APPENDIX 6

Traffic Impact Analysis

Traffic Impact Analysis

State Center Community College District
Fresno City College
Parking and Facilities Expansion

Located at Northwest Quadrant of
Blackstone Avenue and McKinley Avenue

In the City of Fresno, California

Prepared for:
State Center Community College District
1171 Fulton Street
Fresno, CA 93721

September 25, 2019

JLB Project No. 004-085

JLB TRAFFIC ENGINEERING, INC.

Traffic Engineering, Transportation Planning, & Parking Solutions
516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
Phone: (559) 570-8991
www.JLBtraffic.com

Traffic Engineering, Transportation Planning, & Parking Solutions

Traffic Impact Analysis

For the State Center Community College District Fresno City College Parking and Facilities Expansion located at the Northwest Quadrant of Blackstone Avenue and McKinley Avenue

In the City of Fresno, CA

September 25, 2019

This Traffic Impact Analysis has been prepared under the direction of a licensed Traffic Engineer. The licensed Traffic Engineer attests to the technical information contained therein and has judged the qualifications of any technical specialists providing engineering data from which recommendations, conclusions, and decisions are based.

Prepared by:

Jose Luis Benavides, PE, TE

President

REGISTERED PROFESSIONAL ENGINEER
JOSE LUIS BENAVIDES
No.T 2328
Exp:06/30/21
TRAFFIC
STATE OF CALIFORNIA

Traffic Engineering, Transportation Planning, & Parking Solutions
516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
Phone: (559) 570-8991
www.JLBtraffic.com

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Introduction and Summary

Introduction

This report describes a Traffic Impact Analysis (TIA) prepared by JLB Traffic Engineering, Inc. (JLB) for the State Center Community College District (District) Environmental Impact Report (EIR) for the proposed Parking and Facilities Expansion of the Fresno City College (FCC) campus (Project) located on and adjacent to the northeast portion of the existing FCC campus in the City of Fresno. The Project consists of the following facilities:

a) Construction of a parking structure on the south side of Cambridge Avenue west of Blackstone Avenue located north of the existing district office building. The proposed parking structure would have a capacity for up to 1,000 parking spaces, include up to five levels of parking, and include ingress/egress points at Weldon Avenue, the Glenn Avenue southerly extension and potentially Cambridge Avenue.
b) Construction of a three-story Science Building approximately 95,000 square-foot located near the southwest corner of Blackstone Avenue and Weldon Avenue. The new Science Building is proposed to include six (6) biology labs, three (3) anatomy and physiology labs, five (5) chemistry labs, two (2) physics labs, two (2) engineering labs, a computer lab, three (3) general educational classrooms, four (4) Design Science (Middle College) classrooms, a welcome center, tutorial space, and 34 faculty offices. Surface parking would also be added adjacent to the building. Existing Maintenance and Operations facilities located in this area would be removed and relocated to a different area of the campus (see section d below).
c) Replacement of the existing one-story, 5,255 square-foot Child Development Center with a new one-story, 16,480 square-foot Child Development Center at its current location.
d) Construction of a one-story, 10,000 square-foot Maintenance and Operations building plus a parking and storage area on the west side of San Pablo Avenue northwest of the existing Health Sciences Building.
e) Repurposing of the existing District administration building located on the north side of Weldon Avenue to accommodate the SCCCD Police Department.

Development of the Project facilities would occur over the next five (5) years. Per information provided to JLB, the Project is consistent with the City of Fresno 2035 General Plan. Figure 1 shows the location of the proposed Project site relative to the surrounding roadway network.

The purpose of the TIA is to evaluate the potential on-site and off-site traffic impacts, identify short-term roadway and circulation needs, determine potential mitigation measures, and identify any critical traffic issues that should be addressed in the on-going planning process. The TIA primarily focused on evaluating traffic conditions at study intersections that may potentially be impacted by the proposed Project. The Scope of Work was prepared via consultation with the District, City of Fresno, County of Fresno and Caltrans staff.

Summary

The potential traffic impacts of the proposed Project were evaluated in accordance with the standards set forth by the Level of Service (LOS) policy of the City of Fresno, County of Fresno and Caltrans.

Existing Traffic Conditions

- At present, the intersection of Blackstone Avenue and University Avenue exceeds its LOS threshold during both peak periods. To improve the LOS at this intersection, it is recommended that University Avenue access at Blackstone Avenue be limited to right-in, right-out and left-in access only by implementation of a raised median island.

Existing plus Project Traffic Conditions

- At present, the Project is estimated to generate a maximum of 2,045 daily trips, 262 AM peak hour trips and 237 PM peak hour trips. However, the trip generation of the Project will differ as a result of the relocation, expansion and modification of the Project's land uses. At buildout, the proposed Future Project is estimated to generate a maximum of 2,230 daily trips, 287 AM peak hour trips and 268 PM peak hour trips. Compared to the Existing Project Trip Generation, the Future Project Trip Generation is estimated to be slightly higher by 185 daily trips, 25 AM peak hour trips, and 31 PM peak hour trips.
- It is recommended that the Project implement Class I Bike Routes along a) Glenn Avenue within the Project site, b) along the Project's frontage to Cambridge Avenue (between San Pablo Avenue and Blackstone Avenue) and c) Weldon Avenue within the Project site.
- It is recommended that the Project retain the existing walkways that are in a good state and ADA compliant along its frontages to San Pablo Avenue, Blackstone Avenue, Cambridge Avenue, and Weldon Avenue. The Project shall reconstruct walkways where needed to conform to current ADA guidelines.
- Where possible, consideration should be given to the planting of trees to provide shade and help reduce heat during the summer months. Additionally, it is recommended that the District work with FAX to improve headways of the existing transit routes serving the FCC campus.
- As the Project will be used to serve an existing student and employee population, it is likely that the Project would not add VMT per capita. Additionally, the Project site is located near transit services and pedestrian and bicycle networks.
- The portion of the Project that is the parking structure is anticipated to add a total of 1,000 parking spaces, while replacing 189 parking stalls. Therefore, the net change is 811 parking stalls (1,000 new parking stalls - 189 existing parking stalls = 811 net new parking stalls). Given that the current number of general public and metered on-site parking stalls is 2,388 and the Project will add 811 general public parking stalls, the new total of general public and metered on-site parking stalls will be 3,199 parking stalls. Since the parking supply is projected to be up to 3,199 general public and metered on-site parking stalls, it is anticipated that the FCC campus will have sufficient parking supply to accommodate the projected parking demand in the year 2028.

- Under this scenario, the intersections of Blackstone Avenue and Cambridge Avenue and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during both peak periods. To improve the LOS at these intersections, it is recommended that access at these intersections be limited to right-in, right-out and left-in access only by implementation of a raised median island. Additional details as to the recommended improvements for these intersections and any other intersection are presented later in this report.
- While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns.

Existing plus Project Traffic Conditions - No Parking Structure Access to Cambridge Avenue

- Under this scenario, the intersections of Blackstone Avenue and Cambridge Avenue and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during both peak periods. To improve the LOS at these intersections, it is recommended that access at these intersections be limited to right-in, right-out and left-in access only by implementation of a raised median island. Additional details as to the recommended improvements for these intersections and any other intersection are presented later in this report.
- While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns.
- When compared to the Existing plus Project Traffic Condition scenario, the prevention of the Parking Structure's access to Cambridge Avenue will encourage most southbound traffic on Blackstone Avenue and all northbound traffic on Blackstone Avenue to enter the site via Weldon Avenue, thus reducing traffic on Cambridge Avenue between Glenn Avenue and Blackstone Avenue. As can be seen from Tables V and VI, the prevention of the Parking Structure's access to Cambridge Avenue is projected to slightly improve the LOS at the intersection of Blackstone Avenue and Cambridge Avenue while the LOS at the intersection of Blackstone Avenue and Weldon Avenue is projected to slightly worsen.

Near Term plus Project Traffic Conditions

- The total trip generation for the Near Term Project is 2,132 daily trips, 171 AM peak hour trips and 150 PM peak hour trips.
- Under this scenario, the intersections of Blackstone Avenue and Cambridge Avenue and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during both peak periods. To improve the LOS at these intersections, it is recommended that access at these intersections be limited to right-in, right-out and left-in access only by implementation of a raised median island. Additional details as to the recommended improvements for these intersections and any other intersection are presented later in this report.
- While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns.

Cumulative Year 2035 No Project Traffic Conditions

- Under this scenario, the intersections of Blackstone Avenue and Cambridge Avenue and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during both peak periods. To improve the LOS at these intersections, it is recommended that access at these intersections be limited to right-in, right-out and left-in access only by implementation of a raised median island. Additional details as to the recommended improvements for these intersections and any other intersection are presented later in this report.
- While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns.

Cumulative Year 2035 plus Project Traffic Conditions

- Under this scenario, the intersections of Glenn Avenue and Clinton Avenue, Blackstone Avenue and Cambridge Avenue, and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during one or both peak periods. To improve the LOS at these intersections, the addition of lanes and modification of access is recommended. Additional details as to the recommended improvements for these intersections and any other intersection are presented later in this report.
- While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns.

Queuing Analysis

- It is recommended that the City consider left-turn and right-turn lane storage lengths as indicated in the Queuing Analysis.

Project's Equitable Fair Share

- It is recommended that the Project contribute its equitable fair share as listed in Table XII for the existing funding shortfall, if any, to future improvements necessary to maintain an acceptable LOS.

Scope of Work

The TIA primarily focused on evaluating traffic conditions at study intersections that may potentially be impacted by the proposed Project. On April 23, 2019, a Draft Scope of Work for the preparation of a TIA for this Project was provided to the City of Fresno, County of Fresno and Caltrans for their review and comment. The Draft Scope of Work was based on communication with City of Fresno staff. Any comments to the proposed Scope of Work were to be provided by May 14, 2019.

On April 29, 2019, the County of Fresno responded and approved the Draft Scope of Work as presented. Similarly, on May 24, 2019, Caltrans responded and approved the Draft Scope of Work as presented. On May 28, 2019, the City of Fresno responded to the Draft Scope of Work and requested that the intersection of Blackstone Avenue and McKinley Avenue be included as a study intersection.

Based on the comments received, this TIA includes the analysis of the additional intersection as requested by the City of Fresno. The Draft Scope of Work and the comments received from the lead agency and responsible agencies are included in Appendix A.

Study Facilities

The majority of the existing peak hour turning movement volume counts were conducted at the study intersections in April 2019. Since the City of Fresno provided comments after the requested deadline of May 14, counts for the additional study intersections were not collected till early June 2019, while most schools in the vicinity of the proposed Project were in session - Fresno City College was out for summer break. Therefore, any counts collected in June were prorated upward to closely match upstream and downstream traffic counts collected while all schools in the vicinity of the Project were in session. The intersection turning movement counts included pedestrian and bicycle volumes. The traffic counts for the existing study intersections are contained in Appendix B. The existing intersection turning movement volumes, intersection geometrics and traffic controls are illustrated in Figure 2.

Study Intersections

1. San Pablo Avenue / Clinton Avenue
2. Glenn Avenue / Clinton Avenue
3. Blackstone Avenue / Cambridge Avenue
4. Blackstone Avenue / Weldon Avenue
5. Blackstone Avenue / University Avenue
6. Blackstone Avenue / McKinley Avenue

Project Only Trips to State Facilities

1. State Route 41 at McKinley Avenue Interchange
2. State Route 180 at Blackstone Avenue/Abby Street Interchange

Study Scenarios

Existing Traffic Conditions

This scenario evaluates the Existing Traffic Conditions based on existing traffic volumes and roadway conditions from traffic counts and field surveys conducted in April and June 2019. June counts were prorated upward to closely match upstream and downstream traffic counts collected while all schools in the vicinity of the Project were in session.

Existing plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Project Traffic Conditions. The Existing plus Project traffic volumes were obtained by adding the Project Only Trips to the Existing Traffic Conditions scenario. The Net New Project Only Trips to the study facilities were developed based on existing travel patterns, the Fresno COG Project Select Zones, the existing roadway network, engineering judgment, data provided by the District, knowledge of the study area, existing residential and commercial densities, and the City of Fresno 2035 General Plan Circulation Element in the vicinity of the Project. The Fresno COG Models for the Project Select Zones are contained in Appendix C.

Existing plus Project Traffic Conditions - No Parking Structure Access to Cambridge Avenue

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Project Traffic Conditions - No Parking Structure Access to Cambridge Avenue. The Existing plus Project - No Parking Structure Access to Cambridge Avenue traffic volumes were obtained by adjusting the anticipated trip distribution of the Parking Structure component of the proposed Project. This scenario assumes that the Parking Structure will not have direct access to Cambridge Avenue.

Near Term plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Near Term plus Project Traffic Conditions. The Near Term plus Project traffic volumes were obtained by adding the Near Term related trips to the Existing plus Project Traffic Conditions scenario.

Cumulative Year 2035 No Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2035 No Project Traffic Conditions. The Cumulative Year 2035 No Project traffic volumes were obtained by subtracting Project Only Trips from the Cumulative Year 2035 plus Project traffic volumes.

Cumulative Year 2035 plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2035 plus Project Traffic Conditions. The Cumulative Year 2035 plus Project traffic volumes were obtained from the Fresno COG traffic model runs (Base Year 2019 and Cumulative Year 2035) and existing traffic counts. Under this scenario, the increment method, as recommended by the Model Steering Committee was utilized to determine the Cumulative Year 2035 plus Project traffic volumes. The Fresno COG models are contained in Appendix C.

Level of Service Analysis Methodology

Level of Service (LOS) is a qualitative index of the performance of an element of the transportation system. LOS is a rating scale running from "A" to "F", with "A" indicating no congestion of any kind and "F" indicating unacceptable congestion and delays. LOS in this study describes the operating conditions for signalized and unsignalized intersections.

The *Highway Capacity Manual* (HCM) 6th Edition is the standard reference published by the Transportation Research Board and contains the specific criteria and methods to be used in assessing LOS. U-turn movements were analyzed using HCM 2000 methodologies and would yield more accurate results for the reason that HCM 6 methodologies do not allow the analysis of U-turns. Synchro software was used to define LOS in this study. Details regarding these calculations are included in Appendix D.

Criteria of Significance

The City of Fresno 2035 General Plan has established various degrees of acceptable LOS on its major streets, which are dependent on four (4) Traffic Impact Zones (TIZs) within the City of Fresno. The standard LOS threshold for TIZ I is LOS F, that for TIZ II is LOS E, that for TIZ III is LOS D, and that for TIZ IV is LOS E. Additionally, the 2035 MEIR made findings of overriding consideration to allow a lower LOS threshold that that established by the underlying TIZ. For those cases in which a LOS criterion for a roadway segment differs from that of the underlying TIZ, such criteria are identified in the roadway description. In this case, all study facilities fall within TIZ II, therefore LOS E is used to evaluate the potential significance of LOS impacts to study intersections.

The County of Fresno has established LOS C as the acceptable level of traffic congestion on county roads and streets that fall entirely outside the Sphere of Influence (SOI) of a City. For those areas that fall within the SOI of a City, the LOS criteria of the City are the criteria of significance used in this report. LOS C is used to evaluate the potential significance of LOS impacts to Fresno County intersections that fall outside the City of Fresno SOI. In this case, all study facilities fall within the City of Fresno SOI, therefore, the City of Fresno LOS thresholds are utilized.

Caltrans endeavors to maintain a target LOS at the transition between LOS C and D on State highway facilities consistent with the *Caltrans Guide for the Preparation of Traffic Impact Studies* dated December 2002. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. In this TIA, however, all study facilities fall within the City of Fresno. Therefore, the City of Fresno LOS thresholds are utilized.

Operational Analysis Assumptions and Defaults

The following operational analysis values, assumptions and defaults were used in this study to ensure a consistent analysis of LOS among the various scenarios.

- Yellow time consistent with the California Manual of Uniform Traffic Control Devices (CA MUTCD) based on approach speeds
- Yellow time of 3.2 seconds for left-turn phases
- All-red clearance intervals of 1.0 second for all phases
- Walk intervals of 7.0 seconds
- Flashing Don't Walk based on 3.5 feet/second walking speed with yellow plus all-red clearance subtracted and 2.0 seconds added
- All new or modified signals utilize protective left-turn phasing, unless otherwise noted
- A 3 percent heavy vehicle factor for all major street to major street movements and a 1 percent heavy vehicle factor to and from minor streets
- The number of observed pedestrians at existing intersections was utilized under all study scenarios
- At existing intersections, the observed approach Peak Hour Factor (PHF) is utilized in the Existing, Existing plus Project, and Near Term plus Project scenarios.
- A PHF of 0.92, or the existing PHF if higher, is utilized for the Cumulative Year 2035 scenarios

Existing Traffic Conditions

Roadway Network

The Project site and surrounding study area are illustrated in Figure 1. Important roadways serving the Project are discussed below.

San Pablo Avenue is an existing north-south two-lane local street adjacent to the proposed Project. In this area, San Pablo Avenue exists as a two-lane undivided local street between Clinton Avenue and Cambridge Avenue. The City of Fresno 2035 General Plan Circulation Element designates San Pablo Avenue as a two-lane local street between Clinton Avenue and Cambridge Avenue.

Glenn Avenue is an existing north-south two-lane local street in the vicinity of the proposed Project. In this area, Glenn Avenue exists as a two-lane undivided local street between Clinton Avenue and Cambridge Avenue. The City of Fresno 2035 General Plan Circulation Element designates Glenn Avenue as a two-lane local street between Clinton Avenue and Cambridge Avenue.

Blackstone Avenue is an existing north-south six-lane divided arterial adjacent to the proposed Project. In this area, Blackstone Avenue exists as a six-lane divided arterial between Nees Avenue and Hedges Avenue, and two one-way three-lane roadways (Blackstone Avenue and Abby Street) between Hedges Avenue and Divisadero Street. The City of Fresno 2035 General Plan Circulation Element designates Blackstone Avenue as a six-lane arterial between Nees Avenue and Hedges Avenue and a four-lane arterial between Hedges Avenue and Divisadero Street.

Clinton Avenue is an existing east-west four-lane collector in the vicinity of the proposed Project. In this area, Clinton Avenue exists west of Chestnut Avenue through the City of Fresno and east of Clovis Avenue through the City of Fresno. The City of Fresno 2035 General Plan Circulation Element designates Clinton Avenue predominantly as a four-lane collector through the City of Fresno.

Cambridge Avenue is an existing east-west two-lane local street adjacent to the proposed Project. In this area, Cambridge Avenue exists as a two-lane local street between San Pablo Avenue and Thesta Avenue. The City of Fresno 2035 General Plan Circulation Element designates Cambridge Avenue as a two-lane local street between San Pablo Avenue and Thesta Avenue.

Weldon Avenue is an existing east-west two-lane local street adjacent to the proposed Project. In this area, Weldon Avenue exists as a two-lane local street west of Blackstone Avenue. Weldon Avenue is the major access point to Fresno City College off of Blackstone Avenue. The City of Fresno 2035 General Plan Circulation Element designates Weldon Avenue as a local street west of Blackstone Avenue.

University Avenue is an existing east-west two-lane local street adjacent to the proposed Project. In this area, University Avenue exists a two-lane local street between Calaveras Street and Fresno Street. The City of Fresno 2035 General Plan Circulation Element designates University Avenue as a local street between Calaveras Street and Fresno Street.

McKinley Avenue is an existing east-west four-lane divided arterial in the vicinity of the proposed Project. In this area, McKinley Avenue exists predominantly as a four-lane arterial west of Clovis Avenue. The City of Fresno 2035 General Plan Circulation Element designates McKinley Avenue as a predominantly four-lane arterial west of Clovis Avenue.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing Traffic Conditions scenario. These warrants are found in Appendix K. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, none of the unsignalized intersections satisfy the peak hour signal warrant during either peak period.

Results of Existing Level of Service Analysis

Figure 2 illustrates the Existing Traffic Conditions turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Existing Traffic Conditions scenario are provided in Appendix E. Table I presents a summary of the Existing peak hour LOS at the study intersections.

At present, the intersection of Blackstone Avenue and University Avenue exceeds its LOS threshold during both peak periods. To improve the LOS at this intersection, it is recommended that the following improvements be implemented.

- Blackstone Avenue / University Avenue
  - Modify University Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Peralta Way, and continue northbound on Blackstone Avenue toward University Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue southbound on Blackstone Avenue toward University Avenue.

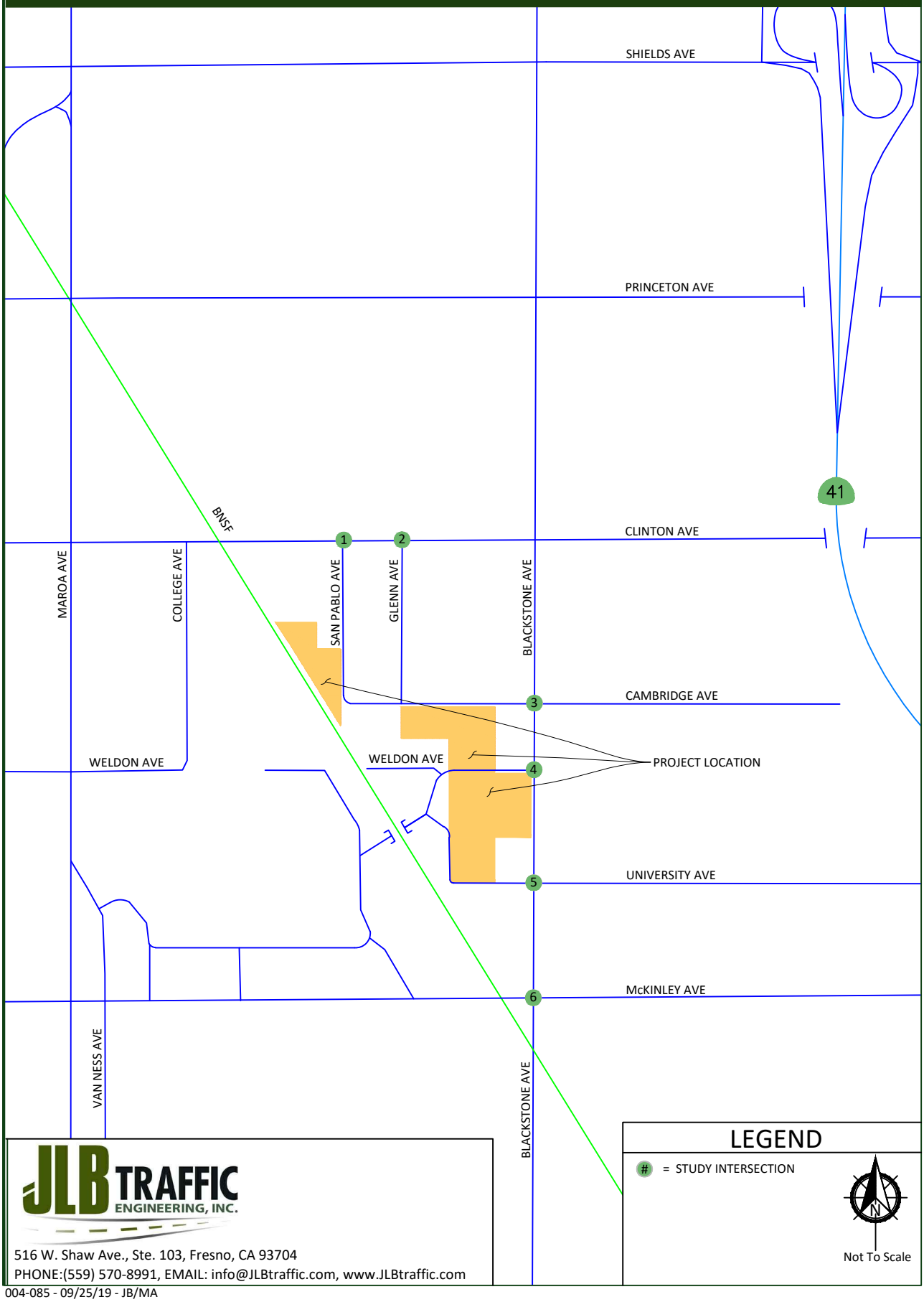
Table I: Existing Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	San Pablo Avenue / Clinton Avenue	One-Way Stop	28.3	D	21.3	C
2	Glenn Avenue / Clinton Avenue	One-Way Stop	26.6	D	25.2	D
3	Blackstone Avenue / Cambridge Avenue	Two-Way Stop	36.2	E	48.8	E
4	Blackstone Avenue / Weldon Avenue	Signalized	9.8	A	10.1	B
5	Blackstone Avenue / University Avenue	Two-Way Stop	**>120.0**	**F**	**>120.0**	**F**
		Two-Way Stop (Improved)	15.0	C	17.9	C
6	Blackstone Avenue / McKinley Avenue	Signalized	26.7	C	28.3	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

FCC Parking and Facilities Expansion - City of Fresno
Vicinity Map

Figure 1



JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

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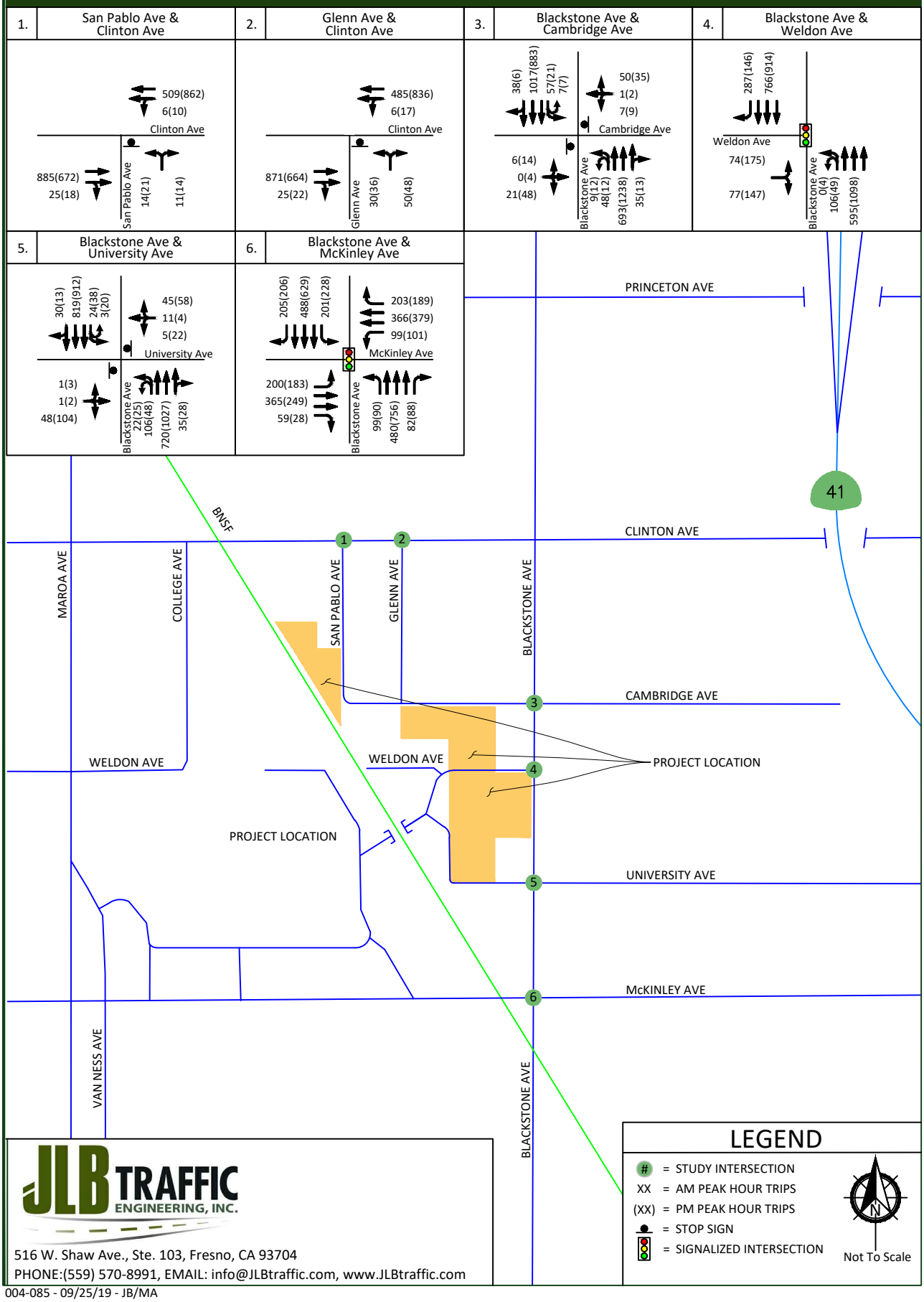
FCC Parking and Facilities Expansion - City of Fresno

Existing - Traffic Volumes, Geometrics and Controls

Figure 2



JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

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Existing plus Project Traffic Conditions

Project Description

The Parking and Facilities Expansion of the FCC campus Project consists of the following facilities:

a) Construction of a parking structure on the south side of Cambridge Avenue west of Blackstone Avenue located north of the existing district office building. The proposed parking structure would have a capacity for up to 1,000 parking spaces, include up to five levels of parking, and include ingress/egress points at Weldon Avenue, the Glenn Avenue southerly extension and potentially Cambridge Avenue.
b) Construction of a three-story Science Building approximately 95,000 square-foot located near the southwest corner of Blackstone Avenue and Weldon Avenue. The new Science Building is proposed to include six (6) biology labs, three (3) anatomy and physiology labs, five (5) chemistry labs, two (2) physics labs, two (2) engineering labs, a computer lab, three (3) general educational classrooms, four (4) Design Science (Middle College) classrooms, a welcome center, tutorial space, and 34 faculty offices. Surface parking would also be added adjacent to the building. Existing Maintenance and Operations facilities located in this area would be removed and relocated to a different area of the campus (see section d below).
c) Replacement of the existing one-story, 5,255 square-foot Child Development Center with a new one-story, 16,480 square-foot Child Development Center at its current location.
d) Construction of a one-story, 10,000 square-foot Maintenance and Operations building plus a parking and storage area on the west side of San Pablo Avenue northwest of the existing Health Sciences Building.
e) Repurposing of the existing District administration building located on the north side of Weldon Avenue to accommodate the SCCCD Police Department.

Development of the Project facilities would occur over the next five (5) years. Per information provided to JLB, the Project is consistent with the City of Fresno 2035 General Plan. Figure 3 illustrates the latest Project Site Plan.

Project Access

Based on the latest Project details, access to and from the Project site will be off of a) Blackstone Avenue via Cambridge Avenue, Weldon Avenue and University Avenue and b) Clinton Avenue via San Pablo Avenue and Glenn Avenue.

Trip Generation

Trip generation rates for the existing and proposed Project were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE) and data provided from the District. Table II presents the trip generation for the Existing Project with trip generation rates for Junior/Community College (Science Building), Day Care Center (Child Development Center), Maintenance and Operations, School District Office (Administration), and Government Office Building (Police Department). At present, the Project is estimated to generate a maximum of 2,045 daily trips, 262 AM peak hour trips and 237 PM peak hour trips. However, the trip generation of the Project will differ as a result of the relocation, expansion and modification of the Project's land uses. Table III presents the trip generation for the proposed Future Project with trip generation rates for Junior/Community College (Science Building), Day Care Center (Child Development Center), Maintenance and Operations, School District Office (Administration), and Government Office Building (Police Department). At buildout, the proposed Future Project is estimated to generate a maximum of 2,230 daily trips, 287 AM peak hour trips and 268 PM peak hour trips. Compared to the Existing Project Trip Generation, the Future Project Trip Generation is estimated to be slightly higher by 185 daily trips, 25 AM peak hour trips, and 31 PM peak hour trips.

Table II: Existing Project Trip Generation

Land Use (ITE Code)	*Size*	*Unit*	*Daily*		*AM (7-9) Peak Hour*						*PM (4-6) Peak Hour*					
			Rate	*Total*	*Trip Rate*	*In*	*Out*	*In*	*Out*	*Total*	*Trip Rate*	*In*	*Out*	*In*	*Out*	*Total*
						%						*%*				
Junior/Community College (540)	980	students	1.15	1,127	0.11	81	19	87	21	108	0.11	56	44	60	48	108
Day Care Center (565)	77	students	4.09	315	0.78	53	47	32	28	60	0.79	47	53	29	32	61
Maintenance and Operations	30	employees	2.52	76	0.38	50	50	6	5	11	0.08	50	50	1	1	2
School District Office (538)	70	employees	5.08	356	0.83	76	24	44	14	58	0.72	17	83	9	41	50
Government Office Building (730) *	23	employees	7.45	171	1.10	75	25	19	6	25	0.71	20	80	3	13	16
Existing Project Trips				**2,045**				**188**	**74**	**262**				**102**	**135**	**237**

Note: * = ITE does not include trip generation rates for Police Department use. Trip generation rates used here are those for Government Office Building use.

Table III: Future Project Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM (7-9) Peak Hour						PM (4-6) Peak Hour					
			Rate	Total	Trip Rate	In %	Out %	In	Out	Total	Trip Rate	In %	Out %	In	Out	Total
Junior/Community College (540)	1110	students	1.15	1,277	0.11	81	19	99	23	122	0.11	56	44	68	54	122
Day Care Center (565)	119	students	4.09	487	0.78	53	47	49	44	93	0.79	47	53	44	50	94
Maintenance and Operations	22	employees	2.52	56	0.38	50	50	4	4	8	0.08	50	50	1	1	2
School District Office (538)	47	employees	5.08	239	0.83	76	24	30	9	39	0.72	17	83	6	28	34
Government Office Building (730) *	23	employees	7.45	171	1.10	75	25	19	6	25	0.71	20	80	3	13	16
Future Project Trips				**2,230**				**201**	**86**	**287**				**122**	**146**	**268**

Note: * = ITE does not include trip generation rates for Police Department use. Trip generation rates used here are those for Government Office Building use.

Table IV: Difference in Trip Generation

	Daily	AM (7-9) Peak Hour			PM (4-6) Peak Hour		
	Total	In	Out	Total	In	Out	Total
Existing Project Trip Generation	2,045	188	74	262	102	135	237
Future Project Trip Generations	2,230	201	86	287	122	146	268
Difference in Trip Generation	**185**	**13**	**12**	**25**	**20**	**11**	**31**

Trip Distribution

The trip distribution assumptions for the Existing Project were developed based on existing travel patterns, the Fresno COG Project Select Zones, the existing roadway network, engineering judgment, data provided by the District, knowledge of the study area, existing residential and commercial densities, and the City of Fresno 2035 General Plan Circulation Element in the vicinity of the Project. The trip distribution assumptions for the Future Project were developed based on existing travel patterns, the Fresno COG Project Select Zones, the existing roadway network, engineering judgment, data provided by the District, knowledge of the study area, existing residential and commercial densities, and the City of Fresno 2035 General Plan Circulation Element in the vicinity of the Project. Figure 4 illustrates the Existing Project Only Trips to the study intersections, Figure 5 illustrates the Future Project Only Trips to the study intersections, and Figure 6 illustrates the Net New Project Only Trips to the study intersections.

Bikeways

Currently, Class II Bike Lanes exist in the vicinity of the proposed Project site along McKinley Avenue. The City of Fresno "Active Transportation Plan" recommends that Class II Bike Lanes be implemented on: 1) Clinton Avenue through the City of Fresno and 2) McKinley Avenue through the City of Fresno. Additionally, the City of Fresno "Active Transportation Plan" recommends that Class I Bike Routes be implemented on: 1) Glenn Avenue between Clinton Avenue and Weldon Avenue, 2) Cambridge Avenue between San Pablo Avenue and Clark Street and 3) Weldon Avenue west of Glenn Avenue. Therefore, it is recommended that the Project implement Class I Bike Routes along a) Glenn Avenue within the Project site, b) along the Project's frontage to Cambridge Avenue (between San Pablo Avenue and Blackstone Avenue) and c) Weldon Avenue within the Project site.

Walkways

Currently, walkways exist in the vicinity of the proposed Project site along San Pablo Avenue, Glenn Avenue, Blackstone Avenue, Clinton Avenue, Cambridge Avenue, Weldon Avenue, University Avenue and McKinley Avenue. The City of Fresno "Active Transportation Plan" recommends that walkways be implemented on: 1) San Pablo Avenue, 2) Glenn Avenue, 3) Blackstone Avenue, 4) Clinton Avenue, 5) Cambridge Avenue, 6) University Avenue and 7) McKinley Avenue. Furthermore, the City of Fresno "Active Transportation Plan" recognizes that Blackstone Avenue between Shaw Avenue and Divisadero Street (BRT corridor) is an area "with a well-connected, grid network of streets with a mix of uses that generate pedestrian activity, as well as streets with commercial establishments oriented toward the sidewalk and street (as opposed to auto-oriented with large parking lots in front)" (p. 138). This area also experiences some of the highest frequency of pedestrian collisions. The City of Fresno "Active Transportation Plan" presents recommendations for enhancement such as wide sidewalks, landscaping, bulb-outs, traffic calming measures, etc. Therefore, it is recommended that the Project retain the existing walkways that are in a good state and ADA compliant along its frontages to San Pablo Avenue, Blackstone Avenue, Cambridge Avenue, and Weldon Avenue. The Project shall reconstruct walkways where needed to conform to current ADA guidelines.

Transit

Fresno Area Express (FAX) is the transit operator in the City of Fresno. At present, there are five (5) FAX transit routes that operate in the vicinity of the proposed Project. These include FAX Route 1 Q Bus Rapid Transit (BRT), FAX Route 39, FAX Route 28, FAX Route 45 and FAX Route 20. Retention of the existing and expansion of future transit routes is dependent on transit ridership demand and available funding.

FAX Route 1 Q BRT runs on Blackstone Avenue adjacent to the proposed Project. Its nearest stop to the Project is located along the west side of Blackstone Avenue approximately 150 feet south of Weldon Avenue. FAX Route 1 Q BRT operates at 10-minute intervals on weekdays starting at approximately 6:00 AM and ending at 9:00 AM, 15-minute intervals starting at approximately 9:00 AM and ending at approximately 2:35 PM, and 10-minute intervals starting at approximately 2:35 PM and ending at 7:00 PM. This route provides a direct connection to various destinations located along Blackstone Avenue and Ventura Avenue/Kings Canyon Road.

FAX Route 39 runs on Clinton Avenue approximately 0.14 miles north of the proposed Project. Its nearest stop to the Project is located along the south side of Clinton Avenue approximately 25 feet west of San Pablo Avenue. FAX Route 39 operates at 30-minute intervals on weekdays and weekends and provides a direct connection to Fresno High School, Fresno City College, Veterans Medical Center, Art Museum, Cedar/Clinton Library, Alliant University and the Fresno Yosemite International Air Terminal.

FAX Route 28 runs on Van Ness Avenue/Maroa Avenue approximately 0.40 miles east of the proposed Project. Its nearest stop to the Project is located along the east side of Maroa Avenue approximately 40 feet south of Weldon Avenue. FAX Route 28 operates at 20-minute intervals on weekdays and weekends and provides a direct connection to Fashion Fair Shopping Center, Fresno State University, Savemart Center, Manchester Center, Fresno City College, Fresno High, Community Regional Medical Center, Convention Center, Chukchansi Park, and Chandler Downtown Airport.

FAX Route 45 runs on Van Ness Avenue/Maroa Avenue approximately 0.40 miles east of the proposed Project. Its nearest stop to the Project is located along the east side of Maroa Avenue approximately 40 feet south of Weldon Avenue. FAX Route 45 operates at 60-minute intervals on weekdays and weekends and provides a direct connection to Bullard High School, Gillis Library, Fresno High School, Fresno City College, Manchester Transit Center and Army Navy Reserve.

FAX Route 20 runs on Blackstone Avenue approximately 0.26 miles south of the proposed Project. Its nearest stop to the Project is located along the west side of Blackstone Avenue approximately 150 feet south of McKinley Avenue. FAX Route 20 operates at 30-minute intervals on weekdays and weekends and provides a direct connection to Lions Park, Fresno High School, Fresno City College, Talking Book Library, Community Center, Cesar E. Chavez Adult School, Fresno Community Hospital and Convention Center.

It is worth noting that the recent implementation of the BRT system has provided for shelters at the intersection of Blackstone Avenue and Weldon Avenue, thus improving conditions for patrons. An observation made by JLB noted that the number of transit users in the vicinity of FCC is relatively high. Where possible, consideration should be given to the planting of trees to provide shade and help reduce heat during the summer months. Additionally, it is recommended that the District work with FAX to improve headways of the existing transit routes serving the FCC campus.

Vehicle Miles Traveled Evaluation

Senate Bill (SB) 743 (Steinberg 2013) was approved by then Governor Brown on September 27, 2013. SB 743 created a path to revise the definition of transportation impacts according to CEQA. The revised CEQA Guidelines requiring VMT analysis became effective December 28, 2018; however, agencies have until July 1, 2020 to finalize their local guidelines on VMT analysis. Therefore, as agencies finalize their VMT analysis protocol, CEQA transportation impacts are to be determined using LOS of intersections and roadways, which is a measure of congestion. The intent of SB 743 is to align CEQA transportation study methodology with and promote the statewide goals and policies of reducing vehicle miles traveled (VMT) and greenhouse gases (GHG). Three objectives of SB 743 related to development are to reduce GHG, diversify land uses, and focus on creating a multimodal environment. It is hoped that this will spur infill development.

The Technical Advisory on Evaluating Transportation Impacts in CEQA published by the Governor's Office of Planning and Research (OPR) dated December 2018 acknowledges that lead agencies should set criteria and thresholds for VMT and transportation impacts. However, the Technical Advisory provides guidance to residential, office and retail uses, citing these as the most common land uses. Beyond these three land uses, there is no guidance provided for any other land use type. The Technical Advisory also notes that land uses may have a less than significant impact if located within low VMT areas of a region. Screening maps are suggested for this determination.

VMT is simply the product of a number of trips and the length of those trips. The first step in a VMT analysis is to establish the baseline average VMT, which requires the definition of a region. The Technical Advisory states that existing VMT may be measured at the regional or city level. On the contrary, the Technical Advisory also notes that VMT analyses should not be truncated due to "jurisdictional or other boundaries."

As the Project will be used to serve an existing student and employee population, it is likely that the Project would not add VMT per capita. Additionally, the Project site is located near transit services and pedestrian and bicycle networks. Currently, Fresno COG and its member agencies, which include the City of Fresno, have begun the process to develop recommended criteria and thresholds that balance the direction from OPR and the goals of SB 743 with the vision of Fresno and economic development, access to goods and services, and overall quality of life. However, these regional recommended criteria are not anticipated to be completed until mid-2020.

Parking Demand

JLB prepared a Traffic and Parking Analysis Report for the SCCCD Master Plan Update (dated October 4, 2018) hereinafter referred to the Master Plan Update Report. The Master Plan Update Report found there is a grand total of 3,349 parking stalls, of which 152 spaces are on-street parking stalls adjacent to the campus, leaving a total of 3,197 on-site parking stalls (3,349 parking stalls - 152 on-street parking stalls = 3,197 on-site parking stalls). Of the 3,197 on-site parking stalls, 2,304 spaces are for the general public, 84 spaces are metered, 638 spaces are for staff, 101 spaces are ADA, 53 spaces are for motorcycles, 15 spaces are time-restricted and two (2) are other. Furthermore, the Master Plan Update Report determined that the number of general public and metered on-site parking stalls needed to meet the 2018 demand is 2,629 (2,497 general public, metered and off-site parking stalls occupied during the peak hour ÷ 95 percent occupancy rate = 2,629). This equates to a 2018 shortage of 241 general public and metered parking stalls (2,388 general public and metered parking stalls available - 2,629 general public and metered parking stalls needed to meet demand = 241 shortage). Lastly, the Master Plan Update Report determined that the number of general public and metered on-site parking stalls needed to meet the 2028 demand is 2,709. This equates to a 2028 shortage of 321 general public and metered parking stalls.

The portion of the Project that is the parking structure is anticipated to add a total of 1,000 parking spaces, while replacing 189 parking stalls. Therefore, the net change is 811 parking stalls (1,000 new parking stalls - 189 existing parking stalls = 811 net new parking stalls). Given that the current number of general public and metered on-site parking stalls is 2,388 and the Project will add 811 general public parking stalls, the new total of general public and metered on-site parking stalls will be 3,199 parking stalls. Since the parking supply is projected to be up to 3,199 general public and metered on-site parking stalls, it is anticipated that the FCC campus will have sufficient parking supply to accommodate the projected parking demand in the year 2028.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing plus Project Traffic Conditions scenario. These warrants are found in Appendix K. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, none of the unsignalized study intersections are projected to satisfy the peak hour signal warrant during either peak period.

Results of Existing plus Project Level of Service Analysis

The Existing plus Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figure 7 illustrates the Existing plus Project turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Existing plus Project Traffic Conditions scenario are provided in Appendix F. Table V presents a summary of the Existing plus Project peak hour LOS at the study intersections.

Under this scenario, the intersections of Blackstone Avenue and Cambridge Avenue and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.

- Blackstone Avenue / Cambridge Avenue
  - Modify Cambridge Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue northbound on Blackstone Avenue toward Cambridge Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Yale Avenue, and continue southbound on Blackstone Avenue toward Cambridge Avenue.
  - Furthermore, it is recommended that Yale Avenue access at Blackstone Avenue also be limited to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. The implementation of the raise median island at the intersection of Blackstone Avenue and Yale Avenue will prevent FCC traffic destined to the north on Blackstone Avenue from using Yale Avenue.
- Blackstone Avenue / University Avenue
  - Modify University Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Peralta Way, and continue northbound on Blackstone Avenue toward University Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue southbound on Blackstone Avenue toward University Avenue.

While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns. To achieve this, it is recommended that the following improvements be implemented.

- Blackstone Avenue / Weldon Avenue
  - Add a southbound U-turn-turn lane;
  - Remove the R3-4 (U-turn prohibition) sign that serves the northbound left-turn pocket; and
  - Modify the traffic signal to accommodate the added lane.

Table V: Existing plus Project Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	San Pablo Avenue / Clinton Avenue	One-Way Stop	37.2	E	25.2	D
2	Glenn Avenue / Clinton Avenue	One-Way Stop	33.1	D	30.1	D
3	Blackstone Avenue / Cambridge Avenue	Two-Way Stop	**>120.0**	**F**	**>120.0**	**F**
		Two-Way Stop (Mitigated)	20.1	C	19.1	C
4	Blackstone Avenue / Weldon Avenue	Signalized	15.8	B	13.0	B
		Signalized (Mitigated)	18.2	B	15.8	B
5	Blackstone Avenue / University Avenue	Two-Way Stop	**>120.0**	**F**	**>120.0**	**F**
		Two-Way Stop (Mitigated)	16.7	C	20.9	C
6	Blackstone Avenue / McKinley Avenue	Signalized	37.3	D	35.0	D

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

FCC Parking and Facilities Expansion - City of Fresno
Project Cite Plan

Figure 3

JLB TRAFFIC ENGINEERING, INC.

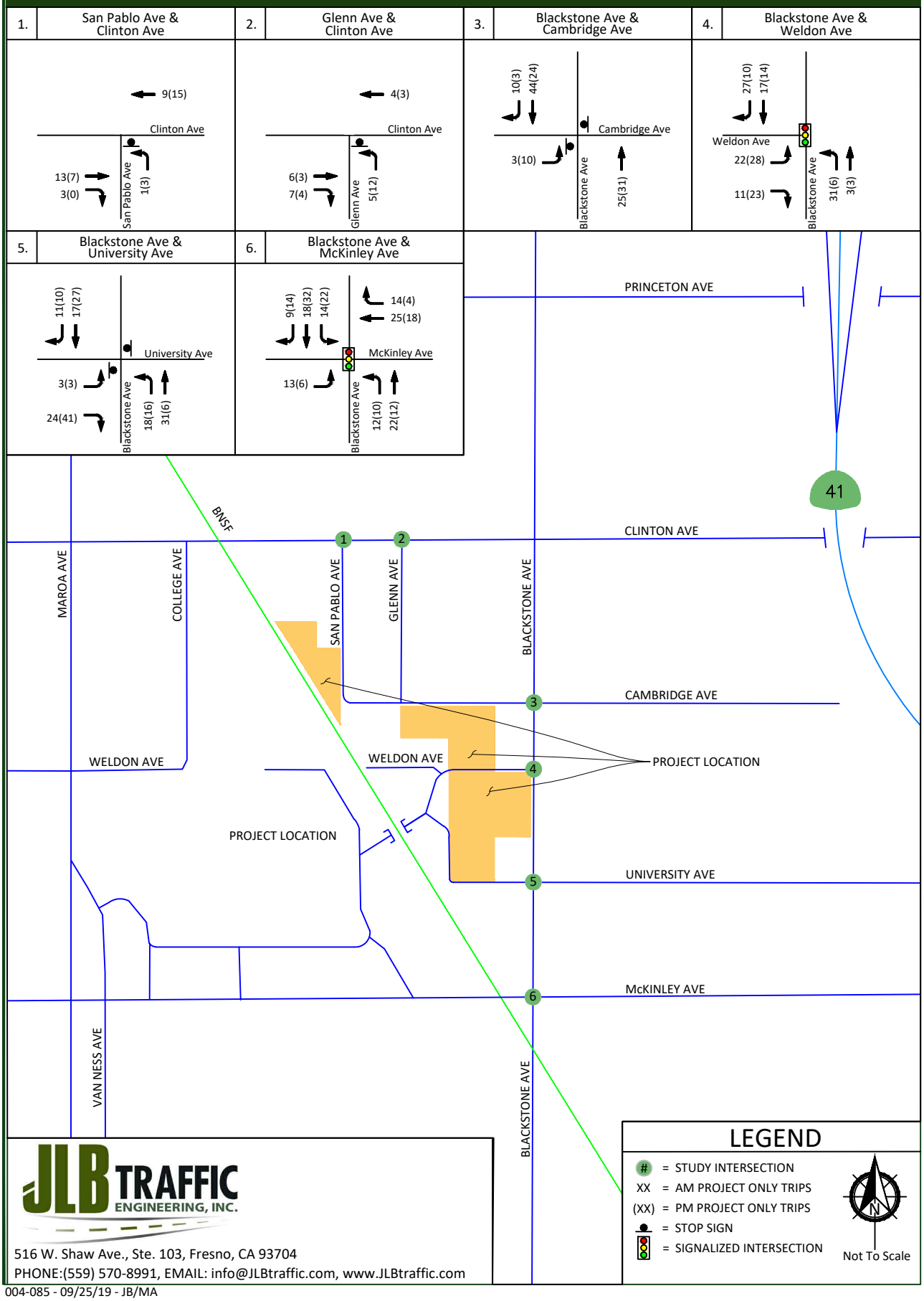
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

Not To Scale

004-085 - 09/25/19 - JB/MA

FCC Parking and Facilities Expansion - City of Fresno
Existing Project Only Trips

Figure 4



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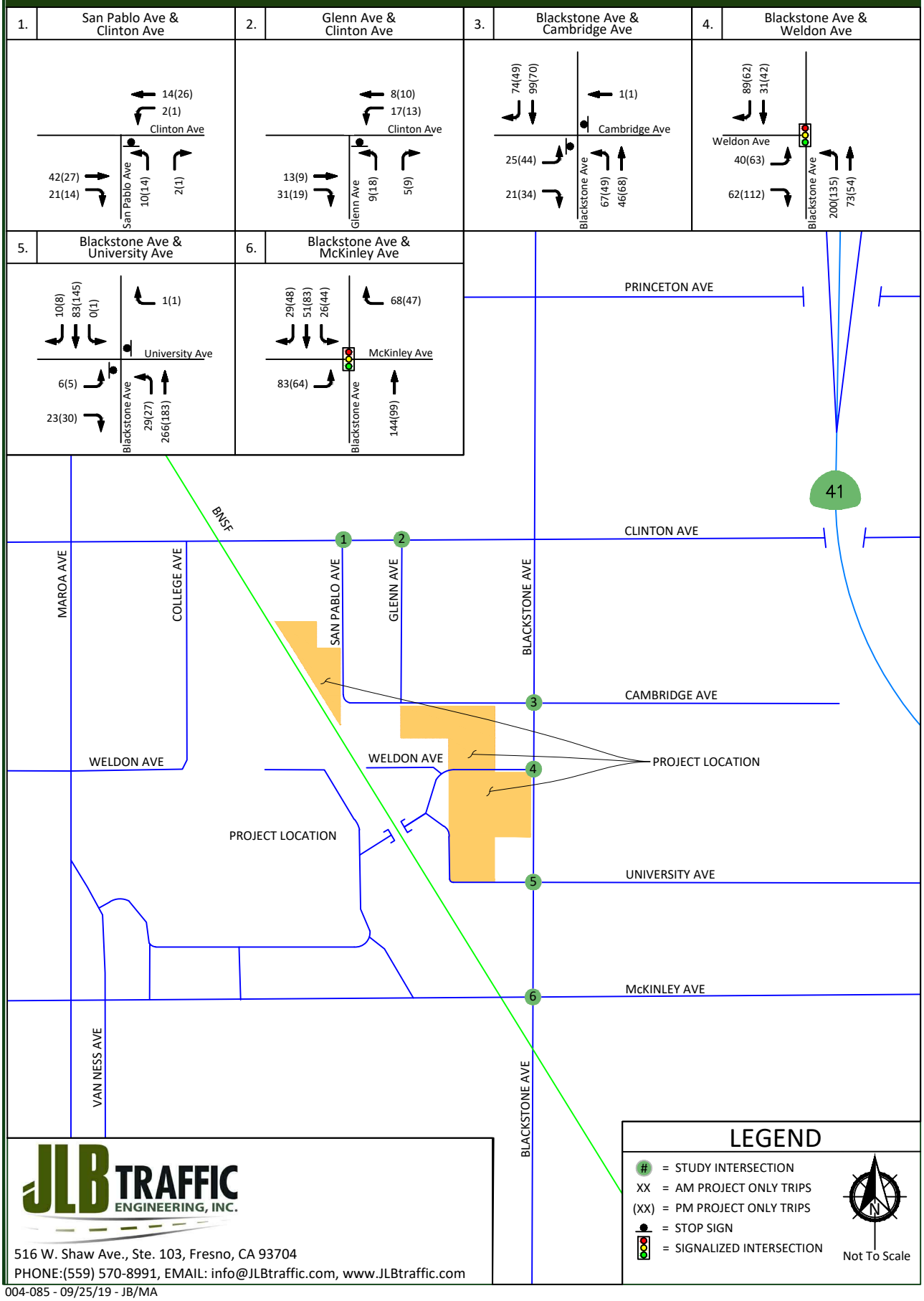
FCC Parking and Facilities Expansion - City of Fresno
Future Project Only Trips

Figure 5



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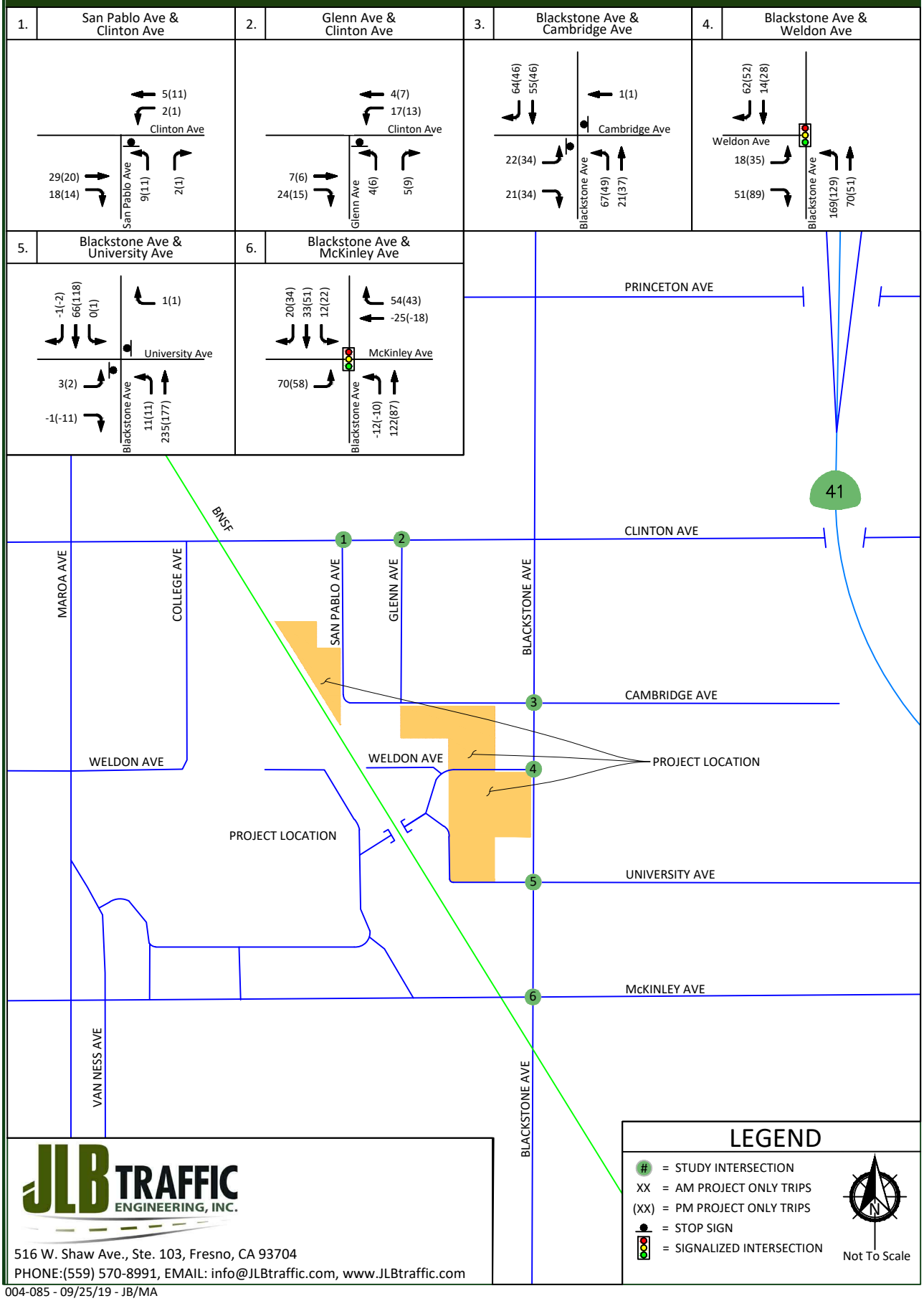
FCC Parking and Facilities Expansion - City of Fresno
Net New Project Only Trips

Figure 6



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516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

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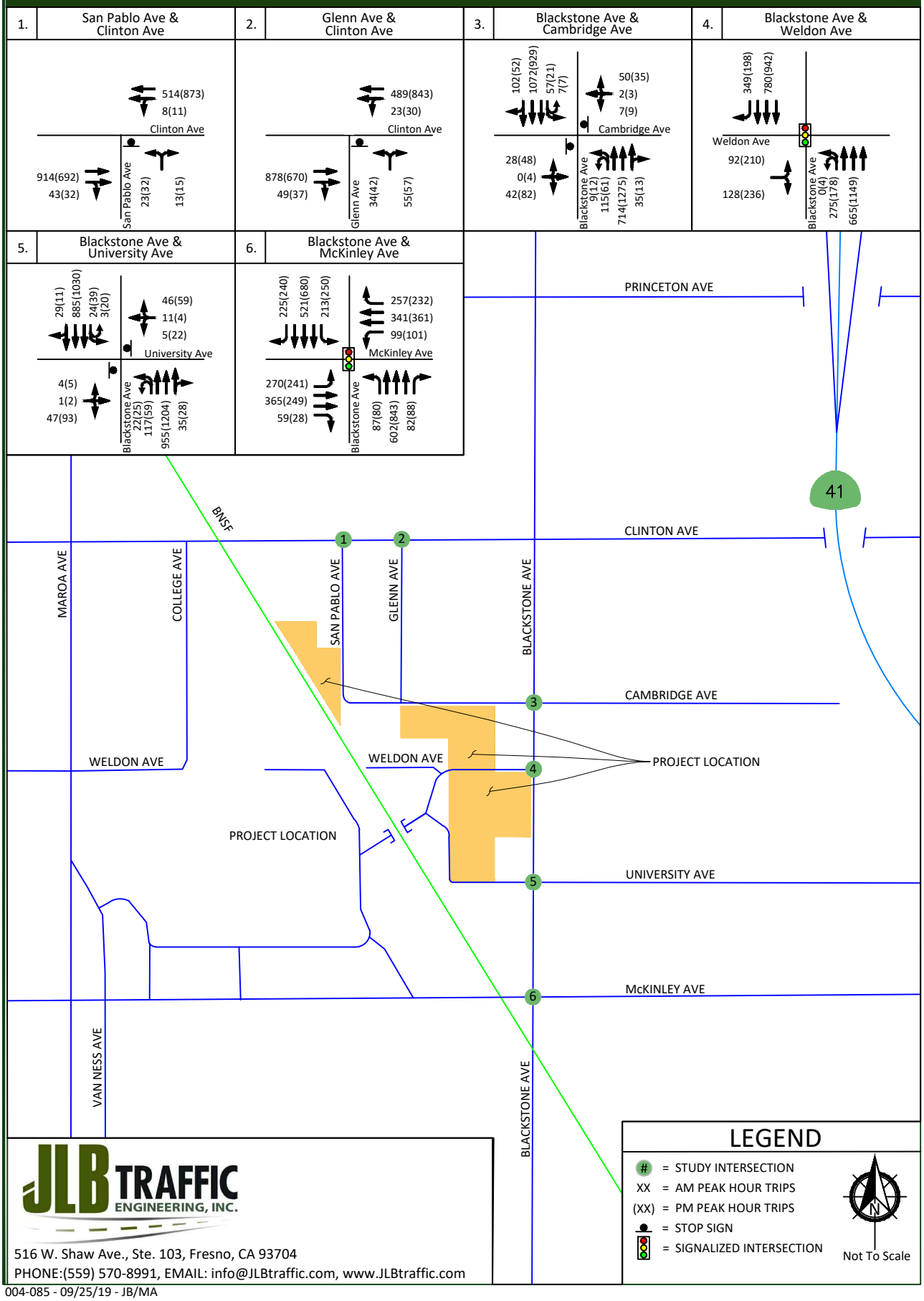
FCC Parking and Facilities Expansion - City of Fresno

Figure 7

Existing plus Project - Traffic Volumes, Geometrics and Controls



JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

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Existing plus Project Traffic Conditions - No Parking Structure Access to Cambridge Avenue

JLB conducted an analysis of the Existing plus Project scenario in which the Parking Structure component of the proposed Project does not have direct access to Cambridge Avenue.

Results of Existing plus Project Level of Service Analysis - No Parking Structure Access to Cambridge Avenue

The Existing plus Project Traffic Conditions - No Parking Structure Access to Cambridge Avenue scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. LOS worksheets for the Existing plus Project Traffic Conditions - No Parking Structure Access to Cambridge Avenue scenario are provided in Appendix G. Table VI presents a summary of the Existing plus Project peak hour LOS at the study intersections.

Under this scenario, the intersections of Blackstone Avenue and Cambridge Avenue and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.

- Blackstone Avenue / Cambridge Avenue
  - Modify Cambridge Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue northbound on Blackstone Avenue toward Cambridge Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Yale Avenue, and continue southbound on Blackstone Avenue toward Cambridge Avenue.
  - Furthermore, it is recommended that Yale Avenue access at Blackstone Avenue also be limited to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. The implementation of the raise median island at the intersection of Blackstone Avenue and Yale Avenue will prevent FCC traffic destined to the north on Blackstone Avenue from using Yale Avenue.

- Blackstone Avenue / University Avenue
  - Modify University Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Peralta Way, and continue northbound on Blackstone Avenue toward University Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue southbound on Blackstone Avenue toward University Avenue.

While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns. To achieve this, it is recommended that the following improvements be implemented.

- Blackstone Avenue / Weldon Avenue
  - Add a southbound U-turn-turn lane;
  - Remove the R3-4 (U-turn prohibition) sign that serves the northbound left-turn pocket; and
  - Modify the traffic signal to accommodate the added lane.

When compared to the Existing plus Project Traffic Condition scenario, the prevention of the Parking Structure's access to Cambridge Avenue will encourage most southbound traffic on Blackstone Avenue and all northbound traffic on Blackstone Avenue to enter the site via Weldon Avenue, thus reducing traffic on Cambridge Avenue between Glenn Avenue and Blackstone Avenue. As can be seen from Tables V and VI, the prevention of the Parking Structure's access to Cambridge Avenue is projected to slightly improve the LOS at the intersection of Blackstone Avenue and Cambridge Avenue while the LOS at the intersection of Blackstone Avenue and Weldon Avenue is projected to slightly worsen. More specifically, the LOS at the intersection of Blackstone Avenue and Cambridge Avenue is projected to reduce from greater than 120.0 seconds during both peak periods under the Existing plus Project Traffic Conditions scenario to 111.2 seconds during the AM peak period and 117.8 seconds during the PM peak period under the Existing plus Project Traffic Conditions - No Parking Structure Access to Cambridge Avenue. Moreover the LOS at the intersection of Blackstone Avenue and Cambridge Avenue is projected to increase from 15.8 seconds during the AM peak period and 13.0 seconds during the PM peak period under the Existing plus Project Traffic Conditions scenario to 18.6 seconds during the AM peak period and 14.4 seconds during the PM peak period under the Existing plus Project Traffic Conditions - No Parking Structure Access to Cambridge Avenue.

Table VI: Existing plus Project Intersection LOS Results - No Parking Structure Access to Cambridge Avenue

ID	*Intersection*	*Intersection Control*	*AM (7-9) Peak Hour*		*PM (4-6) Peak Hour*	
			Average Delay (sec/veh)	*LOS*	*Average Delay (sec/veh)*	*LOS*
1	San Pablo Avenue / Clinton Avenue	One-Way Stop	37.2	E	25.2	D
2	Glenn Avenue / Clinton Avenue	One-Way Stop	33.1	D	30.1	D
3	Blackstone Avenue / Cambridge Avenue	Two-Way Stop	**111.2**	**F**	**117.8**	**F**
		Two-Way Stop (Mitigated)	18.6	C	19.1	C
4	Blackstone Avenue / Weldon Avenue	Signalized	18.6	B	14.4	B
		Signalized (Mitigated)	18.7	B	17.0	B
5	Blackstone Avenue / University Avenue	Two-Way Stop	**>120.0**	**F**	**>120.0**	**F**
		Two-Way Stop (Mitigated)	16.7	C	20.9	C
6	Blackstone Avenue / McKinley Avenue	Signalized	37.3	D	35.0	D

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

Near Term plus Project Traffic Conditions

Description of Approved and Pipeline Projects

Approved and Pipeline Projects consist of developments that are either under construction, built but not fully occupied, are not built but have final site development review (SDR) approval, or for which the lead agency or responsible agencies have knowledge of. The City of Fresno, County of Fresno and Caltrans staff were consulted throughout the preparation of this TIA regarding approved and/or known projects that could potentially impact the study intersections. JLB staff conducted a reconnaissance of the surrounding area to confirm the Near Term Projects. Subsequently, it was agreed that the project listed in Table VII was approved, near approval, or in the pipeline within the proximity of the proposed Project.

The trip generation listed in Table VII is that which is anticipated to be added to the streets and highways by this project between the time of the preparation of this report and five years from 2019. As shown in Table VII, the total trip generation for the Near Term Project is 2,132 daily trips, 171 AM peak hour trips and 150 PM peak hour trips. Figure 8 illustrates the location of the approved, near approval, or pipeline project and their combined trip assignment to the study intersections and segments under the Near Term plus Project Traffic Conditions scenario.

Table VII: Near Term Projects' Trip Generation

Approved Project Location	*Approved or Pipeline Project Name*	*Daily Trips*	*AM Peak Hour*	*PM Peak Hour*
A	Blackstone and Clinton Commercial Development[1]	1,104	111	63
B	Blackstone and McKinley Commercial Development[2]	1,028	60	87
Total Approved and Pipeline Project Trips		**2,132**	**171**	**150**

Note: 1 = Trip Generation based on Traffic Impact Analysis prepared by JLB Traffic Engineering, Inc.
1 = Trip Generation prepared by JLB Traffic Engineering, Inc. based on readily available information

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Near Term plus Project Traffic Conditions scenario. These warrants are found in Appendix K. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, none of the unsignalized study intersections are projected to satisfy the peak hour signal warrant during either peak period.

Results of Near Term plus Project Level of Service Analysis

The Near Term plus Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figure 9 illustrates the Near Term plus Project turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Near Term plus Project Traffic Conditions scenario are provided in Appendix H. Table VIII presents a summary of the Near Term plus Project peak hour LOS at the study intersections.

Under this scenario, the intersections of Blackstone Avenue and Cambridge Avenue and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.

- Blackstone Avenue / Cambridge Avenue
  - Modify Cambridge Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue northbound on Blackstone Avenue toward Cambridge Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Yale Avenue, and continue southbound on Blackstone Avenue toward Cambridge Avenue.
  - Furthermore, it is recommended that Yale Avenue access at Blackstone Avenue also be limited to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. The implementation of the raise median island at the intersection of Blackstone Avenue and Yale Avenue will prevent FCC traffic destined to the north on Blackstone Avenue from using Yale Avenue.
- Blackstone Avenue / University Avenue
  - Modify University Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Peralta Way, and continue northbound on Blackstone Avenue toward University Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue southbound on Blackstone Avenue toward University Avenue.

While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns. To achieve this, it is recommended that the following improvements be implemented.

- Blackstone Avenue / Weldon Avenue
  - Add a southbound U-turn-turn lane;
  - Remove the R3-4 (U-turn prohibition) sign that serves the northbound left-turn pocket; and
  - Modify the traffic signal to accommodate the added lane.

Table VIII: Near Term plus Project Intersection LOS Results

ID	*Intersection*	*Intersection Control*	*AM (7-9) Peak Hour*		*PM (4-6) Peak Hour*	
			Average Delay (sec/veh)	*LOS*	*Average Delay (sec/veh)*	*LOS*
1	San Pablo Avenue / Clinton Avenue	One-Way Stop	38.6	E	25.7	D
2	Glenn Avenue / Clinton Avenue	One-Way Stop	34.2	D	30.8	D
3	Blackstone Avenue / Cambridge Avenue	Two-Way Stop	**>120.0**	**F**	**>120.0**	**F**
		Two-Way Stop (Mitigated)	21.5	C	19.9	C
4	Blackstone Avenue / Weldon Avenue	Signalized	16.0	B	13.0	B
		Signalized (Mitigated)	20.3	C	16.5	B
5	Blackstone Avenue / University Avenue	Two-Way Stop	**>120.0**	**F**	**>120.0**	**F**
		Two-Way Stop (Mitigated)	17.9	C	22.1	C
6	Blackstone Avenue / McKinley Avenue	Signalized	40.5	D	37.9	D

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

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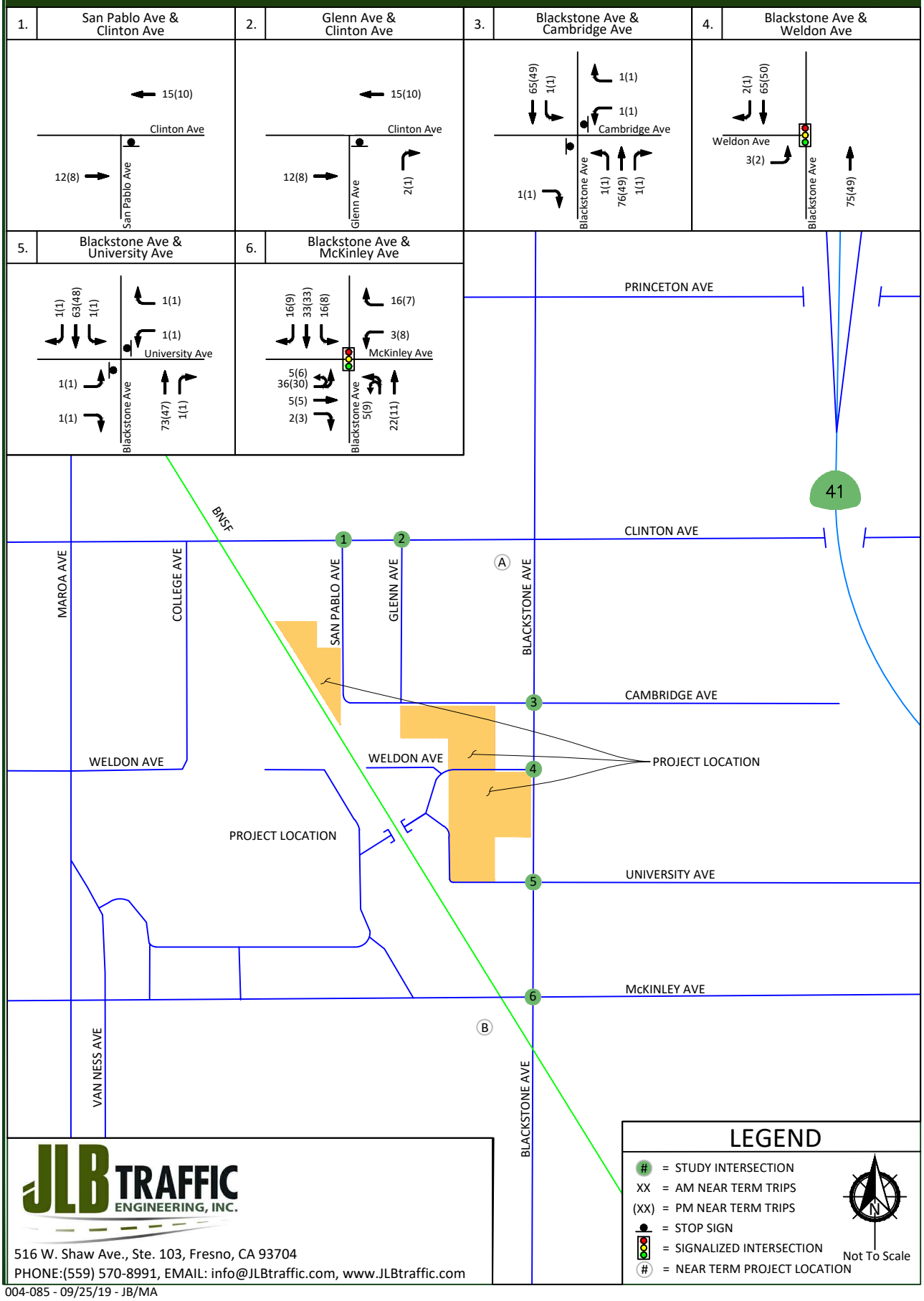
Near Term Projects' Trip Assignment

Figure 8



JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

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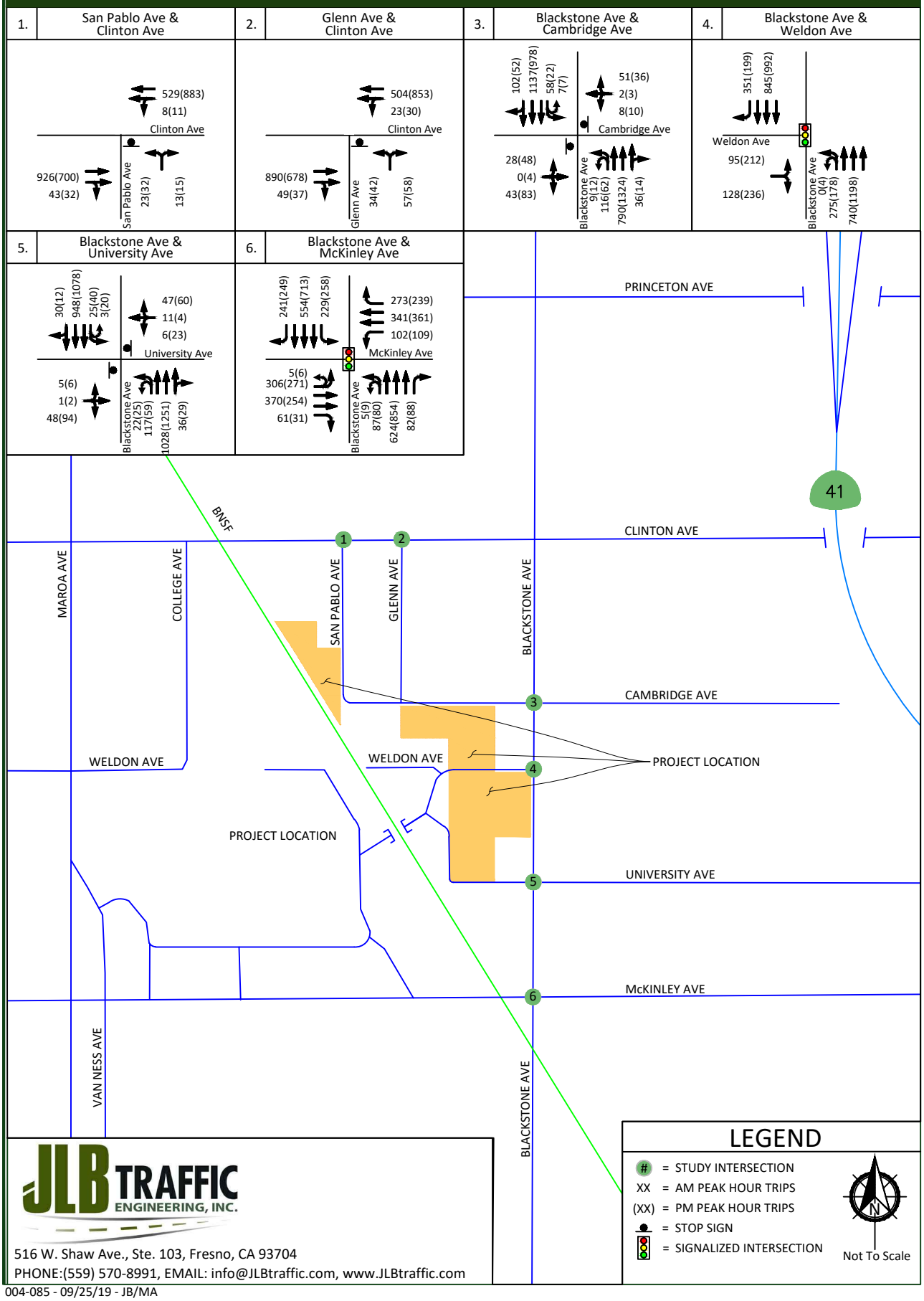
Figure 9

Near Term plus Project - Traffic Volumes, Geometrics and Controls



JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

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Cumulative Year 2035 No Project Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2035 No Project Traffic Conditions scenario. These warrants are found in Appendix K. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, none of the unsignalized study intersections are projected to satisfy the peak hour signal warrant during either peak period.

Results of Cumulative Year 2035 No Project Level of Service Analysis

The Cumulative Year 2035 No Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario with one exception. The exception is that the southbound left-turn pocket at Blackstone Avenue and Peralta Way will be blocked as part of the City of Fresno Grade Separation of both McKinley Avenue and Blackstone Avenue from the BNSF Railway Tracks. Figure 10 illustrates the Cumulative Year 2035 No Project turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Cumulative Year 2035 plus Project Traffic Conditions scenario are provided in Appendix I. Table IX presents a summary of the Cumulative Year 2035 No Project peak hour LOS at the study intersections.

Under this scenario, the intersections of Blackstone Avenue and Cambridge Avenue and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.

- Blackstone Avenue / Cambridge Avenue
  - Modify Cambridge Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue northbound on Blackstone Avenue toward Cambridge Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Yale Avenue, and continue southbound on Blackstone Avenue toward Cambridge Avenue.
  - Furthermore, it is recommended that Yale Avenue access at Blackstone Avenue also be limited to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. The implementation of the raise median island at the intersection of Blackstone Avenue and Yale Avenue will prevent FCC traffic destined to the north on Blackstone Avenue from using Yale Avenue.

- Blackstone Avenue / University Avenue
  - Modify University Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and McKinley Avenue, and continue northbound on Blackstone Avenue toward University Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue southbound on Blackstone Avenue toward University Avenue.

While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns. To achieve this, it is recommended that the following improvements be implemented.

- Blackstone Avenue / Weldon Avenue
  - Add a southbound U-turn-turn lane;
  - Remove the R3-4 (U-turn prohibition) sign that serves the northbound left-turn pocket; and
  - Modify the traffic signal to accommodate the added lane.

Table IX: Cumulative Year 2035 No Project Intersection LOS Results

ID	*Intersection*	*Intersection Control*	*AM (7-9) Peak Hour*		*PM (4-6) Peak Hour*	
			Average Delay (sec/veh)	*LOS*	*Average Delay (sec/veh)*	*LOS*
1	San Pablo Avenue / Clinton Avenue	One-Way Stop	29.8	D	29.5	D
2	Glenn Avenue / Clinton Avenue	One-Way Stop	31.9	D	39.4	E
3	Blackstone Avenue / Cambridge Avenue	Two-Way Stop	**64.0**	**F**	**>120.0**	**F**
		Two-Way Stop (Improved)	17.4	C	21.5	C
4	Blackstone Avenue / Weldon Avenue	Signalized	8.8	A	10.0	A
		Signalized (Improved)	9.9	A	13.3	B
5	Blackstone Avenue / University Avenue	Two-Way Stop	**>120.0**	**F**	**>120.0**	**F**
		Two-Way Stop (Improved)	17.0	C	19.5	C
6	Blackstone Avenue / McKinley Avenue	Signalized	36.8	D	38.2	D

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls.
LOS for two-way STOP controlled intersections are based on the worst approach/movement of the minor street.

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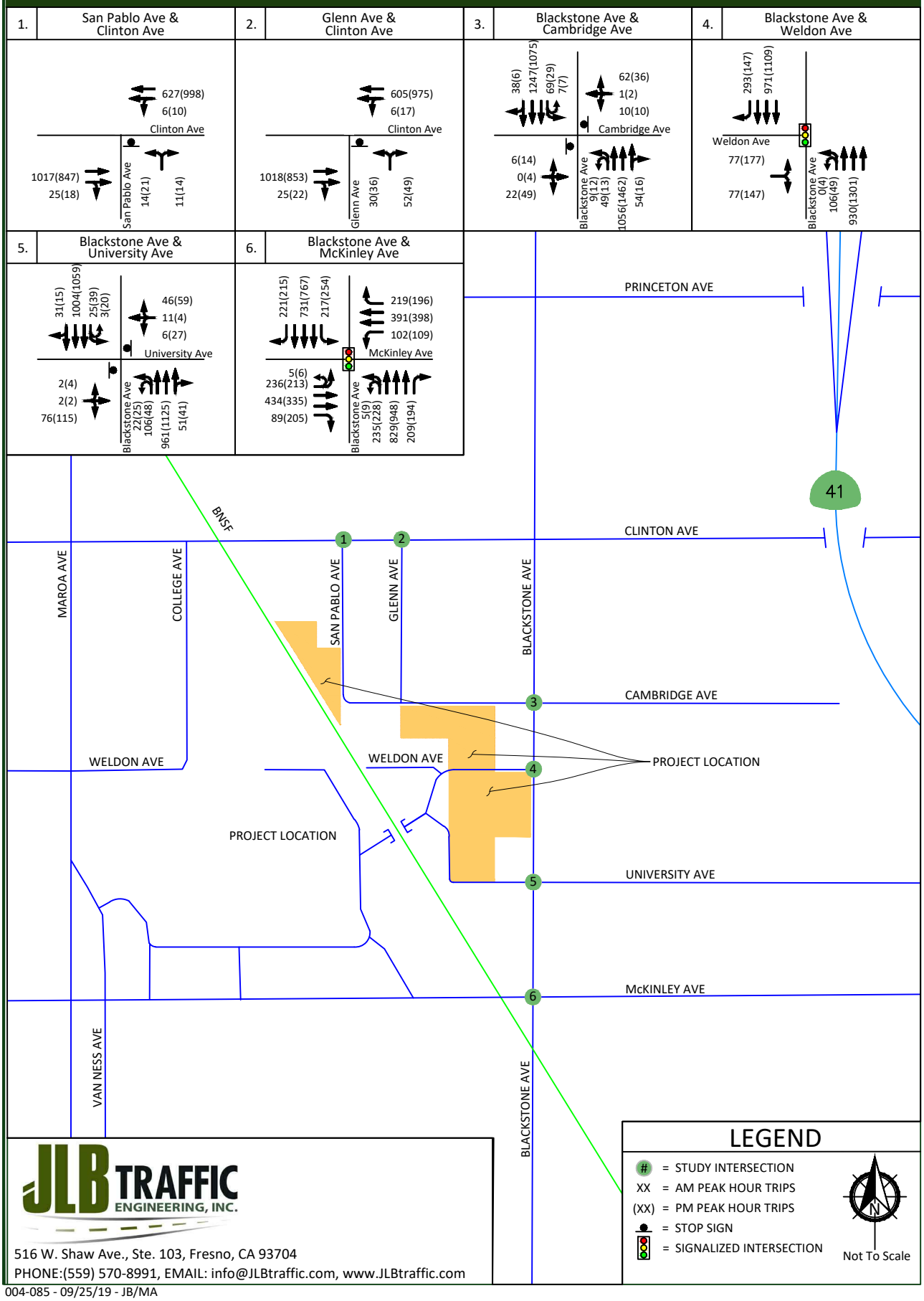
Figure 10

Cumulative Year 2035 No Project - Traffic Volumes, Geometrics and Controls



JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

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Cumulative Year 2035 plus Project Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2035 plus Project Traffic Conditions scenario. These warrants are found in Appendix K. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, none of the unsignalized study intersections are projected to satisfy the peak hour signal warrant during either peak period.

Results of Cumulative Year 2035 plus Project Level of Service Analysis

The Cumulative Year 2035 plus Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario with one exception. The exception is that the southbound left-turn pocket at Blackstone Avenue and Peralta Way will be blocked as part of the City of Fresno Grade Separation of both McKinley Avenue and Blackstone Avenue from the BNSF Railway Tracks. Figure 11 illustrates the Cumulative Year 2035 plus Project turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Cumulative Year 2035 plus Project Traffic Conditions scenario are provided in Appendix J. Table X presents a summary of the Cumulative Year 2035 plus Project peak hour LOS at the study intersections.

Under this scenario, the intersections of Glenn Avenue and Clinton Avenue, Blackstone Avenue and Cambridge Avenue, and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during one or both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.

- Glenn Avenue / Clinton Avenue
  - Modify the northbound left-right lane to a left-turn lane;
  - Add a northbound right-turn lane; and
  - Eliminate curbside parking along Glenn Avenue within the limits of the proposed right-turn lane and transitions thereof. The Queuing Analysis presents the storage capacity recommendation for this movement.
- Blackstone Avenue / Cambridge Avenue
  - Modify Cambridge Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue northbound on Blackstone Avenue toward Cambridge Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Yale Avenue, and continue southbound on Blackstone Avenue toward Cambridge Avenue.

  - Furthermore, it is recommended that Yale Avenue access at Blackstone Avenue also be limited to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. The implementation of the raise median island at the intersection of Blackstone Avenue and Yale Avenue will prevent FCC traffic destined to the north on Blackstone Avenue from using Yale Avenue.
- Blackstone Avenue / University Avenue
  - Modify University Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and McKinley Avenue, and continue northbound on Blackstone Avenue toward University Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue southbound on Blackstone Avenue toward University Avenue.

While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns. To achieve this, it is recommended that the following improvements be implemented.

- Blackstone Avenue / Weldon Avenue
  - Add a southbound U-turn-turn lane;
  - Remove the R3-4 (U-turn prohibition) sign that serves the northbound left-turn pocket; and
  - Modify the traffic signal to accommodate the added lane.

Table X: Cumulative Year 2035 plus Project Intersection LOS Results

ID	*Intersection*	*Intersection Control*	*AM (7-9) Peak Hour*		*PM (4-6) Peak Hour*	
			Average Delay (sec/veh)	*LOS*	*Average Delay (sec/veh)*	*LOS*
1	San Pablo Avenue / Clinton Avenue	One-Way Stop	38.5	E	37.4	E
2	Glenn Avenue / Clinton Avenue	One-Way Stop	40.7	E	**53.8**	**F**
		One-Way Stop (Mitigated)	31.3	D	40.1	E
3	Blackstone Avenue / Cambridge Avenue	Two-Way Stop	**>120.0**	**F**	**>120.0**	**F**
		Two-Way Stop (Mitigated)	21.8	C	22.8	C
4	Blackstone Avenue / Weldon Avenue	Signalized	12.6	B	13.6	B
		Signalized (Mitigated)	17.5	B	16.9	B
5	Blackstone Avenue / University Avenue	Two-Way Stop	**>120.0**	**F**	**>120.0**	**F**
		Two-Way Stop (Mitigated)	18.5	C	22.6	C
6	Blackstone Avenue / McKinley Avenue	Signalized	43.9	D	43.9	D

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls.
LOS for two-way STOP controlled intersections are based on the worst approach/movement of the minor street.

Project Only Trips to State Facilities

The Net New Project Only Trips to the interchange of State Route 41 at McKinley Avenue are illustrated in Figure 12, while the Net New Project Only Trips to the interchange of State Route 180 at Blackstone Avenue/Abby Street are illustrated in Figure 13.

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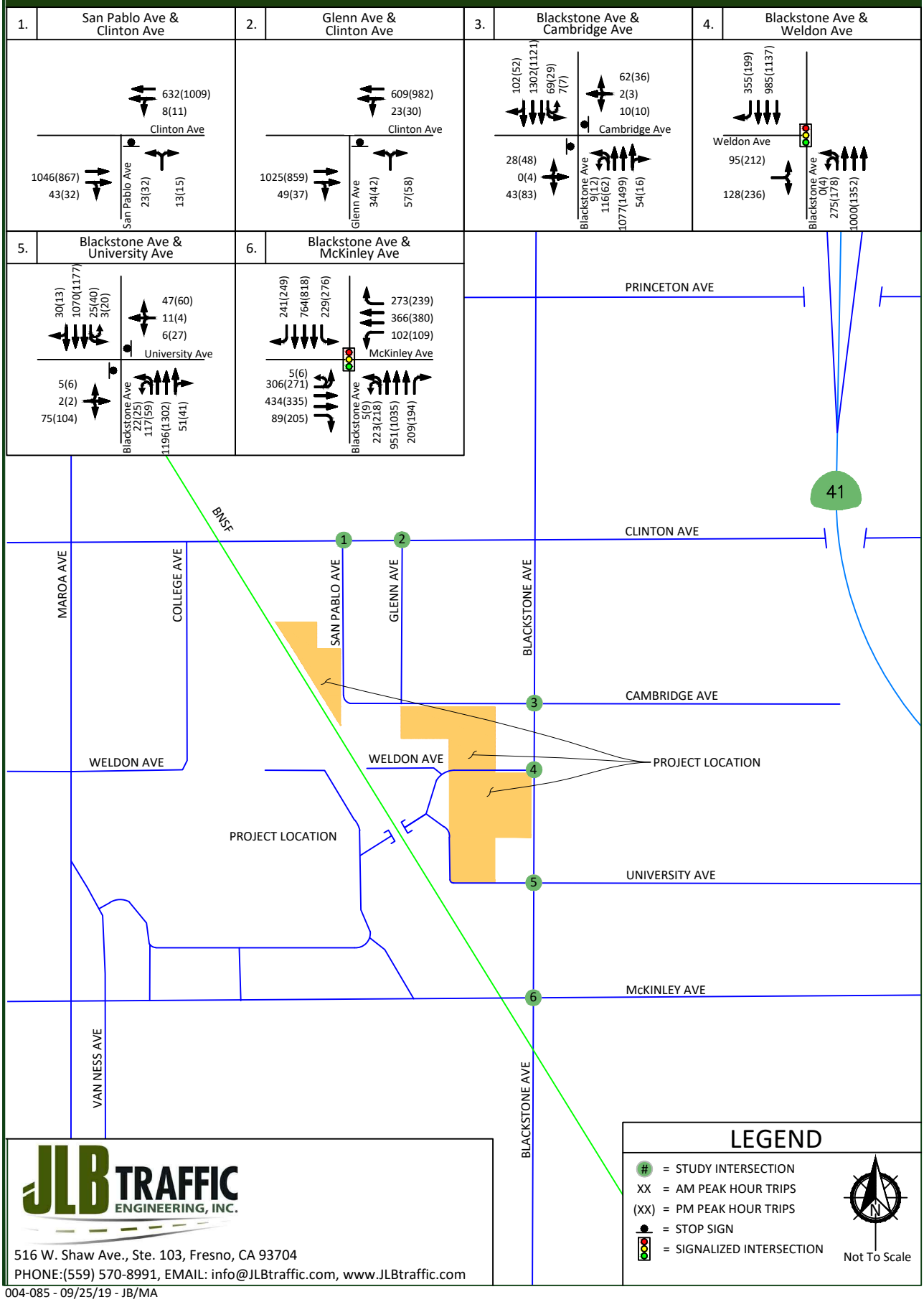
Figure 11

Cumulative Year 2035 plus Project - Traffic Volumes, Geometrics and Controls



JLB TRAFFIC ENGINEERING, INC.
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

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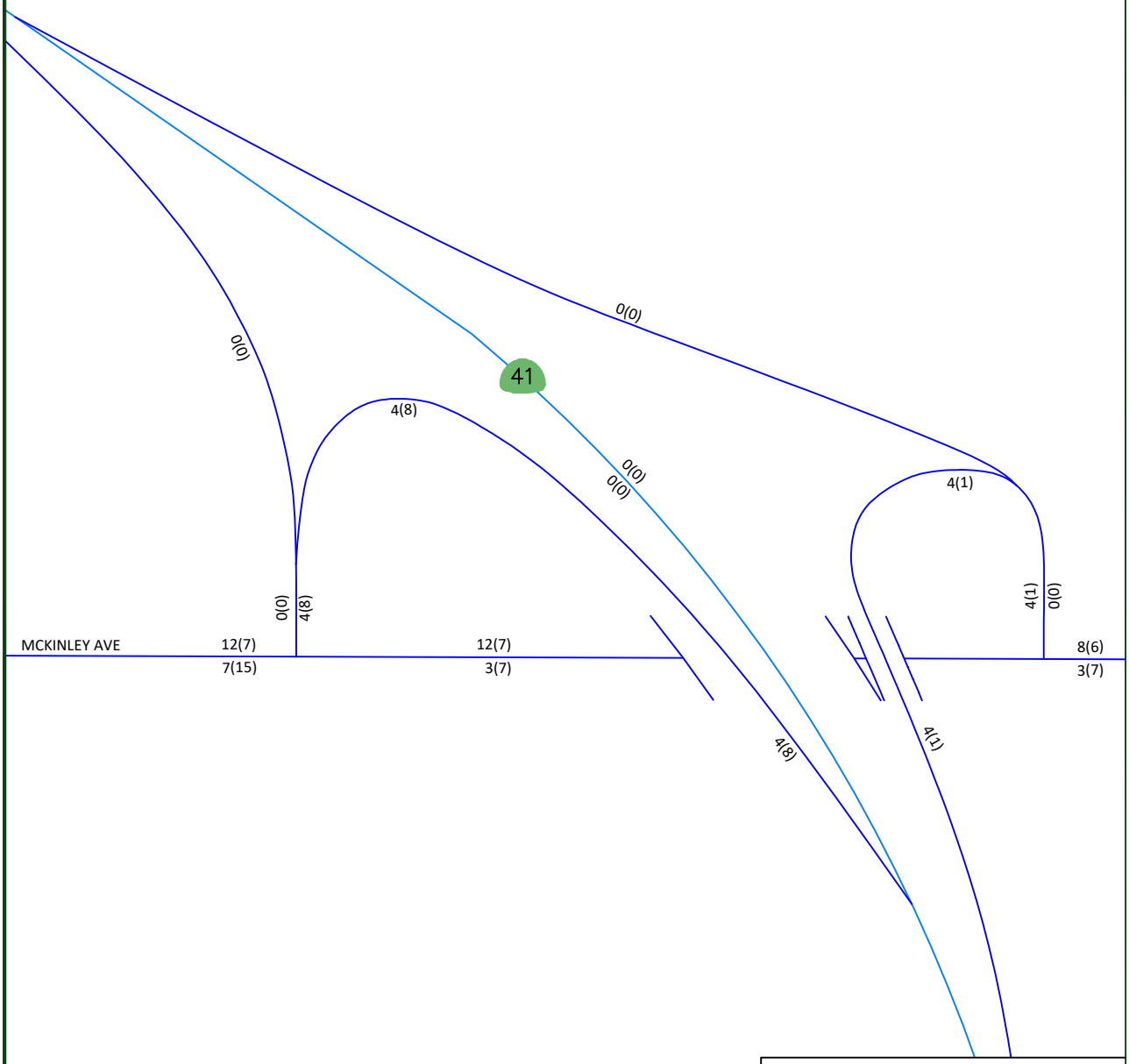
State Route 41 at McKinley Avenue Interchange -
Net New Project Only Trips

Figure 12



LEGEND

XX = AM PROJECT ONLY TRIPS

(XX) = PM PROJECT ONLY TRIPS

N

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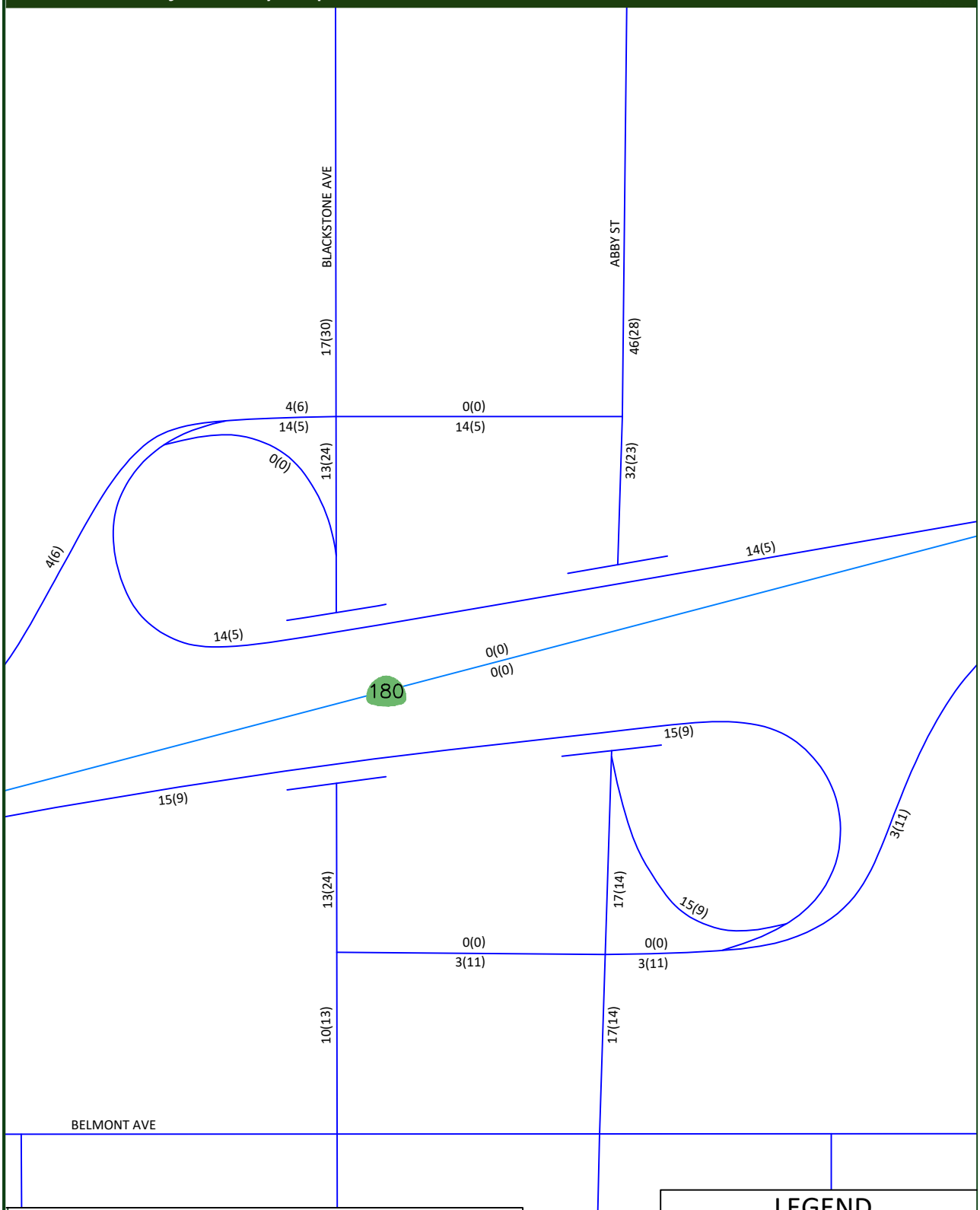
JLB TRAFFIC ENGINEERING, INC.

516 W. Shaw Ave., Ste. 103, Fresno, CA 93704

PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

FCC Parking and Facilities Expansion - City of Fresno
State Route 180 at Blackstone Avenue & Abby Street Interchange - Net New Project Only Trips

Figure 13



LEGEND

XX = AM PROJECT ONLY TRIPS

(XX) = PM PROJECT ONLY TRIPS

N

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JLB TRAFFIC ENGINEERING, INC.

516 W. Shaw Ave., Ste. 103, Fresno, CA 93704

PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

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Queuing Analysis

Table XI provides a queue length summary for left-turn and right-turn lanes at the study intersections under all study scenarios. The queuing analyses for the study intersections are contained in the LOS worksheets for the respective scenarios. Appendix D contains the methodologies used to evaluate these intersections. Queuing analyses were completed using Sim Traffic output information. Synchro provides both 50th and 95th percentile maximum queue lengths (in feet). According to the Synchro manual, "the 50th percentile maximum queue is the maximum back of queue on a typical cycle and the 95th percentile queue is the maximum back of queue with 95th percentile volumes." The queues shown on Table XI are the 95th percentile queue lengths for the respective lane movements.

The *Highway Design Manual* (HDM) provides guidance for determining deceleration lengths for the left-turn and right-turn lanes based on design speeds. Per the HDM criteria, "tapers for right-turn lanes are usually un-necessary since the main line traffic need not be shifted laterally to provide space for the right-turn lane. If, in some rare instances, a lateral shift were needed, the approach taper would use the same formula as for a left-turn lane." Therefore, a bay taper length pursuant to the Caltrans HDM would need to be added, as necessary, to the recommended storage lengths presented in Table XI.

Based on the SimTraffic output files and engineering judgement, it is recommended that the storage capacity for the following be considered for the Cumulative Year 2035 plus Project Traffic Conditions. While the City of Fresno does not have minimum storage length requirements for left-turn and right-turn lanes on major streets, it does prefer that these be set at 200 feet for left-turns and 75 feet for right-turns. At the remaining approaches of the study intersections, the greater of the existing storage capacity or the 200-foot left-turn lanes and 75-foot right-turn lanes will be sufficient to accommodate the maximum queue.

- Glenn Avenue / Clinton Avenue
  - Consider setting the storage capacity of the northbound right-turn lane to 100 feet. Doing so requires that curbside parking be prohibited along Glenn Avenue within the limits of the proposed right-turn lane and transitions thereof.
- Blackstone Avenue / Cambridge Avenue
  - The existing storage capacity of the northbound left-turn lane is projected to exceed that available during the AM peak period in the Cumulative Year 2035 plus Project Traffic Conditions scenario. However, increasing the storage capacity of this movement is not possible without impacting the recommended storage capacity of the southbound left-turn lane at Blackstone Avenue and Weldon Avenue. Therefore, this cumulative impact is considered adverse but not significant.
- Blackstone Avenue / Weldon Avenue
  - Consider increasing the storage capacity of the eastbound left-turn lane to 175 feet.
  - The storage capacity of the southbound left-turn lane is projected to be 151 feet during the PM peak period in the Cumulative Year 2035 plus Project Traffic Conditions scenario. However, a storage capacity of 150 feet for the southbound left-turn lane would require a reduction in storage capacity of the northbound left-turn lane at Blackstone Avenue and Cambridge Avenue. Therefore, it is recommended that the storage capacity of this movement be set at 100 feet.
  - Consider increasing the storage capacity of the southbound right-turn lane to 175 feet.

- Blackstone Avenue / University Avenue
  - The existing storage capacity of the northbound left-turn lane is projected to exceed that available during the AM peak period in the Cumulative Year 2035 plus Project Traffic Conditions scenario. However, increasing the storage capacity of this movement is not possible without impacting the storage capacity of the southbound left-turn lane at Blackstone Avenue and Peralta Way. Therefore, this cumulative impact is considered adverse but not significant. However, as part of the City of Fresno Grade Separation of the BNSF Railway improvements, it is recommended that the storage capacity of the northbound left-turn lane be increased to 100 feet.
- Blackstone Avenue / McKinley Avenue
  - The existing storage capacity of the eastbound left-turn lane is projected to exceed that available during both peak periods in the Cumulative Year 2035 plus Project Traffic Conditions scenario. However, increasing the storage capacity of this movement is not possible without impacting the westbound left-turn lane at the intersection of Calaveras Street and McKinley Avenue. Therefore, this cumulative impact is considered adverse but not significant.
  - Consider increasing the storage capacity of the westbound right-turn lane to 175 feet.
  - Consider increasing the storage capacity of the northbound left-turn lane to 275 feet.
  - Consider increasing the storage capacity of the southbound left-turn lane to 350 feet.
  - Consider increasing the storage capacity of the southbound right-turn lane to 225 feet.

Table XI: Queuing Analysis

ID	Intersection	Existing Queue Storage Length (ft.)		Existing		Existing plus Project		Near Term plus Project		Cumulative Year 2035 No Project		Cumulative Year 2035 plus Project	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	San Pablo Avenue / Clinton Avenue	EB Thru	>500	0	0	0	0	0	0	0	0	0	18
		EB Thru-Right	>500	0	0	0	0	0	0	0	0	0	0
		WB Left-Thru	>300	29	16	13	0	24	39	27	45	39	44
		WB Thru	>300	0	0	0	0	0	0	0	0	0	0
		NB Left-Right	>500	36	52	49	45	57	49	51	46	47	58
2	Glenn Avenue / Clinton Avenue	EB Thru	>300	15	0	17	0	23	0	18	15	10	0
		EB Thru-Right	>300	19	0	19	0	20	0	25	14	8	0
		WB Left-Thru	>500	59	63	56	24	72	57	46	75	116	64
		WB Thru	>500	0	0	10	0	0	0	10	0	81	10
		NB Left-Right	>500	60	54	75	71	74	84	73	91	*	*
		NB Left	>500	*	*	*	*	*	*	*	*	60	124
		NB Right	*	*	*	*	*	*	*	*	*	44	87
3	Blackstone Avenue / Cambridge Avenue	EB Left-Thru-Right	>300	50	88	*	*	*	*	*	*	*	*
		EB Right	>300	*	*	54	187	70	112	59	56	68	109
		WB Left-Thru-Right	>300	69	54	*	*	*	*	*	*	*	*
		WB Right	>300	*	*	52	58	50	52	59	56	59	58
		NB Left	75	67	39	103	132	154	77	62	42	180	73
		NB Thru	>300	0	0	0	124	116	0	33	0	238	0
		NB Thru	>300	0	0	0	0	9	0	0	0	208	0
		NB Thru-Right	>300	0	0	10	0	9	0	0	10	0	8
		SB Left	75	43	51	47	36	48	38	55	51	76	34
		SB Thru	>500	10	31	0	0	28	0	0	17	27	17
		SB Thru	>500	0	0	0	0	0	0	0	0	0	0
		SB Thru-Right	>500	7	0	30	0	29	10	16	0	34	10
4	Blackstone Avenue / Weldon Avenue	EB Left	105	74	126	102	150	109	150	64	155	101	158
		EB Right	>300	55	104	90	87	59	122	54	192	103	139
		NB Left	395	157	92	254	133	306	177	128	88	250	199
		NB Thru	>500	99	155	128	287	117	190	154	217	197	228
		NB Thru	>500	111	161	135	266	140	213	197	248	239	263
		NB Thru	>500	129	198	158	235	156	239	231	260	239	261
		SB U-turn	*	*	*	140	66	131	68	25	37	112	151
		SB Thru	>300	212	219	255	239	258	228	215	232	267	273
		SB Thru	>300	163	195	235	167	225	215	175	206	223	255
		SB Thru	>300	145	115	163	128	223	157	140	149	214	199
		SB Right	100	99	67	144	94	202	108	90	60	172	104

Note: * = Does not exist or is not projected to exist

Table XI: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Existing		Existing plus Project		Near Term plus Project		Cumulative Year 2035 No Project		Cumulative Year 2035 plus Project	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
5	Blackstone Avenue / University Avenue	EB Left-Thru-Right	>300	62	69	*	*	*	*	*	*	*	*
		EB Right	>300	*	*	49	31	45	79	68	72	62	67
		WB Left-Thru-Right	>500	54	64	*	*	*	*	*	*	*	*
		WB Right	>300	*	*	76	69	54	61	66	90	55	68
		NB Left	85	82	55	84	55	96	69	98	58	99	68
		NB Thru	>500	0	0	0	0	54	29	10	0	10	17
		NB Thru	>500	0	0	0	0	0	0	0	0	0	10
		NB Thru-Right	>500	0	0	9	0	0	0	17	16	17	0
		SB Left	75	37	52	34	30	45	57	24	58	43	59
		SB Thru	>500	30	0	18	0	0	0	0	9	38	39
		SB Thru	>500	25	0	0	0	0	0	0	10	25	9
		SB Thru-Right	>500	17	10	0	0	7	10	0	32	44	19
6	Blackstone Avenue / McKinley Avenue	EB Left	245	184	215	259	180	345	357	253	245	380	409
		EB Thru	>500	133	90	152	65	245	405	145	173	930	607
		EB Thru	>500	129	79	127	52	203	292	165	139	874	499
		EB Right	150	28	17	43	20	34	23	49	129	62	97
		WB Left	255	113	114	120	72	139	128	141	150	115	160
		WB Thru	>500	178	169	153	137	188	178	190	174	186	169
		WB Thru	>500	150	132	147	87	199	169	169	156	192	163
		WB Right	100	98	105	130	65	159	131	102	98	171	123
		NB Left	185	107	139	158	81	169	165	250	256	251	261
		NB Thru	>500	165	188	251	209	315	234	336	365	611	513
		NB Thru	>500	150	190	158	237	237	218	269	294	517	454
		NB Thru	>500	105	148	109	164	158	202	199	218	383	247
		NB Right	160	41	45	48	27	38	55	93	73	149	111
		SB Left	205	189	266	269	191	256	310	275	250	307	328
		SB Thru	>500	127	120	186	133	213	261	236	225	276	571
		SB Thru	>500	151	148	141	135	163	182	216	225	246	316
		SB Thru	>500	139	153	135	107	141	168	193	189	264	218
		SB Right	105	102	92	105	85	116	130	103	121	215	192

Note: * = Does not exist or is not projected to exist

Project's Pro-Rata Fair Share of Future Transportation Improvements

The Project's fair share percentage impacts to study intersections projected to fall below their LOS threshold and which are not covered by an existing impact fee program is provided in Table XII. The Project's fair share percentage impacts were calculated pursuant to the Caltrans Guide for the Preparation of Traffic Impact Studies. The Project's pro-rata fair shares were calculated utilizing the Existing volumes, Project Only Trips, and Cumulative Year 2035 plus Project volumes. Figure 2 illustrates the Existing traffic volumes, Figure 6 illustrates the Net New Project Only Trips, and Figure 11 illustrates the Cumulative Year 2035 plus Project traffic volumes. Since the critical peak period for the study facilities was determined to be during the PM peak, the PM peak volumes are utilized to determine the Project's pro-rata fair share.

It is recommended that the Project contribute its equitable fair share as listed in Table XII for the future improvements necessary to maintain an acceptable LOS. However, fair share contributions should only be made for those facilities, or portion thereof, currently not funded by the responsible agencies roadway impact fee program(s) or grant funded projects, as appropriate. For those improvements not presently covered by local and regional roadway impact fee programs or grant funding, it is recommended that the Project contribute its equitable fair share. Payment of the Project's equitable fair share in addition to the local and regional impact fee programs would satisfy the Project's traffic mitigation measures.

This study does not provide construction costs for the recommended mitigation measures; therefore, if the recommended mitigation measures are implemented, it is recommended that the District work with the City of Fresno to develop the estimated construction cost.

Table XII: Project's Fair Share of Future Roadway Improvements

ID	*Intersection*	*Existing Traffic Volumes (PM Peak)*	*Cumulative Year 2035 plus Project Traffic Volumes (PM Peak)*	*Net New Project Only Trips (PM Peak)*	*Project's Fair Share (%)*
2	Glenn Avenue / Clinton Avenue	1,623	2,008	56	14.55
3	Blackstone Avenue / Cambridge Avenue	2,304	2,982	180	26.55
4	Blackstone Avenue / Weldon Avenue	2,533	3,318	434	55.29
5	Blackstone Avenue / University Avenue	2,304	2,880	297	51.56

Note: Project Fair Share = ((Net New Project Only Trips) / (Cumulative Year 2035 + Project Traffic Volumes - Existing Traffic Volumes)) x 100

Conclusions and Recommendations

Conclusions and recommendations regarding the proposed Project are presented below.

Existing Traffic Conditions

- At present, the intersection of Blackstone Avenue and University Avenue exceeds its LOS threshold during both peak periods. To improve the LOS at this intersection, it is recommended that the following improvements be implemented.
  - Blackstone Avenue / University Avenue
    - Modify University Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Peralta Way, and continue northbound on Blackstone Avenue toward University Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue southbound on Blackstone Avenue toward University Avenue.

Existing plus Project Traffic Conditions

- At present, the Project is estimated to generate a maximum of 2,045 daily trips, 262 AM peak hour trips and 237 PM peak hour trips. However, the trip generation of the Project will differ as a result of the relocation, expansion and modification of the Project's land uses. At buildout, the proposed Future Project is estimated to generate a maximum of 2,230 daily trips, 287 AM peak hour trips and 268 PM peak hour trips. Compared to the Existing Project Trip Generation, the Future Project Trip Generation is estimated to be slightly higher by 185 daily trips, 25 AM peak hour trips, and 31 PM peak hour trips.
- It is recommended that the Project implement Class I Bike Routes along a) Glenn Avenue within the Project site, b) along the Project's frontage to Cambridge Avenue (between San Pablo Avenue and Blackstone Avenue) and c) Weldon Avenue within the Project site.
- It is recommended that the Project retain the existing walkways that are in a good state and ADA compliant along its frontages to San Pablo Avenue, Blackstone Avenue, Cambridge Avenue, and Weldon Avenue. The Project shall reconstruct walkways where needed to conform to current ADA guidelines.
- Where possible, consideration should be given to the planting of trees to provide shade and help reduce heat during the summer months. Additionally, it is recommended that the District work with FAX to improve headways of the existing transit routes serving the FCC campus.
- As the Project will be used to serve an existing student and employee population, it is likely that the Project would not add VMT per capita. Additionally, the Project site is located near transit services and pedestrian and bicycle networks.

- The portion of the Project that is the parking structure is anticipated to add a total of 1,000 parking spaces, while replacing 189 parking stalls. Therefore, the net change is 811 parking stalls (1,000 new parking stalls - 189 existing parking stalls = 811 net new parking stalls). Given that the current number of general public and metered on-site parking stalls is 2,388 and the Project will add 811 general public parking stalls, the new total of general public and metered on-site parking stalls will be 3,199 parking stalls. Since the parking supply is projected to be up to 3,199 general public and metered on-site parking stalls, it is anticipated that the FCC campus will have sufficient parking supply to accommodate the projected parking demand in the year 2028.
- Under this scenario, the intersections of Blackstone Avenue and Cambridge Avenue and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.
  - Blackstone Avenue / Cambridge Avenue
    - Modify Cambridge Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue northbound on Blackstone Avenue toward Cambridge Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Yale Avenue, and continue southbound on Blackstone Avenue toward Cambridge Avenue.
    - Furthermore, it is recommended that Yale Avenue access at Blackstone Avenue also be limited to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. The implementation of the raise median island at the intersection of Blackstone Avenue and Yale Avenue will prevent FCC traffic destined to the north on Blackstone Avenue from using Yale Avenue.
  - Blackstone Avenue / University Avenue
    - Modify University Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Peralta Way, and continue northbound on Blackstone Avenue toward University Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue southbound on Blackstone Avenue toward University Avenue.

- While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns. To achieve this, it is recommended that the following improvements be implemented.
  - Blackstone Avenue / Weldon Avenue
    - Add a southbound U-turn-turn lane;
    - Remove the R3-4 (U-turn prohibition) sign that serves the northbound left-turn pocket; and
    - Modify the traffic signal to accommodate the added lane.

Existing plus Project Traffic Conditions - No Access to Cambridge Avenue

- Under this scenario, the intersections of Blackstone Avenue and Cambridge Avenue and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.
  - Blackstone Avenue / Cambridge Avenue
    - Modify Cambridge Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue northbound on Blackstone Avenue toward Cambridge Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Yale Avenue, and continue southbound on Blackstone Avenue toward Cambridge Avenue.
    - Furthermore, it is recommended that Yale Avenue access at Blackstone Avenue also be limited to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. The implementation of the raise median island at the intersection of Blackstone Avenue and Yale Avenue will prevent FCC traffic destined to the north on Blackstone Avenue from using Yale Avenue.
  - Blackstone Avenue / University Avenue
    - Modify University Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Peralta Way, and continue northbound on Blackstone Avenue toward University Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue southbound on Blackstone Avenue toward University Avenue.

- While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns. To achieve this, it is recommended that the following improvements be implemented.
  - Blackstone Avenue / Weldon Avenue
    - Add a southbound U-turn-turn lane;
    - Remove the R3-4 (U-turn prohibition) sign that serves the northbound left-turn pocket; and
    - Modify the traffic signal to accommodate the added lane.
- When compared to the Existing plus Project Traffic Condition scenario, the prevention of the Parking Structure's access to Cambridge Avenue will encourage most southbound traffic on Blackstone Avenue and all northbound traffic on Blackstone Avenue to enter the site via Weldon Avenue, thus reducing traffic on Cambridge Avenue between Glenn Avenue and Blackstone Avenue. As can be seen from Tables V and VI, the prevention of the Parking Structure's access to Cambridge Avenue is projected to slightly improve the LOS at the intersection of Blackstone Avenue and Cambridge Avenue while the LOS at the intersection of Blackstone Avenue and Weldon Avenue is projected to slightly worsen.

Near Term plus Project Traffic Conditions

- The total trip generation for the Near Term Project is 2,132 daily trips, 171 AM peak hour trips and 150 PM peak hour trips.
- Under this scenario, the intersections of Blackstone Avenue and Cambridge Avenue and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.
  - Blackstone Avenue / Cambridge Avenue
    - Modify Cambridge Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue northbound on Blackstone Avenue toward Cambridge Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Yale Avenue, and continue southbound on Blackstone Avenue toward Cambridge Avenue.
    - Furthermore, it is recommended that Yale Avenue access at Blackstone Avenue also be limited to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. The implementation of the raise median island at the intersection of Blackstone Avenue and Yale Avenue will prevent FCC traffic destined to the north on Blackstone Avenue from using Yale Avenue.

- Blackstone Avenue / University Avenue
  - Modify University Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Peralta Way, and continue northbound on Blackstone Avenue toward University Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue southbound on Blackstone Avenue toward University Avenue.

- While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns. To achieve this, it is recommended that the following improvements be implemented.
  - Blackstone Avenue / Weldon Avenue
    - Add a southbound U-turn-turn lane;
    - Remove the R3-4 (U-turn prohibition) sign that serves the northbound left-turn pocket; and
    - Modify the traffic signal to accommodate the added lane.

Cumulative Year 2035 No Project Traffic Conditions

- Under this scenario, the intersections of Blackstone Avenue and Cambridge Avenue and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.
  - Blackstone Avenue / Cambridge Avenue
    - Modify Cambridge Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue northbound on Blackstone Avenue toward Cambridge Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Yale Avenue, and continue southbound on Blackstone Avenue toward Cambridge Avenue.
    - Furthermore, it is recommended that Yale Avenue access at Blackstone Avenue also be limited to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. The implementation of the raise median island at the intersection of Blackstone Avenue and Yale Avenue will prevent FCC traffic destined to the north on Blackstone Avenue from using Yale Avenue.

- Blackstone Avenue / University Avenue
  - Modify University Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and McKinley Avenue, and continue northbound on Blackstone Avenue toward University Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue southbound on Blackstone Avenue toward University Avenue.

- While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns. To achieve this, it is recommended that the following improvements be implemented.
  - Blackstone Avenue / Weldon Avenue
    - Add a southbound U-turn-turn lane;
    - Remove the R3-4 (U-turn prohibition) sign that serves the northbound left-turn pocket; and
    - Modify the traffic signal to accommodate the added lane.

Cumulative Year 2035 plus Project Traffic Conditions

- Under this scenario, the intersections of Glenn Avenue and Clinton Avenue, Blackstone Avenue and Cambridge Avenue, and Blackstone Avenue and University Avenue are projected to exceed their LOS threshold during one or both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.
  - Glenn Avenue / Clinton Avenue
    - Modify the northbound left-right lane to a left-turn lane;
    - Add a northbound right-turn lane; and
    - Eliminate curbside parking along Glenn Avenue within the limits of the proposed right-turn lane and transitions thereof. The Queuing Analysis presents the storage capacity recommendation for this movement.
  - Blackstone Avenue / Cambridge Avenue
    - Modify Cambridge Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue northbound on Blackstone Avenue toward Cambridge Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Yale Avenue, and continue southbound on Blackstone Avenue toward Cambridge Avenue.

        - Furthermore, it is recommended that Yale Avenue access at Blackstone Avenue also be limited to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. The implementation of the raise median island at the intersection of Blackstone Avenue and Yale Avenue will prevent FCC traffic destined to the north on Blackstone Avenue from using Yale Avenue.
    - Blackstone Avenue / University Avenue
        - Modify University Avenue access at Blackstone Avenue to right-in, right-out and left-in access only. To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, eastbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto southbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and McKinley Avenue, and continue northbound on Blackstone Avenue toward University Avenue. Furthermore, with the introduction of the raised median island, westbound left-turns and through movements will need to be redirected. These movements will need to make a right-turn onto northbound Blackstone Avenue, proceed to make a U-turn at Blackstone Avenue and Weldon Avenue, and continue southbound on Blackstone Avenue toward University Avenue.
- While the intersection of Blackstone Avenue and Weldon Avenue is projected to operate at an acceptable LOS during both peak periods, it is recommended that this intersection be improved to allow for northbound and southbound U-turns. To achieve this, it is recommended that the following improvements be implemented.
    - Blackstone Avenue / Weldon Avenue
        - Add a southbound U-turn-turn lane;
        - Remove the R3-4 (U-turn prohibition) sign that serves the northbound left-turn pocket; and
        - Modify the traffic signal to accommodate the added lane.

Queuing Analysis

- It is recommended that the City consider left-turn and right-turn lane storage lengths as indicated in the Queuing Analysis.

Project's Equitable Fair Share

- It is recommended that the Project contribute its equitable fair share as listed in Table XII for the existing funding shortfall, if any, to future improvements necessary to maintain an acceptable LOS.

Study Participants

JLB Traffic Engineering, Inc. Personnel:

Jose Luis Benavides, PE, TE	Project Manager
Susana Maciel, EIT	Engineer I/II
Matthew Arndt, EIT	Engineer I/II
Javier Rios	Engineer I/II
Jove Alcazar	Engineer I/II
Dennis Wynn	Sr. Engineering Technician
Adrian Benavides	Engineering Aide
Justin Barnett	Engineering Aide
Jesus Garcia	Engineering Aide

Persons Consulted:

Scott Odell	Odell Planning and Research, Inc.
Jill Gormley, PE	City of Fresno
Harmanjit Dhaliwal, PE	City of Fresno
Brian Spaunhurst	County of Fresno
David Padilla	Caltrans
Kai Han, TE	Fresno COG
Lang Yu	Fresno COG

References

1. City of Fresno, *2035 General Plan*.
2. County of Fresno, *2000 General Plan*.
3. *Guide for the Preparation of Traffic Impact Studies*, Caltrans, dated December 2002.
4. *Trip Generation,* 10th Edition, Washington D.C., Institute of Transportation Engineers, 2017.
5. *2014 California Manual on Uniform Traffic Control Devices*, Caltrans, November 7, 2014.
6. City of Fresno, *Active Transportation Plan*, December 2016, adopted March 2, 2017.
7. *Technical Advisory on Evaluating Transportation Impacts in CEQA*. Governor's Office of Planning and Research, 2017, *Technical Advisory on Evaluating Transportation Impacts in CEQA*.

Appendix A: Scope of Work

April 23, 2019

Mrs. Jill Gormley, P.E.
Traffic Engineer
City of Fresno
2600 Fresno Street
Fresno, CA 93721-3616

Via Email Only: Jill.Gormley@fresno.gov

Subject: ***Proposed Scope of Work for the Preparation of a Traffic Impact Analysis for the Fresno City College Parking and Facilities Expansion Project in the City of Fresno (JLB Project 004-085)***

Dear Mrs. Gormley,

JLB Traffic Engineering, Inc. (JLB) hereby submits this Draft Scope of Work for the preparation of a Traffic Impact Analysis (TIA) for the State Center Community College District (SCCCD) Environmental Impact Report (EIR) for the proposed Parking and Facilities Expansion Project at the Fresno City College (FCC) campus. The Project is located on and adjacent to the northeast portion of the existing FCC campus in the City of Fresno. The Project consists of the following facilities:

a) Construction of a parking structure on the south side of Cambridge Avenue west of Blackstone Avenue located north of the existing district office building. The proposed parking structure would have a capacity for up to 1,000 parking spaces, include up to five levels of parking, and include ingress/egress points at Weldon Avenue and potentially Cambridge Avenue.
b) Construction of a three-story Science Building approximately 95,000 square-foot located near the southwest corner of Blackstone Avenue and Weldon Avenue. The new Science Building is proposed to include six (6) biology labs, three (3) anatomy and physiology labs, five (5) chemistry labs, two (2) physics labs, two (2) engineering labs, a computer lab, three (3) general educational classrooms, four (4) Design Science (Middle College) classrooms, a welcome center, tutorial space, and 34 faculty offices. Surface parking would also be added adjacent to the building. Existing Maintenance and Operations facilities located in this area would be removed and relocated to a different area of the campus (see section d below).
c) Replacement of the existing one-story, 5,255 square-foot Child Development Center with a new one-story, 16,480 square-foot Child Development Center at its current location.
d) Construction of a one-story, 10,000 square-foot Maintenance and Operations building plus a parking and storage area on the west side of San Pablo Avenue northwest of the existing Health Sciences Building.
e) Repurposing of the existing District administration building located on the north side of Weldon Avenue to accommodate the SCCCD Police Department.

Development of the Project facilities would occur over the next five (5) years. Per information provided to JLB, the Project is consistent with the City of Fresno 2035 General Plan. An aerial of the Project vicinity and the Project Site Plan are shown in Exhibits A and B, respectively.

The purpose of the TIA is to evaluate the potential on-site and off-site traffic impacts, identify short-term roadway and circulation needs, determine potential mitigation measures, and identify any critical traffic issues that should be addressed in the on-going planning process. In order to evaluate on-site and off-site traffic impacts of the proposed Project, JLB proposes the following Scope of Work.

Scope of Work

- Request a Fresno Council of Governments (Fresno COG) traffic forecast model run for the Project (Select Zone Analysis) which will include the Project and the streets to be analyzed. The Fresno COG traffic forecasting model will be used to forecast traffic volumes for the Base Year 2019 and Cumulative Year 2035 scenarios.
- As necessary obtain recent (less than 12 months) or schedule and conduct new traffic counts at the study facility(ies). These counts will include pedestrians and vehicles. These counts will be conducted on typical school schedule and non-inclement weather days as soon as possible. These counts will not take place during weeks with holidays, non-school days, roadway construction, etc.
- Perform a site visit to observe existing traffic conditions, especially during the AM and PM peak hours. Existing roadway conditions including geometrics and traffic controls will be verified.
- Evaluate onsite circulation and provide recommendations as necessary to improve circulation to and within the Project site.
- JLB will prepare California Manual on Uniform Traffic Control Devices (CA MUTCD) peak hour signal warrants for unsignalized study intersections under all study scenarios.
- JLB will qualitatively analyze parking demand in the proximity of the proposed new buildings.
- JLB will qualitatively analyze existing and planned transit routes in the Project's vicinity.
- JLB will qualitatively analyze existing and planned bikeways in the Project's vicinity.
- Forecast trip distribution will be made on the basis of turn count information and knowledge of the existing and planned circulation network in the vicinity of the Project.
- JLB will evaluate existing and forecast future levels of service (LOS) at the study intersection(s) and/or segment(s). JLB will use HCM 6th Edition or HCM 2000 methodologies as appropriate within Synchro software to perform this analysis for the AM and PM peak hours. JLB will identify the cause(s) of poor level of service and proposed improvement measures (if any).
- JLB will prepare a table with the Project's pro-rata fair share allocation to improvement measures identified (if any) that are not currently funded by an existing funding source.

Study Scenarios:

1. Existing Traffic Conditions with needed improvements (if any);
2. Existing plus Project Traffic Conditions with proposed mitigation measures (if any);
3. Near Term plus Project Traffic Conditions with proposed mitigation measures (if any);
4. Cumulative Year 2035 No Project Traffic Conditions with proposed improvement measures (if any); and
5. Cumulative Year 2035 plus Project Traffic Conditions with proposed mitigation measures (if any).

Weekday peak hours to be analyzed (Tuesday through Thursday only):

1. 7-9 AM peak hour
2. 4-6 PM peak hour

Study Intersections:

1. San Pablo Avenue / Clinton Avenue
2. Blackstone Avenue / Cambridge Avenue
3. Blackstone Avenue / Weldon Avenue
4. Blackstone Avenue / University Avenue

Queuing analysis is included in the proposed Scope of Work for the study intersection(s) listed above under all study scenarios. This analysis will be utilized to recommend minimum storage lengths for left-turn and right-turn lanes at all study intersections.

Study Segments:

1. None

Project Only Trip Assignment to State Facilities:

1. State Route 41 at McKinley Avenue Interchange
2. State Route 180 at Blackstone Avenue & Abby Street Interchange

Project Trip Generation

Trip generation rates for the proposed Project will be obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE).

Near Term Projects to be Included

JLB will be consulting with City of Fresno Planning & Development and Traffic Engineering staff to determine which Projects should be included in the Near Term plus Project analysis. JLB will include Near Term Projects in the vicinity of the proposed Project under the Near Term plus Project analysis for which the City, County or Caltrans has knowledge of and for which it is anticipated that said project(s) is/are projected to be whole or partially built by the Near Term Project year 2025. City, County of Fresno and Caltrans, as appropriate, would provide JLB with Near Term Project details such as a project description, location, proposed land uses with breakdowns and type of residential units and amount of square footages for non-residential uses.

The Scope of Work is based on our understanding of this Project and our experience with similar TIAs. In the absence of comments by May 14, 2019, it will be assumed that the above Scope of Work is acceptable to the agency(ies) that have not submitted any comments. If you have any questions or require additional information, please contact me by phone at (559) 317-6273 or by email at smaciel@JLBtraffic.com.

Sincerely,

Susana Maciel

Susana Maciel, EIT
Engineer I/II

cc: Harmanjit Dhaliwal, City of Fresno
Brian Spaunhurst, County of Fresno
David Padilla, Caltrans

Exhibit A - Aerial

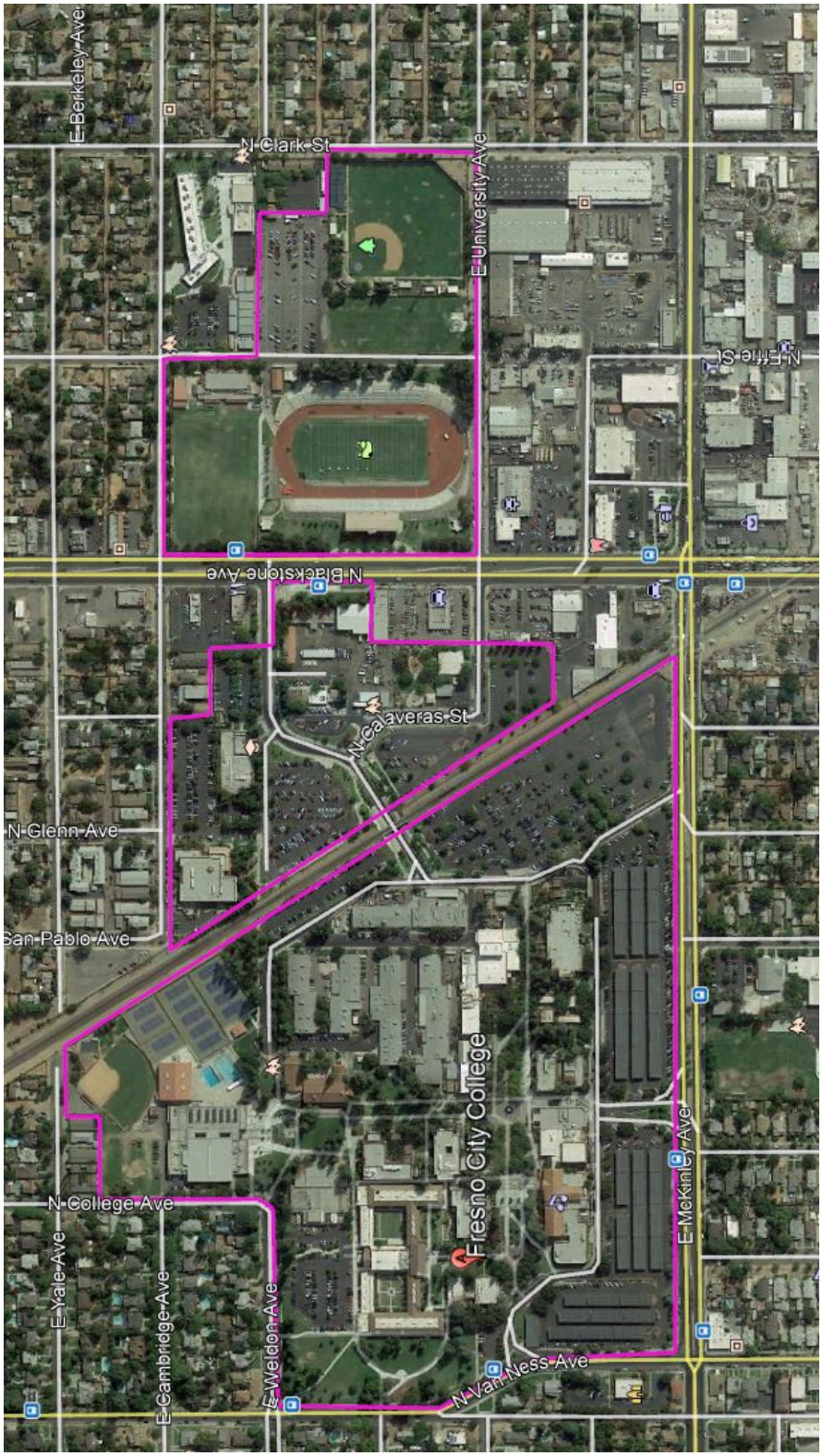

Exhibit B - Project Site Plan

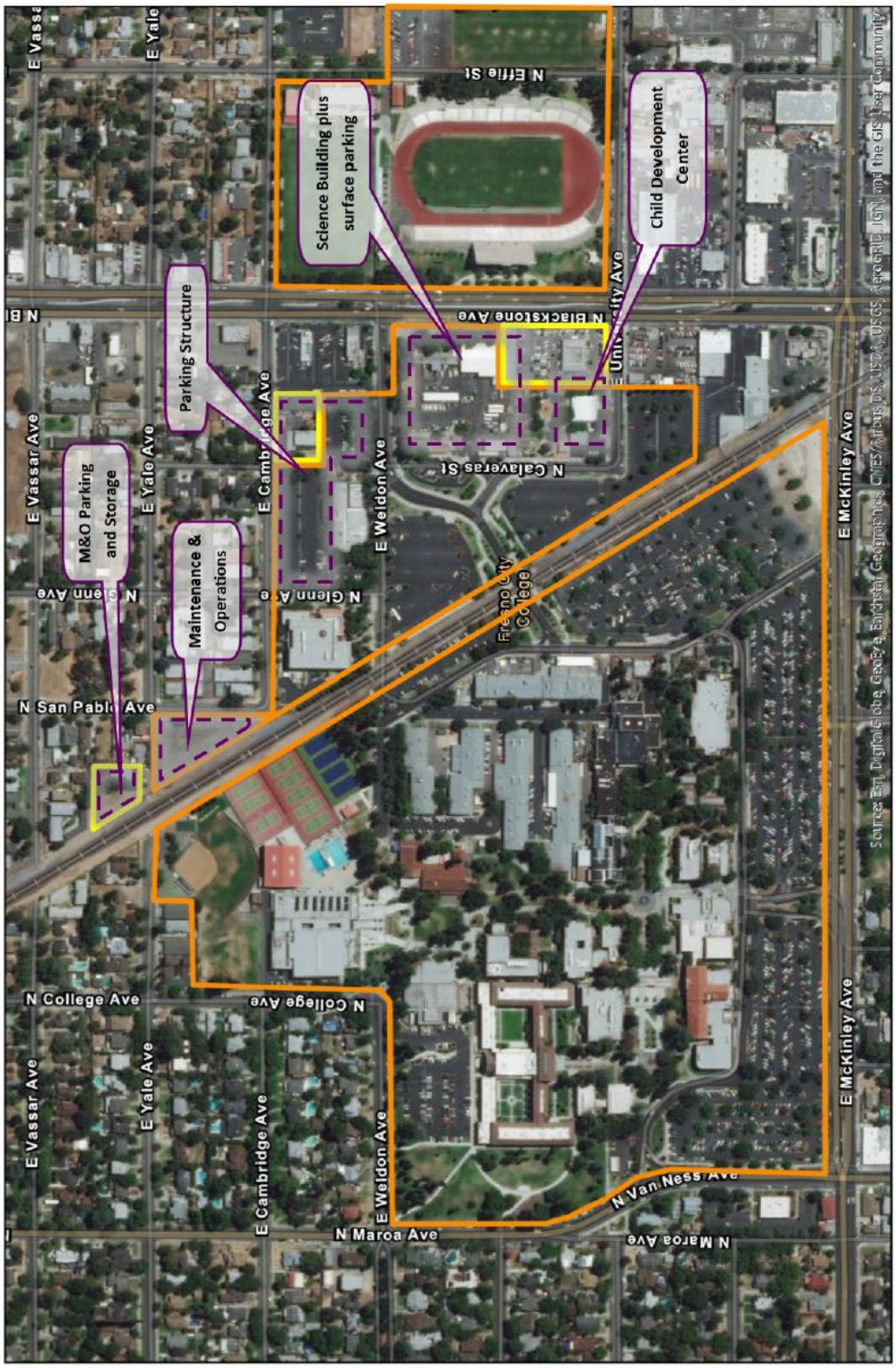

Figure 2

Project Site

Fresno City College Parking and Facilities Expansion Project
State Center Community College District

ODELL Planning & Research, Inc.
Environmental Planning • School Facility Planning • Demographics

Existing Campus
Expansion Areas
Proposed Facilities Locations

Jose Benavides

From: Spaunhurst, Brian <bspaunhurst@fresnocountyca.gov>
Sent: Monday, April 29, 2019 11:27 AM
To: Susana Maciel; Jill Gormley
Cc: Harmanjit Dhaliwal; David Padilla (dave_padilla@dot.ca.gov); Jose Benavides
Subject: RE: FCC Parking & Facilities Expansion TIA: Draft Scope of Work

Good Morning Susana,

The proposed scope is acceptable to the County.

Respectfully,

Brian Spaunhurst | **Planner II**
Department of Public Works and Planning | Design Division
2220 Tulare St. 6th Floor Fresno, CA 93721
Main Office: (559) 600-4532 | Direct: (559) 600-4532
Email: bspaunhurst@FresnoCountyCa.gov
Your input matters! Customer Service Survey

From: Susana Maciel <smaciel@jlbtraffic.com>
Sent: Tuesday, April 23, 2019 8:34 AM
To: Jill Gormley <Jill.Gormley@fresno.gov>
Cc: Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>; Spaunhurst, Brian <bspaunhurst@fresnocountyca.gov>; David Padilla (dave_padilla@dot.ca.gov) <dave_padilla@dot.ca.gov>; Jose Benavides <jbenavides@jlbtraffic.com>
Subject: FCC Parking & Facilities Expansion TIA: Draft Scope of Work

County of Fresno

Internal Services Department (ISD) - IT Services

Service Desk 600-5900 (Help Desk)

CAUTION!!!

This email has been flagged as containing one or more attachments from an outside source.

Please check the senders email address carefully.

If you were not expecting to receive an email with attachments, please **DO NOT** open the file.

IF this email is Junk/Phishing, report it via the "Report Message" button in Outlook.

Good morning, Mrs. Gormley,

Attached you will find a Draft Scope of Work Letter for the preparation of a TIA for the SCCCD EIR for the proposed Parking and Facilities Expansion Project at the Fresno City College campus. I kindly ask that you take some time to review and comment on the proposed Scope of Work.

In the absence of comments by May 14th, it will be assumed that the proposed Scope of Work is acceptable to the agency(ies) that have not submitted any comments. Please feel welcome to contact me if you have any questions or require any additional information.

I sincerely appreciate your time and attention to this matter and look forward to hearing from you soon. Have a great day!

Best,

Susana Maciel, EIT
Engineer I/II

Traffic Engineering, Transportation Planning and Parking Solutions
Certified Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE)

1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
Direct: (559) 317-6273
Office: (559) 570-8991
Cell: (559) 232-9474
www.JLBtraffic.com

Attached you will find a Draft Scope of Work for the preparation of a Traffic Impact Analysis for a Project adjacent to the City of Fresno in Fresno County. I kindly ask that you take a moment to review and comment on the proposed Scope of Work.

In the absence of comments by April 3, 2018, it will be assumed that the proposed Scope of Work is acceptable to the agency(ies) that have not submitted any comments. Please do not hesitate to contact me if you have any questions or require any additional information. I can be reached by phone at 559.570.8991 or by email at smaciel@jlbtraffic.com.

I sincerely appreciate your time and attention to this matter and look forward to hearing from you soon.

From:	Padilla, Dave@DOT
To:	Susana Maciel; Jill Gormley; Harmanjit Dhaliwal
Cc:	Jose Benavides
Subject:	RE: FCC Parking & Facilities Expansion TIA: Draft Scope of Work
Date:	Friday, May 24, 2019 11:35:09 AM
Attachments:	image001.jpg

Hello Susana,

We are satisfied with the SOW as proposed.

Thank you

DAVID PADILLA
Associate Transportation Planner
Caltrans
Office of Planning & Local Assistance
1352 W. Olive Avenue
Fresno, CA 93778-2616
Office: (559) 444-2493, Fax: (559) 445-5875

From: Susana Maciel <smaciel@jlbtraffic.com>
Sent: Friday, May 24, 2019 11:18 AM
To: Jill Gormley <Jill.Gormley@fresno.gov>; Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>; Padilla, Dave@DOT <dave.padilla@dot.ca.gov>
Cc: Jose Benavides <jbenavides@jlbtraffic.com>
Subject: RE: FCC Parking & Facilities Expansion TIA: Draft Scope of Work

Good morning,

I want to verify that neither the City nor Caltrans has any comments of the proposed Scope of Work for this Project and thus approves the Scope of Work as presented. If for any reason this is not the case, I ask that you please respond with your comment(s) at your earliest convenience.

I appreciate your time and attention to this matter.

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Susana Maciel, EIT
Engineer I/II

JLB Logo

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I sincerely appreciate your time and attention to this matter and look forward to hearing from you soon.

Jose Benavides

From: Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>
Sent: Tuesday, May 28, 2019 5:28 PM
To: Susana Maciel; Jill Gormley; David Padilla (dave_padilla@dot.ca.gov)
Cc: Jose Benavides
Subject: RE: FCC Parking & Facilities Expansion TIA: Draft Scope of Work

Good Evening Susana,

The City would like to add the intersection of McKinley and Blackstone to this Scope of Work.

Thanks,

Harmanjit Dhaliwal, PE

Public Works Department
Traffic Operations & Planning Division
2600 Fresno Street, Room 4064
Fresno, CA 93721
Ph: (559) 621-8694
Harmanjit.Dhaliwal@fresno.gov

From: Susana Maciel [mailto:smaciel@jlbtraffic.com]
Sent: Friday, May 24, 2019 11:18 AM
To: Jill Gormley; Harmanjit Dhaliwal; David Padilla (dave_padilla@dot.ca.gov)
Cc: Jose Benavides
Subject: RE: FCC Parking & Facilities Expansion TIA: Draft Scope of Work

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Sent: Tuesday, April 23, 2019 8:34 AM
To: Jill Gormley <Jill.Gormley@fresno.gov>
Cc: Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>; Spaunhurst, Brian (bspaunhurst@fresnocountyca.gov) <bspaunhurst@fresnocountyca.gov>; David Padilla (dave_padilla@dot.ca.gov) <dave_padilla@dot.ca.gov>; Jose Benavides <jbenavides@jlbtraffic.com>
Subject: FCC Parking & Facilities Expansion TIA: Draft Scope of Work

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Engineer I/II

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I sincerely appreciate your time and attention to this matter and look forward to hearing from you soon.

Appendix B: Traffic Counts

JLB Traffic Engineering, Inc.

1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
(559) 570-8991
Traffic Engineering, Transportation Planning & Parking Solutions
www.JLBtraffic.com

File Name : San Pablo at Clinton
Site Code : 00000000
Start Date : 4/25/2019
Page No : 1

Groups Printed- Unshifted

	CLINTON Westbound			SAN PABLO Northbound			CLINTON Eastbound			
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Int. Total
07:00 AM	0	63	0	3	0	0	135	2	1	204
07:15 AM	1	97	0	2	0	0	178	6	1	285
07:30 AM	1	111	0	3	4	0	217	8	4	348
07:45 AM	3	179	0	4	4	0	245	7	0	442
Total	5	450	0	12	8	0	775	23	6	1279
08:00 AM	1	122	0	5	3	0	239	4	0	374
08:15 AM	0	79	0	3	1	0	170	6	2	261
08:30 AM	4	91	0	5	2	0	123	9	0	234
08:45 AM	1	88	0	3	3	0	119	6	1	221
Total	6	380	0	16	9	0	651	25	3	1090

******

03:00 PM	1	132	0	4	1	0	181	4	1	324
03:15 PM	1	152	0	2	5	0	170	4	6	340
03:30 PM	3	144	0	5	4	0	174	7	3	340
03:45 PM	2	169	0	5	3	0	152	3	2	336
Total	7	597	0	16	13	0	677	18	12	1340
04:00 PM	2	184	0	6	3	0	153	0	1	349
04:15 PM	5	166	0	4	5	0	129	7	1	317
04:30 PM	4	223	0	7	0	0	166	3	1	404
04:45 PM	1	203	0	5	7	0	161	7	2	386
Total	12	776	0	22	15	0	609	17	5	1456
05:00 PM	2	228	0	5	3	0	162	4	2	406
05:15 PM	3	208	0	4	4	0	183	4	2	408
05:30 PM	3	185	0	2	1	0	148	4	1	344
05:45 PM	2	167	0	7	1	0	164	2	1	344
Total	10	788	0	18	9	0	657	14	6	1502
Grand Total	40	2991	0	84	54	0	3369	97	32	6667
Apprch %	1.3	98.7	0	60.9	39.1	0	96.3	2.8	0.9	
Total %	0.6	44.9	0	1.3	0.8	0	50.5	1.5	0.5	

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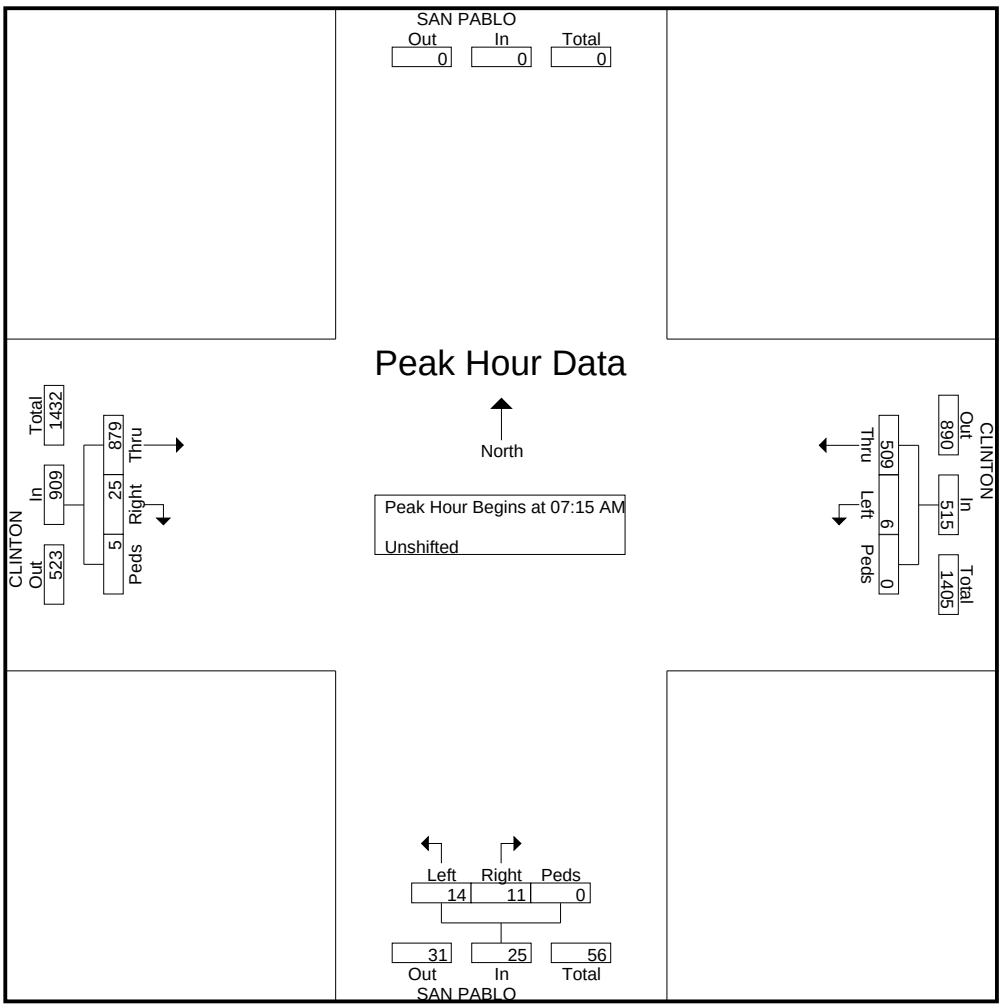
File Name : San Pablo at Clinton
Site Code : 00000000
Start Date : 4/25/2019
Page No : 2

	CLINTON Westbound				SAN PABLO Northbound				CLINTON Eastbound				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	1	97	0	98	2	0	0	2	178	6	1	185	285
07:30 AM	1	111	0	112	3	**4**	0	7	217	**8**	**4**	229	348
07:45 AM	**3**	**179**	0	**182**	4	4	0	**8**	**245**	7	0	**252**	**442**
08:00 AM	1	122	0	123	**5**	3	0	8	239	4	0	243	374
Total Volume	6	509	0	515	14	11	0	25	879	25	5	909	1449
% App. Total	1.2	98.8	0		56	44	0		96.7	2.8	0.6		
PHF	.500	.711	.000	.707	.700	.688	.000	.781	.897	.781	.313	.902	.820



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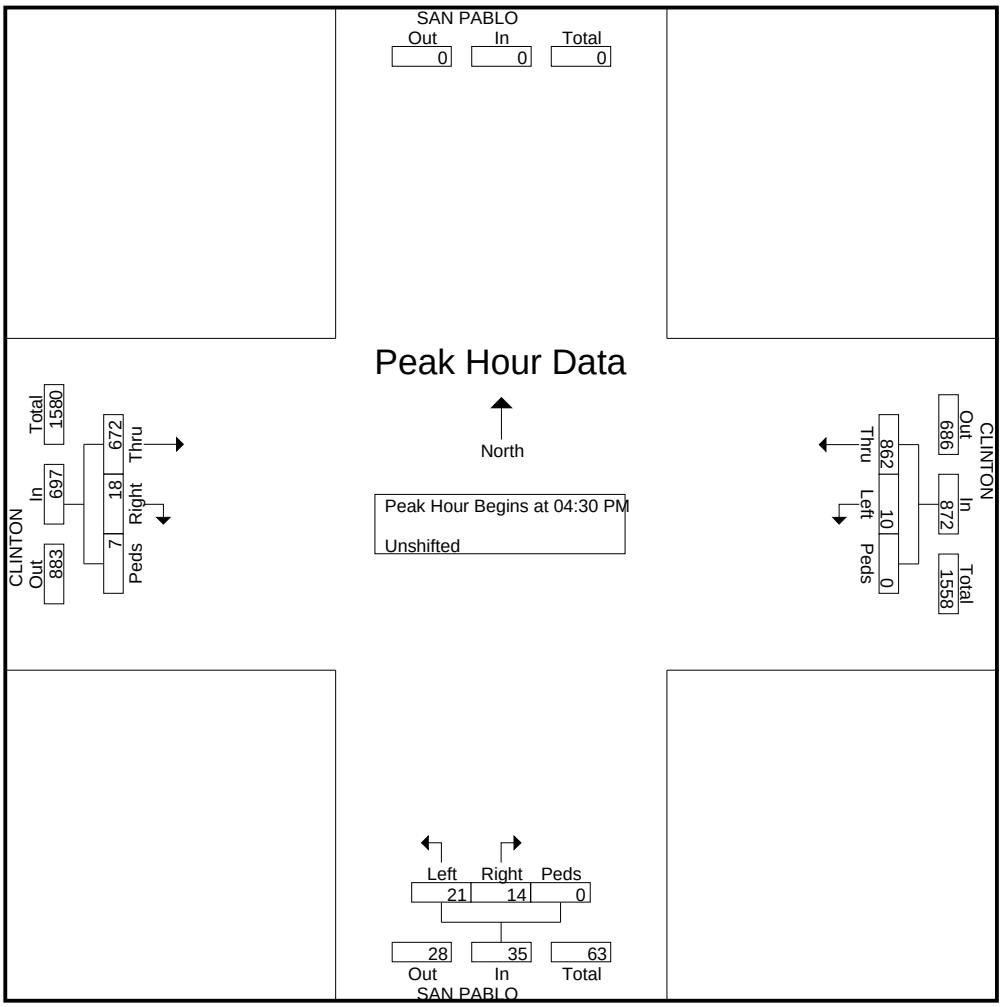
File Name : San Pablo at Clinton
Site Code : 00000000
Start Date : 4/25/2019
Page No : 3

	CLINTON Westbound				SAN PABLO Northbound				CLINTON Eastbound				
Start Time	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:30 PM													
04:30 PM	**4**	223	0	227	**7**	0	0	7	166	3	1	170	404
04:45 PM	1	203	0	204	5	**7**	0	**12**	161	**7**	**2**	170	386
05:00 PM	2	**228**	0	**230**	5	3	0	8	162	4	2	168	406
05:15 PM	3	208	0	211	4	4	0	8	**183**	4	2	**189**	**408**
Total Volume	10	862	0	872	21	14	0	35	672	18	7	697	1604
% App. Total	1.1	98.9	0		60	40	0		96.4	2.6	1		
PHF	.625	.945	.000	.948	.750	.500	.000	.729	.918	.643	.875	.922	.983



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION Clinton Ave @ Glenn Ave

LATITUDE 36.7723

COUNTY Fresno

LONGITUDE -119.7934

COLLECTION DATE Wednesday, June 5, 2019

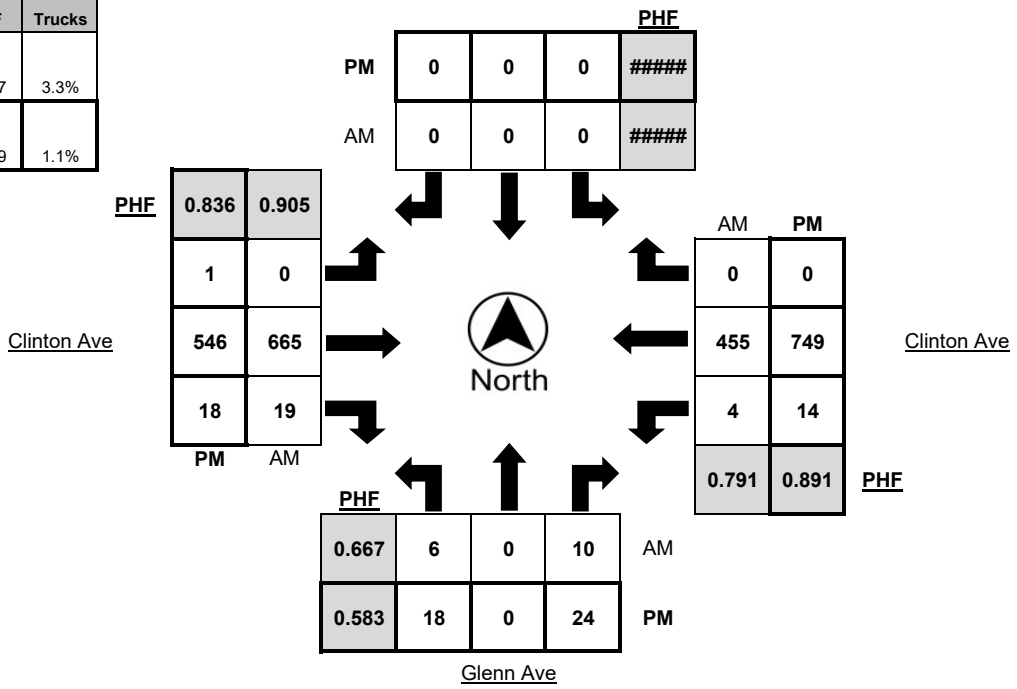
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	4	0	1	0	0	0	0	0	0	92	6	6	3	61	0	0
7:15 AM - 7:30 AM	1	0	3	0	0	0	0	0	0	141	0	11	0	88	0	0
7:30 AM - 7:45 AM	1	0	1	0	0	0	0	0	0	158	8	4	1	112	0	2
7:45 AM - 8:00 AM	2	0	2	0	0	0	0	0	0	184	5	8	1	144	0	4
8:00 AM - 8:15 AM	2	0	4	0	0	0	0	0	0	182	6	4	2	111	0	5
8:15 AM - 8:30 AM	1	0	2	0	0	0	0	0	0	118	2	6	0	105	0	4
8:30 AM - 8:45 AM	1	0	0	0	0	0	0	0	0	138	0	4	2	69	0	6
8:45 AM - 9:00 AM	1	0	2	0	0	0	0	0	0	108	0	6	3	85	0	4
TOTAL	**13**	**0**	**15**	**0**	**0**	**0**	**0**	**0**	**0**	**1121**	**27**	**49**	**12**	**775**	**0**	**25**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	4	0	6	0	0	0	0	0	0	127	1	0	5	185	0	3
4:15 PM - 4:30 PM	5	0	1	0	0	0	0	0	0	134	4	0	2	199	0	5
4:30 PM - 4:45 PM	6	0	2	0	0	0	0	0	0	119	5	0	2	175	0	7
4:45 PM - 5:00 PM	2	0	6	0	0	0	0	0	0	145	7	0	5	163	0	2
5:00 PM - 5:15 PM	3	0	5	0	0	0	0	0	1	163	5	0	1	203	0	5
5:15 PM - 5:30 PM	7	0	11	0	0	0	0	0	0	119	1	0	6	208	0	1
5:30 PM - 5:45 PM	4	0	5	0	0	0	0	0	0	150	4	0	7	122	0	1
5:45 PM - 6:00 PM	1	0	7	1	0	0	0	0	0	125	4	0	4	139	0	2
TOTAL	**32**	**0**	**43**	**1**	**0**	**0**	**0**	**0**	**1**	**1082**	**31**	**0**	**32**	**1394**	**0**	**26**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	6	0	10	0	0	0	0	0	0	665	19	27	4	455	0	11
4:30 PM - 5:30 PM	18	0	24	0	0	0	0	0	1	546	18	0	14	749	0	15

	PHF	Trucks
AM	0.857	3.3%
PM	0.899	1.1%



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LOCATION Clinton Ave @ Glenn Ave

LATITUDE 36.7723

COUNTY Fresno

LONGITUDE -119.7934

COLLECTION DATE Wednesday, June 5, 2019

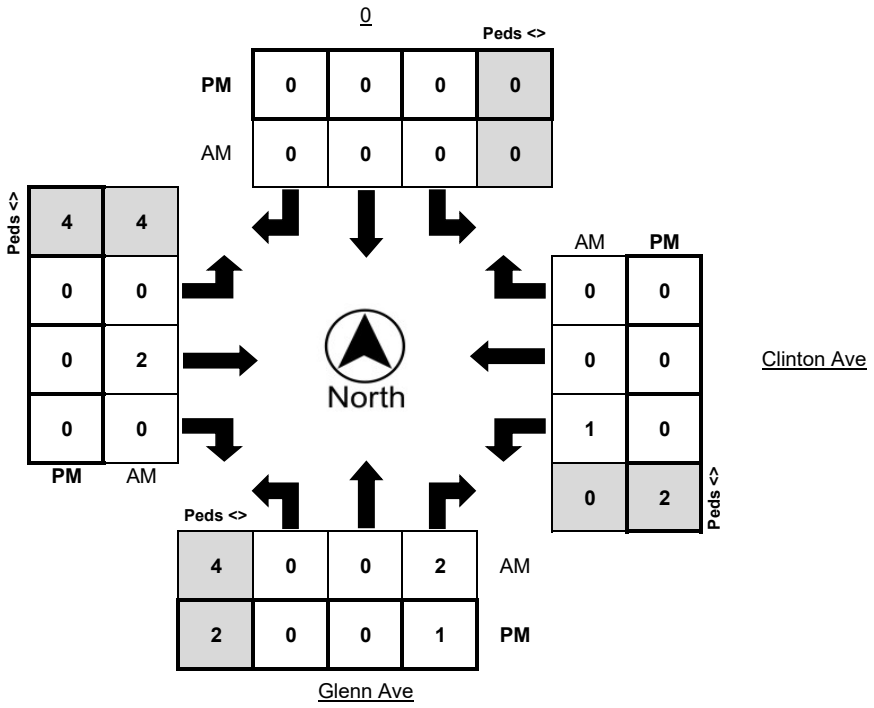
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
7:30 AM - 7:45 AM	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**5**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**6**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	2	0	0	0	0	4	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:30 PM - 5:45 PM	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
TOTAL	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**11**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**4**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:15 AM - 8:15 AM	0	0	2	0	0	0	0	4	0	2	0	0	1	0	0	4
4:30 PM - 5:30 PM	0	0	1	0	0	0	0	2	0	0	0	2	0	0	0	4

	Bikes	Peds
AM Peak Total	5	8
PM Peak Total	**1**	**8**



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File Name : Blackstone at Cambridge
Site Code : 00000000
Start Date : 4/30/2019
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Groups Printed- Unshifted - Bank 2 (Uturns)

	BLACKSTONE Southbound				CAMBRIDGE Westbound				BLACKSTONE Northbound				CAMBRIDGE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	10	130	6	1	2	0	5	0	8	51	9	1	0	1	1	0	225
07:15 AM	26	178	8	3	2	0	15	0	10	99	2	9	0	1	7	0	360
07:30 AM	23	234	6	3	5	1	16	0	19	153	13	2	0	0	4	0	479
07:45 AM	18	336	13	1	1	0	21	1	15	167	10	0	4	0	7	0	594
Total	77	878	33	8	10	1	57	1	52	470	34	12	4	2	19	0	1658
08:00 AM	14	275	13	3	1	0	12	0	17	206	5	1	1	0	5	0	553
08:15 AM	9	172	6	1	0	0	1	0	6	167	7	2	1	0	5	0	377
08:30 AM	13	160	11	0	2	0	6	0	9	126	8	2	1	1	2	2	343
08:45 AM	12	147	4	0	0	0	3	0	12	142	7	7	0	0	8	0	342
Total	48	754	34	4	3	0	22	0	44	641	27	12	3	1	20	2	1615
******																	
03:00 PM	9	194	2	1	1	0	0	0	12	239	5	6	2	0	2	0	473
03:15 PM	5	206	4	3	2	1	5	0	5	229	9	2	3	1	8	1	484
03:30 PM	8	182	1	2	2	0	10	0	10	243	5	2	2	1	4	1	473
03:45 PM	31	209	2	0	1	1	9	0	3	289	9	2	3	1	8	0	568
Total	53	791	9	6	6	2	24	0	30	1000	28	12	10	3	22	2	1998
04:00 PM	21	162	4	2	8	1	30	1	4	243	7	4	4	3	11	1	506
04:15 PM	11	167	3	6	3	1	9	0	7	264	4	5	4	0	12	0	496
04:30 PM	7	205	1	1	1	0	10	0	9	278	2	4	3	1	24	0	546
04:45 PM	7	226	1	4	3	0	8	0	4	281	4	4	3	1	11	1	558
Total	46	760	9	13	15	2	57	1	24	1066	17	17	14	5	58	2	2106
05:00 PM	6	236	1	3	2	0	7	0	4	343	5	4	5	1	7	0	624
05:15 PM	8	216	3	1	3	2	10	0	7	336	2	6	3	1	6	0	604
05:30 PM	5	245	2	0	0	0	6	0	7	246	0	4	0	0	2	0	517
05:45 PM	7	235	2	1	5	0	4	0	2	218	2	2	1	0	0	0	479
Total	26	932	8	5	10	2	27	0	20	1143	9	16	9	2	15	0	2224
Grand Total	250	4115	93	36	44	7	187	2	170	4320	115	69	40	13	134	6	9601
Apprch %	5.6	91.6	2.1	0.8	18.3	2.9	77.9	0.8	3.6	92.4	2.5	1.5	20.7	6.7	69.4	3.1	
Total %	2.6	42.9	1	0.4	0.5	0.1	1.9	0	1.8	45	1.2	0.7	0.4	0.1	1.4	0.1	
Unshifted	209	4111	93	36	44	6	187	2	125	4320	113	69	40	13	134	6	9508
% Unshifted	83.6	99.9	100	100	100	85.7	100	100	73.5	100	98.3	100	100	100	100	100	99
Bank 2 (Uturns)	41	4	0	0	0	1	0	0	45	0	2	0	0	0	0	0	93
% Bank 2 (Uturns)	16.4	0.1	0	0	0	14.3	0	0	26.5	0	1.7	0	0	0	0	0	1

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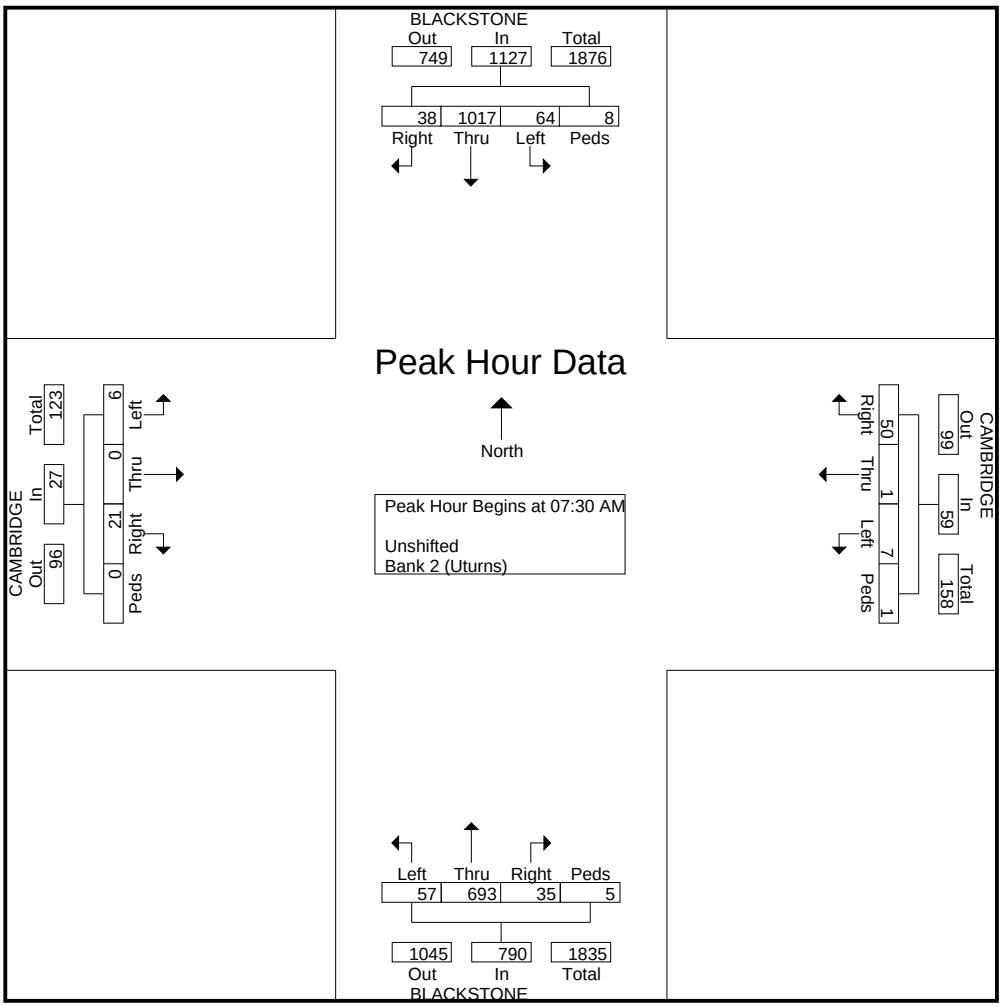
	BLACKSTONE Southbound					CAMBRIDGE Westbound					BLACKSTONE Northbound					CAMBRIDGE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	**23**	234	6	**3**	266	**5**	**1**	16	0	22	**19**	153	**13**	**2**	187	0	0	4	0	4	479
07:45 AM	18	**336**	**13**	1	**368**	1	0	**21**	**1**	**23**	15	167	10	0	192	**4**	0	**7**	0	**11**	**594**
08:00 AM	14	275	13	3	305	1	0	12	0	13	17	**206**	5	1	**229**	1	0	5	0	6	553
08:15 AM	9	172	6	1	188	0	0	1	0	1	6	167	7	2	182	1	0	5	0	6	377
Total Volume	64	1017	38	8	1127	7	1	50	1	59	57	693	35	5	790	6	0	21	0	27	2003
% App. Total	5.7	90.2	3.4	0.7		11.9	1.7	84.7	1.7		7.2	87.7	4.4	0.6		22.2	0	77.8	0		
PHF	.696	.757	.731	.667	.766	.350	.250	.595	.250	.641	.750	.841	.673	.625	.862	.375	.000	.750	.000	.614	.843



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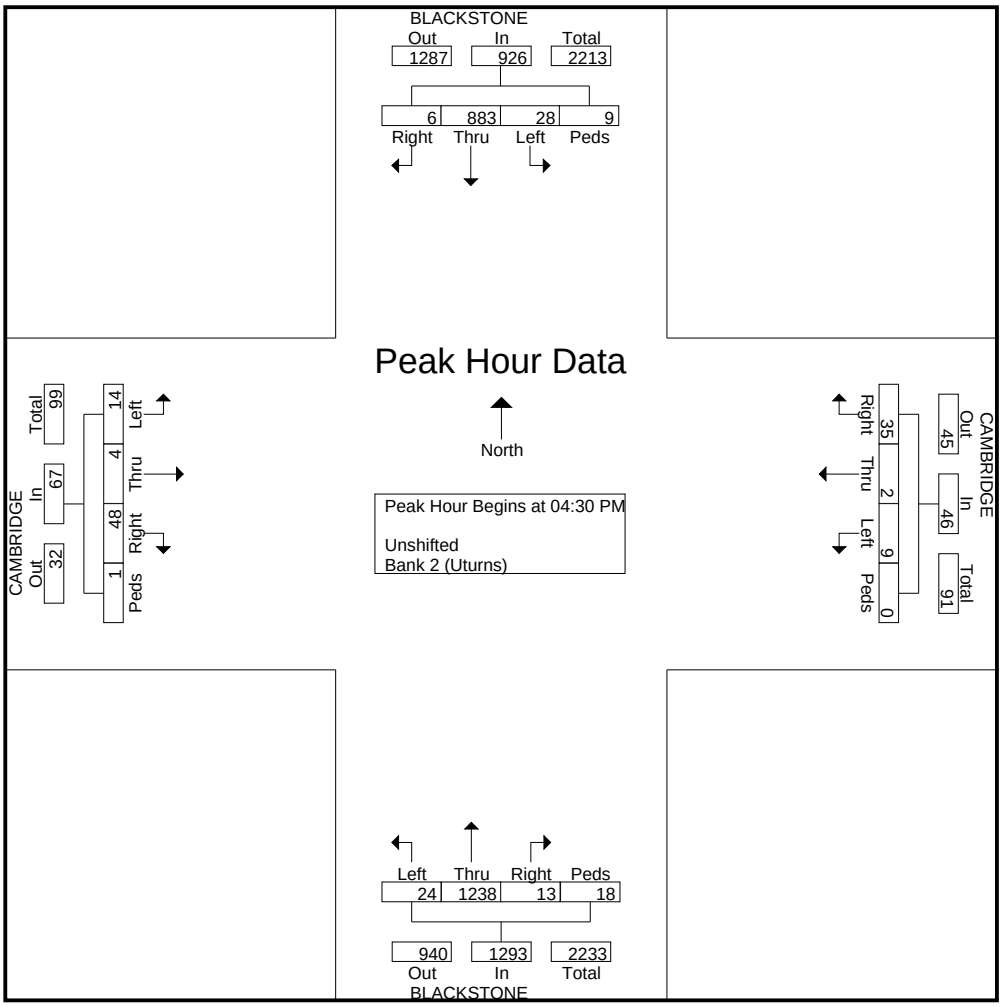
	BLACKSTONE Southbound					CAMBRIDGE Westbound					BLACKSTONE Northbound					CAMBRIDGE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	7	205	1	1	214	1	0	**10**	0	11	**9**	278	2	4	293	3	**1**	**24**	0	**28**	546
04:45 PM	7	226	1	**4**	238	**3**	0	8	0	11	4	281	4	4	293	3	1	11	**1**	16	558
05:00 PM	6	**236**	1	3	**246**	2	0	7	0	9	4	**343**	**5**	4	**356**	**5**	1	7	0	13	**624**
05:15 PM	**8**	216	**3**	1	228	3	**2**	10	0	**15**	7	336	2	**6**	351	3	1	6	0	10	604
Total Volume	28	883	6	9	926	9	2	35	0	46	24	1238	13	18	1293	14	4	48	1	67	2332
% App. Total	3	95.4	0.6	1		19.6	4.3	76.1	0		1.9	95.7	1	1.4		20.9	6	71.6	1.5		
PHF	.875	.935	.500	.563	.941	.750	.250	.875	.000	.767	.667	.902	.650	.750	.908	.700	1.00	.500	.250	.598	.934



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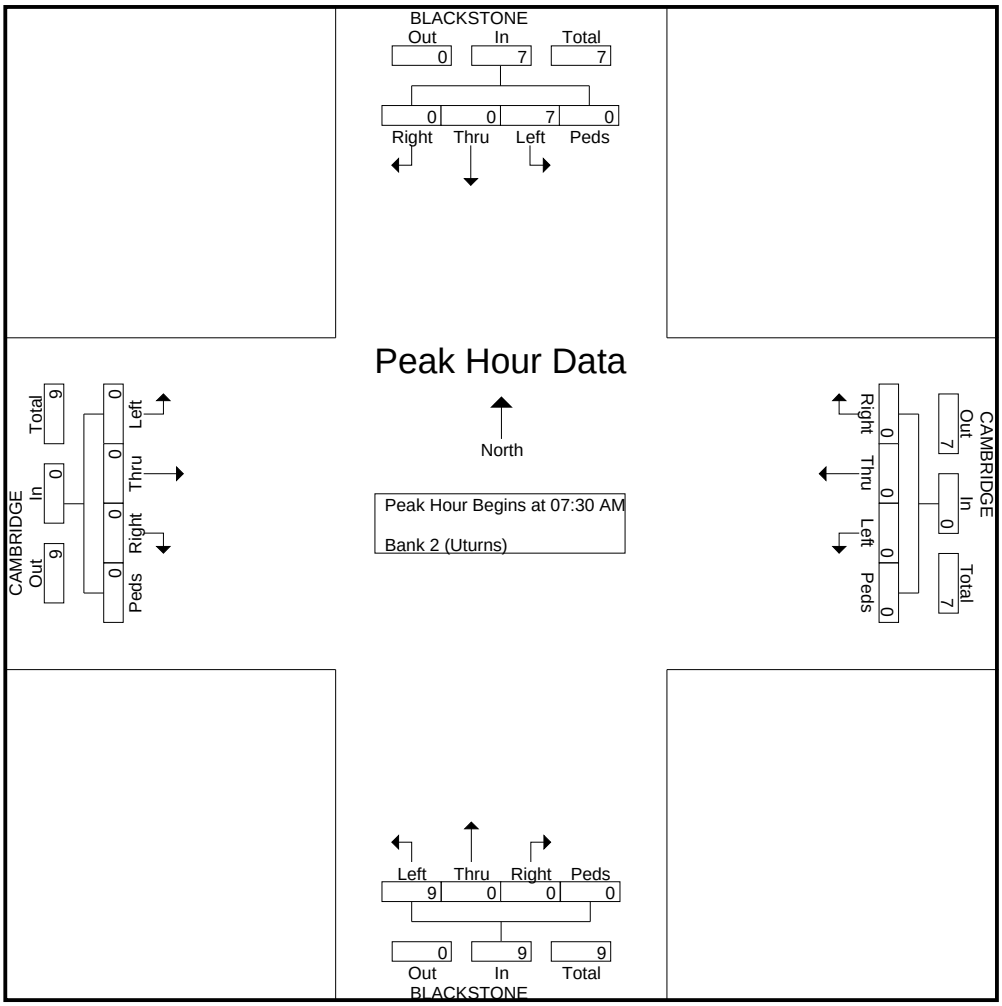
	BLACKSTONE Southbound					CAMBRIDGE Westbound					BLACKSTONE Northbound					CAMBRIDGE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	0	0	1	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	4
08:00 AM	2	0	0	0	2	0	0	0	0	0	**5**	0	0	0	**5**	0	0	0	0	0	**7**
08:15 AM	**4**	0	0	0	**4**	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	5
Total Volume	7	0	0	0	7	0	0	0	0	0	9	0	0	0	9	0	0	0	0	0	16
% App. Total	100	0	0	0		0	0	0	0		100	0	0	0		0	0	0	0		
PHF	.438	.000	.000	.000	.438	.000	.000	.000	.000	.000	.450	.000	.000	.000	.450	.000	.000	.000	.000	.000	.571



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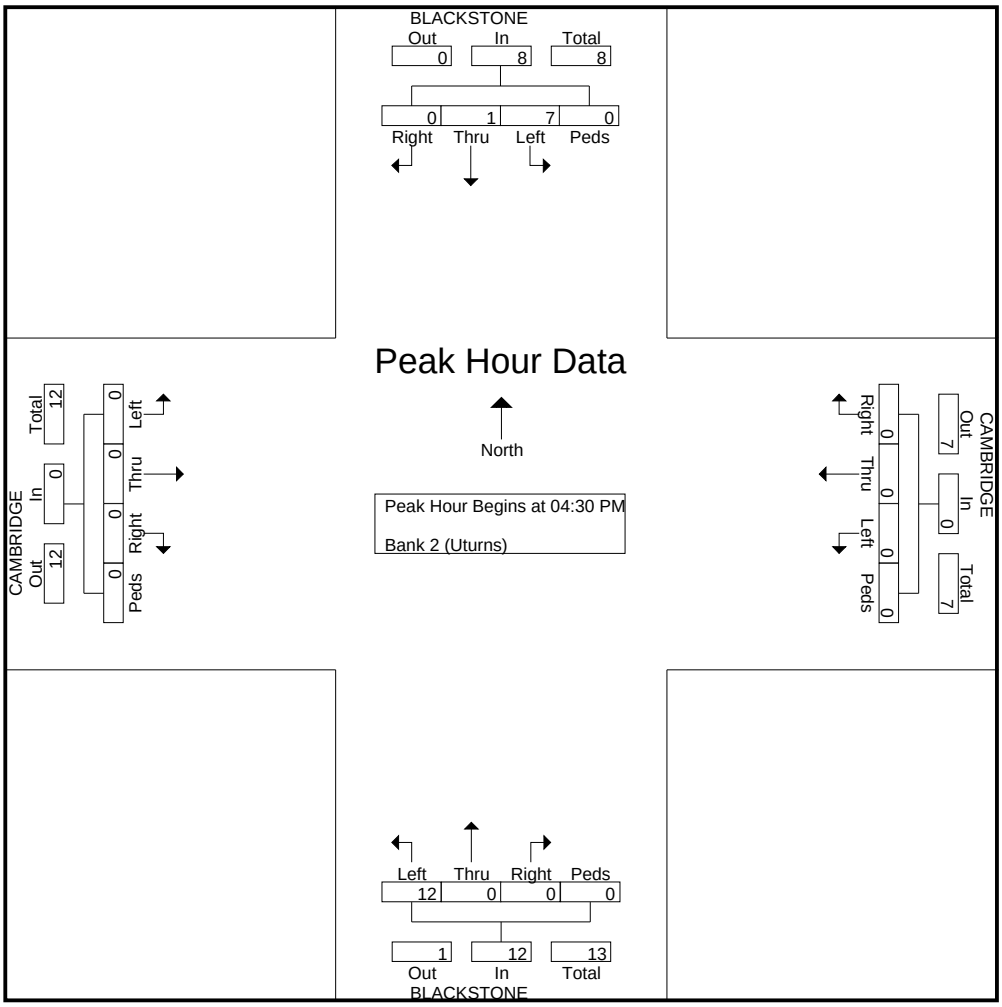
	BLACKSTONE Southbound					CAMBRIDGE Westbound					BLACKSTONE Northbound					CAMBRIDGE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	**2**	0	0	0	**2**	0	0	0	0	0	**4**	0	0	0	**4**	0	0	0	0	0	**6**
04:45 PM	1	**1**	0	0	2	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	3
05:00 PM	2	0	0	0	2	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	6
05:15 PM	2	0	0	0	2	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	5
Total Volume	7	1	0	0	8	0	0	0	0	0	12	0	0	0	12	0	0	0	0	0	20
% App. Total	87.5	12.5	0	0		0	0	0	0		100	0	0	0		0	0	0	0		
PHF	.875	.250	.000	.000	1.00	.000	.000	.000	.000	.000	.750	.000	.000	.000	.750	.000	.000	.000	.000	.000	.833



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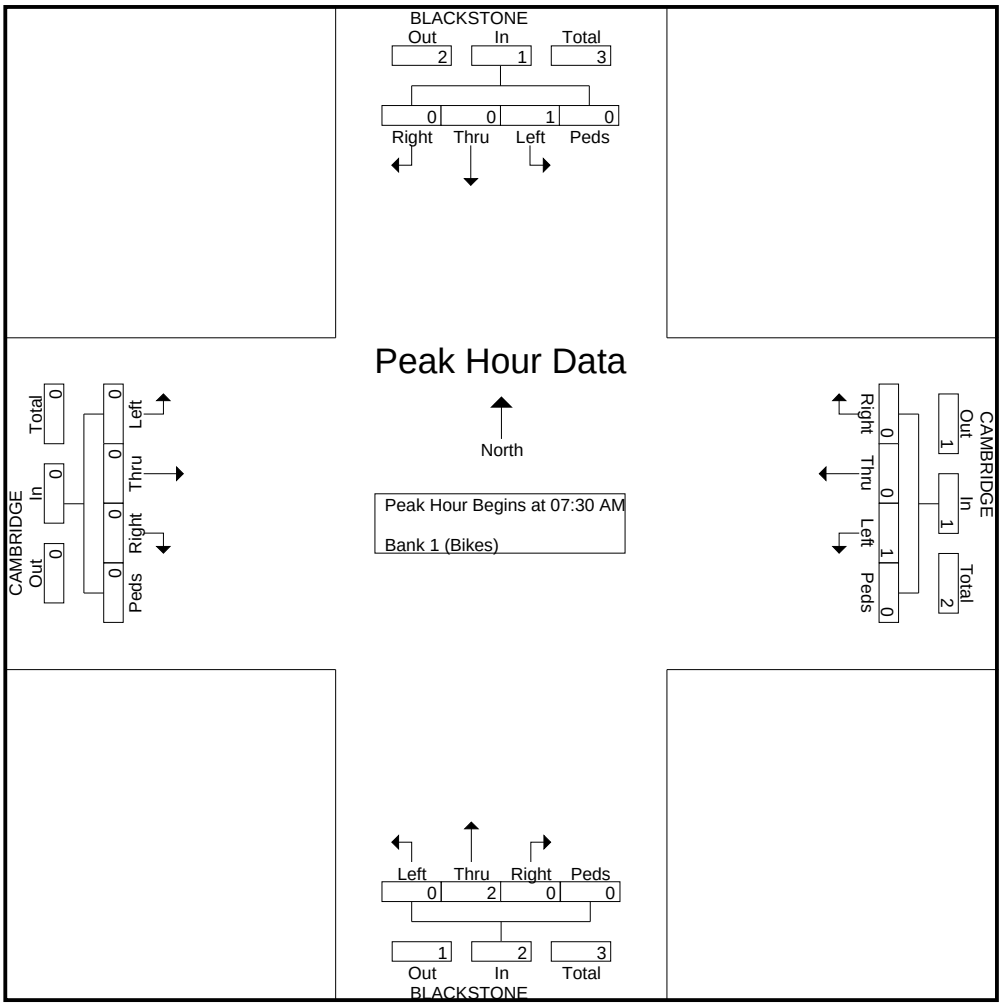
	BLACKSTONE Southbound					CAMBRIDGE Westbound					BLACKSTONE Northbound					CAMBRIDGE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	**1**	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	**1**	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	**2**	0	0	**2**	0	0	0	0	0	**2**
Total Volume	1	0	0	0	1	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	4
% App. Total	100	0	0	0		100	0	0	0		0	100	0	0		0	0	0	0		
PHF	.250	.000	.000	.000	.250	.250	.000	.000	.000	.250	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.500



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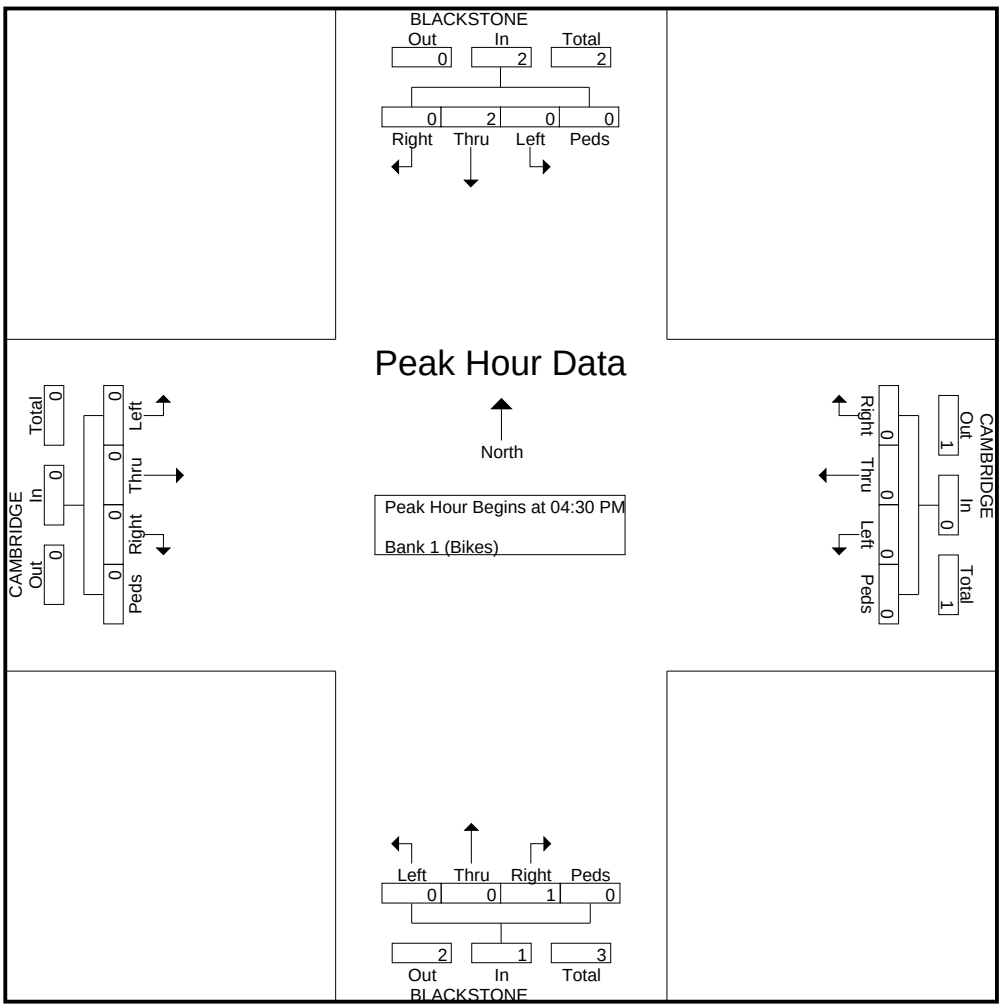
	BLACKSTONE Southbound					CAMBRIDGE Westbound					BLACKSTONE Northbound					CAMBRIDGE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	1
Total Volume	0	2	0	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3
% App. Total	0	100	0	0		0	0	0	0		0	0	100	0		0	0	0	0		
PHF	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.750



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File Name : Blackstone at Weldon
Site Code : 00000000
Start Date : 4/9/2019
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Groups Printed- Unshifted - turns)

	BLACKSTONE Southbound			BLACKSTONE Northbound			WELDON Eastbound			
Start Time	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Int. Total
07:00 AM	68	35	0	9	46	0	10	5	3	176
07:15 AM	131	44	4	15	92	0	11	4	5	306
07:30 AM	146	79	2	26	122	0	9	4	27	415
07:45 AM	240	110	4	34	165	0	30	27	37	647
Total	585	268	10	84	425	0	60	40	72	1544
08:00 AM	230	66	1	26	170	0	20	25	5	543
08:15 AM	150	32	0	20	138	0	15	21	10	386
08:30 AM	139	22	2	21	155	0	22	18	6	385
08:45 AM	122	33	3	19	119	0	33	19	34	382
Total	641	153	6	86	582	0	90	83	55	1696
******										
04:00 PM	195	17	3	9	208	0	36	22	31	521
04:15 PM	169	24	9	18	225	0	45	42	21	553
04:30 PM	197	27	5	13	270	0	40	47	9	608
04:45 PM	205	27	8	14	239	0	39	42	8	582
Total	766	95	25	54	942	0	160	153	69	2264
05:00 PM	204	30	5	8	294	0	56	51	4	652
05:15 PM	239	38	4	15	307	0	42	28	4	677
05:30 PM	266	51	0	16	258	0	38	26	7	662
05:45 PM	233	56	0	16	195	0	47	27	9	583
Total	942	175	9	55	1054	0	183	132	24	2574
Grand Total	2934	691	50	279	3003	0	493	408	220	8078
Apprch %	79.8	18.8	1.4	8.5	91.5	0	44	36.4	19.6	
Total %	36.3	8.6	0.6	3.5	37.2	0	6.1	5.1	2.7	
Unshifted	2934	691	50	269	3003	0	493	408	220	8068
% Unshifted	100	100	100	96.4	100	0	100	100	100	99.9
Bank 2 (U-turns)	0	0	0	10	0	0	0	0	0	10
% Bank 2 (U-turns)	0	0	0	3.6	0	0	0	0	0	0.1

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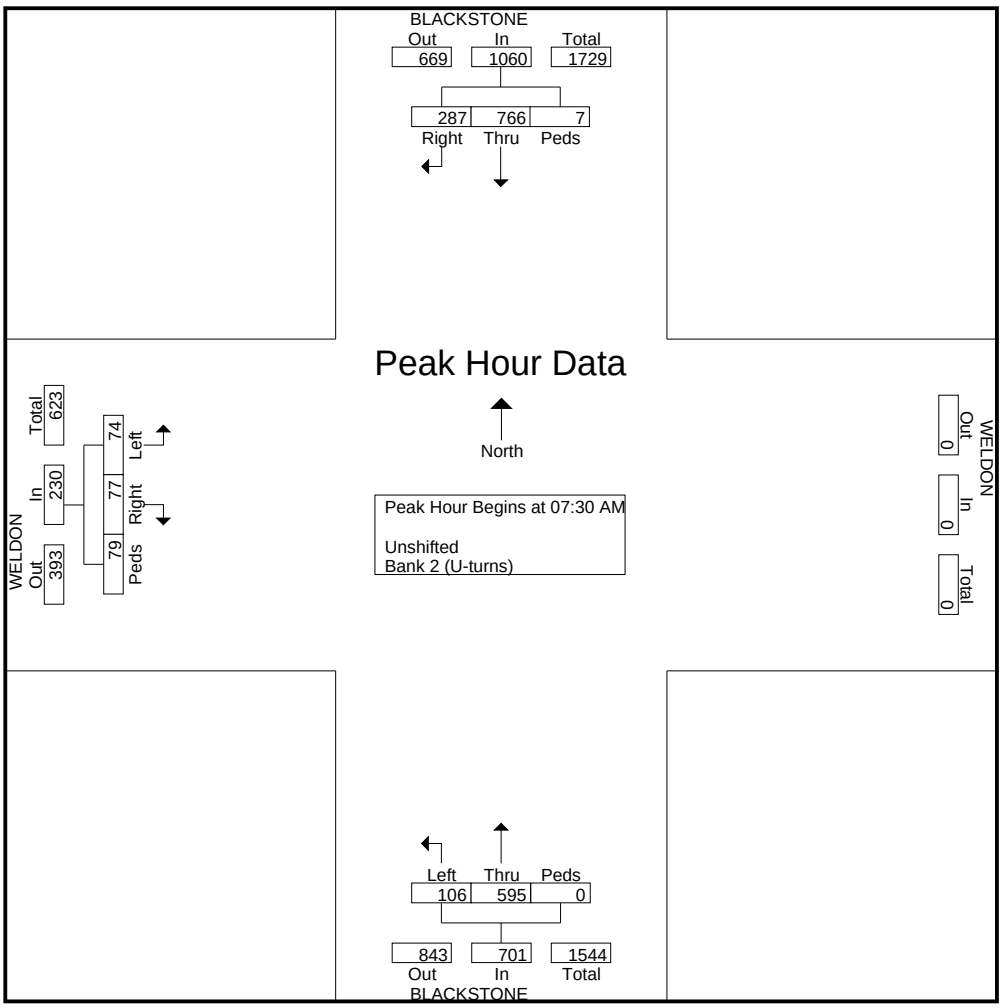
Site Code : 00000000
Start Date : 4/9/2019

	BLACKSTONE Southbound				BLACKSTONE Northbound				WELDON Eastbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	146	79	2	227	26	122	0	148	9	4	27	40	415
07:45 AM	**240**	**110**	**4**	**354**	**34**	165	0	**199**	**30**	**27**	**37**	**94**	**647**
08:00 AM	230	66	1	297	26	**170**	0	196	20	25	5	50	543
08:15 AM	150	32	0	182	20	138	0	158	15	21	10	46	386
Total Volume	766	287	7	1060	106	595	0	701	74	77	79	230	1991
% App. Total	72.3	27.1	0.7		15.1	84.9	0		32.2	33.5	34.3		
PHF	.798	.652	.438	.749	.779	.875	.000	.881	.617	.713	.534	.612	.769



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File Name : Blackstone at Weldon
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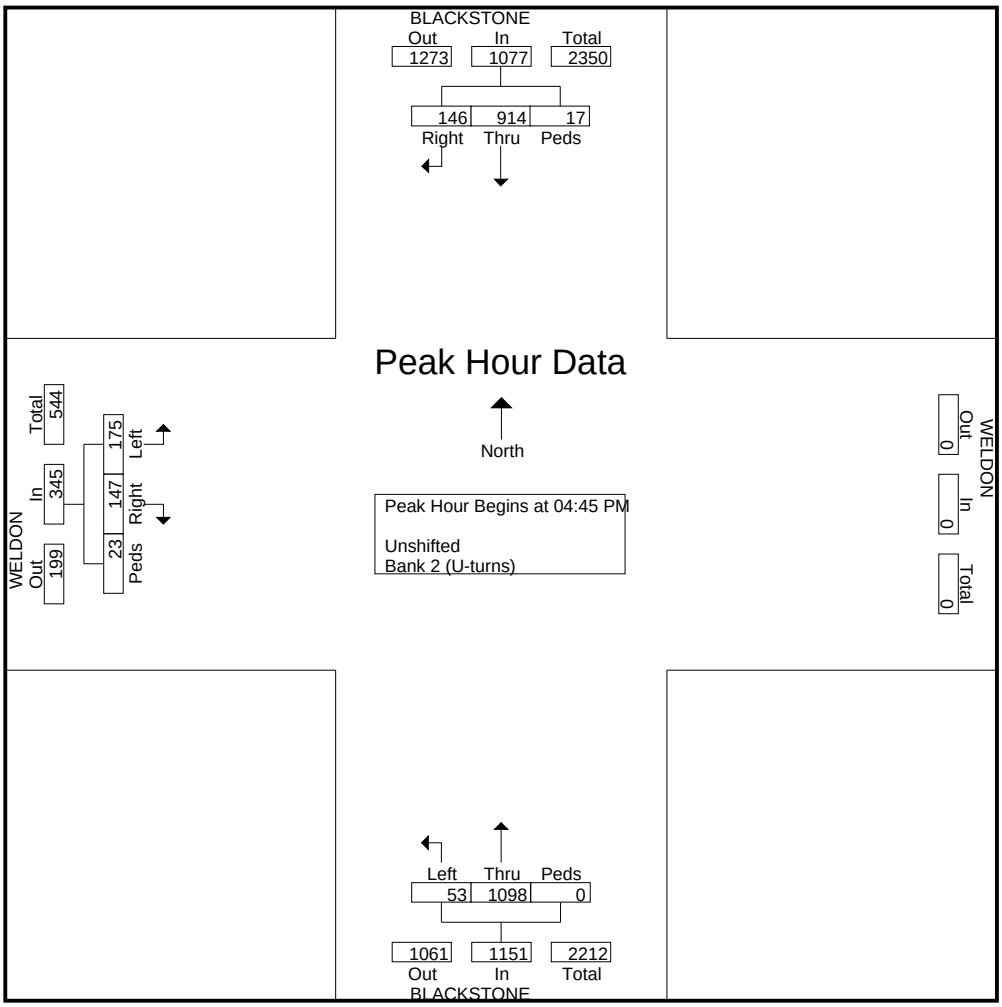
	BLACKSTONE Southbound				BLACKSTONE Northbound				WELDON Eastbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	205	27	**8**	240	14	239	0	253	39	42	**8**	89	582
05:00 PM	204	30	5	239	8	294	0	302	**56**	**51**	4	**111**	652
05:15 PM	239	38	4	281	15	**307**	0	**322**	42	28	4	74	**677**
05:30 PM	**266**	**51**	0	**317**	**16**	258	0	274	38	26	7	71	662
Total Volume	914	146	17	1077	53	1098	0	1151	175	147	23	345	2573
% App. Total	84.9	13.6	1.6		4.6	95.4	0		50.7	42.6	6.7		
PHF	.859	.716	.531	.849	.828	.894	.000	.894	.781	.721	.719	.777	.950



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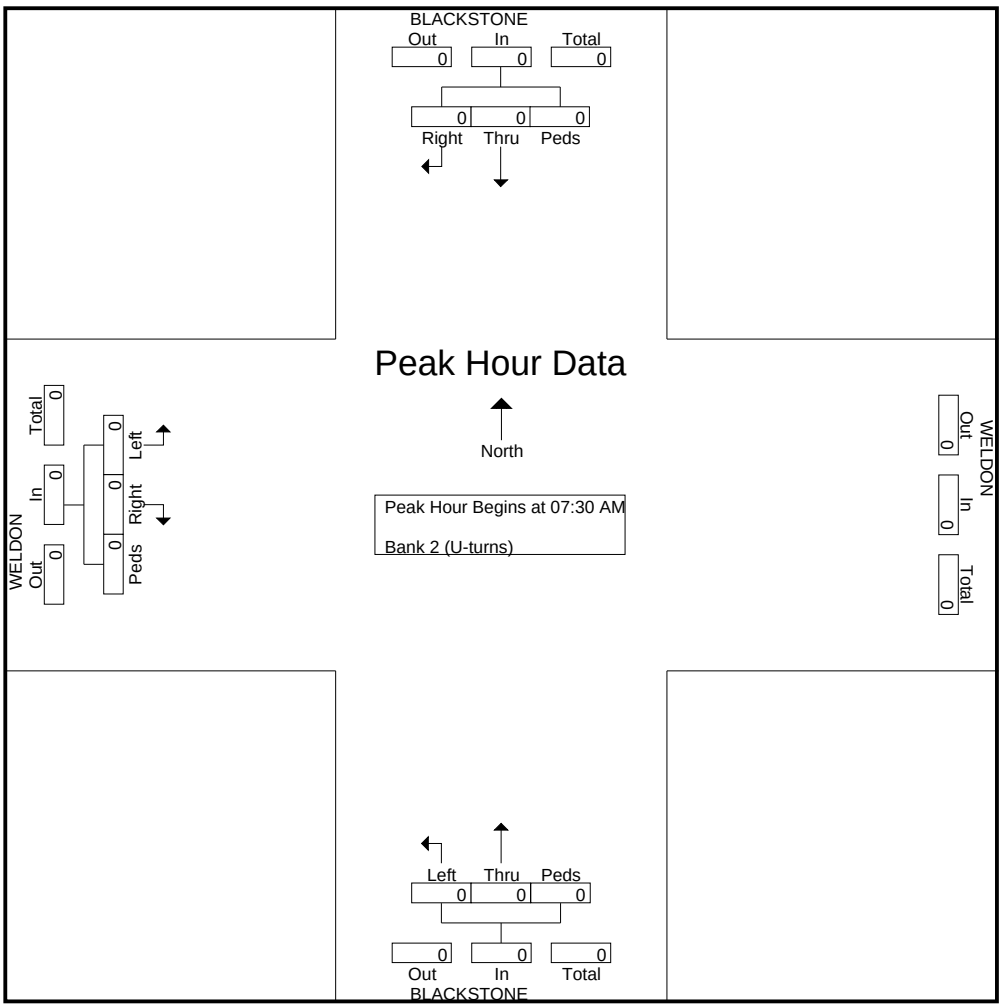
	BLACKSTONE Southbound				BLACKSTONE Northbound				WELDON Eastbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



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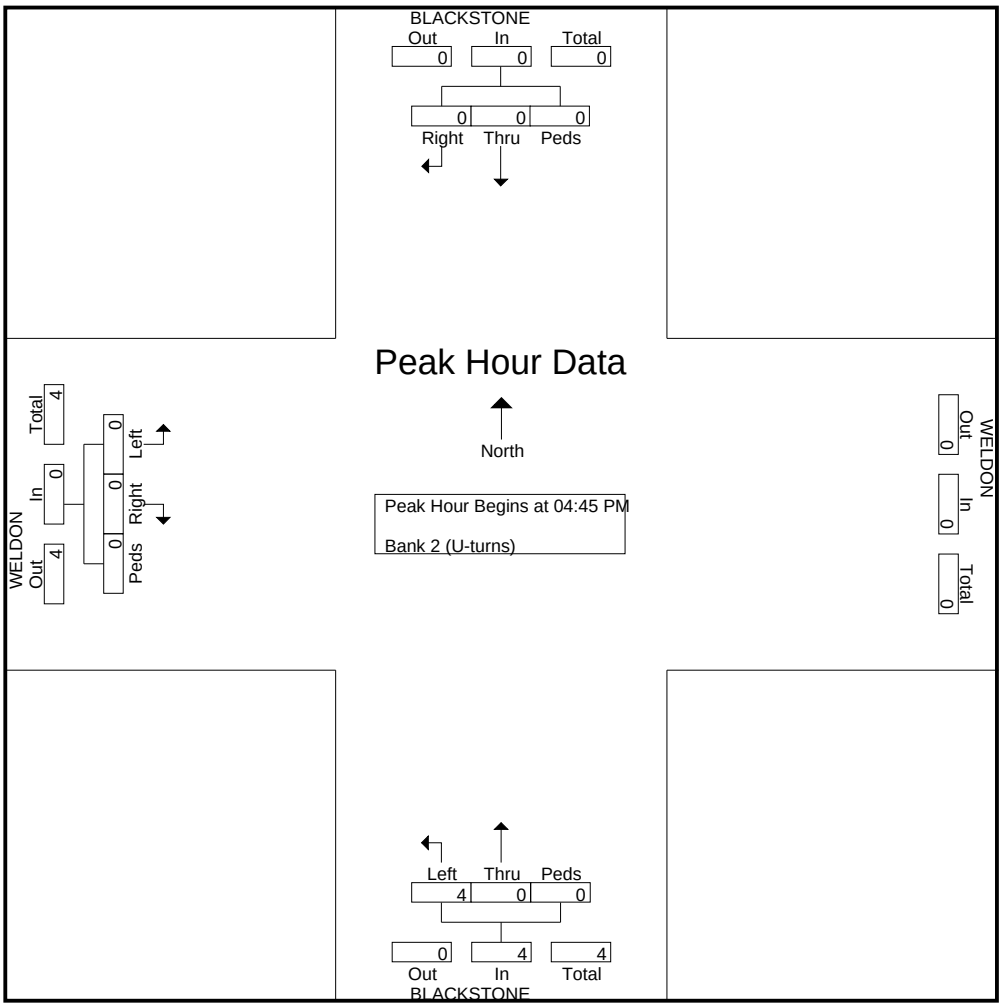
	BLACKSTONE Southbound				BLACKSTONE Northbound				WELDON Eastbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
05:30 PM	0	0	0	0	**2**	0	0	**2**	0	0	0	0	**2**
Total Volume	0	0	0	0	4	0	0	4	0	0	0	0	4
% App. Total	0	0	0		100	0	0		0	0	0		
PHF	.000	.000	.000	.000	.500	.000	.000	.500	.000	.000	.000	.000	.500



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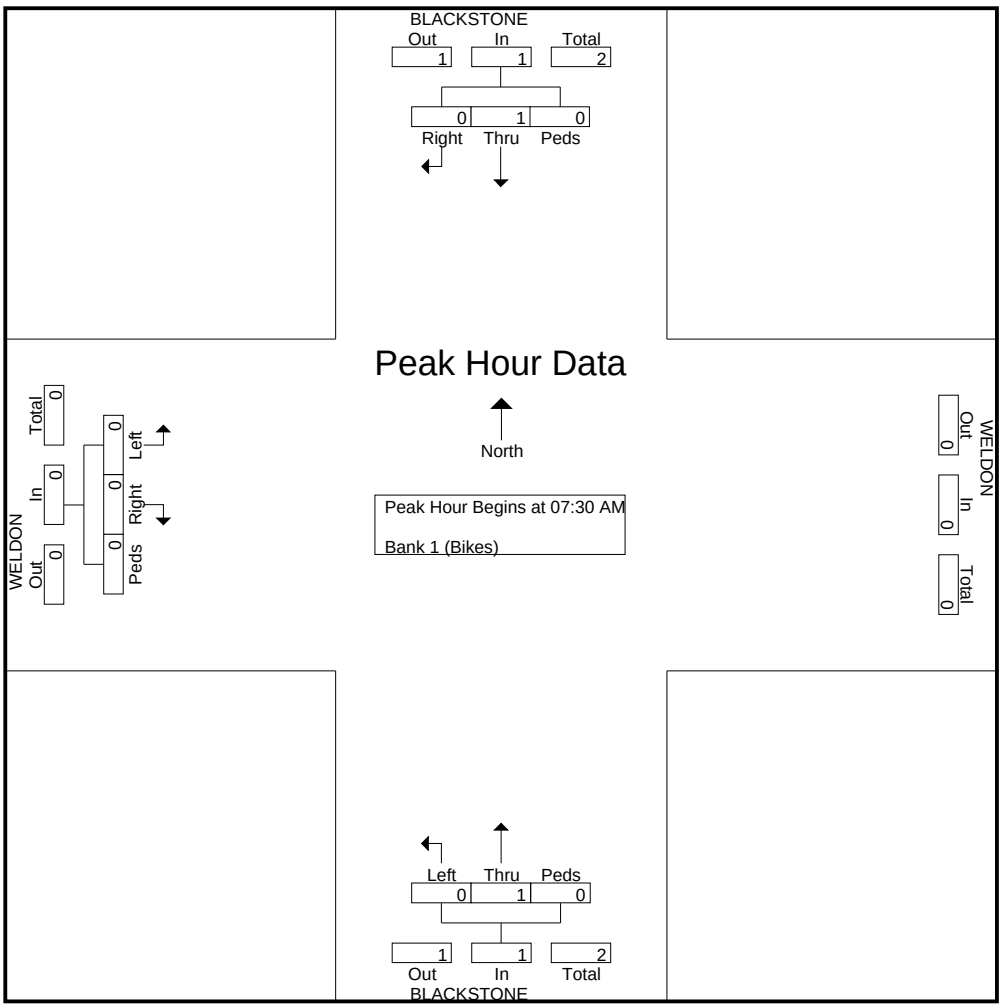
	BLACKSTONE Southbound				BLACKSTONE Northbound				WELDON Eastbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	**1**	0	0	**1**	0	0	0	0	0	0	0	0	**1**
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	**1**	0	**1**	0	0	0	0	1
Total Volume	1	0	0	1	0	1	0	1	0	0	0	0	2
% App. Total	100	0	0		0	100	0		0	0	0		
PHF	.250	.000	.000	.250	.000	.250	.000	.250	.000	.000	.000	.000	.500



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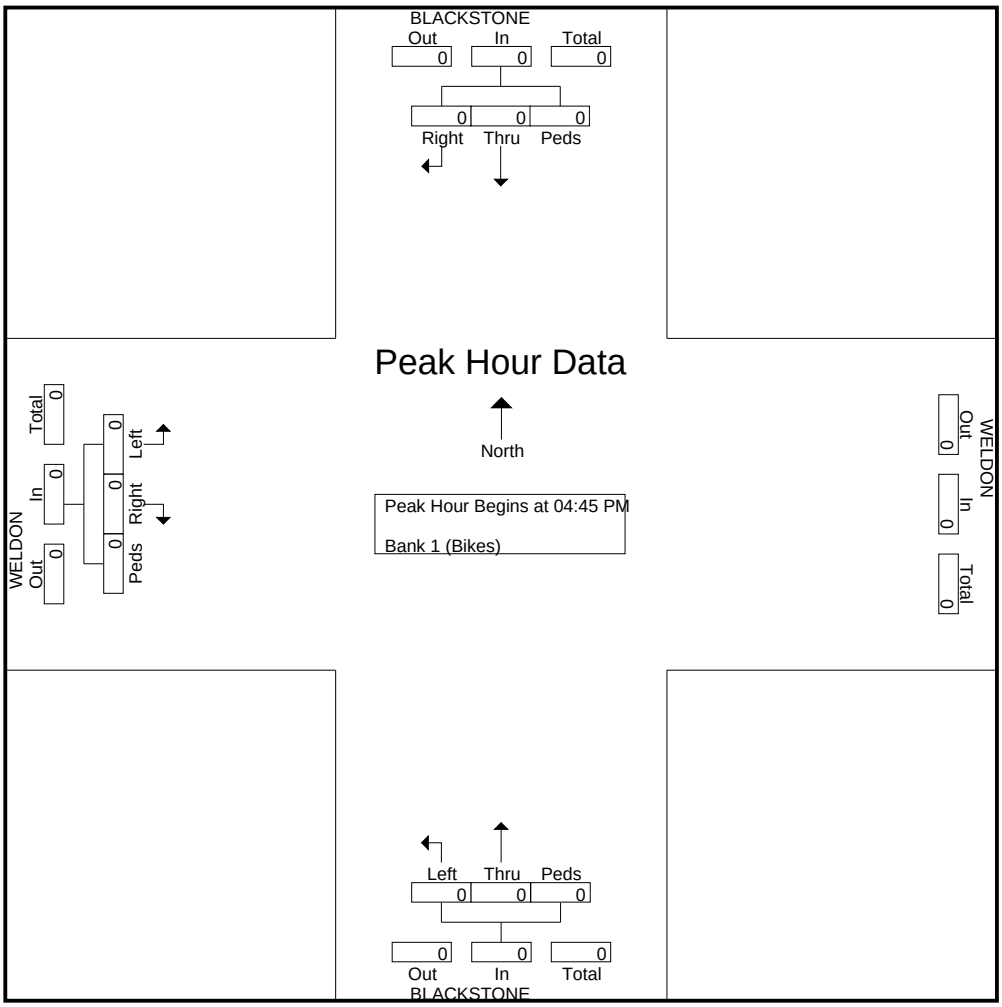
	BLACKSTONE Southbound				BLACKSTONE Northbound				WELDON Eastbound				
Start Time	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



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Groups Printed- Unshifted - turns)

	BLACKSTONE Southbound				UNIVERSITY Westbound				BLACKSTONE Northbound				UNIVERSITY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	6	89	4	3	0	3	0	0	14	75	4	0	1	0	8	0	207
07:15 AM	6	126	3	0	1	3	11	0	28	99	11	0	0	0	4	0	292
07:30 AM	5	178	1	9	4	1	13	0	32	164	7	0	0	0	7	0	421
07:45 AM	9	236	16	0	1	5	17	0	43	210	14	0	1	0	17	0	569
Total	26	629	24	12	6	12	41	0	117	548	36	0	2	0	36	0	1489
08:00 AM	8	223	7	3	0	4	12	0	29	186	8	0	0	1	11	2	494
08:15 AM	5	182	6	1	0	1	3	0	24	160	6	2	0	0	13	0	403
08:30 AM	5	132	12	0	2	0	4	0	21	165	6	2	0	0	12	0	361
08:45 AM	8	155	7	0	2	0	3	3	29	166	8	2	0	0	23	0	406
Total	26	692	32	4	4	5	22	3	103	677	28	6	0	1	59	2	1664
******																	
04:00 PM	5	192	6	6	1	0	18	0	16	231	4	1	3	2	25	0	510
04:15 PM	11	206	4	1	0	0	7	0	15	210	3	1	1	0	28	0	487
04:30 PM	16	207	2	3	0	1	6	0	17	262	10	2	2	0	17	0	545
04:45 PM	9	217	5	3	1	1	10	1	17	229	6	0	0	1	35	0	535
Total	41	822	17	13	2	2	41	1	65	932	23	4	6	3	105	0	2077
05:00 PM	17	229	3	1	3	2	10	0	17	262	7	3	1	1	25	0	581
05:15 PM	21	242	4	0	5	0	23	0	13	311	6	2	0	0	23	0	650
05:30 PM	11	224	1	2	13	1	15	1	26	225	9	6	2	0	21	0	557
05:45 PM	9	226	0	1	1	3	12	0	16	206	3	5	0	1	14	0	497
Total	58	921	8	4	22	6	60	1	72	1004	25	16	3	2	83	0	2285
Grand Total	151	3064	81	33	34	25	164	5	357	3161	112	26	11	6	283	2	7515
Apprch %	4.5	92	2.4	1	14.9	11	71.9	2.2	9.8	86.5	3.1	0.7	3.6	2	93.7	0.7	
Total %	2	40.8	1.1	0.4	0.5	0.3	2.2	0.1	4.8	42.1	1.5	0.3	0.1	0.1	3.8	0	
Unshifted	109	3064	81	33	34	25	164	5	284	3158	112	26	11	6	283	2	7397
% Unshifted	72.2	100	100	100	100	100	100	100	79.6	99.9	100	100	100	100	100	100	98.4
Bank 2 (U-turns)	42	0	0	0	0	0	0	0	73	3	0	0	0	0	0	0	118
% Bank 2 (U-turns)	27.8	0	0	0	0	0	0	0	20.4	0.1	0	0	0	0	0	0	1.6

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Site Code : 00000000
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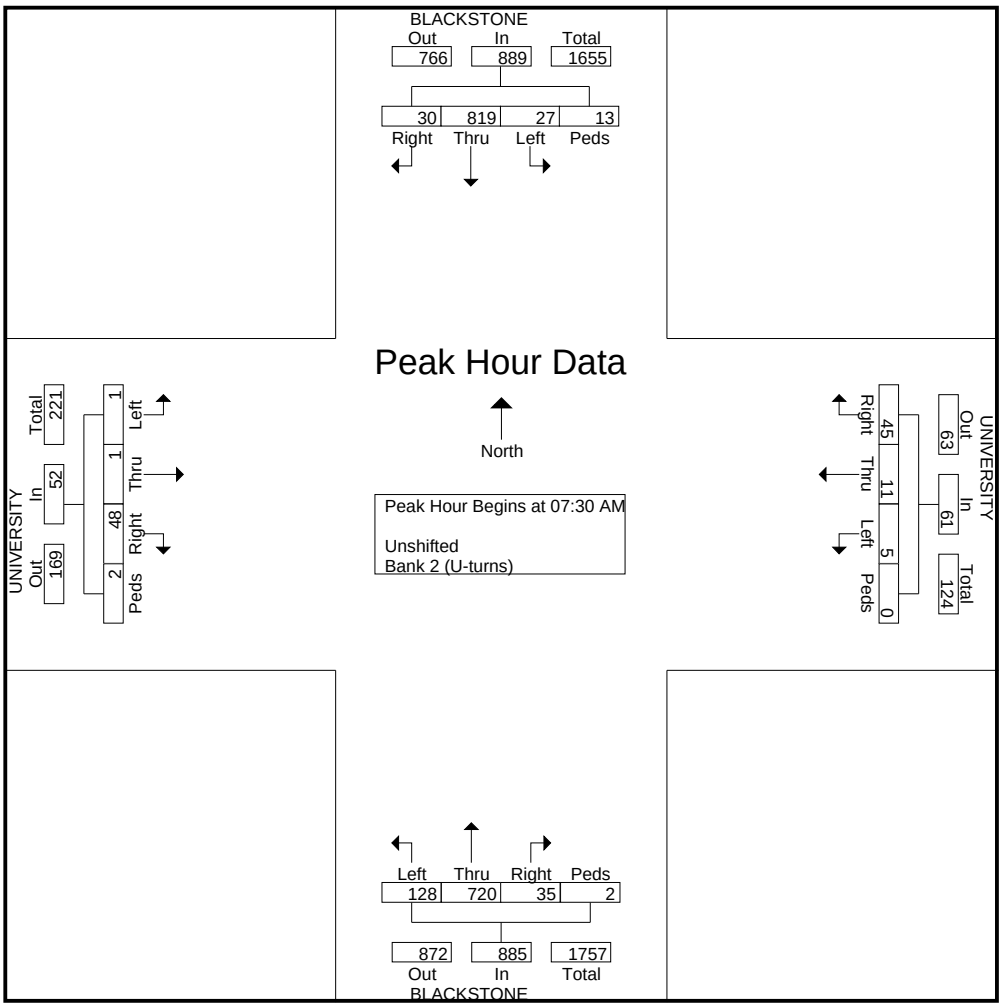
	BLACKSTONE Southbound					UNIVERSITY Westbound					BLACKSTONE Northbound					UNIVERSITY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	5	178	1	**9**	193	**4**	1	13	0	18	32	164	7	0	203	0	0	7	0	7	421
07:45 AM	**9**	**236**	**16**	0	**261**	1	**5**	**17**	0	**23**	**43**	**210**	**14**	0	**267**	**1**	0	**17**	0	**18**	**569**
08:00 AM	8	223	7	3	241	0	4	12	0	16	29	186	8	0	223	0	**1**	11	**2**	14	494
08:15 AM	5	182	6	1	194	0	1	3	0	4	24	160	6	**2**	192	0	0	13	0	13	403
Total Volume	27	819	30	13	889	5	11	45	0	61	128	720	35	2	885	1	1	48	2	52	1887
% App. Total	3	92.1	3.4	1.5		8.2	18	73.8	0		14.5	81.4	4	0.2		1.9	1.9	92.3	3.8		
PHF	.750	.868	.469	.361	.852	.313	.550	.662	.000	.663	.744	.857	.625	.250	.829	.250	.250	.706	.250	.722	.829



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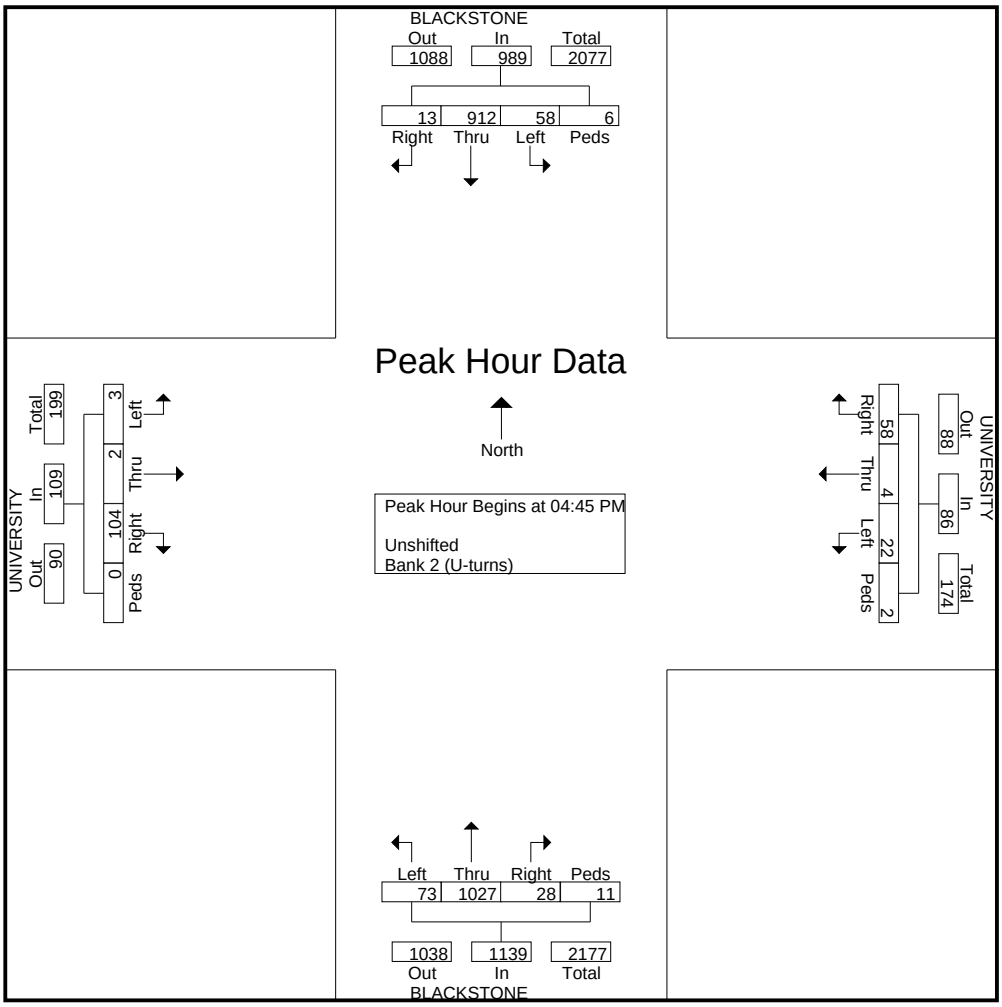
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	9	217	**5**	**3**	234	1	1	10	**1**	13	17	229	6	0	252	0	**1**	**35**	0	**36**	535
05:00 PM	17	229	3	1	250	3	**2**	10	0	15	17	262	7	3	289	1	1	25	0	27	581
05:15 PM	**21**	**242**	4	0	**267**	5	0	**23**	0	28	13	**311**	6	2	**332**	0	0	23	0	23	**650**
05:30 PM	11	224	1	2	238	**13**	1	15	1	**30**	**26**	225	**9**	**6**	266	**2**	0	21	0	23	557
Total Volume	58	912	13	6	989	22	4	58	2	86	73	1027	28	11	1139	3	2	104	0	109	2323
% App. Total	5.9	92.2	1.3	0.6		25.6	4.7	67.4	2.3		6.4	90.2	2.5	1		2.8	1.8	95.4	0		
PHF	.690	.942	.650	.500	.926	.423	.500	.630	.500	.717	.702	.826	.778	.458	.858	.375	.500	.743	.000	.757	.893



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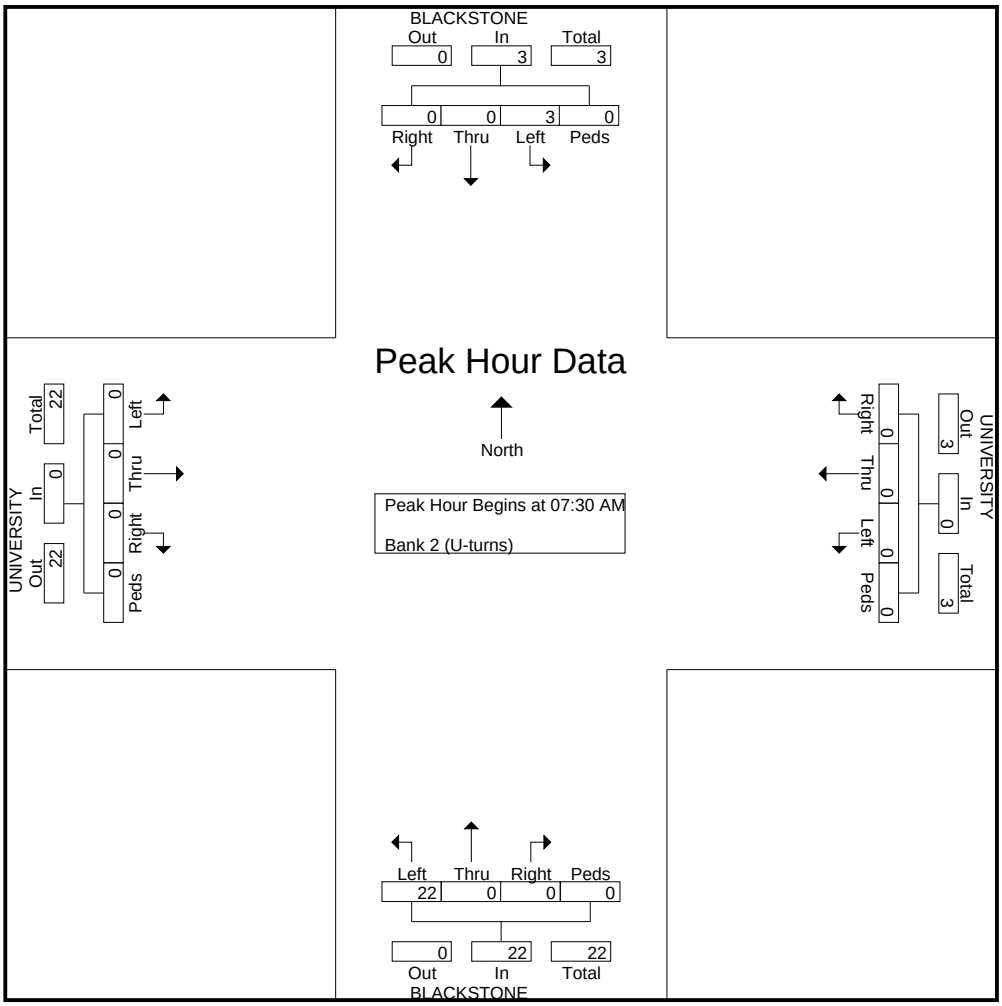
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	0	0	5
07:45 AM	**1**	0	0	0	**1**	0	0	0	0	0	**10**	0	0	0	**10**	0	0	0	0	0	**11**
08:00 AM	1	0	0	0	1	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	4
08:15 AM	1	0	0	0	1	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	5
Total Volume	3	0	0	0	3	0	0	0	0	0	22	0	0	0	22	0	0	0	0	0	25
% App. Total	100	0	0	0		0	0	0	0		100	0	0	0		0	0	0	0		
PHF	.750	.000	.000	.000	.750	.000	.000	.000	.000	.000	.550	.000	.000	.000	.550	.000	.000	.000	.000	.000	.568



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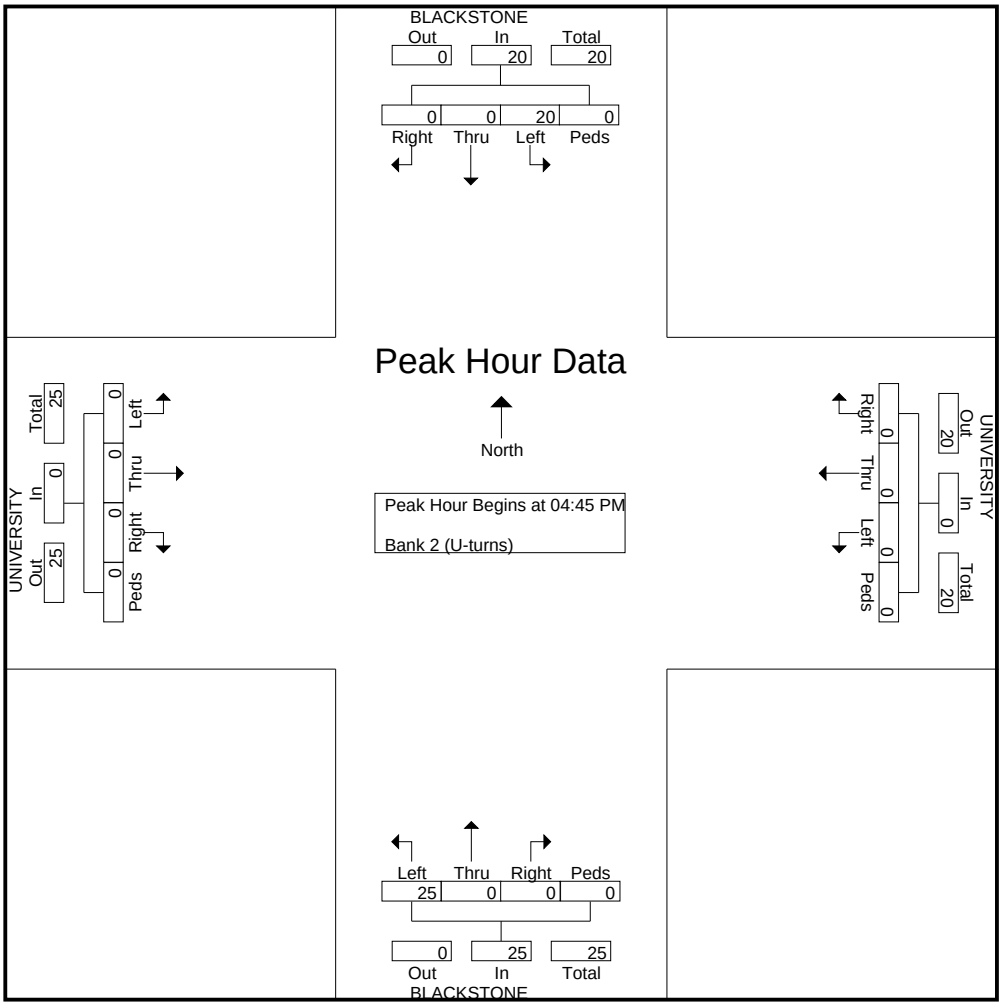
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	1	0	0	0	1	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	7
05:00 PM	6	0	0	0	6	0	0	0	0	0	6	0	0	0	6	0	0	0	0	0	12
05:15 PM	**7**	0	0	0	**7**	0	0	0	0	0	4	0	0	0	4	0	0	0	0	0	11
05:30 PM	6	0	0	0	6	0	0	0	0	0	**9**	0	0	0	**9**	0	0	0	0	0	**15**
Total Volume	20	0	0	0	20	0	0	0	0	0	25	0	0	0	25	0	0	0	0	0	45
% App. Total	100	0	0	0		0	0	0	0		100	0	0	0		0	0	0	0		
PHF	.714	.000	.000	.000	.714	.000	.000	.000	.000	.000	.694	.000	.000	.000	.694	.000	.000	.000	.000	.000	.750



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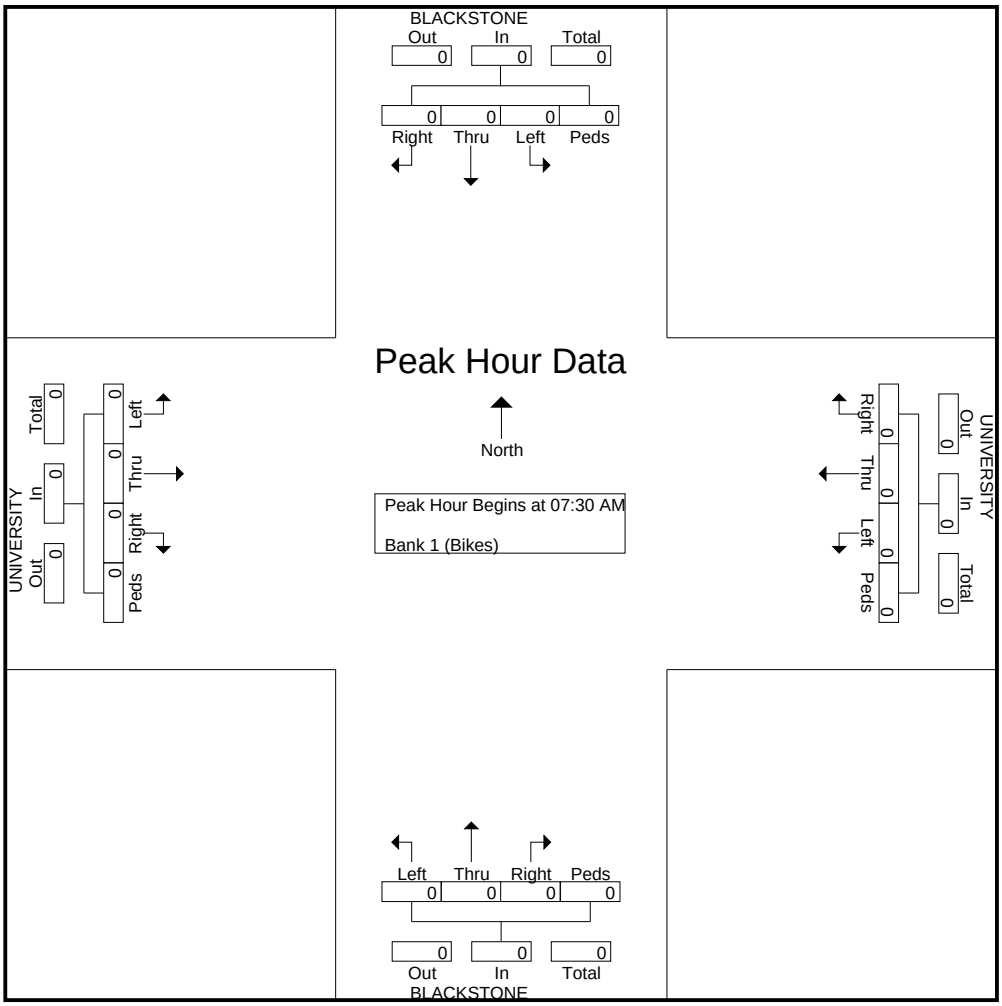
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

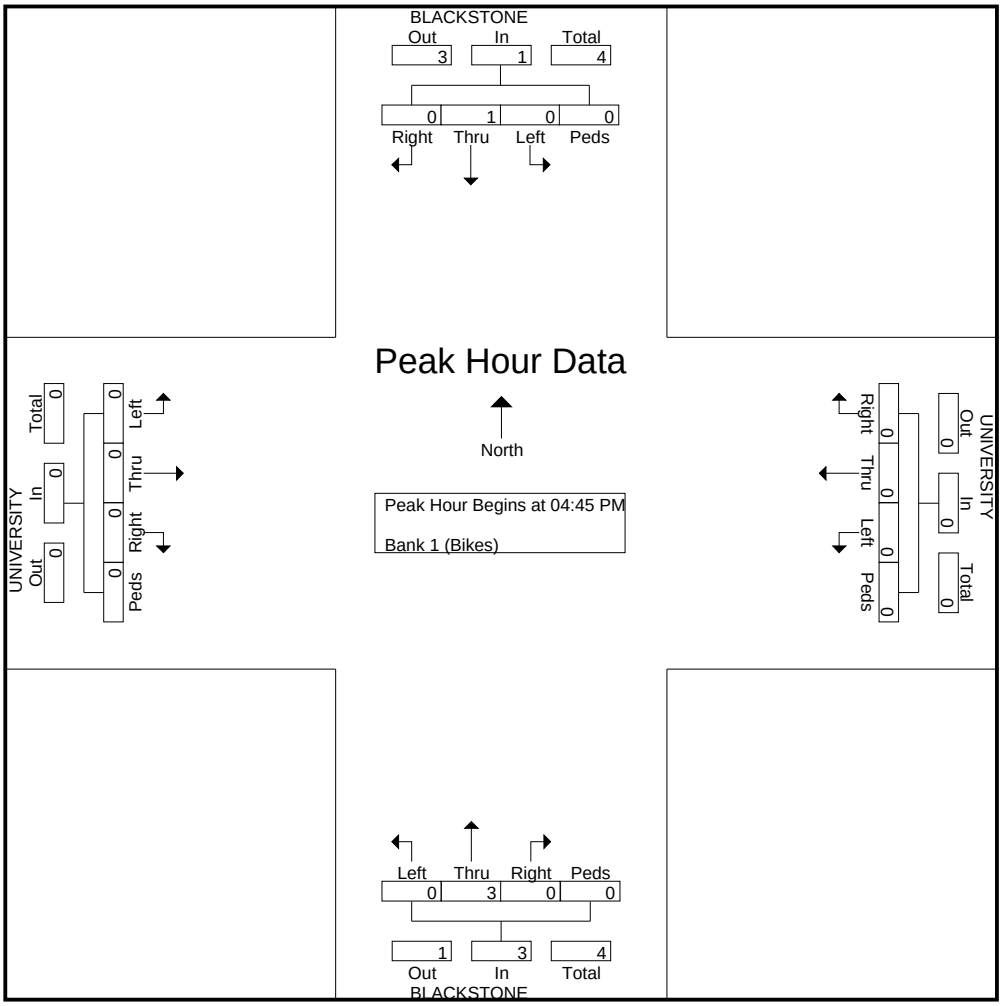


JLB Traffic Engineering, Inc.

1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
(559) 570-8991
Traffic Engineering, Transportation Planning & Parking Solutions
www.JLBtraffic.com

File Name : Blackstone at University
Site Code : 00000000
Start Date : 4/10/2019
Page No : 3

	BLACKSTONE Southbound					UNIVERSITY Westbound					BLACKSTONE Northbound					UNIVERSITY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	**1**	0	0	**1**	0	0	0	0	0	0	**2**	0	0	**2**	0	0	0	0	0	**3**
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total Volume	0	1	0	0	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	4
% App. Total	0	100	0	0		0	0	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.375	.000	.000	.375	.000	.000	.000	.000	.000	.333



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION Blackstone Ave @ McKinley Ave

LATITUDE 36.7651

COUNTY Fresno

LONGITUDE -119.7905

COLLECTION DATE Wednesday, June 5, 2019

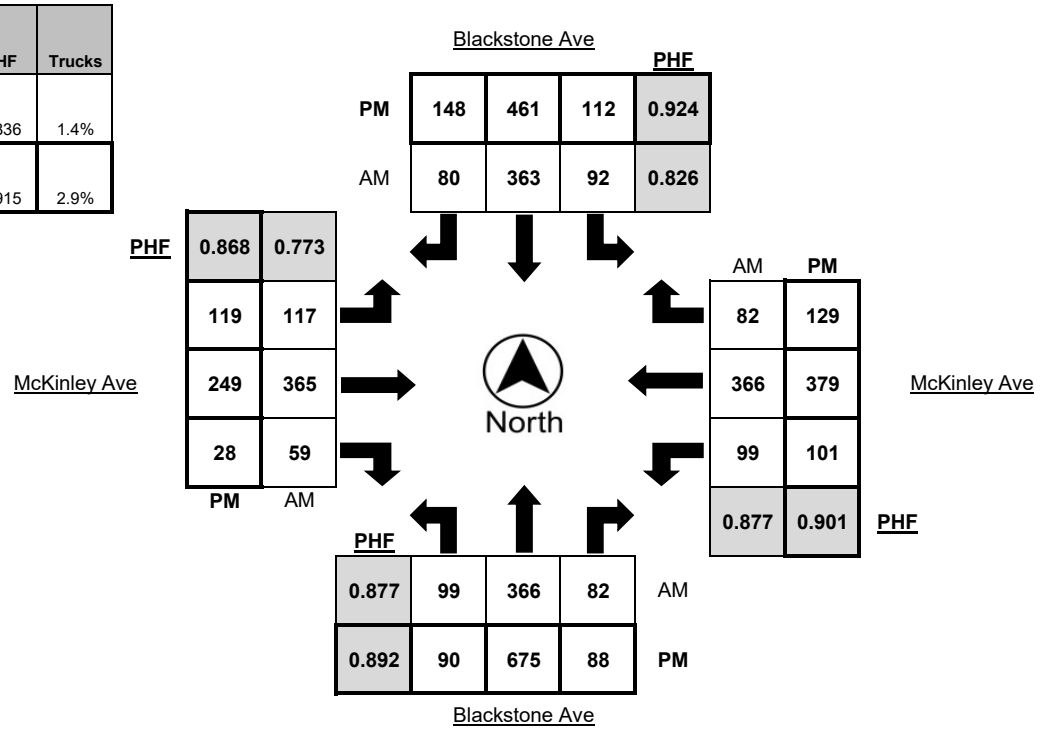
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	19	32	13	3	7	40	13	0	16	43	10	4	19	32	13	0
7:15 AM - 7:30 AM	12	51	14	1	12	72	10	1	25	64	8	8	12	61	14	1
7:30 AM - 7:45 AM	20	110	12	2	16	78	19	2	30	90	13	5	20	110	12	2
7:45 AM - 8:00 AM	20	116	20	0	36	100	26	1	36	122	17	5	20	116	20	0
8:00 AM - 8:15 AM	24	82	21	2	29	95	17	1	33	91	13	4	24	82	21	2
8:15 AM - 8:30 AM	35	58	29	0	11	90	18	0	18	62	16	4	35	58	29	0
8:30 AM - 8:45 AM	19	59	25	4	19	77	31	3	17	51	5	2	19	59	25	4
8:45 AM - 9:00 AM	41	83	24	2	11	65	12	0	14	67	7	8	41	83	24	2
TOTAL	**190**	**591**	**158**	**14**	**141**	**617**	**146**	**8**	**189**	**590**	**89**	**40**	**190**	**601**	**158**	**11**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	10	133	17	12	30	128	29	1	24	52	11	4	28	102	37	3
4:15 PM - 4:30 PM	10	138	23	6	40	93	44	8	30	54	10	6	23	85	40	1
4:30 PM - 4:45 PM	18	162	22	15	25	124	35	3	21	61	12	4	28	84	32	1
4:45 PM - 5:00 PM	20	164	18	12	25	88	35	6	27	50	9	2	26	90	31	0
5:00 PM - 5:15 PM	27	161	22	11	30	120	44	1	37	73	4	1	28	96	25	1
5:15 PM - 5:30 PM	25	188	26	11	32	129	34	3	34	65	3	2	19	109	41	2
5:30 PM - 5:45 PM	22	147	17	10	28	141	35	2	27	58	11	4	26	70	33	2
5:45 PM - 6:00 PM	20	122	15	7	30	129	24	2	24	62	13	0	11	66	36	2
TOTAL	**152**	**1215**	**160**	**84**	**240**	**952**	**280**	**26**	**224**	**475**	**73**	**23**	**189**	**702**	**275**	**12**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	99	366	82	4	92	363	80	4	117	365	59	18	99	366	82	4
4:30 PM - 5:30 PM	90	675	88	49	112	461	148	13	119	249	28	9	101	379	129	4

	PHF	Trucks
AM	0.836	1.4%
PM	0.915	2.9%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

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Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION Blackstone Ave @ McKinley Ave

LATITUDE 36.7651

COUNTY Fresno

LONGITUDE -119.7905

COLLECTION DATE Wednesday, June 5, 2019

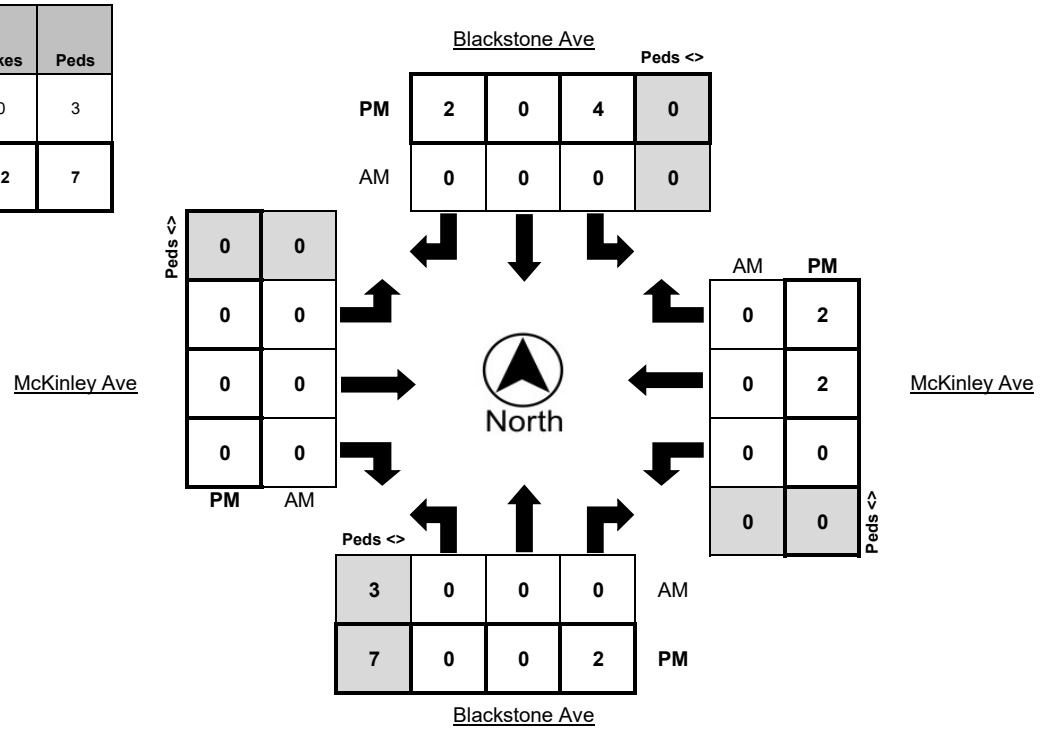
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	1	0	0	1	0	0	0	0	1	0	0	0	1	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	1	1	0	0	0	0	2	0	0	0	0	0	0	0	0
TOTAL	**0**	**2**	**3**	**1**	**0**	**1**	**0**	**6**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	1	0	1	0	0	2	0	0	0	0	0	1	1	0
4:45 PM - 5:00 PM	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	1	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	4	0	0	0	0	0	1	0	0
5:30 PM - 5:45 PM	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0
TOTAL	**0**	**0**	**4**	**0**	**4**	**0**	**2**	**11**	**2**	**0**	**0**	**0**	**0**	**5**	**2**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
4:30 PM - 5:30 PM	0	0	2	0	4	0	2	7	0	0	0	0	0	2	2	0

	Bikes	Peds
AM Peak Total	0	3
PM Peak Total	**12**	**7**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

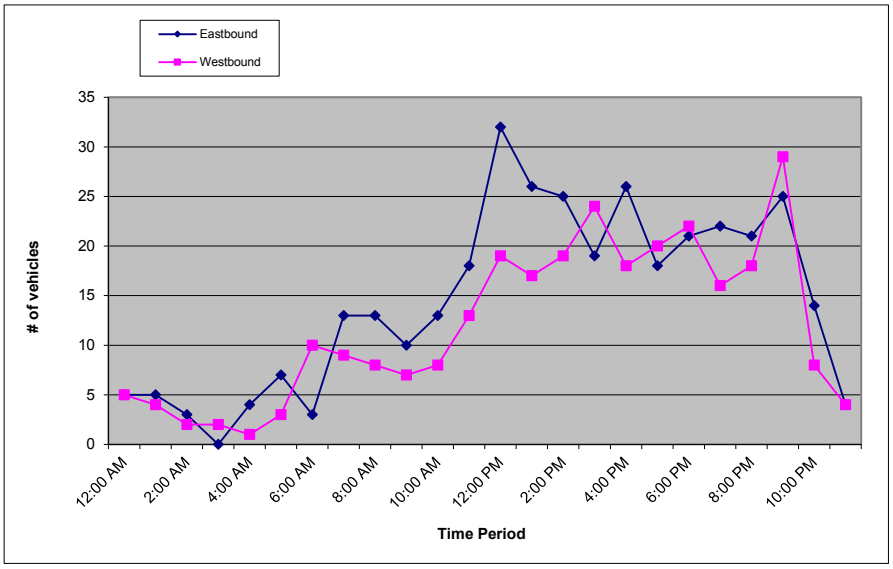
24 Hour Volume Report

Prepared For: **JLB Traffic Engineering, Inc.**
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION Cambridge Ave w/o Blackstone Ave
LATITUDE 36.7695441
COUNTY Fresno
LONGITUDE -119.7912379
COLLECTION DATE Wednesday, June 05, 2019
WEATHER Clear
NUMBER OF LANES 2

	Eastbound					Westbound					Hourly
Hour	:00	:15	:30	:45	**Total**	:00	:15	:30	:45	**Total**	**Totals**
12:00 AM	4	0	0	1	**5**	3	1	1	0	**5**	**10**
1:00 AM	1	0	3	1	**5**	0	0	2	2	**4**	**9**
2:00 AM	2	0	0	1	**3**	0	1	0	1	**2**	**5**
3:00 AM	0	0	0	0	**0**	1	0	0	1	**2**	**2**
4:00 AM	0	1	0	3	**4**	0	0	1	0	**1**	**5**
5:00 AM	0	1	3	3	**7**	1	0	0	2	**3**	**10**
6:00 AM	0	0	0	3	**3**	1	1	1	7	**10**	**13**
7:00 AM	2	2	5	4	**13**	2	1	1	5	**9**	**22**
8:00 AM	3	4	4	2	**13**	1	2	4	1	**8**	**21**
9:00 AM	2	1	3	4	**10**	2	4	1	0	**7**	**17**
10:00 AM	4	2	2	5	**13**	2	0	1	5	**8**	**21**
11:00 AM	3	3	7	5	**18**	1	5	3	4	**13**	**31**
12:00 PM	9	5	9	9	**32**	7	5	7	0	**19**	**51**
1:00 PM	6	7	5	8	**26**	4	6	2	5	**17**	**43**
2:00 PM	2	5	5	13	**25**	5	6	4	4	**19**	**44**
3:00 PM	3	5	8	3	**19**	4	5	5	10	**24**	**43**
4:00 PM	4	8	7	7	**26**	2	3	8	5	**18**	**44**
5:00 PM	5	3	2	8	**18**	5	2	5	8	**20**	**38**
6:00 PM	6	10	2	3	**21**	5	10	5	2	**22**	**43**
7:00 PM	6	6	5	5	**22**	5	3	5	3	**16**	**38**
8:00 PM	2	7	8	4	**21**	4	4	3	7	**18**	**39**
9:00 PM	6	8	7	4	**25**	11	7	7	4	**29**	**54**
10:00 PM	7	4	1	2	**14**	3	2	3	0	**8**	**22**
11:00 PM	4	0	0	0	**4**	2	1	1	0	**4**	**8**
Total	**54.8%**				**347**	**45.2%**				**286**	
	633										

AM%	**26.2%**	**AM Peak**	**32**	**10:45 am to 11:45 am**	**AM P.H.F.**	**0.80**
PM%	**73.8%**	**PM Peak**	**57**	**8:45 pm to 9:45 pm**	**PM P.H.F.**	**0.84**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

24 Hour Volume Report

Prepared For: **JLB Traffic Engineering, Inc.**
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION Glenn Ave s/o Clinton Ave

LATITUDE 36.7718076

COUNTY Fresno

LONGITUDE -119.7933795

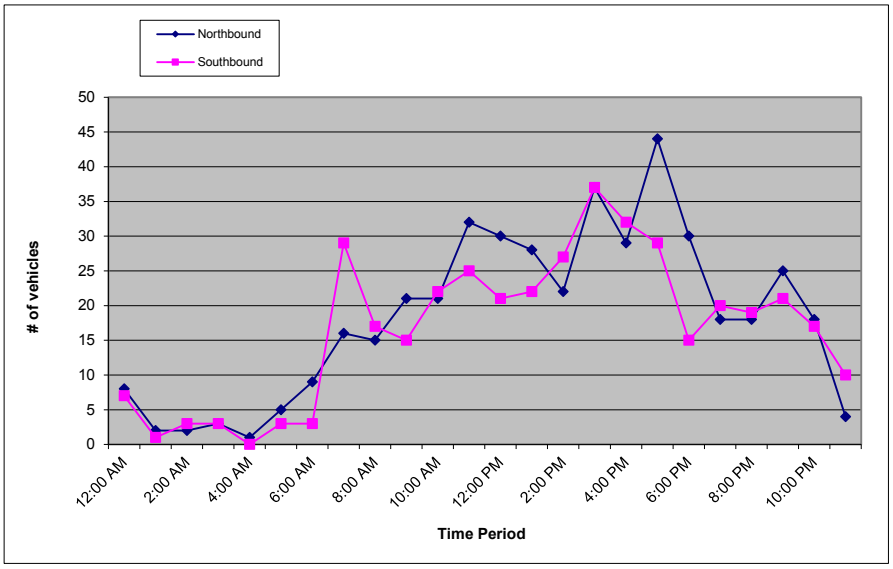
COLLECTION DATE Wednesday, June 05, 2019

WEATHER Clear

NUMBER OF LANES 2

	Northbound					Southbound					Hourly
Hour	:00	:15	:30	:45	**Total**	:00	:15	:30	:45	**Total**	**Totals**
12:00 AM	0	4	3	1	**8**	2	3	2	0	**7**	**15**
1:00 AM	1	1	0	0	**2**	1	0	0	0	**1**	**3**
2:00 AM	0	0	0	2	**2**	1	1	0	1	**3**	**5**
3:00 AM	1	0	2	0	**3**	0	0	2	1	**3**	**6**
4:00 AM	0	0	0	1	**1**	0	0	0	0	**0**	**1**
5:00 AM	1	0	1	3	**5**	3	0	0	0	**3**	**8**
6:00 AM	1	1	3	4	**9**	1	0	1	1	**3**	**12**
7:00 AM	5	4	3	4	**16**	10	0	9	10	**29**	**45**
8:00 AM	6	3	1	5	**15**	8	4	2	3	**17**	**32**
9:00 AM	8	6	6	1	**21**	3	4	3	5	**15**	**36**
10:00 AM	1	7	7	6	**21**	4	5	8	5	**22**	**43**
11:00 AM	9	2	9	12	**32**	5	8	6	6	**25**	**57**
12:00 PM	5	6	10	9	**30**	1	6	9	5	**21**	**51**
1:00 PM	6	4	7	11	**28**	8	4	4	6	**22**	**50**
2:00 PM	2	2	7	11	**22**	6	10	3	8	**27**	**49**
3:00 PM	5	10	12	10	**37**	9	7	14	7	**37**	**74**
4:00 PM	8	7	7	7	**29**	5	5	9	13	**32**	**61**
5:00 PM	9	21	6	8	**44**	5	6	11	7	**29**	**73**
6:00 PM	10	6	7	7	**30**	4	3	5	3	**15**	**45**
7:00 PM	5	6	5	2	**18**	8	5	4	3	**20**	**38**
8:00 PM	3	1	3	11	**18**	5	6	4	4	**19**	**37**
9:00 PM	7	8	8	2	**25**	8	2	8	3	**21**	**46**
10:00 PM	3	10	1	4	**18**	6	4	3	4	**17**	**35**
11:00 PM	2	0	1	1	**4**	2	0	6	2	**10**	**14**
Total	**52.4%**				**438**	**47.6%**				**398**	
	836										

AM%	**31.5%**	**AM Peak**	**57**	**11:00 am to 12:00 pm**	**AM P.H.F.**	**0.79**
PM%	**68.5%**	**PM Peak**	**76**	**2:45 pm to 3:45 pm**	**PM P.H.F.**	**0.73**



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24 Hour Volume Report

Prepared For: **JLB Traffic Engineering, Inc.**
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION San Pablo Ave s/o Clinton Ave

LATITUDE 36.771822

COUNTY Fresno

LONGITUDE -119.7945014

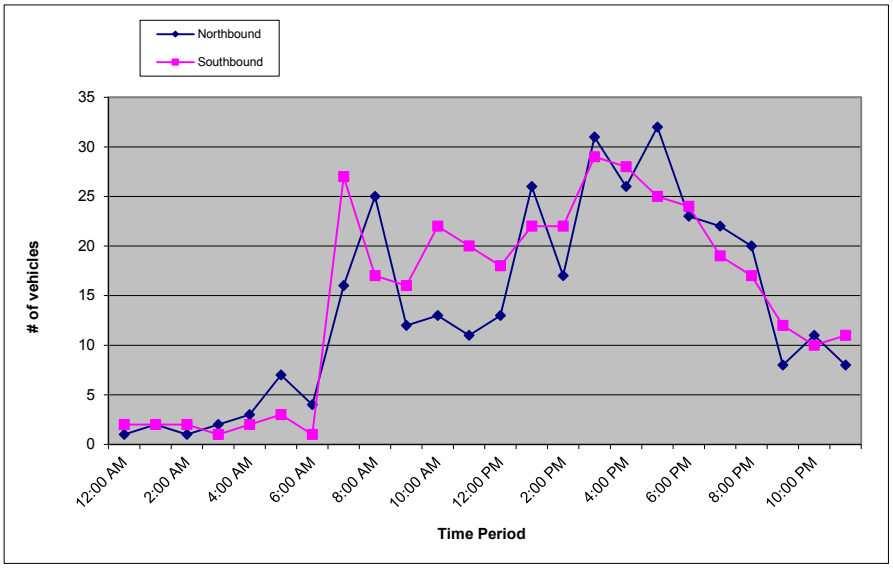
COLLECTION DATE Wednesday, June 05, 2019

WEATHER Clear

NUMBER OF LANES 2

	Northbound					Southbound					Hourly
Hour	:00	:15	:30	:45	**Total**	:00	:15	:30	:45	**Total**	**Totals**
12:00 AM	0	0	1	0	**1**	0	1	1	0	**2**	**3**
1:00 AM	1	1	0	0	**2**	0	2	0	0	**2**	**4**
2:00 AM	1	0	0	0	**1**	2	0	0	0	**2**	**3**
3:00 AM	0	1	1	0	**2**	1	0	0	0	**1**	**3**
4:00 AM	0	0	1	2	**3**	0	0	0	2	**2**	**5**
5:00 AM	1	1	5	0	**7**	0	1	0	2	**3**	**10**
6:00 AM	0	1	2	1	**4**	1	0	0	0	**1**	**5**
7:00 AM	3	6	2	5	**16**	6	3	15	3	**27**	**43**
8:00 AM	3	6	8	8	**25**	7	3	3	4	**17**	**42**
9:00 AM	1	2	6	3	**12**	5	4	2	5	**16**	**28**
10:00 AM	5	3	3	2	**13**	8	6	2	6	**22**	**35**
11:00 AM	2	3	4	2	**11**	5	2	6	7	**20**	**31**
12:00 PM	3	0	6	4	**13**	7	2	2	7	**18**	**31**
1:00 PM	6	3	5	12	**26**	5	2	4	11	**22**	**48**
2:00 PM	5	3	5	4	**17**	8	1	9	4	**22**	**39**
3:00 PM	7	3	11	10	**31**	8	9	9	3	**29**	**60**
4:00 PM	5	7	9	5	**26**	9	9	5	5	**28**	**54**
5:00 PM	4	6	7	15	**32**	6	9	2	8	**25**	**57**
6:00 PM	4	5	9	5	**23**	6	9	3	6	**24**	**47**
7:00 PM	4	7	4	7	**22**	5	5	4	5	**19**	**41**
8:00 PM	2	3	9	6	**20**	4	6	4	3	**17**	**37**
9:00 PM	1	4	2	1	**8**	2	3	4	3	**12**	**20**
10:00 PM	4	0	4	3	**11**	3	3	2	2	**10**	**21**
11:00 PM	1	0	4	3	**8**	4	4	2	1	**11**	**19**
Total	**48.7%**				**334**	**51.3%**				**352**	
	686										

AM%	**30.9%**	**AM Peak**	**44**	**7:30 am to 8:30 am**	**AM P.H.F.**	**0.65**
PM%	**69.1%**	**PM Peak**	**63**	**3:30 pm to 4:30 pm**	**PM P.H.F.**	**0.79**



Appendix C: Traffic Modeling

May 31, 2018

Kai Han, TE
Council of Fresno County Governments
2035 Tulare Street, Suite 201
Fresno, CA 93721

Via E-mail Only: khan@fresnocog.org

Subject: ***Traffic Modeling Request for the Preparation of a Traffic Impact Analysis for the Fresno City College Parking and Facilities Expansion Project in the City of Fresno (JLB Project 004-085)***

Dear Mr. Han,

JLB Traffic Engineering, Inc. (JLB) hereby requests traffic modeling for the State Center Community College District (SCCCD) Environmental Impact Report (EIR) for the proposed Parking and Facilities Expansion Project at the Fresno City College (FCC) campus. The Project is located on and adjacent to the northeast portion of the existing FCC campus in the City of Fresno. The Project consists of the following facilities:

a) Construction of a parking structure on the south side of Cambridge Avenue west of Blackstone Avenue located north of the existing district office building. The proposed parking structure would have a capacity for up to 1,000 parking spaces, include up to five levels of parking, and include ingress/egress points at Weldon Avenue and potentially Cambridge Avenue.
b) Construction of a three-story Science Building approximately 95,000 square-foot located near the southwest corner of Blackstone Avenue and Weldon Avenue. The new Science Building is proposed to include six (6) biology labs, three (3) anatomy and physiology labs, five (5) chemistry labs, two (2) physics labs, two (2) engineering labs, a computer lab, three (3) general educational classrooms, four (4) Design Science (Middle College) classrooms, a welcome center, tutorial space, and 34 faculty offices. Surface parking would also be added adjacent to the building. Existing Maintenance and Operations facilities located in this area would be removed and relocated to a different area of the campus (see section d below).
c) Replacement of the existing one-story, 5,255 square-foot Child Development Center with a new one-story, 16,480 square-foot Child Development Center at its current location.
d) Construction of a one-story, 10,000 square-foot Maintenance and Operations building plus a parking and storage area on the west side of San Pablo Avenue northwest of the existing Health Sciences Building.
e) Repurposing of the existing District administration building located on the north side of Weldon Avenue to accommodate the SCCCD Police Department.

Development of the Project facilities would occur over the next five (5) years. Per information provided to JLB, the Project is consistent with the City of Fresno 2035 General Plan. An aerial of the Project vicinity is shown in Exhibit A.

The purpose of the TIA is to evaluate the potential on-site and off-site traffic impacts, identify short-term roadway and circulation needs, determine potential mitigation measures, and identify any critical traffic issues that should be addressed in the on-going planning process.

Scenarios:

The following scenarios are requested:

1. Base Year 2019 (with Link and TAZ modifications)
2. Cumulative Year 2035 plus Project Select Zone (with Link and TAZ modifications)
3. Difference between model runs 2 and 1 above

Changes and/or additions to the Model Network or TAZ's

JLB reviewed the Fresno COG model network for the Base Year 2019 and Cumulative Year 2035. Based on this review, JLB requests the following link and TAZ Network modifications. Details on the requested Link and TAZ modifications for Base Year 2019 and Cumulative Year 2035 are illustrated in Exhibit B.

LINK and TAZ MODIFICATIONS (For Base Year 2019 Scenario Only):

1. Create existing TAZ A generally located between McKinley Avenue and Weldon Avenue (see Exhibit B). Existing TAZ A shall have one TAZ connector to McKinley Avenue and another to Weldon Avenue. (Note: Existing TAZ A is being removed from the 2019 network and thus its trip generation is presented in negative numbers.)
2. Create existing TAZ B generally located west of Blackstone Avenue between Weldon Avenue and University Avenue (see Exhibit B). Existing TAZ B shall have one TAZ connector to Weldon Avenue and another to University Avenue. (Note: Existing TAZ B is being removed from the 2019 network and thus its trip generation is presented in negative numbers.)
3. Create existing TAZ C1 generally located south of Weldon Avenue and west of Blackstone Avenue (see Exhibit B). Existing TAZ C1 shall have one TAZ connector to Weldon Avenue. (Note: Existing TAZ C1 is being removed from the 2019 network and thus its trip generation is presented in negative numbers.)
4. Create existing TAZ C2 generally located west of Blackstone Avenue and between Cambridge Avenue and Weldon Avenue (see Exhibit B). Existing TAZ C2 shall have one TAZ connector to Cambridge Avenue and another to Weldon Avenue. (Note: Existing TAZ C2 is being removed from the 2019 network and thus its trip generation is presented in negative numbers.)
5. Create existing TAZ D generally located south of Weldon Avenue and west of Blackstone Avenue (see Exhibit B). Existing TAZ D shall have one TAZ connector to Weldon Avenue. (Note: Existing TAZ D is being removed from the 2019 network and thus its trip generation is presented in negative numbers.)

LINK and TAZ MODIFICATIONS (For Base Year 2019 and Cumulative Year 2035 plus Project Select Zone Scenarios):

1. Modify TAZ 965 to eliminate TAZ connector to Shields Avenue.
2. Modify TAZ 967 to eliminate TAZ connector to Shields Avenue.
3. Modify Maroa Avenue to increase northbound lanes between McKinley Avenue and Node 2597 to two lanes.

4. Create College Avenue between Clinton Avenue and Weldon Avenue. College Avenue is located approximately 650 feet east of Maroa Avenue.
   a. Classification: Local Street
   b. Lanes: One in each direction
   c. Speed: 25 MPH
5. Create Weldon Avenue between Maroa Avenue and College Avenue. Weldon Avenue is located approximately 1,320 feet south of Clinton Avenue.
   a. Classification: Local Street
   b. Lanes: One in each direction
   c. Speed: 25 MPH
6. Create San Pablo Avenue between Clinton Avenue and Cambridge Avenue. San Pablo Avenue is located approximately 1,140 feet west of Blackstone Avenue.
   a. Classification: Local Street
   b. Lanes: One in each direction
   c. Speed: 25 MPH
7. Create Glenn Avenue between Clinton Avenue and Cambridge Avenue. Glenn Avenue is located approximately 800 feet west of Blackstone Avenue.
   a. Classification: Local Street
   b. Lanes: One in each direction
   c. Speed: 25 MPH
8. Create Cambridge Avenue between San Pablo Avenue and 1,950 feet east of Blackstone Avenue. Cambridge Avenue is located approximately 1,000 feet south of Clinton Avenue.
   a. Classification: Local Street
   b. Lanes: One in each direction
   c. Speed: 25 MPH
9. Create Weldon Avenue west of Blackstone Avenue for approximately 925 feet. Weldon Avenue is located approximately 340 feet south of Cambridge Avenue.
   a. Classification: Local Street
   b. Lanes: One in each direction
   c. Speed: 25 MPH
10. Create University Avenue between Fresno Street and 460 feet west of Blackstone Avenue. University Avenue is located approximately 650 feet south of Weldon Avenue.
    a. Classification: Local Street
    b. Lanes: One in each direction
    c. Speed: 25 MPH
11. Modify TAZ 963 as follows:
    a. Eliminate existing TAZ connectors to Clinton Avenue, Maroa Avenue, and McKinley Avenue.
    b. Split existing TAZ 963 into three (3) TAZs – TAZ 963A, TAZ 963B, and TAZ 963C.
       i. Create TAZ 963A (residential land use) bounded by Clinton Avenue, the railroad, and College Avenue. TAZ 963A shall have one TAZ connector to College Avenue.

ii. Create TAZ 963B (residential land use) bounded by Clinton Avenue, College Avenue, Weldon Avenue, and Maroa Avenue. TAZ 963B shall have TAZ connectors to Clinton Avenue, College Avenue, Weldon Avenue, and Maroa Avenue.

iii. Create TAZ 963C (junior/community college land use) bounded by College Avenue, the railroad, McKinley Avenue, and Maroa Avenue. TAZ 963C shall have TAZ connectors to both Weldon Avenue extensions, University Avenue, McKinley Avenue, and Maroa Avenue.

12. Modify TAZ 964 as follows:
    a. Eliminate existing TAZ connectors to Clinton Avenue and Blackstone Avenue.
    b. Split existing TAZ 964 into six (6) TAZs – TAZ 964A, TAZ 964B, TAZ 964C, TAZ 964D, TAZ 964E, and TAZ 964F.
        i. Create TAZ 964A (residential land use) bounded by the railroad, Clinton Avenue, and San Pablo Avenue. TAZ 964A shall have TAZ connectors to Clinton Avenue and San Pablo Avenue.
        ii. Create TAZ 964B (residential land use) bounded by Clinton Avenue, Glenn Avenue, Cambridge Avenue, and San Pablo Avenue. TAZ 964B shall have TAZ connectors to Glenn Avenue and San Pablo Avenue.
        iii. Create TAZ 964C (residential land use) bounded by Clinton Avenue, Blackstone Avenue, Cambridge Avenue, and Glenn Avenue. TAZ 964C shall have TAZ connectors to Clinton Avenue, Blackstone Avenue, Cambridge Avenue, and Glenn Avenue.
        iv. Create TAZ 964D (junior/community college land use) bounded by the railroad, Cambridge Avenue, Blackstone Avenue, and Weldon Avenue. TAZ 964D shall have TAZ connectors to Cambridge Avenue and Weldon Avenue.
        v. Create TAZ 964E (junior/community college land use) bounded by the railroad, Weldon Avenue, Blackstone Avenue, and University Avenue. TAZ 964E shall have TAZ connectors to Weldon Avenue and University Avenue.
        vi. Create TAZ 964F (commercial land use) bounded by the railroad, University Avenue, Blackstone Avenue, and McKinley Avenue. TAZ 964F shall have TAZ connectors to University Avenue, Blackstone Avenue, and McKinley Avenue.
13. Modify TAZ 966 as follows:
    a. Eliminate existing TAZ connectors to Clinton Avenue, Blackstone Avenue, and McKinley Avenue.
    b. Split existing TAZ 966 into three (3) TAZs – TAZ 966A, TAZ 966B, and TAZ 966C.
        i. Create TAZ 966A bounded by Clinton Avenue, Blackstone Avenue, and Cambridge Avenue. TAZ 966A shall have TAZ connectors to Clinton Avenue, Blackstone Avenue, and Cambridge Avenue.
        ii. Create TAZ 966B bounded by Cambridge Avenue, Fresno Street, University Avenue, and Blackstone Avenue. TAZ 966B shall have TAZ connectors to Cambridge Avenue, Fresno Avenue, and University Avenue.
        iii. Create TAZ 966C bounded by University Avenue, Fresno Avenue, McKinley Avenue, and Blackstone Avenue. TAZ 966C shall have TAZ connectors to University Avenue, Fresno Avenue, McKinley Avenue, and Blackstone Avenue.
14. Modify Fresno Avenue to increase lanes between McKinley Avenue and Divisadero Street to two lanes in each direction.

LINK and TAZ MODIFICATIONS (For Cumulative Year 2035 plus Project Select Zone Scenario Only):

1. Create future TAZ A generally located south of Weldon Avenue and west of Blackstone Avenue (see Exhibit B). Future TAZ A shall have one TAZ connector to Weldon Avenue. (Note: Future TAZ A is being added to the 2035 network and thus its trip generation is presented in positive numbers.)
2. Create future TAZ B generally located west of Blackstone Avenue between Weldon Avenue and University Avenue (see Exhibit B). Future TAZ B shall have one TAZ connector to Weldon Avenue and another to University Avenue. (Note: Future TAZ B is being added to the 2035 network and thus its trip generation is presented in positive numbers.)
3. Create future TAZ C generally located west of Blackstone Avenue and between Cambridge Avenue and Weldon Avenue (see Exhibit B). Future TAZ C shall have one TAZ connector to Cambridge Avenue and another to Weldon Avenue. (Note: Future TAZ C is being added to the 2035 network and thus its trip generation is presented in positive numbers.)
4. Create future TAZ D generally located west of San Pablo Avenue and south of Clinton Avenue (see Exhibit B). Future TAZ D shall have one TAZ connector to San Pablo Avenue. (Note: Future TAZ D is being added to the 2035 network and thus its trip generation is presented in positive numbers.)

TAZ A Trip Generation (For Base Year 2019 and Cumulative Year 2035 plus Project Select Zone Scenarios)

Table I presents the trip generation for 2019 TAZ A pursuant to the 10th Edition of the Trip Generation Manual with trip generation rates for Junior/Community College. At present, TAZ A is estimated to generate a maximum of 1,127 daily trips, 108 AM peak hour trips and 108 PM peak hour trips.

Table I: 2019 TAZ A Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In %	Out %	In	Out	Total	Trip Rate	In %	Out %	In	Out	Total
Junior/Community College (540)	980	students	1.15	-1,127	0.11	81	19	-87	-21	-108	0.11	56	44	-60	-48	-108
2019 TAZ A Trips				**-1,127**				**-87**	**-21**	**-108**				**-60**	**-48**	**-108**

Table II presents the trip generation for 2035 TAZ A pursuant to the 10th Edition of the Trip Generation Manual with trip generation rates for Junior/Community College. At buildout, TAZ A is estimated to generate a maximum of 1,127 daily trips, 108 AM peak hour trips and 108 PM peak hour trips.

Table II: 2035 TAZ A Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In %	Out %	In	Out	Total	Trip Rate	In %	Out %	In	Out	Total
Junior/Community College (540)	1,110	students	1.15	1,277	0.11	81	19	99	23	122	0.11	56	44	68	54	122
2035 TAZ A Trips				**1,277**				**99**	**23**	**122**				**68**	**54**	**122**

TAZ B Trip Generation (For Base Year 2019 and Cumulative Year 2035 plus Project Select Zone Scenarios)

Table III presents the trip generation for 2019 TAZ B pursuant to the 10th Edition of the Trip Generation Manual with trip generation rates for Day Care Center. At present, TAZ B is estimated to generate a maximum of 315 daily trips, 60 AM peak hour trips and 61 PM peak hour trips.

Table III: 2019 TAZ B Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In %	Out %	In	Out	Total	Trip Rate	In %	Out %	In	Out	Total
Day Care Center (565)	77	students	4.09	-315	0.78	53	47	-32	-28	-60	0.79	47	53	-29	-32	-61
2019 TAZ B Trips				**-315**				**-32**	**-28**	**-60**				**-29**	**-32**	**-61**

Table VI presents the trip generation for 2035 TAZ B pursuant to the 10th Edition of the Trip Generation Manual with trip generation rates for Day Care Center. At buildout, TAZ B is estimated to generate a maximum of 487 daily trips, 93 AM peak hour trips and 94 PM peak hour trips.

Table IV: 2035 TAZ B Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In %	Out %	In	Out	Total	Trip Rate	In %	Out %	In	Out	Total
Day Care Center (565)	119	students	4.09	487	0.78	53	47	49	44	93	0.79	47	53	44	50	94
2035 TAZ B Trips				**487**				**49**	**44**	**93**				**44**	**50**	**94**

TAZ C Trip Generation (For Base Year 2019 and Cumulative Year 2035 plus Project Select Zone Scenarios)

Table V presents the trip generation for 2019 TAZ C1 pursuant to the 10th Edition of the Trip Generation Manual with trip generation rates for Government Office Building. At present, TAZ C1 is estimated to generate a maximum of 171 daily trips, 25 AM peak hour trips and 16 PM peak hour trips.

Table V: 2019 TAZ C1 Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In %	Out %	In	Out	Total	Trip Rate	In %	Out %	In	Out	Total
Government Office Building (730)	23	employees	7.45	-171	1.10	75	25	-19	-6	-25	0.71	20	80	-3	-13	-16
2019 TAZ C1 Trips				**-171**				**-19**	**-6**	**-25**				**-3**	**-13**	**-16**

Table VI presents the trip generation for 2019 TAZ C2 pursuant to the 10th Edition of the Trip Generation Manual with trip generation rates for School District Office. At present, TAZ C2 is estimated to generate a maximum of 356 daily trips, 58 AM peak hour trips and 50 PM peak hour trips.

Table VI: 2019 TAZ C2 Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In %	Out %	In	Out	Total	Trip Rate	In %	Out %	In	Out	Total
School District Office (538)	70	employees	5.08	-356	0.83	76	24	-44	-14	-58	0.72	17	83	-9	-41	-50
2019 TAZ C2 Trips				**-356**				**-44**	**-14**	**-58**				**-9**	**-41**	**-50**

Table VII presents the trip generation for 2035 TAZ C pursuant to the 10th Edition of the Trip Generation Manual with trip generation rates for School District Office and Government Office Building. At buildout, TAZ C is estimated to generate a maximum of 410 daily trips, 64 AM peak hour trips and 50 PM peak hour trips.

Table VII: 2035 TAZ C Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In %	Out %	In	Out	Total	Trip Rate	In %	Out %	In	Out	Total
School District Office (538)	47	employees	5.08	239	0.83	76	24	30	9	39	0.72	17	83	6	28	34
Government Office Building (730)	23	employees	7.45	171	1.10	75	25	19	6	25	0.71	20	80	3	13	16
2035 TAZ B Trips				**410**				**49**	**15**	**64**				**9**	**41**	**50**

TAZ D Trip Generation (For Base Year 2019 and Cumulative Year 2035 plus Project Select Zone Scenarios)

Table VIII presents the trip generation for 2019 TAZ D with trip generation rates for Maintenance and Operations. The trip generation rates for the Maintenance and Operations building were prepared based on operational data provided by SCCCD. At present, TAZ D is estimated to generate a maximum of 76 daily trips, 11 AM peak hour trips and 2 PM peak hour trips.

Table VIII: 2019 TAZ D Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In %	Out %	In	Out	Total	Trip Rate	In %	Out %	In	Out	Total
Maintenance and Operations	30	employees	2.52	-76	0.38	50	50	-6	-5	-11	0.08	50	50	-1	-1	-2
2019 TAZ D Trips				**-76**				**-6**	**-5**	**-11**				**-1**	**-1**	**-2**

Table IX presents the trip generation for 2035 TAZ D with trip generation rates for Maintenance and Operations. The trip generation rates for the Maintenance and Operations building were prepared based on operational data provided by SCCCD. At buildout, TAZ D is estimated to generate a maximum of 56 daily trips, 8 AM peak hour trips and 2 PM peak hour trips.

Table IX: 2035 TAZ D Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In %	Out %	In	Out	Total	Trip Rate	In %	Out %	In	Out	Total
Maintenance and Operations	22	employees	2.52	56	0.38	50	50	4	4	8	0.08	50	50	1	1	2
2035 TAZ D Trips				**56**				**4**	**4**	**8**				**1**	**1**	**2**

Please invoice JLB Traffic Engineering, Inc. and reference JLB Project No. 004-085 on the invoice. If you have any questions or require additional information, please do not hesitate to contact me by phone at (559) 317-6273 or by e-mail at smaciel@JLBtraffic.com.

Sincerely,

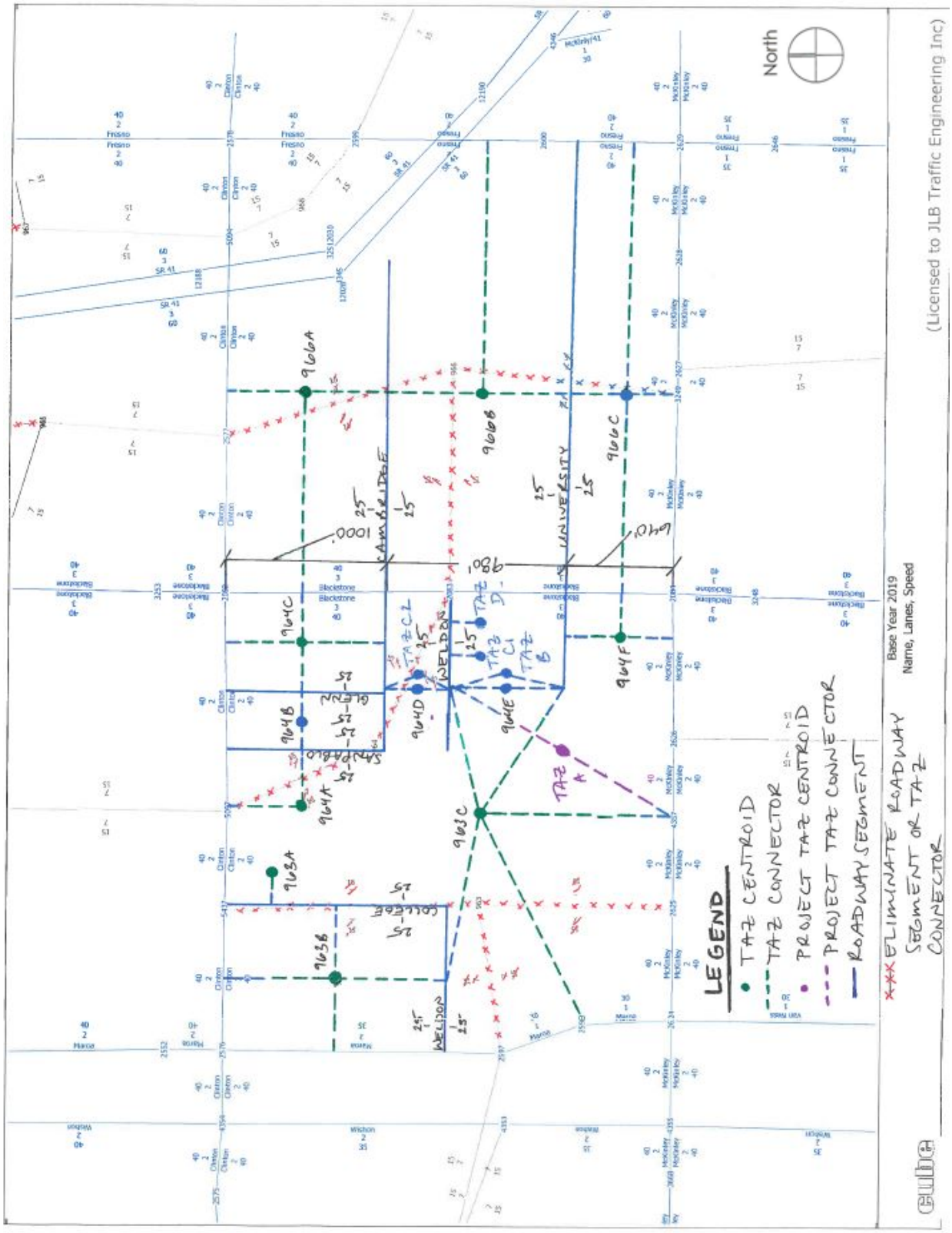
Susana Maciel

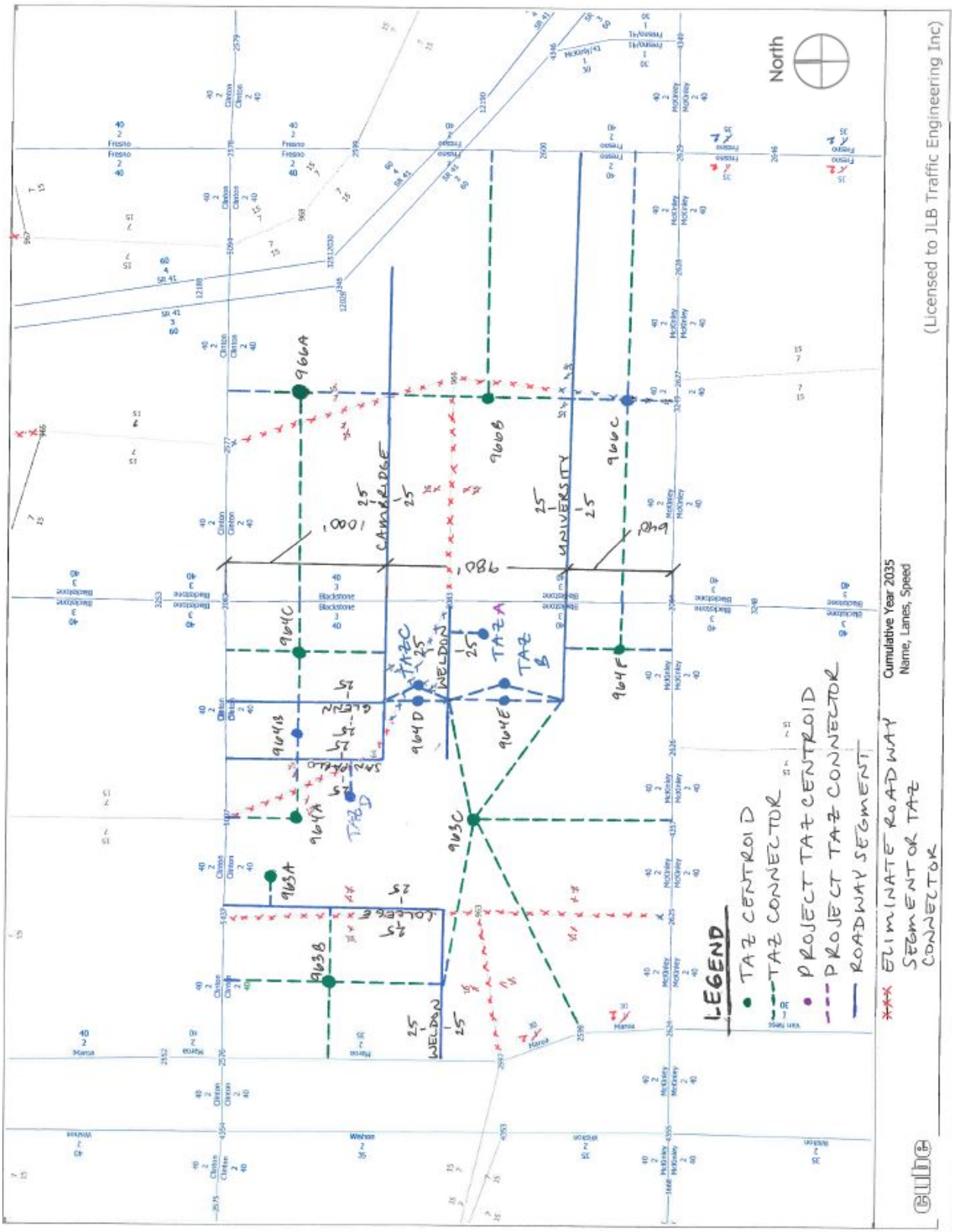
Susana Maciel, EIT
Engineer I/II

cc: Lang Yu, Fresno COG
Jose Benavides, JLB Traffic Engineering, Inc.

Exhibit A – Aerial

Exhibit B – Model TAZ Modifications




North
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Cumulative Year 2035
Name, Lanes, Speed
LEGEND
TAZ CENTROID
TAZ CONNECTOR
PROJECT TAZ CENTROID
PROJECT TAZ CONNECTOR
ROADWAY SEGMENT
ELIMINATE ROADWAY SEGMENT OR TAZ CONNECTOR
CAMBRIDGE
UNIVERSITY
WELDON
GLENN
SAN PABLO
COLLEGE
966A
966B
966C
964C
964D
964E
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TAZ C
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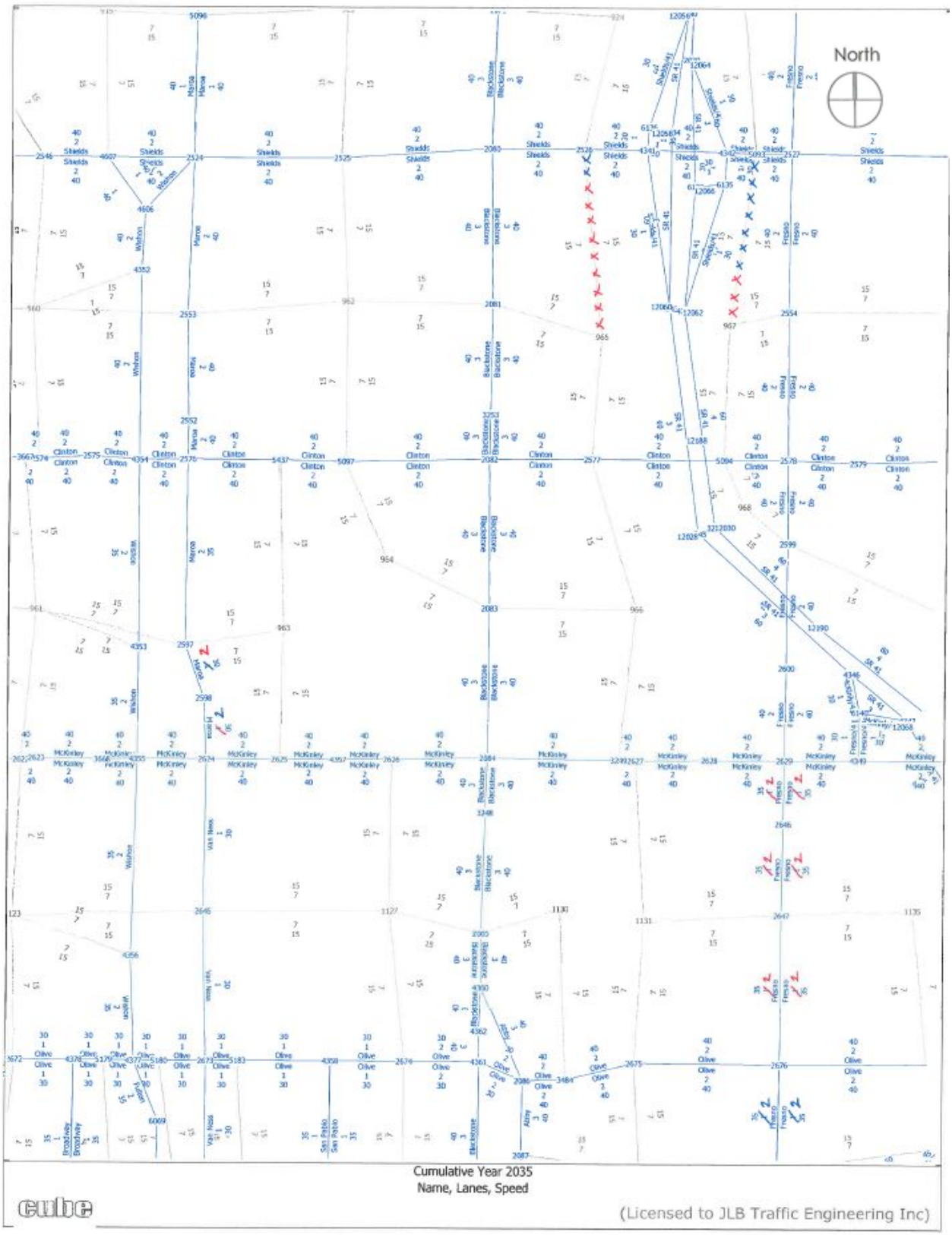
980'
940'


North
Cumulative Year 2035
Name, Lanes, Speed
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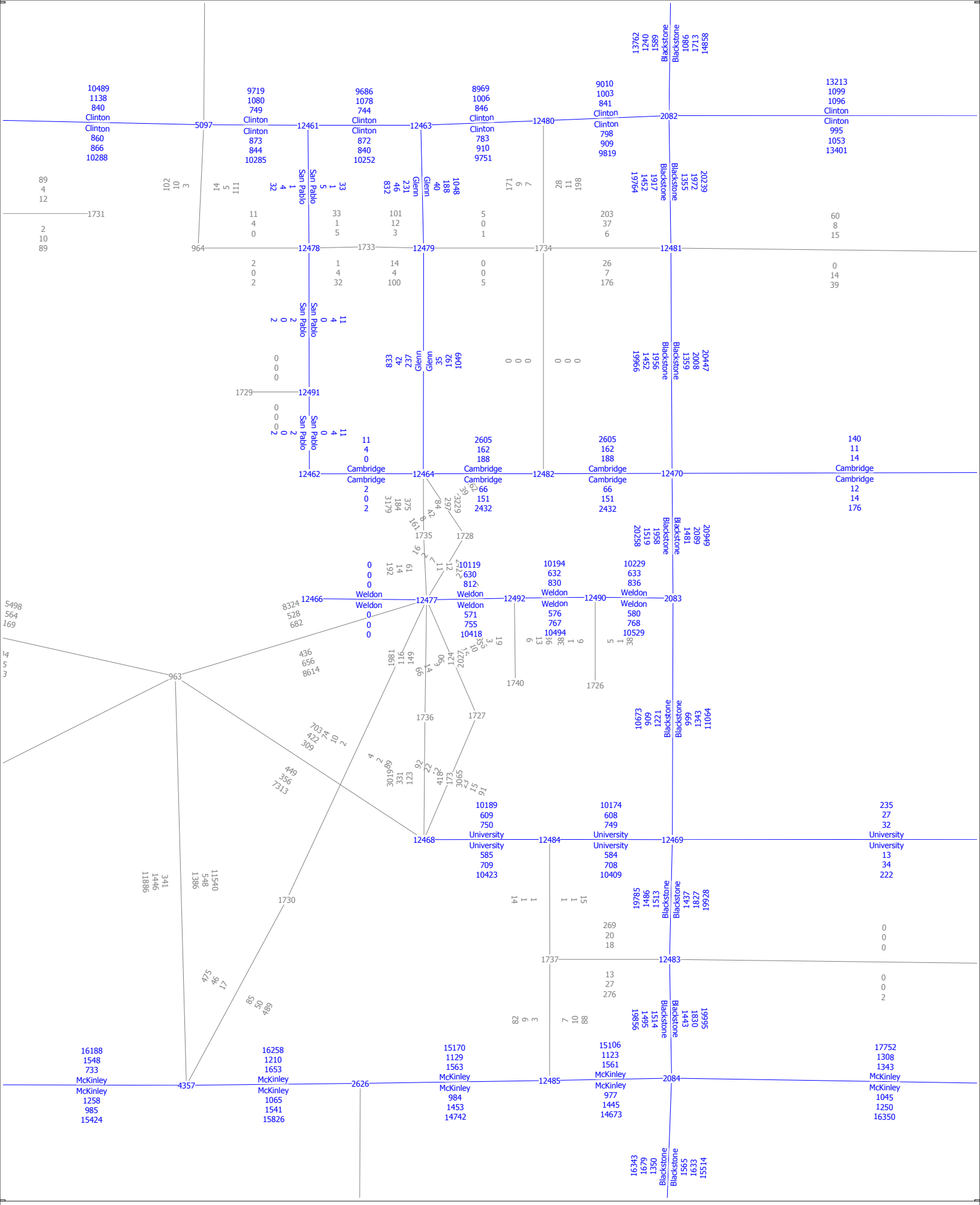

Base Year 2019
AM, PM and Daily Volumes

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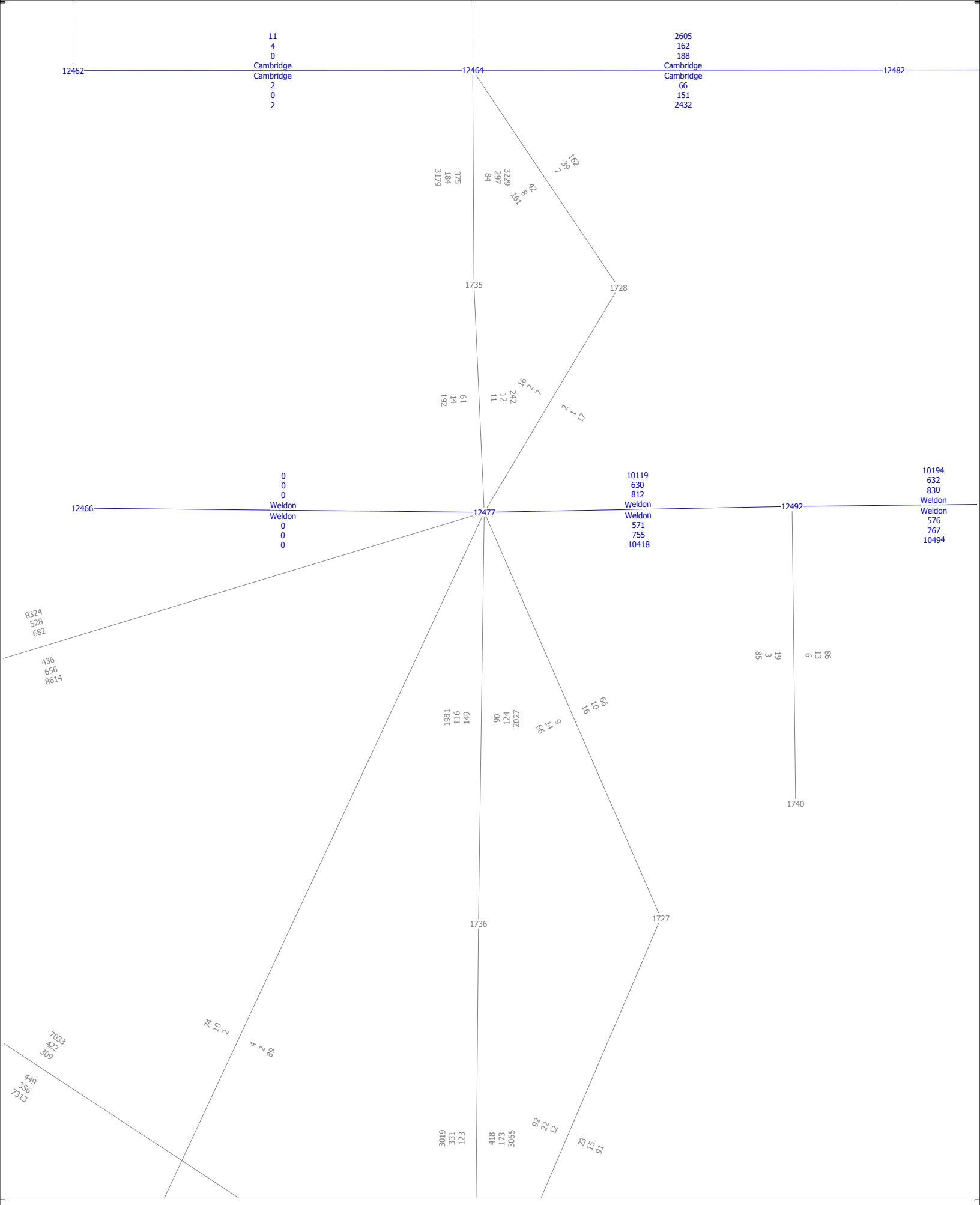

Base Year 2019
AM, PM and Daily Volumes

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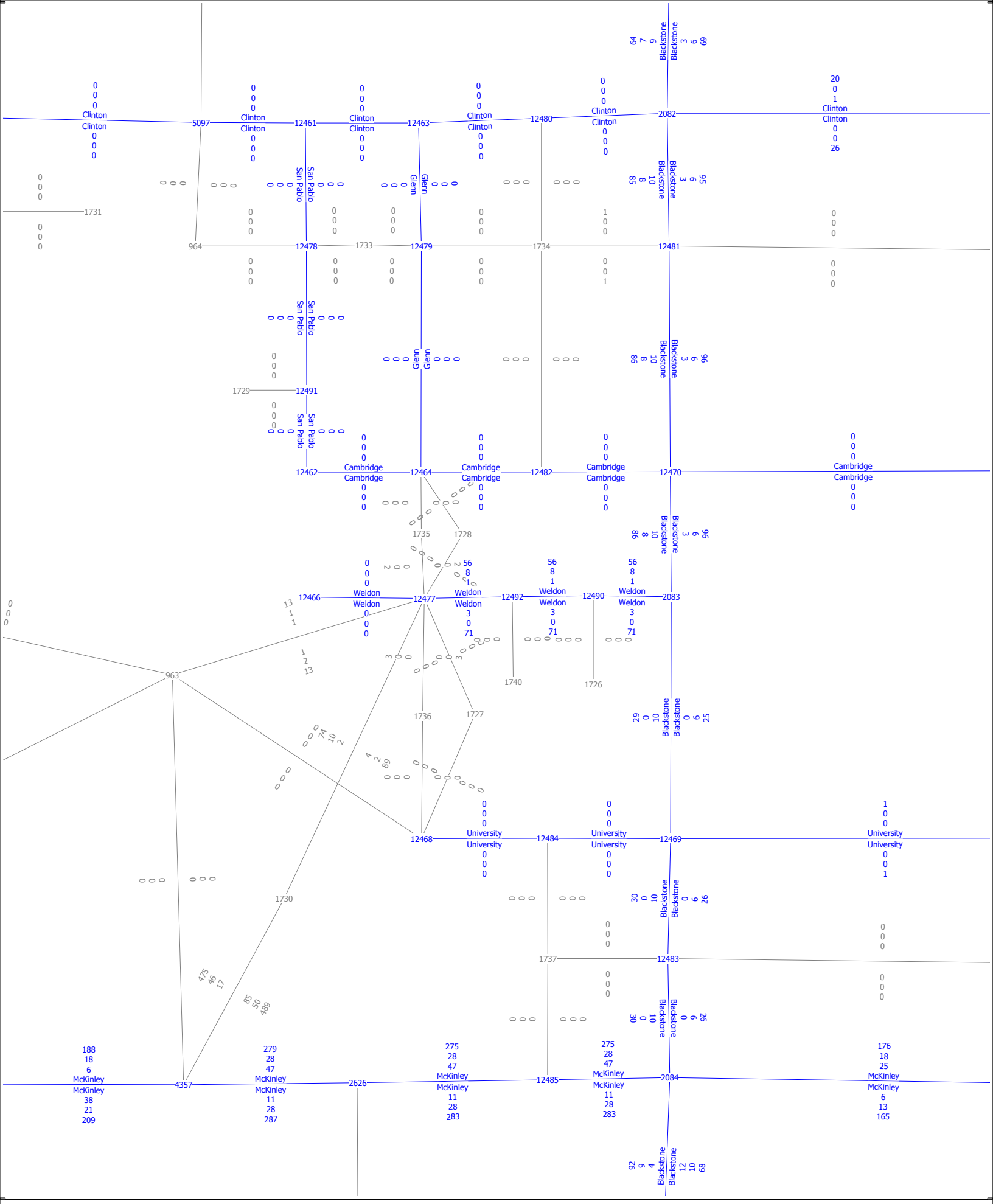

Base Year 2019
Science Building
AM, PM and Daily Volumes

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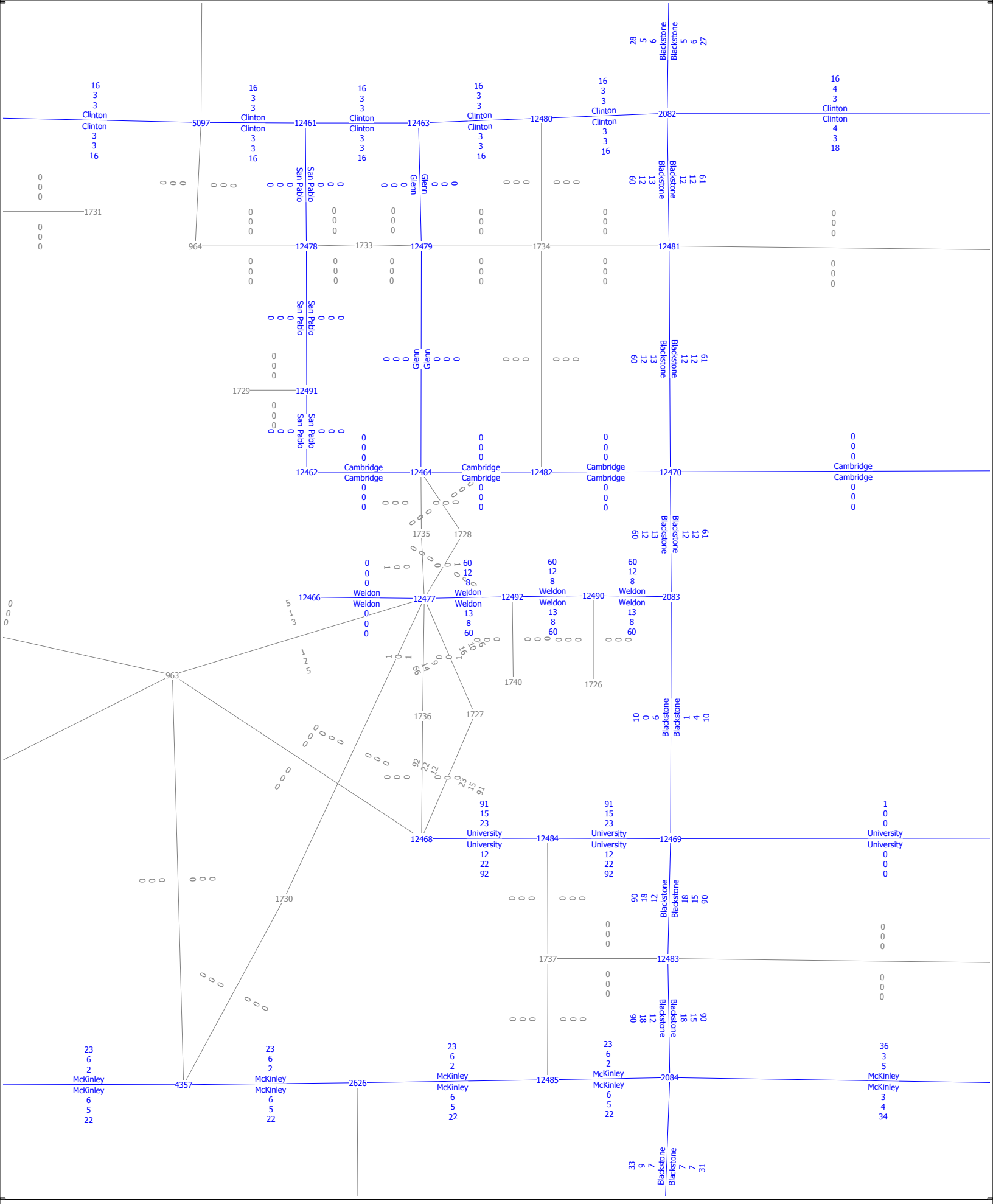

Base Year 2019
Child Development Center
AM, PM and Daily Volumes

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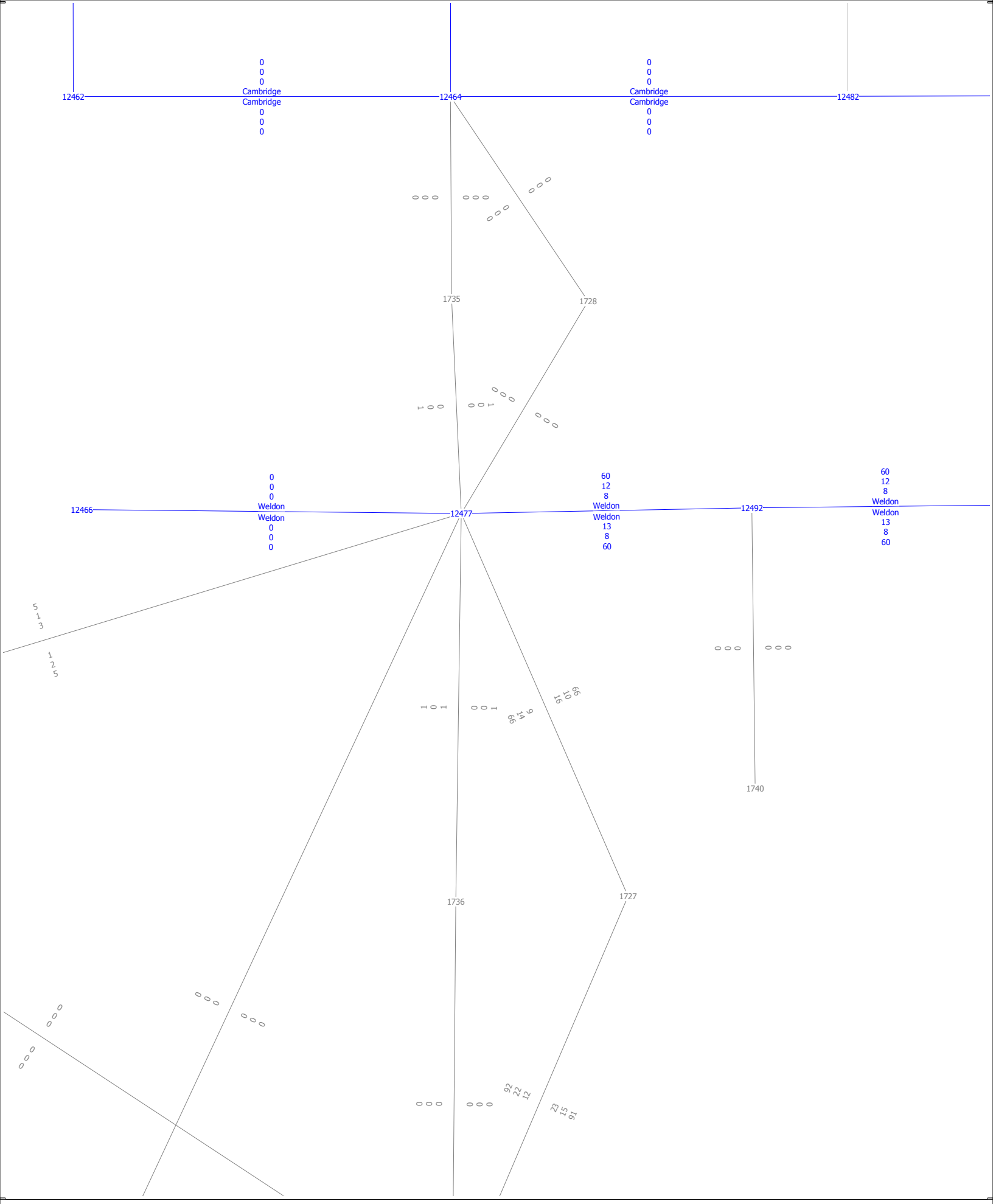

Base Year 2019
Child Development Center
AM, PM and Daily Volumes

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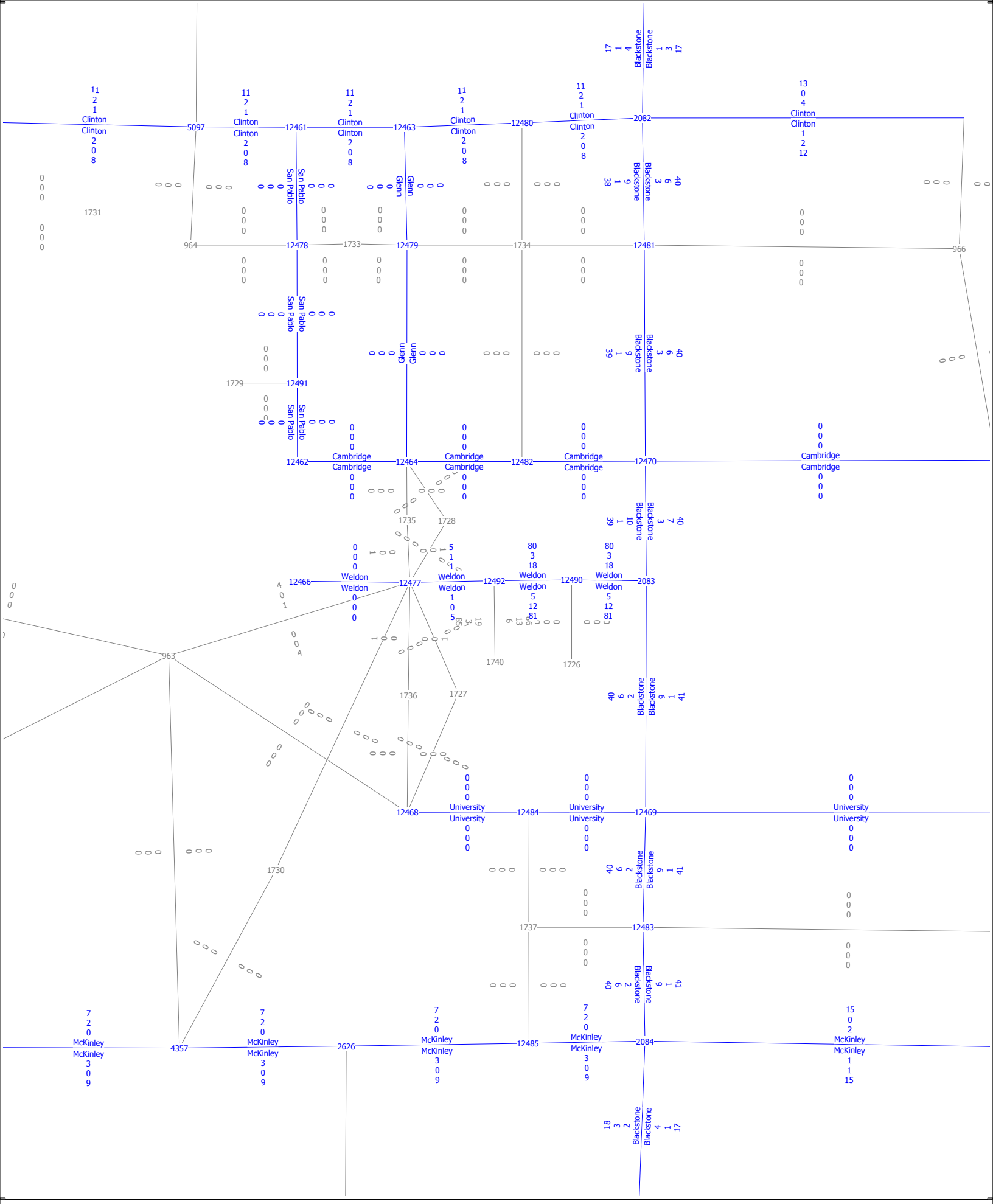

Base Year 2019
Police Department
AM, PM and Daily Volumes

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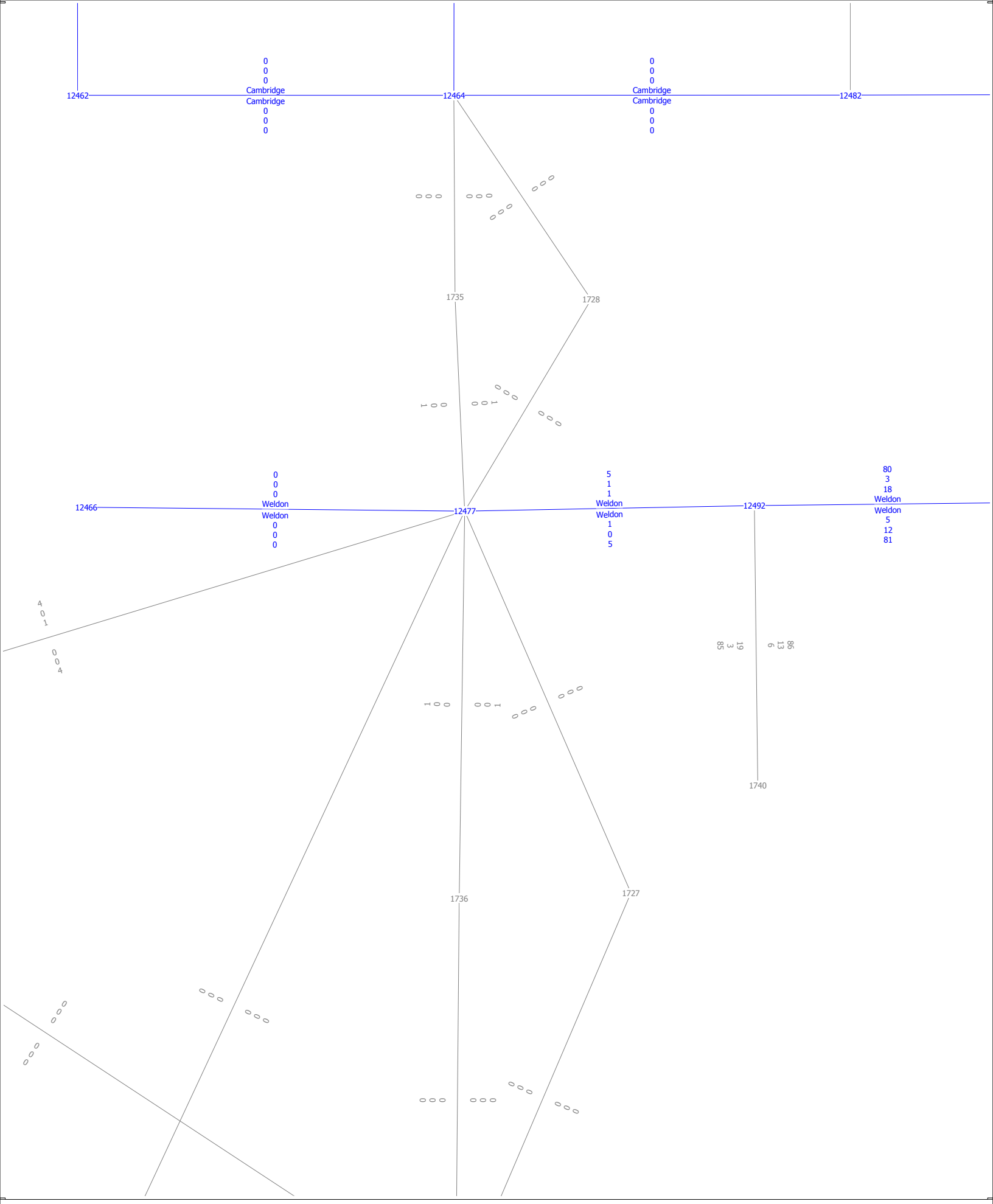

Base Year 2019
Police Department
AM, PM and Daily Volumes

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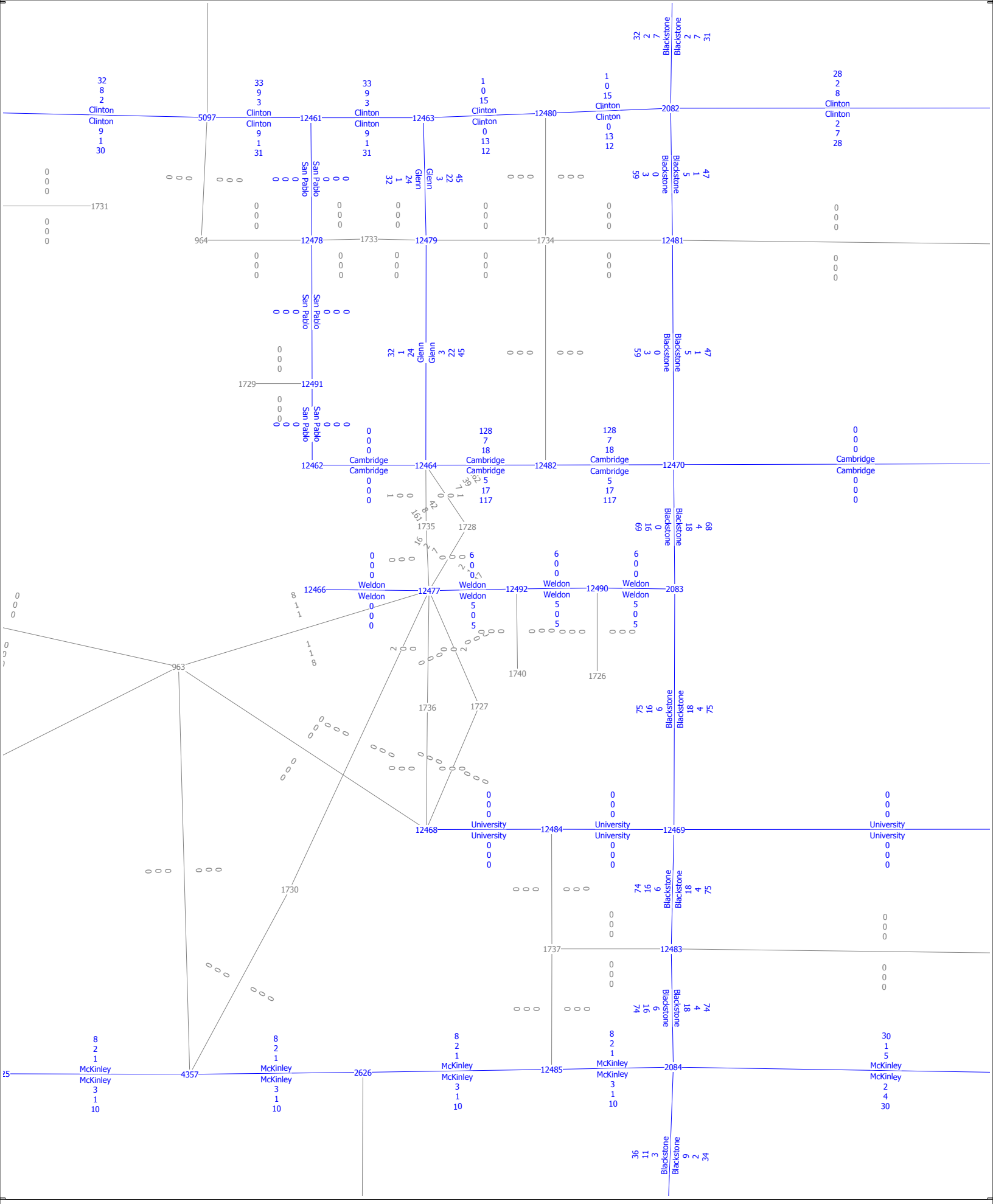

Base Year 2019
Administration
AM, PM and Daily Volumes

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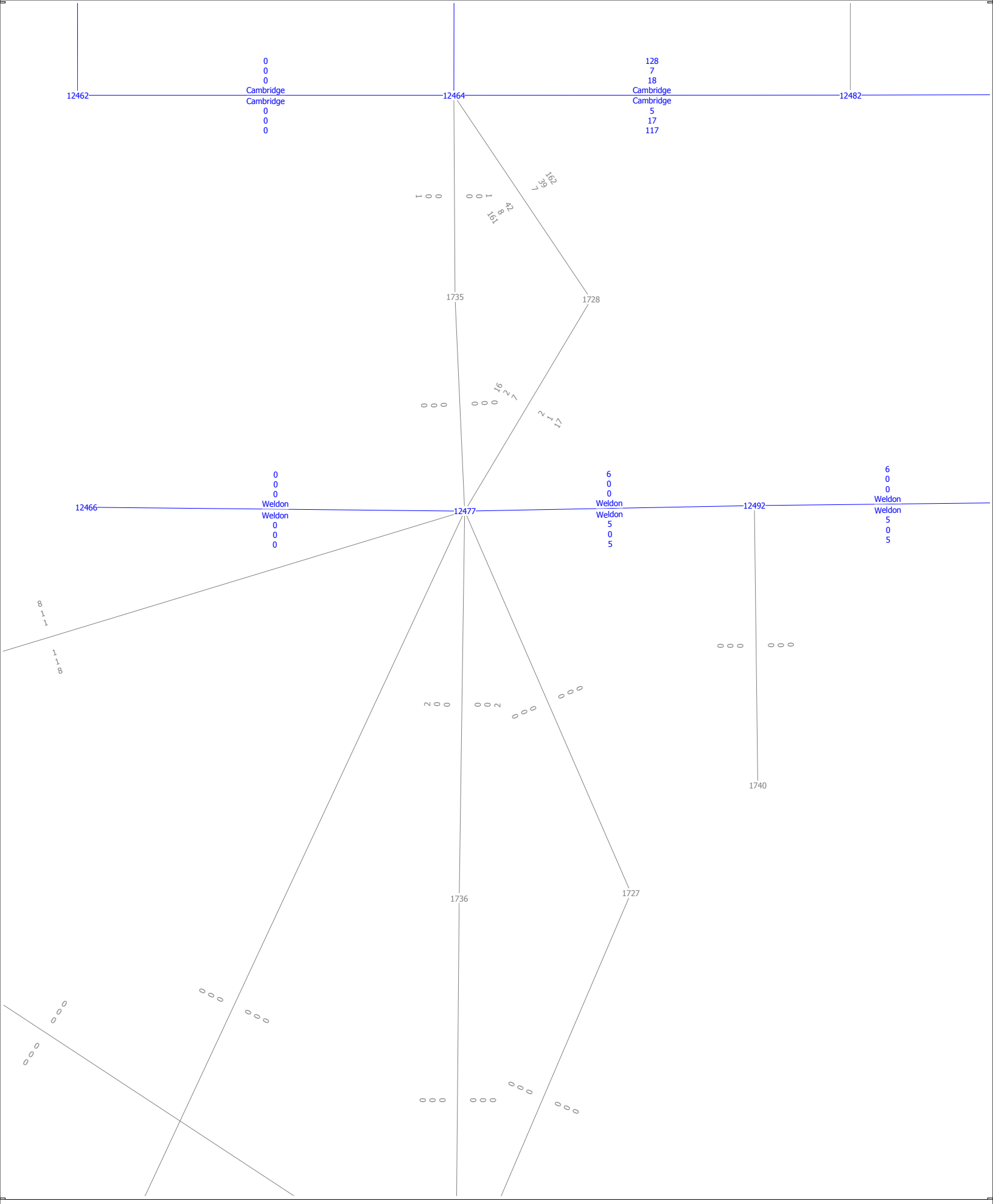

Base Year 2019
Administration
AM, PM and Daily Volumes

cube
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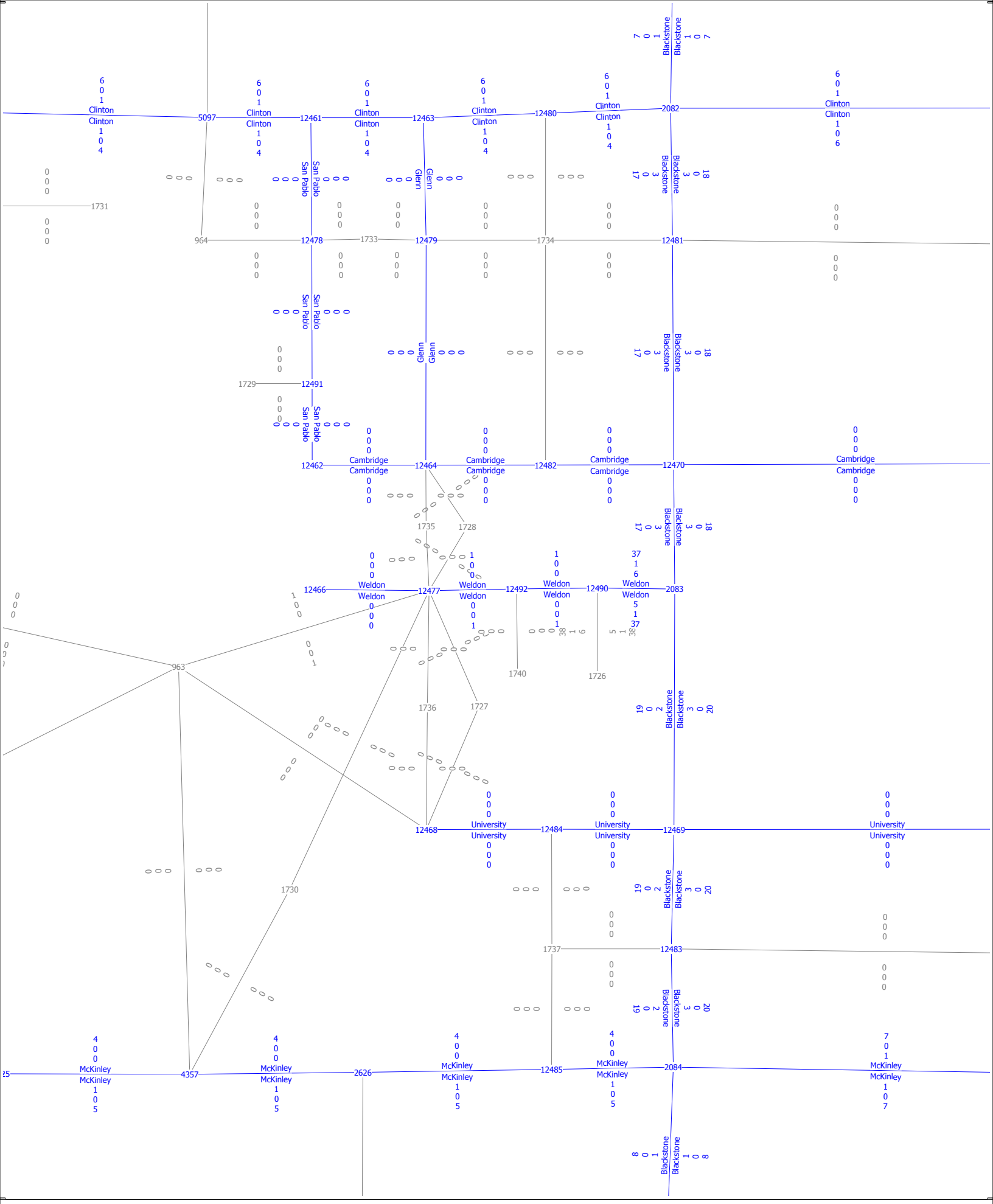

Base Year 2019
Maintenance and Operations
AM, PM and Daily Volumes

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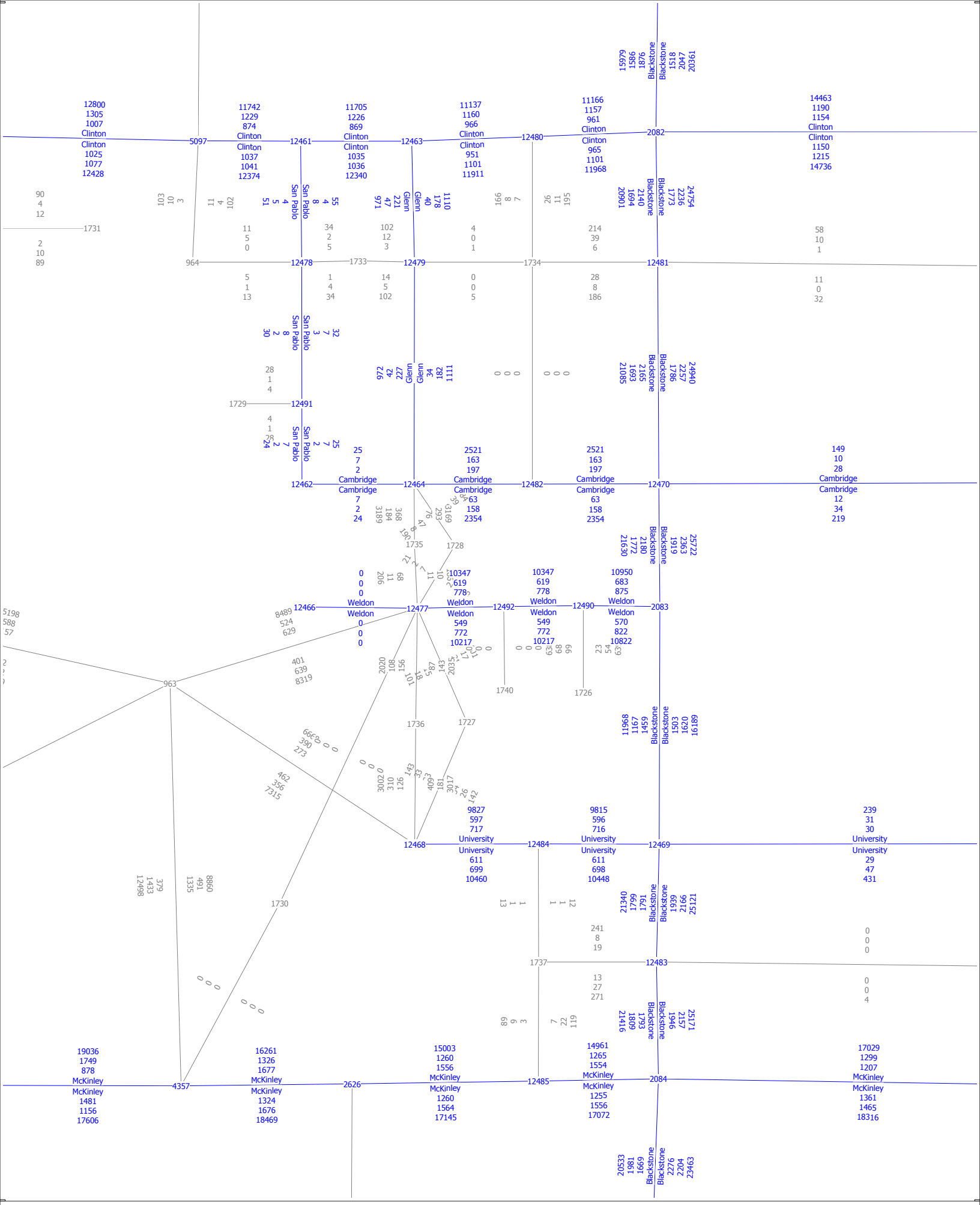

Cumulative Year 2035
AM, PM and Daily Volumes

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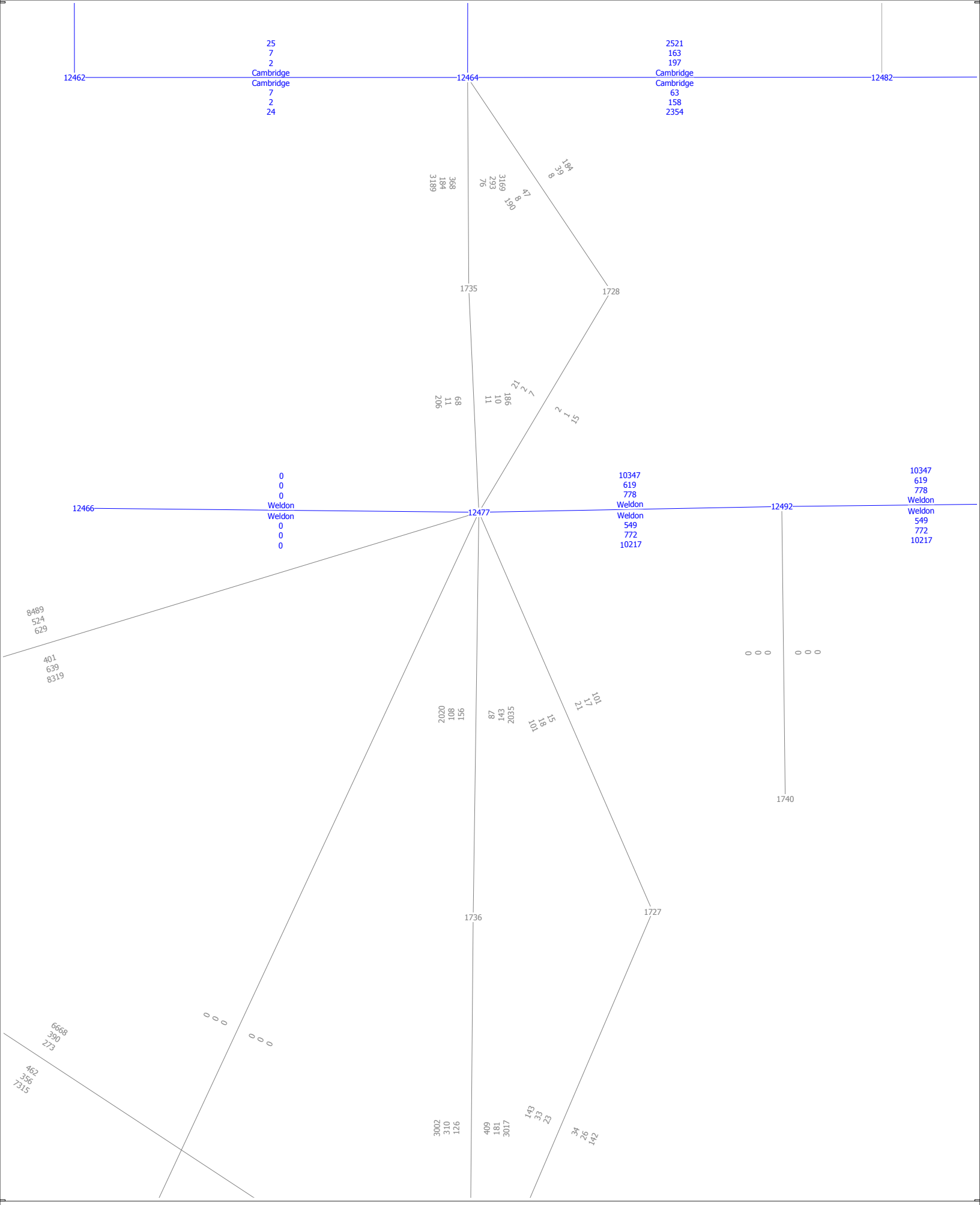
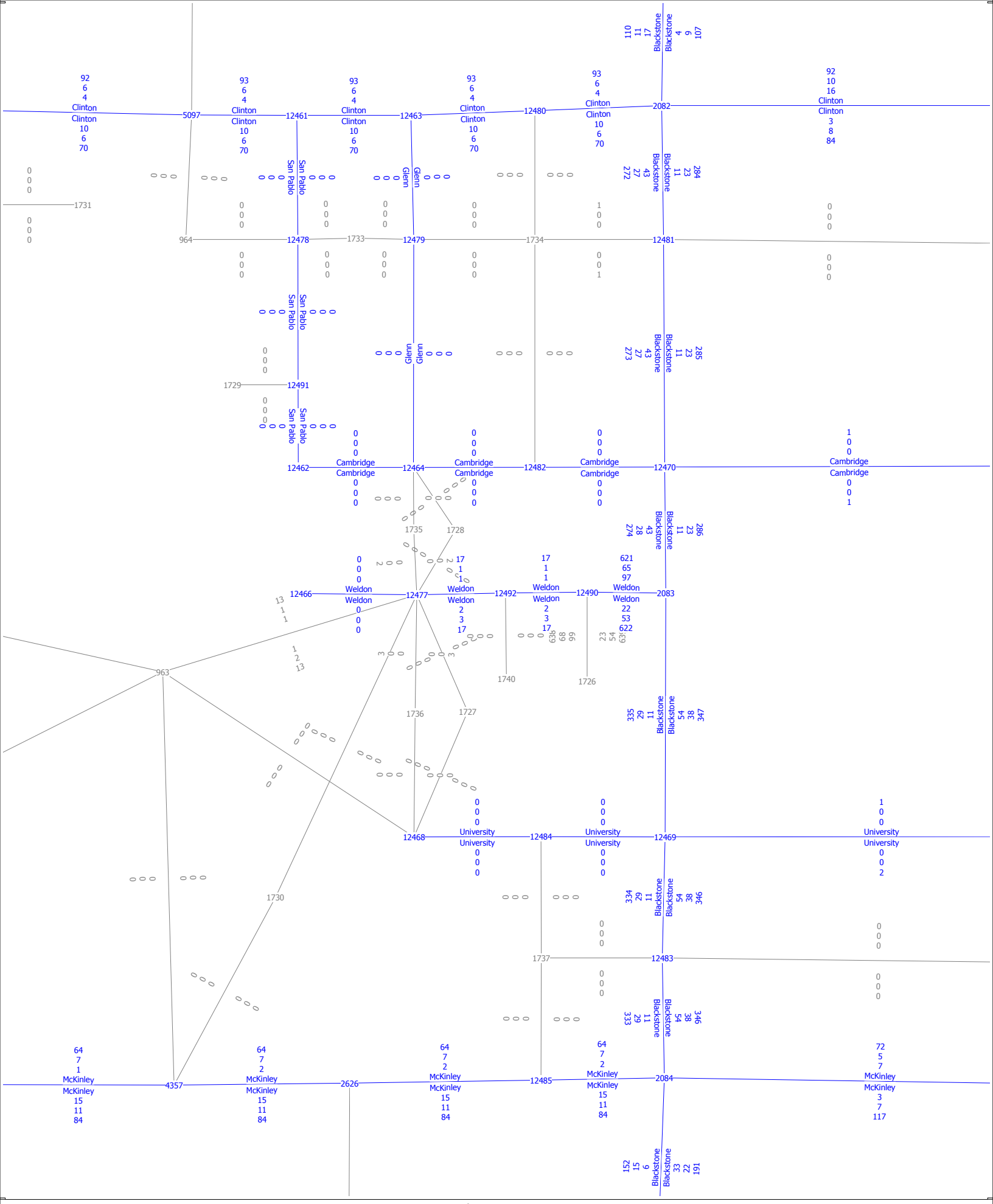


Cumulative Year 2035
AM, PM and Daily Volumes

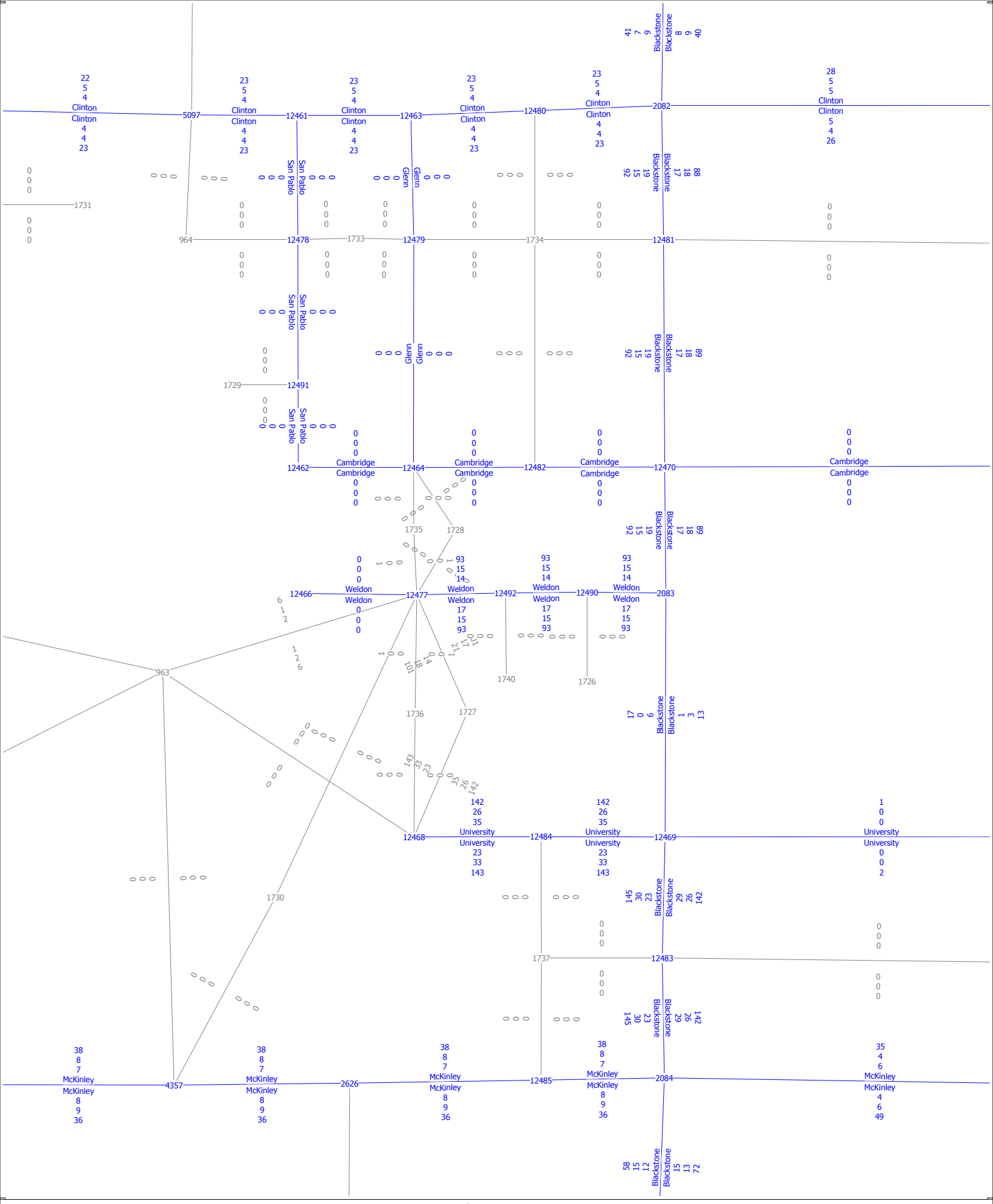
cube
(Licensed to JLB Traffic Engineering Inc)



Cumulative Year 2035
Science Building
AM, PM and Daily Volumes

cube

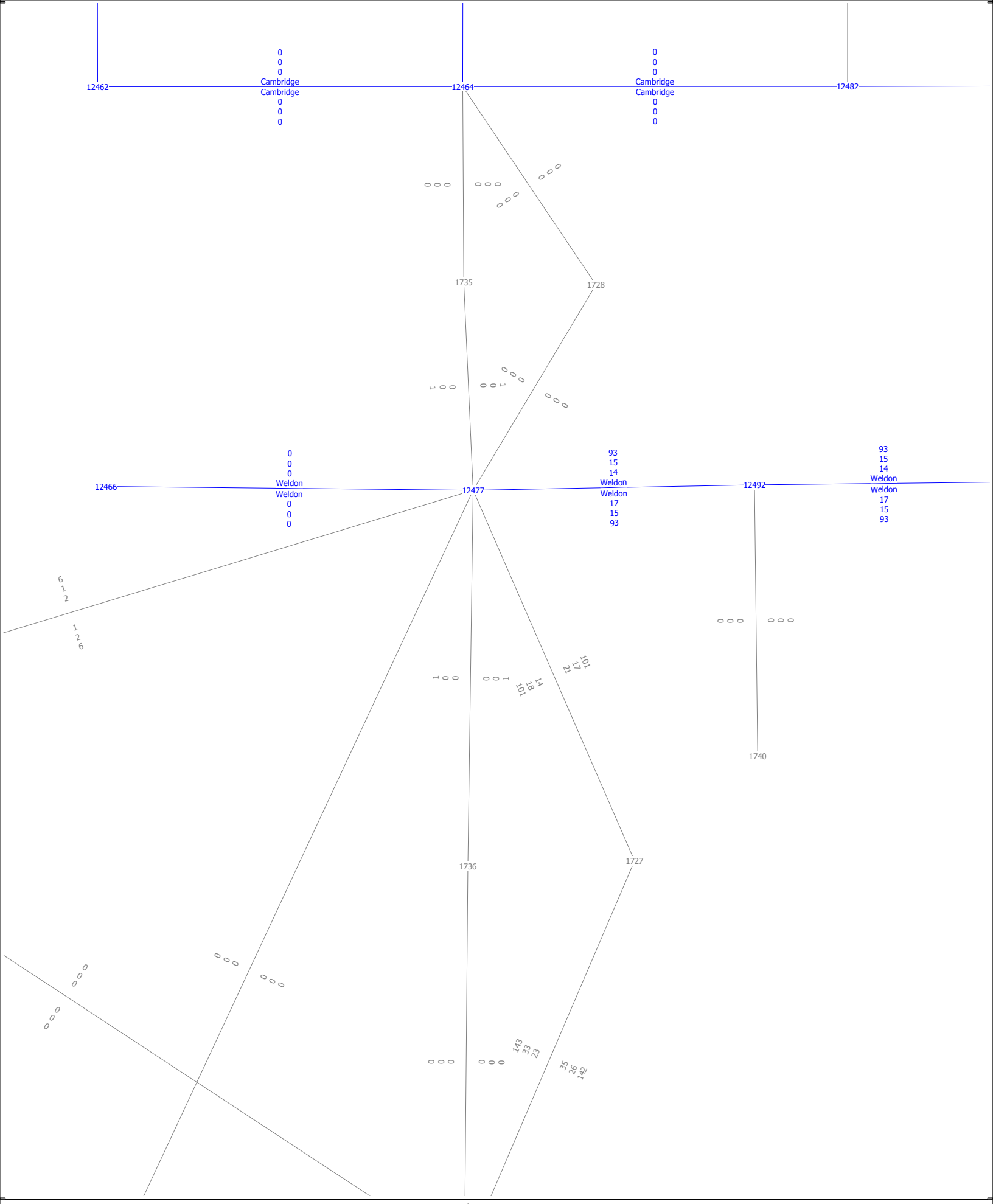
(Licensed to JLB Traffic Engineering Inc)



Cumulative Year 2035
Child Development Center
AM, PM and Daily Volumes

cube

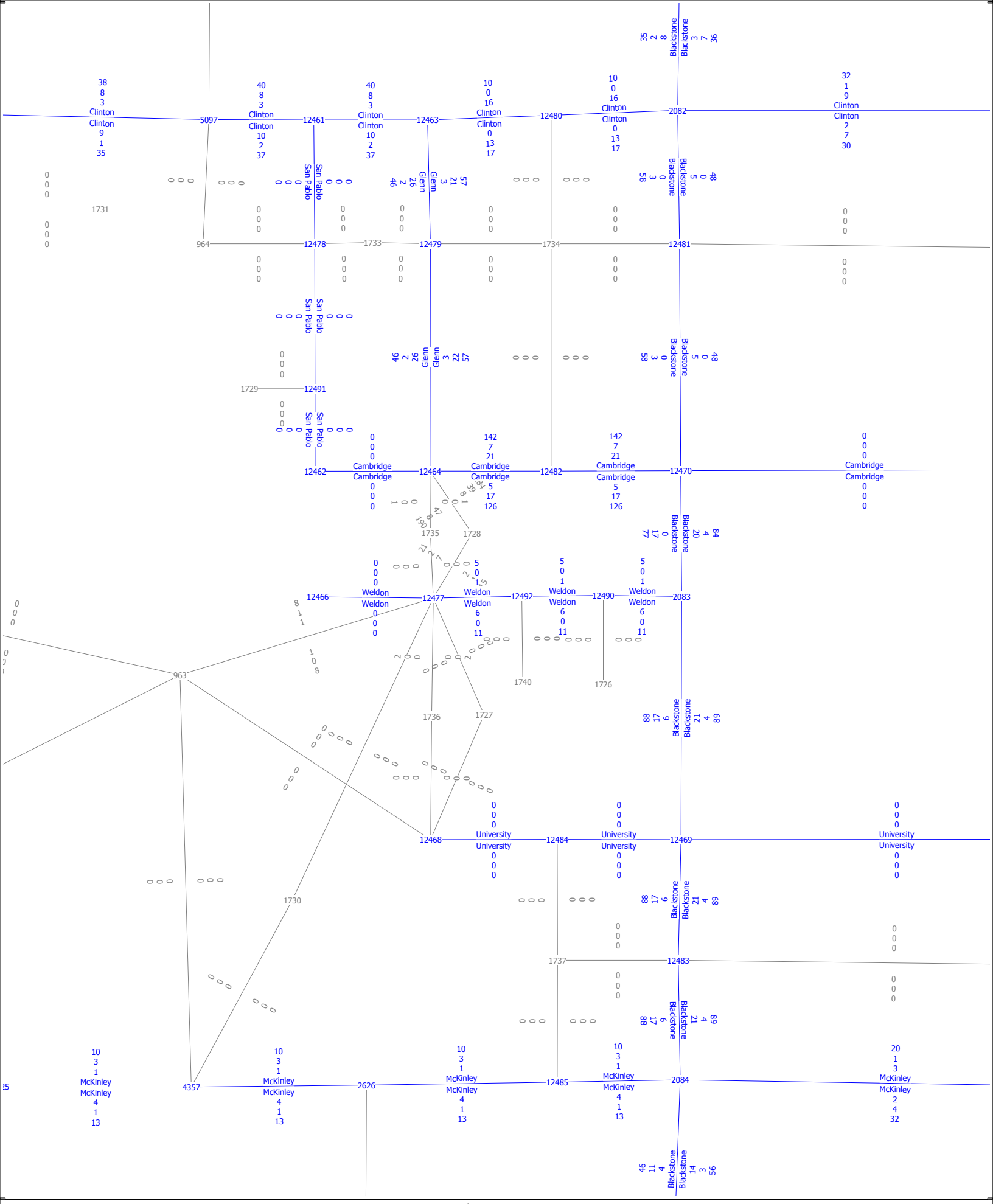
(Licensed to JLB Traffic Engineering Inc)



Cumulative Year 2035
Child Development Center
AM, PM and Daily Volumes

cube

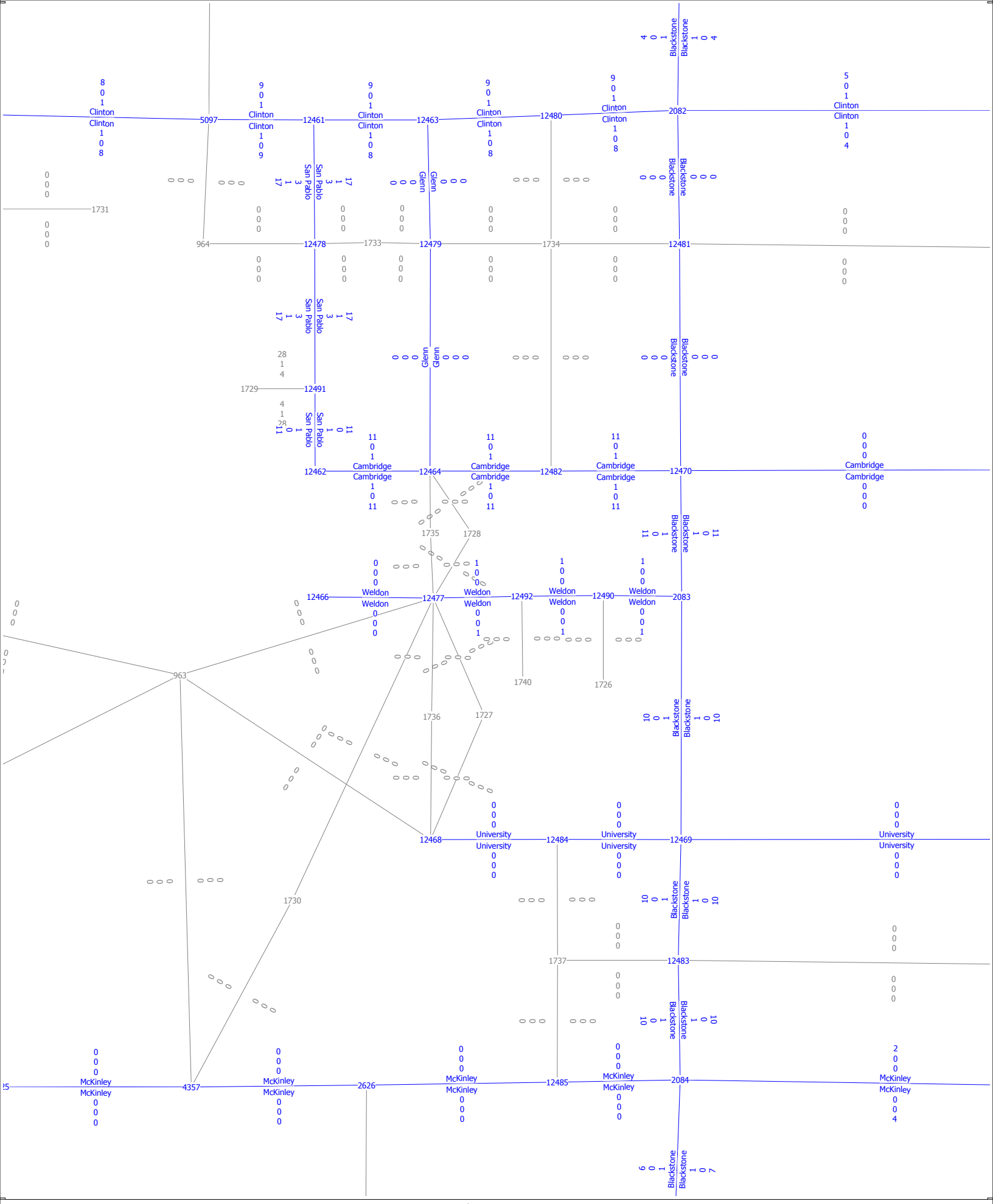
(Licensed to JLB Traffic Engineering Inc)



Cumulative Year 2035
Administration and Police Department
AM, PM and Daily Volumes

cube

(Licensed to JLB Traffic Engineering Inc)



Cumulative Year 2035
Maintenance and Operations
AM, PM and Daily Volumes

cube

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Appendix D: Methodology

Levels of Service Methodology

The description and procedures for calculating capacity and level of service (LOS) are found in the Transportation Research Board, Highway Capacity Manual (HCM). The HCM 2010 represents the research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level of service (LOS), from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each LOS represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish a LOS.

Urban Streets (Automobile Mode)

The term "urban streets" refers to urban arterials and collectors, including those in downtown areas. Arterial streets are roads that primarily serve longer through trips. However, providing access to abutting commercial and residential land uses is also an important function of arterials. Collector streets provide both land access and traffic circulation within residential, commercial and industrial areas. Their access function is more important than that of arterials, and unlike arterials their operation is not always dominated by traffic signals. Downtown streets are signalized facilities that often resemble arterials. They not only move through traffic but also provide access to local businesses for passenger cars, transit buses, and trucks. Pedestrian conflicts and lane obstructions created by stopping or standing taxicabs, buses, trucks and parking vehicles that cause turbulence in the traffic flow are typical of downtown streets.

Flow Characteristics

The speed of vehicles on urban streets is influenced by three main factors, street environment, interaction among vehicles and traffic control.

The street environment includes the geometric characteristics of the facility, the character of roadside activity, and adjacent land uses. Thus, the environment reflects the number and width of lanes, type of median, driveway/access point density, spacing between signalized intersections, existence of parking, level of pedestrian and bicyclist activity and speed limit.

The interaction among vehicles is determined by traffic density, the proportion of trucks and buses, and turning movements. This interaction affects the operation of vehicles at intersections and, to a lesser extent, between signals.

Traffic controls (including signals and signs) forces a portion of all vehicles to slow or stop. The delays and speed changes caused by traffic control devices reduce vehicle speeds; however, such controls are needed to establish right-of-way.

Levels of Service (automobile Mode)

The average travel speed for through vehicles along an urban street is the determinant of the operating level of service (LOS). The travel speed along a segment, section or entire length of an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections.

LOS A describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is minimal. Travel speeds exceed 85 of the base free flow speed (FFS).

LOS B describes reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67 and 85 percent of the base FFS.

LOS C describes stable operations. The ability to maneuver and change lanes in midblock location may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50 and 67 percent of the base FFS.

LOS D indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volumes, inappropriate signal timing, at the boundary intersections. The travel speed is between 40 and 50 percent of the base FFS.

LOS E is characterized unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30 and 40 percent of the base FFS.

LOS F is characterized by street flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30 percent or less of the base FFS.

Table A-1: Urban Street Levels of Service (Automobile Mode)

Travel Speed as a Percentage of Base Free-Flow Speed (%)	LOS by Critical Volume-to-Capacity Ratio[a]	
	≤1.0	>1.0
>85	A	F
>67 to 85	B	F
>50 to 67	C	F
>40 to 50	D	F
>30 to 40	E	F
≤30	F	F

a = The Critical volume-to-capacity ratio is based on consideration of the through movement-to-capacity ratio at each boundary intersection in the subject direction of travel. The critical volume-to-capacity ratio is the largest ratio of those considered.
Source: Highway Capacity Manual 2010, Exhibit 16-4. Urban Street LOS Criteria (Automobile Mode)

Intersection Levels of Service

One of the more important elements limiting, and often interrupting the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals, stop and yield signs.

Signalized Intersections – Performance Measures

For signalized intersections the performance measures include automobile volume-to-capacity ratio, automobile delay, queue storage length, ratio of pedestrian delay, pedestrian circulation area, pedestrian perception score, bicycle delay, and bicycle perception score. LOS is also considered a performance measure. For the automobile mode average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A LOS designation is given to the weighted average control delay to better describe the level of operation. A description of LOS for signalized intersections is found in Table A-2.

Table A-2: Signalized Intersection Level of Service Description (Automobile Mode)

Level of Service	Description	Average Control Delay (seconds per vehicle)
A	Operations with a control delay of 10 seconds/vehicle or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when volume-to-capacity ratio is and either progression is exceptionally favorable or the cycle length is very short. If it's due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.	≤10
B	Operations with control delay between 10.1 to 20.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.	>10.0 to 20.0
C	Operations with average control delays between 20.1 to 35.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	>20 to 35
D	Operations with control delay between 35.1 to 55.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop, and i ndividual cycle failures are noticeable.	>35 to 55
E	Operations with control delay between 55.1 to 80.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.	>55 to 80
F	Operations with unacceptable control delay exceeding 80.0 seconds/vehicle and a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.	>80

Source: Highway Capacity Manual 2010

Unsignalized Intersections

The HCM 2010 procedures use control delay as a measure of effectiveness to determine level of service. Delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, i. e., in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

All-Way Stop Controlled Intersections

All-way stop controlled intersections is a form of traffic controls in which all approaches to an intersection are required to stop. Similar to signalized intersections, at all-way stop controlled intersections the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection as a whole. In other words the delay measured for all-way stop controlled intersections is a measure of the average delay for all vehicles passing through the intersection during the peak hour. A LOS designation is given to the weighted average control delay to better describe the level of operation.

Two-Way Stop Controlled Intersections

Two-way stop controlled (TWSC) intersections in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At TWSC intersections the stop-controlled approaches are referred as the minor street approaches and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the major street approaches.

The capacity of movements subject to delay are determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A LOS for TWSC intersection is determined by the computed or measured control delay for each minor movement. LOS is not defined for the intersection as a whole for three main reasons: (a) major-street through vehicles are assumed to experience zero delay; (b) the disproportionate number of major-street through vehicles at the typical TWSC intersection skews the weighted average of all movements, resulting in a very low overall average delay from all vehicles; and (c) the resulting low delay can mask important LOS deficiencies for minor movements. Table A-3 provides a description of LOS at unsignalized intersections.

Table A-3: Unsignalized Intersection Level of Service Description (Automobile Mode)

Control Delay (seconds per vehicle)	**LOS by Volume-to-Capacity Ratio**	
	v/c ≤ 1.0	**v/c > 1.0**
≤10	A	F
>10 to 15	B	F
>15 to 25	C	F
>25 to 35	D	F
>35 to 50	E	F
>50	F	F

Source: HCM 2010 Exhibit 19-1.

Appendix E: Existing Traffic Conditions

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	885	25	6	509	14	11
Future Vol, veh/h	885	25	6	509	14	11
Conflicting Peds, #/hr	0	5	5	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1079	30	7	621	17	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1114	0	1424	560
Stage 1	-	-	-	-	1099	-
Stage 2	-	-	-	-	325	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	628	-	128	474
Stage 1	-	-	-	-	283	-
Stage 2	-	-	-	-	708	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	625	-	125	472
Mov Cap-2 Maneuver	-	-	-	-	125	-
Stage 1	-	-	-	-	282	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	28.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	185	-	-	625	-
HCM Lane V/C Ratio	0.165	-	-	0.012	-
HCM Control Delay (s)	28.3	-	-	10.8	0.1
HCM Lane LOS	D	-	-	B	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	871	25	6	485	30	50
Future Vol, veh/h	871	25	6	485	30	50
Conflicting Peds, #/hr	0	4	4	0	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1013	29	7	564	35	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1046	0	1332	529
Stage 1	-	-	-	-	1032	-
Stage 2	-	-	-	-	300	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	667	-	147	497
Stage 1	-	-	-	-	307	-
Stage 2	-	-	-	-	728	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	664	-	144	493
Mov Cap-2 Maneuver	-	-	-	-	144	-
Stage 1	-	-	-	-	306	-
Stage 2	-	-	-	-	714	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	26.6
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	258	-	-	664	-
HCM Lane V/C Ratio	0.361	-	-	0.011	-
HCM Control Delay (s)	26.6	-	-	10.5	0.1
HCM Lane LOS	D	-	-	B	A
HCM 95th %tile Q(veh)	1.6	-	-	0	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	6	0	21	7	1	50	9	48	693	35	7	57	1017	38
Future Vol, veh/h	6	0	21	7	1	50	9	48	693	35	7	57	1017	38
Conflicting Peds, #/hr	1	0	0	0	0	1	0	8	0	5	0	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	92	84	84	84	92	84	84	84
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	7	0	25	8	1	60	10	57	825	42	8	68	1211	45

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1860	2400	636	1621	2401	440	917	1264	0	0	633	872	0	0
Stage 1	1394	1394	-	985	985	-	-	-	-	-	-	-	-	-
Stage 2	466	1006	-	636	1416	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	78	33	362	110	33	485	497	294	-	-	711	454	-	-
Stage 1	106	209	-	205	327	-	-	-	-	-	-	-	-	-
Stage 2	502	319	-	396	204	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	48	21	359	75	21	482	309	309	-	-	466	466	-	-
Mov Cap-2 Maneuver	48	21	-	75	21	-	-	-	-	-	-	-	-	-
Stage 1	82	174	-	160	255	-	-	-	-	-	-	-	-	-
Stage 2	343	249	-	309	170	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	36.2	26.3	1.4	0.8
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	309	-	-	147	237	466	-	-
HCM Lane V/C Ratio	0.217	-	-	0.219	0.291	0.162	-	-
HCM Control Delay (s)	19.8	-	-	36.2	26.3	14.2	-	-
HCM Lane LOS	C	-	-	E	D	B	-	-
HCM 95th %tile Q(veh)	0.8	-	-	0.8	1.2	0.6	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	74	77	106	595	766	287
Future Volume (vph)	74	77	106	595	766	287
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0	4.2	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.95	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1523	1787	5036	5036	1551
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1787	1523	1787	5036	5036	1551
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	96	100	138	773	995	373
RTOR Reduction (vph)	0	81	0	0	0	187
Lane Group Flow (vph)	96	19	138	773	995	186
Confl. Peds. (#/hr)		79	7			7
Heavy Vehicles (%)	1%	1%	1%	3%	3%	1%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	9.5	9.7	6.6	33.3	22.5	22.5
Effective Green, g (s)	9.5	9.7	6.6	33.3	22.5	22.5
Actuated g/C Ratio	0.18	0.19	0.13	0.64	0.43	0.43
Clearance Time (s)	4.2	4.0	4.2	4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	327	284	227	3231	2183	672
v/s Ratio Prot	c0.05		c0.08	0.15	c0.20	
v/s Ratio Perm		0.01				0.12
v/c Ratio	0.29	0.07	0.61	0.24	0.46	0.28
Uniform Delay, d1	18.3	17.4	21.4	3.9	10.4	9.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1	4.6	0.0	0.2	0.2
Delay (s)	18.8	17.5	26.0	4.0	10.5	9.7
Level of Service	B	B	C	A	B	A
Approach Delay (s)	18.1			7.3	10.3	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	51.9	Sum of lost time (s)	13.3
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	1	1	48	5	11	45	22	106	720	35	3	24	819	30
Future Vol, veh/h	1	1	48	5	11	45	22	106	720	35	3	24	819	30
Conflicting Peds, #/hr	0	0	2	2	0	0	0	13	0	2	0	2	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	1	1	58	6	13	54	27	128	867	42	4	29	987	36

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1747	2305	527	1663	2302	457	747	1036	0	0	664	911	0	0
Stage 1	1084	1084	-	1200	1200	-	-	-	-	-	-	-	-	-
Stage 2	663	1221	-	463	1102	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	92	38	426	103	39	473	616	379	-	-	684	435	-	-
Stage 1	175	293	-	145	258	-	-	-	-	-	-	-	-	-
Stage 2	381	253	-	504	288	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	29	21	420	56	22	472	395	395	-	-	449	449	-	-
Mov Cap-2 Maneuver	29	21	-	56	22	-	-	-	-	-	-	-	-	-
Stage 1	106	268	-	88	157	-	-	-	-	-	-	-	-	-
Stage 2	189	154	-	400	264	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.4	135	2.9	0.4
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	395	-	-	255	89	449	-	-
HCM Lane V/C Ratio	0.39	-	-	0.236	0.826	0.072	-	-
HCM Control Delay (s)	19.8	-	-	23.4	135	13.6	-	-
HCM Lane LOS	C	-	-	C	F	B	-	-
HCM 95th %tile Q(veh)	1.8	-	-	0.9	4.4	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	365	59	99	366	203	99	480	82	201	488	205
Future Volume (veh/h)	200	365	59	99	366	203	99	480	82	201	488	205
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	238	435	70	118	436	242	118	571	98	239	581	244
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	283	1090	485	152	795	355	152	959	298	284	1386	429
Arrive On Green	0.16	0.31	0.31	0.09	0.23	0.23	0.09	0.19	0.19	0.16	0.27	0.27
Sat Flow, veh/h	1767	3526	1568	1767	3526	1572	1767	5066	1572	1767	5066	1567
Grp Volume(v), veh/h	238	435	70	118	436	242	118	571	98	239	581	244
Grp Sat Flow(s),veh/h/ln	1767	1763	1568	1767	1763	1572	1767	1689	1572	1767	1689	1567
Q Serve(g_s), s	9.7	7.2	2.4	4.9	8.1	10.5	4.9	7.7	3.0	9.8	7.0	6.0
Cycle Q Clear(g_c), s	9.7	7.2	2.4	4.9	8.1	10.5	4.9	7.7	3.0	9.8	7.0	6.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	1090	485	152	795	355	152	959	298	284	1386	429
V/C Ratio(X)	0.84	0.40	0.14	0.77	0.55	0.68	0.77	0.60	0.33	0.84	0.42	0.57
Avail Cap(c_a), veh/h	399	1855	825	373	1802	804	373	2058	639	399	2133	660
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.3	20.2	18.6	33.3	25.4	26.3	33.3	27.5	14.4	30.3	22.2	8.3
Incr Delay (d2), s/veh	10.6	0.2	0.1	8.1	0.6	2.3	8.1	0.6	0.6	10.7	0.2	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	2.7	0.8	2.3	3.2	3.8	2.3	2.9	1.4	4.7	2.6	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.9	20.5	18.7	41.4	26.0	28.7	41.4	28.1	15.0	41.0	22.4	9.5
LnGrp LOS	D	C	B	D	C	C	D	C	B	D	C	A
Approach Vol, veh/h		743			796			787			1064	
Approach Delay, s/veh		26.8			29.1			28.5			23.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.9	19.0	10.6	27.9	10.6	25.2	16.8	21.7
Change Period (Y+Rc), s	4.9	* 4.9	* 4.2	4.9	* 4.2	4.9	4.9	* 4.9
Max Green Setting (Gmax), s	16.8	* 30	* 16	39.1	* 16	31.3	16.8	* 38
Max Q Clear Time (g_c+I1), s	11.8	9.7	6.9	9.2	6.9	9.0	11.7	12.5
Green Ext Time (p_c), s	0.3	3.9	0.2	3.1	0.2	4.6	0.3	3.6

Intersection Summary	
HCM 6th Ctrl Delay	26.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	672	18	10	862	21	14
Future Vol, veh/h	672	18	10	862	21	14
Conflicting Peds, #/hr	0	7	7	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	686	18	10	880	21	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	711	0	1162	359
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	460	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	891	-	190	640
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	605	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	885	-	184	636
Mov Cap-2 Maneuver	-	-	-	-	184	-
Stage 1	-	-	-	-	452	-
Stage 2	-	-	-	-	592	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	21.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	257	-	-	885	-
HCM Lane V/C Ratio	0.139	-	-	0.012	-
HCM Control Delay (s)	21.3	-	-	9.1	0.1
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	664	22	17	836	36	48
Future Vol, veh/h	664	22	17	836	36	48
Conflicting Peds, #/hr	0	4	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	738	24	19	929	40	53

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	766	0	1259	387
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	505	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	850	-	164	614
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	574	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	847	-	155	610
Mov Cap-2 Maneuver	-	-	-	-	155	-
Stage 1	-	-	-	-	426	-
Stage 2	-	-	-	-	546	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	25.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	270	-	-	847	-
HCM Lane V/C Ratio	0.346	-	-	0.022	-
HCM Control Delay (s)	25.2	-	-	9.3	0.2
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	14	4	48	9	2	35	12	12	1238	13	7	21	883	6
Future Vol, veh/h	14	4	48	9	2	35	12	12	1238	13	7	21	883	6
Conflicting Peds, #/hr	0	0	1	1	0	0	0	9	0	18	0	18	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	15	4	52	10	2	38	13	13	1331	14	8	23	949	6

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1608	2438	488	1853	2434	691	698	964	0	0	982	1363	0	0
Stage 1	1023	1023	-	1408	1408	-	-	-	-	-	-	-	-	-
Stage 2	585	1415	-	445	1026	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	112	32	452	79	32	334	655	410	-	-	457	263	-	-
Stage 1	193	313	-	104	205	-	-	-	-	-	-	-	-	-
Stage 2	425	204	-	516	312	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	81	26	448	53	26	328	479	479	-	-	284	284	-	-
Mov Cap-2 Maneuver	81	26	-	53	26	-	-	-	-	-	-	-	-	-
Stage 1	181	277	-	97	191	-	-	-	-	-	-	-	-	-
Stage 2	352	190	-	402	276	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	47.9	48.8	0.2	0.6
HCM LOS	E	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	479	-	-	152	130	284	-	-
HCM Lane V/C Ratio	0.054	-	-	0.467	0.38	0.106	-	-
HCM Control Delay (s)	12.9	-	-	47.9	48.8	19.2	-	-
HCM Lane LOS	B	-	-	E	E	C	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.2	1.6	0.4	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	175	147	4	49	1098	914	146
Future Volume (vph)	175	147	4	49	1098	914	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1563		1779	5036	5036	1547
Flt Permitted	0.95	1.00		0.85	1.00	1.00	1.00
Satd. Flow (perm)	1787	1563		1593	5036	5036	1547
Peak-hour factor, PHF	0.95	0.95	0.92	0.95	0.95	0.95	0.95
Adj. Flow (vph)	184	155	4	52	1156	962	154
RTOR Reduction (vph)	0	115	0	0	0	0	85
Lane Group Flow (vph)	184	40	0	56	1156	962	69
Confl. Peds. (#/hr)		24		9			9
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	1%
Turn Type	Prot	Perm	custom	Prot	NA	NA	Perm
Protected Phases	7			5	2	6	
Permitted Phases		4	5				6
Actuated Green, G (s)	13.2	13.4		4.7	29.2	20.3	20.3
Effective Green, g (s)	13.2	13.4		4.7	29.2	20.3	20.3
Actuated g/C Ratio	0.26	0.26		0.09	0.57	0.39	0.39
Clearance Time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	458	406		145	2855	1985	609
v/s Ratio Prot	c0.10				c0.23	c0.19	
v/s Ratio Perm		0.03		0.04			0.04
v/c Ratio	0.40	0.10		0.39	0.40	0.48	0.11
Uniform Delay, d1	15.9	14.5		22.0	6.3	11.7	9.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1		1.7	0.1	0.2	0.1
Delay (s)	16.5	14.6		23.8	6.4	11.9	10.0
Level of Service	B	B		C	A	B	A
Approach Delay (s)	15.6				7.2	11.6	
Approach LOS	B				A	B	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	13.3
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	10.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	3	2	104	22	4	58	25	48	1027	28	20	38	912	13
Future Vol, veh/h	3	2	104	22	4	58	25	48	1027	28	20	38	912	13
Conflicting Peds, #/hr	2	0	0	0	0	2	0	6	0	11	0	11	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	3	2	117	25	4	65	28	54	1154	31	22	43	1025	15

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1799	2529	526	1886	2521	606	759	1046	0	0	865	1196	0	0
Stage 1	1169	1169	-	1345	1345	-	-	-	-	-	-	-	-	-
Stage 2	630	1360	-	541	1176	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	85	28	427	76	28	379	607	375	-	-	531	317	-	-
Stage 1	153	267	-	115	220	-	-	-	-	-	-	-	-	-
Stage 2	399	217	-	452	265	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	41	18	425	36	18	374	398	398	-	-	350	350	-	-
Mov Cap-2 Maneuver	41	18	-	36	18	-	-	-	-	-	-	-	-	-
Stage 1	121	216	-	90	173	-	-	-	-	-	-	-	-	-
Stage 2	254	171	-	264	214	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	31.7	219.8	1.1	1
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	398	-	-	254	85	350	-	-
HCM Lane V/C Ratio	0.206	-	-	0.482	1.11	0.186	-	-
HCM Control Delay (s)	16.4	-	-	31.7	219.8	17.6	-	-
HCM Lane LOS	C	-	-	D	F	C	-	-
HCM 95th %tile Q(veh)	0.8	-	-	2.4	6.6	0.7	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	183	249	28	101	379	189	90	756	88	228	629	206
Future Volume (veh/h)	183	249	28	101	379	189	90	756	88	228	629	206
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	199	271	30	110	412	205	98	822	96	248	684	224
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	237	881	393	141	671	299	126	1316	405	286	1802	556
Arrive On Green	0.13	0.25	0.25	0.08	0.19	0.19	0.07	0.26	0.26	0.16	0.36	0.36
Sat Flow, veh/h	1767	3526	1572	1767	3526	1572	1767	5066	1560	1767	5066	1563
Grp Volume(v), veh/h	199	271	30	110	412	205	98	822	96	248	684	224
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1572	1767	1689	1560	1767	1689	1563
Q Serve(g_s), s	8.5	4.8	1.1	4.7	8.3	9.4	4.2	11.1	2.7	10.6	7.8	4.9
Cycle Q Clear(g_c), s	8.5	4.8	1.1	4.7	8.3	9.4	4.2	11.1	2.7	10.6	7.8	4.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	881	393	141	671	299	126	1316	405	286	1802	556
V/C Ratio(X)	0.84	0.31	0.08	0.78	0.61	0.68	0.78	0.62	0.24	0.87	0.38	0.40
Avail Cap(c_a), veh/h	241	1759	785	229	1736	775	211	1983	611	286	2200	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	23.5	22.1	34.9	28.6	29.1	35.2	25.2	11.9	31.5	18.5	6.6
Incr Delay (d2), s/veh	22.3	0.2	0.1	9.1	0.9	2.8	9.9	0.5	0.3	23.3	0.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	1.9	0.4	2.3	3.3	3.5	2.1	4.2	1.3	6.1	2.8	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.9	23.7	22.2	44.0	29.5	31.8	45.1	25.7	12.2	54.8	18.6	7.1
LnGrp LOS	D	C	C	D	C	C	D	C	B	D	B	A
Approach Vol, veh/h		500			727			1016			1156	
Approach Delay, s/veh		36.0			32.4			26.3			24.2	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.4	24.9	10.6	24.2	10.0	32.3	15.2	19.6
Change Period (Y+Rc), s	4.9	* 4.9	4.5	4.9	4.5	4.9	4.9	* 4.9
Max Green Setting (Gmax), s	12.5	* 30	10.0	38.5	9.2	33.5	10.5	* 38
Max Q Clear Time (g_c+I1), s	12.6	13.1	6.7	6.8	6.2	9.8	10.5	11.4
Green Ext Time (p_c), s	0.0	5.3	0.1	1.8	0.1	5.4	0.0	3.3

Intersection Summary	
HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	74	77	5	117	595	766	287
Future Volume (vph)	74	77	5	117	595	766	287
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.95		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1521		1781	5036	5036	1551
Flt Permitted	0.95	1.00		0.43	1.00	1.00	1.00
Satd. Flow (perm)	1787	1521		815	5036	5036	1551
Peak-hour factor, PHF	0.77	0.77	0.92	0.77	0.77	0.77	0.77
Adj. Flow (vph)	96	100	5	152	773	995	373
RTOR Reduction (vph)	0	81	0	0	0	0	200
Lane Group Flow (vph)	96	19	0	157	773	995	173
Confl. Peds. (#/hr)		79		7			7
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	1%
Turn Type	Prot	Perm	custom	Prot	NA	NA	Perm
Protected Phases	7			5	2	6	
Permitted Phases		4	5				6
Actuated Green, G (s)	10.0	10.2		9.2	34.6	21.2	21.2
Effective Green, g (s)	10.0	10.2		9.2	34.6	21.2	21.2
Actuated g/C Ratio	0.19	0.19		0.17	0.64	0.39	0.39
Clearance Time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	332	288		139	3244	1988	612
v/s Ratio Prot	c0.05				0.15	c0.20	
v/s Ratio Perm		0.01		c0.19			0.11
v/c Ratio	0.29	0.07		1.13	0.24	0.50	0.28
Uniform Delay, d1	18.8	17.8		22.2	4.0	12.3	11.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1		115.3	0.0	0.2	0.3
Delay (s)	19.3	17.9		137.6	4.1	12.5	11.3
Level of Service	B	B		F	A	B	B
Approach Delay (s)	18.6				26.6	12.1	
Approach LOS	B				C	B	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	53.7	Sum of lost time (s)	13.3
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	50	0	0	61	22	106	721	36	3	24	824	30
Future Vol, veh/h	0	0	50	0	0	61	22	106	721	36	3	24	824	30
Conflicting Peds, #/hr	0	0	2	2	0	0	0	13	0	2	0	2	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	60	0	0	73	27	128	869	43	4	29	993	36

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1748	2314	530	1668	2311	458	751	1042	0	0	666	914	0	0
Stage 1	1090	1090	-	1203	1203	-	-	-	-	-	-	-	-	-
Stage 2	658	1224	-	465	1108	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	92	38	425	103	38	472	613	376	-	-	682	434	-	-
Stage 1	174	291	-	145	258	-	-	-	-	-	-	-	-	-
Stage 2	384	252	-	502	286	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	50	21	419	58	21	471	392	392	-	-	446	446	-	-
Mov Cap-2 Maneuver	50	21	-	58	21	-	-	-	-	-	-	-	-	-
Stage 1	104	266	-	88	156	-	-	-	-	-	-	-	-	-
Stage 2	197	153	-	397	262	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15	14.1	2.9	0.4
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	392	-	-	419	471	446	-	-
HCM Lane V/C Ratio	0.393	-	-	0.144	0.156	0.073	-	-
HCM Control Delay (s)	20	-	-	15	14.1	13.7	-	-
HCM Lane LOS	C	-	-	C	B	B	-	-
HCM 95th %tile Q(veh)	1.8	-	-	0.5	0.5	0.2	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	175	147	26	53	1098	914	146
Future Volume (vph)	175	147	26	53	1098	914	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1561		1769	5036	5036	1545
Flt Permitted	0.95	1.00		0.43	1.00	1.00	1.00
Satd. Flow (perm)	1787	1561		801	5036	5036	1545
Peak-hour factor, PHF	0.95	0.95	0.92	0.95	0.95	0.95	0.95
Adj. Flow (vph)	184	155	28	56	1156	962	154
RTOR Reduction (vph)	0	117	0	0	0	0	91
Lane Group Flow (vph)	184	38	0	84	1156	962	63
Confl. Peds. (#/hr)		24		9			9
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	1%
Turn Type	Prot	Perm	custom	Prot	NA	NA	Perm
Protected Phases	7			5	2	6	
Permitted Phases		4	5				6
Actuated Green, G (s)	13.6	13.8		9.3	33.0	19.5	19.5
Effective Green, g (s)	13.6	13.8		9.3	33.0	19.5	19.5
Actuated g/C Ratio	0.24	0.25		0.17	0.59	0.35	0.35
Clearance Time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	436	386		133	2983	1763	540
v/s Ratio Prot	c0.10				0.23	c0.19	
v/s Ratio Perm		0.02		c0.10			0.04
v/c Ratio	0.42	0.10		0.63	0.39	0.55	0.12
Uniform Delay, d1	17.7	16.2		21.6	6.0	14.5	12.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1		9.4	0.1	0.3	0.1
Delay (s)	18.4	16.3		31.0	6.1	14.9	12.4
Level of Service	B	B		C	A	B	B
Approach Delay (s)	17.4				7.8	14.5	
Approach LOS	B				A	B	

Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	55.7	Sum of lost time (s)	13.3
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	109	0	0	84	25	48	1030	30	20	38	934	13
Future Vol, veh/h	0	0	109	0	0	84	25	48	1030	30	20	38	934	13
Conflicting Peds, #/hr	2	0	0	0	0	2	0	6	0	11	0	11	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	122	0	0	94	28	54	1157	34	22	43	1049	15

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1822	2559	538	1899	2549	609	777	1070	0	0	869	1202	0	0
Stage 1	1193	1193	-	1349	1349	-	-	-	-	-	-	-	-	-
Stage 2	629	1366	-	550	1200	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	83	26	420	74	27	377	593	365	-	-	528	315	-	-
Stage 1	147	260	-	114	219	-	-	-	-	-	-	-	-	-
Stage 2	400	215	-	446	258	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	44	16	418	37	17	372	386	386	-	-	340	340	-	-
Mov Cap-2 Maneuver	44	16	-	37	17	-	-	-	-	-	-	-	-	-
Stage 1	115	209	-	89	171	-	-	-	-	-	-	-	-	-
Stage 2	235	167	-	255	207	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.1	17.9	1.1	1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	386	-	-	418	372	340	-	-
HCM Lane V/C Ratio	0.212	-	-	0.293	0.254	0.192	-	-
HCM Control Delay (s)	16.8	-	-	17.1	17.9	18.1	-	-
HCM Lane LOS	C	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	0.8	-	-	1.2	1	0.7	-	-

Intersection: 1: San Pablo Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	52	31
Average Queue (ft)	5	11
95th Queue (ft)	29	36
Link Distance (ft)	281	901
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Glenn Ave & Clinton Ave

Movement	EB	EB	WB	NB
Directions Served	T	TR	LT	LR
Maximum Queue (ft)	31	47	140	72
Average Queue (ft)	2	3	11	34
95th Queue (ft)	15	19	59	60
Link Distance (ft)	281	281	745	635
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Cambridge Ave & Blackstone Ave

Movement	EB	WB	NB	SB	SB	SB
Directions Served	LTR	LTR	UL	UL	T	TR
Maximum Queue (ft)	52	97	75	53	30	21
Average Queue (ft)	20	37	36	25	1	1
95th Queue (ft)	50	69	67	43	10	7
Link Distance (ft)	1033	1240			898	898
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			75	75		
Storage Blk Time (%)			2			
Queuing Penalty (veh)			4			

Intersection: 4: Blackstone Ave & Weldon Ave

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	T	T	T	T	R
Maximum Queue (ft)	71	64	185	119	136	161	221	188	158	113
Average Queue (ft)	45	28	82	41	56	73	140	103	86	61
95th Queue (ft)	74	55	157	99	111	129	212	163	145	99
Link Distance (ft)		850		608	608	608	270	270	270	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	105		395							100
Storage Blk Time (%)									8	1
Queuing Penalty (veh)									22	2

Intersection: 5: Blackstone Ave & University Ave

Movement	EB	WB	NB	SB	SB	SB	SB
Directions Served	LTR	LTR	UL	UL	T	T	TR
Maximum Queue (ft)	74	69	96	31	75	76	51
Average Queue (ft)	32	31	40	13	4	3	2
95th Queue (ft)	62	54	82	37	30	25	17
Link Distance (ft)	407	1233			608	608	608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			85	75			
Storage Blk Time (%)			0		0		
Queuing Penalty (veh)			1		0		

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	T
Maximum Queue (ft)	223	150	137	37	158	191	151	158	131	195	176	146
Average Queue (ft)	114	84	74	13	63	112	83	48	62	108	89	43
95th Queue (ft)	184	133	129	28	113	178	150	98	107	165	150	105
Link Distance (ft)		2178	2178			1224	1224			2721	2721	2721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	245			150	255			100	185			
Storage Blk Time (%)			0				2	0		0		0
Queuing Penalty (veh)			0				5	0		0		0

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	55	231	139	158	150	124
Average Queue (ft)	22	108	77	100	81	55
95th Queue (ft)	41	189	127	151	139	102
Link Distance (ft)			570	570	570	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	160	205				105
Storage Blk Time (%)		1			4	1
Queuing Penalty (veh)		2			7	1

Network Summary

Network wide Queuing Penalty: 45

Intersection: 1: San Pablo Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	30	53
Average Queue (ft)	3	27
95th Queue (ft)	16	52
Link Distance (ft)	281	901
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Glenn Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	94	55
Average Queue (ft)	19	37
95th Queue (ft)	63	54
Link Distance (ft)	745	635
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Cambridge Ave & Blackstone Ave

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	UL	UL	T
Maximum Queue (ft)	162	54	54	59	89
Average Queue (ft)	45	27	13	20	4
95th Queue (ft)	88	54	39	51	31
Link Distance (ft)	1033	1240			898
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			75	75	
Storage Blk Time (%)				1	0
Queuing Penalty (veh)				2	0

Intersection: 4: Blackstone Ave & Weldon Ave

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	T	T	T	T	R
Maximum Queue (ft)	135	180	98	205	204	261	270	269	120	76
Average Queue (ft)	71	49	53	65	78	99	148	94	66	41
95th Queue (ft)	126	104	92	155	161	198	219	195	115	67
Link Distance (ft)		850		608	608	608	270	270	270	
Upstream Blk Time (%)							0	0		
Queuing Penalty (veh)							0	0		
Storage Bay Dist (ft)	105		395							100
Storage Blk Time (%)	3	1							3	
Queuing Penalty (veh)	5	1							4	

Intersection: 5: Blackstone Ave & University Ave

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	UL	UL	TR
Maximum Queue (ft)	98	76	53	52	31
Average Queue (ft)	44	39	26	22	1
95th Queue (ft)	69	64	55	52	10
Link Distance (ft)	407	1233			608
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			85	75	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	T
Maximum Queue (ft)	266	103	90	18	151	179	143	162	155	211	254	192
Average Queue (ft)	118	55	43	5	62	113	74	51	71	134	126	75
95th Queue (ft)	215	90	79	17	114	169	132	105	139	188	190	148
Link Distance (ft)		2178	2178			1224	1224			2721	2721	2721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	245			150	255			100	185			
Storage Blk Time (%)	1						1	0		1		
Queuing Penalty (veh)	1						3	1		1		

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	60	272	121	188	176	134
Average Queue (ft)	22	173	74	100	102	47
95th Queue (ft)	45	266	120	148	153	92
Link Distance (ft)			570	570	570	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	160	205				105
Storage Blk Time (%)		5			7	1
Queuing Penalty (veh)		11			14	1

Network Summary

Network wide Queuing Penalty: 44

Appendix F: Existing plus Project Traffic Conditions

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	914	43	8	514	23	13
Future Vol, veh/h	914	43	8	514	23	13
Conflicting Peds, #/hr	0	5	5	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1115	52	10	627	28	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1172	0	1480	589
Stage 1	-	-	-	-	1146	-
Stage 2	-	-	-	-	334	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	597	-	117	454
Stage 1	-	-	-	-	267	-
Stage 2	-	-	-	-	700	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	594	-	113	452
Mov Cap-2 Maneuver	-	-	-	-	113	-
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	682	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	37.2
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	155	-	-	594	-
HCM Lane V/C Ratio	0.283	-	-	0.016	-
HCM Control Delay (s)	37.2	-	-	11.2	0.1
HCM Lane LOS	E	-	-	B	A
HCM 95th %tile Q(veh)	1.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	878	49	23	489	34	55
Future Vol, veh/h	878	49	23	489	34	55
Conflicting Peds, #/hr	0	4	4	0	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1021	57	27	569	40	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1082	0	1397	547
Stage 1	-	-	-	-	1054	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	646	-	133	484
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	693	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	644	-	124	480
Mov Cap-2 Maneuver	-	-	-	-	124	-
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	648	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	33.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	229	-	-	644	-
HCM Lane V/C Ratio	0.452	-	-	0.042	-
HCM Control Delay (s)	33.1	-	-	10.8	0.3
HCM Lane LOS	D	-	-	B	A
HCM 95th %tile Q(veh)	2.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	28.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	28	0	42	7	2	50	9	115	714	35	7	57	1072	102
Future Vol, veh/h	28	0	42	7	2	50	9	115	714	35	7	57	1072	102
Conflicting Peds, #/hr	1	0	0	0	0	1	0	8	0	5	0	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	33	0	50	8	2	60	11	137	850	42	8	68	1276	121

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	2135	2690	707	1834	2729	452	1020	1405	0	0	651	897	0	0
Stage 1	1497	1497	-	1172	1172	-	-	-	-	-	-	-	-	-
Stage 2	638	1193	-	662	1557	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	53	22	326	81	20	477	436	251	-	-	695	442	-	-
Stage 1	90	186	-	152	267	-	-	-	-	-	-	-	-	-
Stage 2	395	260	-	382	174	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	~ 17	8	324	33	7	474	255	255	-	-	455	455	-	-
Mov Cap-2 Maneuver	~ 17	8	-	33	7	-	-	-	-	-	-	-	-	-
Stage 1	38	154	-	64	112	-	-	-	-	-	-	-	-	-
Stage 2	142	109	-	269	144	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 745.7	104.1	5.2	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	255	-	-	39	98	455	-	-
HCM Lane V/C Ratio	0.579	-	-	2.137	0.717	0.167	-	-
HCM Control Delay (s)	36.8	-	-	$ 745.7	104.1	14.5	-	-
HCM Lane LOS	E	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	3.3	-	-	9	3.7	0.6	-	-

Notes

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

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	92	128	275	665	780	349
Future Volume (vph)	92	128	275	665	780	349
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0	4.2	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.94	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1509	1787	5036	5036	1547
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1787	1509	1787	5036	5036	1547
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	119	166	357	864	1013	453
RTOR Reduction (vph)	0	134	0	0	0	216
Lane Group Flow (vph)	119	32	357	864	1013	237
Confl. Peds. (#/hr)		79	7			7
Heavy Vehicles (%)	1%	1%	1%	3%	3%	1%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	12.3	12.5	18.1	43.1	20.8	20.8
Effective Green, g (s)	12.3	12.5	18.1	43.1	20.8	20.8
Actuated g/C Ratio	0.19	0.19	0.28	0.67	0.32	0.32
Clearance Time (s)	4.2	4.0	4.2	4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	340	292	501	3365	1624	498
v/s Ratio Prot	c0.07		c0.20	0.17	c0.20	
v/s Ratio Perm		0.02				0.15
v/c Ratio	0.35	0.11	0.71	0.26	0.62	0.48
Uniform Delay, d1	22.6	21.4	20.9	4.3	18.5	17.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.2	4.8	0.0	0.8	0.7
Delay (s)	23.3	21.6	25.6	4.3	19.3	18.2
Level of Service	C	C	C	A	B	B
Approach Delay (s)	22.3			10.6	19.0	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	64.5	Sum of lost time (s)	13.3
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	16.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	4	1	47	5	11	46	22	117	955	35	3	24	885	29
Future Vol, veh/h	4	1	47	5	11	46	22	117	955	35	3	24	885	29
Conflicting Peds, #/hr	0	0	2	2	0	0	0	13	0	2	0	2	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	5	1	57	6	13	55	27	141	1151	42	4	29	1066	35

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1966	2694	566	2005	2690	599	804	1114	0	0	871	1195	0	0
Stage 1	1163	1163	-	1510	1510	-	-	-	-	-	-	-	-	-
Stage 2	803	1531	-	495	1180	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	67	22	402	64	22	383	573	347	-	-	527	317	-	-
Stage 1	154	269	-	88	183	-	-	-	-	-	-	-	-	-
Stage 2	313	179	-	482	264	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	10	396	30	~ 10	382	361	361	-	-	328	328	-	-
Mov Cap-2 Maneuver	-	10	-	30	~ 10	-	-	-	-	-	-	-	-	-
Stage 1	82	239	-	47	98	-	-	-	-	-	-	-	-	-
Stage 2	124	96	-	369	234	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		$ 519.5	2.9	0.5
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	361	-	-	-	45	328	-	-
HCM Lane V/C Ratio	0.464	-	-	-	1.66	0.099	-	-
HCM Control Delay (s)	23.3	-	-	-	$ 519.5	17.2	-	-
HCM Lane LOS	C	-	-	-	F	C	-	-
HCM 95th %tile Q(veh)	2.4	-	-	-	7.5	0.3	-	-

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	365	59	99	341	257	87	602	82	213	521	225
Future Volume (veh/h)	270	365	59	99	341	257	87	602	82	213	521	225
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	321	435	70	118	406	306	104	717	98	254	620	268
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	331	1255	559	149	866	386	132	1038	322	275	1486	460
Arrive On Green	0.19	0.36	0.36	0.08	0.25	0.25	0.07	0.20	0.20	0.16	0.29	0.29
Sat Flow, veh/h	1767	3526	1569	1767	3526	1572	1767	5066	1572	1767	5066	1568
Grp Volume(v), veh/h	321	435	70	118	406	306	104	717	98	254	620	268
Grp Sat Flow(s),veh/h/ln	1767	1763	1569	1767	1763	1572	1767	1689	1572	1767	1689	1568
Q Serve(g_s), s	17.1	8.6	2.9	6.2	9.3	17.3	5.5	12.5	3.9	13.5	9.4	8.2
Cycle Q Clear(g_c), s	17.1	8.6	2.9	6.2	9.3	17.3	5.5	12.5	3.9	13.5	9.4	8.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	331	1255	559	149	866	386	132	1038	322	275	1486	460
V/C Ratio(X)	0.97	0.35	0.13	0.79	0.47	0.79	0.79	0.69	0.30	0.92	0.42	0.58
Avail Cap(c_a), veh/h	331	1488	662	292	1410	629	255	1664	516	275	1722	533
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	22.5	20.6	42.7	30.6	33.6	43.2	35.0	19.2	39.5	27.0	9.9
Incr Delay (d2), s/veh	41.1	0.2	0.1	9.1	0.4	3.7	9.8	0.8	0.5	34.4	0.2	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	3.4	1.0	3.0	3.8	6.7	2.7	5.0	1.9	8.2	3.6	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.5	22.6	20.7	51.8	31.0	37.3	53.0	35.8	19.7	74.0	27.2	11.1
LnGrp LOS	E	C	C	D	C	D	D	D	B	E	C	B
Approach Vol, veh/h		826			830			919			1142	
Approach Delay, s/veh		44.6			36.3			36.0			33.8	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.7	24.4	12.2	38.7	11.3	32.8	22.7	28.2
Change Period (Y+Rc), s	4.9	* 4.9	* 4.2	4.9	* 4.2	4.9	4.9	* 4.9
Max Green Setting (Gmax), s	14.8	* 31	* 16	40.1	* 14	32.3	17.8	* 38
Max Q Clear Time (g_c+I1), s	15.5	14.5	8.2	10.6	7.5	11.4	19.1	19.3
Green Ext Time (p_c), s	0.0	4.6	0.1	3.1	0.1	4.9	0.0	3.4

Intersection Summary	
HCM 6th Ctrl Delay	37.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	692	32	11	873	32	15
Future Vol, veh/h	692	32	11	873	32	15
Conflicting Peds, #/hr	0	7	7	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	706	33	11	891	33	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	746	0	1198	377
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	468	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	865	-	180	624
Stage 1	-	-	-	-	440	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	859	-	174	620
Mov Cap-2 Maneuver	-	-	-	-	174	-
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	584	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	25.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	226	-	-	859	-
HCM Lane V/C Ratio	0.212	-	-	0.013	-
HCM Control Delay (s)	25.2	-	-	9.2	0.1
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	670	37	30	843	42	57
Future Vol, veh/h	670	37	30	843	42	57
Conflicting Peds, #/hr	0	4	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	744	41	33	937	47	63

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	789	0	1306	399
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	537	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	833	-	153	603
Stage 1	-	-	-	-	420	-
Stage 2	-	-	-	-	553	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	830	-	140	600
Mov Cap-2 Maneuver	-	-	-	-	140	-
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	506	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	30.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	251	-	-	830	-
HCM Lane V/C Ratio	0.438	-	-	0.04	-
HCM Control Delay (s)	30.1	-	-	9.5	0.4
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	2.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	22.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	48	4	82	9	3	35	12	61	1275	13	7	21	929	52
Future Vol, veh/h	48	4	82	9	3	35	12	61	1275	13	7	21	929	52
Conflicting Peds, #/hr	0	0	1	1	0	0	0	9	0	18	0	18	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	52	4	88	10	3	38	13	66	1371	14	8	23	999	56

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1806	2659	538	2019	2680	711	770	1064	0	0	1011	1403	0	0
Stage 1	1098	1098	-	1554	1554	-	-	-	-	-	-	-	-	-
Stage 2	708	1561	-	465	1126	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	85	23	420	63	22	324	598	367	-	-	441	251	-	-
Stage 1	171	289	-	82	174	-	-	-	-	-	-	-	-	-
Stage 2	358	173	-	502	280	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	~ 48	16	416	30	15	318	379	379	-	-	272	272	-	-
Mov Cap-2 Maneuver	~ 48	16	-	30	15	-	-	-	-	-	-	-	-	-
Stage 1	135	255	-	64	136	-	-	-	-	-	-	-	-	-
Stage 2	245	135	-	346	247	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 372.9	115.1	0.9	0.6
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	379	-	-	93	77	272	-	-
HCM Lane V/C Ratio	0.207	-	-	1.549	0.656	0.111	-	-
HCM Control Delay (s)	17	-	-	$ 372.9	115.1	19.9	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	0.8	-	-	11.2	3	0.4	-	-

Notes

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

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	210	236	4	178	1149	942	198
Future Volume (vph)	210	236	4	178	1149	942	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1562		1786	5036	5036	1546
Flt Permitted	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)	1787	1562		1786	5036	5036	1546
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	221	248	4	187	1209	992	208
RTOR Reduction (vph)	0	182	0	0	0	0	124
Lane Group Flow (vph)	221	66	0	191	1209	992	84
Confl. Peds. (#/hr)		24		9			9
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	NA	Perm
Protected Phases	7		5	5	2	6	
Permitted Phases		4					6
Actuated Green, G (s)	14.3	14.5		10.0	31.4	17.2	17.2
Effective Green, g (s)	14.3	14.5		10.0	31.4	17.2	17.2
Actuated g/C Ratio	0.26	0.26		0.18	0.57	0.31	0.31
Clearance Time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	466	413		325	2885	1580	485
v/s Ratio Prot	c0.12			c0.11	0.24	c0.20	
v/s Ratio Perm		0.04					0.05
v/c Ratio	0.47	0.16		0.59	0.42	0.63	0.17
Uniform Delay, d1	17.1	15.5		20.5	6.6	16.1	13.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.2		2.7	0.1	0.8	0.2
Delay (s)	17.8	15.6		23.2	6.7	16.9	13.8
Level of Service	B	B		C	A	B	B
Approach Delay (s)	16.7				8.9	16.3	
Approach LOS	B				A	B	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	54.8	Sum of lost time (s)	13.3
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	25

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	5	2	93	22	4	59	25	59	1204	28	20	39	1030	11
Future Vol, veh/h	5	2	93	22	4	59	25	59	1204	28	20	39	1030	11
Conflicting Peds, #/hr	2	0	0	0	0	2	0	6	0	11	0	11	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	6	2	104	25	4	66	28	66	1353	31	22	44	1157	12

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	2034	2884	591	2164	2875	705	854	1175	0	0	1011	1395	0	0
Stage 1	1301	1301	-	1568	1568	-	-	-	-	-	-	-	-	-
Stage 2	733	1583	-	596	1307	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	61	16	388	51	16	327	538	325	-	-	441	253	-	-
Stage 1	124	231	-	80	172	-	-	-	-	-	-	-	-	-
Stage 2	346	169	-	419	230	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	20	9	386	~ 20	9	323	344	344	-	-	279	279	-	-
Mov Cap-2 Maneuver	20	9	-	~ 20	9	-	-	-	-	-	-	-	-	-
Stage 1	90	175	-	58	124	-	-	-	-	-	-	-	-	-
Stage 2	192	122	-	230	174	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	92.4	$ 623.7	1.2	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	344	-	-	140	49	279	-	-
HCM Lane V/C Ratio	0.274	-	-	0.803	1.949	0.238	-	-
HCM Control Delay (s)	19.4	-	-	92.4	$ 623.7	21.9	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	1.1	-	-	5	9.6	0.9	-	-

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	241	249	28	101	361	232	80	843	88	250	680	240
Future Volume (veh/h)	241	249	28	101	361	232	80	843	88	250	680	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	262	271	30	110	392	252	87	916	96	272	739	261
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	287	1037	463	139	727	324	112	1286	396	303	1856	573
Arrive On Green	0.16	0.29	0.29	0.08	0.21	0.21	0.06	0.25	0.25	0.17	0.37	0.37
Sat Flow, veh/h	1767	3526	1572	1767	3526	1572	1767	5066	1559	1767	5066	1563
Grp Volume(v), veh/h	262	271	30	110	392	252	87	916	96	272	739	261
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1572	1767	1689	1559	1767	1689	1563
Q Serve(g_s), s	13.9	5.6	1.3	5.8	9.5	14.4	4.6	15.7	3.6	14.4	10.3	7.0
Cycle Q Clear(g_c), s	13.9	5.6	1.3	5.8	9.5	14.4	4.6	15.7	3.6	14.4	10.3	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	1037	463	139	727	324	112	1286	396	303	1856	573
V/C Ratio(X)	0.91	0.26	0.06	0.79	0.54	0.78	0.78	0.71	0.24	0.90	0.40	0.46
Avail Cap(c_a), veh/h	287	1420	634	280	1406	627	234	1658	510	306	1865	576
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	25.7	24.2	43.1	33.8	35.8	44.0	32.4	16.4	38.6	22.4	7.8
Incr Delay (d2), s/veh	31.2	0.1	0.1	9.5	0.6	4.0	11.0	1.0	0.3	26.9	0.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	2.3	0.5	2.8	4.0	5.7	2.3	6.2	1.7	8.2	3.9	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.4	25.9	24.3	52.6	34.4	39.8	55.0	33.4	16.7	65.6	22.5	8.3
LnGrp LOS	E	C	C	D	C	D	D	C	B	E	C	A
Approach Vol, veh/h		563			754			1099			1272	
Approach Delay, s/veh		46.5			38.9			33.7			28.8	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.3	29.1	12.0	32.9	10.5	39.8	20.4	24.6
Change Period (Y+Rc), s	4.9	* 4.9	4.5	4.9	4.5	4.9	4.9	* 4.9
Max Green Setting (Gmax), s	16.5	* 31	15.1	38.4	12.6	35.1	15.5	* 38
Max Q Clear Time (g_c+I1), s	16.4	17.7	7.8	7.6	6.6	12.3	15.9	16.4
Green Ext Time (p_c), s	0.0	5.3	0.1	1.8	0.1	6.0	0.0	3.2

Intersection Summary	
HCM 6th Ctrl Delay	35.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	70	0	0	59	9	115	742	35	7	57	1079	104
Future Vol, veh/h	0	0	70	0	0	59	9	115	742	35	7	57	1079	104
Conflicting Peds, #/hr	1	0	0	0	0	1	0	8	0	5	0	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	83	0	0	70	11	137	883	42	8	68	1285	124

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	713	-	-	469	1028	1417	0	0	675	930	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	323	0	0	465	431	247	-	-	674	426	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	321	-	-	462	250	250	-	-	437	437	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.1	14.2	5.3	0.8
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	250	-	-	321	462	437	-	-
HCM Lane V/C Ratio	0.59	-	-	0.26	0.152	0.174	-	-
HCM Control Delay (s)	38.3	-	-	20.1	14.2	15	-	-
HCM Lane LOS	E	-	-	C	B	B	-	-
HCM 95th %tile Q(veh)	3.4	-	-	1	0.5	0.6	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	92	128	5	286	665	28	780	349
Future Volume (vph)	92	128	5	286	665	28	780	349
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	1.00	0.91	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1505		1787	5036	1752	5036	1546
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1505		1787	5036	1752	5036	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	119	166	6	371	864	36	1013	453
RTOR Reduction (vph)	0	135	0	0	0	0	0	223
Lane Group Flow (vph)	119	31	0	377	864	36	1013	230
Confl. Peds. (#/hr)		79		7				7
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	Prot	NA	Perm
Protected Phases	7		5	5	2	1	6	
Permitted Phases		4						6
Actuated Green, G (s)	12.4	12.6		22.1	40.7	2.1	20.7	20.7
Effective Green, g (s)	12.4	12.6		22.1	40.7	2.1	20.7	20.7
Actuated g/C Ratio	0.18	0.18		0.32	0.59	0.03	0.30	0.30
Clearance Time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	323	276		576	2992	53	1521	467
v/s Ratio Prot	c0.07			c0.21	0.17	0.02	c0.20	
v/s Ratio Perm		0.02						0.15
v/c Ratio	0.37	0.11		0.65	0.29	0.68	0.67	0.49
Uniform Delay, d1	24.6	23.3		19.9	6.8	32.9	20.9	19.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2		2.7	0.1	29.4	1.1	0.8
Delay (s)	25.3	23.5		22.6	6.9	62.3	22.0	20.4
Level of Service	C	C		C	A	E	C	C
Approach Delay (s)	24.2				11.6		22.5	
Approach LOS	C				B		C	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	68.5	Sum of lost time (s)	13.3
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	52	0	0	62	22	117	959	36	3	24	890	29
Future Vol, veh/h	0	0	52	0	0	62	22	117	959	36	3	24	890	29
Conflicting Peds, #/hr	0	0	2	2	0	0	0	13	0	2	0	2	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	63	0	0	75	27	141	1155	43	4	29	1072	35

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	569	-	-	601	808	1120	0	0	875	1200	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	401	0	0	382	570	345	-	-	524	316	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	395	-	-	381	359	359	-	-	325	325	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.8	16.7	2.9	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	359	-	-	395	381	325	-	-
HCM Lane V/C Ratio	0.466	-	-	0.159	0.196	0.1	-	-
HCM Control Delay (s)	23.5	-	-	15.8	16.7	17.3	-	-
HCM Lane LOS	C	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	2.4	-	-	0.6	0.7	0.3	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	134	0	0	47	12	61	1323	17	7	21	938	55
Future Vol, veh/h	0	0	134	0	0	47	12	61	1323	17	7	21	938	55
Conflicting Peds, #/hr	0	0	1	1	0	0	0	9	0	18	0	18	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	144	0	0	51	13	66	1423	18	8	23	1009	59

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	544	-	-	739	779	1077	0	0	1052	1459	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	416	0	0	311	591	362	-	-	418	236	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	412	-	-	306	365	365	-	-	254	254	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.4	19.1	0.9	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	365	-	-	412	306	254	-	-
HCM Lane V/C Ratio	0.215	-	-	0.35	0.165	0.119	-	-
HCM Control Delay (s)	17.5	-	-	18.4	19.1	21.1	-	-
HCM Lane LOS	C	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	0.8	-	-	1.5	0.6	0.4	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	210	236	26	182	1149	52	942	198
Future Volume (vph)	210	236	26	182	1149	52	942	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	1.00	0.91	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1561		1783	5036	1752	5036	1545
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1561		1783	5036	1752	5036	1545
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	221	248	27	192	1209	55	992	208
RTOR Reduction (vph)	0	185	0	0	0	0	0	126
Lane Group Flow (vph)	221	63	0	219	1209	55	992	82
Confl. Peds. (#/hr)		24		9				9
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	Prot	NA	Perm
Protected Phases	7		5	5	2	1	6	
Permitted Phases		4						6
Actuated Green, G (s)	14.3	14.5		12.1	26.5	2.8	17.2	17.2
Effective Green, g (s)	14.3	14.5		12.1	26.5	2.8	17.2	17.2
Actuated g/C Ratio	0.25	0.25		0.21	0.47	0.05	0.30	0.30
Clearance Time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	449	397		379	2345	86	1522	467
v/s Ratio Prot	c0.12			0.12	c0.24	0.03	c0.20	
v/s Ratio Perm		0.04						0.05
v/c Ratio	0.49	0.16		0.58	0.52	0.64	0.65	0.17
Uniform Delay, d1	18.2	16.5		20.1	10.7	26.6	17.2	14.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.2		2.1	0.2	14.6	1.0	0.2
Delay (s)	19.0	16.7		22.2	10.8	41.1	18.3	14.8
Level of Service	B	B		C	B	D	B	B
Approach Delay (s)	17.8				12.6		18.7	
Approach LOS	B				B		B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	13.3
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	100	0	0	85	25	59	1209	30	20	39	1052	11
Future Vol, veh/h	0	0	100	0	0	85	25	59	1209	30	20	39	1052	11
Conflicting Peds, #/hr	2	0	0	0	0	2	0	6	0	11	0	11	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	112	0	0	96	28	66	1358	34	22	44	1182	12

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	603	-	-	709	872	1200	0	0	1016	1403	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	381	0	0	325	526	316	-	-	438	251	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	379	-	-	321	333	333	-	-	269	269	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.5	20.9	1.3	1.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	333	-	-	379	321	269	-	-
HCM Lane V/C Ratio	0.283	-	-	0.296	0.298	0.246	-	-
HCM Control Delay (s)	20.1	-	-	18.5	20.9	22.7	-	-
HCM Lane LOS	C	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	1.1	-	-	1.2	1.2	0.9	-	-

Intersection: 1: San Pablo Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	28	53
Average Queue (ft)	2	22
95th Queue (ft)	13	49
Link Distance (ft)	281	901
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Glenn Ave & Clinton Ave

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	LT	T	LR
Maximum Queue (ft)	50	51	115	30	116
Average Queue (ft)	2	2	18	1	41
95th Queue (ft)	17	19	56	10	75
Link Distance (ft)	281	281	745	745	635
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Cambridge Ave & Blackstone Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	R	R	UL	TR	UL	TR
Maximum Queue (ft)	55	55	119	22	54	52
Average Queue (ft)	29	31	54	1	20	6
95th Queue (ft)	54	52	103	10	47	30
Link Distance (ft)	1033	1240		270		898
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			75		75	
Storage Blk Time (%)			6			
Queuing Penalty (veh)			15			

Intersection: 4: Blackstone Ave & Weldon Ave

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	T	U	T	T	T	R
Maximum Queue (ft)	147	174	266	136	154	179	190	270	257	203	158
Average Queue (ft)	51	37	153	60	68	90	49	189	143	101	92
95th Queue (ft)	102	90	254	128	135	158	140	255	235	163	144
Link Distance (ft)		847		608	608	608		270	270	270	
Upstream Blk Time (%)								0	0		
Queuing Penalty (veh)								0	0		
Storage Bay Dist (ft)	105		395				100				100
Storage Blk Time (%)	1							37		9	7
Queuing Penalty (veh)	2							10		33	18

Intersection: 5: Blackstone Ave & University Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	R	R	UL	TR	UL	T
Maximum Queue (ft)	53	100	120	26	31	53
Average Queue (ft)	25	42	40	1	12	2
95th Queue (ft)	49	76	84	9	34	18
Link Distance (ft)	407	1233		570		608
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			85		75	
Storage Blk Time (%)			1			
Queuing Penalty (veh)			3			

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	T
Maximum Queue (ft)	260	235	156	43	111	152	185	168	220	300	198	129
Average Queue (ft)	165	82	72	20	68	100	74	67	73	155	99	47
95th Queue (ft)	259	152	127	43	120	153	147	130	158	251	158	109
Link Distance (ft)		2178	2178			1224	1224			2721	2721	2721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	245			150	255			100	185			
Storage Blk Time (%)	1	0	1				4	3		4		
Queuing Penalty (veh)	3	0	1				9	5		3		

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	52	274	298	157	141	127
Average Queue (ft)	22	185	88	88	83	58
95th Queue (ft)	48	269	186	141	135	105
Link Distance (ft)			570	570	570	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	160	205				105
Storage Blk Time (%)		10			3	1
Queuing Penalty (veh)		17			8	2

Network Summary

Network wide Queuing Penalty: 129

Intersection: 1: San Pablo Ave & Clinton Ave

Movement	NB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	25
95th Queue (ft)	45
Link Distance (ft)	901
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Glenn Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	28	72
Average Queue (ft)	6	44
95th Queue (ft)	24	71
Link Distance (ft)	745	635
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Cambridge Ave & Blackstone Ave

Movement	EB	WB	NB	NB	SB
Directions Served	R	R	UL	T	UL
Maximum Queue (ft)	199	55	114	144	31
Average Queue (ft)	87	29	72	29	12
95th Queue (ft)	187	58	132	124	36
Link Distance (ft)	1033	1240		270	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			75		75
Storage Blk Time (%)			23		
Queuing Penalty (veh)			104		

Intersection: 4: Blackstone Ave & Weldon Ave

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	T	U	T	T	T	R
Maximum Queue (ft)	130	84	118	264	244	226	72	242	157	123	78
Average Queue (ft)	107	50	95	146	159	159	39	168	136	79	62
95th Queue (ft)	150	87	133	287	266	235	66	239	167	128	94
Link Distance (ft)		847		608	608	608		270	270	270	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	105		395				100				100
Storage Blk Time (%)	12							34		3	
Queuing Penalty (veh)	28							18		6	

Intersection: 5: Blackstone Ave & University Ave

Movement	EB	WB	NB	SB
Directions Served	R	R	UL	UL
Maximum Queue (ft)	31	75	52	30
Average Queue (ft)	31	40	28	29
95th Queue (ft)	31	69	55	30
Link Distance (ft)	407	1233		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			85	75
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	T
Maximum Queue (ft)	182	64	43	16	69	128	84	63	86	194	213	134
Average Queue (ft)	152	44	25	11	58	111	48	39	55	144	154	108
95th Queue (ft)	180	65	52	20	72	137	87	65	81	209	237	164
Link Distance (ft)		2178	2178			1224	1224			2721	2721	2721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	245			150	255			100	185			
Storage Blk Time (%)							0			2		
Queuing Penalty (veh)							0			2		

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	19	188	115	135	111	91
Average Queue (ft)	15	152	77	89	72	56
95th Queue (ft)	27	191	133	135	107	85
Link Distance (ft)			570	570	570	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	160	205				105
Storage Blk Time (%)		0			1	0
Queuing Penalty (veh)		0			3	0

Network Summary

Network wide Queuing Penalty: 160

Appendix G: Existing plus Project Traffic Conditions - No Parking Structure Access to Cambridge Avenue

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	914	43	8	514	23	13
Future Vol, veh/h	914	43	8	514	23	13
Conflicting Peds, #/hr	0	5	5	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1115	52	10	627	28	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1172	0	1480	589
Stage 1	-	-	-	-	1146	-
Stage 2	-	-	-	-	334	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	597	-	117	454
Stage 1	-	-	-	-	267	-
Stage 2	-	-	-	-	700	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	594	-	113	452
Mov Cap-2 Maneuver	-	-	-	-	113	-
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	682	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	37.2
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	155	-	-	594	-
HCM Lane V/C Ratio	0.283	-	-	0.016	-
HCM Control Delay (s)	37.2	-	-	11.2	0.1
HCM Lane LOS	E	-	-	B	A
HCM 95th %tile Q(veh)	1.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	878	49	23	489	34	55
Future Vol, veh/h	878	49	23	489	34	55
Conflicting Peds, #/hr	0	4	4	0	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1021	57	27	569	40	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1082	0	1397	547
Stage 1	-	-	-	-	1054	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	646	-	133	484
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	693	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	644	-	124	480
Mov Cap-2 Maneuver	-	-	-	-	124	-
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	648	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	33.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	229	-	-	644	-
HCM Lane V/C Ratio	0.452	-	-	0.042	-
HCM Control Delay (s)	33.1	-	-	10.8	0.3
HCM Lane LOS	D	-	-	B	A
HCM 95th %tile Q(veh)	2.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	16	0	31	7	2	50	9	49	726	35	7	57	1113	61
Future Vol, veh/h	16	0	31	7	2	50	9	49	726	35	7	57	1113	61
Conflicting Peds, #/hr	1	0	0	0	0	1	0	8	0	5	0	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	19	0	37	8	2	60	11	58	864	42	8	68	1325	73

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	2008	2571	707	1710	2586	459	1020	1406	0	0	661	911	0	0
Stage 1	1522	1522	-	1028	1028	-	-	-	-	-	-	-	-	-
Stage 2	486	1049	-	682	1558	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	64	26	326	97	25	472	436	250	-	-	686	435	-	-
Stage 1	86	181	-	192	312	-	-	-	-	-	-	-	-	-
Stage 2	488	305	-	371	174	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	34	16	324	60	15	469	263	263	-	-	447	447	-	-
Mov Cap-2 Maneuver	34	16	-	60	15	-	-	-	-	-	-	-	-	-
Stage 1	63	149	-	141	229	-	-	-	-	-	-	-	-	-
Stage 2	311	224	-	273	143	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	111.2	42.1	1.7	0.8
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	263	-	-	83	165	447	-	-
HCM Lane V/C Ratio	0.263	-	-	0.674	0.426	0.17	-	-
HCM Control Delay (s)	23.5	-	-	111.2	42.1	14.7	-	-
HCM Lane LOS	C	-	-	F	E	B	-	-
HCM 95th %tile Q(veh)	1	-	-	3.2	1.9	0.6	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	104	122	341	599	769	390
Future Volume (vph)	104	122	341	599	769	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0	4.2	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.94	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1505	1787	5036	5036	1546
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1787	1505	1787	5036	5036	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	135	158	443	778	999	506
RTOR Reduction (vph)	0	128	0	0	0	251
Lane Group Flow (vph)	135	30	443	778	999	255
Confl. Peds. (#/hr)		79	7			7
Heavy Vehicles (%)	1%	1%	1%	3%	3%	1%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	12.9	13.1	22.7	46.7	19.8	19.8
Effective Green, g (s)	12.9	13.1	22.7	46.7	19.8	19.8
Actuated g/C Ratio	0.19	0.19	0.33	0.68	0.29	0.29
Clearance Time (s)	4.2	4.0	4.2	4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	335	286	590	3423	1451	445
v/s Ratio Prot	c0.08		c0.25	0.15	c0.20	
v/s Ratio Perm		0.02				0.16
v/c Ratio	0.40	0.11	0.75	0.23	0.69	0.57
Uniform Delay, d1	24.5	23.0	20.5	4.2	21.7	20.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.2	5.4	0.0	1.4	1.8
Delay (s)	25.3	23.1	25.8	4.2	23.1	22.6
Level of Service	C	C	C	A	C	C
Approach Delay (s)	24.1			12.0	22.9	
Approach LOS	C			B	C	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	13.3
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	16.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	4	1	47	5	11	46	22	117	955	35	3	24	885	29
Future Vol, veh/h	4	1	47	5	11	46	22	117	955	35	3	24	885	29
Conflicting Peds, #/hr	0	0	2	2	0	0	0	13	0	2	0	2	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	5	1	57	6	13	55	27	141	1151	42	4	29	1066	35

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1966	2694	566	2005	2690	599	804	1114	0	0	871	1195	0	0
Stage 1	1163	1163	-	1510	1510	-	-	-	-	-	-	-	-	-
Stage 2	803	1531	-	495	1180	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	67	22	402	64	22	383	573	347	-	-	527	317	-	-
Stage 1	154	269	-	88	183	-	-	-	-	-	-	-	-	-
Stage 2	313	179	-	482	264	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	10	396	30	~ 10	382	361	361	-	-	328	328	-	-
Mov Cap-2 Maneuver	-	10	-	30	~ 10	-	-	-	-	-	-	-	-	-
Stage 1	82	239	-	47	98	-	-	-	-	-	-	-	-	-
Stage 2	124	96	-	369	234	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		$ 519.5	2.9	0.5
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	361	-	-	-	45	328	-	-
HCM Lane V/C Ratio	0.464	-	-	-	1.66	0.099	-	-
HCM Control Delay (s)	23.3	-	-	-	$ 519.5	17.2	-	-
HCM Lane LOS	C	-	-	-	F	C	-	-
HCM 95th %tile Q(veh)	2.4	-	-	-	7.5	0.3	-	-

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	365	59	99	341	257	87	602	82	213	521	225
Future Volume (veh/h)	270	365	59	99	341	257	87	602	82	213	521	225
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	321	435	70	118	406	306	104	717	98	254	620	268
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	331	1255	559	149	866	386	132	1038	322	275	1486	460
Arrive On Green	0.19	0.36	0.36	0.08	0.25	0.25	0.07	0.20	0.20	0.16	0.29	0.29
Sat Flow, veh/h	1767	3526	1569	1767	3526	1572	1767	5066	1572	1767	5066	1568
Grp Volume(v), veh/h	321	435	70	118	406	306	104	717	98	254	620	268
Grp Sat Flow(s),veh/h/ln	1767	1763	1569	1767	1763	1572	1767	1689	1572	1767	1689	1568
Q Serve(g_s), s	17.1	8.6	2.9	6.2	9.3	17.3	5.5	12.5	3.9	13.5	9.4	8.2
Cycle Q Clear(g_c), s	17.1	8.6	2.9	6.2	9.3	17.3	5.5	12.5	3.9	13.5	9.4	8.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	331	1255	559	149	866	386	132	1038	322	275	1486	460
V/C Ratio(X)	0.97	0.35	0.13	0.79	0.47	0.79	0.79	0.69	0.30	0.92	0.42	0.58
Avail Cap(c_a), veh/h	331	1488	662	292	1410	629	255	1664	516	275	1722	533
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	22.5	20.6	42.7	30.6	33.6	43.2	35.0	19.2	39.5	27.0	9.9
Incr Delay (d2), s/veh	41.1	0.2	0.1	9.1	0.4	3.7	9.8	0.8	0.5	34.4	0.2	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	3.4	1.0	3.0	3.8	6.7	2.7	5.0	1.9	8.2	3.6	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.5	22.6	20.7	51.8	31.0	37.3	53.0	35.8	19.7	74.0	27.2	11.1
LnGrp LOS	E	C	C	D	C	D	D	D	B	E	C	B
Approach Vol, veh/h		826			830			919			1142	
Approach Delay, s/veh		44.6			36.3			36.0			33.8	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.7	24.4	12.2	38.7	11.3	32.8	22.7	28.2
Change Period (Y+Rc), s	4.9	* 4.9	* 4.2	4.9	* 4.2	4.9	4.9	* 4.9
Max Green Setting (Gmax), s	14.8	* 31	* 16	40.1	* 14	32.3	17.8	* 38
Max Q Clear Time (g_c+I1), s	15.5	14.5	8.2	10.6	7.5	11.4	19.1	19.3
Green Ext Time (p_c), s	0.0	4.6	0.1	3.1	0.1	4.9	0.0	3.4

Intersection Summary	
HCM 6th Ctrl Delay	37.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	692	32	11	873	32	15
Future Vol, veh/h	692	32	11	873	32	15
Conflicting Peds, #/hr	0	7	7	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	706	33	11	891	33	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	746	0	1198	377
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	468	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	865	-	180	624
Stage 1	-	-	-	-	440	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	859	-	174	620
Mov Cap-2 Maneuver	-	-	-	-	174	-
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	584	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	25.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	226	-	-	859	-
HCM Lane V/C Ratio	0.212	-	-	0.013	-
HCM Control Delay (s)	25.2	-	-	9.2	0.1
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	670	37	30	843	42	57
Future Vol, veh/h	670	37	30	843	42	57
Conflicting Peds, #/hr	0	4	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	744	41	33	937	47	63

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	789	0	1306	399
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	537	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	833	-	153	603
Stage 1	-	-	-	-	420	-
Stage 2	-	-	-	-	553	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	830	-	140	600
Mov Cap-2 Maneuver	-	-	-	-	140	-
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	506	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	30.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	251	-	-	830	-
HCM Lane V/C Ratio	0.438	-	-	0.04	-
HCM Control Delay (s)	30.1	-	-	9.5	0.4
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	2.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	29	4	64	9	3	35	12	12	1294	13	7	21	960	21
Future Vol, veh/h	29	4	64	9	3	35	12	12	1294	13	7	21	960	21
Conflicting Peds, #/hr	0	0	1	1	0	0	0	9	0	18	0	18	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	31	4	69	10	3	38	13	13	1391	14	8	23	1032	23

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1725	2590	538	1946	2594	721	770	1064	0	0	1026	1423	0	0
Stage 1	1115	1115	-	1468	1468	-	-	-	-	-	-	-	-	-
Stage 2	610	1475	-	478	1126	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	95	25	420	69	25	319	598	367	-	-	433	246	-	-
Stage 1	167	284	-	94	192	-	-	-	-	-	-	-	-	-
Stage 2	411	191	-	493	280	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	64	20	416	41	20	314	423	423	-	-	267	267	-	-
Mov Cap-2 Maneuver	64	20	-	41	20	-	-	-	-	-	-	-	-	-
Stage 1	155	250	-	87	177	-	-	-	-	-	-	-	-	-
Stage 2	333	176	-	359	246	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	117.8	75.6	0.3	0.6
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	423	-	-	120	98	267	-	-
HCM Lane V/C Ratio	0.061	-	-	0.869	0.516	0.113	-	-
HCM Control Delay (s)	14.1	-	-	117.8	75.6	20.2	-	-
HCM Lane LOS	B	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	0.2	-	-	5.3	2.3	0.4	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	229	254	4	227	1100	924	229
Future Volume (vph)	229	254	4	227	1100	924	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1560		1787	5036	5036	1544
Flt Permitted	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)	1787	1560		1787	5036	5036	1544
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	241	267	4	239	1158	973	241
RTOR Reduction (vph)	0	197	0	0	0	0	139
Lane Group Flow (vph)	241	70	0	243	1158	973	102
Confl. Peds. (#/hr)		24		9			9
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	NA	Perm
Protected Phases	7		5	5	2	6	
Permitted Phases		4					6
Actuated Green, G (s)	15.3	15.5		12.7	35.0	18.1	18.1
Effective Green, g (s)	15.3	15.5		12.7	35.0	18.1	18.1
Actuated g/C Ratio	0.26	0.26		0.21	0.59	0.30	0.30
Clearance Time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	460	407		382	2967	1534	470
v/s Ratio Prot	c0.13			c0.14	0.23	c0.19	
v/s Ratio Perm		0.04					0.07
v/c Ratio	0.52	0.17		0.64	0.39	0.63	0.22
Uniform Delay, d1	18.9	17.0		21.2	6.5	17.8	15.4
Progression Factor	1.00	1.00		0.99	0.99	1.00	1.00
Incremental Delay, d2	1.1	0.2		3.5	0.1	0.9	0.2
Delay (s)	20.0	17.2		24.6	6.5	18.7	15.6
Level of Service	C	B		C	A	B	B
Approach Delay (s)	18.5				9.7	18.1	
Approach LOS	B				A	B	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	13.3
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	25

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	5	2	93	22	4	59	25	59	1204	28	20	39	1030	11
Future Vol, veh/h	5	2	93	22	4	59	25	59	1204	28	20	39	1030	11
Conflicting Peds, #/hr	2	0	0	0	0	2	0	6	0	11	0	11	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	6	2	104	25	4	66	28	66	1353	31	22	44	1157	12

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	2034	2884	591	2164	2875	705	854	1175	0	0	1011	1395	0	0
Stage 1	1301	1301	-	1568	1568	-	-	-	-	-	-	-	-	-
Stage 2	733	1583	-	596	1307	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	61	16	388	51	16	327	538	325	-	-	441	253	-	-
Stage 1	124	231	-	80	172	-	-	-	-	-	-	-	-	-
Stage 2	346	169	-	419	230	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	20	9	386	~ 20	9	323	344	344	-	-	279	279	-	-
Mov Cap-2 Maneuver	20	9	-	~ 20	9	-	-	-	-	-	-	-	-	-
Stage 1	90	175	-	58	124	-	-	-	-	-	-	-	-	-
Stage 2	192	122	-	230	174	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	92.4	$ 623.7	1.2	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	344	-	-	140	49	279	-	-
HCM Lane V/C Ratio	0.274	-	-	0.803	1.949	0.238	-	-
HCM Control Delay (s)	19.4	-	-	92.4	$ 623.7	21.9	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	1.1	-	-	5	9.6	0.9	-	-

Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	241	249	28	101	361	232	80	843	88	250	680	240
Future Volume (veh/h)	241	249	28	101	361	232	80	843	88	250	680	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	262	271	30	110	392	252	87	916	96	272	739	261
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	287	1037	463	139	727	324	112	1286	396	303	1856	573
Arrive On Green	0.16	0.29	0.29	0.08	0.21	0.21	0.06	0.25	0.25	0.17	0.37	0.37
Sat Flow, veh/h	1767	3526	1572	1767	3526	1572	1767	5066	1559	1767	5066	1563
Grp Volume(v), veh/h	262	271	30	110	392	252	87	916	96	272	739	261
Grp Sat Flow(s),veh/h/ln	1767	1763	1572	1767	1763	1572	1767	1689	1559	1767	1689	1563
Q Serve(g_s), s	13.9	5.6	1.3	5.8	9.5	14.4	4.6	15.7	3.6	14.4	10.3	7.0
Cycle Q Clear(g_c), s	13.9	5.6	1.3	5.8	9.5	14.4	4.6	15.7	3.6	14.4	10.3	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	287	1037	463	139	727	324	112	1286	396	303	1856	573
V/C Ratio(X)	0.91	0.26	0.06	0.79	0.54	0.78	0.78	0.71	0.24	0.90	0.40	0.46
Avail Cap(c_a), veh/h	287	1420	634	280	1406	627	234	1658	510	306	1865	576
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	25.7	24.2	43.1	33.8	35.8	44.0	32.4	16.4	38.6	22.4	7.8
Incr Delay (d2), s/veh	31.2	0.1	0.1	9.5	0.6	4.0	11.0	1.0	0.3	26.9	0.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	2.3	0.5	2.8	4.0	5.7	2.3	6.2	1.7	8.2	3.9	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.4	25.9	24.3	52.6	34.4	39.8	55.0	33.4	16.7	65.6	22.5	8.3
LnGrp LOS	E	C	C	D	C	D	D	C	B	E	C	A
Approach Vol, veh/h		563			754			1099			1272	
Approach Delay, s/veh		46.5			38.9			33.7			28.8	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.3	29.1	12.0	32.9	10.5	39.8	20.4	24.6
Change Period (Y+Rc), s	4.9	* 4.9	4.5	4.9	4.5	4.9	4.9	* 4.9
Max Green Setting (Gmax), s	16.5	* 31	15.1	38.4	12.6	35.1	15.5	* 38
Max Q Clear Time (g_c+I1), s	16.4	17.7	7.8	7.6	6.6	12.3	15.9	16.4
Green Ext Time (p_c), s	0.0	5.3	0.1	1.8	0.1	6.0	0.0	3.2

Intersection Summary	
HCM 6th Ctrl Delay	35.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	47	0	0	59	9	49	742	35	7	57	1120	63
Future Vol, veh/h	0	0	47	0	0	59	9	49	742	35	7	57	1120	63
Conflicting Peds, #/hr	1	0	0	0	0	1	0	8	0	5	0	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	56	0	0	70	11	58	883	42	8	68	1333	75

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	712	-	-	469	1028	1416	0	0	675	930	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	323	0	0	465	431	248	-	-	674	426	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	321	-	-	462	259	259	-	-	437	437	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.6	14.2	1.7	0.8
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	259	-	-	321	462	437	-	-
HCM Lane V/C Ratio	0.267	-	-	0.174	0.152	0.174	-	-
HCM Control Delay (s)	23.8	-	-	18.6	14.2	15	-	-
HCM Lane LOS	C	-	-	C	B	B	-	-
HCM 95th %tile Q(veh)	1	-	-	0.6	0.5	0.6	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	104	122	5	352	599	16	769	390
Future Volume (vph)	104	122	5	352	599	16	769	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.2	4.2	4.2
Lane Util. Factor	1.00	1.00		1.00	0.91	1.00	0.91	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1505		1787	5036	1752	5036	1546
Flt Permitted	0.95	1.00		0.95	1.00	0.35	1.00	1.00
Satd. Flow (perm)	1787	1505		1787	5036	637	5036	1546
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	135	158	6	457	778	21	999	506
RTOR Reduction (vph)	0	128	0	0	0	0	0	252
Lane Group Flow (vph)	135	30	0	463	778	21	999	254
Confl. Peds. (#/hr)		79		7				7
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	Perm	NA	Perm
Protected Phases	7		5	5	2		6	
Permitted Phases		4				6		6
Actuated Green, G (s)	12.9	13.1		23.6	46.7	19.6	19.6	19.6
Effective Green, g (s)	12.9	13.1		23.6	46.7	19.6	19.6	19.6
Actuated g/C Ratio	0.19	0.19		0.34	0.68	0.29	0.29	0.29
Clearance Time (s)	4.2	4.0		4.2	4.9	4.2	4.2	4.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	335	286		613	3423	181	1436	441
v/s Ratio Prot	c0.08			c0.26	0.15		c0.20	
v/s Ratio Perm		0.02				0.03		0.16
v/c Ratio	0.40	0.11		0.76	0.23	0.12	0.70	0.58
Uniform Delay, d1	24.5	23.0		20.0	4.2	18.1	21.9	21.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.2		5.3	0.0	0.3	1.5	1.8
Delay (s)	25.3	23.1		25.3	4.2	18.4	23.4	22.8
Level of Service	C	C		C	A	B	C	C
Approach Delay (s)	24.1				12.1		23.1	
Approach LOS	C				B		C	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	12.6
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	52	0	0	62	22	117	959	36	3	24	890	29
Future Vol, veh/h	0	0	52	0	0	62	22	117	959	36	3	24	890	29
Conflicting Peds, #/hr	0	0	2	2	0	0	0	13	0	2	0	2	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	63	0	0	75	27	141	1155	43	4	29	1072	35

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	569	-	-	601	808	1120	0	0	875	1200	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	401	0	0	382	570	345	-	-	524	316	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	395	-	-	381	359	359	-	-	325	325	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.8	16.7	2.9	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	359	-	-	395	381	325	-	-
HCM Lane V/C Ratio	0.466	-	-	0.159	0.196	0.1	-	-
HCM Control Delay (s)	23.5	-	-	15.8	16.7	17.3	-	-
HCM Lane LOS	C	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	2.4	-	-	0.6	0.7	0.3	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	97	0	0	47	12	12	1323	17	7	21	969	24
Future Vol, veh/h	0	0	97	0	0	47	12	12	1323	17	7	21	969	24
Conflicting Peds, #/hr	0	0	1	1	0	0	0	9	0	18	0	18	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	104	0	0	51	13	13	1423	18	8	23	1042	26

Major/Minor	Minor2		Minor1			Major1				Major2				
Conflicting Flow All	-	-	544	-	-	739	779	1077	0	0	1052	1459	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	416	0	0	311	591	362	-	-	418	236	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	412	-	-	306	400	400	-	-	254	254	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	19.1	0.3	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	400	-	-	412	306	254	-	-
HCM Lane V/C Ratio	0.065	-	-	0.253	0.165	0.119	-	-
HCM Control Delay (s)	14.6	-	-	16.7	19.1	21.1	-	-
HCM Lane LOS	B	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1	0.6	0.4	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	229	254	26	231	1100	33	924	229
Future Volume (vph)	229	254	26	231	1100	33	924	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	1.00	0.91	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1559		1784	5036	1752	5036	1542
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1559		1784	5036	1752	5036	1542
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	241	267	27	243	1158	35	973	241
RTOR Reduction (vph)	0	201	0	0	0	0	0	143
Lane Group Flow (vph)	241	66	0	270	1158	35	973	98
Confl. Peds. (#/hr)		24		9				9
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	Prot	NA	Perm
Protected Phases	7		5	5	2	1	6	
Permitted Phases		4						6
Actuated Green, G (s)	15.4	15.6		16.3	32.3	2.1	18.1	18.1
Effective Green, g (s)	15.4	15.6		16.3	32.3	2.1	18.1	18.1
Actuated g/C Ratio	0.24	0.25		0.26	0.51	0.03	0.29	0.29
Clearance Time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	436	385		460	2577	58	1444	442
v/s Ratio Prot	c0.13			c0.15	0.23	0.02	c0.19	
v/s Ratio Perm		0.04						0.06
v/c Ratio	0.55	0.17		0.59	0.45	0.60	0.67	0.22
Uniform Delay, d1	20.8	18.7		20.5	9.8	30.1	19.9	17.1
Progression Factor	1.00	1.00		0.99	0.99	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.2		1.9	0.1	16.4	1.3	0.3
Delay (s)	22.4	18.9		22.3	9.8	46.5	21.1	17.4
Level of Service	C	B		C	A	D	C	B
Approach Delay (s)	20.5				12.2		21.1	
Approach LOS	C				B		C	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	13.3
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	100	0	0	85	25	59	1209	30	20	39	1052	11
Future Vol, veh/h	0	0	100	0	0	85	25	59	1209	30	20	39	1052	11
Conflicting Peds, #/hr	2	0	0	0	0	2	0	6	0	11	0	11	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	112	0	0	96	28	66	1358	34	22	44	1182	12

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	603	-	-	709	872	1200	0	0	1016	1403	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	381	0	0	325	526	316	-	-	438	251	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	379	-	-	321	333	333	-	-	269	269	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.5	20.9	1.3	1.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	333	-	-	379	321	269	-	-
HCM Lane V/C Ratio	0.283	-	-	0.296	0.298	0.246	-	-
HCM Control Delay (s)	20.1	-	-	18.5	20.9	22.7	-	-
HCM Lane LOS	C	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	1.1	-	-	1.2	1.2	0.9	-	-

Intersection: 1: San Pablo Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	31
Average Queue (ft)	4	21
95th Queue (ft)	21	44
Link Distance (ft)	281	901
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Glenn Ave & Clinton Ave

Movement	EB	EB	WB	NB
Directions Served	T	TR	LT	LR
Maximum Queue (ft)	29	31	110	116
Average Queue (ft)	1	1	14	43
95th Queue (ft)	10	10	54	90
Link Distance (ft)	281	281	745	635
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Cambridge Ave & Blackstone Ave

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	R	R	UL	T	UL	T	TR
Maximum Queue (ft)	95	55	81	31	53	121	74
Average Queue (ft)	34	32	29	1	21	5	2
95th Queue (ft)	70	55	65	10	48	42	24
Link Distance (ft)	1033	1240		270		898	898
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			75		75		
Storage Blk Time (%)			2			1	
Queuing Penalty (veh)			5			0	

Intersection: 4: Blackstone Ave & Weldon Ave

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	T	U	T	T	T	R
Maximum Queue (ft)	121	88	346	169	191	202	53	272	270	212	216
Average Queue (ft)	61	30	206	49	64	83	20	176	132	113	116
95th Queue (ft)	102	62	319	122	132	157	49	256	223	189	197
Link Distance (ft)		847		608	608	608		270	270	270	
Upstream Blk Time (%)								0	0		
Queuing Penalty (veh)								2	0		
Storage Bay Dist (ft)	105		395				100				100
Storage Blk Time (%)	2	0						37		11	18
Queuing Penalty (veh)	2	0						6		44	45

Intersection: 5: Blackstone Ave & University Ave

Movement	EB	WB	NB	NB	NB	SB	SB
Directions Served	R	R	UL	T	TR	UL	TR
Maximum Queue (ft)	55	56	114	31	27	47	22
Average Queue (ft)	26	35	42	1	1	16	1
95th Queue (ft)	50	56	88	10	9	42	7
Link Distance (ft)	407	1233		570	570		608
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			85			75	
Storage Blk Time (%)			1				
Queuing Penalty (veh)			4				

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	T
Maximum Queue (ft)	339	450	373	43	150	178	177	167	172	259	224	231
Average Queue (ft)	197	116	102	19	70	116	87	77	56	155	109	54
95th Queue (ft)	319	273	225	42	123	174	161	141	118	227	189	150
Link Distance (ft)		2178	2178			1224	1224			2721	2721	2721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	245			150	255			100	185			
Storage Blk Time (%)	13	0	0				3	5	0	3		1
Queuing Penalty (veh)	24	0	0				9	9	0	3		0

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	224	273	172	191	152	154
Average Queue (ft)	27	163	82	102	84	67
95th Queue (ft)	91	261	151	159	138	124
Link Distance (ft)			570	570	570	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	160	205				105
Storage Blk Time (%)		5			4	2
Queuing Penalty (veh)		9			10	3

Network Summary

Network wide Queuing Penalty: 174

Intersection: 1: San Pablo Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	76	55
Average Queue (ft)	10	28
95th Queue (ft)	48	55
Link Distance (ft)	281	901
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Glenn Ave & Clinton Ave

Movement	EB	WB	WB	NB
Directions Served	T	LT	T	LR
Maximum Queue (ft)	31	197	200	94
Average Queue (ft)	3	34	7	44
95th Queue (ft)	18	115	66	80
Link Distance (ft)	281	745	745	635
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Cambridge Ave & Blackstone Ave

Movement	EB	WB	NB	SB	SB
Directions Served	R	R	UL	UL	T
Maximum Queue (ft)	162	74	56	32	89
Average Queue (ft)	47	34	21	17	3
95th Queue (ft)	104	60	49	40	29
Link Distance (ft)	1033	1240			898
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			75	75	
Storage Blk Time (%)			0		0
Queuing Penalty (veh)			0		0

Intersection: 4: Blackstone Ave & Weldon Ave

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	T	U	T	T	T	R
Maximum Queue (ft)	171	196	315	181	222	332	186	287	236	202	142
Average Queue (ft)	98	73	156	89	118	123	42	182	136	101	64
95th Queue (ft)	164	149	281	167	206	222	113	274	224	174	108
Link Distance (ft)		847		608	608	608		270	270	270	
Upstream Blk Time (%)								0			
Queuing Penalty (veh)								2			
Storage Bay Dist (ft)	105		395				100				100
Storage Blk Time (%)	6	1						32		8	1
Queuing Penalty (veh)	15	2						11		19	3

Intersection: 5: Blackstone Ave & University Ave

Movement	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	R	R	UL	T	T	TR	UL	T	T	TR
Maximum Queue (ft)	97	55	76	94	74	126	59	92	52	31
Average Queue (ft)	46	36	37	5	2	6	27	3	3	1
95th Queue (ft)	74	58	69	36	25	44	58	30	21	10
Link Distance (ft)	407	1233		570	570	570		608	608	608
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			85				75			
Storage Blk Time (%)			0	0			1	0		
Queuing Penalty (veh)			0	0			2	0		

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	T
Maximum Queue (ft)	340	480	392	58	193	174	139	125	219	305	253	186
Average Queue (ft)	210	123	73	10	89	112	73	60	65	159	157	115
95th Queue (ft)	353	356	216	32	159	160	126	109	133	237	224	188
Link Distance (ft)		2178	2178			1224	1224			2721	2721	2721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	245			150	255			100	185			
Storage Blk Time (%)	16						4	2		3		1
Queuing Penalty (veh)	20						9	4		2		1

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	43	280	502	316	217	172
Average Queue (ft)	19	206	165	140	136	68
95th Queue (ft)	37	308	388	231	198	121
Link Distance (ft)			570	570	570	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	160	205				105
Storage Blk Time (%)		28			17	1
Queuing Penalty (veh)		63			41	2

Network Summary

Network wide Queuing Penalty: 197

Appendix H: Near Term plus Project Traffic Conditions

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	926	43	8	529	23	13
Future Vol, veh/h	926	43	8	529	23	13
Conflicting Peds, #/hr	0	5	5	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1129	52	10	645	28	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1186	0	1503	596
Stage 1	-	-	-	-	1160	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	590	-	113	449
Stage 1	-	-	-	-	263	-
Stage 2	-	-	-	-	693	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	587	-	109	447
Mov Cap-2 Maneuver	-	-	-	-	109	-
Stage 1	-	-	-	-	262	-
Stage 2	-	-	-	-	674	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	38.6
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	150	-	-	587	-
HCM Lane V/C Ratio	0.293	-	-	0.017	-
HCM Control Delay (s)	38.6	-	-	11.2	0.1
HCM Lane LOS	E	-	-	B	A
HCM 95th %tile Q(veh)	1.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	890	49	23	504	34	57
Future Vol, veh/h	890	49	23	504	34	57
Conflicting Peds, #/hr	0	4	4	0	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1035	57	27	586	40	66

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1096	0	1419	554
Stage 1	-	-	-	-	1068	-
Stage 2	-	-	-	-	351	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	638	-	129	479
Stage 1	-	-	-	-	294	-
Stage 2	-	-	-	-	687	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	636	-	120	475
Mov Cap-2 Maneuver	-	-	-	-	120	-
Stage 1	-	-	-	-	293	-
Stage 2	-	-	-	-	641	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	34.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	226	-	-	636	-
HCM Lane V/C Ratio	0.468	-	-	0.042	-
HCM Control Delay (s)	34.2	-	-	10.9	0.3
HCM Lane LOS	D	-	-	B	A
HCM 95th %tile Q(veh)	2.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	47.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	28	0	43	8	2	51	9	116	790	36	7	58	1137	102
Future Vol, veh/h	28	0	43	8	2	51	9	116	790	36	7	58	1137	102
Conflicting Peds, #/hr	1	0	0	0	0	1	0	8	0	5	0	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	33	0	51	10	2	61	11	138	940	43	8	69	1354	121

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	2253	2863	746	1961	2902	498	1077	1483	0	0	718	988	0	0
Stage 1	1577	1577	-	1265	1265	-	-	-	-	-	-	-	-	-
Stage 2	676	1286	-	696	1637	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	45	17	307	68	16	445	405	229	-	-	639	400	-	-
Stage 1	79	170	-	131	241	-	-	-	-	-	-	-	-	-
Stage 2	375	235	-	364	159	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	~ 11	5	305	24	5	442	233	233	-	-	411	411	-	-
Mov Cap-2 Maneuver	~ 11	5	-	24	5	-	-	-	-	-	-	-	-	-
Stage 1	~ 28	137	-	47	86	-	-	-	-	-	-	-	-	-
Stage 2	113	84	-	246	128	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 1327.5	207.6	5.8	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	233	-	-	26	72	411	-	-
HCM Lane V/C Ratio	0.639	-	-	3.251	1.009	0.188	-	-
HCM Control Delay (s)	44.3	-	-	$ 1327.5	207.6	15.8	-	-
HCM Lane LOS	E	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	3.9	-	-	10.4	5.3	0.7	-	-

Notes

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

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	95	128	275	740	845	351
Future Volume (vph)	95	128	275	740	845	351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0	4.2	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.94	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1508	1787	5036	5036	1547
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1787	1508	1787	5036	5036	1547
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	123	166	357	961	1097	456
RTOR Reduction (vph)	0	134	0	0	0	202
Lane Group Flow (vph)	123	32	357	961	1097	254
Confl. Peds. (#/hr)		79	7			7
Heavy Vehicles (%)	1%	1%	1%	3%	3%	1%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	12.5	12.7	18.6	44.5	21.7	21.7
Effective Green, g (s)	12.5	12.7	18.6	44.5	21.7	21.7
Actuated g/C Ratio	0.19	0.19	0.28	0.67	0.33	0.33
Clearance Time (s)	4.2	4.0	4.2	4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	337	289	502	3390	1653	507
v/s Ratio Prot	c0.07		c0.20	0.19	c0.22	
v/s Ratio Perm		0.02				0.16
v/c Ratio	0.36	0.11	0.71	0.28	0.66	0.50
Uniform Delay, d1	23.3	22.0	21.3	4.4	19.1	17.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	4.7	0.0	1.0	0.8
Delay (s)	24.0	22.2	26.1	4.4	20.1	18.6
Level of Service	C	C	C	A	C	B
Approach Delay (s)	23.0			10.3	19.7	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	66.1	Sum of lost time (s)	13.3
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	26.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	5	1	48	6	11	47	22	117	1028	36	3	25	948	30
Future Vol, veh/h	5	1	48	6	11	47	22	117	1028	36	3	25	948	30
Conflicting Peds, #/hr	0	0	2	2	0	0	0	13	0	2	0	2	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	6	1	58	7	13	57	27	141	1239	43	4	30	1142	36

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	2079	2861	604	2126	2858	643	860	1191	0	0	936	1284	0	0
Stage 1	1241	1241	-	1599	1599	-	-	-	-	-	-	-	-	-
Stage 2	838	1620	-	527	1259	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	57	17	380	54	17	359	534	319	-	-	485	287	-	-
Stage 1	136	247	-	76	166	-	-	-	-	-	-	-	-	-
Stage 2	298	162	-	461	242	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	7	375	22	~ 7	358	332	332	-	-	296	296	-	-
Mov Cap-2 Maneuver	-	7	-	22	~ 7	-	-	-	-	-	-	-	-	-
Stage 1	67	216	-	38	82	-	-	-	-	-	-	-	-	-
Stage 2	105	80	-	343	212	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		$ 906.5	3	0.5
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	332	-	-	-	32	296	-	-
HCM Lane V/C Ratio	0.504	-	-	-	2.41	0.114	-	-
HCM Control Delay (s)	26.4	-	-	-	$ 906.5	18.7	-	-
HCM Lane LOS	D	-	-	-	F	C	-	-
HCM 95th %tile Q(veh)	2.7	-	-	-	8.9	0.4	-	-

Notes

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

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	306	370	61	102	341	273	5	87	624	82	229
Future Volume (vph)	5	306	370	61	102	341	273	5	87	624	82	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	4.2
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00		1.00	0.91	1.00	1.00
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00	1.00		1.00	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	1.00	1.00
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)		1752	3505	1546	1752	3505	1568		1752	5036	1568	1752
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)		1752	3505	1546	1752	3505	1568		1752	5036	1568	1752
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	6	364	440	73	121	406	325	6	104	743	98	273
RTOR Reduction (vph)	0	0	0	51	0	0	214	0	0	0	76	0
Lane Group Flow (vph)	0	370	440	22	121	406	111	0	110	743	22	273
Confl. Peds. (#/hr)				3								3
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4			8				2	
Actuated Green, G (s)		19.2	27.1	27.1	11.5	19.4	19.4		10.1	20.8	20.8	14.1
Effective Green, g (s)		19.2	27.1	27.1	11.5	19.4	19.4		10.1	20.8	20.8	14.1
Actuated g/C Ratio		0.21	0.30	0.30	0.13	0.21	0.21		0.11	0.23	0.23	0.15
Clearance Time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		366	1035	456	219	741	331		192	1142	355	269
v/s Ratio Prot		c0.21	0.13		0.07	c0.12			0.06	c0.15		c0.16
v/s Ratio Perm				0.01			0.07				0.01	
v/c Ratio		1.01	0.43	0.05	0.55	0.55	0.34		0.57	0.65	0.06	1.01
Uniform Delay, d1		36.2	26.0	23.1	37.7	32.2	30.7		38.8	32.2	27.8	38.8
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99
Incremental Delay, d2		49.8	0.3	0.0	3.0	0.8	0.6		4.1	1.3	0.1	58.7
Delay (s)		86.1	26.3	23.1	40.7	33.1	31.3		42.8	33.5	27.9	97.3
Level of Service		F	C	C	D	C	C		D	C	C	F
Approach Delay (s)			51.1			33.5				34.0		
Approach LOS			D			C				C		

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	91.7	Sum of lost time (s)	18.2
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	554	241
Future Volume (vph)	554	241
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.9	4.9
Lane Util. Factor	0.91	1.00
Frpb, ped/bikes	1.00	1.00
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	5036	1568
Flt Permitted	1.00	1.00
Satd. Flow (perm)	5036	1568
Peak-hour factor, PHF	0.84	0.84
Adj. Flow (vph)	660	287
RTOR Reduction (vph)	0	188
Lane Group Flow (vph)	660	99
Confl. Peds. (#/hr)		
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	24.8	24.8
Effective Green, g (s)	24.8	24.8
Actuated g/C Ratio	0.27	0.27
Clearance Time (s)	4.9	4.9
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1361	424
v/s Ratio Prot	0.13	
v/s Ratio Perm		0.06
v/c Ratio	0.48	0.23
Uniform Delay, d1	28.1	26.0
Progression Factor	0.99	0.96
Incremental Delay, d2	0.3	0.3
Delay (s)	28.1	25.3
Level of Service	C	C
Approach Delay (s)	42.9	
Approach LOS	D	

Intersection Summary

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	700	32	11	883	32	15
Future Vol, veh/h	700	32	11	883	32	15
Conflicting Peds, #/hr	0	7	7	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	714	33	11	901	33	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	754	0	1211	381
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	473	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	859	-	176	620
Stage 1	-	-	-	-	436	-
Stage 2	-	-	-	-	596	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	853	-	170	616
Mov Cap-2 Maneuver	-	-	-	-	170	-
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	581	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	25.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	221	-	-	853	-
HCM Lane V/C Ratio	0.217	-	-	0.013	-
HCM Control Delay (s)	25.7	-	-	9.3	0.1
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	678	37	30	853	42	58
Future Vol, veh/h	678	37	30	853	42	58
Conflicting Peds, #/hr	0	4	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	753	41	33	948	47	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	798	0	1320	403
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	542	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	827	-	150	600
Stage 1	-	-	-	-	416	-
Stage 2	-	-	-	-	550	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	824	-	137	597
Mov Cap-2 Maneuver	-	-	-	-	137	-
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	502	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	30.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	248	-	-	824	-
HCM Lane V/C Ratio	0.448	-	-	0.04	-
HCM Control Delay (s)	30.8	-	-	9.6	0.4
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	2.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	29.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	48	4	83	10	3	36	12	62	1324	14	7	22	978	52
Future Vol, veh/h	48	4	83	10	3	36	12	62	1324	14	7	22	978	52
Conflicting Peds, #/hr	0	0	1	1	0	0	0	9	0	18	0	18	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	52	4	89	11	3	39	13	67	1424	15	8	24	1052	56

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1884	2770	564	2098	2791	738	808	1117	0	0	1050	1457	0	0
Stage 1	1153	1153	-	1610	1610	-	-	-	-	-	-	-	-	-
Stage 2	731	1617	-	488	1181	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	76	19	404	56	19	311	570	346	-	-	420	236	-	-
Stage 1	157	272	-	75	164	-	-	-	-	-	-	-	-	-
Stage 2	347	162	-	487	264	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	~ 41	13	400	24	13	306	357	357	-	-	255	255	-	-
Mov Cap-2 Maneuver	~ 41	13	-	24	13	-	-	-	-	-	-	-	-	-
Stage 1	121	237	-	57	125	-	-	-	-	-	-	-	-	-
Stage 2	229	124	-	326	230	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 498.5	171.2	0.9	0.6
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	357	-	-	80	64	255	-	-
HCM Lane V/C Ratio	0.223	-	-	1.815	0.823	0.122	-	-
HCM Control Delay (s)	18	-	-	$ 498.5	171.2	21.1	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	0.8	-	-	12.5	3.8	0.4	-	-

Notes

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

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	212	236	4	178	1198	992	199
Future Volume (vph)	212	236	4	178	1198	992	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1562		1786	5036	5036	1546
Flt Permitted	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)	1787	1562		1786	5036	5036	1546
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	223	248	4	187	1261	1044	209
RTOR Reduction (vph)	0	182	0	0	0	0	119
Lane Group Flow (vph)	223	66	0	191	1261	1044	90
Confl. Peds. (#/hr)		24		9			9
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	NA	Perm
Protected Phases	7		5	5	2	6	
Permitted Phases		4					6
Actuated Green, G (s)	14.3	14.5		9.4	31.5	17.9	17.9
Effective Green, g (s)	14.3	14.5		9.4	31.5	17.9	17.9
Actuated g/C Ratio	0.26	0.26		0.17	0.57	0.33	0.33
Clearance Time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	465	412		305	2889	1641	504
v/s Ratio Prot	c0.12			c0.11	0.25	c0.21	
v/s Ratio Perm		0.04					0.06
v/c Ratio	0.48	0.16		0.63	0.44	0.64	0.18
Uniform Delay, d1	17.2	15.5		21.1	6.7	15.7	13.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.2		4.0	0.1	0.8	0.2
Delay (s)	17.9	15.7		25.1	6.8	16.5	13.4
Level of Service	B	B		C	A	B	B
Approach Delay (s)	16.8				9.2	16.0	
Approach LOS	B				A	B	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	54.9	Sum of lost time (s)	13.3
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	38.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	6	2	94	23	4	60	25	59	1251	29	20	40	1078	12
Future Vol, veh/h	6	2	94	23	4	60	25	59	1251	29	20	40	1078	12
Conflicting Peds, #/hr	2	0	0	0	0	2	0	6	0	11	0	11	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	7	2	106	26	4	67	28	66	1406	33	22	45	1211	13

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	2112	2996	618	2241	2986	733	894	1230	0	0	1050	1450	0	0
Stage 1	1358	1358	-	1622	1622	-	-	-	-	-	-	-	-	-
Stage 2	754	1638	-	619	1364	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	55	14	372	45	14	313	511	305	-	-	420	238	-	-
Stage 1	113	217	-	73	161	-	-	-	-	-	-	-	-	-
Stage 2	336	158	-	406	216	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	14	7	370	~ 15	7	309	323	323	-	-	262	262	-	-
Mov Cap-2 Maneuver	14	7	-	~ 15	7	-	-	-	-	-	-	-	-	-
Stage 1	80	161	-	51	113	-	-	-	-	-	-	-	-	-
Stage 2	178	111	-	213	160	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	191.3	$ 938.1	1.3	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	323	-	-	105	38	262	-	-
HCM Lane V/C Ratio	0.292	-	-	1.091	2.572	0.257	-	-
HCM Control Delay (s)	20.7	-	-	191.3	$ 938.1	23.4	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	1.2	-	-	7.2	10.8	1	-	-

Notes

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

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	6	271	254	31	109	361	239	9	80	854	88	258
Future Volume (vph)	6	271	254	31	109	361	239	9	80	854	88	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	4.2
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00		1.00	0.91	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00
Flpb, ped/bikes		1.00	1.00	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	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)		1752	3505	1568	1752	3505	1568		1752	5036	1539	1752
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)		1752	3505	1568	1752	3505	1568		1752	5036	1539	1752
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	295	276	34	118	392	260	10	87	928	96	280
RTOR Reduction (vph)	0	0	0	25	0	0	208	0	0	0	71	0
Lane Group Flow (vph)	0	302	276	9	118	392	52	0	97	928	25	280
Confl. Peds. (#/hr)											7	7
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4			8				2	
Actuated Green, G (s)		17.1	25.0	25.0	11.5	19.4	19.4		8.7	25.1	25.1	17.1
Effective Green, g (s)		17.1	25.0	25.0	11.5	19.4	19.4		8.7	25.1	25.1	17.1
Actuated g/C Ratio		0.18	0.26	0.26	0.12	0.20	0.20		0.09	0.26	0.26	0.18
Clearance Time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		309	904	404	207	701	313		157	1304	398	309
v/s Ratio Prot		c0.17	0.08		0.07	c0.11			0.06	c0.18		c0.16
v/s Ratio Perm				0.01			0.03				0.02	
v/c Ratio		0.98	0.31	0.02	0.57	0.56	0.17		0.62	0.71	0.06	0.91
Uniform Delay, d1		39.7	29.0	26.8	40.4	34.9	32.1		42.5	32.6	27.0	39.1
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99
Incremental Delay, d2		44.6	0.2	0.0	3.8	1.0	0.3		7.1	1.9	0.1	28.3
Delay (s)		84.3	29.1	26.8	44.1	35.9	32.3		49.5	34.5	27.1	67.1
Level of Service		F	C	C	D	D	C		D	C	C	E
Approach Delay (s)			56.2			35.9				35.1		
Approach LOS			E			D				D		

Intersection Summary			
HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	96.9	Sum of lost time (s)	18.2
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	713	249
Future Volume (vph)	713	249
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.9	4.9
Lane Util. Factor	0.91	1.00
Frpb, ped/bikes	1.00	1.00
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	5036	1568
Flt Permitted	1.00	1.00
Satd. Flow (perm)	5036	1568
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	775	271
RTOR Reduction (vph)	0	135
Lane Group Flow (vph)	775	136
Confl. Peds. (#/hr)		
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	33.5	33.5
Effective Green, g (s)	33.5	33.5
Actuated g/C Ratio	0.35	0.35
Clearance Time (s)	4.9	4.9
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1741	542
v/s Ratio Prot	0.15	
v/s Ratio Perm		0.09
v/c Ratio	0.45	0.25
Uniform Delay, d1	24.5	22.7
Progression Factor	0.99	0.96
Incremental Delay, d2	0.2	0.2
Delay (s)	24.4	22.1
Level of Service	C	C
Approach Delay (s)	33.0	
Approach LOS	C	

Intersection Summary

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	71	0	0	61	9	116	818	36	7	58	1145	104
Future Vol, veh/h	0	0	71	0	0	61	9	116	818	36	7	58	1145	104
Conflicting Peds, #/hr	1	0	0	0	0	1	0	8	0	5	0	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	85	0	0	73	11	138	974	43	8	69	1363	124

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	752	-	-	515	1085	1495	0	0	742	1022	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	304	0	0	434	401	226	-	-	620	385	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	302	-	-	432	228	228	-	-	395	395	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.5	15	5.9	0.8
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	228	-	-	302	432	395	-	-
HCM Lane V/C Ratio	0.653	-	-	0.28	0.168	0.196	-	-
HCM Control Delay (s)	46.1	-	-	21.5	15	16.3	-	-
HCM Lane LOS	E	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	4	-	-	1.1	0.6	0.7	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	95	128	6	286	740	28	845	351
Future Volume (vph)	95	128	6	286	740	28	845	351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	1.00	0.91	1.00
Frpb, ped/bikes	1.00	0.91		1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1449		1786	5036	1752	5036	1530
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1449		1786	5036	1752	5036	1530
Peak-hour factor, PHF	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Adj. Flow (vph)	123	166	8	371	961	36	1097	456
RTOR Reduction (vph)	0	143	0	0	0	0	0	127
Lane Group Flow (vph)	123	23	0	379	961	36	1097	329
Confl. Peds. (#/hr)		79		7				7
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	Prot	NA	Perm
Protected Phases	7		5	5	2	1	6	
Permitted Phases		4						6
Actuated Green, G (s)	16.6	16.8		31.2	85.4	4.7	58.9	58.9
Effective Green, g (s)	16.6	16.8		31.2	85.4	4.7	58.9	58.9
Actuated g/C Ratio	0.14	0.14		0.26	0.71	0.04	0.49	0.49
Clearance Time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	247	202		464	3583	68	2471	750
v/s Ratio Prot	c0.07			c0.21	0.19	0.02	c0.22	
v/s Ratio Perm		0.02						0.22
v/c Ratio	0.50	0.12		0.82	0.27	0.53	0.44	0.44
Uniform Delay, d1	47.8	45.1		41.7	6.2	56.6	19.9	19.8
Progression Factor	1.00	1.00		0.70	0.40	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.3		9.2	0.2	7.3	0.6	1.9
Delay (s)	49.4	45.4		38.4	2.6	63.8	20.5	21.7
Level of Service	D	D		D	A	E	C	C
Approach Delay (s)	47.1				12.7		21.8	
Approach LOS	D				B		C	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.3
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	54	0	0	64	22	117	1033	37	3	25	954	30
Future Vol, veh/h	0	0	54	0	0	64	22	117	1033	37	3	25	954	30
Conflicting Peds, #/hr	0	0	2	2	0	0	0	13	0	2	0	2	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	65	0	0	77	27	141	1245	45	4	30	1149	36

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	608	-	-	647	865	1198	0	0	941	1292	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	378	0	0	357	531	316	-	-	482	285	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	373	-	-	356	328	328	-	-	293	293	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	17.9	3.1	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	328	-	-	373	356	293	-	-
HCM Lane V/C Ratio	0.511	-	-	0.174	0.217	0.115	-	-
HCM Control Delay (s)	26.9	-	-	16.7	17.9	18.9	-	-
HCM Lane LOS	D	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	2.8	-	-	0.6	0.8	0.4	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	135	0	0	49	12	62	1372	18	7	22	988	55
Future Vol, veh/h	0	0	135	0	0	49	12	62	1372	18	7	22	988	55
Conflicting Peds, #/hr	0	0	1	1	0	0	0	9	0	18	0	18	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	145	0	0	53	13	67	1475	19	8	24	1062	59

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	571	-	-	765	819	1130	0	0	1091	1512	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	399	0	0	299	562	341	-	-	398	222	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	395	-	-	294	343	343	-	-	238	238	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.3	19.9	0.9	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	343	-	-	395	294	238	-	-
HCM Lane V/C Ratio	0.232	-	-	0.367	0.179	0.131	-	-
HCM Control Delay (s)	18.6	-	-	19.3	19.9	22.4	-	-
HCM Lane LOS	C	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	0.9	-	-	1.7	0.6	0.4	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	212	236	27	182	1198	52	992	199
Future Volume (vph)	212	236	27	182	1198	52	992	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	1.00	0.91	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1560		1783	5036	1752	5036	1543
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1560		1783	5036	1752	5036	1543
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	223	248	28	192	1261	55	1044	209
RTOR Reduction (vph)	0	187	0	0	0	0	0	113
Lane Group Flow (vph)	223	61	0	220	1261	55	1044	96
Confl. Peds. (#/hr)		24		9				9
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	Prot	NA	Perm
Protected Phases	7		5	5	2	1	6	
Permitted Phases		4						6
Actuated Green, G (s)	14.8	15.0		13.9	30.0	2.7	18.8	18.8
Effective Green, g (s)	14.8	15.0		13.9	30.0	2.7	18.8	18.8
Actuated g/C Ratio	0.24	0.25		0.23	0.49	0.04	0.31	0.31
Clearance Time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	434	384		407	2484	77	1557	477
v/s Ratio Prot	c0.12			0.12	c0.25	0.03	c0.21	
v/s Ratio Perm		0.04						0.06
v/c Ratio	0.51	0.16		0.54	0.51	0.71	0.67	0.20
Uniform Delay, d1	19.9	18.0		20.6	10.4	28.7	18.3	15.5
Progression Factor	1.00	1.00		1.00	0.99	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.2		1.5	0.2	26.8	1.1	0.2
Delay (s)	20.9	18.2		22.0	10.5	55.5	19.4	15.7
Level of Service	C	B		C	B	E	B	B
Approach Delay (s)	19.5				12.2		20.4	
Approach LOS	B				B		C	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	13.3
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	102	0	0	87	25	59	1257	31	20	40	1101	12
Future Vol, veh/h	0	0	102	0	0	87	25	59	1257	31	20	40	1101	12
Conflicting Peds, #/hr	2	0	0	0	0	2	0	6	0	11	0	11	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	115	0	0	98	28	66	1412	35	22	45	1237	13

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	631	-	-	737	913	1256	0	0	1056	1458	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	365	0	0	311	499	296	-	-	416	236	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	363	-	-	307	311	311	-	-	252	252	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.4	22.1	1.3	1.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	311	-	-	363	307	252	-	-
HCM Lane V/C Ratio	0.303	-	-	0.316	0.318	0.268	-	-
HCM Control Delay (s)	21.6	-	-	19.4	22.1	24.4	-	-
HCM Lane LOS	C	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	1.2	-	-	1.3	1.3	1	-	-

Intersection: 1: San Pablo Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	55	76
Average Queue (ft)	4	26
95th Queue (ft)	24	57
Link Distance (ft)	281	901
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Glenn Ave & Clinton Ave

Movement	EB	EB	WB	NB
Directions Served	T	TR	LT	LR
Maximum Queue (ft)	52	50	131	95
Average Queue (ft)	4	3	21	42
95th Queue (ft)	23	20	72	74
Link Distance (ft)	281	281	745	635
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Cambridge Ave & Blackstone Ave

Movement	EB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	R	R	UL	T	T	TR	UL	T	TR
Maximum Queue (ft)	91	53	175	231	28	26	53	76	55
Average Queue (ft)	43	32	82	19	1	1	21	4	8
95th Queue (ft)	70	50	154	116	9	9	48	28	29
Link Distance (ft)	1033	1240		270	270	270		898	898
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			75				75		
Storage Blk Time (%)			28					0	
Queuing Penalty (veh)			75					0	

Intersection: 4: Blackstone Ave & Weldon Ave

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	T	U	T	T	T	R
Maximum Queue (ft)	112	81	415	173	233	246	190	270	230	270	250
Average Queue (ft)	62	29	193	48	56	74	43	171	142	135	103
95th Queue (ft)	109	59	306	117	140	156	131	258	225	223	202
Link Distance (ft)		847		608	608	608		270	270	270	
Upstream Blk Time (%)								0		0	0
Queuing Penalty (veh)								1		1	0
Storage Bay Dist (ft)	105		395				100				100
Storage Blk Time (%)	1		0				0	32		22	13
Queuing Penalty (veh)	1		1				0	9		77	36

Intersection: 5: Blackstone Ave & University Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	R	R	UL	T	UL	TR
Maximum Queue (ft)	50	56	103	165	51	22
Average Queue (ft)	28	36	46	6	17	1
95th Queue (ft)	45	54	96	54	45	7
Link Distance (ft)	407	1233		570		608
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			85		75	
Storage Blk Time (%)			2			
Queuing Penalty (veh)			8			

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	UL	T	T	R	L	T	T	R	UL	T	T	T
Maximum Queue (ft)	339	409	369	42	200	195	287	170	220	348	289	177
Average Queue (ft)	218	106	95	15	80	128	108	82	81	192	138	75
95th Queue (ft)	345	245	203	34	139	188	199	159	169	315	237	158
Link Distance (ft)		2178	2178			1224	1224			2721	2721	2721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	245			150	255			100	185			
Storage Blk Time (%)	12	0	1				9	7		12		1
Queuing Penalty (veh)	23	0	0				24	11		11		1

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	41	280	324	155	153	161
Average Queue (ft)	20	170	101	108	89	65
95th Queue (ft)	38	256	213	163	141	116
Link Distance (ft)			570	570	570	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	160	205				105
Storage Blk Time (%)		4			3	1
Queuing Penalty (veh)		8			7	2

Network Summary

Network wide Queuing Penalty: 297

Intersection: 1: San Pablo Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	96	53
Average Queue (ft)	8	27
95th Queue (ft)	39	49
Link Distance (ft)	281	901
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Glenn Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	76	118
Average Queue (ft)	19	46
95th Queue (ft)	57	84
Link Distance (ft)	745	635
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Cambridge Ave & Blackstone Ave

Movement	EB	WB	NB	SB	SB
Directions Served	R	R	UL	UL	TR
Maximum Queue (ft)	160	54	96	29	22
Average Queue (ft)	57	29	38	17	1
95th Queue (ft)	112	52	77	38	10
Link Distance (ft)	1020	1240			898
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			75	75	
Storage Blk Time (%)			3		
Queuing Penalty (veh)			12		

Intersection: 4: Blackstone Ave & Weldon Ave

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	T	U	T	T	T	R
Maximum Queue (ft)	164	167	198	275	266	258	74	239	262	182	162
Average Queue (ft)	88	63	108	87	112	129	33	155	121	102	56
95th Queue (ft)	150	122	177	190	213	239	68	228	215	157	108
Link Distance (ft)		842		608	608	608	267	267	267	267	
Upstream Blk Time (%)									0		
Queuing Penalty (veh)									0		
Storage Bay Dist (ft)	105		395								100
Storage Blk Time (%)	5	1								9	1
Queuing Penalty (veh)	13	1								17	3

Intersection: 5: Blackstone Ave & University Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	R	R	UL	T	UL	TR
Maximum Queue (ft)	99	70	74	88	71	31
Average Queue (ft)	47	37	35	3	23	1
95th Queue (ft)	79	61	69	29	57	10
Link Distance (ft)	407	1233		570		608
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			85		75	
Storage Blk Time (%)			0	0	0	
Queuing Penalty (veh)			0	0	0	

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	UL	T	T	R	L	T	T	R	UL	T	T	T
Maximum Queue (ft)	339	510	464	19	152	218	226	170	219	258	240	212
Average Queue (ft)	200	140	90	9	69	113	94	67	75	162	156	130
95th Queue (ft)	357	405	292	23	128	178	169	131	165	234	218	202
Link Distance (ft)		2178	2178			1224	1224			2721	2721	2721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	245			150	255			100	185			
Storage Blk Time (%)	20						4	5		4		3
Queuing Penalty (veh)	25						9	9		4		2

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	L	T	T	T	R
Maximum Queue (ft)	79	279	342	240	198	145
Average Queue (ft)	22	206	117	109	108	69
95th Queue (ft)	55	310	261	182	168	130
Link Distance (ft)			570	570	570	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	160	205				105
Storage Blk Time (%)		21	0		11	2
Queuing Penalty (veh)		49	0		29	5

Network Summary

Network wide Queuing Penalty: 180

Appendix I: Cumulative Year 2035 No Project Traffic Conditions

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1017	25	6	627	14	11
Future Vol, veh/h	1017	25	6	627	14	11
Conflicting Peds, #/hr	0	5	5	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1105	27	7	682	15	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1137	0	1479	571
Stage 1	-	-	-	-	1124	-
Stage 2	-	-	-	-	355	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	616	-	118	466
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	684	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	613	-	115	464
Mov Cap-2 Maneuver	-	-	-	-	115	-
Stage 1	-	-	-	-	273	-
Stage 2	-	-	-	-	672	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	29.8
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	172	-	-	613	-
HCM Lane V/C Ratio	0.158	-	-	0.011	-
HCM Control Delay (s)	29.8	-	-	10.9	0.1
HCM Lane LOS	D	-	-	B	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1018	25	6	605	30	52
Future Vol, veh/h	1018	25	6	605	30	52
Conflicting Peds, #/hr	0	4	4	0	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1107	27	7	658	33	57

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1138	0	1472	575
Stage 1	-	-	-	-	1125	-
Stage 2	-	-	-	-	347	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	615	-	119	464
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	690	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	613	-	116	460
Mov Cap-2 Maneuver	-	-	-	-	116	-
Stage 1	-	-	-	-	273	-
Stage 2	-	-	-	-	675	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	31.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	221	-	-	613	-
HCM Lane V/C Ratio	0.403	-	-	0.011	-
HCM Control Delay (s)	31.9	-	-	10.9	0.1
HCM Lane LOS	D	-	-	B	A
HCM 95th %tile Q(veh)	1.8	-	-	0	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	6	0	22	10	1	62	9	49	1056	54	7	69	1247	38
Future Vol, veh/h	6	0	22	10	1	62	9	49	1056	54	7	69	1247	38
Conflicting Peds, #/hr	1	0	0	0	0	1	0	8	0	5	0	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	7	0	24	11	1	67	10	53	1148	59	8	75	1355	41

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	2137	2888	706	2017	2879	610	1020	1404	0	0	881	1212	0	0
Stage 1	1550	1550	-	1309	1309	-	-	-	-	-	-	-	-	-
Stage 2	587	1338	-	708	1570	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	53	16	326	63	16	377	436	251	-	-	520	311	-	-
Stage 1	82	175	-	122	229	-	-	-	-	-	-	-	-	-
Stage 2	424	222	-	358	171	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	26	9	324	38	9	375	265	265	-	-	318	318	-	-
Mov Cap-2 Maneuver	26	9	-	38	9	-	-	-	-	-	-	-	-	-
Stage 1	62	128	-	93	174	-	-	-	-	-	-	-	-	-
Stage 2	263	168	-	245	125	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	60.6	64	1.1	1.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	265	-	-	94	135	318	-	-
HCM Lane V/C Ratio	0.238	-	-	0.324	0.588	0.26	-	-
HCM Control Delay (s)	22.8	-	-	60.6	64	20.2	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	0.9	-	-	1.2	3	1	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	77	77	106	930	971	293
Future Volume (vph)	77	77	106	930	971	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0	4.2	4.9	4.2	4.2
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.95	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1515	1787	5036	5036	1549
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1787	1515	1787	5036	5036	1549
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	84	84	115	1011	1055	318
RTOR Reduction (vph)	0	70	0	0	0	108
Lane Group Flow (vph)	84	14	115	1011	1055	210
Confl. Peds. (#/hr)		79	7			7
Heavy Vehicles (%)	1%	1%	1%	3%	3%	1%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	9.4	9.6	8.1	41.1	29.5	29.5
Effective Green, g (s)	9.4	9.6	8.1	41.1	29.5	29.5
Actuated g/C Ratio	0.16	0.16	0.14	0.69	0.49	0.49
Clearance Time (s)	4.2	4.0	4.2	4.9	4.2	4.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	281	244	242	3472	2492	766
v/s Ratio Prot	c0.05		c0.06	0.20	c0.21	
v/s Ratio Perm		0.01				0.14
v/c Ratio	0.30	0.06	0.48	0.29	0.42	0.27
Uniform Delay, d1	22.2	21.2	23.8	3.6	9.6	8.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	1.5	0.0	0.1	0.2
Delay (s)	22.8	21.3	25.3	3.6	9.7	9.0
Level of Service	C	C	C	A	A	A
Approach Delay (s)	22.0			5.8	9.6	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	59.6	Sum of lost time (s)	12.6
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	9.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	2	2	76	6	11	46	22	106	961	51	3	25	1004	31
Future Vol, veh/h	2	2	76	6	11	46	22	106	961	51	3	25	1004	31
Conflicting Peds, #/hr	0	0	2	2	0	0	0	13	0	2	0	2	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	2	2	83	7	12	50	24	115	1045	55	3	27	1091	34

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1883	2561	578	1852	2551	552	821	1138	0	0	803	1102	0	0
Stage 1	1181	1181	-	1353	1353	-	-	-	-	-	-	-	-	-
Stage 2	702	1380	-	499	1198	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	76	26	395	79	27	411	561	338	-	-	574	352	-	-
Stage 1	150	264	-	114	218	-	-	-	-	-	-	-	-	-
Stage 2	361	212	-	479	259	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	16	14	389	36	15	410	350	350	-	-	363	363	-	-
Mov Cap-2 Maneuver	16	14	-	36	15	-	-	-	-	-	-	-	-	-
Stage 1	89	239	-	69	131	-	-	-	-	-	-	-	-	-
Stage 2	174	127	-	342	235	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	45.2	258.1	2.5	0.4
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	350	-	-	173	62	363	-	-
HCM Lane V/C Ratio	0.398	-	-	0.503	1.104	0.084	-	-
HCM Control Delay (s)	21.9	-	-	45.2	258.1	15.8	-	-
HCM Lane LOS	C	-	-	E	F	C	-	-
HCM 95th %tile Q(veh)	1.9	-	-	2.5	5.5	0.3	-	-

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	236	434	89	102	391	219	5	235	829	209	217
Future Volume (vph)	5	236	434	89	102	391	219	5	235	829	209	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	4.2
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00		1.00	0.91	1.00	1.00
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00	1.00		1.00	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	1.00	1.00
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)		1752	3505	1546	1752	3505	1568		1752	5036	1568	1752
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)		1752	3505	1546	1752	3505	1568		1752	5036	1568	1752
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	257	472	97	111	425	238	5	255	901	227	236
RTOR Reduction (vph)	0	0	0	71	0	0	185	0	0	0	152	0
Lane Group Flow (vph)	0	262	472	26	111	425	53	0	260	901	75	236
Confl. Peds. (#/hr)				3								3
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4			8				2	
Actuated Green, G (s)		17.1	26.1	26.1	11.2	20.2	20.2		17.1	24.9	24.9	16.7
Effective Green, g (s)		17.1	26.1	26.1	11.2	20.2	20.2		17.1	24.9	24.9	16.7
Actuated g/C Ratio		0.18	0.27	0.27	0.12	0.21	0.21		0.18	0.26	0.26	0.17
Clearance Time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		308	942	415	202	729	326		308	1291	402	301
v/s Ratio Prot		c0.15	0.13		0.06	c0.12			c0.15	c0.18		c0.13
v/s Ratio Perm				0.02			0.03				0.05	
v/c Ratio		0.85	0.50	0.06	0.55	0.58	0.16		0.84	0.70	0.19	0.78
Uniform Delay, d1		38.8	30.0	26.4	40.6	34.7	31.5		38.7	32.7	28.2	38.5
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99
Incremental Delay, d2		19.6	0.4	0.1	3.0	1.2	0.2		18.6	1.7	0.2	12.5
Delay (s)		58.4	30.4	26.5	43.6	35.8	31.8		57.3	34.4	28.4	50.7
Level of Service		E	C	C	D	D	C		E	C	C	D
Approach Delay (s)			38.8			35.7				37.7		
Approach LOS			D			D				D		

Intersection Summary			
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	97.1	Sum of lost time (s)	18.2
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	731	221
Future Volume (vph)	731	221
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.9	4.9
Lane Util. Factor	0.91	1.00
Frpb, ped/bikes	1.00	1.00
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	5036	1568
Flt Permitted	1.00	1.00
Satd. Flow (perm)	5036	1568
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	795	240
RTOR Reduction (vph)	0	129
Lane Group Flow (vph)	795	111
Confl. Peds. (#/hr)		
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	24.5	24.5
Effective Green, g (s)	24.5	24.5
Actuated g/C Ratio	0.25	0.25
Clearance Time (s)	4.9	4.9
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1270	395
v/s Ratio Prot	0.16	
v/s Ratio Perm		0.07
v/c Ratio	0.63	0.28
Uniform Delay, d1	32.2	29.2
Progression Factor	0.99	0.97
Incremental Delay, d2	1.0	0.4
Delay (s)	32.8	28.7
Level of Service	C	C
Approach Delay (s)	35.4	
Approach LOS	D	

Intersection Summary

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	847	18	10	998	21	14
Future Vol, veh/h	847	18	10	998	21	14
Conflicting Peds, #/hr	0	7	7	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	864	18	10	1018	21	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	889	0	1409	448
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	529	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	764	-	131	561
Stage 1	-	-	-	-	368	-
Stage 2	-	-	-	-	558	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	759	-	126	557
Mov Cap-2 Maneuver	-	-	-	-	126	-
Stage 1	-	-	-	-	365	-
Stage 2	-	-	-	-	541	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	29.5
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	182	-	-	759	-
HCM Lane V/C Ratio	0.196	-	-	0.013	-
HCM Control Delay (s)	29.5	-	-	9.8	0.1
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	853	22	17	975	36	49
Future Vol, veh/h	853	22	17	975	36	49
Conflicting Peds, #/hr	0	4	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	927	24	18	1060	39	53

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	955	0	1511	482
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	568	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	722	-	112	533
Stage 1	-	-	-	-	341	-
Stage 2	-	-	-	-	533	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	719	-	104	530
Mov Cap-2 Maneuver	-	-	-	-	104	-
Stage 1	-	-	-	-	340	-
Stage 2	-	-	-	-	499	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	39.4
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	194	-	-	719	-
HCM Lane V/C Ratio	0.476	-	-	0.026	-
HCM Control Delay (s)	39.4	-	-	10.1	0.3
HCM Lane LOS	E	-	-	B	A
HCM 95th %tile Q(veh)	2.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	14	4	49	10	2	36	12	13	1462	16	7	29	1075	6
Future Vol, veh/h	14	4	49	10	2	36	12	13	1462	16	7	29	1075	6
Conflicting Peds, #/hr	0	0	1	1	0	0	0	9	0	18	0	18	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	15	4	53	11	2	39	13	14	1572	17	8	31	1156	6

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1930	2907	591	2196	2902	813	849	1171	0	0	1160	1607	0	0
Stage 1	1246	1246	-	1653	1653	-	-	-	-	-	-	-	-	-
Stage 2	684	1661	-	543	1249	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	71	16	388	48	16	278	541	326	-	-	365	199	-	-
Stage 1	135	246	-	69	156	-	-	-	-	-	-	-	-	-
Stage 2	370	154	-	451	245	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	43	12	384	24	12	273	381	381	-	-	212	212	-	-
Mov Cap-2 Maneuver	43	12	-	24	12	-	-	-	-	-	-	-	-	-
Stage 1	124	199	-	63	142	-	-	-	-	-	-	-	-	-
Stage 2	291	141	-	310	198	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	144.7	153	0.3	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	381	-	-	85	67	212	-	-
HCM Lane V/C Ratio	0.071	-	-	0.848	0.77	0.183	-	-
HCM Control Delay (s)	15.2	-	-	144.7	153	25.8	-	-
HCM Lane LOS	C	-	-	F	F	D	-	-
HCM 95th %tile Q(veh)	0.2	-	-	4.5	3.5	0.7	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	177	147	4	49	1301	1109	147
Future Volume (vph)	177	147	4	49	1301	1109	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1562		1785	5036	5036	1546
Flt Permitted	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)	1787	1562		1785	5036	5036	1546
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	186	155	4	52	1369	1167	155
RTOR Reduction (vph)	0	87	0	0	0	0	70
Lane Group Flow (vph)	186	68	0	56	1369	1167	85
Confl. Peds. (#/hr)		24		9			9
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	NA	Perm
Protected Phases	7		5	5	2	6	
Permitted Phases		4					6
Actuated Green, G (s)	13.3	13.5		2.7	30.2	23.3	23.3
Effective Green, g (s)	13.3	13.5		2.7	30.2	23.3	23.3
Actuated g/C Ratio	0.25	0.26		0.05	0.57	0.44	0.44
Clearance Time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	451	400		91	2891	2230	684
v/s Ratio Prot	c0.10			0.03	c0.27	c0.23	
v/s Ratio Perm		0.04					0.06
v/c Ratio	0.41	0.17		0.62	0.47	0.52	0.12
Uniform Delay, d1	16.4	15.2		24.4	6.6	10.6	8.6
Progression Factor	1.00	1.00		1.01	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.2		11.7	0.1	0.2	0.1
Delay (s)	17.0	15.4		36.3	6.7	10.8	8.7
Level of Service	B	B		D	A	B	A
Approach Delay (s)	16.3				7.9	10.6	
Approach LOS	B				A	B	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	13.3
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	19.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	4	2	115	27	4	59	25	48	1125	41	20	39	1059	15
Future Vol, veh/h	4	2	115	27	4	59	25	48	1125	41	20	39	1059	15
Conflicting Peds, #/hr	2	0	0	0	0	2	0	6	0	11	0	11	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	4	2	125	29	4	64	27	52	1223	45	22	42	1151	16

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	1944	2730	590	2004	2716	647	852	1173	0	0	925	1279	0	0
Stage 1	1293	1293	-	1415	1415	-	-	-	-	-	-	-	-	-
Stage 2	651	1437	-	589	1301	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	70	20	388	64	21	357	539	325	-	-	492	289	-	-
Stage 1	125	233	-	103	204	-	-	-	-	-	-	-	-	-
Stage 2	388	199	-	423	231	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	30	12	386	~ 26	13	353	340	340	-	-	319	319	-	-
Mov Cap-2 Maneuver	30	12	-	~ 26	13	-	-	-	-	-	-	-	-	-
Stage 1	95	185	-	78	155	-	-	-	-	-	-	-	-	-
Stage 2	236	151	-	226	183	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	51	$ 473.8	1.1	1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	340	-	-	202	59	319	-	-
HCM Lane V/C Ratio	0.233	-	-	0.651	1.658	0.201	-	-
HCM Control Delay (s)	18.8	-	-	51	$ 473.8	19.1	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	0.9	-	-	3.9	9	0.7	-	-

Notes

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

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	6	213	335	205	109	398	196	9	228	948	194	254
Future Volume (vph)	6	213	335	205	109	398	196	9	228	948	194	254
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	4.2
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00		1.00	0.91	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00
Flpb, ped/bikes		1.00	1.00	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	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)		1752	3505	1568	1752	3505	1568		1752	5036	1538	1752
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)		1752	3505	1568	1752	3505	1568		1752	5036	1538	1752
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	232	364	223	118	433	213	10	248	1030	211	276
RTOR Reduction (vph)	0	0	0	168	0	0	163	0	0	0	121	0
Lane Group Flow (vph)	0	239	364	55	118	433	50	0	258	1030	90	276
Confl. Peds. (#/hr)											7	7
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4			8				2	
Actuated Green, G (s)		15.9	24.9	24.9	11.7	20.7	20.7		18.0	27.5	27.5	18.2
Effective Green, g (s)		15.9	24.9	24.9	11.7	20.7	20.7		18.0	27.5	27.5	18.2
Actuated g/C Ratio		0.16	0.25	0.25	0.12	0.21	0.21		0.18	0.27	0.27	0.18
Clearance Time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		277	868	388	203	721	322		313	1378	420	317
v/s Ratio Prot		c0.14	0.10		0.07	c0.12			c0.15	c0.20		c0.16
v/s Ratio Perm				0.04			0.03				0.06	
v/c Ratio		0.86	0.42	0.14	0.58	0.60	0.16		0.82	0.75	0.22	0.87
Uniform Delay, d1		41.2	31.7	29.5	42.1	36.2	32.7		39.7	33.3	28.2	40.0
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99
Incremental Delay, d2		23.1	0.3	0.2	4.2	1.4	0.2		16.0	2.3	0.3	22.0
Delay (s)		64.3	32.1	29.6	46.3	37.6	33.0		55.7	35.6	28.4	61.6
Level of Service		E	C	C	D	D	C		E	D	C	E
Approach Delay (s)			40.7			37.6				38.0		
Approach LOS			D			D				D		

Intersection Summary			
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.5	Sum of lost time (s)	18.2
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	767	215
Future Volume (vph)	767	215
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.9	4.9
Lane Util. Factor	0.91	1.00
Frpb, ped/bikes	1.00	1.00
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	5036	1568
Flt Permitted	1.00	1.00
Satd. Flow (perm)	5036	1568
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	834	234
RTOR Reduction (vph)	0	116
Lane Group Flow (vph)	834	118
Confl. Peds. (#/hr)		
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	27.7	27.7
Effective Green, g (s)	27.7	27.7
Actuated g/C Ratio	0.28	0.28
Clearance Time (s)	4.9	4.9
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1388	432
v/s Ratio Prot	0.17	
v/s Ratio Perm		0.08
v/c Ratio	0.60	0.27
Uniform Delay, d1	31.6	28.5
Progression Factor	0.99	0.96
Incremental Delay, d2	0.7	0.3
Delay (s)	31.9	27.9
Level of Service	C	C
Approach Delay (s)	37.3	
Approach LOS	D	

Intersection Summary

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	28	0	0	73	9	49	1062	54	7	69	1257	39
Future Vol, veh/h	0	0	28	0	0	73	9	49	1062	54	7	69	1257	39
Conflicting Peds, #/hr	1	0	0	0	0	1	0	8	0	5	0	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	30	0	0	79	10	53	1154	59	8	75	1366	42

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	712	-	-	613	1028	1416	0	0	886	1218	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	323	0	0	375	431	248	-	-	517	309	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	321	-	-	373	261	261	-	-	316	316	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.4	17.2	1.1	1.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	261	-	-	321	373	316	-	-
HCM Lane V/C Ratio	0.242	-	-	0.095	0.213	0.261	-	-
HCM Control Delay (s)	23.1	-	-	17.4	17.2	20.4	-	-
HCM Lane LOS	C	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	0.9	-	-	0.3	0.8	1	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	77	77	6	117	930	6	971	293
Future Volume (vph)	77	77	6	117	930	6	971	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.2	4.2	4.2
Lane Util. Factor	1.00	1.00		1.00	0.91	1.00	0.91	1.00
Frpb, ped/bikes	1.00	0.95		1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1524		1785	5036	1752	5036	1551
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1524		1785	5036	1752	5036	1551
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	84	84	7	127	1011	7	1055	318
RTOR Reduction (vph)	0	71	0	0	0	0	0	166
Lane Group Flow (vph)	84	13	0	134	1011	7	1055	152
Confl. Peds. (#/hr)		79		7				7
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	Prot	NA	Perm
Protected Phases	7		5	5	2	1	6	
Permitted Phases		4						6
Actuated Green, G (s)	7.7	7.9		9.3	29.7	0.7	21.8	21.8
Effective Green, g (s)	7.7	7.9		9.3	29.7	0.7	21.8	21.8
Actuated g/C Ratio	0.15	0.15		0.18	0.58	0.01	0.42	0.42
Clearance Time (s)	4.2	4.0		4.2	4.9	4.2	4.2	4.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	267	234		322	2909	23	2135	657
v/s Ratio Prot	c0.05			c0.08	0.20	0.00	c0.21	
v/s Ratio Perm		0.01						0.10
v/c Ratio	0.31	0.06		0.42	0.35	0.30	0.49	0.23
Uniform Delay, d1	19.5	18.6		18.6	5.7	25.1	10.8	9.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1		0.9	0.1	7.4	0.2	0.2
Delay (s)	20.2	18.7		19.5	5.8	32.5	11.0	9.6
Level of Service	C	B		B	A	C	B	A
Approach Delay (s)	19.4				7.4		10.8	
Approach LOS	B				A		B	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	51.4	Sum of lost time (s)	13.3
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	80	0	0	63	22	106	963	53	3	25	1010	31
Future Vol, veh/h	0	0	80	0	0	63	22	106	963	53	3	25	1010	31
Conflicting Peds, #/hr	0	0	2	2	0	0	0	13	0	2	0	2	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	87	0	0	68	24	115	1047	58	3	27	1098	34

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	581	-	-	555	826	1145	0	0	806	1107	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	393	0	0	409	557	336	-	-	572	350	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	387	-	-	408	347	347	-	-	360	360	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17	15.6	2.5	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	347	-	-	387	408	360	-	-
HCM Lane V/C Ratio	0.401	-	-	0.225	0.168	0.085	-	-
HCM Control Delay (s)	22.2	-	-	17	15.6	15.9	-	-
HCM Lane LOS	C	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	1.9	-	-	0.8	0.6	0.3	-	-

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	5	236	434	89	102	391	219	5	235	829	209	4
Future Volume (vph)	5	236	434	89	102	391	219	5	235	829	209	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00		1.00	0.91	1.00	
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00	1.00		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	1.00	
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1546	1752	3505	1568		1752	5036	1568	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1546	1752	3505	1568		1752	5036	1568	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	257	472	97	111	425	238	5	255	901	227	4
RTOR Reduction (vph)	0	0	0	71	0	0	185	0	0	0	152	0
Lane Group Flow (vph)	0	262	472	26	111	425	53	0	260	901	75	0
Confl. Peds. (#/hr)				3								
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4			8				2	
Actuated Green, G (s)		17.1	26.1	26.1	11.2	20.2	20.2		17.1	25.0	25.0	
Effective Green, g (s)		17.1	26.1	26.1	11.2	20.2	20.2		17.1	25.0	25.0	
Actuated g/C Ratio		0.18	0.27	0.27	0.11	0.21	0.21		0.18	0.26	0.26	
Clearance Time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		307	939	414	201	726	325		307	1292	402	
v/s Ratio Prot		c0.15	0.13		0.06	c0.12			c0.15	c0.18		
v/s Ratio Perm				0.02			0.03				0.05	
v/c Ratio		0.85	0.50	0.06	0.55	0.59	0.16		0.85	0.70	0.19	
Uniform Delay, d1		38.9	30.2	26.5	40.7	34.8	31.7		38.9	32.8	28.3	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		19.9	0.4	0.1	3.3	1.2	0.2		18.9	1.7	0.2	
Delay (s)		58.9	30.6	26.6	44.0	36.0	31.9		57.8	34.4	28.5	
Level of Service		E	C	C	D	D	C		E	C	C	
Approach Delay (s)			39.0			35.9				37.8		
Approach LOS			D			D				D		

Intersection Summary			
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	97.4	Sum of lost time (s)	18.2
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	217	731	221
Future Volume (vph)	217	731	221
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.9	4.9
Lane Util. Factor	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1752	5036	1568
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1752	5036	1568
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	236	795	240
RTOR Reduction (vph)	0	0	128
Lane Group Flow (vph)	240	795	112
Confl. Peds. (#/hr)	3		
Turn Type	Prot	NA	Perm
Protected Phases	1	6	
Permitted Phases			6
Actuated Green, G (s)	16.9	24.8	24.8
Effective Green, g (s)	16.9	24.8	24.8
Actuated g/C Ratio	0.17	0.25	0.25
Clearance Time (s)	4.2	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0
Lane Grp Cap (vph)	303	1282	399
v/s Ratio Prot	c0.14	0.16	
v/s Ratio Perm			0.07
v/c Ratio	0.79	0.62	0.28
Uniform Delay, d1	38.6	32.1	29.1
Progression Factor	0.99	0.99	0.97
Incremental Delay, d2	13.2	0.9	0.4
Delay (s)	51.5	32.7	28.6
Level of Service	D	C	C
Approach Delay (s)		35.5	
Approach LOS		D	

Intersection Summary

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	67	0	0	48	12	13	1476	20	7	29	1085	8
Future Vol, veh/h	0	0	67	0	0	48	12	13	1476	20	7	29	1085	8
Conflicting Peds, #/hr	0	0	1	1	0	0	0	9	0	18	0	18	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	72	0	0	52	13	14	1587	22	8	31	1167	9

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	598	-	-	823	858	1185	0	0	1174	1627	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	384	0	0	274	535	321	-	-	358	195	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	380	-	-	269	367	367	-	-	206	206	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	21.5	0.3	0.8
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	367	-	-	380	269	206	-	-
HCM Lane V/C Ratio	0.073	-	-	0.19	0.192	0.188	-	-
HCM Control Delay (s)	15.6	-	-	16.7	21.5	26.5	-	-
HCM Lane LOS	C	-	-	C	C	D	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.7	0.7	0.7	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	177	147	31	53	1301	18	1109	147
Future Volume (vph)	177	147	31	53	1301	18	1109	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	1.00	0.91	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1561		1774	5036	1752	5036	1545
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1561		1774	5036	1752	5036	1545
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	186	155	33	56	1369	19	1167	155
RTOR Reduction (vph)	0	63	0	0	0	0	0	74
Lane Group Flow (vph)	186	92	0	89	1369	19	1167	81
Confl. Peds. (#/hr)		24		9				9
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	Prot	NA	Perm
Protected Phases	7		5	5	2	1	6	
Permitted Phases		4						6
Actuated Green, G (s)	13.4	13.6		6.8	29.2	0.7	23.1	23.1
Effective Green, g (s)	13.4	13.6		6.8	29.2	0.7	23.1	23.1
Actuated g/C Ratio	0.24	0.24		0.12	0.52	0.01	0.41	0.41
Clearance Time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	423	375		213	2598	21	2055	630
v/s Ratio Prot	c0.10			0.05	c0.27	0.01	c0.23	
v/s Ratio Perm		0.06						0.05
v/c Ratio	0.44	0.25		0.42	0.53	0.90	0.57	0.13
Uniform Delay, d1	18.4	17.4		23.1	9.1	27.9	12.9	10.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.3		1.3	0.2	151.1	0.4	0.1
Delay (s)	19.1	17.7		24.5	9.3	179.0	13.3	10.6
Level of Service	B	B		C	A	F	B	B
Approach Delay (s)	18.5				10.2		15.3	
Approach LOS	B				B		B	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	56.6	Sum of lost time (s)	13.3
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	121	0	0	90	25	48	1129	43	20	39	1086	15
Future Vol, veh/h	0	0	121	0	0	90	25	48	1129	43	20	39	1086	15
Conflicting Peds, #/hr	2	0	0	0	0	2	0	6	0	11	0	11	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	132	0	0	98	27	52	1227	47	22	42	1180	16

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	604	-	-	650	874	1202	0	0	930	1285	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	380	0	0	355	525	315	-	-	489	287	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	378	-	-	351	327	327	-	-	307	307	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.5	19.2	1.1	1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	327	-	-	378	351	307	-	-
HCM Lane V/C Ratio	0.243	-	-	0.348	0.279	0.209	-	-
HCM Control Delay (s)	19.5	-	-	19.5	19.2	19.8	-	-
HCM Lane LOS	C	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	0.9	-	-	1.5	1.1	0.8	-	-

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	6	213	335	205	109	398	196	9	228	948	194	6
Future Volume (vph)	6	213	335	205	109	398	196	9	228	948	194	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00		1.00	0.91	1.00	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	
Flpb, ped/bikes		1.00	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	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1568	1752	3505	1568		1752	5036	1538	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1568	1752	3505	1568		1752	5036	1538	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	232	364	223	118	433	213	10	248	1030	211	7
RTOR Reduction (vph)	0	0	0	167	0	0	162	0	0	0	121	0
Lane Group Flow (vph)	0	239	364	56	118	433	51	0	258	1030	90	0
Confl. Peds. (#/hr)											7	
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4			8				2	
Actuated Green, G (s)		15.0	25.1	25.1	10.6	20.7	20.7		17.0	27.7	27.7	
Effective Green, g (s)		15.0	25.1	25.1	10.6	20.7	20.7		17.0	27.7	27.7	
Actuated g/C Ratio		0.15	0.25	0.25	0.11	0.21	0.21		0.17	0.28	0.28	
Clearance Time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		263	883	395	186	728	325		299	1400	427	
v/s Ratio Prot		c0.14	0.10		0.07	c0.12			c0.15	c0.20		
v/s Ratio Perm				0.04			0.03				0.06	
v/c Ratio		0.91	0.41	0.14	0.63	0.59	0.16		0.86	0.74	0.21	
Uniform Delay, d1		41.6	31.1	28.9	42.6	35.7	32.3		40.2	32.6	27.6	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		32.1	0.3	0.2	6.9	1.3	0.2		21.7	2.0	0.2	
Delay (s)		73.7	31.4	29.1	49.5	37.0	32.5		61.9	34.7	27.8	
Level of Service		E	C	C	D	D	C		E	C	C	
Approach Delay (s)			43.0			37.7				38.4		
Approach LOS			D			D				D		

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	99.6	Sum of lost time (s)	18.2
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	254	767	215
Future Volume (vph)	254	767	215
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.9	4.9
Lane Util. Factor	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1752	5036	1568
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1752	5036	1568
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	276	834	234
RTOR Reduction (vph)	0	0	117
Lane Group Flow (vph)	283	834	117
Confl. Peds. (#/hr)	7		
Turn Type	Prot	NA	Perm
Protected Phases	1	6	
Permitted Phases			6
Actuated Green, G (s)	18.0	28.7	28.7
Effective Green, g (s)	18.0	28.7	28.7
Actuated g/C Ratio	0.18	0.29	0.29
Clearance Time (s)	4.2	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0
Lane Grp Cap (vph)	316	1451	451
v/s Ratio Prot	c0.16	0.17	
v/s Ratio Perm			0.07
v/c Ratio	0.90	0.57	0.26
Uniform Delay, d1	39.9	30.2	27.3
Progression Factor	0.99	0.99	0.96
Incremental Delay, d2	25.9	0.6	0.3
Delay (s)	65.5	30.4	26.6
Level of Service	E	C	C
Approach Delay (s)		37.1	
Approach LOS		D	

Intersection Summary

Intersection: 1: San Pablo Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	52	53
Average Queue (ft)	6	24
95th Queue (ft)	27	51
Link Distance (ft)	281	901
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Glenn Ave & Clinton Ave

Movement	EB	EB	WB	WB	NB
Directions Served	T	TR	LT	T	LR
Maximum Queue (ft)	31	55	75	31	96
Average Queue (ft)	3	4	12	1	42
95th Queue (ft)	18	25	46	10	73
Link Distance (ft)	281	281	745	745	635
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Cambridge Ave & Blackstone Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	R	R	UL	T	UL	TR
Maximum Queue (ft)	74	77	70	93	73	48
Average Queue (ft)	24	36	29	4	29	2
95th Queue (ft)	59	59	62	33	55	16
Link Distance (ft)	1033	1240		270		898
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			75		75	
Storage Blk Time (%)			3	0	0	
Queuing Penalty (veh)			10	0	1	

Intersection: 4: Blackstone Ave & Weldon Ave

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	T	U	T	T	T	R
Maximum Queue (ft)	70	104	162	161	226	293	31	248	205	160	125
Average Queue (ft)	36	24	72	76	102	127	6	149	105	88	57
95th Queue (ft)	64	54	128	154	197	231	25	215	175	140	90
Link Distance (ft)		847		608	608	608		270	270	270	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	105		395				100				100
Storage Blk Time (%)		0						26		4	0
Queuing Penalty (veh)		0						2		13	1

Intersection: 5: Blackstone Ave & University Ave

Movement	EB	WB	NB	NB	NB	SB
Directions Served	R	R	UL	T	TR	UL
Maximum Queue (ft)	92	79	178	31	53	31
Average Queue (ft)	41	39	44	1	2	5
95th Queue (ft)	68	66	98	10	17	24
Link Distance (ft)	407	1233		570	570	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			85			75
Storage Blk Time (%)			1			
Queuing Penalty (veh)			4			

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	UL	T	T	R	L	T	T	R	UL	T	T	T
Maximum Queue (ft)	290	190	259	68	194	214	200	151	220	356	305	255
Average Queue (ft)	159	87	85	22	72	127	91	49	197	206	170	130
95th Queue (ft)	253	145	165	49	141	190	169	102	250	336	269	199
Link Distance (ft)		2178	2178			1224	1224			2721	2721	2721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	245			150	255			100	185			
Storage Blk Time (%)	2		1				4	1	25	4		2
Queuing Penalty (veh)	3		1				8	2	70	9		4

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	UL	T	T	T	R
Maximum Queue (ft)	150	279	301	234	194	125
Average Queue (ft)	45	174	143	148	130	59
95th Queue (ft)	93	275	236	216	193	103
Link Distance (ft)			570	570	570	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	160	205				105
Storage Blk Time (%)	0	11			20	0
Queuing Penalty (veh)	0	26			44	1

Network Summary

Network wide Queuing Penalty: 200

Intersection: 1: San Pablo Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	72	52
Average Queue (ft)	11	22
95th Queue (ft)	45	46
Link Distance (ft)	281	901
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Glenn Ave & Clinton Ave

Movement	EB	EB	WB	NB
Directions Served	T	TR	LT	LR
Maximum Queue (ft)	31	29	97	142
Average Queue (ft)	2	2	22	44
95th Queue (ft)	15	14	75	91
Link Distance (ft)	281	281	745	635
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Cambridge Ave & Blackstone Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	R	R	UL	TR	UL	T
Maximum Queue (ft)	72	54	50	31	88	52
Average Queue (ft)	38	30	15	1	20	2
95th Queue (ft)	56	56	42	10	51	17
Link Distance (ft)	1033	1240		270		898
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			75		75	
Storage Blk Time (%)					0	
Queuing Penalty (veh)					1	

Intersection: 4: Blackstone Ave & Weldon Ave

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	T	U	T	T	T	R
Maximum Queue (ft)	180	320	98	217	268	266	49	278	258	181	73
Average Queue (ft)	79	66	51	114	134	151	10	152	122	90	32
95th Queue (ft)	155	192	88	217	248	260	37	232	206	149	60
Link Distance (ft)		847		608	608	608		270	270	270	
Upstream Blk Time (%)								0	0		
Queuing Penalty (veh)								1	0		
Storage Bay Dist (ft)	105		395				100				100
Storage Blk Time (%)	3	0						21		6	
Queuing Penalty (veh)	5	0						4		9	

Intersection: 5: Blackstone Ave & University Ave

Movement	EB	WB	NB	NB	SB	SB	SB	SB
Directions Served	R	R	UL	TR	UL	T	T	TR
Maximum Queue (ft)	78	103	57	50	72	28	31	97
Average Queue (ft)	46	50	25	2	30	1	1	3
95th Queue (ft)	72	90	58	16	58	9	10	32
Link Distance (ft)	407	1233		570		608	608	608
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			85		75			
Storage Blk Time (%)					1			
Queuing Penalty (veh)					3			

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	UL	T	T	R	L	T	T	R	UL	T	T	T
Maximum Queue (ft)	268	278	152	259	195	194	188	170	220	424	381	253
Average Queue (ft)	143	97	78	51	80	125	93	46	181	223	192	148
95th Queue (ft)	245	173	139	129	150	174	156	98	256	365	294	218
Link Distance (ft)		2178	2178			1224	1224			2721	2721	2721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	245			150	255			100	185			
Storage Blk Time (%)	2		0	1			5	0	20	3		4
Queuing Penalty (veh)	4		1	2			9	0	65	6		8

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	UL	T	T	T	R
Maximum Queue (ft)	85	279	341	306	208	170
Average Queue (ft)	40	163	133	152	142	62
95th Queue (ft)	73	250	225	225	189	121
Link Distance (ft)			570	570	570	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	160	205				105
Storage Blk Time (%)		7	0		22	2
Queuing Penalty (veh)		19	0		46	5

Network Summary

Network wide Queuing Penalty: 188

Appendix J: Cumulative Year 2035 plus Project Traffic Conditions

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1046	43	8	632	23	13
Future Vol, veh/h	1046	43	8	632	23	13
Conflicting Peds, #/hr	0	5	5	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1137	47	9	687	25	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1189	0	1528	597
Stage 1	-	-	-	-	1166	-
Stage 2	-	-	-	-	362	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	589	-	109	449
Stage 1	-	-	-	-	261	-
Stage 2	-	-	-	-	678	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	586	-	106	447
Mov Cap-2 Maneuver	-	-	-	-	106	-
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	661	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	38.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	146	-	-	586	-
HCM Lane V/C Ratio	0.268	-	-	0.015	-
HCM Control Delay (s)	38.5	-	-	11.2	0.1
HCM Lane LOS	E	-	-	B	A
HCM 95th %tile Q(veh)	1	-	-	0	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1025	49	23	609	34	57
Future Vol, veh/h	1025	49	23	609	34	57
Conflicting Peds, #/hr	0	4	4	0	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1114	53	25	662	37	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1171	0	1530	592
Stage 1	-	-	-	-	1145	-
Stage 2	-	-	-	-	385	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	598	-	109	452
Stage 1	-	-	-	-	267	-
Stage 2	-	-	-	-	660	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	596	-	101	449
Mov Cap-2 Maneuver	-	-	-	-	101	-
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	614	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	40.7
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	196	-	-	596	-
HCM Lane V/C Ratio	0.505	-	-	0.042	-
HCM Control Delay (s)	40.7	-	-	11.3	0.3
HCM Lane LOS	E	-	-	B	A
HCM 95th %tile Q(veh)	2.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	72.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	28	0	43	10	2	62	9	116	1077	54	7	69	1302	102
Future Vol, veh/h	28	0	43	10	2	62	9	116	1077	54	7	69	1302	102
Conflicting Peds, #/hr	1	0	0	0	0	1	0	8	0	5	0	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	30	0	47	11	2	67	10	126	1171	59	8	75	1415	111

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	2387	3152	771	2210	3178	621	1114	1534	0	0	897	1235	0	0
Stage 1	1645	1645	-	1478	1478	-	-	-	-	-	-	-	-	-
Stage 2	742	1507	-	732	1700	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	37	11	296	48	10	371	387	217	-	-	509	304	-	-
Stage 1	70	157	-	93	190	-	-	-	-	-	-	-	-	-
Stage 2	341	184	-	346	148	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	~ 6	3	294	17	3	369	221	221	-	-	311	311	-	-
Mov Cap-2 Maneuver	~ 6	3	-	17	3	-	-	-	-	-	-	-	-	-
Stage 1	~ 27	114	-	35	72	-	-	-	-	-	-	-	-	-
Stage 2	104	70	-	213	108	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 2371.5	$ 448.9	4.4	1.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	221	-	-	15	52	311	-	-
HCM Lane V/C Ratio	0.615	-	-	5.145	1.547	0.266	-	-
HCM Control Delay (s)	44.4	-	-	$ 2371.5	$ 448.9	20.7	-	-
HCM Lane LOS	E	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	3.6	-	-	10.5	7.5	1	-	-

Notes

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

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	95	128	275	1000	985	355
Future Volume (vph)	95	128	275	1000	985	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0	4.2	4.9	4.2	4.2
Lane Util. Factor	1.00	1.00	1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.95	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1517	1787	5036	5036	1550
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1787	1517	1787	5036	5036	1550
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	139	299	1087	1071	386
RTOR Reduction (vph)	0	114	0	0	0	190
Lane Group Flow (vph)	103	25	299	1087	1071	196
Confl. Peds. (#/hr)		79	7			7
Heavy Vehicles (%)	1%	1%	1%	3%	3%	1%
Turn Type	Prot	Perm	Prot	NA	NA	Perm
Protected Phases	7		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	10.0	10.2	14.9	38.0	19.6	19.6
Effective Green, g (s)	10.0	10.2	14.9	38.0	19.6	19.6
Actuated g/C Ratio	0.18	0.18	0.26	0.67	0.34	0.34
Clearance Time (s)	4.2	4.0	4.2	4.9	4.2	4.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	312	270	466	3351	1728	532
v/s Ratio Prot	c0.06		c0.17	0.22	c0.21	
v/s Ratio Perm		0.02				0.13
v/c Ratio	0.33	0.09	0.64	0.32	0.62	0.37
Uniform Delay, d1	20.6	19.6	18.7	4.1	15.6	14.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	3.0	0.1	0.7	0.4
Delay (s)	21.2	19.7	21.7	4.1	16.3	14.5
Level of Service	C	B	C	A	B	B
Approach Delay (s)	20.4			7.9	15.8	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	57.1	Sum of lost time (s)	12.6
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	21.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	5	2	75	6	11	47	22	117	1196	51	3	25	1070	30
Future Vol, veh/h	5	2	75	6	11	47	22	117	1196	51	3	25	1070	30
Conflicting Peds, #/hr	0	0	2	2	0	0	0	13	0	2	0	2	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	5	2	82	7	12	51	24	127	1300	55	3	27	1163	33

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	2081	2912	613	2160	2901	680	873	1209	0	0	989	1357	0	0
Stage 1	1253	1253	-	1632	1632	-	-	-	-	-	-	-	-	-
Stage 2	828	1659	-	528	1269	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	57	16	375	51	16	339	525	313	-	-	453	265	-	-
Stage 1	134	244	-	72	160	-	-	-	-	-	-	-	-	-
Stage 2	302	155	-	460	240	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	7	370	18	~ 7	338	322	322	-	-	273	273	-	-
Mov Cap-2 Maneuver	-	7	-	18	~ 7	-	-	-	-	-	-	-	-	-
Stage 1	70	214	-	38	85	-	-	-	-	-	-	-	-	-
Stage 2	117	82	-	315	211	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		$ 843.3	2.6	0.5
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	322	-	-	-	31	273	-	-
HCM Lane V/C Ratio	0.469	-	-	-	2.244	0.111	-	-
HCM Control Delay (s)	25.6	-	-	-	$ 843.3	19.8	-	-
HCM Lane LOS	D	-	-	-	F	C	-	-
HCM 95th %tile Q(veh)	2.4	-	-	-	8.1	0.4	-	-

Notes

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

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	5	306	434	89	102	366	273	5	223	951	209	229
Future Volume (vph)	5	306	434	89	102	366	273	5	223	951	209	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	4.2
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00		1.00	0.91	1.00	1.00
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00	1.00		1.00	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	1.00	1.00
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)		1752	3505	1546	1752	3505	1568		1752	5036	1568	1752
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)		1752	3505	1546	1752	3505	1568		1752	5036	1568	1752
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	333	472	97	111	398	297	5	242	1034	227	249
RTOR Reduction (vph)	0	0	0	70	0	0	213	0	0	0	130	0
Lane Group Flow (vph)	0	338	472	27	111	398	84	0	247	1034	97	249
Confl. Peds. (#/hr)				3								3
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4			8				2	
Actuated Green, G (s)		19.1	27.7	27.7	11.2	19.8	19.8		14.0	27.7	27.7	14.0
Effective Green, g (s)		19.1	27.7	27.7	11.2	19.8	19.8		14.0	27.7	27.7	14.0
Actuated g/C Ratio		0.19	0.28	0.28	0.11	0.20	0.20		0.14	0.28	0.28	0.14
Clearance Time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		338	982	433	198	702	314		248	1411	439	248
v/s Ratio Prot		c0.19	0.13		0.06	c0.11			c0.14	c0.21		c0.14
v/s Ratio Perm				0.02			0.05				0.06	
v/c Ratio		1.00	0.48	0.06	0.56	0.57	0.27		1.00	0.73	0.22	1.00
Uniform Delay, d1		39.8	29.6	26.0	41.5	35.6	33.4		42.4	32.2	27.3	42.4
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99
Incremental Delay, d2		49.0	0.4	0.1	3.6	1.1	0.5		55.7	2.0	0.3	58.2
Delay (s)		88.8	29.9	26.1	45.1	36.7	33.8		98.0	34.2	27.5	100.3
Level of Service		F	C	C	D	D	C		F	C	C	F
Approach Delay (s)			51.5			36.8				43.7		
Approach LOS			D			D				D		

Intersection Summary			
HCM 2000 Control Delay	43.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	18.2
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	764	241
Future Volume (vph)	764	241
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.9	4.9
Lane Util. Factor	0.91	1.00
Frpb, ped/bikes	1.00	1.00
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	5036	1568
Flt Permitted	1.00	1.00
Satd. Flow (perm)	5036	1568
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	830	262
RTOR Reduction (vph)	0	131
Lane Group Flow (vph)	830	131
Confl. Peds. (#/hr)		
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	27.7	27.7
Effective Green, g (s)	27.7	27.7
Actuated g/C Ratio	0.28	0.28
Clearance Time (s)	4.9	4.9
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1411	439
v/s Ratio Prot	0.16	
v/s Ratio Perm		0.08
v/c Ratio	0.59	0.30
Uniform Delay, d1	30.6	27.9
Progression Factor	0.99	0.98
Incremental Delay, d2	0.6	0.4
Delay (s)	31.0	27.7
Level of Service	C	C
Approach Delay (s)	43.2	
Approach LOS	D	

Intersection Summary

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	867	32	11	1009	32	15
Future Vol, veh/h	867	32	11	1009	32	15
Conflicting Peds, #/hr	0	7	7	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	885	33	11	1030	33	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	925	0	1446	466
Stage 1	-	-	-	-	909	-
Stage 2	-	-	-	-	537	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	741	-	124	546
Stage 1	-	-	-	-	356	-
Stage 2	-	-	-	-	553	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	736	-	119	542
Mov Cap-2 Maneuver	-	-	-	-	119	-
Stage 1	-	-	-	-	354	-
Stage 2	-	-	-	-	534	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	37.4
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	158	-	-	736	-
HCM Lane V/C Ratio	0.304	-	-	0.015	-
HCM Control Delay (s)	37.4	-	-	10	0.2
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	0	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	859	37	30	982	42	58
Future Vol, veh/h	859	37	30	982	42	58
Conflicting Peds, #/hr	0	4	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	934	40	33	1067	46	63

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	978	0	1560	493
Stage 1	-	-	-	-	958	-
Stage 2	-	-	-	-	602	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	707	-	104	524
Stage 1	-	-	-	-	335	-
Stage 2	-	-	-	-	512	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	704	-	92	521
Mov Cap-2 Maneuver	-	-	-	-	92	-
Stage 1	-	-	-	-	334	-
Stage 2	-	-	-	-	452	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	53.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	176	-	-	704	-
HCM Lane V/C Ratio	0.618	-	-	0.046	-
HCM Control Delay (s)	53.8	-	-	10.4	0.6
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	3.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	79.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	48	4	83	10	3	36	12	62	1499	16	7	29	1121	52
Future Vol, veh/h	48	4	83	10	3	36	12	62	1499	16	7	29	1121	52
Conflicting Peds, #/hr	0	0	1	1	0	0	0	9	0	18	0	18	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	52	4	89	11	3	39	13	67	1612	17	8	31	1205	56

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	2126	3127	641	2362	3147	833	921	1270	0	0	1189	1647	0	0
Stage 1	1320	1320	-	1799	1799	-	-	-	-	-	-	-	-	-
Stage 2	806	1807	-	563	1348	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	54	11	360	38	11	269	494	292	-	-	351	190	-	-
Stage 1	120	226	-	55	132	-	-	-	-	-	-	-	-	-
Stage 2	312	131	-	438	220	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	~ 19	6	357	~ 8	6	264	301	301	-	-	202	202	-	-
Mov Cap-2 Maneuver	~ 19	6	-	~ 8	6	-	-	-	-	-	-	-	-	-
Stage 1	87	181	-	40	95	-	-	-	-	-	-	-	-	-
Stage 2	189	95	-	259	176	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 1437.6	$ 798.2	1	0.8
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	301	-	-	39	26	202	-	-
HCM Lane V/C Ratio	0.264	-	-	3.722	2.026	0.192	-	-
HCM Control Delay (s)	21.2	-	-	$ 1437.6	$ 798.2	27	-	-
HCM Lane LOS	C	-	-	F	F	D	-	-
HCM 95th %tile Q(veh)	1	-	-	16.6	6.4	0.7	-	-

Notes

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

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	212	236	4	178	1352	1137	199
Future Volume (vph)	212	236	4	178	1352	1137	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	0.91	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1787	1560		1786	5036	5036	1544
Flt Permitted	0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (perm)	1787	1560		1786	5036	5036	1544
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	223	248	4	187	1423	1197	209
RTOR Reduction (vph)	0	185	0	0	0	0	96
Lane Group Flow (vph)	223	63	0	191	1423	1197	113
Confl. Peds. (#/hr)		24		9			9
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	NA	Perm
Protected Phases	7		5	5	2	6	
Permitted Phases		4					6
Actuated Green, G (s)	14.9	15.1		10.6	35.9	21.1	21.1
Effective Green, g (s)	14.9	15.1		10.6	35.9	21.1	21.1
Actuated g/C Ratio	0.25	0.25		0.18	0.60	0.35	0.35
Clearance Time (s)	4.2	4.0		4.2	4.9	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	444	393		316	3018	1773	543
v/s Ratio Prot	c0.12			c0.11	0.28	c0.24	
v/s Ratio Perm		0.04					0.07
v/c Ratio	0.50	0.16		0.60	0.47	0.68	0.21
Uniform Delay, d1	19.3	17.5		22.7	6.7	16.5	13.6
Progression Factor	1.00	1.00		1.00	0.99	1.00	1.00
Incremental Delay, d2	0.9	0.2		3.2	0.1	1.0	0.2
Delay (s)	20.2	17.6		25.9	6.8	17.5	13.8
Level of Service	C	B		C	A	B	B
Approach Delay (s)	18.9				9.0	17.0	
Approach LOS	B				A	B	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	13.3
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	51.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	6	2	104	27	4	60	25	59	1302	41	20	40	1177	13
Future Vol, veh/h	6	2	104	27	4	60	25	59	1302	41	20	40	1177	13
Conflicting Peds, #/hr	2	0	0	0	0	2	0	6	0	11	0	11	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	-	-	-	-	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	7	2	113	29	4	65	27	64	1415	45	22	43	1279	14

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	2174	3075	653	2274	3060	743	944	1299	0	0	1066	1471	0	0
Stage 1	1422	1422	-	1631	1631	-	-	-	-	-	-	-	-	-
Stage 2	752	1653	-	643	1429	-	-	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	7.12	6.42	6.52	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	7.32	5.52	-	7.32	5.52	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.72	5.52	-	6.72	5.52	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.81	4.01	3.91	3.81	4.01	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	50	12	353	43	12	309	480	282	-	-	411	233	-	-
Stage 1	101	202	-	72	160	-	-	-	-	-	-	-	-	-
Stage 2	337	156	-	392	201	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	11	6	351	~ 13	6	305	295	295	-	-	257	257	-	-
Mov Cap-2 Maneuver	11	6	-	~ 13	6	-	-	-	-	-	-	-	-	-
Stage 1	69	150	-	49	110	-	-	-	-	-	-	-	-	-
Stage 2	176	107	-	196	149	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	267	$ 1254.1	1.3	1.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	295	-	-	95	31	257	-	-
HCM Lane V/C Ratio	0.31	-	-	1.281	3.191	0.254	-	-
HCM Control Delay (s)	22.6	-	-	267	$ 1254.1	23.7	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	1.3	-	-	8.6	11.7	1	-	-

Notes

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

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	6	271	335	205	109	380	239	9	218	1035	194	276
Future Volume (vph)	6	271	335	205	109	380	239	9	218	1035	194	276
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	4.2
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00		1.00	0.91	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00
Flpb, ped/bikes		1.00	1.00	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	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)		1752	3505	1568	1752	3505	1568		1752	5036	1538	1752
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)		1752	3505	1568	1752	3505	1568		1752	5036	1538	1752
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	295	364	223	118	413	260	10	237	1125	211	300
RTOR Reduction (vph)	0	0	0	167	0	0	208	0	0	0	109	0
Lane Group Flow (vph)	0	302	364	56	118	413	52	0	247	1125	102	300
Confl. Peds. (#/hr)											7	7
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4			8				2	
Actuated Green, G (s)		17.0	25.6	25.6	11.7	20.3	20.3		16.4	28.8	28.8	17.0
Effective Green, g (s)		17.0	25.6	25.6	11.7	20.3	20.3		16.4	28.8	28.8	17.0
Actuated g/C Ratio		0.17	0.25	0.25	0.12	0.20	0.20		0.16	0.28	0.28	0.17
Clearance Time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		294	885	396	202	702	314		283	1431	437	294
v/s Ratio Prot		c0.17	0.10		0.07	c0.12			c0.14	c0.22		c0.17
v/s Ratio Perm				0.04			0.03				0.07	
v/c Ratio		1.03	0.41	0.14	0.58	0.59	0.17		0.87	0.79	0.23	1.02
Uniform Delay, d1		42.1	31.6	29.3	42.5	36.7	33.5		41.4	33.4	27.8	42.1
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.99
Incremental Delay, d2		59.7	0.3	0.2	4.3	1.3	0.3		24.3	2.9	0.3	57.8
Delay (s)		101.8	31.9	29.5	46.8	38.0	33.7		65.7	36.3	28.1	99.6
Level of Service		F	C	C	D	D	C		E	D	C	F
Approach Delay (s)			55.0			37.9				39.8		
Approach LOS			E			D				D		

Intersection Summary			
HCM 2000 Control Delay	43.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	101.3	Sum of lost time (s)	18.2
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	818	249
Future Volume (vph)	818	249
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.9	4.9
Lane Util. Factor	0.91	1.00
Frpb, ped/bikes	1.00	1.00
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	5036	1568
Flt Permitted	1.00	1.00
Satd. Flow (perm)	5036	1568
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	889	271
RTOR Reduction (vph)	0	124
Lane Group Flow (vph)	889	147
Confl. Peds. (#/hr)		
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	29.4	29.4
Effective Green, g (s)	29.4	29.4
Actuated g/C Ratio	0.29	0.29
Clearance Time (s)	4.9	4.9
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1461	455
v/s Ratio Prot	0.18	
v/s Ratio Perm		0.09
v/c Ratio	0.61	0.32
Uniform Delay, d1	31.0	28.2
Progression Factor	0.99	0.97
Incremental Delay, d2	0.7	0.4
Delay (s)	31.3	27.8
Level of Service	C	C
Approach Delay (s)	44.7	
Approach LOS	D	

Intersection Summary

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1025	49	23	609	34	57
Future Vol, veh/h	1025	49	23	609	34	57
Conflicting Peds, #/hr	0	4	4	0	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	1114	53	25	662	37	62

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1171	0	1530	592
Stage 1	-	-	-	-	1145	-
Stage 2	-	-	-	-	385	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	598	-	109	452
Stage 1	-	-	-	-	267	-
Stage 2	-	-	-	-	660	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	596	-	101	449
Mov Cap-2 Maneuver	-	-	-	-	101	-
Stage 1	-	-	-	-	266	-
Stage 2	-	-	-	-	614	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	31.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	101	449	-	-	596	-
HCM Lane V/C Ratio	0.366	0.138	-	-	0.042	-
HCM Control Delay (s)	59.9	14.3	-	-	11.3	0.3
HCM Lane LOS	F	B	-	-	B	A
HCM 95th %tile Q(veh)	1.5	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	71	0	0	74	9	116	1105	54	7	69	1312	104
Future Vol, veh/h	0	0	71	0	0	74	9	116	1105	54	7	69	1312	104
Conflicting Peds, #/hr	1	0	0	0	0	1	0	8	0	5	0	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	77	0	0	80	10	126	1201	59	8	75	1426	113

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	778	-	-	636	1124	1547	0	0	920	1265	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	293	0	0	362	382	213	-	-	495	293	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	291	-	-	360	215	215	-	-	299	299	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.8	17.9	4.5	1.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	215	-	-	291	360	299	-	-
HCM Lane V/C Ratio	0.632	-	-	0.265	0.223	0.276	-	-
HCM Control Delay (s)	46.6	-	-	21.8	17.9	21.6	-	-
HCM Lane LOS	E	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	3.7	-	-	1	0.8	1.1	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	95	128	6	286	1000	28	985	355
Future Volume (vph)	95	128	6	286	1000	28	985	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.2	4.2	4.2
Lane Util. Factor	1.00	1.00		1.00	0.91	1.00	0.91	1.00
Frpb, ped/bikes	1.00	0.95		1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1513		1786	5036	1752	5036	1549
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1513		1786	5036	1752	5036	1549
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	139	7	311	1087	30	1071	386
RTOR Reduction (vph)	0	116	0	0	0	0	0	198
Lane Group Flow (vph)	103	23	0	318	1087	30	1071	188
Confl. Peds. (#/hr)		79		7				7
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	Prot	NA	Perm
Protected Phases	7		5	5	2	1	6	
Permitted Phases		4						6
Actuated Green, G (s)	10.0	10.2		19.1	36.7	0.8	19.1	19.1
Effective Green, g (s)	10.0	10.2		19.1	36.7	0.8	19.1	19.1
Actuated g/C Ratio	0.16	0.17		0.31	0.60	0.01	0.31	0.31
Clearance Time (s)	4.2	4.0		4.2	4.9	4.2	4.2	4.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	293	253		561	3039	23	1582	486
v/s Ratio Prot	c0.06			c0.18	0.22	0.02	c0.21	
v/s Ratio Perm		0.02						0.12
v/c Ratio	0.35	0.09		0.57	0.36	1.30	0.68	0.39
Uniform Delay, d1	22.5	21.4		17.4	6.1	30.0	18.2	16.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2		1.3	0.1	293.5	1.2	0.5
Delay (s)	23.3	21.5		18.7	6.2	323.5	19.3	16.8
Level of Service	C	C		B	A	F	B	B
Approach Delay (s)	22.3				9.0		24.8	
Approach LOS	C				A		C	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	13.3
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	82	0	0	64	22	117	1201	53	3	25	1076	30
Future Vol, veh/h	0	0	82	0	0	64	22	117	1201	53	3	25	1076	30
Conflicting Peds, #/hr	0	0	2	2	0	0	0	13	0	2	0	2	0	13
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	89	0	0	70	24	127	1305	58	3	27	1170	33

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	617	-	-	684	878	1216	0	0	995	1365	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	373	0	0	337	522	310	-	-	450	262	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	368	-	-	336	318	318	-	-	270	270	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.9	18.5	2.6	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	318	-	-	368	336	270	-	-
HCM Lane V/C Ratio	0.475	-	-	0.242	0.207	0.113	-	-
HCM Control Delay (s)	26.1	-	-	17.9	18.5	20	-	-
HCM Lane LOS	D	-	-	C	C	C	-	-
HCM 95th %tile Q(veh)	2.4	-	-	0.9	0.8	0.4	-	-

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	5	306	434	89	102	366	273	5	223	951	209	7
Future Volume (vph)	5	306	434	89	102	366	273	5	223	951	209	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00		1.00	0.91	1.00	
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00	1.00		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	1.00	
Frt		1.00	1.00	0.85	1.00	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1546	1752	3505	1568		1752	5036	1568	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1546	1752	3505	1568		1752	5036	1568	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	333	472	97	111	398	297	5	242	1034	227	8
RTOR Reduction (vph)	0	0	0	70	0	0	200	0	0	0	129	0
Lane Group Flow (vph)	0	338	472	27	111	398	97	0	247	1034	98	0
Confl. Peds. (#/hr)				3								
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4			8				2	
Actuated Green, G (s)		19.0	27.6	27.6	11.3	19.9	19.9		14.0	27.4	27.4	
Effective Green, g (s)		19.0	27.6	27.6	11.3	19.9	19.9		14.0	27.4	27.4	
Actuated g/C Ratio		0.19	0.28	0.28	0.11	0.20	0.20		0.14	0.28	0.28	
Clearance Time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		334	972	428	198	701	313		246	1386	431	
v/s Ratio Prot		c0.19	0.13		0.06	c0.11			c0.14	c0.21		
v/s Ratio Perm				0.02			0.06				0.06	
v/c Ratio		1.01	0.49	0.06	0.56	0.57	0.31		1.00	0.75	0.23	
Uniform Delay, d1		40.2	30.0	26.4	41.7	35.9	33.9		42.8	32.9	27.9	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		52.3	0.4	0.1	3.6	1.1	0.6		58.4	2.2	0.3	
Delay (s)		92.6	30.4	26.5	45.3	37.0	34.5		101.2	35.1	28.1	
Level of Service		F	C	C	D	D	C		F	D	C	
Approach Delay (s)			53.1			37.2				44.9		
Approach LOS			D			D				D		

Intersection Summary			
HCM 2000 Control Delay	44.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	99.5	Sum of lost time (s)	18.2
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	229	764	241
Future Volume (vph)	229	764	241
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.9	4.9
Lane Util. Factor	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1752	5036	1568
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1752	5036	1568
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	249	830	262
RTOR Reduction (vph)	0	0	130
Lane Group Flow (vph)	257	830	132
Confl. Peds. (#/hr)	3		
Turn Type	Prot	NA	Perm
Protected Phases	1	6	
Permitted Phases			6
Actuated Green, G (s)	15.0	28.4	28.4
Effective Green, g (s)	15.0	28.4	28.4
Actuated g/C Ratio	0.15	0.29	0.29
Clearance Time (s)	4.2	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0
Lane Grp Cap (vph)	264	1437	447
v/s Ratio Prot	c0.15	0.16	
v/s Ratio Perm			0.08
v/c Ratio	0.97	0.58	0.30
Uniform Delay, d1	42.1	30.4	27.7
Progression Factor	0.99	0.99	0.98
Incremental Delay, d2	47.7	0.6	0.4
Delay (s)	89.5	30.7	27.5
Level of Service	F	C	C
Approach Delay (s)		41.3	
Approach LOS		D	

Intersection Summary

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	859	37	30	982	42	58
Future Vol, veh/h	859	37	30	982	42	58
Conflicting Peds, #/hr	0	4	2	0	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	1	1	3	1	1
Mvmt Flow	934	40	33	1067	46	63

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	978	0	1560	493
Stage 1	-	-	-	-	958	-
Stage 2	-	-	-	-	602	-
Critical Hdwy	-	-	4.12	-	6.82	6.92
Critical Hdwy Stg 1	-	-	-	-	5.82	-
Critical Hdwy Stg 2	-	-	-	-	5.82	-
Follow-up Hdwy	-	-	2.21	-	3.51	3.31
Pot Cap-1 Maneuver	-	-	707	-	104	524
Stage 1	-	-	-	-	335	-
Stage 2	-	-	-	-	512	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	704	-	92	521
Mov Cap-2 Maneuver	-	-	-	-	92	-
Stage 1	-	-	-	-	334	-
Stage 2	-	-	-	-	452	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	40.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	92	521	-	-	704	-
HCM Lane V/C Ratio	0.496	0.121	-	-	0.046	-
HCM Control Delay (s)	77.7	12.9	-	-	10.4	0.6
HCM Lane LOS	F	B	-	-	B	A
HCM 95th %tile Q(veh)	2.2	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	135	0	0	49	12	62	1547	20	7	29	1131	55
Future Vol, veh/h	0	0	135	0	0	49	12	62	1547	20	7	29	1131	55
Conflicting Peds, #/hr	0	0	1	1	0	0	0	9	0	18	0	18	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	75	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	145	0	0	53	13	67	1663	22	8	31	1216	59

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	648	-	-	861	931	1284	0	0	1230	1703	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	356	0	0	258	488	287	-	-	334	178	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	353	-	-	254	287	287	-	-	188	188	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.1	22.8	1	0.9
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	287	-	-	353	254	188	-	-
HCM Lane V/C Ratio	0.277	-	-	0.411	0.207	0.206	-	-
HCM Control Delay (s)	22.2	-	-	22.1	22.8	29.1	-	-
HCM Lane LOS	C	-	-	C	C	D	-	-
HCM 95th %tile Q(veh)	1.1	-	-	1.9	0.8	0.7	-	-

Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	212	236	31	182	1352	52	1137	199
Future Volume (vph)	212	236	31	182	1352	52	1137	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Lane Util. Factor	1.00	1.00		1.00	0.91	1.00	0.91	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1559		1782	5036	1752	5036	1543
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	1559		1782	5036	1752	5036	1543
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	223	248	33	192	1423	55	1197	209
RTOR Reduction (vph)	0	188	0	0	0	0	0	98
Lane Group Flow (vph)	223	60	0	225	1423	55	1197	111
Confl. Peds. (#/hr)		24		9				9
Heavy Vehicles (%)	1%	1%	3%	1%	3%	3%	3%	1%
Turn Type	Prot	Perm	Prot	Prot	NA	Prot	NA	Perm
Protected Phases	7		5	5	2	1	6	
Permitted Phases		4						6
Actuated Green, G (s)	14.9	15.1		13.5	31.4	2.8	20.7	20.7
Effective Green, g (s)	14.9	15.1		13.5	31.4	2.8	20.7	20.7
Actuated g/C Ratio	0.24	0.24		0.22	0.50	0.04	0.33	0.33
Clearance Time (s)	4.2	4.0		4.2	4.9	4.2	4.9	4.9
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	426	377		385	2534	78	1670	511
v/s Ratio Prot	c0.12			0.13	c0.28	0.03	c0.24	
v/s Ratio Perm		0.04						0.07
v/c Ratio	0.52	0.16		0.58	0.56	0.71	0.72	0.22
Uniform Delay, d1	20.7	18.6		21.9	10.7	29.4	18.3	15.0
Progression Factor	1.00	1.00		1.00	0.99	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.2		2.3	0.3	25.1	1.5	0.2
Delay (s)	21.8	18.8		24.1	11.0	54.5	19.8	15.2
Level of Service	C	B		C	B	D	B	B
Approach Delay (s)	20.3				12.8		20.4	
Approach LOS	C				B		C	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	13.3
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	0	0	112	0	0	91	25	59	1308	43	20	40	1204	13
Future Vol, veh/h	0	0	112	0	0	91	25	59	1308	43	20	40	1204	13
Conflicting Peds, #/hr	2	0	0	0	0	2	0	6	0	11	0	11	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	-	None	-	-	-	None
Storage Length	-	-	0	-	-	0	-	85	-	-	-	75	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-	0	-	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	0	1	3	1	0	1	3	1
Mvmt Flow	0	0	122	0	0	99	27	64	1422	47	22	43	1309	14

Major/Minor	Minor2			Minor1			Major1				Major2			
Conflicting Flow All	-	-	668	-	-	748	966	1329	0	0	1072	1480	0	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	7.12	-	-	7.12	5.6	5.32	-	-	5.6	5.32	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.91	-	-	3.91	2.3	3.11	-	-	2.3	3.11	-	-
Pot Cap-1 Maneuver	0	0	345	0	0	306	467	273	-	-	408	230	-	-
Stage 1	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Stage 2	0	0	-	0	0	-	-	-	-	-	-	-	-	-
Platoon blocked, %									-	-			-	-
Mov Cap-1 Maneuver	-	-	343	-	-	302	283	283	-	-	244	244	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.2	22.6	1.4	1.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	283	-	-	343	302	244	-	-
HCM Lane V/C Ratio	0.323	-	-	0.355	0.328	0.267	-	-
HCM Control Delay (s)	23.7	-	-	21.2	22.6	25	-	-
HCM Lane LOS	C	-	-	C	C	D	-	-
HCM 95th %tile Q(veh)	1.4	-	-	1.6	1.4	1	-	-

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	6	271	335	205	109	380	239	9	218	1035	194	8
Future Volume (vph)	6	271	335	205	109	380	239	9	218	1035	194	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00		1.00	0.91	1.00	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	
Flpb, ped/bikes		1.00	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	1.00	0.85		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1568	1752	3505	1568		1752	5036	1538	
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1568	1752	3505	1568		1752	5036	1538	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	295	364	223	118	413	260	10	237	1125	211	9
RTOR Reduction (vph)	0	0	0	168	0	0	208	0	0	0	109	0
Lane Group Flow (vph)	0	302	364	55	118	413	52	0	247	1125	102	0
Confl. Peds. (#/hr)											7	
Turn Type	Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases				4			8				2	
Actuated Green, G (s)		16.0	24.6	24.6	11.7	20.3	20.3		14.0	29.1	29.1	
Effective Green, g (s)		16.0	24.6	24.6	11.7	20.3	20.3		14.0	29.1	29.1	
Actuated g/C Ratio		0.16	0.24	0.24	0.12	0.20	0.20		0.14	0.29	0.29	
Clearance Time (s)		4.2	4.9	4.9	4.2	4.9	4.9		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		278	857	383	203	707	316		243	1456	444	
v/s Ratio Prot		c0.17	0.10		0.07	c0.12			c0.14	c0.22		
v/s Ratio Perm				0.03			0.03				0.07	
v/c Ratio		1.09	0.42	0.14	0.58	0.58	0.17		1.02	0.77	0.23	
Uniform Delay, d1		42.3	32.0	29.7	42.1	36.3	33.2		43.3	32.7	27.2	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		78.9	0.3	0.2	4.2	1.2	0.2		62.0	2.6	0.3	
Delay (s)		121.2	32.4	29.9	46.3	37.6	33.4		105.3	35.3	27.5	
Level of Service		F	C	C	D	D	C		F	D	C	
Approach Delay (s)			61.9			37.5				45.2		
Approach LOS			E			D				D		

Intersection Summary			
HCM 2000 Control Delay	46.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.6	Sum of lost time (s)	18.2
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	276	818	249
Future Volume (vph)	276	818	249
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.9	4.9
Lane Util. Factor	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1752	5036	1568
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1752	5036	1568
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	300	889	271
RTOR Reduction (vph)	0	0	123
Lane Group Flow (vph)	309	889	148
Confl. Peds. (#/hr)	7		
Turn Type	Prot	NA	Perm
Protected Phases	1	6	
Permitted Phases			6
Actuated Green, G (s)	17.0	32.1	32.1
Effective Green, g (s)	17.0	32.1	32.1
Actuated g/C Ratio	0.17	0.32	0.32
Clearance Time (s)	4.2	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0
Lane Grp Cap (vph)	296	1606	500
v/s Ratio Prot	c0.18	0.18	
v/s Ratio Perm			0.09
v/c Ratio	1.04	0.55	0.30
Uniform Delay, d1	41.8	28.3	25.7
Progression Factor	0.99	0.99	0.97
Incremental Delay, d2	64.2	0.4	0.3
Delay (s)	105.7	28.4	25.4
Level of Service	F	C	C
Approach Delay (s)		44.1	
Approach LOS		D	

Intersection Summary

Intersection: 1: San Pablo Ave & Clinton Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	72	53
Average Queue (ft)	10	23
95th Queue (ft)	39	47
Link Distance (ft)	281	901
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Glenn Ave & Clinton Ave

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	31	26	246	245	73	53
Average Queue (ft)	1	1	31	8	36	29
95th Queue (ft)	10	8	116	81	60	44
Link Distance (ft)	281	281	733	733	635	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						50
Storage Blk Time (%)					5	0
Queuing Penalty (veh)					3	0

Intersection: 3: Cambridge Ave & Blackstone Ave

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	R	UL	T	T	UL	T	TR
Maximum Queue (ft)	75	56	174	274	289	93	75	56
Average Queue (ft)	38	34	92	64	54	39	4	9
95th Queue (ft)	68	59	180	238	208	76	27	34
Link Distance (ft)	1033	1240		270	270		898	898
Upstream Blk Time (%)				5	0			
Queuing Penalty (veh)				17	1			
Storage Bay Dist (ft)			75			75		
Storage Blk Time (%)			31	0		2	0	
Queuing Penalty (veh)			114	0		9	0	

Intersection: 4: Blackstone Ave & Weldon Ave

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	T	U	T	T	T	R
Maximum Queue (ft)	138	170	288	205	317	315	190	274	234	270	250
Average Queue (ft)	51	40	165	113	143	147	35	188	147	137	93
95th Queue (ft)	101	103	250	197	239	239	112	267	223	214	172
Link Distance (ft)		847		608	608	608		270	270	270	
Upstream Blk Time (%)								1		0	
Queuing Penalty (veh)								4		1	
Storage Bay Dist (ft)	105		395				100				100
Storage Blk Time (%)	2	0					1	44		21	7
Queuing Penalty (veh)	2	0					3	12		74	22

Intersection: 5: Blackstone Ave & University Ave

Movement	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	R	R	UL	T	TR	UL	T	T	TR
Maximum Queue (ft)	74	54	151	31	53	50	115	76	127
Average Queue (ft)	37	34	46	1	2	14	4	3	5
95th Queue (ft)	62	55	99	10	17	43	38	25	44
Link Distance (ft)	407	1233		570	570		608	608	608
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85			75			
Storage Blk Time (%)			1				0		
Queuing Penalty (veh)			4				0		

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	UL	T	T	R	L	T	T	R	UL	T	T	T
Maximum Queue (ft)	340	851	807	84	120	198	214	170	220	661	556	520
Average Queue (ft)	332	591	507	28	71	124	102	94	204	362	295	194
95th Queue (ft)	380	930	874	62	115	186	192	171	251	611	517	383
Link Distance (ft)		2178	2178			1224	1224			2721	2721	2721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	245			150	255			100	185			
Storage Blk Time (%)	77		6				7	8	52	14		7
Queuing Penalty (veh)	168		5				18	15	165	31		15

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	UL	T	T	T	R
Maximum Queue (ft)	225	279	349	293	303	225
Average Queue (ft)	67	214	153	157	155	111
95th Queue (ft)	149	307	276	246	264	215
Link Distance (ft)			570	570	570	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	160	205				105
Storage Blk Time (%)		19	1		22	5
Queuing Penalty (veh)		47	3		53	12

Network Summary

Network wide Queuing Penalty: 799

Intersection: 1: San Pablo Ave & Clinton Ave

Movement	EB	WB	NB
Directions Served	T	LT	LR
Maximum Queue (ft)	55	94	55
Average Queue (ft)	2	8	32
95th Queue (ft)	18	44	58
Link Distance (ft)	1058	281	901
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Glenn Ave & Clinton Ave

Movement	WB	WB	NB	NB
Directions Served	LT	T	L	R
Maximum Queue (ft)	74	31	179	100
Average Queue (ft)	24	1	48	40
95th Queue (ft)	64	10	124	87
Link Distance (ft)	733	733	635	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				50
Storage Blk Time (%)			20	1
Queuing Penalty (veh)			11	0

Intersection: 3: Cambridge Ave & Blackstone Ave

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	R	R	UL	TR	UL	T	TR
Maximum Queue (ft)	120	54	94	23	31	52	21
Average Queue (ft)	65	32	37	1	11	2	1
95th Queue (ft)	109	58	73	8	34	17	10
Link Distance (ft)	1033	1240		270		898	898
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			75		75		
Storage Blk Time (%)			0				
Queuing Penalty (veh)			2				

Intersection: 4: Blackstone Ave & Weldon Ave

Movement	EB	EB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	R	UL	T	T	T	U	T	T	T	R
Maximum Queue (ft)	172	195	227	269	290	315	190	280	270	276	149
Average Queue (ft)	102	72	123	127	144	155	61	200	159	114	56
95th Queue (ft)	158	139	199	228	263	261	151	273	255	199	104
Link Distance (ft)		847		608	608	608		270	270	270	
Upstream Blk Time (%)								0	0	0	
Queuing Penalty (veh)								1	0	0	
Storage Bay Dist (ft)	105		395				100				100
Storage Blk Time (%)	7	1					1	38		11	1
Queuing Penalty (veh)	16	2					3	20		22	2

Intersection: 5: Blackstone Ave & University Ave

Movement	EB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	R	R	UL	T	T	UL	T	T	TR
Maximum Queue (ft)	72	76	94	53	31	75	96	28	51
Average Queue (ft)	45	40	33	2	1	33	6	1	2
95th Queue (ft)	67	68	68	17	10	59	39	9	19
Link Distance (ft)	407	1233		570	570		608	608	608
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			85			75			
Storage Blk Time (%)			1			1	0		
Queuing Penalty (veh)			2			5	0		

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	UL	T	T	R	L	T	T	R	UL	T	T	T
Maximum Queue (ft)	340	623	559	128	194	180	189	152	220	576	563	303
Average Queue (ft)	269	250	202	50	84	107	89	65	182	290	250	164
95th Queue (ft)	409	607	499	97	160	169	163	123	261	513	454	247
Link Distance (ft)		2178	2178			1224	1224			2721	2721	2721
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	245			150	255			100	185			
Storage Blk Time (%)	41		1				4	3	38	4		4
Queuing Penalty (veh)	68		1				11	5	132	8		8

Intersection: 6: Blackstone Ave & McKinley Ave

Movement	NB	SB	SB	SB	SB	SB
Directions Served	R	UL	T	T	T	R
Maximum Queue (ft)	225	280	572	500	249	225
Average Queue (ft)	48	247	278	171	152	86
95th Queue (ft)	111	328	571	316	218	192
Link Distance (ft)			570	570	570	
Upstream Blk Time (%)			2			
Queuing Penalty (veh)			8			
Storage Bay Dist (ft)	160	205				105
Storage Blk Time (%)		51	0		25	2
Queuing Penalty (veh)		139	0		62	4

Network Summary

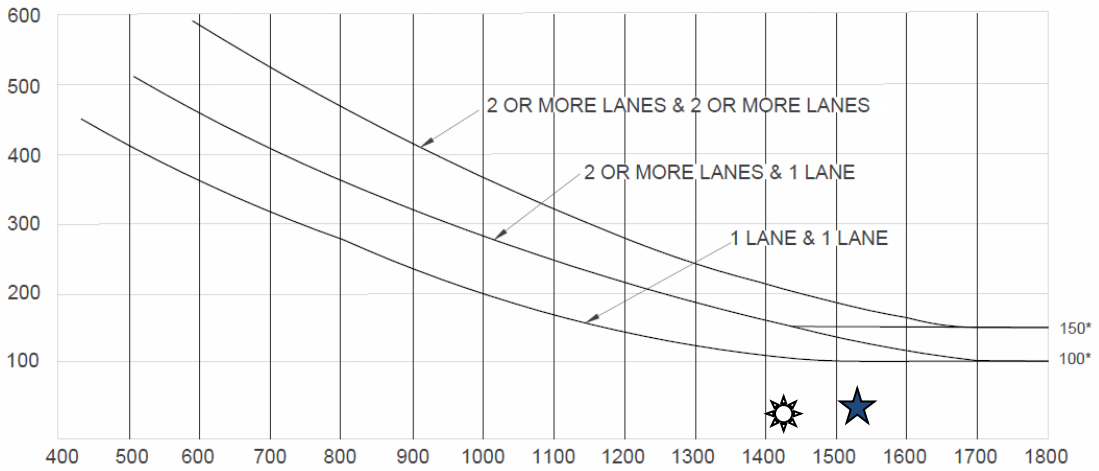
Network wide Queuing Penalty: 535

Appendix K: Signal Warrants

Warrant 3: Peak Hour (Urban)

Existing Traffic Conditions
1. San Pablo Avenue / Clinton Avenue
AM (PM) Peak Hour

San Pablo Avenue Highest Approach Volume = 20 (28) VPH



Clinton Avenue Total of Both Approaches = 1425 (1562) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

☼ **AM Peak Hour – Signal Warrant is Not Met**

★ **PM Peak Hour – Signal Warrant is Not Met**

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

JLB TRAFFIC ENGINEERING, INC.

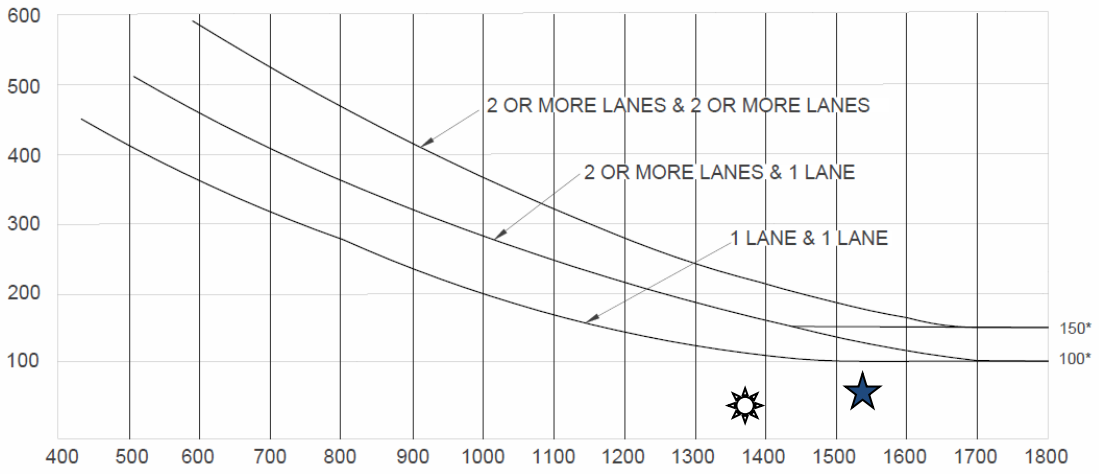
www.JLBtraffic.com
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

Warrant 3: Peak Hour (Urban)

Existing Traffic Conditions
2. Glenn Avenue / Clinton Avenue
AM (PM) Peak Hour

Glenn Avenue Highest Approach Volume = 55 (60) VPH



Clinton Avenue Total of Both Approaches = 1387 (1539) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

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Fresno, CA 93704
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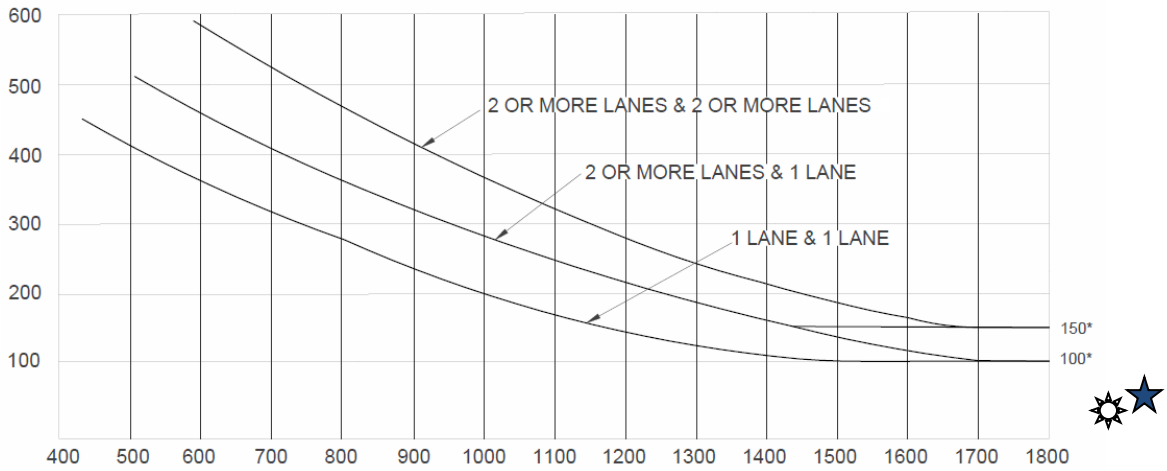
Warrant 3: Peak Hour (Urban)

Existing Traffic Conditions
3. Blackstone Avenue / Cambridge Avenue
AM (PM) Peak Hour

Cambridge Avenue Highest Approach Volume = 33 (42) VPH



Blackstone Avenue Total of Both Approaches = 1904 (2192) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

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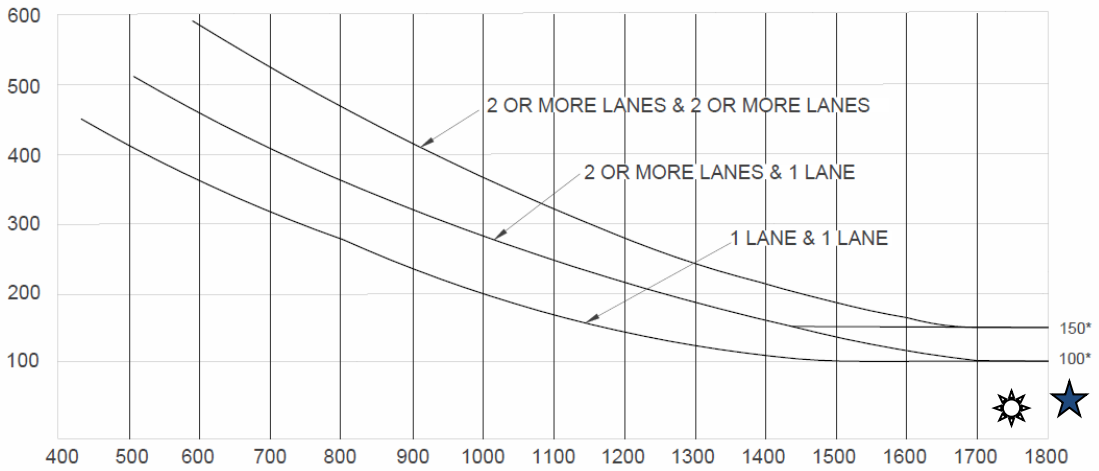
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

Warrant 3: Peak Hour (Urban)

Existing Traffic Conditions
5. Blackstone Avenue / University Avenue
AM (PM) Peak Hour

University Avenue Highest Approach Volume = 39 (57) VPH



Blackstone Avenue Total of Both Approaches =

1759 (2111) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

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info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103

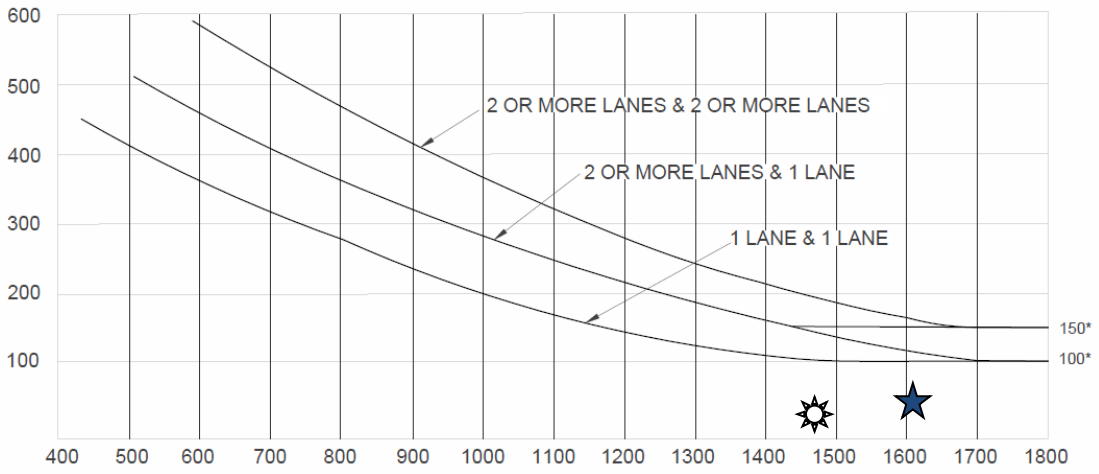
Fresno, CA 93704

(559) 570-8991

Warrant 3: Peak Hour (Urban)

Existing plus Project Traffic Conditions
1. San Pablo Avenue / Clinton Avenue
AM (PM) Peak Hour

San Pablo Avenue Highest Approach Volume = 30 (40) VPH



Clinton Avenue Total of Both Approaches = 1479 (1608) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

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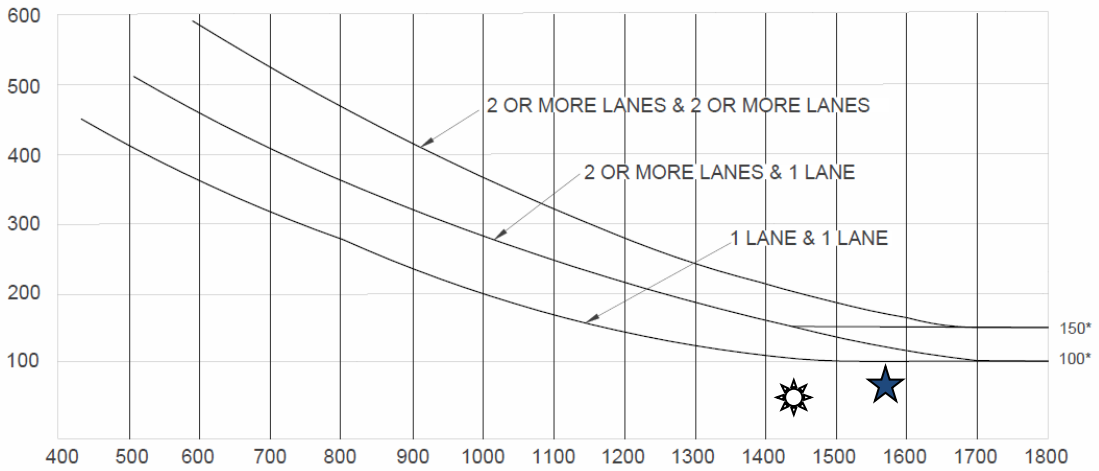
Warrant 3: Peak Hour (Urban)

Existing plus Project Traffic Conditions
2. Glenn Avenue / Clinton Avenue
AM (PM) Peak Hour

Glenn Avenue Highest Approach Volume = 62 (71) VPH



Clinton Avenue Total of Both Approaches = 1439 (1580) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

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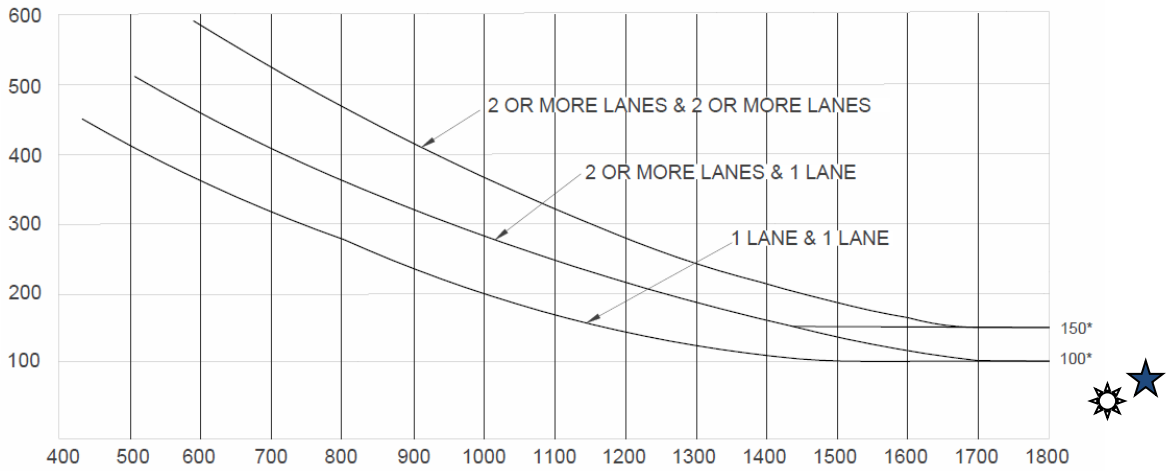
Warrant 3: Peak Hour (Urban)

Existing plus Project Traffic Conditions
3. Blackstone Avenue / Cambridge Avenue
AM (PM) Peak Hour

Cambridge Avenue Highest Approach Volume = 49 (93) VPH



Blackstone Avenue Total of Both Approaches = 2111 (2370) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

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info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
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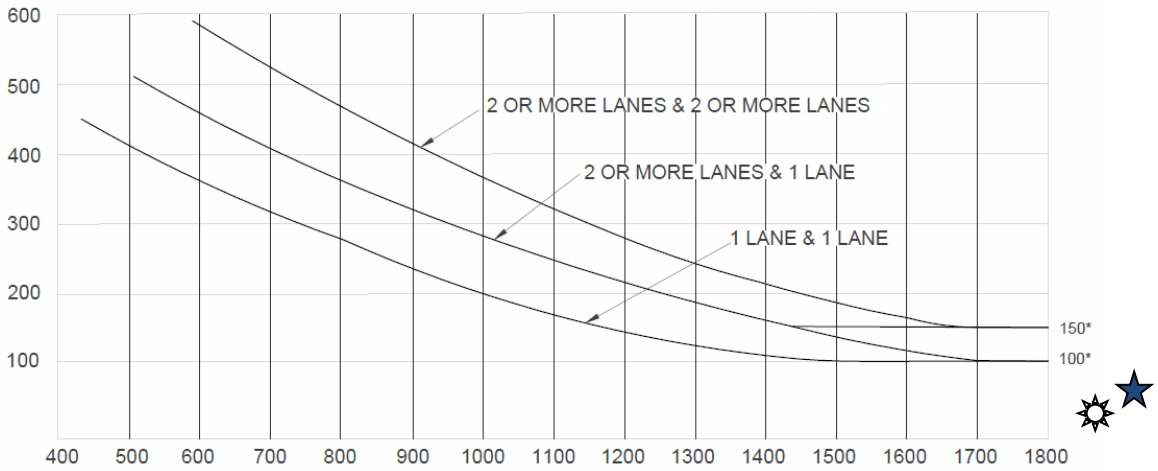
Warrant 3: Peak Hour (Urban)

Existing plus Project Traffic Conditions
5. Blackstone Avenue / University Avenue
AM (PM) Peak Hour

University Avenue Highest Approach Volume = 39 (56) VPH



Blackstone Avenue Total of Both Approaches = 2070 (2416) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
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November 7, 2014

JLB TRAFFIC ENGINEERING, INC.

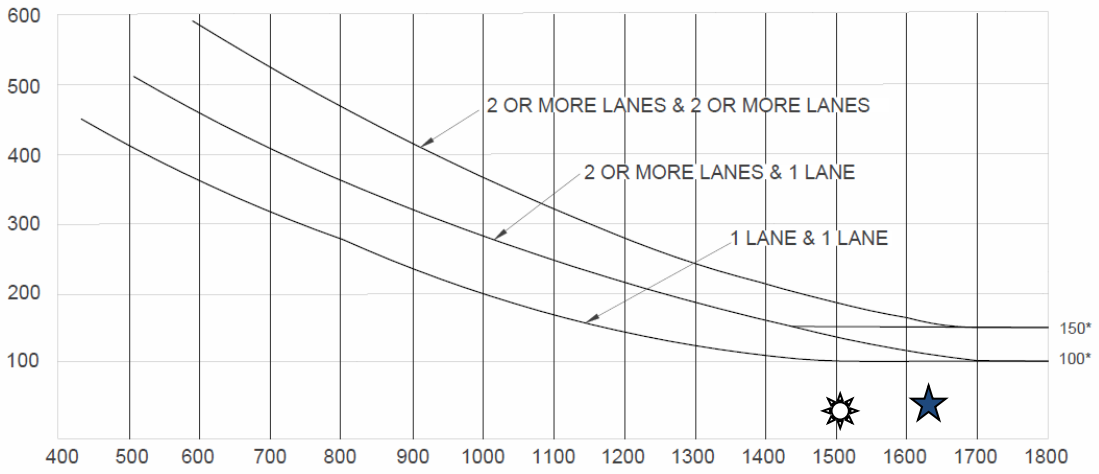
www.JLBtraffic.com
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

Warrant 3: Peak Hour (Urban)

Near Term plus Project Traffic Conditions
1. San Pablo Avenue / Clinton Avenue
AM (PM) Peak Hour

San Pablo Avenue Highest Approach Volume = 30 (40) VPH



Clinton Avenue Total of Both Approaches = 1506 (1626) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

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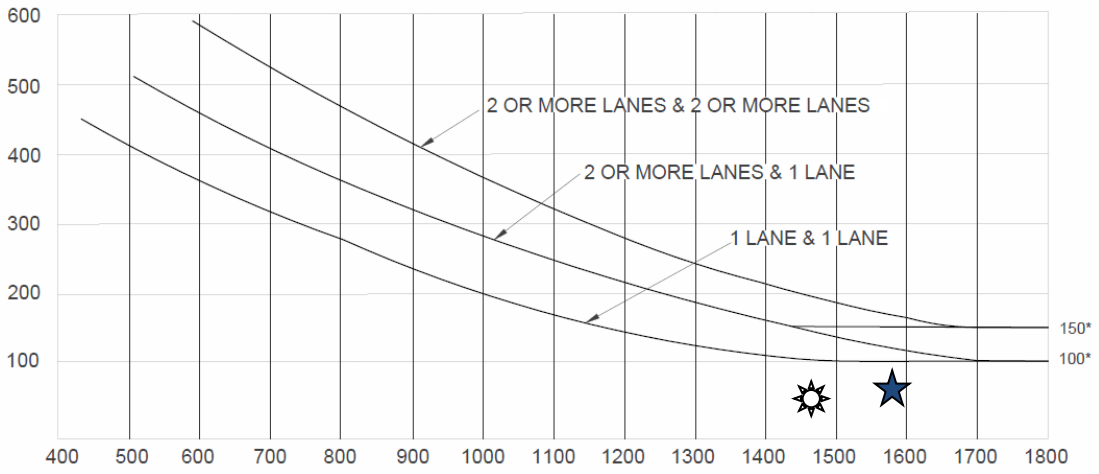
Warrant 3: Peak Hour (Urban)

Near Term plus Project Traffic Conditions
2. Glenn Avenue / Clinton Avenue
AM (PM) Peak Hour

Glenn Avenue Highest Approach Volume = 63 (71) VPH



Clinton Avenue Total of Both Approaches = 1466 (1598) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

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PM Peak Hour – Signal Warrant is Not Met

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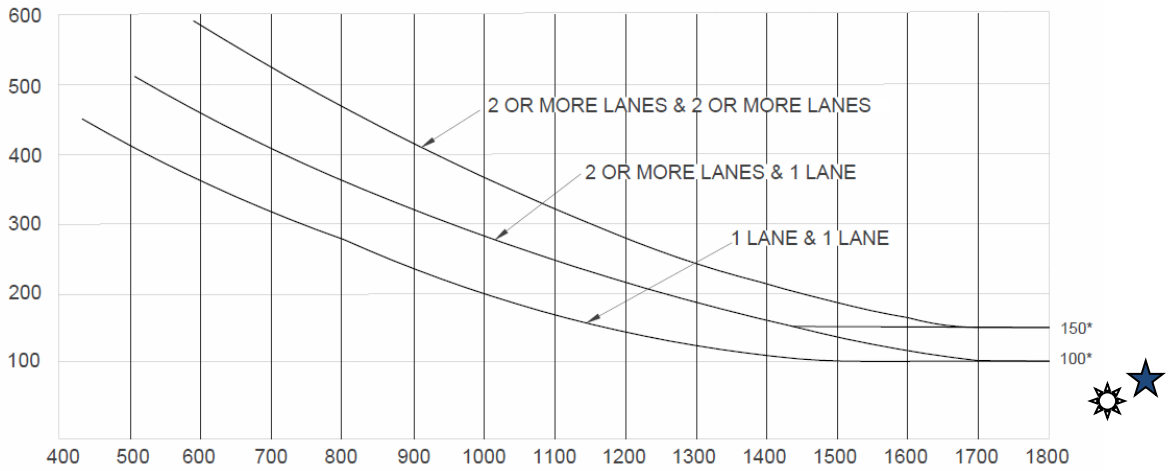
Warrant 3: Peak Hour (Urban)

Near Term plus Project Traffic Conditions
3. Blackstone Avenue / Cambridge Avenue
AM (PM) Peak Hour

Cambridge Avenue Highest Approach Volume = 50 (94) VPH



Blackstone Avenue Total of Both Approaches = 2239 (2452) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

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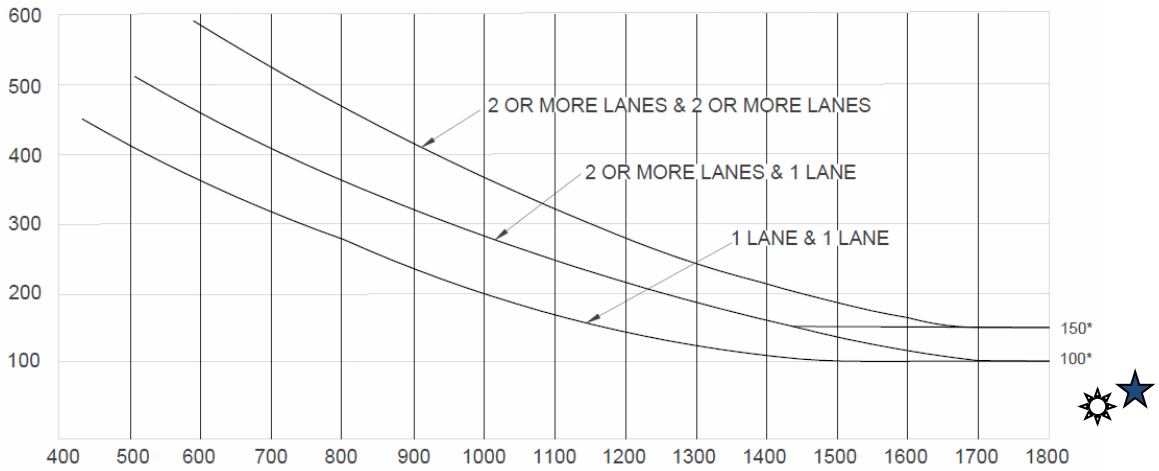
Warrant 3: Peak Hour (Urban)

Near Term plus Project Traffic Conditions
5. Blackstone Avenue / University Avenue
AM (PM) Peak Hour

University Avenue Highest Approach Volume = 41 (57) VPH



Blackstone Avenue Total of Both Approaches = 2184 (2469) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

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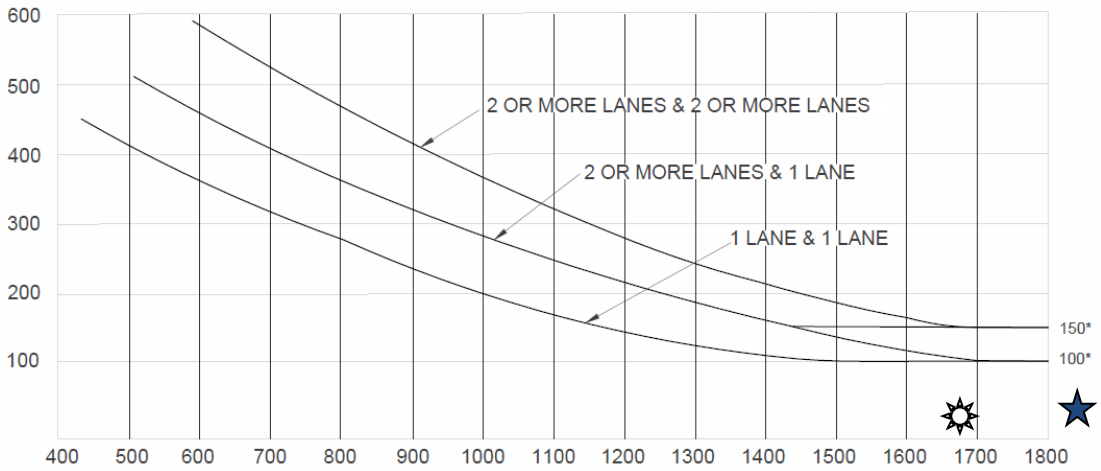
Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 No Project Traffic Conditions
1. San Pablo Avenue / Clinton Avenue
AM (PM) Peak Hour

San Pablo Avenue Highest Approach Volume = 20 (28) VPH



Clinton Avenue Total of Both Approaches = 1675 (1873) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

☼ **AM Peak Hour – Signal Warrant is Not Met**

★ **PM Peak Hour – Signal Warrant is Not Met**

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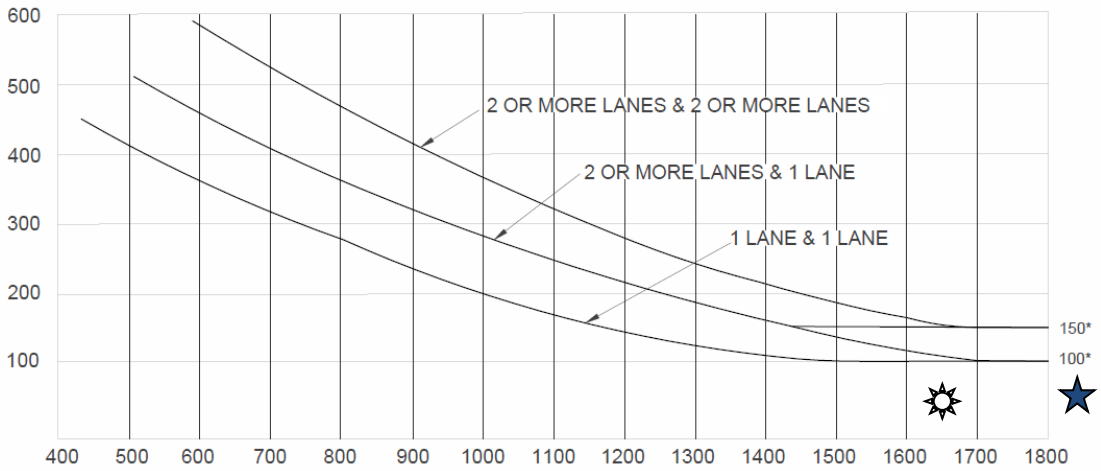
Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 No Project Traffic Conditions
2. Glenn Avenue / Clinton Avenue
AM (PM) Peak Hour

Glenn Avenue Highest Approach Volume = 56 (61) VPH



Clinton Avenue Total of Both Approaches = 1654 (1867) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

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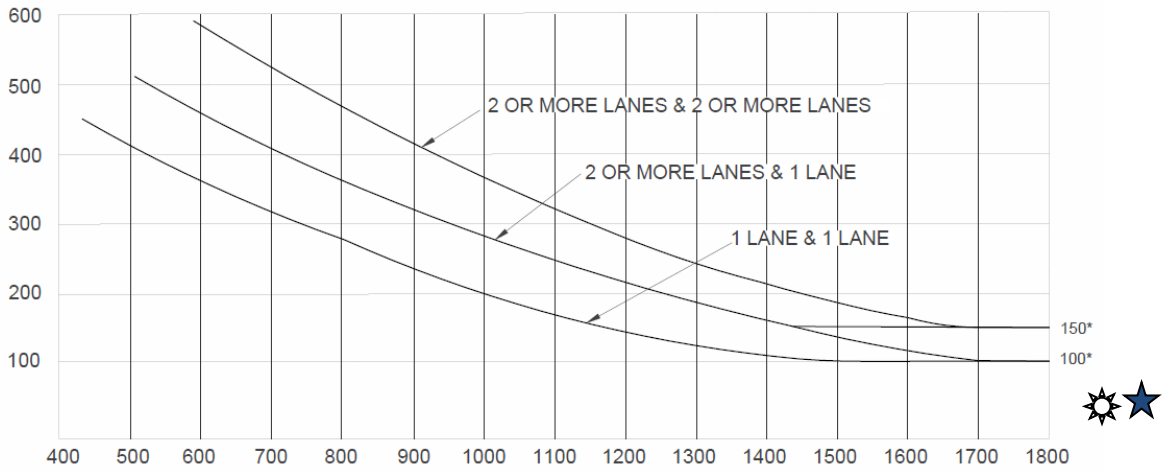
Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 No Project Traffic Conditions
3. Blackstone Avenue / Cambridge Avenue
AM (PM) Peak Hour

Cambridge Avenue Highest Approach Volume = 42 (43) VPH



Blackstone Avenue Total of Both Approaches = 2513 (2601) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

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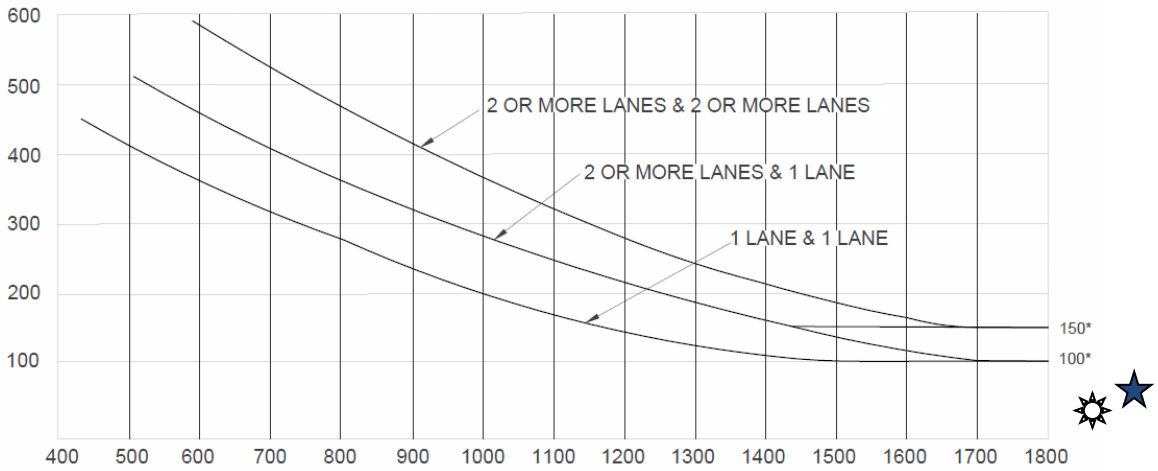
Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 No Project Traffic Conditions
5. Blackstone Avenue / University Avenue
AM (PM) Peak Hour

University Avenue Highest Approach Volume = 42 (64) VPH



Blackstone Avenue Total of Both Approaches = 2178 (2327) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

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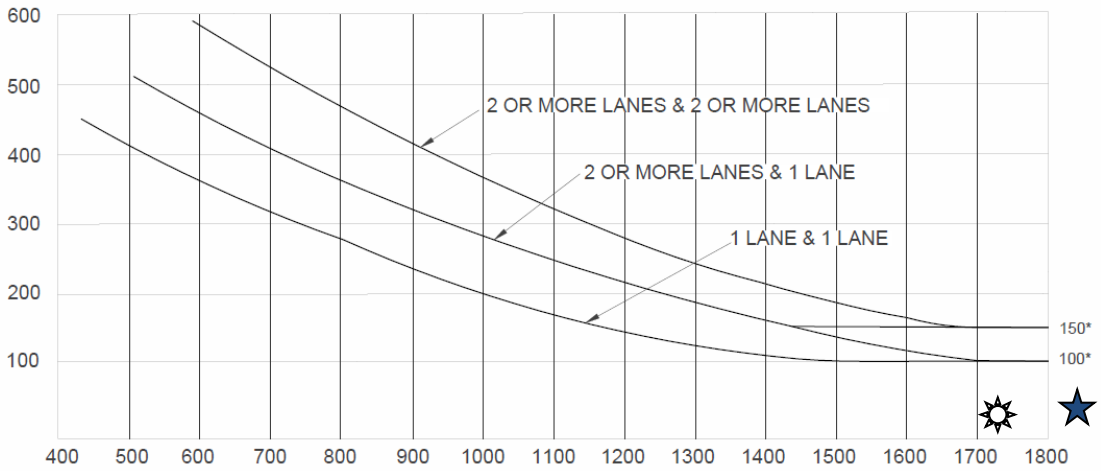
Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 plus Project Traffic Conditions
1. San Pablo Avenue / Clinton Avenue
AM (PM) Peak Hour

San Pablo Avenue Highest Approach Volume = 30 (40) VPH



Clinton Avenue Total of Both Approaches = 1729 (1919) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

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PM Peak Hour – Signal Warrant is Not Met

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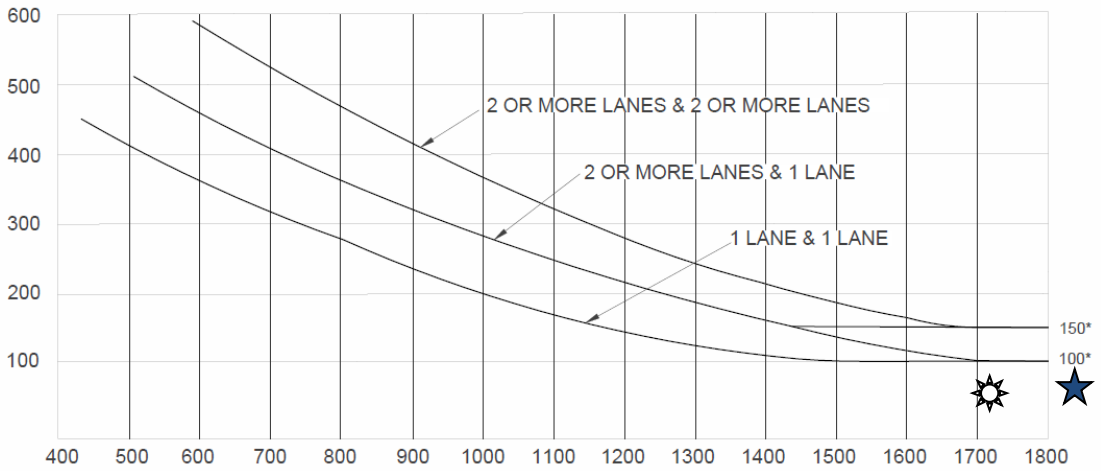
Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 plus Project Traffic Conditions
2. Glenn Avenue / Clinton Avenue
AM (PM) Peak Hour

Glenn Avenue Highest Approach Volume = 63 (71) VPH



Clinton Avenue Total of Both Approaches = 1706 (1908) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

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PM Peak Hour – Signal Warrant is Not Met

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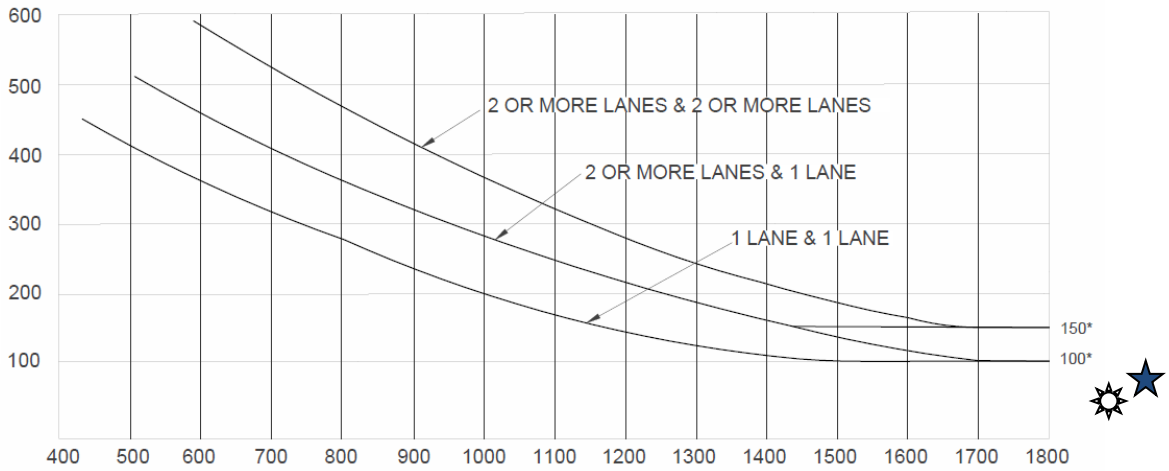
Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 plus Project Traffic Conditions
3. Blackstone Avenue / Cambridge Avenue
AM (PM) Peak Hour

Cambridge Avenue Highest Approach Volume = 50 (94) VPH



Blackstone Avenue Total of Both Approaches = 2720 (2779) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

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PM Peak Hour – Signal Warrant is Not Met

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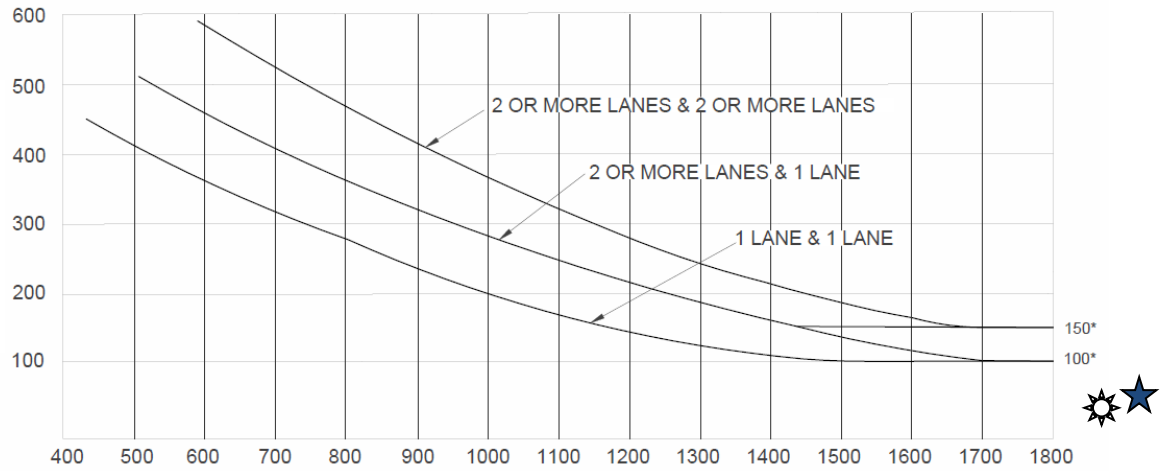
Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 plus Project Traffic Conditions
5. Blackstone Avenue / University Avenue
AM (PM) Peak Hour

University Avenue Highest Approach Volume = 45 (61) VPH



Blackstone Avenue Total of Both Approaches = 2489 (2632) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

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