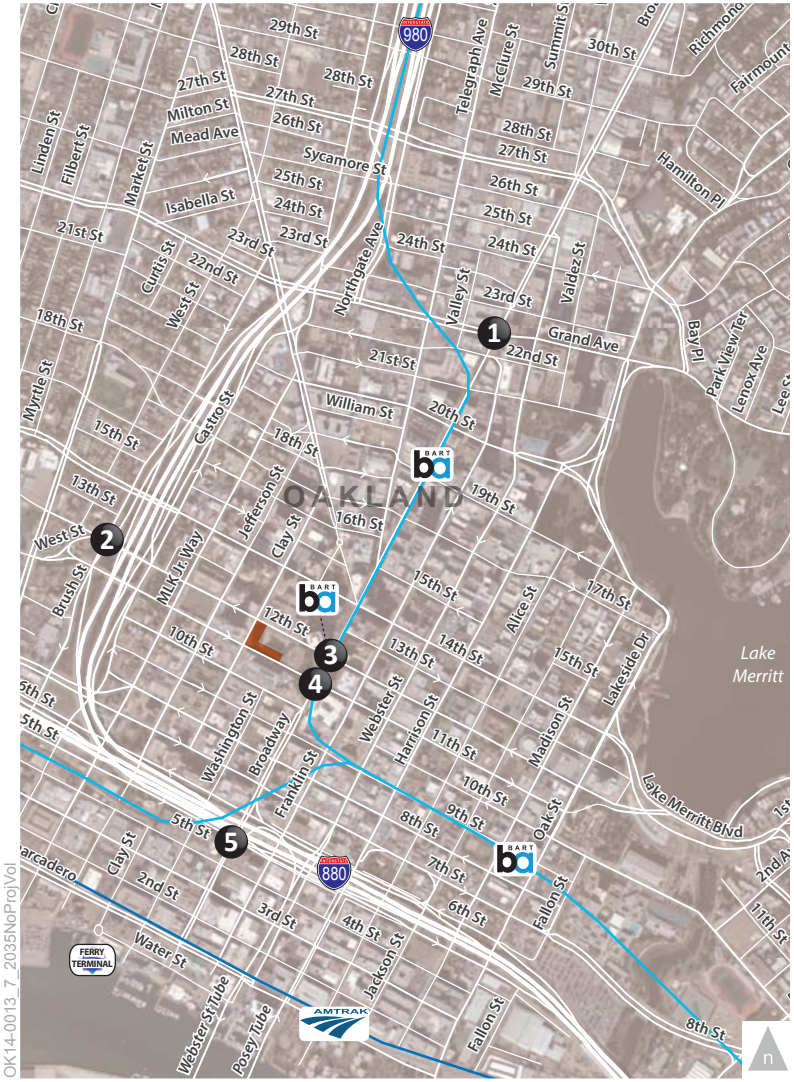
Stop Sign

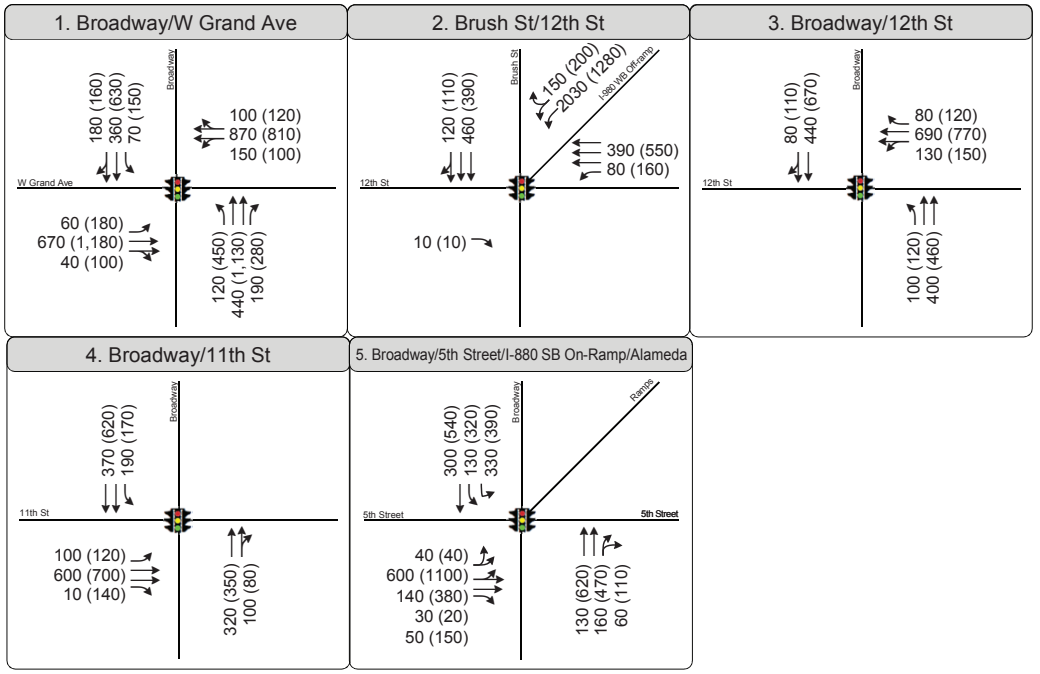
Study Intersection

Project Site

Figure 6

Existing Plus Project Lane Configurations, Traffic Control and Peak Hour Traffic Volumes





LEGEND

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

Signalized Intersection

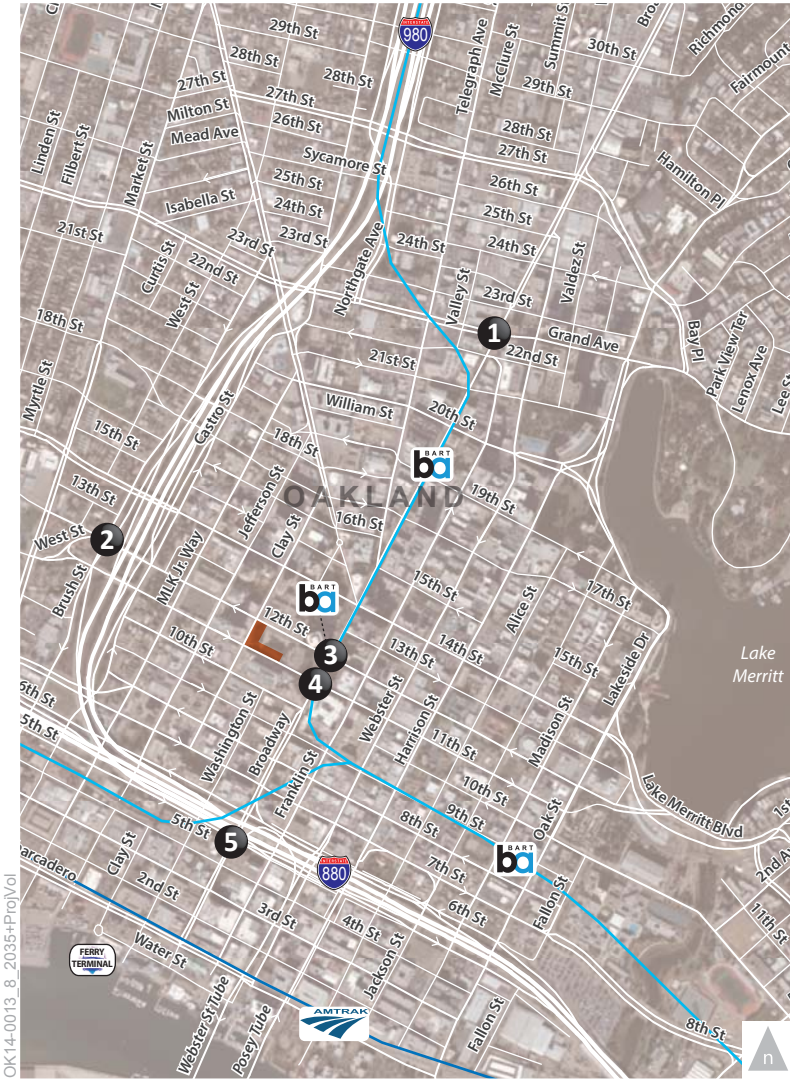
Stop Sign

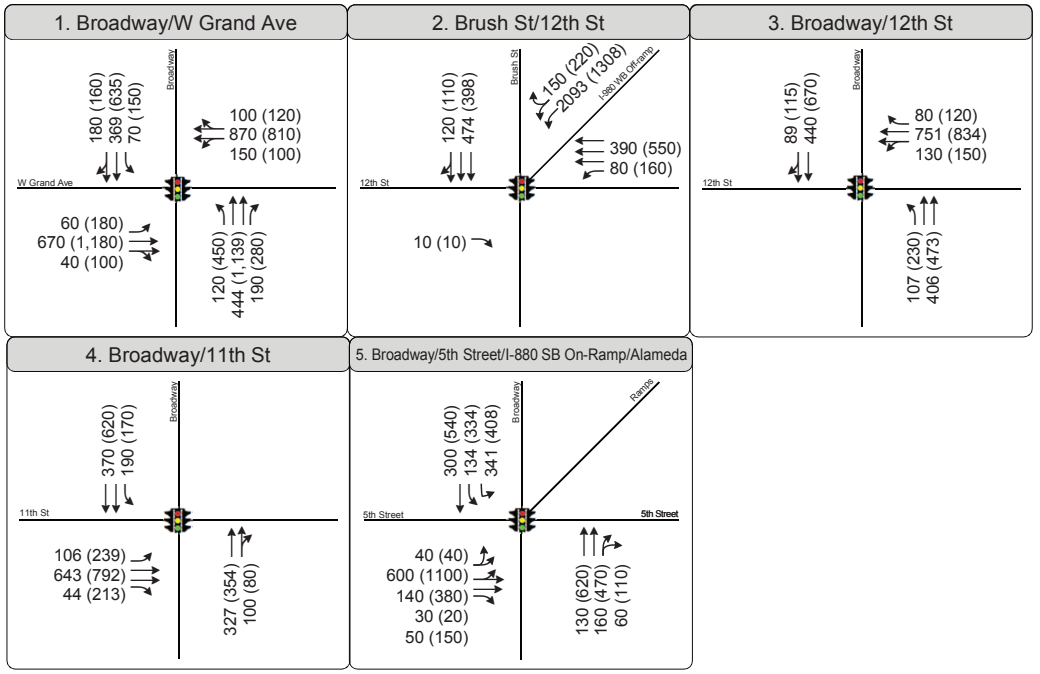
Study Intersection

Project Site

Figure 7

2035 No Project Lane Configurations, Traffic Control and Peak Hour Traffic Volumes





LEGEND

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

Signalized Intersection

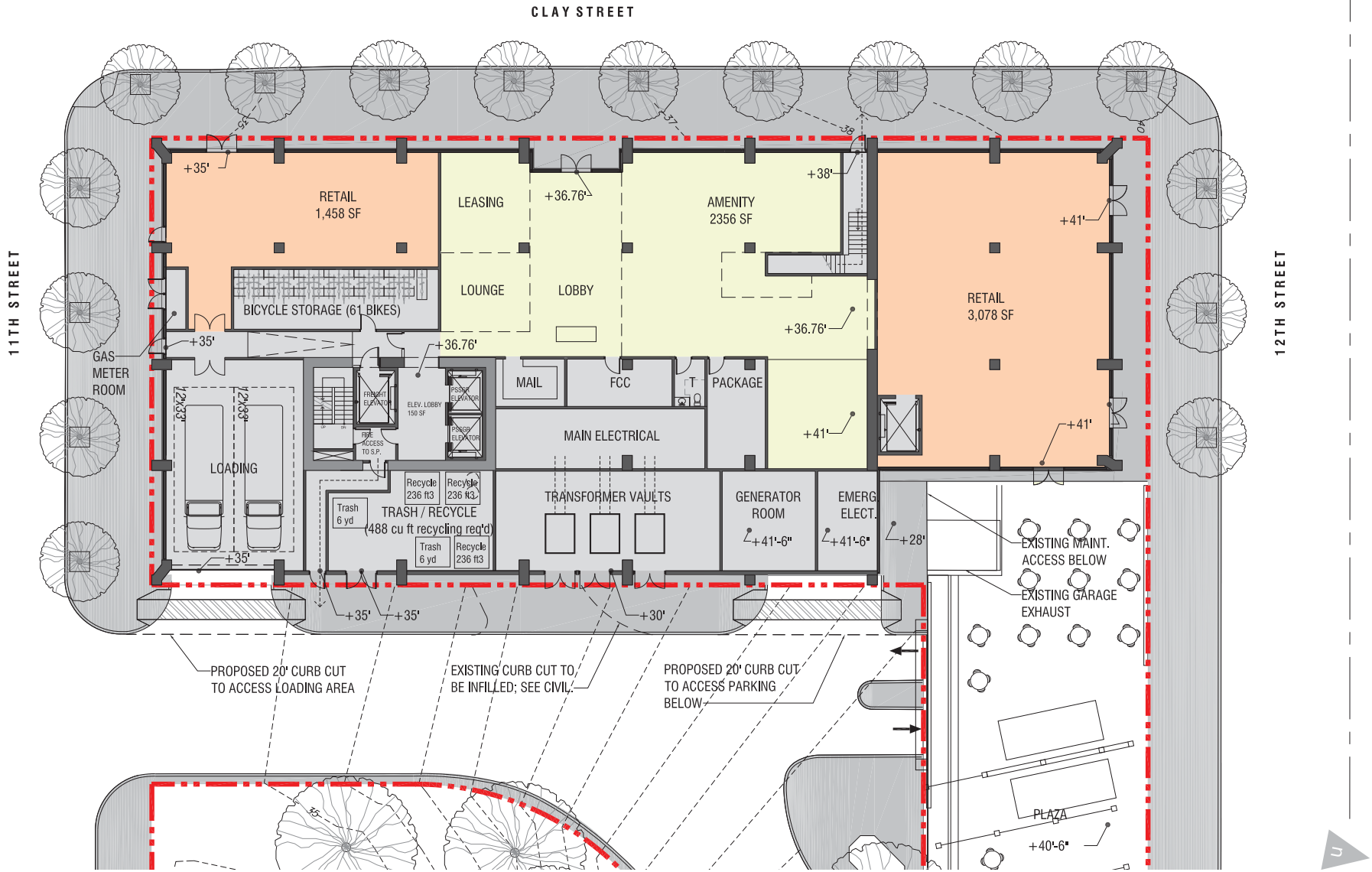
Stop Sign

Study Intersection

Project Site

Figure 8

2035 Plus Project Lane Configurations, Traffic Control and Peak Hour Traffic Volumes



OK14-0013_9_SitePlan

Site Plan Source: Arquitectonica, Strada

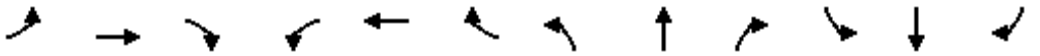
Figure 9

Site A Ground Level Site Plan

Appendix A

LOS Calculations

FEHR PEERS



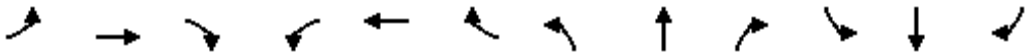
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	447	36	89	322	51	74	342	101	34	290	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99			0.99		1.00	1.00	0.91	1.00	0.98	
Flpb, ped/bikes	0.97	1.00			0.99		0.96	1.00	1.00	0.95	1.00	
Frt	1.00	0.99			0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1541	3130			3053		1526	3185	1087	1515	2997	
Flt Permitted	0.37	1.00			0.70		0.52	1.00	1.00	0.55	1.00	
Satd. Flow (perm)	604	3130			2157		841	3185	1087	871	2997	
Peak-hour factor, PHF	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. Flow (vph)	58	447	36	89	322	51	74	342	101	34	290	95
RTOR Reduction (vph)	0	10	0	0	16	0	0	0	38	0	24	0
Lane Group Flow (vph)	58	473	0	0	446	0	74	342	63	34	361	0
Confl. Peds. (#/hr)	71		73	73		71	84		80	80		84
Confl. Bikes (#/hr)			15			21			9			34
Bus Blockages (#/hr)	0	0	0	0	0	10	0	0	10	0	0	10
Parking (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.8	23.8			23.8		53.2	53.2	53.2	53.2	53.2	
Effective Green, g (s)	23.8	23.8			23.8		53.2	53.2	53.2	53.2	53.2	
Actuated g/C Ratio	0.28	0.28			0.28		0.63	0.63	0.63	0.63	0.63	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	169	876			603		526	1993	680	545	1875	
v/s Ratio Prot		0.15						0.11			c0.12	
v/s Ratio Perm	0.10				c0.21		0.09		0.06	0.04		
v/c Ratio	0.34	0.54			0.74		0.14	0.17	0.09	0.06	0.19	
Uniform Delay, d1	24.4	26.0			27.8		6.5	6.7	6.3	6.2	6.8	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.3			4.1		0.6	0.2	0.3	0.2	0.2	
Delay (s)	24.8	26.3			31.9		7.1	6.9	6.6	6.4	7.0	
Level of Service	C	C			C		A	A	A	A	A	
Approach Delay (s)		26.1			31.9			6.8			6.9	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBR	WBL	WBT	SBT	SBR	SWL	SWR
Lane Configurations							
Volume (vph)	2	53	116	418	89	1816	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		5.0	
Lane Util. Factor	1.00	1.00	0.91	0.91		0.97	
Frpb, ped/bikes	0.93	1.00	1.00	1.00		1.00	
Flpb, ped/bikes	1.00	0.94	1.00	1.00		1.00	
Frt	0.86	1.00	1.00	0.97		1.00	
Flt Protected	1.00	0.95	1.00	1.00		0.95	
Satd. Flow (prot)	1345	1496	4577	4254		3185	
Flt Permitted	1.00	0.95	1.00	1.00		0.95	
Satd. Flow (perm)	1345	1496	4577	4254		3185	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	53	116	418	89	1816	18
RTOR Reduction (vph)	2	46	0	29	0	0	0
Lane Group Flow (vph)	0	7	116	478	0	1834	0
Confl. Peds. (#/hr)	35	35			4	35	4
Confl. Bikes (#/hr)	1				1		
Parking (#/hr)				5	5		
Turn Type	Perm	Perm	NA	NA		Prot	
Protected Phases			4	5		6	
Permitted Phases	4	4					
Actuated Green, G (s)	14.8	14.8	14.8	16.5		69.7	
Effective Green, g (s)	14.8	14.8	14.8	16.5		69.7	
Actuated g/C Ratio	0.13	0.13	0.13	0.14		0.61	
Clearance Time (s)	4.5	4.5	4.5	4.5		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	173	192	589	610		1930	
v/s Ratio Prot			c0.03	c0.11		c0.58	
v/s Ratio Perm	0.00	0.00					
v/c Ratio	0.00	0.04	0.20	0.78		0.95	
Uniform Delay, d1	43.7	43.9	44.8	47.5		21.0	
Progression Factor	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.1	0.2	6.5		11.7	
Delay (s)	43.7	43.9	45.0	54.0		32.7	
Level of Service	D	D	D	D		C	
Approach Delay (s)			44.6	54.0		32.7	
Approach LOS			D	D		C	

Intersection Summary			
HCM 2000 Control Delay	37.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

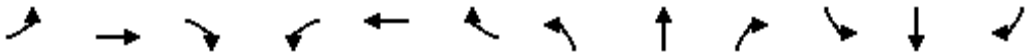
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	94	303	71	93	395	0	0	400	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0	4.5			4.5	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.98		1.00	1.00			0.96	
Flpb, ped/bikes					0.97		1.00	1.00			1.00	
Frt					0.98		1.00	1.00			0.98	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					4001		1593	3122			2933	
Flt Permitted					0.99		0.95	1.00			1.00	
Satd. Flow (perm)					4001		1593	3122			2933	
Peak-hour factor, PHF	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. Flow (vph)	0	0	0	94	303	71	93	395	0	0	400	53
RTOR Reduction (vph)	0	0	0	0	43	0	0	0	0	0	17	0
Lane Group Flow (vph)	0	0	0	0	425	0	93	395	0	0	436	0
Confl. Peds. (#/hr)				164		113	522					522
Confl. Bikes (#/hr)						6						10
Bus Blockages (#/hr)	0	0	0	0	10	10	0	10	0	0	10	10
Parking (#/hr)				5	5	5						
Turn Type				Perm	NA		Prot	NA			NA	
Protected Phases					4		5	2			6	
Permitted Phases				4								
Actuated Green, G (s)					21.0		4.5	30.5			22.0	
Effective Green, g (s)					21.0		4.5	30.5			22.0	
Actuated g/C Ratio					0.35		0.08	0.51			0.37	
Clearance Time (s)					4.0		4.0	4.5			4.5	
Lane Grp Cap (vph)					1400		119	1587			1075	
v/s Ratio Prot							c0.06	0.13			c0.15	
v/s Ratio Perm					0.11							
v/c Ratio					0.30		0.78	0.25			0.41	
Uniform Delay, d1					14.2		27.3	8.3			14.1	
Progression Factor					1.00		1.57	2.28			1.00	
Incremental Delay, d2					0.6		36.0	0.3			1.1	
Delay (s)					14.7		78.9	19.3			15.3	
Level of Service					B		E	B			B	
Approach Delay (s)		0.0			14.7			30.6			15.3	
Approach LOS		A			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



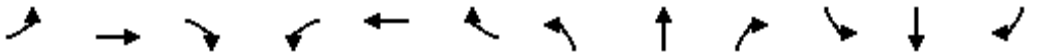
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	448	97	0	0	0	0	402	74	88	403	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.86						0.95		1.00	0.95	
Frpb, ped/bikes		0.98						0.95		1.00	1.00	
Flpb, ped/bikes		0.98						1.00		1.00	1.00	
Frt		0.98						0.98		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		5150						2898		1593	3122	
Flt Permitted		0.99						1.00		0.95	1.00	
Satd. Flow (perm)		5150						2898		1593	3122	
Peak-hour factor, PHF	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. Flow (vph)	85	448	97	0	0	0	0	402	74	88	403	0
RTOR Reduction (vph)	0	55	0	0	0	0	0	25	0	0	0	0
Lane Group Flow (vph)	0	575	0	0	0	0	0	451	0	88	403	0
Confl. Peds. (#/hr)	139		172						313	313		
Confl. Bikes (#/hr)			11						3			
Bus Blockages (#/hr)	0	10	10	0	0	0	0	10	10	0	10	0
Parking (#/hr)	5	5	5									
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)		23.0						20.0		5.0	29.0	
Effective Green, g (s)		23.0						20.0		5.0	29.0	
Actuated g/C Ratio		0.38						0.33		0.08	0.48	
Clearance Time (s)		4.0						4.0		4.0	4.0	
Lane Grp Cap (vph)		1974						966		132	1508	
v/s Ratio Prot								c0.16		c0.06	0.13	
v/s Ratio Perm		0.11										
v/c Ratio		0.29						0.47		0.67	0.27	
Uniform Delay, d1		12.8						15.8		26.7	9.2	
Progression Factor		1.00						1.00		0.64	1.03	
Incremental Delay, d2		0.4						1.6		22.2	0.4	
Delay (s)		13.2						17.4		39.2	9.9	
Level of Service		B						B		D	A	
Approach Delay (s)		13.2			0.0			17.4			15.2	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL2	EBL	EBT	EBR	EBR2	NBT	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations											
Volume (vph)	43	595	141	31	51	131	155	57	326	130	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0		4.0	4.5	4.0
Lane Util. Factor		0.91	0.91		1.00	0.95	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.99		0.95	1.00	0.89		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.99		0.85	1.00	0.85		1.00	1.00	1.00
Flt Protected		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (prot)		1449	2913		1356	3185	1262		1593	1593	1676
Flt Permitted		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (perm)		1449	2913		1356	3185	1262		1593	1593	1676
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	43	595	141	31	51	131	155	57	326	130	295
RTOR Reduction (vph)	0	0	0	0	35	0	0	0	0	0	0
Lane Group Flow (vph)	0	358	452	0	16	131	212	0	326	130	295
Confl. Peds. (#/hr)				25	25		40	40	40	40	
Confl. Bikes (#/hr)							1	1			
Turn Type	Perm	Perm	NA		Perm	NA	Perm		Prot	Prot	NA
Protected Phases			4			2			1	1	6
Permitted Phases	4	4			4		2				
Actuated Green, G (s)		26.8	26.8		26.8	18.5	18.5		31.2	31.2	53.2
Effective Green, g (s)		28.3	28.3		28.3	18.0	18.0		31.7	31.2	53.7
Actuated g/C Ratio		0.31	0.31		0.31	0.20	0.20		0.35	0.35	0.60
Clearance Time (s)		5.5	5.5		5.5	3.5	3.5		4.5	4.5	4.5
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)		455	915		426	637	252		561	552	1000
v/s Ratio Prot						0.04			c0.20	0.08	0.18
v/s Ratio Perm		c0.25	0.16		0.01		c0.17				
v/c Ratio		0.79	0.49		0.04	0.21	0.84		0.58	0.24	0.29
Uniform Delay, d1		28.1	25.0		21.4	30.0	34.6		23.7	20.9	8.9
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.1	0.2		0.0	0.1	20.9		4.4	1.0	0.8
Delay (s)		36.2	25.2		21.4	30.1	55.5		28.1	21.9	9.6
Level of Service		D	C		C	C	E		C	C	A
Approach Delay (s)			29.5			45.8					19.8
Approach LOS			C			D					B

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

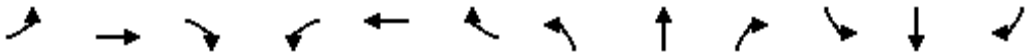


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	630	89	71	341	40	240	565	133	85	389	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99			0.99		1.00	1.00	0.91	1.00	0.99	
Flpb, ped/bikes	0.98	1.00			1.00		0.98	1.00	1.00	0.98	1.00	
Frt	1.00	0.98			0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1557	3098			3091		1564	3185	1093	1561	3059	
Flt Permitted	0.40	1.00			0.66		0.46	1.00	1.00	0.42	1.00	
Satd. Flow (perm)	648	3098			2043		760	3185	1093	685	3059	
Peak-hour factor, PHF	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. Flow (vph)	100	630	89	71	341	40	240	565	133	85	389	94
RTOR Reduction (vph)	0	17	0	0	12	0	0	0	53	0	17	0
Lane Group Flow (vph)	100	702	0	0	440	0	240	565	80	85	466	0
Confl. Peds. (#/hr)	47		62	62		47	43		66	47		43
Confl. Bikes (#/hr)			10			19			35			22
Bus Blockages (#/hr)	0	0	0	0	0	10	0	0	10	0	0	10
Parking (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	25.8	25.8			25.8		51.2	51.2	51.2	51.2	51.2	
Effective Green, g (s)	25.8	25.8			25.8		51.2	51.2	51.2	51.2	51.2	
Actuated g/C Ratio	0.30	0.30			0.30		0.60	0.60	0.60	0.60	0.60	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	196	940			620		457	1918	658	412	1842	
v/s Ratio Prot		c0.23						0.18			0.15	
v/s Ratio Perm	0.15				0.22		c0.32		0.07	0.12		
v/c Ratio	0.51	0.75			0.71		0.53	0.29	0.12	0.21	0.25	
Uniform Delay, d1	24.4	26.7			26.3		9.8	8.2	7.3	7.7	7.9	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	2.9			3.1		4.3	0.4	0.4	1.1	0.3	
Delay (s)	25.3	29.5			29.3		14.1	8.6	7.6	8.8	8.3	
Level of Service	C	C			C		B	A	A	A	A	
Approach Delay (s)		29.0			29.3			9.8			8.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

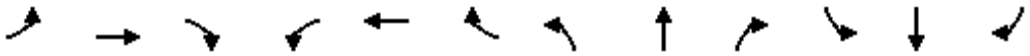
Movement	EBR	WBL	WBT	SBT	SBR	SWL	SWR
Lane Configurations							
Volume (vph)	3	89	119	275	46	986	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		5.0	
Lane Util. Factor	1.00	1.00	0.91	0.91		0.97	
Frpb, ped/bikes	0.92	1.00	1.00	0.99		1.00	
Flpb, ped/bikes	1.00	0.93	1.00	1.00		1.00	
Frt	0.86	1.00	1.00	0.98		0.99	
Flt Protected	1.00	0.95	1.00	1.00		0.95	
Satd. Flow (prot)	1337	1485	4577	4261		3185	
Flt Permitted	1.00	0.95	1.00	1.00		0.95	
Satd. Flow (perm)	1337	1485	4577	4261		3185	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	89	119	275	46	986	43
RTOR Reduction (vph)	2	74	0	31	0	0	0
Lane Group Flow (vph)	1	15	119	290	0	1029	0
Confl. Peds. (#/hr)	53	53			23	53	23
Parking (#/hr)				5	5		
Turn Type	Perm	Perm	NA	NA		Prot	
Protected Phases			4	5		6	
Permitted Phases	4	4					
Actuated Green, G (s)	14.6	14.6	14.6	11.2		45.2	
Effective Green, g (s)	14.6	14.6	14.6	11.2		45.2	
Actuated g/C Ratio	0.17	0.17	0.17	0.13		0.53	
Clearance Time (s)	4.5	4.5	4.5	4.5		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	229	255	786	561		1693	
v/s Ratio Prot			c0.03	c0.07		c0.32	
v/s Ratio Perm	0.00	0.01					
v/c Ratio	0.00	0.06	0.15	0.52		0.61	
Uniform Delay, d1	29.2	29.5	29.9	34.4		13.8	
Progression Factor	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.1	0.1	0.8		1.6	
Delay (s)	29.2	29.6	30.0	35.2		15.4	
Level of Service	C	C	C	D		B	
Approach Delay (s)			29.8	35.2		15.4	
Approach LOS			C	D		B	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	142	509	101	112	453	0	0	589	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0	4.5			4.5	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.99		1.00	1.00			0.96	
Flpb, ped/bikes					0.98		1.00	1.00			1.00	
Frt					0.98		1.00	1.00			0.98	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					4085		1450	3122			2938	
Flt Permitted					0.99		0.95	1.00			1.00	
Satd. Flow (perm)					4085		1450	3122			2938	
Peak-hour factor, PHF	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. Flow (vph)	0	0	0	142	509	101	112	453	0	0	589	79
RTOR Reduction (vph)	0	0	0	0	19	0	0	0	0	0	17	0
Lane Group Flow (vph)	0	0	0	0	733	0	112	453	0	0	651	0
Confl. Peds. (#/hr)				125		48	446		455	455		446
Confl. Bikes (#/hr)						6			10			9
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	12%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	10	10	0	10	0	0	10	10
Parking (#/hr)				5	5	5						
Turn Type				Perm	NA		Prot	NA			NA	
Protected Phases					4		5	2			6	
Permitted Phases				4								
Actuated Green, G (s)					21.0		4.5	30.5			22.0	
Effective Green, g (s)					21.0		4.5	30.5			22.0	
Actuated g/C Ratio					0.35		0.08	0.51			0.37	
Clearance Time (s)					4.0		4.0	4.5			4.5	
Lane Grp Cap (vph)					1429		108	1587			1077	
v/s Ratio Prot							c0.08	0.15			c0.22	
v/s Ratio Perm					0.18							
v/c Ratio					0.51		1.04	0.29			0.60	
Uniform Delay, d1					15.4		27.8	8.5			15.5	
Progression Factor					1.00		1.15	1.10			1.00	
Incremental Delay, d2					1.3		91.4	0.4			2.5	
Delay (s)					16.8		123.4	9.7			18.0	
Level of Service					B		F	A			B	
Approach Delay (s)		0.0			16.8			32.2			18.0	
Approach LOS		A			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



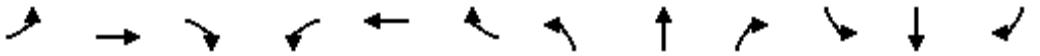
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	95	428	148	0	0	0	0	457	80	112	601	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.86						0.95		1.00	0.95	
Frpb, ped/bikes		0.93						0.95		1.00	1.00	
Flpb, ped/bikes		0.99						1.00		1.00	1.00	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		4868						2885		1593	3122	
Flt Permitted		0.99						1.00		0.95	1.00	
Satd. Flow (perm)		4868						2885		1593	3122	
Peak-hour factor, PHF	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. Flow (vph)	95	428	148	0	0	0	0	457	80	112	601	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	23	0	0	0	0
Lane Group Flow (vph)	0	664	0	0	0	0	0	514	0	112	601	0
Confl. Peds. (#/hr)	77		535				490		535	535		490
Confl. Bikes (#/hr)			6						9			16
Bus Blockages (#/hr)	0	10	10	0	0	0	0	10	10	0	10	0
Parking (#/hr)	5	5	5									
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)		23.0						20.0		5.0	29.0	
Effective Green, g (s)		23.0						20.0		5.0	29.0	
Actuated g/C Ratio		0.38						0.33		0.08	0.48	
Clearance Time (s)		4.0						4.0		4.0	4.0	
Lane Grp Cap (vph)		1866						961		132	1508	
v/s Ratio Prot								c0.18		c0.07	0.19	
v/s Ratio Perm		0.14										
v/c Ratio		0.36						0.53		0.85	0.40	
Uniform Delay, d1		13.2						16.2		27.1	9.9	
Progression Factor		1.00						1.00		0.90	1.76	
Incremental Delay, d2		0.5						2.1		39.2	0.6	
Delay (s)		13.7						18.4		63.6	18.1	
Level of Service		B						B		E	B	
Approach Delay (s)		13.7			0.0			18.4			25.2	
Approach LOS		B			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL2	EBL	EBT	EBR	EBR2	NBT	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations											
Volume (vph)	28	896	268	7	64	293	232	56	308	243	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0		3.5	4.0	4.0
Lane Util. Factor		0.91	0.91		1.00	0.95	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00		0.95	1.00	0.81		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	1.00		0.85	1.00	0.85		1.00	1.00	1.00
Flt Protected		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (prot)		1449	2955		1353	3185	1149		1593	1593	1676
Flt Permitted		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (perm)		1449	2955		1353	3185	1149		1593	1593	1676
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	28	896	268	7	64	293	232	56	308	243	262
RTOR Reduction (vph)	0	0	0	0	38	0	0	0	0	0	0
Lane Group Flow (vph)	0	503	696	0	26	293	288	0	308	243	262
Confl. Peds. (#/hr)				26	26		71	71	71	71	
Confl. Bikes (#/hr)				1	1		2	2			
Turn Type	Perm	Perm	NA		Perm	NA	Perm		Prot	Prot	NA
Protected Phases			4			2			1	1	6
Permitted Phases	4	4			4		2				
Actuated Green, G (s)		31.9	31.9		31.9	22.5	22.5		22.6	22.6	48.1
Effective Green, g (s)		33.4	33.4		33.4	22.0	22.0		23.1	22.6	48.6
Actuated g/C Ratio		0.37	0.37		0.37	0.24	0.24		0.26	0.25	0.54
Clearance Time (s)		5.5	5.5		5.5	3.5	3.5		4.0	4.0	4.5
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)		537	1096		502	778	280		408	400	905
v/s Ratio Prot						0.09			c0.19	0.15	0.16
v/s Ratio Perm		c0.35	0.24		0.02		c0.25				
v/c Ratio		0.94	0.64		0.05	0.38	1.03		0.75	0.61	0.29
Uniform Delay, d1		27.3	23.3		18.1	28.3	34.0		30.8	29.8	11.3
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		23.7	0.9		0.0	0.1	61.4		12.2	6.7	0.8
Delay (s)		51.0	24.2		18.2	28.4	95.4		43.1	36.5	12.1
Level of Service		D	C		B	C	F		D	D	B
Approach Delay (s)			34.5			61.6					31.1
Approach LOS			C			E					C

Intersection Summary			
HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



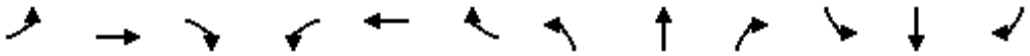
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	447	36	89	322	51	74	346	101	34	299	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99			0.99		1.00	1.00	0.91	1.00	0.98	
Flpb, ped/bikes	0.97	1.00			0.99		0.96	1.00	1.00	0.95	1.00	
Frt	1.00	0.99			0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1541	3130			3053		1527	3185	1087	1515	3002	
Flt Permitted	0.37	1.00			0.70		0.52	1.00	1.00	0.54	1.00	
Satd. Flow (perm)	604	3130			2157		833	3185	1087	868	3002	
Peak-hour factor, PHF	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. Flow (vph)	58	447	36	89	322	51	74	346	101	34	299	95
RTOR Reduction (vph)	0	10	0	0	16	0	0	0	38	0	23	0
Lane Group Flow (vph)	58	473	0	0	446	0	74	346	63	34	371	0
Confl. Peds. (#/hr)	71		73	73		71	84		80	80		84
Confl. Bikes (#/hr)			15			21			9			34
Bus Blockages (#/hr)	0	0	0	0	0	10	0	0	10	0	0	10
Parking (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.8	23.8			23.8		53.2	53.2	53.2	53.2	53.2	
Effective Green, g (s)	23.8	23.8			23.8		53.2	53.2	53.2	53.2	53.2	
Actuated g/C Ratio	0.28	0.28			0.28		0.63	0.63	0.63	0.63	0.63	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	169	876			603		521	1993	680	543	1878	
v/s Ratio Prot		0.15						0.11			c0.12	
v/s Ratio Perm	0.10				c0.21		0.09		0.06	0.04		
v/c Ratio	0.34	0.54			0.74		0.14	0.17	0.09	0.06	0.20	
Uniform Delay, d1	24.4	26.0			27.8		6.5	6.7	6.3	6.2	6.8	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.3			4.1		0.6	0.2	0.3	0.2	0.2	
Delay (s)	24.8	26.3			31.9		7.1	6.9	6.6	6.4	7.0	
Level of Service	C	C			C		A	A	A	A	A	
Approach Delay (s)		26.1			31.9			6.8			7.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBR	WBL	WBT	SBT	SBR	SWL	SWR
Lane Configurations							
Volume (vph)	2	53	116	432	89	1879	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		5.0	
Lane Util. Factor	1.00	1.00	0.91	0.91		0.97	
Frpb, ped/bikes	0.93	1.00	1.00	1.00		1.00	
Flpb, ped/bikes	1.00	0.94	1.00	1.00		1.00	
Frt	0.86	1.00	1.00	0.97		1.00	
Flt Protected	1.00	0.95	1.00	1.00		0.95	
Satd. Flow (prot)	1345	1496	4577	4257		3185	
Flt Permitted	1.00	0.95	1.00	1.00		0.95	
Satd. Flow (perm)	1345	1496	4577	4257		3185	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2	53	116	432	89	1879	18
RTOR Reduction (vph)	2	46	0	27	0	0	0
Lane Group Flow (vph)	0	7	116	494	0	1897	0
Confl. Peds. (#/hr)	35	35			4	35	4
Confl. Bikes (#/hr)	1				1		
Parking (#/hr)				5	5		
Turn Type	Perm	Perm	NA	NA		Prot	
Protected Phases			4	5		6	
Permitted Phases	4	4					
Actuated Green, G (s)	14.8	14.8	14.8	16.7		69.5	
Effective Green, g (s)	14.8	14.8	14.8	16.7		69.5	
Actuated g/C Ratio	0.13	0.13	0.13	0.15		0.60	
Clearance Time (s)	4.5	4.5	4.5	4.5		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	173	192	589	618		1924	
v/s Ratio Prot			c0.03	c0.12		c0.60	
v/s Ratio Perm	0.00	0.00					
v/c Ratio	0.00	0.04	0.20	0.80		0.99	
Uniform Delay, d1	43.7	43.9	44.8	47.5		22.3	
Progression Factor	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.1	0.2	7.1		17.5	
Delay (s)	43.7	43.9	45.0	54.7		39.7	
Level of Service	D	D	D	D		D	
Approach Delay (s)			44.6	54.7		39.7	
Approach LOS			D	D		D	

Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		

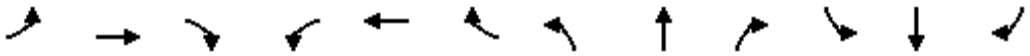
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	94	364	71	100	401	0	0	400	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0	4.5			4.5	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.99		1.00	1.00			0.95	
Flpb, ped/bikes					0.98		1.00	1.00			1.00	
Frt					0.98		1.00	1.00			0.98	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					4038		1593	3122			2906	
Flt Permitted					0.99		0.95	1.00			1.00	
Satd. Flow (perm)					4038		1593	3122			2906	
Peak-hour factor, PHF	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. Flow (vph)	0	0	0	94	364	71	100	401	0	0	400	62
RTOR Reduction (vph)	0	0	0	0	34	0	0	0	0	0	20	0
Lane Group Flow (vph)	0	0	0	0	495	0	100	401	0	0	442	0
Confl. Peds. (#/hr)				164		113	522					522
Confl. Bikes (#/hr)						6						10
Bus Blockages (#/hr)	0	0	0	0	10	10	0	10	0	0	10	10
Parking (#/hr)				5	5	5						
Turn Type				Perm	NA		Prot	NA			NA	
Protected Phases					4		5	2			6	
Permitted Phases				4								
Actuated Green, G (s)					21.0		4.5	30.5			22.0	
Effective Green, g (s)					21.0		4.5	30.5			22.0	
Actuated g/C Ratio					0.35		0.08	0.51			0.37	
Clearance Time (s)					4.0		4.0	4.5			4.5	
Lane Grp Cap (vph)					1413		119	1587			1065	
v/s Ratio Prot							c0.06	0.13			c0.15	
v/s Ratio Perm					0.12							
v/c Ratio					0.35		0.84	0.25			0.41	
Uniform Delay, d1					14.4		27.4	8.3			14.2	
Progression Factor					1.00		1.56	2.26			1.00	
Incremental Delay, d2					0.7		44.4	0.3			1.2	
Delay (s)					15.1		87.3	19.2			15.4	
Level of Service					B		F	B			B	
Approach Delay (s)		0.0			15.1			32.8			15.4	
Approach LOS		A			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



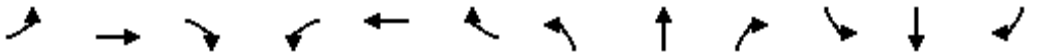
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	491	131	0	0	0	0	409	74	88	403	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.86						0.95		1.00	0.95	
Frpb, ped/bikes		0.97						0.95		1.00	1.00	
Flpb, ped/bikes		0.98						1.00		1.00	1.00	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		5107						2902		1593	3122	
Flt Permitted		0.99						1.00		0.95	1.00	
Satd. Flow (perm)		5107						2902		1593	3122	
Peak-hour factor, PHF	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. Flow (vph)	91	491	131	0	0	0	0	409	74	88	403	0
RTOR Reduction (vph)	0	68	0	0	0	0	0	25	0	0	0	0
Lane Group Flow (vph)	0	645	0	0	0	0	0	458	0	88	403	0
Confl. Peds. (#/hr)	139		172						313	313		
Confl. Bikes (#/hr)			11						3			
Bus Blockages (#/hr)	0	10	10	0	0	0	0	10	10	0	10	0
Parking (#/hr)	5	5	5									
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)		23.0						20.0		5.0	29.0	
Effective Green, g (s)		23.0						20.0		5.0	29.0	
Actuated g/C Ratio		0.38						0.33		0.08	0.48	
Clearance Time (s)		4.0						4.0		4.0	4.0	
Lane Grp Cap (vph)		1957						967		132	1508	
v/s Ratio Prot								c0.16		c0.06	0.13	
v/s Ratio Perm		0.13										
v/c Ratio		0.33						0.47		0.67	0.27	
Uniform Delay, d1		13.1						15.8		26.7	9.2	
Progression Factor		1.00						1.00		0.64	1.04	
Incremental Delay, d2		0.5						1.7		22.0	0.4	
Delay (s)		13.5						17.5		39.0	10.0	
Level of Service		B						B		D	A	
Approach Delay (s)		13.5			0.0			17.5			15.2	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL2	EBL	EBT	EBR	EBR2	NBT	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations											
Volume (vph)	43	595	141	31	51	131	155	57	337	134	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0		4.0	4.5	4.0
Lane Util. Factor		0.91	0.91		1.00	0.95	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.99		0.95	1.00	0.89		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.99		0.85	1.00	0.85		1.00	1.00	1.00
Flt Protected		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (prot)		1449	2913		1356	3185	1262		1593	1593	1676
Flt Permitted		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (perm)		1449	2913		1356	3185	1262		1593	1593	1676
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	43	595	141	31	51	131	155	57	337	134	295
RTOR Reduction (vph)	0	0	0	0	35	0	0	0	0	0	0
Lane Group Flow (vph)	0	358	452	0	16	131	212	0	337	134	295
Confl. Peds. (#/hr)				25	25		40	40	40	40	
Confl. Bikes (#/hr)							1	1			
Turn Type	Perm	Perm	NA		Perm	NA	Perm		Prot	Prot	NA
Protected Phases			4			2			1	1	6
Permitted Phases	4	4			4		2				
Actuated Green, G (s)		26.8	26.8		26.8	18.5	18.5		31.2	31.2	53.2
Effective Green, g (s)		28.3	28.3		28.3	18.0	18.0		31.7	31.2	53.7
Actuated g/C Ratio		0.31	0.31		0.31	0.20	0.20		0.35	0.35	0.60
Clearance Time (s)		5.5	5.5		5.5	3.5	3.5		4.5	4.5	4.5
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)		455	915		426	637	252		561	552	1000
v/s Ratio Prot						0.04			c0.21	0.08	0.18
v/s Ratio Perm		c0.25	0.16		0.01		c0.17				
v/c Ratio		0.79	0.49		0.04	0.21	0.84		0.60	0.24	0.29
Uniform Delay, d1		28.1	25.0		21.4	30.0	34.6		24.0	21.0	8.9
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.1	0.2		0.0	0.1	20.9		4.7	1.0	0.8
Delay (s)		36.2	25.2		21.4	30.1	55.5		28.7	22.0	9.6
Level of Service		D	C		C	C	E		C	C	A
Approach Delay (s)			29.5			45.8					20.2
Approach LOS			C			D					C

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

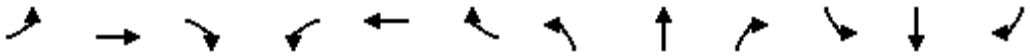


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	630	89	71	341	40	240	574	133	85	394	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99			0.99		1.00	1.00	0.91	1.00	0.99	
Flpb, ped/bikes	0.98	1.00			1.00		0.98	1.00	1.00	0.98	1.00	
Frt	1.00	0.98			0.99		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1557	3098			3091		1564	3185	1093	1561	3060	
Flt Permitted	0.40	1.00			0.66		0.46	1.00	1.00	0.41	1.00	
Satd. Flow (perm)	648	3098			2043		756	3185	1093	677	3060	
Peak-hour factor, PHF	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. Flow (vph)	100	630	89	71	341	40	240	574	133	85	394	94
RTOR Reduction (vph)	0	17	0	0	12	0	0	0	53	0	17	0
Lane Group Flow (vph)	100	702	0	0	440	0	240	574	80	85	471	0
Confl. Peds. (#/hr)	47		62	62		47	43		66	47		43
Confl. Bikes (#/hr)			10			19			35			22
Bus Blockages (#/hr)	0	0	0	0	0	10	0	0	10	0	0	10
Parking (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	25.8	25.8			25.8		51.2	51.2	51.2	51.2	51.2	
Effective Green, g (s)	25.8	25.8			25.8		51.2	51.2	51.2	51.2	51.2	
Actuated g/C Ratio	0.30	0.30			0.30		0.60	0.60	0.60	0.60	0.60	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	196	940			620		455	1918	658	407	1843	
v/s Ratio Prot		c0.23						0.18			0.15	
v/s Ratio Perm	0.15				0.22		c0.32		0.07	0.13		
v/c Ratio	0.51	0.75			0.71		0.53	0.30	0.12	0.21	0.26	
Uniform Delay, d1	24.4	26.7			26.3		9.8	8.2	7.3	7.7	7.9	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	2.9			3.1		4.3	0.4	0.4	1.2	0.3	
Delay (s)	25.3	29.5			29.3		14.2	8.6	7.6	8.9	8.3	
Level of Service	C	C			C		B	A	A	A	A	
Approach Delay (s)		29.0			29.3			9.9			8.4	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

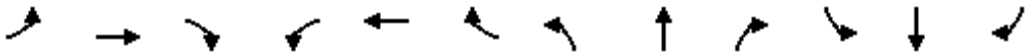
Movement	EBR	WBL	WBT	SBT	SBR	SWL	SWR
Lane Configurations							
Volume (vph)	3	89	119	283	46	1014	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		5.0	
Lane Util. Factor	1.00	1.00	0.91	0.91		0.97	
Frpb, ped/bikes	0.92	1.00	1.00	0.99		1.00	
Flpb, ped/bikes	1.00	0.93	1.00	1.00		1.00	
Frt	0.86	1.00	1.00	0.98		0.99	
Flt Protected	1.00	0.95	1.00	1.00		0.95	
Satd. Flow (prot)	1337	1485	4577	4264		3185	
Flt Permitted	1.00	0.95	1.00	1.00		0.95	
Satd. Flow (perm)	1337	1485	4577	4264		3185	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	3	89	119	283	46	1014	43
RTOR Reduction (vph)	2	74	0	30	0	0	0
Lane Group Flow (vph)	1	15	119	299	0	1057	0
Confl. Peds. (#/hr)	53	53			23	53	23
Parking (#/hr)				5	5		
Turn Type	Perm	Perm	NA	NA		Prot	
Protected Phases			4	5		6	
Permitted Phases	4	4					
Actuated Green, G (s)	14.6	14.6	14.6	11.4		45.0	
Effective Green, g (s)	14.6	14.6	14.6	11.4		45.0	
Actuated g/C Ratio	0.17	0.17	0.17	0.13		0.53	
Clearance Time (s)	4.5	4.5	4.5	4.5		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	229	255	786	571		1686	
v/s Ratio Prot			c0.03	c0.07		c0.33	
v/s Ratio Perm	0.00	0.01					
v/c Ratio	0.00	0.06	0.15	0.52		0.63	
Uniform Delay, d1	29.2	29.5	29.9	34.3		14.1	
Progression Factor	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.1	0.1	0.9		1.8	
Delay (s)	29.2	29.6	30.0	35.1		15.9	
Level of Service	C	C	C	D		B	
Approach Delay (s)			29.8	35.1		15.9	
Approach LOS			C	D		B	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	142	573	101	222	466	0	0	589	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0	4.5			4.5	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.99		1.00	1.00			0.96	
Flpb, ped/bikes					0.98		1.00	1.00			1.00	
Frt					0.98		1.00	1.00			0.98	
Flt Protected					0.99		0.95	1.00			1.00	
Satd. Flow (prot)					4104		1450	3122			2928	
Flt Permitted					0.99		0.95	1.00			1.00	
Satd. Flow (perm)					4104		1450	3122			2928	
Peak-hour factor, PHF	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. Flow (vph)	0	0	0	142	573	101	222	466	0	0	589	84
RTOR Reduction (vph)	0	0	0	0	18	0	0	0	0	0	18	0
Lane Group Flow (vph)	0	0	0	0	798	0	222	466	0	0	655	0
Confl. Peds. (#/hr)				125		48	446		455	455		446
Confl. Bikes (#/hr)						6			10			9
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	12%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	10	10	0	10	0	0	10	10
Parking (#/hr)				5	5	5						
Turn Type				Perm	NA		Prot	NA			NA	
Protected Phases					4		5	2			6	
Permitted Phases				4								
Actuated Green, G (s)					21.0		6.0	30.5			20.5	
Effective Green, g (s)					21.0		6.0	30.5			20.5	
Actuated g/C Ratio					0.35		0.10	0.51			0.34	
Clearance Time (s)					4.0		4.0	4.5			4.5	
Lane Grp Cap (vph)					1436		145	1587			1000	
v/s Ratio Prot							c0.15	0.15			c0.22	
v/s Ratio Perm					0.19							
v/c Ratio					0.56		1.53	0.29			0.65	
Uniform Delay, d1					15.7		27.0	8.5			16.7	
Progression Factor					1.00		1.07	0.97			1.00	
Incremental Delay, d2					1.6		266.5	0.4			3.3	
Delay (s)					17.3		295.5	8.6			20.1	
Level of Service					B		F	A			C	
Approach Delay (s)		0.0			17.3			101.2			20.1	
Approach LOS		A			B			F			C	

Intersection Summary			
HCM 2000 Control Delay	44.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



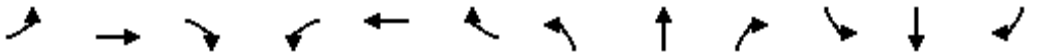
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	214	520	221	0	0	0	0	461	80	112	601	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0		4.0	4.0	
Lane Util. Factor		0.86						0.95		1.00	0.95	
Frpb, ped/bikes		0.92						0.95		1.00	1.00	
Flpb, ped/bikes		0.99						1.00		1.00	1.00	
Frt		0.97						0.98		1.00	1.00	
Flt Protected		0.99						1.00		0.95	1.00	
Satd. Flow (prot)		4794						2886		1593	3122	
Flt Permitted		0.99						1.00		0.95	1.00	
Satd. Flow (perm)		4794						2886		1593	3122	
Peak-hour factor, PHF	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. Flow (vph)	214	520	221	0	0	0	0	461	80	112	601	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	23	0	0	0	0
Lane Group Flow (vph)	0	948	0	0	0	0	0	518	0	112	601	0
Confl. Peds. (#/hr)	77		535				490		535	535		490
Confl. Bikes (#/hr)			6						9			16
Bus Blockages (#/hr)	0	10	10	0	0	0	0	10	10	0	10	0
Parking (#/hr)	5	5	5									
Turn Type	Perm	NA						NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4											
Actuated Green, G (s)		23.0						20.0		5.0	29.0	
Effective Green, g (s)		23.0						20.0		5.0	29.0	
Actuated g/C Ratio		0.38						0.33		0.08	0.48	
Clearance Time (s)		4.0						4.0		4.0	4.0	
Lane Grp Cap (vph)		1837						962		132	1508	
v/s Ratio Prot								c0.18		c0.07	0.19	
v/s Ratio Perm		0.20										
v/c Ratio		0.52						0.54		0.85	0.40	
Uniform Delay, d1		14.2						16.2		27.1	9.9	
Progression Factor		1.00						1.00		0.85	1.67	
Incremental Delay, d2		1.0						2.2		37.6	0.6	
Delay (s)		15.3						18.4		60.6	17.2	
Level of Service		B						B		E	B	
Approach Delay (s)		15.3			0.0			18.4			24.0	
Approach LOS		B			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL2	EBL	EBT	EBR	EBR2	NBT	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations											
Volume (vph)	28	896	268	7	64	293	232	56	326	257	262
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0		3.5	4.0	4.0
Lane Util. Factor		0.91	0.91		1.00	0.95	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00		0.95	1.00	0.81		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	1.00		0.85	1.00	0.85		1.00	1.00	1.00
Flt Protected		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (prot)		1449	2955		1353	3185	1149		1593	1593	1676
Flt Permitted		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (perm)		1449	2955		1353	3185	1149		1593	1593	1676
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	28	896	268	7	64	293	232	56	326	257	262
RTOR Reduction (vph)	0	0	0	0	38	0	0	0	0	0	0
Lane Group Flow (vph)	0	503	696	0	26	293	288	0	326	257	262
Confl. Peds. (#/hr)				26	26		71	71	71	71	
Confl. Bikes (#/hr)				1	1		2	2			
Turn Type	Perm	Perm	NA		Perm	NA	Perm		Prot	Prot	NA
Protected Phases			4			2			1	1	6
Permitted Phases	4	4			4		2				
Actuated Green, G (s)		31.9	31.9		31.9	22.5	22.5		22.6	22.6	48.1
Effective Green, g (s)		33.4	33.4		33.4	22.0	22.0		23.1	22.6	48.6
Actuated g/C Ratio		0.37	0.37		0.37	0.24	0.24		0.26	0.25	0.54
Clearance Time (s)		5.5	5.5		5.5	3.5	3.5		4.0	4.0	4.5
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)		537	1096		502	778	280		408	400	905
v/s Ratio Prot						0.09			c0.20	0.16	0.16
v/s Ratio Perm		c0.35	0.24		0.02		c0.25				
v/c Ratio		0.94	0.64		0.05	0.38	1.03		0.80	0.64	0.29
Uniform Delay, d1		27.3	23.3		18.1	28.3	34.0		31.3	30.1	11.3
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		23.7	0.9		0.0	0.1	61.4		15.0	7.7	0.8
Delay (s)		51.0	24.2		18.2	28.4	95.4		46.3	37.8	12.1
Level of Service		D	C		B	C	F		D	D	B
Approach Delay (s)			34.5			61.6					33.1
Approach LOS			C			E					C

Intersection Summary			
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



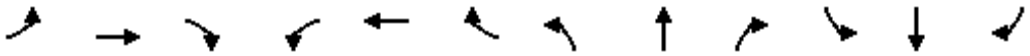
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	670	40	150	870	100	120	440	190	70	360	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00			0.99		1.00	1.00	0.91	1.00	0.97	
Flpb, ped/bikes	0.99	1.00			1.00		0.97	1.00	1.00	0.96	1.00	
Frt	1.00	0.99			0.99		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1577	3144			3088		1544	3185	1086	1529	2927	
Flt Permitted	0.15	1.00			0.68		0.39	1.00	1.00	0.45	1.00	
Satd. Flow (perm)	243	3144			2103		627	3185	1086	728	2927	
Peak-hour factor, PHF	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. Flow (vph)	60	670	40	150	870	100	120	440	190	70	360	180
RTOR Reduction (vph)	0	5	0	0	9	0	0	0	67	0	38	0
Lane Group Flow (vph)	60	705	0	0	1111	0	120	440	123	70	502	0
Confl. Peds. (#/hr)	71		73	73		71	84		80	80		84
Confl. Bikes (#/hr)			15			21			9			34
Bus Blockages (#/hr)	0	0	0	0	0	10	0	0	10	0	0	10
Parking (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	41.0	41.0			41.0		36.0	36.0	36.0	36.0	36.0	
Effective Green, g (s)	41.0	41.0			41.0		36.0	36.0	36.0	36.0	36.0	
Actuated g/C Ratio	0.48	0.48			0.48		0.42	0.42	0.42	0.42	0.42	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	117	1516			1014		265	1348	459	308	1239	
v/s Ratio Prot		0.22						0.14			0.17	
v/s Ratio Perm	0.25				c0.53		c0.19		0.11	0.10		
v/c Ratio	0.51	0.46			1.10		0.45	0.33	0.27	0.23	0.41	
Uniform Delay, d1	15.1	14.7			22.0		17.5	16.4	15.9	15.6	17.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.1			58.2		5.5	0.6	1.4	1.7	1.0	
Delay (s)	16.7	14.8			80.2		23.0	17.0	17.3	17.3	18.0	
Level of Service	B	B			F		C	B	B	B	B	
Approach Delay (s)		14.9			80.2			18.1			18.0	
Approach LOS		B			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	105.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBR	WBL	WBT	SBT	SBR	SWL	SWR
Lane Configurations							
Volume (vph)	10	80	390	460	120	2030	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		5.0	
Lane Util. Factor	1.00	1.00	0.91	0.91		0.97	
Frpb, ped/bikes	0.93	1.00	1.00	1.00		1.00	
Flpb, ped/bikes	1.00	0.94	1.00	1.00		1.00	
Frt	0.86	1.00	1.00	0.97		0.99	
Flt Protected	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1345	1496	4577	4230		3185	
Flt Permitted	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (perm)	1345	1496	4577	4230		3185	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	80	390	460	120	2030	150
RTOR Reduction (vph)	9	53	0	41	0	0	0
Lane Group Flow (vph)	1	27	390	539	0	2180	0
Confl. Peds. (#/hr)	35	35			4	35	4
Confl. Bikes (#/hr)	1				1		
Parking (#/hr)				5	5		
Turn Type	Perm	Perm	NA	NA		Prot	
Protected Phases			4	5		6	
Permitted Phases	4	4					
Actuated Green, G (s)	17.0	17.0	17.0	17.1		66.9	
Effective Green, g (s)	17.0	17.0	17.0	17.1		66.9	
Actuated g/C Ratio	0.15	0.15	0.15	0.15		0.58	
Clearance Time (s)	4.5	4.5	4.5	4.5		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	198	221	676	628		1852	
v/s Ratio Prot			c0.09	c0.13		c0.68	
v/s Ratio Perm	0.00	0.02					
v/c Ratio	0.01	0.12	0.58	0.86		1.18	
Uniform Delay, d1	41.8	42.5	45.6	47.8		24.0	
Progression Factor	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.3	1.2	11.2		85.7	
Delay (s)	41.8	42.8	46.8	59.0		109.8	
Level of Service	D	D	D	E		F	
Approach Delay (s)			46.2	59.0		109.8	
Approach LOS			D	E		F	

Intersection Summary			
HCM 2000 Control Delay	91.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		

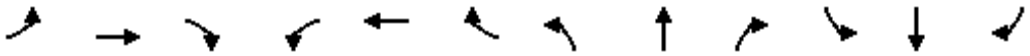
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	130	690	80	100	400	0	0	440	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	5.0	7.5			4.5	
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	
Frpb, ped/bikes					1.00	0.89	1.00	1.00			0.94	
Flpb, ped/bikes					0.98	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.98	
Flt Protected					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					2839	1065	1593	3122			2875	
Flt Permitted					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					2839	1065	1593	3122			2875	
Peak-hour factor, PHF	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. Flow (vph)	0	0	0	130	690	80	100	400	0	0	440	80
RTOR Reduction (vph)	0	0	0	0	0	52	0	0	0	0	25	0
Lane Group Flow (vph)	0	0	0	0	820	28	100	400	0	0	495	0
Confl. Peds. (#/hr)				164		113	522					522
Confl. Bikes (#/hr)						6						10
Bus Blockages (#/hr)	0	0	0	0	10	10	0	10	0	0	10	10
Parking (#/hr)				5	5	5						
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					4		5	2			6	
Permitted Phases				4		4						
Actuated Green, G (s)					21.0	21.0	4.5	30.5			22.0	
Effective Green, g (s)					21.0	21.0	3.5	27.5			22.0	
Actuated g/C Ratio					0.35	0.35	0.06	0.46			0.37	
Clearance Time (s)					4.0	4.0	4.0	4.5			4.5	
Lane Grp Cap (vph)					993	372	92	1430			1054	
v/s Ratio Prot							c0.06	0.13			c0.17	
v/s Ratio Perm					0.29	0.03						
v/c Ratio					0.83	0.08	1.09	0.28			0.47	
Uniform Delay, d1					17.8	13.0	28.2	10.1			14.5	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					7.8	0.4	119.3	0.5			1.5	
Delay (s)					25.6	13.4	147.6	10.6			16.0	
Level of Service					C	B	F	B			B	
Approach Delay (s)		0.0			24.6			38.0			16.0	
Approach LOS		A			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	600	10	0	0	0	0	320	100	190	370	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00					0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.85					0.93		1.00	1.00	
Flpb, ped/bikes	0.89	1.00	1.00					1.00		1.00	1.00	
Frt	1.00	1.00	0.85					0.96		1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1241	2926	1018					2787		1593	3122	
Flt Permitted	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1241	2926	1018					2787		1593	3122	
Peak-hour factor, PHF	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. Flow (vph)	100	600	10	0	0	0	0	320	100	190	370	0
RTOR Reduction (vph)	0	0	6	0	0	0	0	38	0	0	0	0
Lane Group Flow (vph)	100	600	4	0	0	0	0	382	0	190	370	0
Confl. Peds. (#/hr)	139		172						313	313		
Confl. Bikes (#/hr)			11						3			
Bus Blockages (#/hr)	0	10	10	0	0	0	0	10	10	0	10	0
Parking (#/hr)	5	5	5									
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)	21.0	21.0	21.0					16.0		6.0	26.0	
Effective Green, g (s)	21.0	21.0	21.0					16.0		6.0	26.0	
Actuated g/C Ratio	0.38	0.38	0.38					0.29		0.11	0.47	
Clearance Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lane Grp Cap (vph)	473	1117	388					810		173	1475	
v/s Ratio Prot		c0.21						c0.14		c0.12	0.12	
v/s Ratio Perm	0.08		0.00									
v/c Ratio	0.21	0.54	0.01					0.47		1.10	0.25	
Uniform Delay, d1	11.4	13.2	10.5					16.0		24.5	8.7	
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2	1.0	1.9	0.0					2.0		97.1	0.4	
Delay (s)	12.4	15.1	10.6					18.0		121.6	9.1	
Level of Service	B	B	B					B		F	A	
Approach Delay (s)		14.6			0.0			18.0			47.3	
Approach LOS		B			A			B			D	

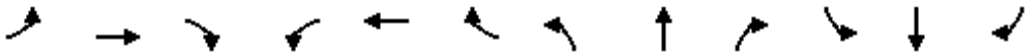
Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL2	EBL	EBT	EBR	EBR2	NBT	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations											
Volume (vph)	40	600	140	30	50	130	160	60	330	130	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0		4.0	4.5	4.0
Lane Util. Factor		0.91	0.91		1.00	0.95	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.99		0.95	1.00	0.89		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.99		0.85	1.00	0.85		1.00	1.00	1.00
Flt Protected		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (prot)		1449	2914		1356	3185	1262		1593	1593	1676
Flt Permitted		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (perm)		1449	2914		1356	3185	1262		1593	1593	1676
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	600	140	30	50	130	160	60	330	130	300
RTOR Reduction (vph)	0	0	0	0	34	0	0	0	0	0	0
Lane Group Flow (vph)	0	358	452	0	16	130	220	0	330	130	300
Confl. Peds. (#/hr)				25	25		40	40	40	40	
Confl. Bikes (#/hr)							1	1			
Turn Type	Perm	Perm	NA		Perm	NA	Perm		Prot	Prot	NA
Protected Phases			4			2			1	1	6
Permitted Phases	4	4			4		2				
Actuated Green, G (s)		26.8	26.8		26.8	18.9	18.9		30.8	30.8	53.2
Effective Green, g (s)		28.3	28.3		28.3	18.4	18.4		31.3	30.8	53.7
Actuated g/C Ratio		0.31	0.31		0.31	0.20	0.20		0.35	0.34	0.60
Clearance Time (s)		5.5	5.5		5.5	3.5	3.5		4.5	4.5	4.5
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)		455	916		426	651	258		554	545	1000
v/s Ratio Prot						0.04			c0.21	0.08	0.18
v/s Ratio Perm		c0.25	0.16		0.01		c0.17				
v/c Ratio		0.79	0.49		0.04	0.20	0.85		0.60	0.24	0.30
Uniform Delay, d1		28.1	25.0		21.4	29.7	34.5		24.1	21.2	8.9
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.1	0.2		0.0	0.1	22.1		4.7	1.0	0.8
Delay (s)		36.2	25.2		21.4	29.7	56.6		28.8	22.2	9.7
Level of Service		D	C		C	C	E		C	C	A
Approach Delay (s)			29.5			46.6					20.1
Approach LOS			C			D					C

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

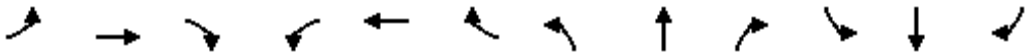


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	1180	100	100	810	120	450	1130	280	150	630	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99			0.99		1.00	1.00	0.91	1.00	0.99	
Flpb, ped/bikes	0.99	1.00			1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	0.99			0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1580	3131			3089		1577	3185	1087	1583	3052	
Flt Permitted	0.18	1.00			0.58		0.25	1.00	1.00	0.11	1.00	
Satd. Flow (perm)	294	3131			1816		411	3185	1087	185	3052	
Peak-hour factor, PHF	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. Flow (vph)	180	1180	100	100	810	120	450	1130	280	150	630	160
RTOR Reduction (vph)	0	7	0	0	10	0	0	0	16	0	27	0
Lane Group Flow (vph)	180	1273	0	0	1020	0	450	1130	264	150	763	0
Confl. Peds. (#/hr)	47		62	62		47	43		66	47		43
Confl. Bikes (#/hr)			10			19			35			22
Bus Blockages (#/hr)	0	0	0	0	0	10	0	0	10	0	0	10
Parking (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	41.0	41.0			41.0		36.0	36.0	36.0	36.0	36.0	
Effective Green, g (s)	41.0	41.0			41.0		36.0	36.0	36.0	36.0	36.0	
Actuated g/C Ratio	0.48	0.48			0.48		0.42	0.42	0.42	0.42	0.42	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	141	1510			875		174	1348	460	78	1292	
v/s Ratio Prot		0.41						0.35			0.25	
v/s Ratio Perm	c0.61				0.56		c1.09		0.24	0.81		
v/c Ratio	1.28	0.84			1.17		2.59	0.84	0.57	1.92	0.59	
Uniform Delay, d1	22.0	19.2			22.0		24.5	21.9	18.7	24.5	18.8	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	168.1	4.3			87.1		730.3	6.4	5.1	458.9	2.0	
Delay (s)	190.1	23.5			109.1		754.8	28.3	23.8	483.4	20.8	
Level of Service	F	C			F		F	C	C	F	C	
Approach Delay (s)		44.0			109.1			203.4			94.6	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	121.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.88		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	139.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBR	WBL	WBT	SBT	SBR	SWL	SWR
Lane Configurations							
Volume (vph)	10	160	550	390	110	1280	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		5.0	
Lane Util. Factor	1.00	1.00	0.91	0.91		0.97	
Frpb, ped/bikes	0.92	1.00	1.00	0.99		1.00	
Flpb, ped/bikes	1.00	0.93	1.00	1.00		1.00	
Frt	0.86	1.00	1.00	0.97		0.98	
Flt Protected	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1337	1485	4577	4194		3185	
Flt Permitted	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (perm)	1337	1485	4577	4194		3185	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	160	550	390	110	1280	200
RTOR Reduction (vph)	8	66	0	67	0	0	0
Lane Group Flow (vph)	2	94	550	433	0	1480	0
Confl. Peds. (#/hr)	53	53			23	53	23
Parking (#/hr)				5	5		
Turn Type	Perm	Perm	NA	NA		Prot	
Protected Phases			4	5		6	
Permitted Phases	4	4					
Actuated Green, G (s)	17.5	17.5	17.5	14.1		39.4	
Effective Green, g (s)	17.5	17.5	17.5	14.1		39.4	
Actuated g/C Ratio	0.21	0.21	0.21	0.17		0.46	
Clearance Time (s)	4.5	4.5	4.5	4.5		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	275	305	942	695		1476	
v/s Ratio Prot			c0.12	c0.10		c0.46	
v/s Ratio Perm	0.00	0.06					
v/c Ratio	0.01	0.31	0.58	0.62		1.00	
Uniform Delay, d1	26.8	28.6	30.5	33.0		22.8	
Progression Factor	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.6	0.9	1.7		24.1	
Delay (s)	26.9	29.2	31.4	34.7		46.9	
Level of Service	C	C	C	C		D	
Approach Delay (s)			30.9	34.7		46.9	
Approach LOS			C	C		D	

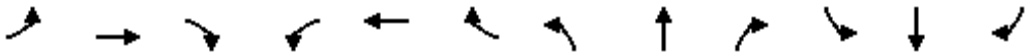
Intersection Summary			
HCM 2000 Control Delay	40.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	150	770	120	120	460	0	0	670	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	5.0	7.5			4.5	
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	
Frpb, ped/bikes					1.00	0.94	1.00	1.00			0.95	
Flpb, ped/bikes					0.98	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.98	
Flt Protected					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					2852	1130	1593	3122			2903	
Flt Permitted					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					2852	1130	1593	3122			2903	
Peak-hour factor, PHF	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. Flow (vph)	0	0	0	150	770	120	120	460	0	0	670	110
RTOR Reduction (vph)	0	0	0	0	0	67	0	0	0	0	22	0
Lane Group Flow (vph)	0	0	0	0	920	53	120	460	0	0	758	0
Confl. Peds. (#/hr)				125		48	446		455	455		446
Confl. Bikes (#/hr)						6			10			9
Bus Blockages (#/hr)	0	0	0	0	10	10	0	10	0	0	10	10
Parking (#/hr)				5	5	5						
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					4		5	2			6	
Permitted Phases				4		4						
Actuated Green, G (s)					23.0	23.0	6.5	28.5			18.0	
Effective Green, g (s)					23.0	23.0	5.5	25.5			18.0	
Actuated g/C Ratio					0.38	0.38	0.09	0.42			0.30	
Clearance Time (s)					4.0	4.0	4.0	4.5			4.5	
Lane Grp Cap (vph)					1093	433	146	1326			870	
v/s Ratio Prot							c0.08	0.15			c0.26	
v/s Ratio Perm					0.32	0.05						
v/c Ratio					0.84	0.12	0.82	0.35			0.87	
Uniform Delay, d1					16.8	12.0	26.8	11.6			19.9	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					7.9	0.6	38.5	0.7			11.7	
Delay (s)					24.7	12.5	65.2	12.4			31.6	
Level of Service					C	B	E	B			C	
Approach Delay (s)		0.0			23.3			23.3			31.6	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	700	140	0	0	0	0	350	80	170	620	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00					0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.67					0.93		1.00	1.00	
Flpb, ped/bikes	0.94	1.00	1.00					1.00		1.00	1.00	
Frt	1.00	1.00	0.85					0.97		1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1309	2926	801					2832		1593	3122	
Flt Permitted	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1309	2926	801					2832		1593	3122	
Peak-hour factor, PHF	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. Flow (vph)	120	700	140	0	0	0	0	350	80	170	620	0
RTOR Reduction (vph)	0	0	61	0	0	0	0	23	0	0	0	0
Lane Group Flow (vph)	120	700	79	0	0	0	0	407	0	170	620	0
Confl. Peds. (#/hr)	77		535				490		535	535		490
Confl. Bikes (#/hr)			6						9			16
Bus Blockages (#/hr)	0	10	10	0	0	0	0	10	10	0	10	0
Parking (#/hr)	5	5	5									
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)	21.0	21.0	21.0					16.0		6.0	26.0	
Effective Green, g (s)	21.0	21.0	21.0					16.0		6.0	26.0	
Actuated g/C Ratio	0.38	0.38	0.38					0.29		0.11	0.47	
Clearance Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lane Grp Cap (vph)	499	1117	305					823		173	1475	
v/s Ratio Prot		c0.24						c0.14		c0.11	0.20	
v/s Ratio Perm	0.09		0.10									
v/c Ratio	0.24	0.63	0.26					0.49		0.98	0.42	
Uniform Delay, d1	11.6	13.8	11.7					16.2		24.4	9.5	
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2	1.1	2.7	2.0					2.1		64.0	0.9	
Delay (s)	12.7	16.5	13.7					18.3		88.5	10.4	
Level of Service	B	B	B					B		F	B	
Approach Delay (s)		15.6			0.0			18.3			27.2	
Approach LOS		B			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

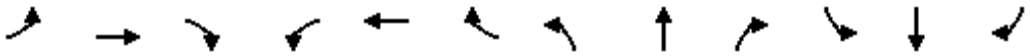
c Critical Lane Group

Movement	EBL2	EBL	EBT	EBR	EBR2	NBT	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations											
Volume (vph)	40	1100	380	20	150	620	470	110	390	320	540
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0		3.5	4.0	4.0
Lane Util. Factor		0.91	0.91		1.00	0.95	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00		0.95	1.00	0.81		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	1.00		0.85	1.00	0.85		1.00	1.00	1.00
Flt Protected		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (prot)		1449	2952		1353	3185	1149		1593	1593	1676
Flt Permitted		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (perm)		1449	2952		1353	3185	1149		1593	1593	1676
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	1100	380	20	150	620	470	110	390	320	540
RTOR Reduction (vph)	0	0	0	0	48	0	0	0	0	0	0
Lane Group Flow (vph)	0	623	917	0	103	620	580	0	390	320	540
Confl. Peds. (#/hr)				26	26		71	71	71	71	
Confl. Bikes (#/hr)				1	1		2	2			
Turn Type	Perm	Perm	NA		Perm	NA	Perm		Prot	Prot	NA
Protected Phases			4			2			1	1	6
Permitted Phases	4	4			4		2				
Actuated Green, G (s)		31.5	31.5		31.5	22.5	22.5		23.0	23.0	48.5
Effective Green, g (s)		33.0	33.0		33.0	22.0	22.0		23.5	23.0	49.0
Actuated g/C Ratio		0.37	0.37		0.37	0.24	0.24		0.26	0.26	0.54
Clearance Time (s)		5.5	5.5		5.5	3.5	3.5		4.0	4.0	4.5
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)		531	1082		496	778	280		415	407	912
v/s Ratio Prot						0.19			c0.24	0.20	0.32
v/s Ratio Perm		c0.43	0.31		0.08		c0.50				
v/c Ratio		1.17	0.93dl		0.21	0.80	2.07		0.94	0.79	0.59
Uniform Delay, d1		28.5	26.2		19.5	31.9	34.0		32.6	31.2	13.8
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		96.5	6.0		0.1	5.3	494.3		31.4	14.2	2.8
Delay (s)		125.0	32.2		19.6	37.2	528.3		63.9	45.4	16.6
Level of Service		F	C		B	D	F		E	D	B
Approach Delay (s)			65.3			274.6					38.7
Approach LOS			E			F					D

Intersection Summary			
HCM 2000 Control Delay	117.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	112.7%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group



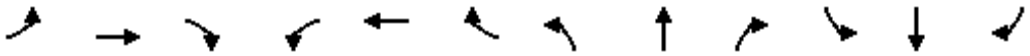
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	670	40	150	870	100	120	444	190	70	369	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00			0.99		1.00	1.00	0.91	1.00	0.97	
Flpb, ped/bikes	0.99	1.00			1.00		0.97	1.00	1.00	0.96	1.00	
Frt	1.00	0.99			0.99		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1577	3144			3088		1544	3185	1086	1529	2932	
Flt Permitted	0.15	1.00			0.68		0.38	1.00	1.00	0.45	1.00	
Satd. Flow (perm)	243	3144			2103		618	3185	1086	723	2932	
Peak-hour factor, PHF	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. Flow (vph)	60	670	40	150	870	100	120	444	190	70	369	180
RTOR Reduction (vph)	0	5	0	0	9	0	0	0	67	0	38	0
Lane Group Flow (vph)	60	705	0	0	1111	0	120	444	123	70	511	0
Confl. Peds. (#/hr)	71		73	73		71	84		80	80		84
Confl. Bikes (#/hr)			15			21			9			34
Bus Blockages (#/hr)	0	0	0	0	0	10	0	0	10	0	0	10
Parking (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	41.0	41.0			41.0		36.0	36.0	36.0	36.0	36.0	
Effective Green, g (s)	41.0	41.0			41.0		36.0	36.0	36.0	36.0	36.0	
Actuated g/C Ratio	0.48	0.48			0.48		0.42	0.42	0.42	0.42	0.42	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	117	1516			1014		261	1348	459	306	1241	
v/s Ratio Prot		0.22						0.14			0.17	
v/s Ratio Perm	0.25				c0.53		c0.19		0.11	0.10		
v/c Ratio	0.51	0.46			1.10		0.46	0.33	0.27	0.23	0.41	
Uniform Delay, d1	15.1	14.7			22.0		17.5	16.4	15.9	15.6	17.1	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.1			58.2		5.7	0.7	1.4	1.7	1.0	
Delay (s)	16.7	14.8			80.2		23.3	17.1	17.3	17.4	18.1	
Level of Service	B	B			F		C	B	B	B	B	
Approach Delay (s)		14.9			80.2			18.1			18.0	
Approach LOS		B			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	105.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBR	WBL	WBT	SBT	SBR	SWL	SWR
Lane Configurations							
Volume (vph)	10	80	390	474	120	2093	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		5.0	
Lane Util. Factor	1.00	1.00	0.91	0.91		0.97	
Frpb, ped/bikes	0.93	1.00	1.00	1.00		1.00	
Flpb, ped/bikes	1.00	0.94	1.00	1.00		1.00	
Frt	0.86	1.00	1.00	0.97		0.99	
Flt Protected	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1345	1496	4577	4234		3185	
Flt Permitted	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (perm)	1345	1496	4577	4234		3185	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	80	390	474	120	2093	150
RTOR Reduction (vph)	9	53	0	38	0	0	0
Lane Group Flow (vph)	1	27	390	556	0	2243	0
Confl. Peds. (#/hr)	35	35			4	35	4
Confl. Bikes (#/hr)	1				1		
Parking (#/hr)				5	5		
Turn Type	Perm	Perm	NA	NA		Prot	
Protected Phases			4	5		6	
Permitted Phases	4	4					
Actuated Green, G (s)	17.0	17.0	17.0	17.2		66.8	
Effective Green, g (s)	17.0	17.0	17.0	17.2		66.8	
Actuated g/C Ratio	0.15	0.15	0.15	0.15		0.58	
Clearance Time (s)	4.5	4.5	4.5	4.5		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	198	221	676	633		1850	
v/s Ratio Prot			c0.09	c0.13		c0.70	
v/s Ratio Perm	0.00	0.02					
v/c Ratio	0.01	0.12	0.58	0.88		1.21	
Uniform Delay, d1	41.8	42.5	45.6	47.9		24.1	
Progression Factor	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.3	1.2	13.1		100.9	
Delay (s)	41.8	42.8	46.8	61.0		125.0	
Level of Service	D	D	D	E		F	
Approach Delay (s)			46.2	61.0		125.0	
Approach LOS			D	E		F	

Intersection Summary			
HCM 2000 Control Delay	102.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	104.9%	ICU Level of Service	G
Analysis Period (min)	15		

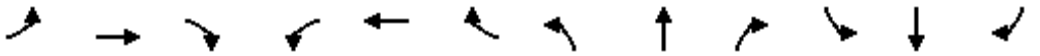
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	130	751	80	107	406	0	0	440	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	5.0	7.5			4.5	
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	
Frpb, ped/bikes					1.00	0.89	1.00	1.00			0.94	
Flpb, ped/bikes					0.98	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.97	
Flt Protected					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					2845	1065	1593	3122			2852	
Flt Permitted					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					2845	1065	1593	3122			2852	
Peak-hour factor, PHF	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. Flow (vph)	0	0	0	130	751	80	107	406	0	0	440	89
RTOR Reduction (vph)	0	0	0	0	0	52	0	0	0	0	23	0
Lane Group Flow (vph)	0	0	0	0	881	28	107	406	0	0	506	0
Confl. Peds. (#/hr)				164		113	522					522
Confl. Bikes (#/hr)						6						10
Bus Blockages (#/hr)	0	0	0	0	10	10	0	10	0	0	10	10
Parking (#/hr)				5	5	5						
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					4		5	2			6	
Permitted Phases				4		4						
Actuated Green, G (s)					21.0	21.0	4.5	30.5			22.0	
Effective Green, g (s)					21.0	21.0	3.5	27.5			22.0	
Actuated g/C Ratio					0.35	0.35	0.06	0.46			0.37	
Clearance Time (s)					4.0	4.0	4.0	4.5			4.5	
Lane Grp Cap (vph)					995	372	92	1430			1045	
v/s Ratio Prot							c0.07	0.13			c0.18	
v/s Ratio Perm					0.31	0.03						
v/c Ratio					0.89	0.08	1.16	0.28			0.48	
Uniform Delay, d1					18.4	13.0	28.2	10.1			14.6	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					11.4	0.4	144.3	0.5			1.6	
Delay (s)					29.8	13.4	172.6	10.6			16.2	
Level of Service					C	B	F	B			B	
Approach Delay (s)		0.0			28.4			44.4			16.2	
Approach LOS		A			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	643	44	0	0	0	0	327	100	190	370	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00					0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.85					0.93		1.00	1.00	
Flpb, ped/bikes	0.89	1.00	1.00					1.00		1.00	1.00	
Frt	1.00	1.00	0.85					0.96		1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1241	2926	1018					2792		1593	3122	
Flt Permitted	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1241	2926	1018					2792		1593	3122	
Peak-hour factor, PHF	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. Flow (vph)	106	643	44	0	0	0	0	327	100	190	370	0
RTOR Reduction (vph)	0	0	27	0	0	0	0	35	0	0	0	0
Lane Group Flow (vph)	106	643	17	0	0	0	0	392	0	190	370	0
Confl. Peds. (#/hr)	139		172						313	313		
Confl. Bikes (#/hr)			11						3			
Bus Blockages (#/hr)	0	10	10	0	0	0	0	10	10	0	10	0
Parking (#/hr)	5	5	5									
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)	21.0	21.0	21.0					16.0		6.0	26.0	
Effective Green, g (s)	21.0	21.0	21.0					16.0		6.0	26.0	
Actuated g/C Ratio	0.38	0.38	0.38					0.29		0.11	0.47	
Clearance Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lane Grp Cap (vph)	473	1117	388					812		173	1475	
v/s Ratio Prot		c0.22						c0.14		c0.12	0.12	
v/s Ratio Perm	0.09		0.02									
v/c Ratio	0.22	0.58	0.04					0.48		1.10	0.25	
Uniform Delay, d1	11.5	13.5	10.7					16.1		24.5	8.7	
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2	1.1	2.2	0.2					2.0		97.1	0.4	
Delay (s)	12.6	15.6	10.9					18.1		121.6	9.1	
Level of Service	B	B	B					B		F	A	
Approach Delay (s)		15.0			0.0			18.1			47.3	
Approach LOS		B			A			B			D	

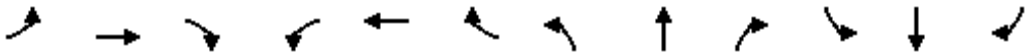
Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL2	EBL	EBT	EBR	EBR2	NBT	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations											
Volume (vph)	40	600	140	30	50	130	160	60	341	134	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0		4.0	4.5	4.0
Lane Util. Factor		0.91	0.91		1.00	0.95	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.99		0.95	1.00	0.89		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.99		0.85	1.00	0.85		1.00	1.00	1.00
Flt Protected		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (prot)		1449	2914		1356	3185	1262		1593	1593	1676
Flt Permitted		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (perm)		1449	2914		1356	3185	1262		1593	1593	1676
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	600	140	30	50	130	160	60	341	134	300
RTOR Reduction (vph)	0	0	0	0	34	0	0	0	0	0	0
Lane Group Flow (vph)	0	358	452	0	16	130	220	0	341	134	300
Confl. Peds. (#/hr)				25	25		40	40	40	40	
Confl. Bikes (#/hr)							1	1			
Turn Type	Perm	Perm	NA		Perm	NA	Perm		Prot	Prot	NA
Protected Phases			4			2			1	1	6
Permitted Phases	4	4			4		2				
Actuated Green, G (s)		26.8	26.8		26.8	18.9	18.9		30.8	30.8	53.2
Effective Green, g (s)		28.3	28.3		28.3	18.4	18.4		31.3	30.8	53.7
Actuated g/C Ratio		0.31	0.31		0.31	0.20	0.20		0.35	0.34	0.60
Clearance Time (s)		5.5	5.5		5.5	3.5	3.5		4.5	4.5	4.5
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)		455	916		426	651	258		554	545	1000
v/s Ratio Prot						0.04			c0.21	0.08	0.18
v/s Ratio Perm		c0.25	0.16		0.01		c0.17				
v/c Ratio		0.79	0.49		0.04	0.20	0.85		0.62	0.25	0.30
Uniform Delay, d1		28.1	25.0		21.4	29.7	34.5		24.4	21.3	8.9
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		8.1	0.2		0.0	0.1	22.1		5.1	1.1	0.8
Delay (s)		36.2	25.2		21.4	29.7	56.6		29.4	22.3	9.7
Level of Service		D	C		C	C	E		C	C	A
Approach Delay (s)			29.5			46.6					20.6
Approach LOS			C			D					C

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

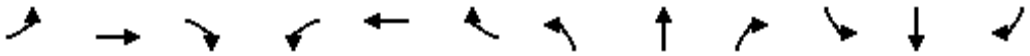


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	1180	100	100	810	120	450	1139	280	150	635	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99			0.99		1.00	1.00	0.91	1.00	0.99	
Flpb, ped/bikes	0.99	1.00			1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	0.99			0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1580	3131			3089		1577	3185	1087	1583	3053	
Flt Permitted	0.18	1.00			0.58		0.25	1.00	1.00	0.11	1.00	
Satd. Flow (perm)	294	3131			1816		407	3185	1087	185	3053	
Peak-hour factor, PHF	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. Flow (vph)	180	1180	100	100	810	120	450	1139	280	150	635	160
RTOR Reduction (vph)	0	7	0	0	9	0	0	0	16	0	27	0
Lane Group Flow (vph)	180	1273	0	0	1021	0	450	1139	264	150	768	0
Confl. Peds. (#/hr)	47		62	62		47	43		66	47		43
Confl. Bikes (#/hr)			10			19			35			22
Bus Blockages (#/hr)	0	0	0	0	0	10	0	0	10	0	0	10
Parking (#/hr)			5			5			5			5
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	41.0	41.0			41.0		36.0	36.0	36.0	36.0	36.0	
Effective Green, g (s)	41.0	41.0			41.0		36.0	36.0	36.0	36.0	36.0	
Actuated g/C Ratio	0.48	0.48			0.48		0.42	0.42	0.42	0.42	0.42	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0			2.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	141	1510			875		172	1348	460	78	1293	
v/s Ratio Prot		0.41						0.36			0.25	
v/s Ratio Perm	c0.61				0.56		c1.10		0.24	0.81		
v/c Ratio	1.28	0.84			1.17		2.62	0.84	0.57	1.92	0.59	
Uniform Delay, d1	22.0	19.2			22.0		24.5	22.0	18.7	24.5	18.9	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	168.1	4.3			87.3		743.9	6.6	5.1	458.9	2.0	
Delay (s)	190.1	23.5			109.3		768.4	28.6	23.8	483.4	20.9	
Level of Service	F	C			F		F	C	C	F	C	
Approach Delay (s)		44.0			109.3			206.0			94.3	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	122.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.90		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	139.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBR	WBL	WBT	SBT	SBR	SWL	SWR
Lane Configurations							
Volume (vph)	10	160	550	399	110	1308	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		5.0	
Lane Util. Factor	1.00	1.00	0.91	0.91		0.97	
Frpb, ped/bikes	0.92	1.00	1.00	0.99		1.00	
Flpb, ped/bikes	1.00	0.93	1.00	1.00		1.00	
Frt	0.86	1.00	1.00	0.97		0.98	
Flt Protected	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (prot)	1337	1485	4577	4198		3185	
Flt Permitted	1.00	0.95	1.00	1.00		0.96	
Satd. Flow (perm)	1337	1485	4577	4198		3185	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	160	550	399	110	1308	200
RTOR Reduction (vph)	8	66	0	66	0	0	0
Lane Group Flow (vph)	2	94	550	443	0	1508	0
Confl. Peds. (#/hr)	53	53			23	53	23
Parking (#/hr)				5	5		
Turn Type	Perm	Perm	NA	NA		Prot	
Protected Phases			4	5		6	
Permitted Phases	4	4					
Actuated Green, G (s)	17.5	17.5	17.5	14.3		39.2	
Effective Green, g (s)	17.5	17.5	17.5	14.3		39.2	
Actuated g/C Ratio	0.21	0.21	0.21	0.17		0.46	
Clearance Time (s)	4.5	4.5	4.5	4.5		5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	275	305	942	706		1468	
v/s Ratio Prot			c0.12	c0.11		c0.47	
v/s Ratio Perm	0.00	0.06					
v/c Ratio	0.01	0.31	0.58	0.63		1.03	
Uniform Delay, d1	26.8	28.6	30.5	32.9		22.9	
Progression Factor	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.6	0.9	1.8		30.7	
Delay (s)	26.9	29.2	31.4	34.6		53.6	
Level of Service	C	C	C	C		D	
Approach Delay (s)			30.9	34.6		53.6	
Approach LOS			C	C		D	

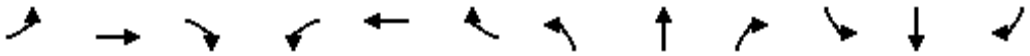
Intersection Summary			
HCM 2000 Control Delay	44.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	150	834	120	230	473	0	0	670	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0	5.0	7.5			4.5	
Lane Util. Factor					0.95	1.00	1.00	0.95			0.95	
Frpb, ped/bikes					1.00	0.94	1.00	1.00			0.95	
Flpb, ped/bikes					0.98	1.00	1.00	1.00			1.00	
Frt					1.00	0.85	1.00	1.00			0.98	
Flt Protected					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					2857	1130	1593	3122			2894	
Flt Permitted					0.99	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					2857	1130	1593	3122			2894	
Peak-hour factor, PHF	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. Flow (vph)	0	0	0	150	834	120	230	473	0	0	670	115
RTOR Reduction (vph)	0	0	0	0	0	67	0	0	0	0	23	0
Lane Group Flow (vph)	0	0	0	0	984	53	230	473	0	0	762	0
Confl. Peds. (#/hr)				125		48	446		455	455		446
Confl. Bikes (#/hr)						6			10			9
Bus Blockages (#/hr)	0	0	0	0	10	10	0	10	0	0	10	10
Parking (#/hr)				5	5	5						
Turn Type				Perm	NA	Perm	Prot	NA			NA	
Protected Phases					4		5	2			6	
Permitted Phases				4		4						
Actuated Green, G (s)					23.0	23.0	6.5	28.5			18.0	
Effective Green, g (s)					23.0	23.0	5.5	25.5			18.0	
Actuated g/C Ratio					0.38	0.38	0.09	0.42			0.30	
Clearance Time (s)					4.0	4.0	4.0	4.5			4.5	
Lane Grp Cap (vph)					1095	433	146	1326			868	
v/s Ratio Prot							c0.14	0.15			c0.26	
v/s Ratio Perm					0.34	0.05						
v/c Ratio					0.90	0.12	1.58	0.36			0.88	
Uniform Delay, d1					17.4	12.0	27.2	11.7			20.0	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					11.6	0.6	289.1	0.8			12.2	
Delay (s)					29.0	12.5	316.4	12.4			32.1	
Level of Service					C	B	F	B			C	
Approach Delay (s)		0.0			27.2			111.9			32.1	
Approach LOS		A			C			F			C	

Intersection Summary					
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.97				
Actuated Cycle Length (s)	60.0	Sum of lost time (s)		13.5	
Intersection Capacity Utilization	81.9%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	239	792	213	0	0	0	0	354	80	170	620	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00					0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.67					0.93		1.00	1.00	
Flpb, ped/bikes	0.94	1.00	1.00					1.00		1.00	1.00	
Frt	1.00	1.00	0.85					0.97		1.00	1.00	
Flt Protected	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)	1309	2926	801					2835		1593	3122	
Flt Permitted	0.95	1.00	1.00					1.00		0.95	1.00	
Satd. Flow (perm)	1309	2926	801					2835		1593	3122	
Peak-hour factor, PHF	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. Flow (vph)	239	792	213	0	0	0	0	354	80	170	620	0
RTOR Reduction (vph)	0	0	61	0	0	0	0	23	0	0	0	0
Lane Group Flow (vph)	239	792	152	0	0	0	0	411	0	170	620	0
Confl. Peds. (#/hr)	77		535				490		535	535		490
Confl. Bikes (#/hr)			6						9			16
Bus Blockages (#/hr)	0	10	10	0	0	0	0	10	10	0	10	0
Parking (#/hr)	5	5	5									
Turn Type	Perm	NA	Perm					NA		Prot	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4									
Actuated Green, G (s)	21.0	21.0	21.0					16.0		6.0	26.0	
Effective Green, g (s)	21.0	21.0	21.0					16.0		6.0	26.0	
Actuated g/C Ratio	0.38	0.38	0.38					0.29		0.11	0.47	
Clearance Time (s)	4.0	4.0	4.0					4.0		4.0	4.0	
Lane Grp Cap (vph)	499	1117	305					824		173	1475	
v/s Ratio Prot		c0.27						c0.15		c0.11	0.20	
v/s Ratio Perm	0.18		0.19									
v/c Ratio	0.48	0.71	0.50					0.50		0.98	0.42	
Uniform Delay, d1	12.9	14.4	13.0					16.2		24.4	9.5	
Progression Factor	1.00	1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2	3.3	3.8	5.7					2.2		64.0	0.9	
Delay (s)	16.1	18.2	18.7					18.3		88.5	10.4	
Level of Service	B	B	B					B		F	B	
Approach Delay (s)		17.9			0.0			18.3			27.2	
Approach LOS		B			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL2	EBL	EBT	EBR	EBR2	NBT	NBR	NBR2	SBL2	SBL	SBT
Lane Configurations											
Volume (vph)	40	1100	380	20	150	620	470	110	408	334	540
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0		3.5	4.0	4.0
Lane Util. Factor		0.91	0.91		1.00	0.95	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00		0.95	1.00	0.81		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	1.00		0.85	1.00	0.85		1.00	1.00	1.00
Flt Protected		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (prot)		1449	2952		1353	3185	1149		1593	1593	1676
Flt Permitted		0.95	0.97		1.00	1.00	1.00		0.95	0.95	1.00
Satd. Flow (perm)		1449	2952		1353	3185	1149		1593	1593	1676
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	1100	380	20	150	620	470	110	408	334	540
RTOR Reduction (vph)	0	0	0	0	48	0	0	0	0	0	0
Lane Group Flow (vph)	0	623	917	0	102	620	580	0	408	334	540
Confl. Peds. (#/hr)				26	26		71	71	71	71	
Confl. Bikes (#/hr)				1	1		2	2			
Turn Type	Perm	Perm	NA		Perm	NA	Perm		Prot	Prot	NA
Protected Phases			4			2			1	1	6
Permitted Phases	4	4			4		2				
Actuated Green, G (s)		30.5	30.5		30.5	22.5	22.5		24.0	24.0	49.5
Effective Green, g (s)		32.0	32.0		32.0	22.0	22.0		24.5	24.0	50.0
Actuated g/C Ratio		0.36	0.36		0.36	0.24	0.24		0.27	0.27	0.56
Clearance Time (s)		5.5	5.5		5.5	3.5	3.5		4.0	4.0	4.5
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)		515	1049		481	778	280		433	424	931
v/s Ratio Prot						0.19			c0.26	0.21	0.32
v/s Ratio Perm		c0.43	0.31		0.08		c0.50				
v/c Ratio		1.21	0.96dl		0.21	0.80	2.07		0.94	0.79	0.58
Uniform Delay, d1		29.0	27.1		20.2	31.9	34.0		32.1	30.6	13.1
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		111.4	8.0		0.1	5.3	494.3		31.0	13.8	2.6
Delay (s)		140.4	35.1		20.3	37.2	528.3		63.0	44.4	15.7
Level of Service		F	D		C	D	F		E	D	B
Approach Delay (s)			72.6			274.6					38.3
Approach LOS			E			F					D

Intersection Summary			
HCM 2000 Control Delay	120.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	113.8%	ICU Level of Service	H
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group