Traffic Impact Study

Broad & Washington Redevelopment

City of Falls Church, VA

December 9, 2015
Revised October 10, 2017

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INTRODUCTION AND SUMMARY

Purpose and Study Objective

This report presents the findings of a traffic impact analysis for the proposed redevelopment of the property located on the northeast corner of the Broad Street and Washington Street intersection in the City of Falls Church. The site is bound by Park Place on the north, E. Broad Street (Route 7) on the south, Lawton Street on the east, and N. Washington Street on the west. The development, which is planned to consist of up to 21,300 square feet of retail (restaurant and specialty retail), 5,000 square feet of theater, up to 300 apartments, and 66,700 square feet of office, is anticipated to be complete in 2020.

The following tasks were completed as part of this study:

- A scoping meeting was held on June 22, 2015 with City of Falls Church staff, which included discussions about the parameters of the study and relevant background information. A scoping letter stating the parameters and assumptions used in the analysis herein is included in Appendix A. Updates to the study have been incorporated to address staff comments of September 28, 2015. This study includes the new development plan and is part of the application previously submitted on December 9, 2015.
- Field reconnaissance in the vicinity of the site was performed to collect information related to existing traffic controls, roadway geometry, and traffic flow characteristics.
- Saturday peak period traffic counts were conducted on Saturday, January 31, 2015. Weekday AM and PM peak period traffic counts were conducted at the study intersections on Tuesday, February 3, 2015.
- Future without development traffic conditions were projected based on existing traffic and trip generated by approved but incomplete development in the vicinity.
- Proposed site traffic volumes were generated based on the methodology outlined in the Institute of Transportation Engineers' (ITE) Trip Generation, 9th Edition publication.
- Future with development traffic conditions were projected based on existing regional and site traffic patterns and the proposed development plan.
- Intersection capacity analyses were performed for the existing conditions (2015) and future conditions with development (2020) during the weekday and Saturday peak hours at the intersections located within the study area.

Sources of data for this study include the City of Falls Church, VDOT, Insight Property Group, MV+A Architects and the office files and field reconnaissance efforts by Gorove/Slade Associates, Inc.

Executive Summary

Site Location and Study Area

The subject development is located in the City of Falls Church, on the north side of E. Broad Street between N. Washington Street and Lawton Street. It is in the vicinity to four major commuter corridors: I-66, Route 7, Route 29, and Route 50. The site is currently occupied by an Applebee's restaurant, a physical therapy clinic, and a combined office/retail building. The study area consists of nine intersections, both local and regional in nature, two of which are the driveways for the existing uses. The proposed development will continue to be served by these two site driveways.

Description of Proposed Development

The 3.22-acre Broad & Washington development site is currently zoned Central Business (B-2) and Transitional 1 (T-1). The project is a special exception application to construct a multi-use building featuring up to 6,000 square feet of sit-down restaurant (ground floor), 15,300 square feet of specialty retail (ground floor), 5,000 square feet of theater, up to 300 apartments, and 66,700 square feet of office use. The plan shows 295 apartments, but this traffic study has used 300 apartments to be conservative. A multi-level garage will be constructed with access off of E. Broad Street to the south of the property. A right-in/right-out driveway will be located along the west side of the property off of N. Washington Street. The site will be served by retail parking spaces at the Broad Street level, and below-grade office and residential parking. The development is anticipated to be complete in 2020.

Principal Findings, Conclusions and Recommendations

The analysis presented in this report supports the following major conclusions:

Existing Conditions (2015)

Weekday traffic counts were conducted at the study intersections during the AM and PM peak periods on Tuesday, February 3, 2015 and Saturday peak period traffic counts were conducted on January 31, 2015. The existing volumes were balanced across proximate intersections to reflect a consistent baseline for the volume projections within this report.

Intersection capacity analyses were performed for the existing conditions at the study area intersections during the weekday morning and afternoon peak hours, as well as the Saturday peak hour. *Synchro, version 9.0* was used to analyze the study intersections with results based on the Highway Capacity Manual (HCM 2000) methodology. For the purpose of this analysis, it is desirable to achieve a LOS D or better for each approach of an intersection. All of the study intersections' approaches currently operate at acceptable levels of service and most queue lengths can be accommodated during the weekday morning, afternoon, and Saturday peak hours, with the following exceptions:

- Broad Street and Washington Street (queues)
- N. Washington Street and Park Avenue (queues)

Future Conditions without Development (2020)

Traffic volumes were projected for the year 2020 without the proposed Broad & Washington redevelopment. The traffic associated with the 301 W. Broad Street project was added to the existing traffic volumes to obtain the future conditions without development.

Most of the study intersections' approaches will continue to operate at acceptable levels of service with manageable queues during the weekday morning, afternoon, and Saturday peak hours, with the following exceptions:

- Broad Street and Washington Street (LOS and queues)

Future Conditions with Development (2020)

The proposed mixed-use redevelopment will generate approximately 148 new external trips during the weekday morning peak hour, 264 new external trips during the weekday afternoon peak hour, 164 new external trips during the Saturday peak hour, and 2,655 new external weekday daily trips, accounting for existing or potential trips associated with the existing buildings. Access to the proposed development will be provided via a full-movement driveway on E. Broad Street and a right-

in/right-out access on N. Washington Street. Future conditions with the development were derived from the future without development scenario and the site generated trips.

As under the existing and future without development conditions, most of the study intersections' approaches will continue to operate at acceptable levels of service with manageable queues during the weekday morning, afternoon, and Saturday peak hours, with the following exceptions:

- Broad Street and Washington Street (LOS and queues)
- E. Broad Street and Site Driveway (LOS and queues)

Signalization of the Site Entrance on E. Broad Street is proposed as part of mitigations. With the addition of a traffic signal at the intersection of E. Broad Street and site driveway, the side street movements operate at acceptable levels of service.

In summary, traffic operations within the study area will be similar with or without the proposed Broad & Washington redevelopment.

An additional scenario was analyzed under the future with development conditions to evaluate traffic operations with a potential full-movement signalized intersection at Park Place and N. Washington Street. The results of the capacity analysis show that the addition of a traffic signal at the intersection of N. Washington Street and Park Place does not result in significantly different results as compared to the existing configuration of this intersection.

BACKGROUND INFORMATION: PROPOSED DEVELOPMENT (SITE AND NEARBY)

Description of On-Site Development

This study is being performed to examine the potential traffic impact of the proposed Broad & Washington redevelopment on the area's future roadway network. The project site is bounded by E. Broad Street to the south and Park Place to the north, N. Washington Street to the west and Lawton Street to the east. A site location map is shown in Figure 1. Portions of the site's development plan showing access points and a typical upper level are shown in Figure 2. The subject parcel is currently zoned Central Business (B-2). The development is anticipated to be complete in 2020.

The project is a special exception application to construct up to approximately 6,000 square feet high of turnover sit-down restaurant space, 15,300 square feet of specialty retail space, 5,000 square feet of theater, 300 apartments, and 66,700 square feet of office space to be located in a multi-use building. As mentioned earlier, the plan shows 295 apartments, but this traffic study has used 300 apartments to be conservative. The restaurant and specialty retail will be located on the ground floor. Access to the proposed development will be provided by one full-entrance into a multi-level garage with full-access off of E. Broad Street. An additional right-in/right-out driveway will be located along N. Washington Street. The garage will be constructed to provide parking for the retail, restaurant, office and residential uses.

Planned Transportation Improvements

Neither the City of Falls Church's Comprehensive Plan, Five-Year Capital Improvements Program, or VDOT's Six-Year Improvement Program (SYIP) propose any major long-term transportation improvements within the study area.

Scope of Study

The study area consists of nine intersections, two of which will allow traffic to enter and exit the site. The study area was determined based on the scoping meeting held with City of Falls Church staff on June 22, 2015. A copy of the agreed-upon scoping document is included in Appendix A. The following intersections were identified for inclusion in this study:

1. Broad Street and Washington Street;
2. E. Broad Street and Applebee's entrance/proposed site entrance;
3. E. Broad Street and Lawton Street;
4. Lawton Street and E. Columbia Street;
5. N. Washington Street and Columbia Street;
6. N. Washington Street and Great Falls Street;
7. N. Washington Street and Park Avenue;
8. N. Washington Street and Park Place;
9. N. Washington Street and existing driveway/proposed driveway

This report presents the findings of analyses performed for the following conditions:

- **Existing Conditions (2015):** Considers existing traffic volumes and existing roadway configurations.
- **Future Conditions without Development (2020):** Considers future traffic conditions for the year 2020 with the other development traffic, but without the proposed development.
- **Future Conditions with Development (2020):** Considers future traffic conditions for the year 2020 (build-out year) with the other development traffic and the proposed Broad & Washington development.

The results of the analysis and the traffic impacts associated with the proposed development plan are presented in the Conclusion section of this report.

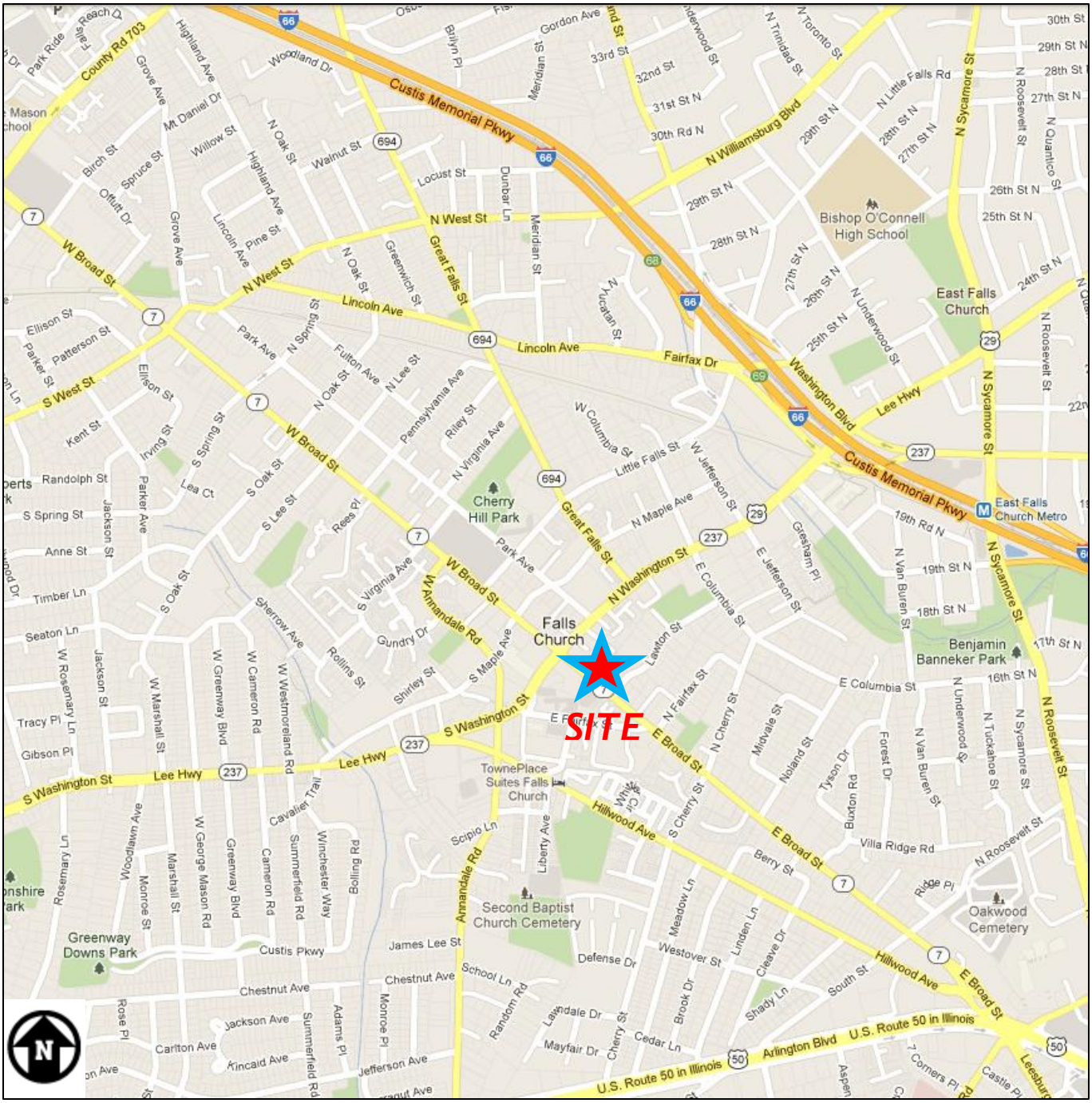


Figure 1: Site Location

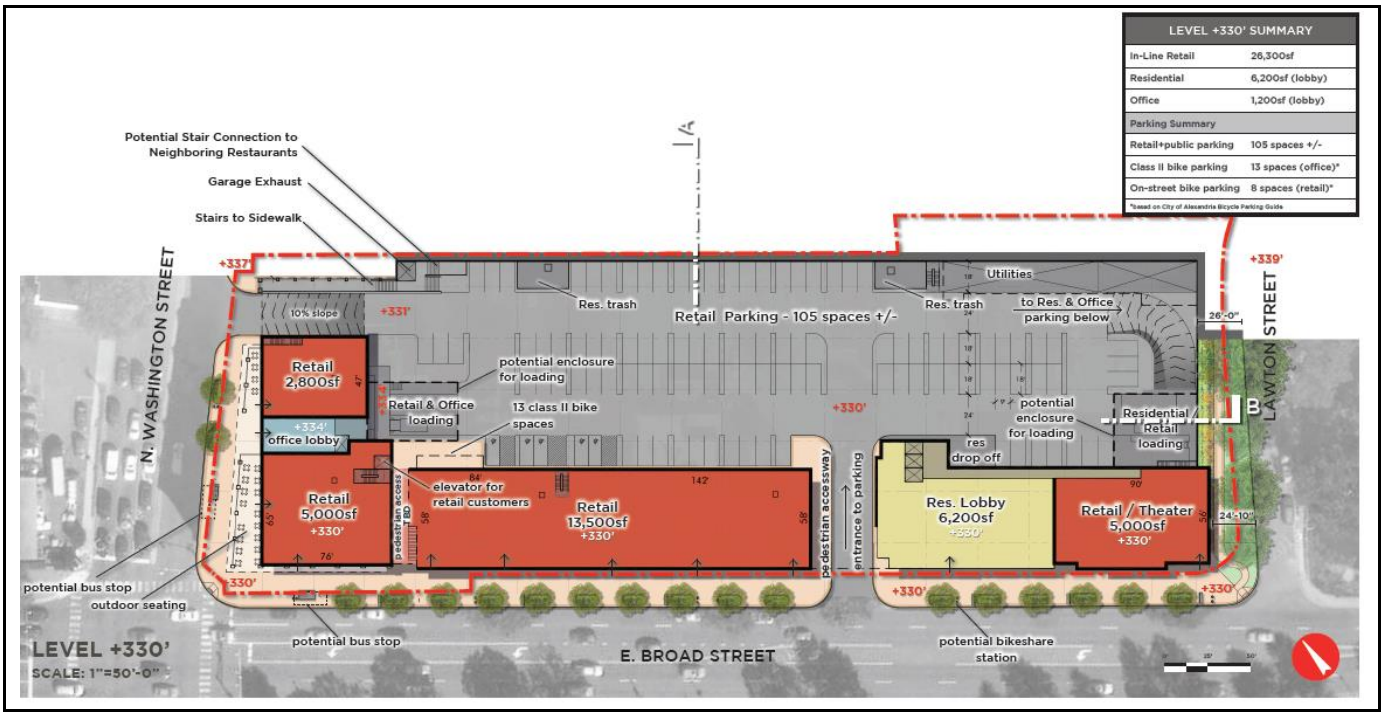


Figure 2: Proposed Development Plan

Roadway Network

A description of the major roadways within the immediate vicinity of the site is presented below. The existing lane configuration and traffic control in the study area is shown in Figure 3.

Broad Street (Route 7) is a four-lane undivided major arterial with left turn bays at its signalized intersections with Washington Street. The posted speed limit is 25 mph within the study area. Published historical traffic count data from VDOT shows that in 2014, W. Broad Street carried approximately 25,000 vehicles per day while E. Broad Street carried approximately 21,000 vehicles per day.

Washington Street (Route 29) is a four-lane divided major arterial with left turn bays at its signalized intersection with Broad Street. The posted speed limit is 30 mph within the study area. VDOT traffic count data from 2014 shows that N. Washington Street carried approximately 22,000 vehicles per day while S. Washington Street carried approximately 13,000 vehicles per day.

Great Falls Street is a two-lane minor arterial extending west from N. Washington Street. The posted speed limit is 25 mph within the study area. 2014 traffic count data from VDOT shows that Great Falls Street carried approximately 3,400 vehicles per day.

Columbia Street is a two-lane undivided collector street. The posted speed limit is 25 mph within the study area. Published historical traffic count data from VDOT shows that west of N. Washington Street, Columbia Street carried 2,900 vehicles and east of Washington Street carried 3,300 vehicles in 2014.

Park Avenue is a two-lane undivided collector street. On-street parking exists along both sides west of Little Falls Street and on the south side of the street along the section of Park Avenue between N. Washington Street and N. Maple Avenue. The posted speed limit is 25 mph within the study area. There is no published historical traffic count data from VDOT available on this roadway.

Park Place is a two-lane undivided local street. Park Avenue is only about 350 feet in length and extends east from N. Washington Street to its terminus at a cluster of single family homes. On-street parking exists along both sides and the statutory speed limit is 25 mph. There is no published historical traffic count data from VDOT available on this roadway.

Lawton Street is a two-lane undivided local street with a statutory speed limit of 25 mph that spans from E. Broad Street to the south and E. Columbia Street to the north. No published historical traffic count data for this roadway is available from VDOT.

Bicycle/Pedestrian Facilities

Dedicated on-street bike lanes are absent within the study area and the entire City of Falls Church. The site is located approximately one mile from the Washington & Old Dominion (W&OD) Trail, which extends 45 miles from Shirlington to Purcellville. To improve future bicycling conditions within the study area, the City's Draft Bicycle Master Plan recommends the implementation of on-street bicycle facilities in the study area along Columbia Street and Great Falls Street to complement the shared use pavement markings (sharrows) recently installed along Park Avenue. Washington Street, W. Broad Street, and Park Avenue are designated as future bike-share corridors within the study area. There is one Capital Bikeshare station proposed in the study area, located in the northeast property corner of the Broad & Washington site.

The roadways in the vicinity of the proposed development provide pedestrian facilities and connectivity throughout the area. Continuous 4 to 8 foot wide sidewalks line all of the study area's roadways on both sides of each street. Continental crosswalk markings link sidewalk segments at all of the study area's signalized intersections with the exception of the southern east/west crossing movement at the N. Washington Street/Park Avenue intersection.

Pedestrian countdown signals are present for all crossing movements at the Broad Street and Washington Street intersection. Countdown pedestrian indications are only installed for the crossing of N. Washington Street at Columbia Street; the remaining crossings do not have pedestrian signals. At the N. Washington Street/Park Avenue intersection, there are pedestrian signals serving both marked crossing movements; however, the pedestrian signals are an older model without the countdown display. Currently, these are in compliance with the Manual on Uniform Traffic Control Devices (MUTCD) until they reach the end of their serviceable life, when they will need to be replaced with pedestrian countdown signals since the pedestrian change interval for these crossings is longer than 7 seconds. The City's guidelines recommend the installation of pedestrian countdown signals for the crossing movements that either lack the countdown displays or lack pedestrian signals altogether.

To aid the movement of pedestrians and cyclists across E. Broad Street, the City is planning a new enhanced crossing at E. Fairfax Street between the widely-spaced existing crossings at Washington Street and Cherry Street. This crossing would improve connectivity in the area, enhancing mobility and encouraging non-motorized travel. The benefits of the new crossing would be supportive of, and complimentary to, the proposed mixed-use Broad & Washington redevelopment.

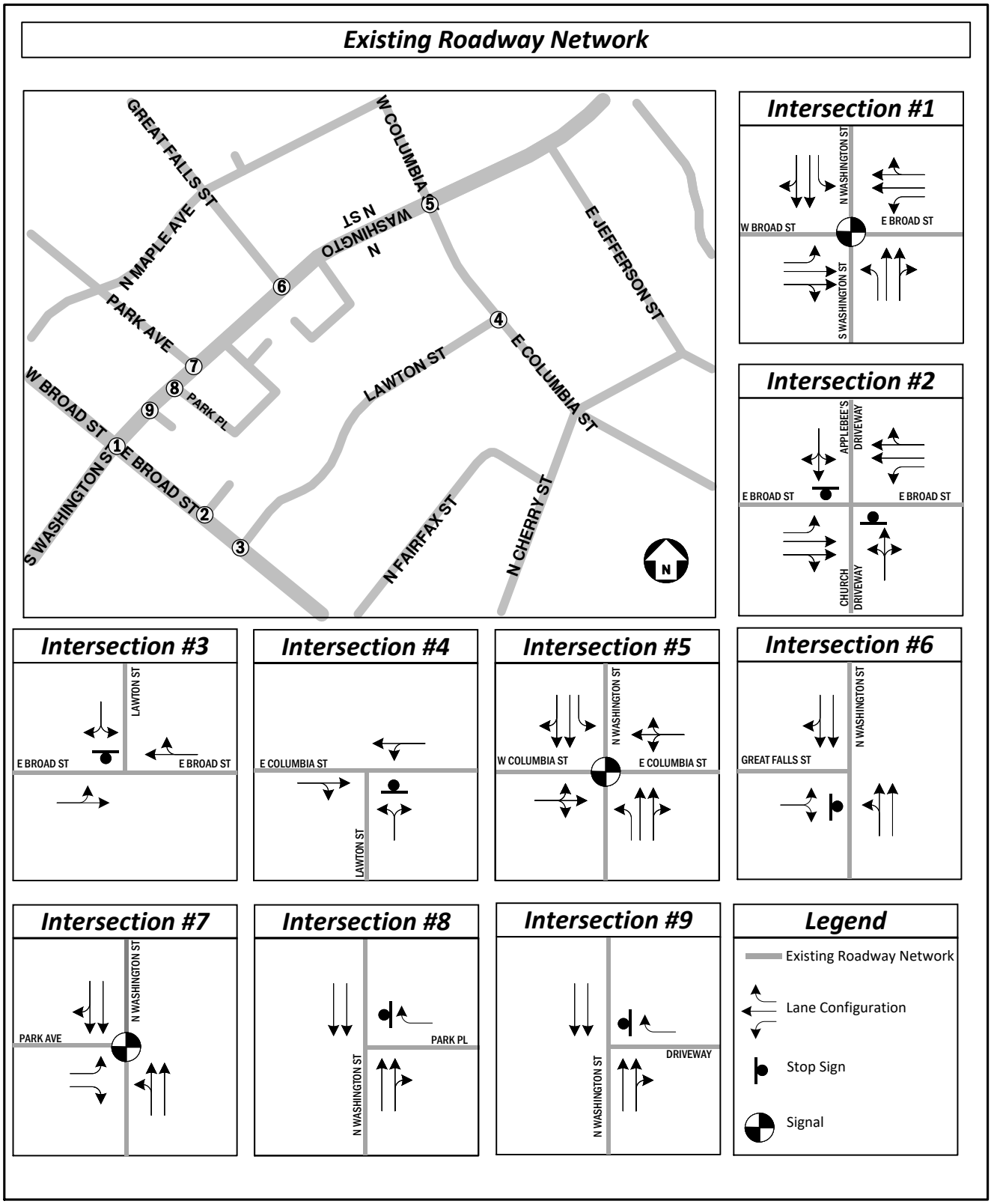


Figure 3: Existing (2015) Roadway Network

Transit

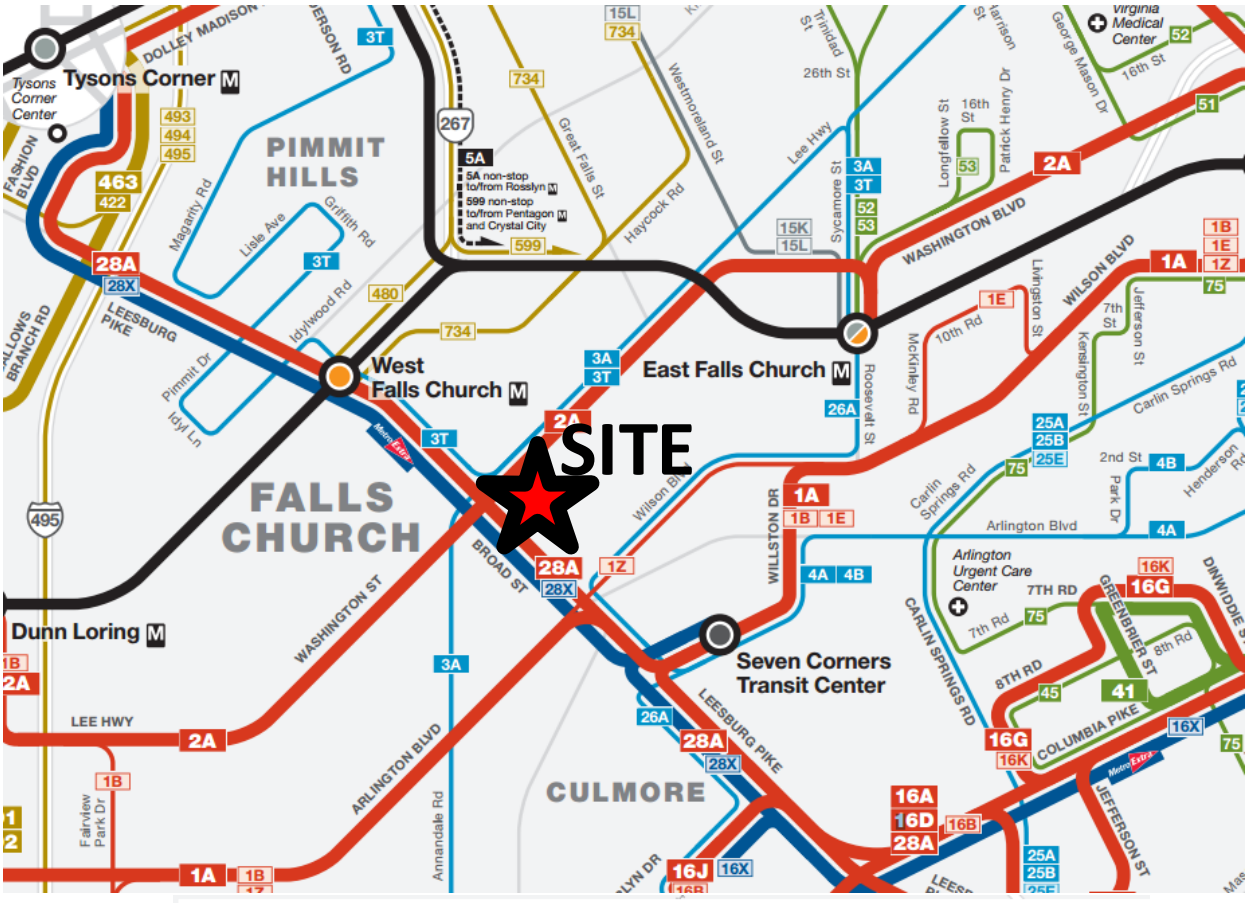
Transit service to the study area is provided by Metrorail. The East Falls Church Metrorail station is located at the I-66/ Sycamore Street interchange, approximately ¾ mile to the east, and operates on Metrorail's Orange and Silver Lines. Metro trains run on each line every six minutes during the morning and afternoon peak periods and every 12 to 20 minutes during the weekday off-peak periods and on weekends. Riders traveling to or from the east as far as the Stadium-Armory station may opt for either Orange or Silver Line trains, increasing the practical frequency of the service. From the station, it is approximately a 0.9-mile walk to the site's northern property line, or an 18-23 minute walk depending on walking speed.

The Washington Transit Metropolitan Authority (WMATA) Metrobus provides bus services to the study area. Table 1 shows a summary of the bus route information for the existing bus route lines that serve the site during weekdays with stops in the study area and Figure 4 illustrates the existing bus service. A bus stop serving westbound trips on the 28A,X Metrobus lines is located on the property along E. Broad Street. Stops for the 2A and 3A are located along S. Washington Boulevard within 250 feet of the site, and the nearest stop for eastbound 28 A,X trips is approximately 400 feet west of the site. The 3T line can be access via stops located north of Park Avenue, approximately 375 feet north of the site.

Table 1: Weekday Bus Route Information

Route Number	Route Name	Destination	Service Hours	Peak Period Headway
WMATA 2A	Washington Boulevard Line	Ballston, Dunn Loring	Weekdays 4:45 am-12:55 am	15-30 min
WMATA 3A,T	Lee Highway Line	Annandale, McLean, Rosslyn	Weekdays 5:00 am-12:57 am	15-30 min
WMATA 28A	Leesburg Pike Line	Tysons Corner, King Street Metro	Weekdays 4:18 am-1:42 am	20 min
WMATA 28X	Leesburg Pike Limited Stop	Tysons Corner, Mark Center	Weekdays 5:45am-9:05am & 3:35pm-7:26pm	15-20 min

WMATA Bus Routes



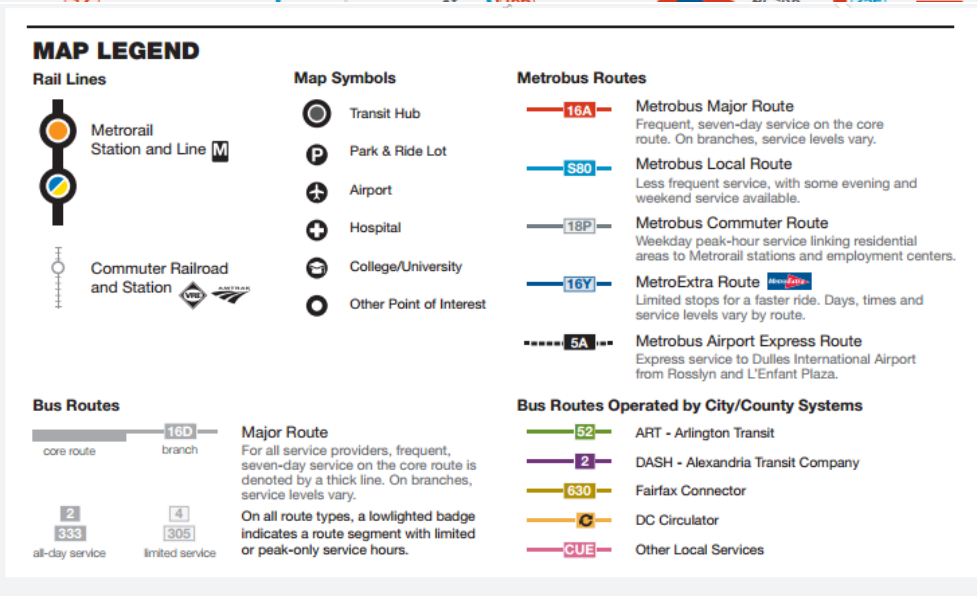


Figure 4: Existing Transit Service

EXISTING CONDITIONS (2015)

Existing Traffic Volumes

In order to determine the weekday and Saturday peak hour turning movement traffic volumes, traffic counts were conducted at the study intersections on Saturday, January 31, 2015 during the midday peak period and on Tuesday, February 3, 2015 during the morning and afternoon peak periods. Analysis of the traffic data found the following peak hours:

- AM Peak Hour: 8:30 AM to 9:30 AM
- PM Peak Hour: 4:45 PM to 5:45 PM
- Saturday Peak Hour: 12:30 PM to 1:30 PM

The counts were balanced at two locations in the study area. The first area is along E. Broad Street between the E. Broad Street/Site Driveway and the E. Broad Street/Lawton Street intersections. The second area that is balanced is along N. Washington Street between the N. Washington Street/Park Avenue and the N. Washington Street/E. Broad Street intersections. The existing balanced peak hour traffic volumes for the intersections contained within the study area are shown in Figure 5. The existing traffic counts are contained in Appendix B.

Existing Conditions Capacity Analysis

Intersection capacity analyses were performed for the existing conditions at the study area intersections during the weekday morning and afternoon peak hours and the Saturday peak hour. Synchro 9.0 was used to analyze the study intersections with the results based on the Highway Capacity Manual (HCM 2000) methodology. The existing peak hour factors acquired from the traffic counts and restricted to within the range of 0.85 to 1.00, were used in the analysis along with the default heavy vehicle percentage of 2%. Synchro files were created based on current lane configurations and traffic signal timing information obtained from the City of Falls Church. The results of the intersection capacity analyses are presented in Table 2, and are expressed in level of service (LOS) and delay (seconds per vehicle) per lane group. The intersections, approaches, and lane groups that operate at LOS E or F are shown in red. Lane groups where the queue length exceeds storage are also shown in red. The 95th and 50th percentile queue lengths are expressed in feet. The detailed analysis worksheets are contained in Appendix D.

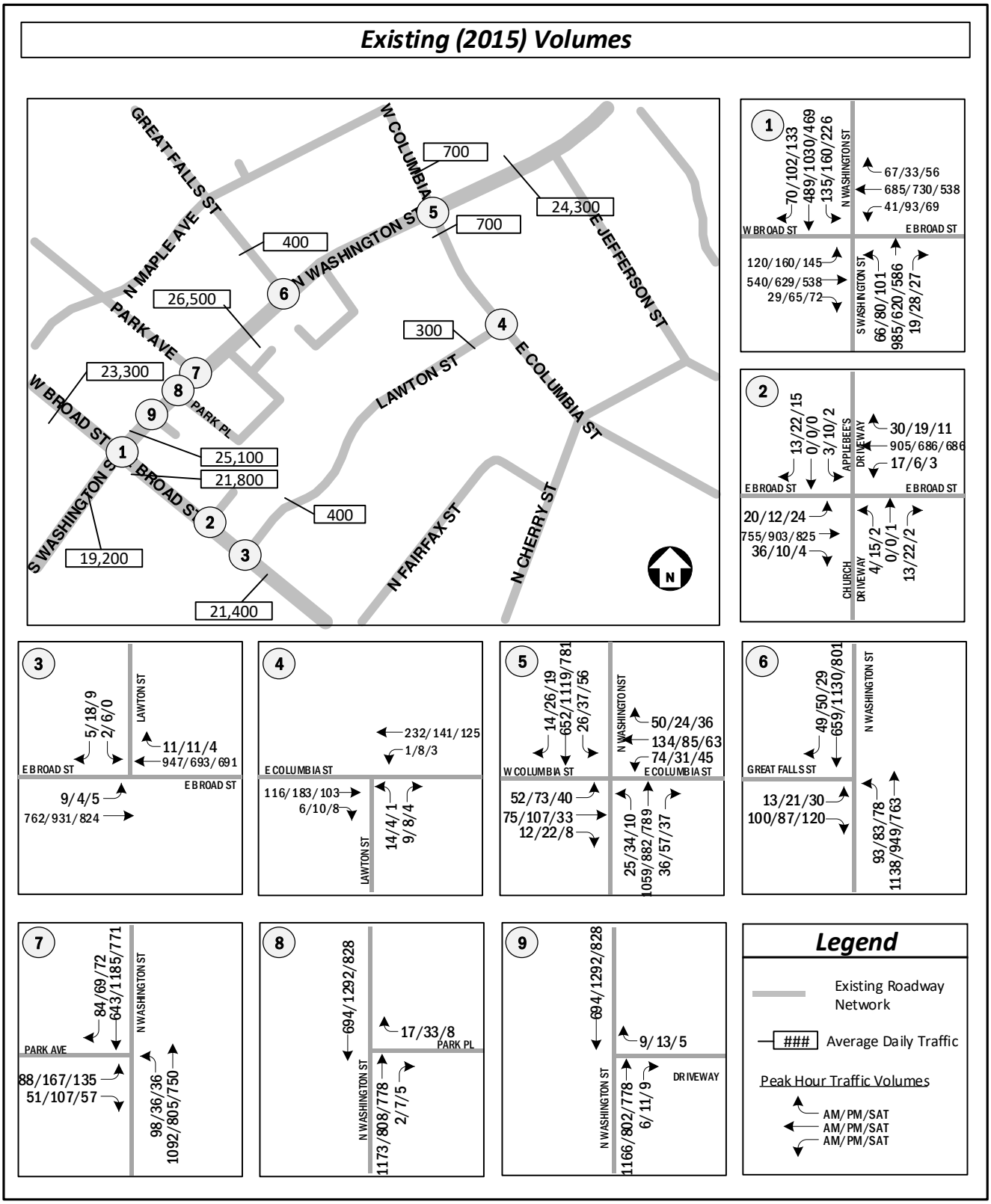


Figure 5: Existing (2015) Traffic Volumes

Table 2: Existing (2015) Intersection Capacity Analysis

No.	Intersection (Movement)	Bay/ Link Length (feet)	AM Peak				PM Peak				SAT Peak			
			50th Queue	95th Queue	LOS	Delay	50th Queue	95th Queue	LOS	Delay	50th Queue	95th Queue	LOS	Delay
1	E./W. Broad St & N./S. Washington St													
	Overall Intersection (Signalized)				**C**	**29.1**			**C**	**29.7**			**C**	**32.1**
	Eastbound Approach				*C*	*34.6*			*C*	*22.2*			*C*	*26.9*
	Eastbound Left	*275*	58	m#110	*D*	*37.0*	31	#126	*C*	*33.6*	56	125	*B*	*19.0*
	Eastbound Thru/Right	*450*	181	167	*C*	*34.2*	176	178	*B*	*19.5*	177	304	*C*	*28.7*
	Westbound Approach				*C*	*25.7*			*C*	*29.6*			*C*	*34.5*
	Westbound Left	255	8	m18	B	12.9	27	50	B	16.3	26	66	C	24.4
	Westbound Thru/Right	400	210	260	C	26.4	255	#322	C	31.2	185	323	D	35.7
	Northbound Approach				*C*	*33.7*			*C*	*33.4*			*D*	*36.6*
	Northbound Left	345	18	m47	B	19.8	37	m56	C	25.3	38	88	C	24.0
	Northbound Thru/Right	580	193	#428	C	34.6	226	291	C	34.4	192	333	D	38.6
	Southbound Approach				C	20.2			C	32.6			C	31.2
	Southbound Left	190	40	100	C	22.6	27	97	B	18.6	91	185	C	26.8
	Southbound Thru/Right	370	147	184	B	19.7	141	#506	C	34.5	178	302	C	32.8
2	E. Broad Street/Driveway													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Eastbound Approach													
	Eastbound Left	75	*n/a*	2	B	10.4	*n/a*	1	A	9.4	*n/a*	2	A	9.4
	Westbound Approach													
	Westbound Left	165	*n/a*	2	A	9.1	*n/a*	1	A	9.5	*n/a*	0	A	9.3
	Northbound Approach				*C*	*15.5*			*C*	*21.7*			*D*	*26.1*
	Northbound Left/Thru/Right	25	*n/a*	4	C	15.5	*n/a*	14	C	21.7	*n/a*	2	D	26.1
	Southbound Approach				*C*	*17.6*			*C*	*17.7*			*B*	*13.1*
	Southbound Left/Thru/Right	25	*n/a*	4	C	17.6	*n/a*	9	C	17.7	*n/a*	3	B	13.1
3	Broad Street and Lawton Street													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Eastbound Approach													
	Eastbound Left/Thru	165	*n/a*	1	A	0.5	*n/a*	0	A	0.2	*n/a*	0	A	0.2
	Southbound Approach				*B*	*14.3*			*B*	*13.9*			*B*	*10.7*
	Southbound Left/Right	1400	*n/a*	2	B	14.3	*n/a*	5	B	13.9	*n/a*	1	B	10.7
4	Lawton Street & Columbia Street													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Westbound Approach	*440*	*n/a*	*0*	*A*	*0.0*	*n/a*	*1*	*A*	*0.5*	*n/a*	*0*	*A*	*0.2*
	Northbound Approach				*B*	*10.6*			*B*	*10.2*			*A*	*9.1*
	Northbound Left/Right	1400	*n/a*	3	B	10.6	*n/a*	2	B	10.2	*n/a*	0	A	9.1
5	N Washington Street/W Columbia Street/E Columbia													
	Overall Intersection (Signalized)				**B**	**17.2**			**C**	**21.4**			**C**	**22.4**
	Eastbound Approach				*C*	*29.0*			*C*	*32.8*			*B*	*17.9*
	Eastbound Left/Thru/Right	370	69	123	C	29.0	111	184	C	32.8	27	68	B	17.9
	Westbound Approach				*C*	*34.0*			*C*	*29.3*			*B*	*19.1*
	Westbound Left/Thru/Right	485	137	221	C	34.0	70	126	C	29.3	46	107	B	19.1
	Northbound Approach				*B*	*12.1*			*B*	*16.2*			*C*	*25.6*
	Northbound Left	70	3	m8	A	8.5	7	m11	A	8.1	3	11	B	17.2
	Northbound Thru/Right	640	147	286	B	12.1	288	306	B	16.5	213	290	C	25.7
	Southbound Approach				*B*	*17.0*			*C*	*22.8*			*C*	*20.3*
	Southbound Left	125	7	18	B	14.2	10	24	B	13.0	16	35	B	14.7
	Southbound Thru/Right	475	148	196	B	17.1	335	424	C	23.1	153	265	C	20.7
6	N Washington Street/Great Falls													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Eastbound Approach				*B*	*11.4*			*C*	*15.8*			*B*	*13.5*
	Eastbound Left/Right	440	n/a	16	B	11.4	n/a	25	C	15.8	n/a	27	B	13.5
	Northbound Approach													
	Northbound Thru/Left	425	n/a	8	A	2.8	*n/a*	10	A	3.4	*n/a*	7	A	2.8
7	N Washington Street/Park Avenue													
	Overall Intersection (Signalized)				**A**	**7.2**			**A**	**7.1**			**A**	**8.9**
	Eastbound Approach				*D*	*42.7*			*D*	*39.5*			*C*	*20.1*
	Eastbound Left	360	65	104	D	42.7	104	168	D	42.4	37	87	C	20.1
	Eastbound Right	360	0	31	D	39.6	0	45	D	35.1	0	24	B	17.9
	Northbound Approach				*A*	*5.9*			*A*	*4.5*			*A*	*4.2*
	Northbound Thru/Left	370	201	463	A	5.9	52	92	A	4.5	51	97	A	4.2
	Southbound Approach				*A*	*2.6*			*A*	*1.7*			*B*	*10.7*
	Southbound Thru/Right	425	48	83	A	2.6	33	41	A	1.7	98	167	B	10.7
8	N Washington Street & Park Place													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Westbound Approach				*A*	*9.8*			*A*	*9.2*			*A*	*9.0*
	Westbound Right	315	*n/a*	2	A	9.8	*n/a*	3	A	9.2	*n/a*	1	A	9.0
9	N Washington Street & Driveway													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Westbound Approach				*A*	*9.7*			*A*	*9.1*			*A*	*9.0*
	Westbound Right	105	*n/a*	1	A	9.7	*n/a*	1	A	9.1	*n/a*	1	A	9.0

Notes: *N/A – Not Applicable*
 # – 95th percentile volume exceeds capacity, queue may be longer. Queue shown is the maximum after two cycles.
m – Volume for 95th percentile queue is metered by upstream signal.
~ – Volume exceeds capacity, queue can be longer. Queue shown is maximum after two cycles.

Consistent with the scoping agreement, it is desirable to achieve a LOS D or better for each approach of an intersection. If an acceptable level of service cannot be achieved, then it is desirable for the future with development conditions to be no worse than the network without the new development. A description of the various levels of service is included in Appendix C.

All of the study intersections' approaches currently operate at acceptable levels of service during the weekday morning, afternoon, and Saturday peak hours.

Based on the queuing analysis, peak hour queue lengths currently exceed the storage lengths in one or more of the lane groups at the following intersections during one or more of the peak periods:

- Broad Street and Washington Street (PM only)
- N. Washington Street and Park Avenue (AM only)

The results of the intersection capacity analyses for the existing conditions are shown in Figure 6.

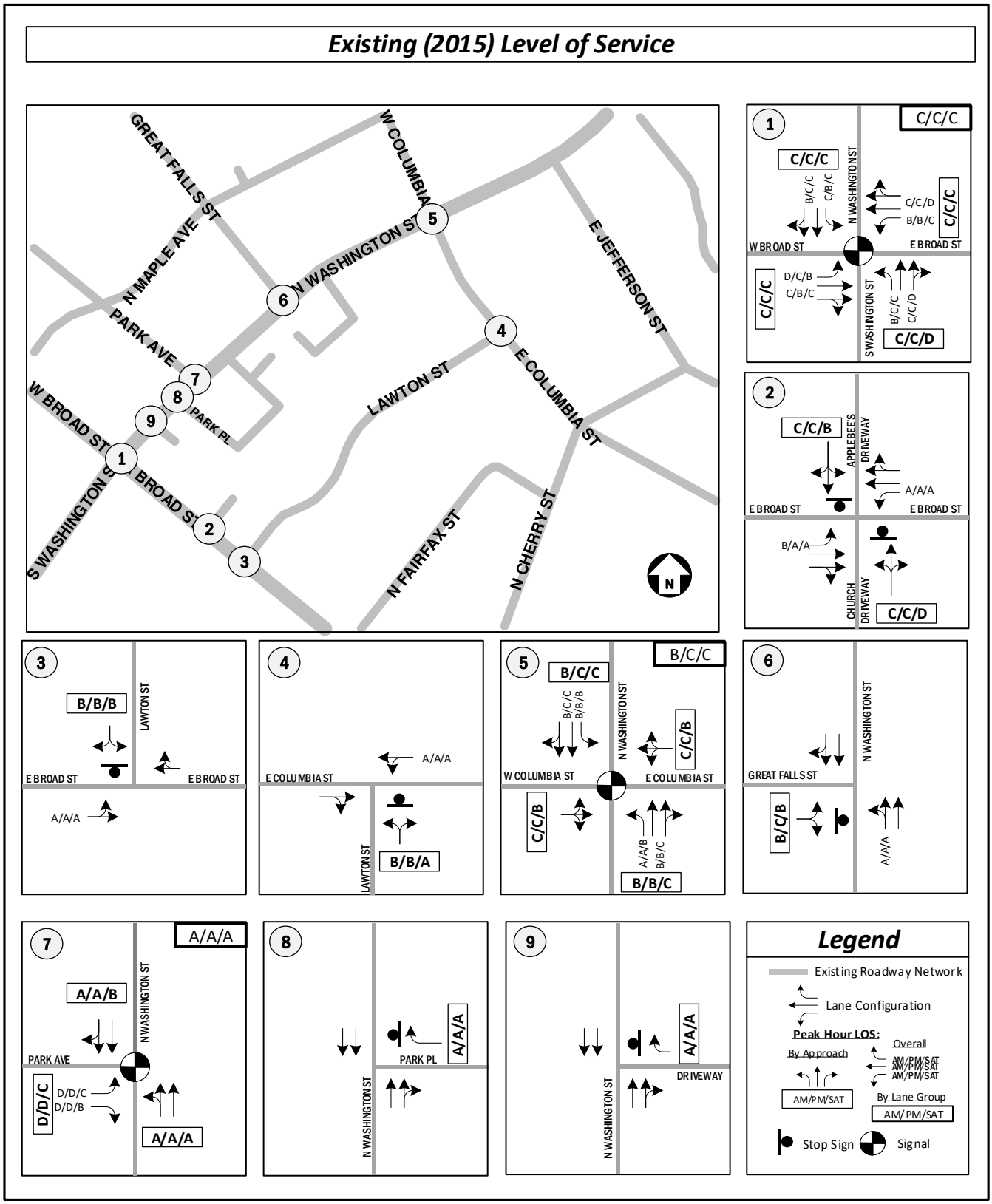


Figure 6: Existing (2015) Level of Service

FUTURE CONDITIONS WITHOUT DEVELOPMENT (2020)

Future without Development Traffic Volumes

The proposed Washington Street and Broad Street redevelopment is anticipated to be complete in 2020. Based on historic traffic counts published by VDOT, area traffic volumes have decreased steadily in recent years. Thus, no regional traffic growth was applied for future conditions.

Background developments include the 301 W. Broad Street redevelopment which is already under construction and is scheduled to be complete in 2016. This redevelopment is planned to consist of one multi-use building featuring a 60,000 square foot supermarket, 282 apartments, and 3,470 square feet of ground floor retail. The associated Traffic Impact Study, prepared by Gorove/Slade and dated January 23, 2013, the analysis was conducted assuming a 60,883 square foot supermarket, 297 apartments, and 4,011 square feet of ground floor retail. The traffic assignments from the 301. W. Broad Street study are included in all future conditions as a background development. As there are currently no road improvements being constructed at the study intersections, no changes to the lane configurations were assumed in the analysis of future scenarios. Additionally, there are no planned funded road improvements within the study area.

The volumes for Future without Development conditions are illustrated in Figure 7.

Future without Development Capacity Analysis

Intersection capacity analyses were performed for the future conditions without the proposed development at the intersections contained within the study area during the weekday morning and afternoon peak hours, as well as the Saturday peak hour. *Synchro 9.0* was used to analyze the study intersections with the results based on the Highway Capacity Manual (HCM 2000) methodology. The default peak hour factor of 0.92 has been used in the analysis. Heavy vehicle percentages, lane widths, road grades, and number of bus blockages per hour were kept the same as the existing conditions. The capacity and queuing analysis results are shown in

Table 3. The detailed analysis worksheets are contained in Appendix E.

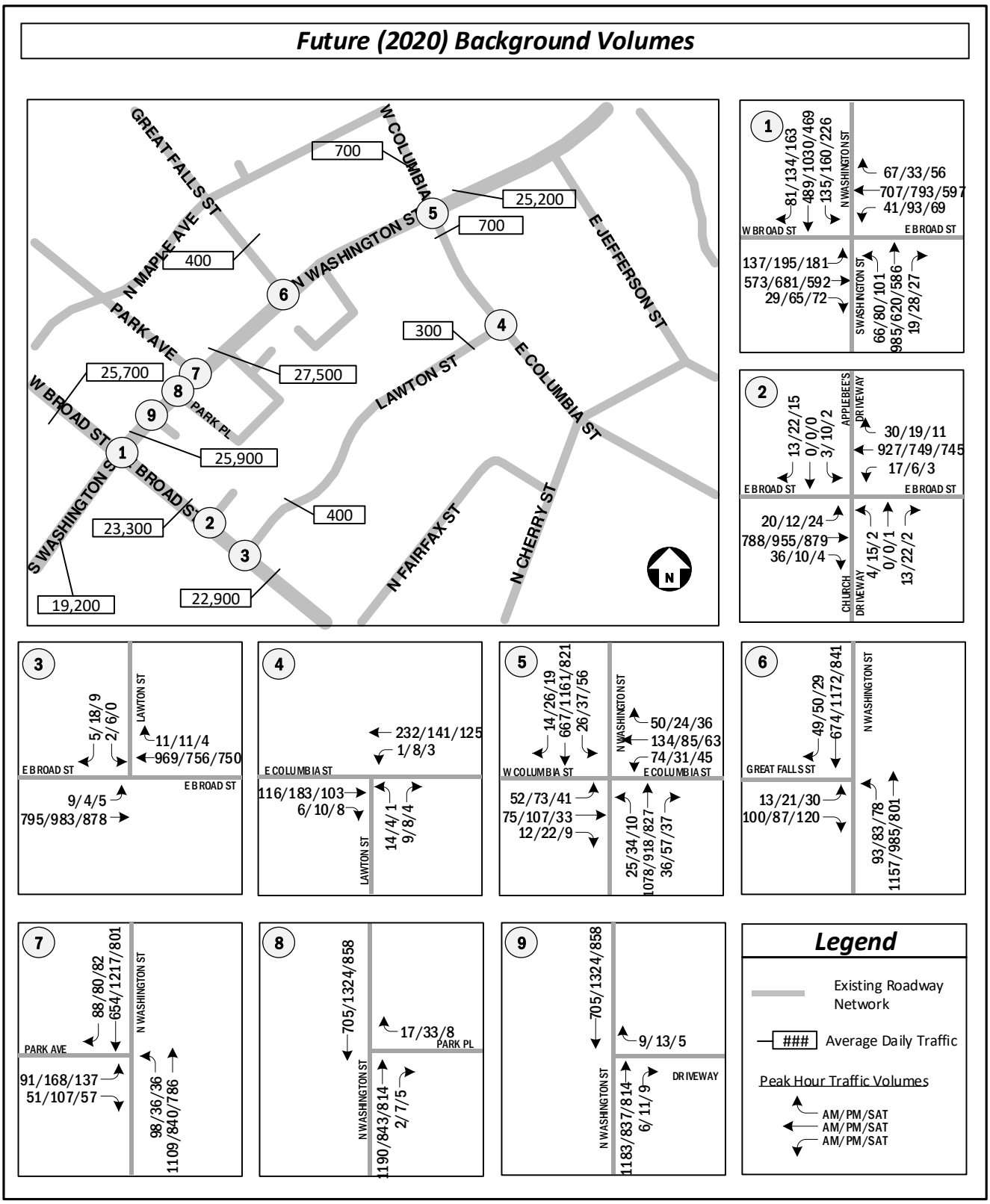


Figure 7: Future without Development (2020) Traffic Volumes

Table 3: Future without Development (2020) Intersection Capacity Analysis

No.	Intersection (Movement)	Bay/ Link Length (feet)	AM Peak				PM Peak				SAT Peak			
			50th Queue	95th Queue	LOS	Delay	50th Queue	95th Queue	LOS	Delay	50th Queue	95th Queue	LOS	Delay
1	Broad St & Washington St													
	Overall Intersection (Signalized)				**C**	**29.5**			**C**	**34.1**			**C**	**34.5**
	Eastbound Approach				*D*	*36.1*			*C*	*28.7*			*C*	*27.2*
	Eastbound Left	*275*	68	68	*D*	*42.9*	65	#213	*E*	*59.6*	76	156	*C*	*20.9*
	Eastbound Thru/Right	*450*	192	192	*C*	*34.5*	196	205	*C*	*20.6*	206	340	*C*	*28.9*
	Westbound Approach				*C*	*26.6*			*C*	*34.0*			*D*	*37.4*
	Westbound Left	255	8	8	B	13.0	27	49	B	16.8	27	67	C	25.7
	Westbound Thru/Right	400	225	225	C	27.3	282	#395	D	26.8	225	369	D	38.7
	Northbound Approach				*C*	*33.7*			*C*	*33.5*			*D*	*39.9*
	Northbound Left	345	18	18	B	19.8	37	m56	C	25.6	42	95	C	26.6
	Northbound Thru/Right	580	193	193	C	34.6	226	291	C	34.4	212	349	D	42.1
	Southbound Approach				B	19.6			D	38.3			C	34.9
	Southbound Left	190	37	37	C	21.5	30	96	B	18.6	103	198	C	30.7
	Southbound Thru/Right	370	151	151	B	19.2	169	#534	D	41.0	209	338	D	36.4
2	E. Broad Street & Driveway													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Eastbound Approach													
	Eastbound Left	75	*n/a*	2	B	10.5	*n/a*	1	A	9.7	*n/a*	3	A	9.7
	Westbound Approach													
	Westbound Left	165	*n/a*	2	A	9.2	*n/a*	1	A	9.7	*n/a*	0	A	9.5
	Northbound Approach				*C*	*16.0*			*C*	*24.1*			*D*	*28.9*
	Northbound Left/Thru/Right	25	*n/a*	4	C	16.0	*n/a*	16	C	24.1	*n/a*	2	D	28.9
	Southbound Approach				*C*	*18.1*			*C*	*19.4*			*B*	*13.7*
	Southbound Left/Thru/Right	25	*n/a*	5	C	18.1	*n/a*	10	C	19.4	*n/a*	3	B	13.7
3	Broad St & Lawton St													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Eastbound Approach													
	Eastbound Left/Thru	165	*n/a*	1	A	0.5	*n/a*	0	A	0.2	*n/a*	0	A	0.2
	Southbound Approach				*B*	*14.7*			*B*	*14.7*			*B*	*10.4*
	Southbound Left/Right	1400	*n/a*	1	B	14.7	*n/a*	5	B	14.7	*n/a*	1	B	10.4
4	Lawton St & Columbia St													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Westbound Approach	*440*	*n/a*	*0*	*A*	*0.0*	*n/a*	*1*	*A*	*0.5*	*n/a*	*0*	*A*	*0.2*
	Northbound Approach				*B*	*10.3*			*A*	*9.9*			*A*	*9.1*
	Northbound Left/Right	1400	*n/a*	3	B	10.3	*n/a*	1	A	9.9	*n/a*	0	A	9.1
5	N Washington St & Columbia Street													
	Overall Intersection (Signalized)				**B**	**16.3**			**C**	**22.0**			**C**	**22.7**
	Eastbound Approach				*C*	*29.0*			*C*	*32.8*			*B*	*18.6*
	Eastbound Left/Thru/Right	370	69	123	C	29.0	111	184	C	32.8	29	71	B	18.6
	Westbound Approach				*C*	*34.0*			*C*	*29.3*			*B*	*19.8*
	Westbound Left/Thru/Right	485	137	221	C	34.0	70	126	C	29.3	49	110	B	19.8
	Northbound Approach				*B*	*10.3*			*B*	*16.7*			*C*	*25.9*
	Northbound Left	70	3	m7	A	6.4	7	m12	A	9.2	3	11	B	17.0
	Northbound Thru/Right	640	136	240	B	10.4	292	331	B	17.0	226	305	C	26.0
	Southbound Approach				*B*	*17.1*			*C*	*23.7*			*C*	*20.5*
	Southbound Left	125	7	18	B	14.3	10	24	B	13.3	16	35	B	14.8
	Southbound Thru/Right	475	153	202	B	17.2	356	448	C	24.0	163	281	C	20.9
6	N Washington Str & Great Falls St													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Eastbound Approach				*B*	*11.7*			*C*	*16.2*			*B*	*13.6*
	Eastbound Left/Right	*440*	*n/a*	*16*	*B*	*11.7*	*n/a*	*26*	*C*	*16.2*	*n/a*	*27*	*B*	*13.6*
	Northbound Approach													
	Northbound Thru/Left	425	*n/a*	8	A	2.8	*n/a*	10	A	3.4	*n/a*	7	A	2.8
7	N Washington St & Park Ave													
	Overall Intersection (Signalized)				**A**	**6.2**			**A**	**7.2**			**A**	**9.0**
	Eastbound Approach				*D*	*48.4*			*D*	*39.6*			*C*	*20.4*
	Eastbound Left	360	61	108	D	48.4	105	169	D	42.4	38	90	C	20.4
	Eastbound Right	360	0	34	D	41.1	0	45	D	35.1	0	25	B	18.0
	Northbound Approach				*A*	*4.1*			*A*	*5.0*			*A*	*4.3*
	Northbound Thru/Left	370	175	m111	A	4.1	70	m104	A	5.0	55	104	A	4.3
	Southbound Approach				*A*	*2.2*			*A*	*1.8*			*B*	*11.0*
	Southbound Thru/Right	425	42	87	A	2.2	33	41	A	1.8	105	178	B	11.0

No.	Intersection (Movement)	Bay/ Link Length (feet)	AM Peak				PM Peak				SAT Peak			
			50th Queue	95th Queue	LOS	Delay	50th Queue	95th Queue	LOS	Delay	50th Queue	95th Queue	LOS	Delay
8	N Washington St & Park Pl													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Westbound Approach				*A*	*9.8*			*A*	*9.2*			*A*	*9.0*
	Westbound Right	315	*n/a*	2	A	9.8	*n/a*	3	A	9.2	*n/a*	1	A	9.0
9	N Washington St & Driveway													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Westbound Approach				*A*	*9.7*			*A*	*9.1*			*A*	*9.0*
	Westbound Right	105	*n/a*	1	A	9.7	*n/a*	1	A	9.1	*n/a*	0	A	9.0

Notes: *N/A – Not Applicable*
 # – 95th percentile volume exceeds capacity, queue may be longer. Queue shown is the maximum after two cycles.
m – Volume for 95th percentile queue is metered by upstream signal.
~ – Volume exceeds capacity, queue can be longer. Queue shown is maximum after two cycles.

Most of the study intersections' approaches will continue to operate at acceptable levels of service during the weekday morning, weekday afternoon, and Saturday peak hours. The eastbound left movement at the Broad Street/Washington Street intersection would operate at LOS E conditions during the PM peak hours.

Based on the queuing analysis, peak hour queue lengths will continue to exceed the storage length in one or more of the lane groups at the following intersection during one or more of the peak periods:

- Broad Street and Washington Street (PM and Saturday)

The minimal improvements that occurred in the delay results at some of the study intersections' approaches and lane groups, when compared to the delay results of the existing conditions, are attributed to the use of existing peak hour factors (by approach) in the existing conditions; whereas the default peak hour factor of 0.92 was used in both future scenarios. The use of the peak hour factor in this way was agreed upon in the scoping document and is standard industry practice.

The results of the intersection capacity analyses for the future without development conditions are shown in Figure 8.

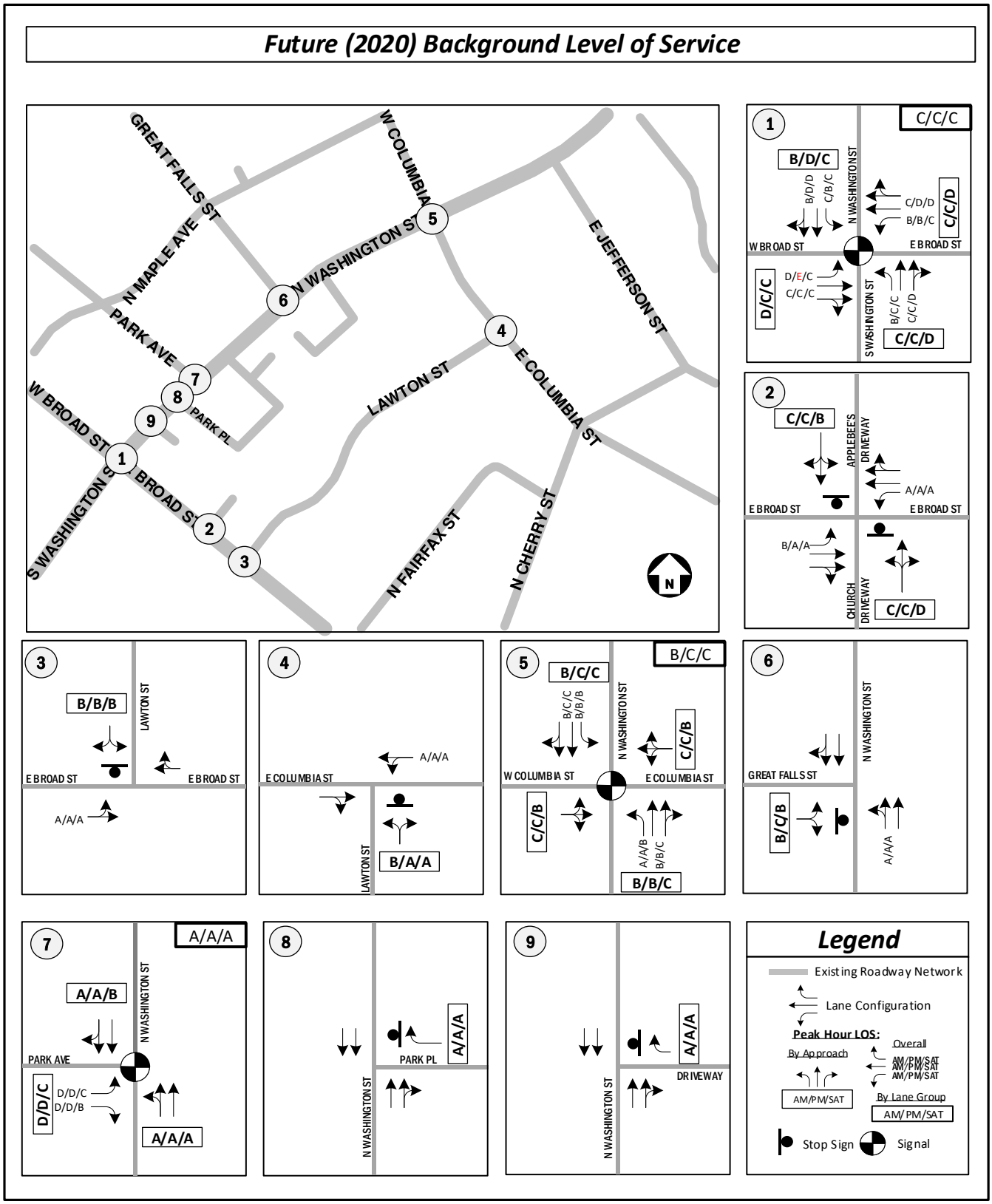


Figure 8: Future without Development (2020) Level of Service

TRIP GENERATION

In order to calculate the trip generation for the proposed redevelopment, the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 9th Edition was used to determine the trips into and out of the Broad & Washington site for the weekday morning, afternoon, and Saturday peak hours, as well as the typical weekday daily and Saturday (24-hour) trips to the site. To account for the synergy between the residential and retail land uses, a 5%, 10%, 15%, 10% internal capture reduction was applied to the weekday AM, PM, Daily, and Saturday site generated trips, respectively, as allowed per VDOT Chapter 870 guidelines. This reduction was calculated based on the site's residential trips, rather than the retail, because it is lesser trip generator of the two land uses. As agreed upon at the scoping meeting with City of Falls Church staff and as allowed per VDOT Chapter 870 guidelines, 36% of the new retail trips generated were assumed to be pass-by trips in order to recognize drivers already on the adjacent streets that will enter from the existing stream of traffic, and then continue in their original path after exiting the site. This rate represents the average pass-by trip percentage for the supermarket land use according to the ITE Trip Generation Manual, 9th Edition. The proposed Broad & Washington redevelopment's trip generation is shown in Table 5.

Table 4: Site Trip Generation

Land Use	ITE Code	Size	Weekday							Saturday			
			AM Peak Hour			PM Peak Hour			Daily	SAT Peak Hour			Daily
			In	*Out*	*Total*	*In*	*Out*	*Total*	*Total*	*In*	*Out*	*Total*	*Total*
Proposed Retail													
High Turnover Sit Down Restaurant	932	6.0 kSF	36	29	65	35	24	59	763	45	39	84	950
Specialty retail	826	15.3 kSF	92	99	191	26	32	58	692	134	124	258	643
Subtotal (Retail without reductions)			*128*	*128*	*256*	*61*	*56*	*117*	*1,455*	*179*	*163*	*342*	*1,593*
Internal Trips Reduction (Retail)			*-6*	*-2*	*-8*	*-5*	*-10*	*-15*	*-233*	*-6*	*-6*	*-11*	*-252*
Subtotal (Retail with internal reduction)			*122*	*127*	*248*	*56*	*46*	*102*	*1,222*	*173*	*157*	*331*	*1,341*
Transit/Walk Reduction - 2% (Retail Only)			*-2*	*-3*	*-5*	*-1*	*-1*	*-2*	*-24*	*-3*	*-3*	*-7*	*-27*
Subtotal (w/ Transit/Walk Reduction)			*120*	*124*	*243*	*55*	*46*	*100*	*1,198*	*170*	*154*	*324*	*1,314*
Pass by Trips Reduction - 36% (Retail Only)			*-43*	*-45*	*-88*	*-20*	*-16*	*-36*	*-431*	*-61*	*-56*	*-117*	*-473*
Existing Restaurant to be removed	*932*	*4.3 kSF*	*-25*	*-21*	*-46*	*-25*	*-17*	*-42*	*-541*	*-32*	*-28*	*-60*	*-674*
Existing Retail to be removed	*826*	*11.4 kSF*	*-83*	*-89*	*-172*	*-22*	*-27*	*-49*	*-526*	*-111*	*-102*	*-213*	*-480*
Total Proposed New External Retail Trips			*-32*	*-31*	*-62*	*-12*	*-15*	*-27*	*-301*	*-34*	*-31*	*-66*	*-313*
Proposed Entertainment													
Live Theater	441	5.0 kSF	0	0	0	50	50	100	1,000	50	50	100	1,000
Internal Trips Reduction (Theater)			*0*	*0*	*0*	*-1*	*-2*	*-4*	*-58*	*-1*	*-1*	*-3*	*-63*
Subtotal (Theater with internal reduction)			*0*	*0*	*0*	*49*	*48*	*96*	*942*	*49*	*49*	*97*	*937*
Transit/Walk Reduction - 2% (Theater Only)			*0*	*0*	*0*	*-1*	*-1*	*-2*	*-19*	*-1*	*-1*	*-2*	*-19*
Subtotal (w/ Transit/Walk Reduction)			*0*	*0*	*0*	*48*	*47*	*94*	*923*	*48*	*48*	*95*	*918*
Total Proposed New External Entertainment Trips			*0*	*0*	*0*	*48*	*47*	*94*	*923*	*48*	*48*	*95*	*918*
Proposed Residential													
Apartment	220	300 DU	30	121	151	119	64	183	1,942	71	71	142	2,099
Internal Trips Reduction (Residential) 5% (AM), 10% (PM & SAT), 15% (Weekday/Weekend Daily)		-	-2	-6	-8	-12	-6	-18	-291	-7	-7	-14	-315
Subtotal (Residential with internal reduction)			*29*	*115*	*143*	*107*	*58*	*165*	*1,651*	*64*	*64*	*128*	*1,784*
Transit Reduction - 10% (Residential Only)			*-3*	*-11*	*-14*	*-11*	*-6*	*-16*	*-165*	*-6*	*-6*	*-13*	*-178*
Subtotal (w/ Transit Reduction)			*26*	*103*	*129*	*96*	*52*	*148*	*1,486*	*58*	*58*	*115*	*1,606*
Total Residential Trips			*26*	*103*	*129*	*96*	*52*	*148*	*1,486*	*58*	*58*	*115*	*1,606*
Proposed Office													
Office	710	66.7 kSF	122	17	139	26	127	153	966	16	13	29	167
Transit/Walk Reduction - 2% (Office Only)			*-2*	*0*	*-3*	*-1*	*-3*	*-3*	*-19*	*0*	*0*	*-1*	*-3*
Subtotal (w/ Transit/Walk Reduction)			*120*	*17*	*136*	*25*	*124*	*150*	*947*	*16*	*13*	*28*	*164*
Office to be removed	*710*	*20.9 kSF*	*-48*	*-7*	*-55*	*-17*	*-85*	*-102*	*-400*	*-5*	*-4*	*-9*	*-74*
Total Office Trips			*72*	*10*	*81*	*8*	*39*	*48*	*547*	*11*	*9*	*19*	*90*
Proposed Site Trips without Reductions			***280***	***266***	***546***	***256***	***297***	***553***	***5,363***	***316***	***297***	***613***	***4,859***
Proposed Site Trips with Reductions			***66***	***82***	***148***	***141***	***123***	***264***	***2,655***	***82***	***83***	***164***	***2,301***

In the context of the trip generation table and discussion, "reductions" refer to deductions from the numbers of vehicle trips generated by a use due to the use of another mode or sharing of trip purpose. The reduction is relative to the raw numbers of trips published by ITE, rather than reflecting the removal of trips currently on the road network. The ITE trip rates represent the number of vehicles expected to enter and exit a site in a location with high auto availability and few travel mode choices and are appropriately modified in environments like the City of Falls Church.

The trips currently associated with the partially-occupied site uses were then removed from the trip generation to account for the demolition of the existing buildings. Given the suburban nature of the buildings with surface parking lots, no reductions for transit use or internal capture, beyond those inherent in the ITE data, were applied. Thus, the proposed redevelopment will generate approximately 148 new external trips during the weekday morning peak hour, 264 new external trips during the weekday afternoon peak hour, 164 new external trips during the Saturday peak hour, and 2,655 new external weekday daily trips.

VDOT Mixed-Use Trip Generation Model

The results of the ITE trip generation analysis were compared with the VDOT Mixed-Use Trip Generation Model to evaluate the similarities and differences in the resulting trip generation. The model was developed for the San Diego Association of Governments (SANDAG) based on data collected at existing "smart growth" sites. Parameters included in the computation of internal and non-auto trip reductions include population, network connectivity, employment, and land area. While the model computes a larger share of non-auto trips than utilized in the ITE calculations above, no breakdown by lane use or trip direction (inbound vs. outbound) is provided. Additionally, the number of land use categories is limited in the Mixed-Use Trip Generation Model and leads to an overestimation of the retail trips in this case. No trip generation for the theater use is provided, so it was included with the retail. It is unclear whether simply modifying the "raw" trip estimates would lead to an accurate representation of the interaction of the land uses, as the underlying computations are not available to the user of the model.

The resulting trip reduction estimates from the model are shown in Table 5, without the adjustments for existing uses to be removed. Accounting for the existing trips, the model would yield 19 AM peak hour trips, 226 PM peak hour trips, and 2,539 daily trips; no estimates for Saturday are computed. These figures represent 87% fewer AM peak hour trips, 14% fewer PM peak hour trips, and 4% fewer daily trips than the net trips in Table 4. Thus, the ITE trip estimates with reductions consistent with VDOT guidelines are within the range of trips estimated by the Mixed-Use Trip Generation Model for two of the time periods. Due to the more complete information provided by the ITE calculations, that methodology was used to derive the site traffic assignments and future with development traffic forecasts.

Table 5: Mixed-Use Trip Generation Model Results

	Daily				AM Peak Hour				PM Peak Hour			
	HBW	HBO	NHB	Total	HBW	HBO	NHB	Total	HBW	HBO	NHB	Total
Number of "Raw" ITE Trips Subject to Model	1673	2952	1465	6090	238	156	22	416	223	244	155	622
Predicted Probabilities:												
Internal Capture	4.32%	3.51%	6.44%	4.44%	4.32%	3.51%	6.44%	4.13%	4.32%	3.51%	6.44%	4.53%
Walking External	2.96%	37.53%	29.47%	26.12%	2.96%	37.53%	29.47%	17.39%	2.96%	37.53%	29.47%	23.13%
Transit External	15.65%	0.84%	1.37%	5.04%	15.65%	0.84%	1.37%	9.31%	15.65%	0.84%	1.37%	6.30%
Number of Trips:												
Internal Capture	72	104	94	270	10	5	1	17	10	9	10	28
Walking External	47	1069	404	1520	7	57	6	69	6	88	43	137
Transit External	250	24	19	293	36	1	0	37	33	2	2	37
Net Number of IXXI Vehicle Trips	**1303**	**1755**	**948**	**4006**	**185**	**93**	**14**	**292**	**174**	**145**	**100**	**419**

	External Vehicle Trips			VMT		
Results	Raw	Net	Reduction %	Raw	Net	Reduction %
Daily	6,090	4,006	34%	25,464	17,459	31%
AM Peak Hour	416	292	30%	2,122	1,553	27%
PM Peak Hour	622	419	33%	2,766	1,944	30%

SITE TRAFFIC DISTRIBUTION AND ASSIGNMENT

Site Access

Vehicular access to the subject property is currently provided via:

- Three driveways along E. Broad Street
- Two driveways along Park Place
- One driveway on N. Washington Street (about 140 feet south of Park Place)

Access to the proposed development will be consolidated to the following:

- One full movement driveway along E. Broad Street (current Applebee's driveway location)
- One limited access driveway on N. Washington Street (current location-about 140 feet south of Park Place)

Distribution and Assignment

The distribution of site trips was based on previous studies performed in the area, existing traffic patterns, the City's TDM plan and the nature of the proposed development. Trips generated from the site were assigned based on the abovementioned factors. The inbound and outbound trips calculated for the weekday morning, afternoon, and Saturday peak hours were routed through the roadway network to the site. The site direction of approach and trip distribution for the weekday and Saturday peak hours is illustrated in Figure 9. The site traffic assignment for the weekday and Saturday peak hours is illustrated in Figure 10. The trip assignments for each of the site land uses, as well as the pass-by trips, are included in Appendix F.

Direction of Approach

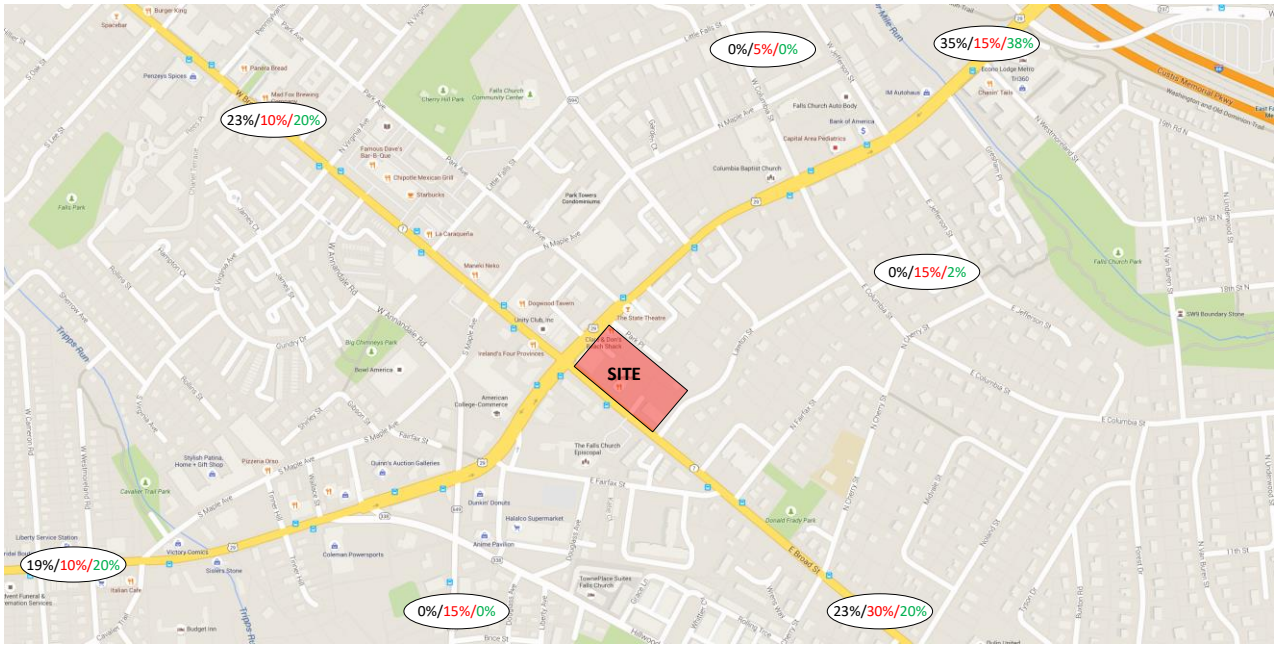


Figure 9: Directions of Approach

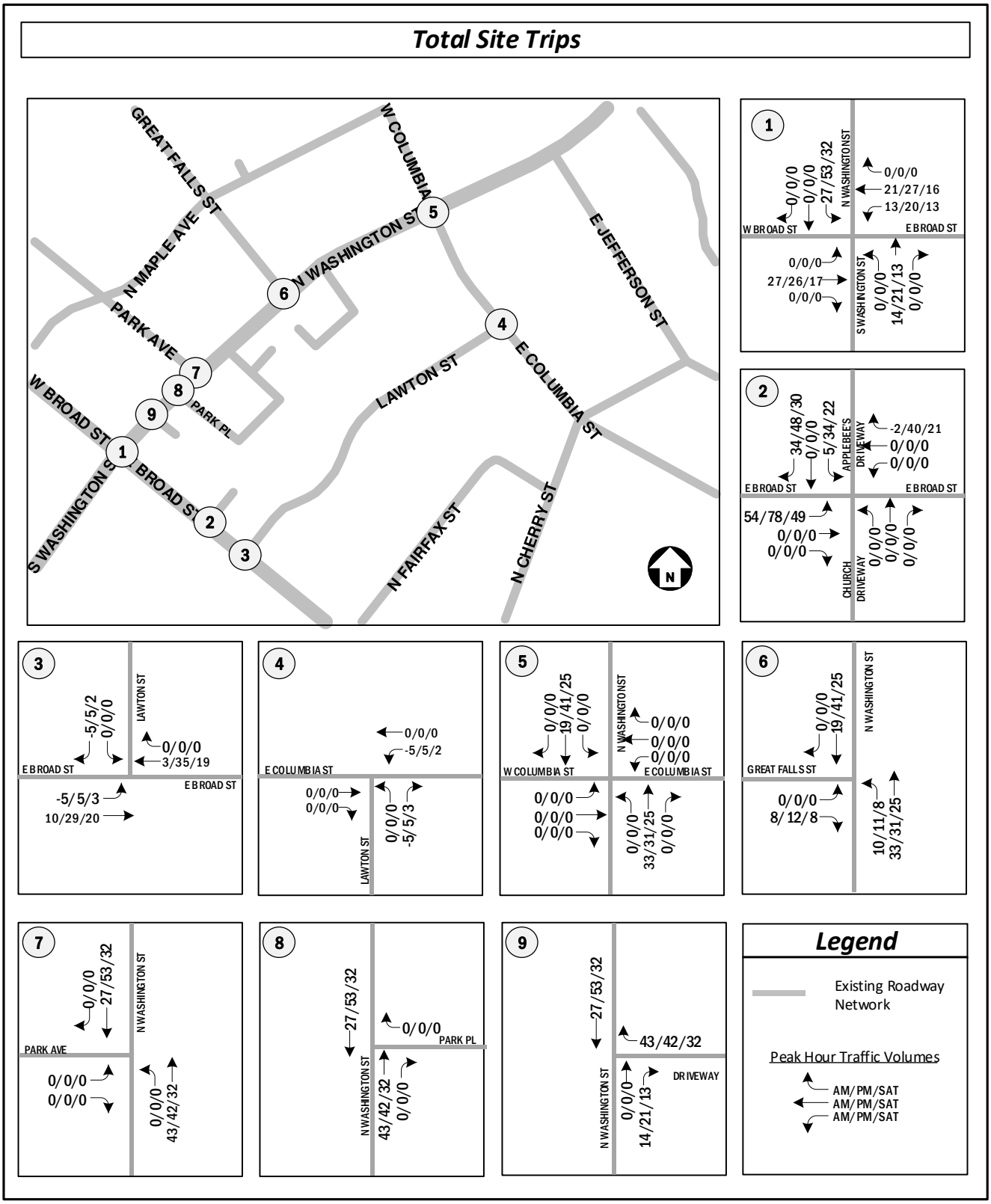


Figure 10: Site Generated Trips

FUTURE CONDITIONS WITH DEVELOPMENT (2020)

Future with Development Traffic Volumes

The proposed site generated development traffic volumes were added to the future without development traffic volumes to forecast the 2020 future with development conditions. The traffic volumes for the future with development traffic conditions are shown in Figure 11.

Future with Development Capacity Analysis

Intersection capacity analyses were performed for the future conditions with the proposed development at the intersections contained within the study area during the weekday morning and afternoon peak hours, as well as the Saturday peak hour. *Synchro 9.0* was used to analyze the study intersections with results based on the Highway Capacity Manual (HCM 2000) methodology. The default peak hour factor of 0.92 has been used in the analysis. Heavy vehicle percentages, lane widths, road grades, and number of bus blockages per hour were kept the same as the existing conditions. The capacity and queuing analysis results are presented in Table 6 and shown in Figure 12. The detailed analysis worksheets are contained in Appendix G.

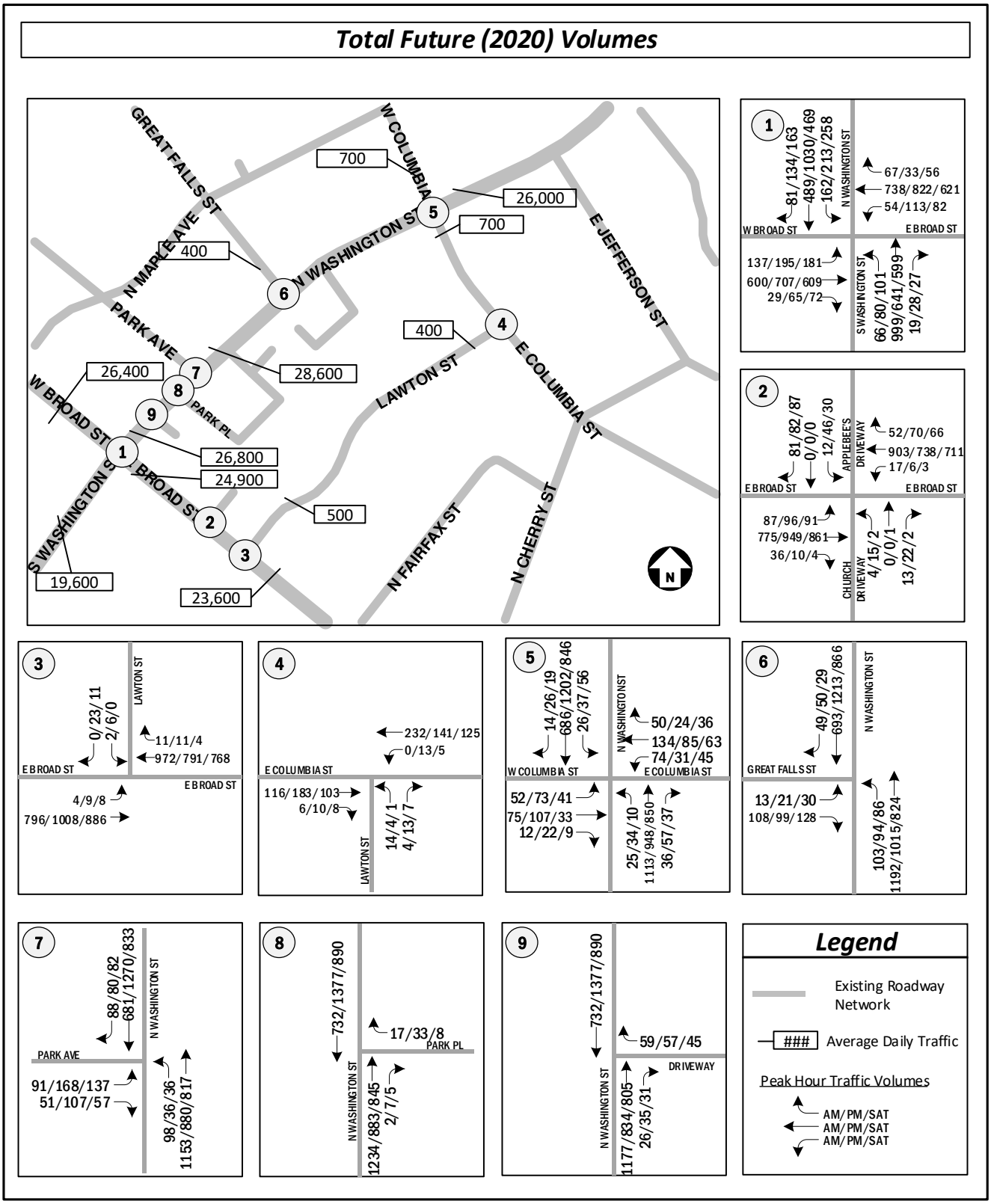


Figure 11: Future with Development (2020) Traffic Volumes

Table 6: Future with Development (2020) Intersection Capacity Analysis

No.	Intersection (Movement)	Bay/ Link Length (feet)	AM Peak 50th Queue	AM Peak 95th Queue	AM Peak LOS	AM Peak Delay	PM Peak 50th Queue	PM Peak 95th Queue	PM Peak LOS	PM Peak Delay	SAT Peak 50th Queue	SAT Peak 95th Queue	SAT Peak LOS	SAT Peak Delay
1	E./W. Broad St & N./S. Washington St													
	Overall Intersection (Signalized)				**C**	**31.3**			**D**	**36.2**			**D**	**36.4**
	Eastbound Approach				*D*	*38.2*			*C*	*30.4*			*C*	*31.1*
	Eastbound Left	*275*	*69*	*m#129*	*D*	*49.8*	*62*	*#210*	*E*	*60.6*	*81*	*159*	*C*	*23.5*
	Eastbound Thru/Right	*450*	*201*	*182*	*D*	*35.6*	*207*	*223*	*C*	*22.8*	*227*	*357*	*C*	*33.1*
	Westbound Approach				*C*	*29.0*			*D*	*37.3*			*D*	*40.7*
	Westbound Left	255	12	m26	B	13.7	34	64	B	19.8	34	78	C	26.2
	Westbound Thru/Right	400	257	302	C	30.0	295	#418	D	39.6	249	389	D	42.4
	Northbound Approach				*D*	*36.5*			*D*	*35.6*			*D*	*40.6*
	Northbound Left	345	18	m47	B	20.0	37	m56	C	25.8	44	96	C	26.9
	Northbound Thru/Right	580	195	#440	D	36.5	244	300	D	36.8	231	363	D	42.8
	Southbound Approach				C	20.6			D	39.7			C	34.5
	Southbound Left	190	52	#135	C	26.9	74	151	C	32.9	125	#273	C	33.6
	Southbound Thru/Right	370	150	182	B	18.8	200	#535	D	40.9	215	345	C	34.9
2	E. Broad Street/Driveway													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Eastbound Approach													
	Eastbound Left	75	*n/a*	12	B	11.2	*n/a*	12	B	12.5	*n/a*	11	B	10.3
	Westbound Approach													
	Westbound Left	165	*n/a*	2	A	9.1	*n/a*	1	A	9.6	*n/a*	0	A	9.3
	Northbound Approach				*C*	*22.9*			*E*	*48.8*			*E*	*43.9*
	Northbound Left/Thru/Right	25	*n/a*	7	C	22.9	*n/a*	33	E	48.8	*n/a*	4	E	43.9
	Southbound Approach				*C*	*24.8*			*F*	*70.4*			*D*	*31.5*
	Southbound Left/Thru/Right	25	*n/a*	38	C	24.8	*n/a*	126	F	70.4	*n/a*	63	D	31.5
	Overall Mitigation: Add a Traffic Signal													
	Overall Intersection (Signalized)				**A**	**3.6**			**A**	**7.1**			**A**	**5.3**
	Eastbound Approach				*A*	*1.8*			*A*	*6.4*			*A*	*4.5*
	Eastbound Left	75	*10*	m19	A	2.4	16	m39	A	7.1	*9*	33	A	4.2
	Eastbound Thru/Right	400	*50*	m63	A	1.7	86	167	A	6.3	*53*	100	A	4.6
	Westbound Approach				*A*	*0.5*			*A*	*2.5*			*A*	*4.4*
	Westbound Left	165	*0*	m0	A	0.3	0	m1	A	1.5	*0*	3	A	3.3
	Westbound Thru/Right	165	*2*	5	A	0.5	19	23	A	2.5	*44*	86	A	4.4
	Northbound Approach				*D*	*44.0*			*C*	*32.6*			*B*	*15.9*
	Northbound Left/Thru/Right	25	*0*	12	D	44.0	4	32	C	32.6	*1*	7	B	15.9
	Southbound Approach				*D*	*45.4*			*C*	*34.2*			*B*	*16.9*
	Southbound Left/Thru/Right	25	*8*	56	D	45.4	32	87	C	34.2	*6*	44	B	16.9
3	Broad Street and Lawton Street													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Eastbound Approach													
	Eastbound Left/Thru	165	*n/a*	0	A	0.2	*n/a*	1	A	0.4	*n/a*	1	A	0.4
	Southbound Approach				*C*	*19.0*			*B*	*14.8*			*B*	*10.5*
	Southbound Left/Right	1400	*n/a*	1	C	19.0	*n/a*	6	B	14.8	*n/a*	1	B	10.5
4	Lawton Street & Columbia Street													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Westbound Approach	*440*	*n/a*	*0*	*A*	*0.0*	*n/a*	*1*	*A*	*0.7*	*n/a*	*0*	*A*	*0.3*
	Northbound Approach				*B*	*10.6*			*A*	*9.9*			*A*	*9.0*
	Northbound Left/Right	1400	*n/a*	2	B	10.6	*n/a*	2	A	9.9	*n/a*	1	A	9.0
5	N Washington Street/W Columbia Street/E Columbia Street													
	Overall Intersection (Signalized)				**B**	**16.8**			**C**	**22.4**			**C**	**23.0**
	Eastbound Approach				*C*	*29.0*			*C*	*32.8*			*B*	*18.8*
	Eastbound Left/Thru/Right	370	69	123	C	29.0	111	184	C	32.8	29	72	B	18.8
	Westbound Approach				*C*	*34.0*			*C*	*29.3*			*C*	*20.0*
	Westbound Left/Thru/Right	485	137	221	C	34.0	70	126	C	29.3	50	112	C	20.0
	Northbound Approach				*B*	*11.2*			*B*	*16.9*			*C*	*26.3*
	Northbound Left	70	3	m7	A	7.1	6	m14	B	10.2	3	11	B	17.0
	Northbound Thru/Right	640	135	277	B	11.3	300	351	B	17.1	235	315	C	26.4
	Southbound Approach				*B*	*17.3*			*C*	*24.6*			*C*	*20.7*
	Southbound Left	125	7	18	B	14.7	10	24	B	13.5	16	34	B	15.0
	Southbound Thru/Right	475	158	208	B	17.4	376	473	C	25.0	170	292	C	21.1
6	N Washington Street/Great Falls Street													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Eastbound Approach				*B*	*11.7*			*C*	*16.8*			*B*	*13.7*
	Eastbound Left/Right	*440*	*n/a*	*18*	*B*	*11.7*	*n/a*	*30*	*C*	*16.8*	*n/a*	*29*	*B*	*13.7*
	Northbound Approach													
	Northbound Thru/Left	425	*n/a*	10	A	3.0	*n/a*	12	A	3.9	*n/a*	8	A	3.1

No.	Intersection (Movement)	Bay/ Link Length (feet)	AM Peak				PM Peak				SAT Peak			
			50th Queue	95th Queue	LOS	Delay	50th Queue	95th Queue	LOS	Delay	50th Queue	95th Queue	LOS	Delay
7	N Washington Street/Park Avenue													
	Overall Intersection (Signalized)				**A**	**6.4**			**A**	**7.1**			**A**	**9.2**
	Eastbound Approach				*D*	*48.4*			*D*	*39.6*			*C*	*20.6*
	Eastbound Left	360	61	108	D	48.4	105	169	D	42.4	38	92	C	21.6
	Eastbound Right	360	0	34	D	41.1	0	45	D	35.1	0	25	B	18.2
	Northbound Approach				*A*	*4.4*			*A*	*5.2*			*A*	*4.3*
	Northbound Thru/Left	370	136	m117	A	4.4	73	m117	A	5.2	58	111	A	4.3
	Southbound Approach				*A*	*2.4*			*A*	*1.8*			*B*	*11.3*
	Southbound Thru/Right	425	44	98	A	2.4	34	43	A	1.8	111	188	B	11.3
8	N Washington Street & Park Place													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Westbound Approach				*A*	*9.8*			*A*	*9.2*			*A*	*9.0*
	Westbound Right	315	*n/a*	2	A	9.8	*n/a*	3	A	9.2	*n/a*	1	A	9.0
9	N Washington Street & Driveway													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Westbound Approach				*B*	*10.1*			*A*	*9.3*			*A*	*9.3*
	Westbound Right	105	n/a	6	B	10.1	n/a	5	A	9.3	n/a	4	A	9.3

Notes: *N/A – Not Applicable*
 # – 95th percentile volume exceeds capacity, queue may be longer. Queue shown is the maximum after two cycles.
m – Volume for 95th percentile queue is metered by upstream signal.
~ – Volume exceeds capacity, queue can be longer. Queue shown is maximum after two cycles.

As mentioned previously, it is desirable to achieve a LOS D or better per approach. Similar to the existing and future without development conditions, most of the study intersections' approaches will continue to operate at acceptable levels of service during the weekday morning, afternoon, and Saturday peak hours. The eastbound thru/right movement at the Broad Street and Washington Street intersection would continue to operate at LOS E conditions during the PM peak hours. The side-street approaches at the site driveway on E. Broad Street will operate at LOS E and F conditions during the PM and Saturday peak hours.

Based on the queuing analysis, peak hour queue lengths will continue to exceed the storage length in one or more of the lane groups at the following intersections during one or more of the peak periods:

- Broad Street and Washington Street (PM and Saturday)
- E. Broad Street and Site Driveway (AM, PM and Saturday)

As part of mitigations, installation of a traffic control signal is proposed at the intersection of the site driveway along E. Broad Street. With the addition of a traffic signal at the site driveway and E. Broad Street, the side streets of the intersection operate at acceptable levels of service.

In summary, some approach delays at signalized intersections, and some stop-controlled side-street delays, will occur within the study area with or without the proposed Broad & Washington redevelopment. These conditions are consistent with an urban street network, particularly one with existing development that frames the streets and constrains the right-of-way. Traffic moving through the street grid "pulses" between closely spaced traffic signals, providing mobility for non-motorized travel as well as transit and private automobile traffic.

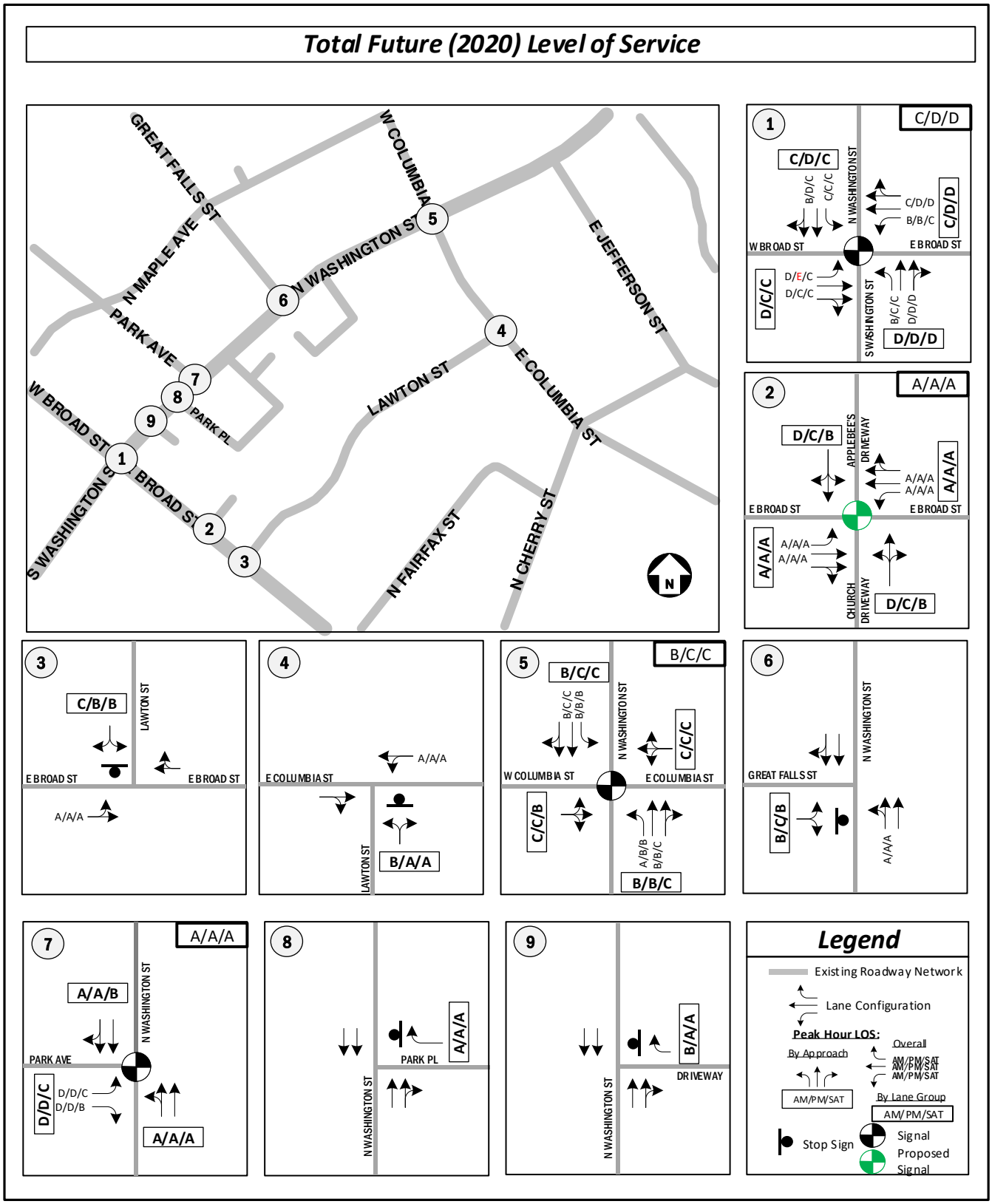


Figure 12: Future With Development (2020) Levels of Service

ADDITIONAL SCENARIO

In order to identify mitigation measures to improve traffic operations at the adjacent intersections, an additional scenario was analyzed. This scenario includes removing the median break along the intersection of N. Washington Street and Park Place and converting it to a full movement signalized intersection. As the intersections of Park Place and Park Avenue along Washington Street are closely spaced (approximately 100 feet center to center), the proposed signal at Park Avenue would be clustered with the existing signal at Park Place for optimal traffic operations.

Rerouting of Traffic Volumes

Under the additional scenario, it is assumed that the intersection of N. Washington Street and Park Place would operate as a full movement intersection. This change in the lane configuration would result in change in the traffic volumes in the network. Based on engineering judgment, it is anticipated that approximately one-third of the westbound right turning traffic volumes at the intersection of N. Washington Street and Park Place would now turn left and continue south along Washington Street to turn right onto W. Broad Street at the intersection of E./W. Broad Street and N. Washington Street. Since Park Place would be accessible from the north, it is anticipated that additional vehicles may use the intersection at N. Washington Street. To be conservative, an additional traffic volume of 2 vehicles was added to the southbound left and to the westbound left turning traffic volumes for each of the three peak hours. These additional vehicles were also added to the southbound through movement at Park Avenue to maintain balanced traffic volumes.

The traffic volumes for the additional scenario of future with development traffic conditions are shown in Figure 13.

Future with Development Capacity Analysis (Additional Scenario)

Intersection capacity analyses were performed for the additional scenario of future conditions with the proposed development at the intersections contained within the study area during the weekday morning and afternoon peak hours, as well as the Saturday peak hour. *Synchro 9.0* was used to analyze the study intersections with results based on the Highway Capacity Manual (HCM 2000) methodology. The default peak hour factor of 0.92 has been used in the analysis. Heavy vehicle percentages, lane widths, road grades, and number of bus blockages per hour were kept the same as the existing conditions. The capacity and queuing analysis results are presented in Table 7 and shown in Figure 14. The detailed analysis worksheets are contained in Appendix G.

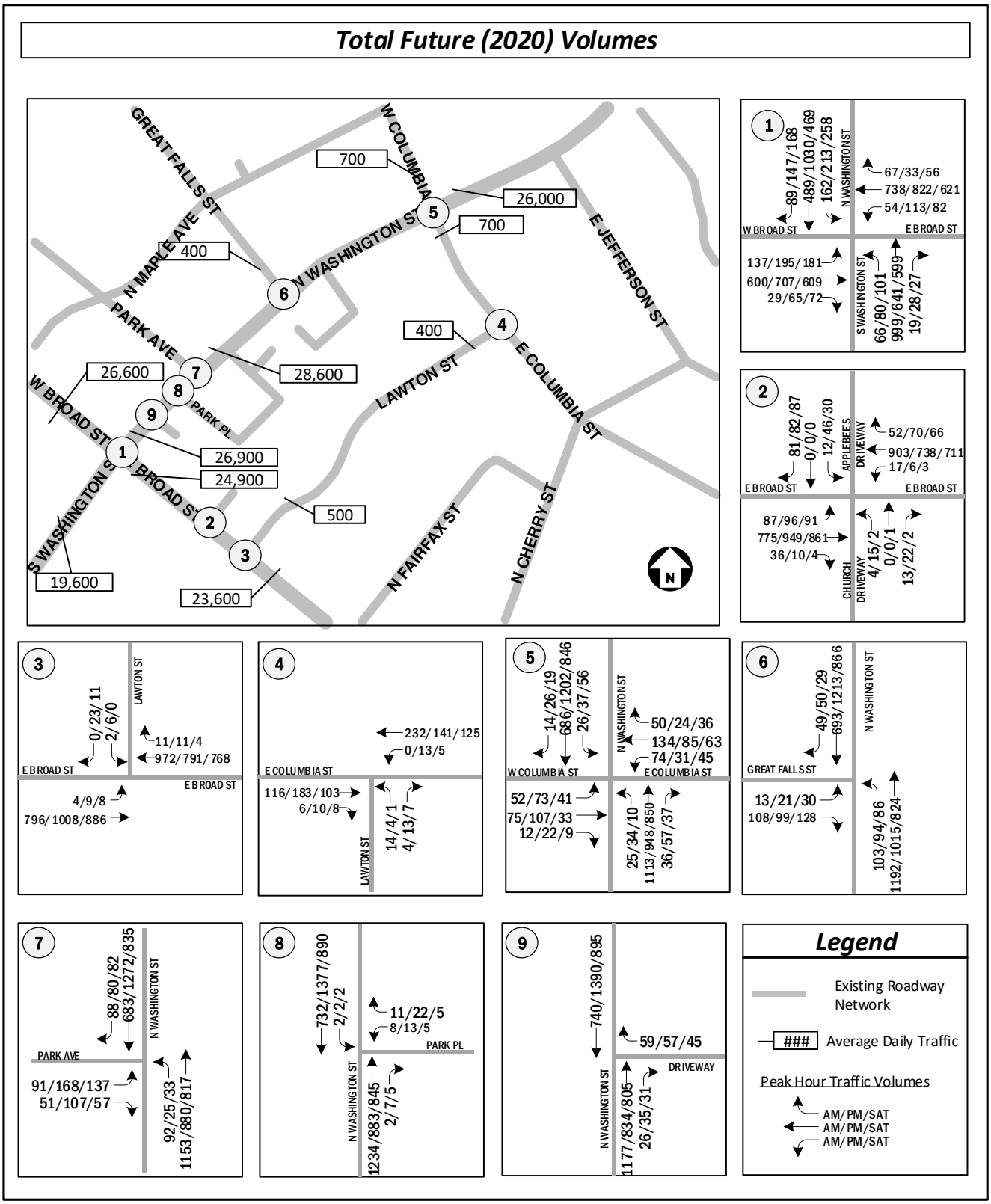


Figure 13: Future with Development (2020) Traffic Volumes (Additional Scenario)

Table 7: Future with Development (2020) Intersection Capacity Analysis (Additional Scenario)

No.	Intersection (Movement)	Bay/ Link Length (feet)	AM Peak 50th Queue	AM Peak 95th Queue	AM Peak LOS	AM Peak Delay	PM Peak 50th Queue	PM Peak 95th Queue	PM Peak LOS	PM Peak Delay	SAT Peak 50th Queue	SAT Peak 95th Queue	SAT Peak LOS	SAT Peak Delay
1	E./W. Broad St & N./S. Washington St													
	Overall Intersection (Signalized)				**C**	**29.7**			**C**	**34.1**			**D**	**36.4**
	Eastbound Approach				*D*	*38.2*			*C*	*30.4*			*C*	*31.1*
	Eastbound Left	*275*	*69*	*m#129*	*D*	*49.8*	*62*	*#210*	*E*	*60.6*	*81*	*159*	*C*	*23.5*
	Eastbound Thru/Right	*450*	*201*	*182*	*D*	*35.6*	*207*	*223*	*C*	*22.8*	*227*	*357*	*C*	*33.1*
	Westbound Approach				*C*	*29.3*			*D*	*36.6*			*D*	*40.7*
	Westbound Left	255	12	27	B	13.7	36	64	B	18.1	34	78	C	26.2
	Westbound Thru/Right	400	257	307	C	30.3	297	#419	D	39.0	249	389	D	42.4
	Northbound Approach				*D*	*36.5*			*D*	*35.6*			*D*	*40.6*
	Northbound Left	345	18	m47	B	20.0	37	m56	C	26.0	44	96	C	26.9
	Northbound Thru/Right	580	195	#440	D	36.5	244	300	D	36.8	231	363	D	42.8
	Southbound Approach				B	12.9			C	34.1			C	34.6
	Southbound Left	190	7	#86	C	21.6	74	147	C	23.5	125	#273	C	33.6
	Southbound Thru/Right	370	176	237	B	10.5	213	#545	D	36.0	217	347	D	35.1
2	E. Broad Street/Driveway													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Eastbound Approach													
	Eastbound Left	75	*n/a*	12	B	11.2	*n/a*	12	B	12.5	*n/a*	11	B	10.3
	Westbound Approach													
	Westbound Left	165	*n/a*	2	A	9.1	*n/a*	1	A	9.6	*n/a*	0	A	9.3
	Northbound Approach				*C*	*22.9*			*E*	*48.8*			*E*	*43.9*
	Northbound Left/Thru/Right	25	*n/a*	7	C	22.9	*n/a*	33	E	48.8	*n/a*	4	E	43.9
	Southbound Approach				*C*	*24.8*			*F*	*70.4*			*D*	*31.5*
	Southbound Left/Thru/Right	25	*n/a*	38	C	24.8	*n/a*	126	F	70.4	*n/a*	63	D	31.5
	Overall Mitigation: Add a Traffic Signal													
	Overall Intersection (Signalized)				**A**	**3.5**			**A**	**7.0**			**A**	**5.3**
	Eastbound Approach				*A*	*1.7*			*A*	*6.3*			*A*	*4.5*
	Eastbound Left	75	*7*	m19	A	2.3	16	m39	A	7.1	*9*	33	A	4.2
	Eastbound Thru/Right	400	*36*	m63	A	1.6	86	167	A	6.2	*53*	100	A	4.6
	Westbound Approach				*A*	*0.5*			*A*	*2.5*			*A*	*4.4*
	Westbound Left	165	*0*	m0	A	0.3	0	m1	A	1.5	*0*	3	A	3.3
	Westbound Thru/Right	165	*2*	5	A	0.5	19	23	A	2.5	*44*	86	A	4.4
	Northbound Approach				*D*	*44.0*			*C*	*32.6*			*B*	*15.9*
	Northbound Left/Thru/Right	25	*0*	12	D	44.0	4	32	C	32.6	*1*	7	B	15.9
	Southbound Approach				*D*	*45.4*			*C*	*34.2*			*B*	*16.9*
	Southbound Left/Thru/Right	25	*8*	56	D	45.4	32	87	C	34.2	*6*	44	B	16.9
3	Broad Street and Lawton Street													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Eastbound Approach													
	Eastbound Left/Thru	165	*n/a*	0	A	0.2	*n/a*	1	A	0.4	*n/a*	1	A	0.4
	Southbound Approach				*C*	*21.3*			*C*	*15.1*			*B*	*10.5*
	Southbound Left/Right	1400	*n/a*	1	C	21.3	*n/a*	6	C	15.1	*n/a*	1	B	10.5
4	Lawton Street & Columbia Street													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Westbound Approach	*440*	*n/a*	*0*	*A*	*0.0*	*n/a*	*1*	*A*	*0.7*	*n/a*	*0*	*A*	*0.3*
	Northbound Approach				*B*	*10.6*			*A*	*9.9*			*A*	*9.0*
	Northbound Left/Right	1400	*n/a*	2	B	10.6	*n/a*	2	A	9.9	*n/a*	1	A	9.0
5	N Washington Street/W Columbia Street/E Columbia Street													
	Overall Intersection (Signalized)				**B**	**16.1**			**C**	**21.6**			**C**	**23.0**
	Eastbound Approach				*C*	*29.0*			*C*	*32.8*			*B*	*18.8*
	Eastbound Left/Thru/Right	370	69	123	C	29.0	111	184	C	32.8	29	72	B	18.8
	Westbound Approach				*C*	*34.0*			*C*	*29.3*			*C*	*20.0*
	Westbound Left/Thru/Right	485	137	221	C	34.0	70	126	C	29.3	50	112	C	20.0
	Northbound Approach				*A*	*9.9*			*B*	*14.8*			*C*	*26.3*
	Northbound Left	70	1	m2	A	3.7	6	m16	B	11.5	3	11	B	17.0
	Northbound Thru/Right	640	200	337	B	10.0	218	276	B	14.9	235	315	C	26.4
	Southbound Approach				*B*	*17.3*			*C*	*24.6*			*C*	*20.7*
	Southbound Left	125	7	18	B	14.7	10	24	B	13.5	16	34	B	15.0
	Southbound Thru/Right	475	158	208	B	17.4	376	473	C	25.0	170	292	C	21.1
6	N Washington Street/Great Falls Street													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Eastbound Approach				*B*	*10.5*			*C*	*15.6*			*B*	*12.3*
	Eastbound Left/Right	*440*	*n/a*	*15*	*B*	*10.5*	*n/a*	*27*	*C*	*15.6*	*n/a*	*25*	*B*	*12.3*
	Northbound Approach													
	Northbound Thru/Left	425	*n/a*	10	A	3.0	*n/a*	12	A	3.9	*n/a*	8	A	3.1

No.	Intersection (Movement)	Bay/ Link Length (feet)	AM Peak				PM Peak				SAT Peak			
			50th Queue	95th Queue	LOS	Delay	50th Queue	95th Queue	LOS	Delay	50th Queue	95th Queue	LOS	Delay
7	N Washington Street/Park Avenue													
	Overall Intersection (Signalized)				**A**	**6.4**			**A**	**7.1**			**A**	**9.2**
	Eastbound Approach				*D*	*48.4*			*D*	*39.6*			*C*	*20.6*
	Eastbound Left	360	61	108	D	48.4	105	169	D	42.4	38	92	C	21.6
	Eastbound Right	360	0	34	D	41.1	0	45	D	35.1	0	25	B	18.2
	Northbound Approach				*A*	*4.4*			*A*	*5.2*			*A*	*4.3*
	Northbound Thru/Left	370	136	m117	A	4.4	73	m117	A	5.2	58	111	A	4.3
	Southbound Approach				*A*	*2.4*			*A*	*1.8*			*B*	*11.3*
	Southbound Thru/Right	425	44	98	A	2.4	34	43	A	1.8	111	188	B	11.3
	N Washington Street/Park Avenue													
	Overall Intersection (Signalized)				**B**	**11.3**			**B**	**11.2**			**B**	**17.0**
	Eastbound Approach				*D*	*47.8*			*D*	*46.3*			*D*	*38.2*
	Eastbound Left	360	62	#130	D	51.2	112	#212	D	51.9	83	159	D	39.4
	Eastbound Right	360	0	37	D	41.6	0	50	D	37.5	0	37	D	35.4
	Northbound Approach				*A*	*5.8*			*A*	*2.6*			*A*	*1.2*
	Northbound Thru/Left	370	34	25	A	5.8	45	27	A	2.6	26	18	A	1.2
	Southbound Approach				*B*	*13.6*			*A*	*9.8*			*C*	*27.0*
	Southbound Thru/Right	425	215	278	B	13.6	117	211	A	9.8	301	335	C	27.0
8	N Washington Street & Park Place													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Westbound Approach				*A*	*9.8*			*A*	*9.2*			*A*	*9.0*
	Westbound Right	315	*n/a*	2	A	9.8	*n/a*	3	A	9.2	*n/a*	1	A	9.0
8	N Washington Street & Park Place													
	Overall Intersection (Signalized)				**A**	**7.9**			**A**	**6.6**			**A**	**9.7**
	Westbound Approach				*D*	*46.0*			*D*	*44.4*			*D*	*46.4*
	Westbound Left/Right	315	*6*	30	D	46.0	*9*	41	D	44.4	*3*	21	D	46.4
	Northbound Approach				*B*	*11.4*			*B*	*12.6*			*B*	*18.1*
	Northbound Thru/Right		104	m129	B	11.4	141	m235	B	12.6	226	232	B	18.1
	Southbound Approach				*A*	*0.9*			*A*	*1.7*			*A*	*1.3*
	Southbound Thru/Right		10	7	A	0.9	38	34	A	1.7	17	16	A	1.3
9	N Washington Street & Driveway													
	Overall Intersection (Unsignalized)				**n/a**	**n/a**			**n/a**	**n/a**			**n/a**	**n/a**
	Westbound Approach				*B*	*10.1*			*A*	*9.3*			*A*	*9.3*
	Westbound Right	105	n/a	6	B	10.1	n/a	5	A	9.3	n/a	4	A	9.3

The analysis of the additional scenario yields similar results as compared to the future with development scenario. The southbound approach at the intersection of Broad Street and Washington Street shows slightly lower delays (approximately 7 seconds in the morning peak hour and 6 seconds in the afternoon peak hour) with the reconfiguration. The intersection of N. Washington Street and Park Place operates at acceptable levels of service upon signalization and the westbound approach operates at level of service D under all the three study peak hours. It should be noted that the signal timings at the intersection of N. Washington Street and Park Avenue were modified to operate as a clustered signal along with the proposed signal at the intersection of N. Washington Street and Park Place. The modified signal timings at N. Washington Street and Park Avenue result in slightly higher but still acceptable delays along the eastbound approach as compared to the future with development scenario.

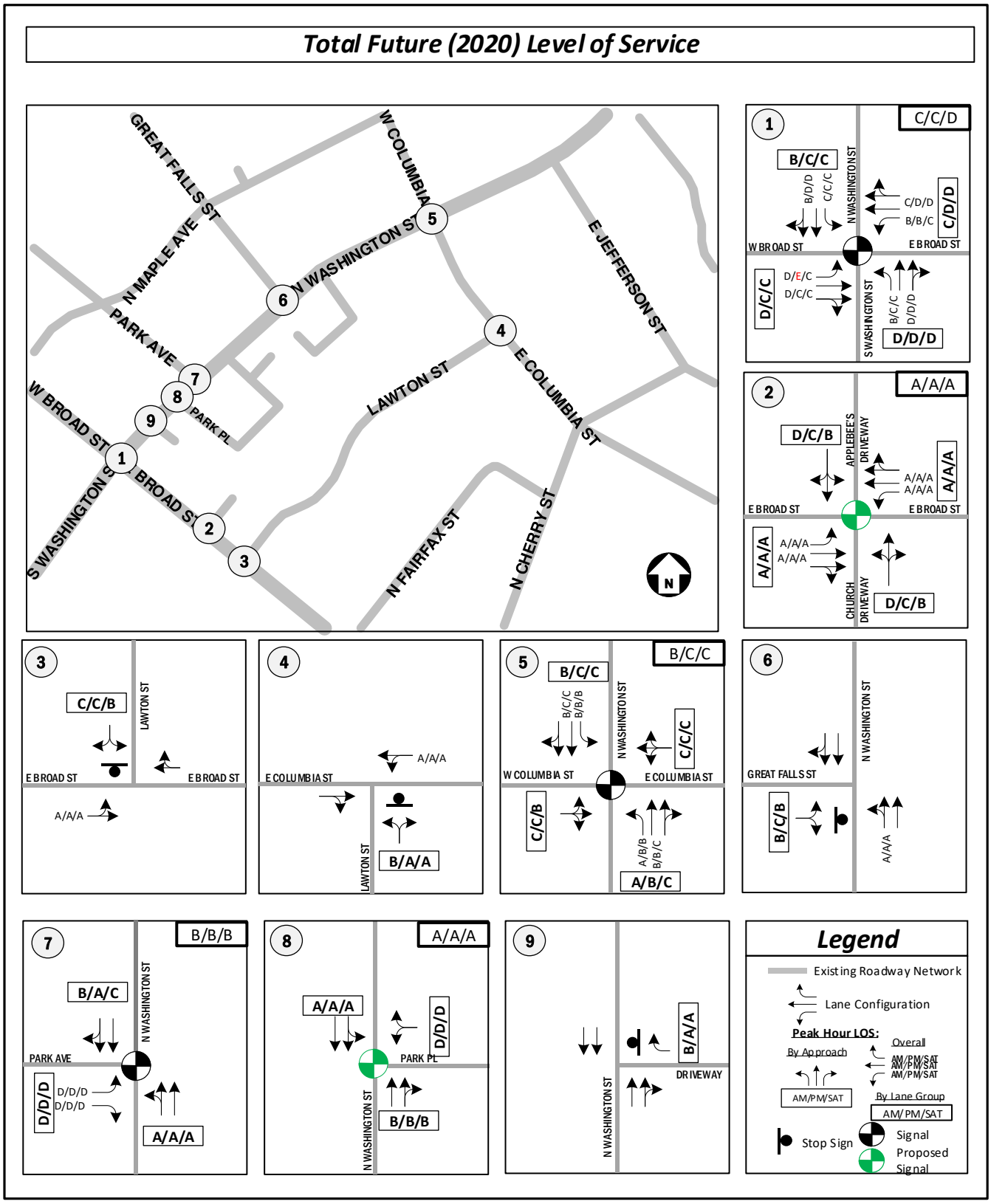


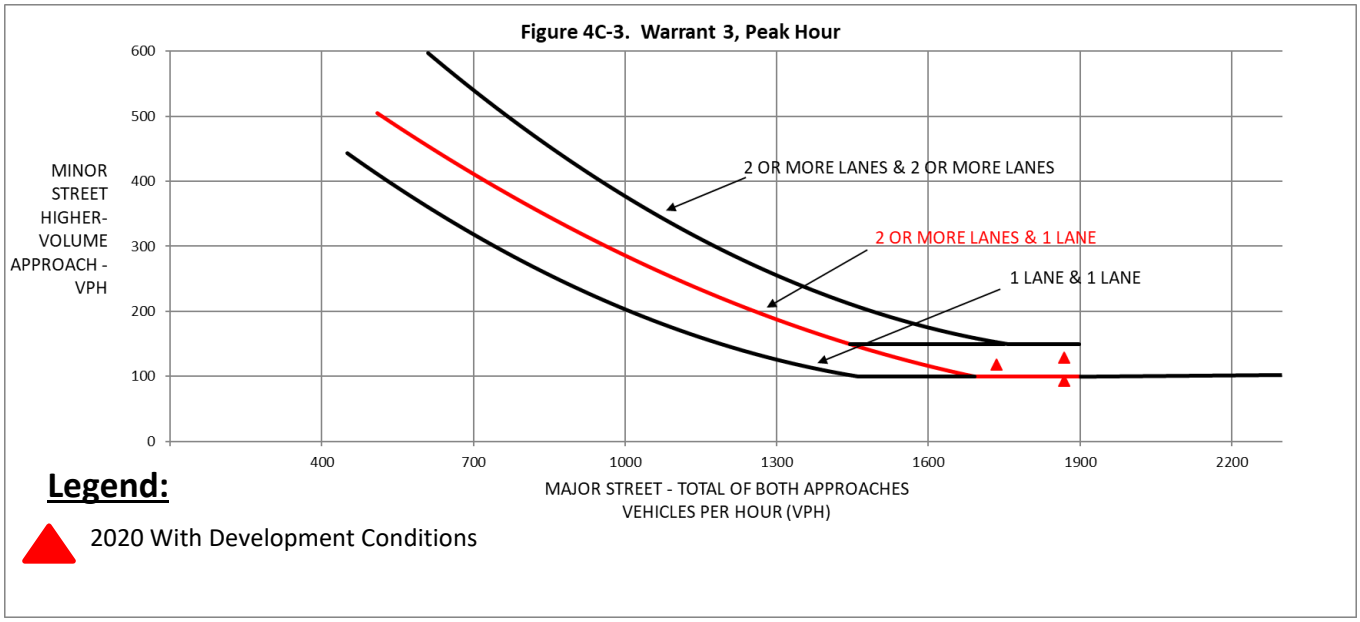
Figure 14: Future with Development (2020) Level of Service (Additional Scenario)

PEAK HOUR SIGNAL WARRANT ANALYSIS

A peak hour signal warrant analysis was conducted for the site driveway along E. Broad Street. Table 8 shows the volumes used in Figure 13 which utilizes the Warrant 3 graph provided in the MUTCD. The traffic volumes assume a full-movement intersection consistent with the configuration analyzed with a signal. As indicated in Figure 13, the peak hour warrant is met during the PM and Saturday peak hours.

Table 8: Volumes used for Peak Hour Warrant Analysis

Condition		Major Street - Total of Both Approaches (VPH)	Minor Street – Site Driveway (VPH)
1	2020 AM Peak	1,870	93
2	2020 PM Peak	1,869	128
3	2020 SAT Peak	1,736	117



**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.*

Figure 15: Warrant 3, Peak Hour Signal Warrant Analysis Results

It should be noted that the signal warrant analysis presented in this section analyzes only the Peak Hour warrant. Additional warrant analysis computations would have to be conducted prior to the installation of the traffic signal. This additional analysis may or may not warrant the need of a traffic signal at the intersection of the site driveway along E. Broad Street.

CONCLUSIONS

This report presents the findings of a traffic impact analysis for the proposed Broad & Washington redevelopment located in the City of Falls Church. The site is bounded by E. Broad Street to the south, N. Washington Street to the west, Lawton Street to the east and Park Place to the north. The development, which is planned to consist of a multi-use building containing retail, restaurant, office, and residential space, is anticipated to be complete in 2020.

The analysis presented in this report supports the following major conclusions:

Existing Conditions (2015)

Weekday traffic counts were conducted at the study intersections during the AM and PM peak periods on Tuesday, February 3, 2015 and Saturday peak period traffic counts were conducted on January 31, 2015. The existing volumes were balanced across proximate intersections to reflect a consistent baseline for the volume projections within this report.

Intersection capacity analyses were performed for the existing conditions at the study area intersections during the weekday morning and afternoon peak hours, as well as the Saturday peak hour. *Synchro, version 9.0* was used to analyze the study intersections with results based on the Highway Capacity Manual (HCM 2000) methodology. For the purpose of this analysis, it is desirable to achieve a LOS D or better for each approach of an intersection. All of the study intersections' approaches currently operate at acceptable levels of service and most queue lengths can be accommodated during the weekday morning, afternoon, and Saturday peak hours, with the following exceptions:

- Broad Street and Washington Street (queues)
- N. Washington Street and Park Avenue (queues)

Future Conditions without Development (2020)

Traffic volumes were projected for the year 2020 without the proposed Broad & Washington redevelopment. The traffic associated with the 301 W. Broad Street project was added to the existing traffic volumes to obtain the future conditions without development.

Most of the study intersections' approaches will continue to operate at acceptable levels of service with manageable queues during the weekday morning, afternoon, and Saturday peak hours, with the following exceptions:

- Broad Street and Washington Street (LOS and queues)

Future Conditions with Development (2020)

The proposed mixed-use redevelopment will generate approximately 148 new external trips during the weekday morning peak hour, 264 new external trips during the weekday afternoon peak hour, 164 new external trips during the Saturday peak hour, and 2,655 new external weekday daily trips, accounting for existing or potential trips associated with the existing buildings. Access to the proposed development will be provided via a full-movement driveway on E. Broad Street and a right-in/right-out access on N. Washington Street. Future conditions with the development were derived from the future without development scenario and the site generated trips.

As under the existing and future without development conditions, most of the study intersections' approaches will continue to operate at acceptable levels of service with manageable queues during the weekday morning, afternoon, and Saturday peak hours, with the following exceptions:

- Broad Street and Washington Street (LOS and queues)

- E. Broad Street and Site Driveway (LOS and queues)

An additional scenario was analyzed under the future with development conditions to evaluate traffic operations with a potential full-movement signalized intersection at Park Place and N. Washington Street. The results of the capacity analysis show that the addition of a traffic signal at the intersection of N. Washington Street and Park Place does not result in significantly different results as compared to the existing configuration of this intersection.

Signalization of the Site Entrance on E. Broad Street is proposed as part of mitigations. With the addition of a traffic signal at the intersection of E. Broad Street and site driveway, the side street movements operate at acceptable levels of service.

In summary, traffic operations within the study area will be similar with or without the proposed Broad & Washington redevelopment.

TECHNICAL APPENDIX

TECHNICAL APPENDIX TABLE OF CONTENTS

Appendix A: Scoping Document

Appendix B: Existing (2015) Traffic Volumes & Count Sheets

Appendix C: Level of Service Definitions

Appendix D: Intersection Capacity Analysis - Existing Conditions (2015)

Appendix E: Intersection Capacity Analysis - Future without Development Condition (2020)

Appendix F: Traffic Volumes for Each Use and Pass-by Trips

Appendix G: Intersection Capacity Analysis - Future with Development Condition (2020)

Appendix H: Intersection Capacity Analysis - Future with Development Condition (2020) (Additional Scenario)

APPENDIX A

SCOPING DOCUMENT

PRE-SCOPE OF WORK MEETING FORM

Information on the Project
Traffic Impact Analysis Base Assumptions

The applicant is responsible for entering the relevant information and submitting the form to VDOT and the locality no less than three (3) business days prior to the meeting. If a form is not received by this deadline, the scope of work meeting may be postponed.

Contact Information	
Consultant Name: Tele: E-mail:	Chad Baird, Gorove/Slade Associates, Inc. 571-248-0992 chad.baird@goroveslade.com
Developer/Owner Name: Tele: E-mail:	Maury Stern Insight Property Group, LLC mstern@insightpropertygroupllc.com

Project Information				
Project Name:	Broad and Washington Street Redevelopment – Traffic Study	Locality/County:	City of Falls Church	
Project Location: (Attach regional and site specific location map)	The proposed development is located north of Broad Street, east of Washington Street, south of Park Place, and west of Lawton Street in the City of Falls Church, Virginia.			
Submission Type	Comp Plan ☐	Rezoning ☒	Site Plan ☐	Subd Plat ☐
Project Description: (Including details on the land use, acreage, phasing, access location, etc. Attach additional sheet if necessary)	This project is part of a planning and redevelopment of the project site. According the City of Falls Church Official Zoning District Map (2007), the site is zoned as B-2, Central Business.			
Proposed Use(s): (Check all that apply; attach additional pages as necessary)	Residential ☐	Commercial ☐	Mixed Use ☒	Other ☐
	Residential Uses(s) Number of Units: 303 ITE LU Code(s): 220 **Commercial Use(s)** ITE LU Code(s): 850 – 47,200 SF 826 – 12,400 SF 932 – 12,400 SF 710 – 36,000 SF		**Other Use(s)** ITE LU Code(s):	
Total Peak Hour Trip Projection:	Less than 100 ☐	100 – 499 ☐	500 – 999 ☒	1,000 or more ☐

Traffic Impact Analysis Assumptions

Study Period	Existing Year: 2015	Build-out Year: 2020	Design Year: N/A
Study Area Boundaries (Attach map)	North: Park Place	South: E Broad Street	
	East: Lawton Street	West: N Washington Street	
External Factors That Could Affect Project (Planned road improvements, other nearby developments)	Review the City Small Area Plan, Comp Plan (transportation multimodal), Parking (how does it become shared as a district)		
Consistency With Comprehensive Plan (Land use, transportation plan)	Consistent		
Available Traffic Data (Historical, forecasts)	VDOT Historical AADT Data		

Trip Distribution (Please refer to attached Figure 1)

	Residential:	Retail:	Office:
- to/from the north on Washington	35%	15%	20%
- to/from the south on Washington	15%	15%	20%
- to/from the west on W Broad	20%	10%	35%
- to/from the east on E Broad	20%	40%	15%
- to/from the west from Great Falls	10%	5%	10%
- to/from the east from neighborhood	0%	15%	0%
-			

Annual Vehicle Trip Growth Rate:	1.0% (based on previous studies in the area)	Peak Period for Study (check all that apply)	☒ AM ☒ PM ☒ SAT
		Peak Hour of the Generator	without reductions: 572 AM; 799 PM; 7,779 Daily; 1,079 Sat after reductions: 414 AM; 582 PM; 5,307 Daily; 716 Sat

Study Intersections and/or Road Segments (Attach additional sheets as necessary) Please refer to attached Figure 1	1. Broad and Washington (Route 29)	6. Washington (Route 29) and Great Falls
	2. Broad and Proposed Site Entrance	7. Washington (Route 29) and Park Avenue
	3. Broad and Lawton	8. Washington (Route 29) and Park Place/Proposed Entrance -North
	4. Lawton and Columbia	9. Washington (Route 29) and Existing Driveway/Proposed Entrance - South
	5. Washington (Route 29) and Columbia	
Trip Adjustment Factors	Internal allowance: ☒ Yes ☐ No Reduction: 5% (AM), 10% (PM, SAT), 15% (Weekday Daily)	Pass-by allowance: ☒ Yes ☐ No Reduction: 36%
Software Methodology	☒ Synchro ☐ HCS (v.2000/+) ☐ aaSIDRA ☐ CORSIM ☐ Other _____	
Traffic Signal Proposed or Affected (Analysis software to be used, progression speed, cycle length)	1. Broad and Washington 2. Washington (Route 29)and Park Avenue 3. Route 29 and Columbia Analysis Software: Synchro version 8 Results: HCM methodology	

Improvement(s) Assumed or to be Considered	Bus Shelters, Ped/Bike facility at East Fairfax
Background Traffic Studies Considered	301 West Broad
Plan Submission	☐ Master Development Plan (MDP) ☒ Generalized Development Plan (GDP) ☐ Preliminary/Sketch Plan ☐ Other Plan type (Final Site, Subd. Plan)
Additional Issues to be Addressed	☒ Queuing analysis ☐ Actuation/Coordination ☐ Weaving analysis ☐ Merge analysis ☒ Bike/Ped Accommodations ☐ Intersection(s) ☒ TDM Measures ☒ Other Parking Management Plan, Site Access

NOTES on ASSUMPTIONS:

1. Synchro files/signal timings will be obtained from the City of Falls Church.
2. The scenarios to be included in the study are Existing (2015), Future without Development (2020), and Future with Development (2020).
3. Existing peak hour factors in the range of 0.85 to 1.00 will be used for existing scenarios. The default peak hour factor of 0.92 will be used for all future scenarios.
4. Default heavy vehicle percentage of 2% will be used for all movements.
5. The VDOT-approved Mixed Use Trip Generation Model 4.0 will be investigated, in addition to the ITE Trip Generation model. A discussion regarding which model is selected, and why, will be included in the study.
6. Trip reductions and the interaction of the TDM and Parking Management Plan will be included in the report. Describe "reductions" in the report. What is pass by, what is internal capture, what is transit?
7. For any approach LOS D or better would be considered as acceptable/desirable traffic operation condition. For all approaches, the projected future conditions without development LOS and delay will be maintained in the future with development condition. Will show intersection, approach, and movement LOS.
8. Evaluate alternative access configurations for the driveways and the intersection of North Washington Street and Park Place.
9. Signal timing adjustments would be considered as an acceptable mitigation measure.
10. Will provide both 95th and 50th percentile queues.
11. Include definitions/examples in the report about Level of Service.

SIGNED: _____ DATE: 8/11/2015
Applicant or Consultant

PRINT NAME: Chad Baird
Applicant or Consultant

SIGNED: Stephanie Rogers DATE: 8·14·15
Local Government Representative

PRINT NAME: Stephanie Rogers
Local Government Representative

Table 1: Trip Generation

Land Use	ITE Code	Size		------ Weekday ------							------ Saturday ------			
				AM Peak Hour			PM Peak Hour			Daily	SAT Peak Hour			Daily
				In	*Out*	*Total*	*In*	*Out*	*Total*	*Total*	*In*	*Out*	*Total*	*Total*
Proposed Retail														
grocery	850	47.2	kSF	99	61	160	228	219	447	4,552	300	288	588	8,382
High Turnover Sit Down Restaurant	932	12.4	kSF	74	60	134	73	49	122	1,577	92	82	174	1,964
specialty retail	826	12.4	kSF	84	92	176	22	29	51	568	117	108	225	521
Subtotal (Retail without reductions)				*257*	*213*	*470*	*323*	*297*	*620*	*6,697*	*509*	*478*	*987*	*10,867*
Internal Trips Reduction (Retail)				*-7*	*-2*	*-8*	*-7*	*-13*	*-20*	*-318*	*-8*	*-8*	*-16*	*-350*
Subtotal (Retail with internal reduction)				*250*	*211*	*462*	*316*	*284*	*600*	*6,379*	*501*	*470*	*972*	*10,517*
Transit/Walk Reduction - 2% (Retail Only)				*-5*	*-4*	*-9*	*-6*	*-6*	*-12*	*-128*	*-10*	*-9*	*-19*	*-210*
Subtotal (w/ Transit/Walk Reduction)				*245*	*207*	*453*	*310*	*278*	*588*	*6,251*	*491*	*461*	*952*	*10,307*
Pass by Trips Reduction - 36% (Retail Only)				*-88*	*-75*	*-163*	*-111*	*-100*	*-212*	*-2,250*	*-177*	*-166*	*-343*	*-3,710*
Total Proposed New External Retail Trips				*157*	*133*	*290*	*198*	*178*	*376*	*4,001*	*314*	*295*	*609*	*6,596*
Proposed Residential														
apartment	220	330	DU	33	132	165	129	70	199	2,123	78	77	155	2,334
Internal Trips Reduction (Residential) -5% (AM), 10% (PM & SAT), 15% (Weekday/Weekend Daily)				-2	-7	-8	-13	-7	-20	-318	-8	-8	-16	-350
Subtotal (Residential with internal reduction)				*31*	*125*	*157*	*116*	*63*	*179*	*1,805*	*70*	*69*	*140*	*1,984*
Transit Reduction - 10% (Residential Only)				*-3*	*-13*	*-16*	*-12*	*-6*	*-18*	*-180*	*-7*	*-7*	*-14*	*-198*
Subtotal (w/ Transit Reduction)				*28*	*113*	*141*	*104*	*57*	*161*	*1,624*	*63*	*62*	*126*	*1,786*
Total Residential Trips				*28*	*113*	*141*	*104*	*57*	*161*	*1,624*	*63*	*62*	*126*	*1,786*
Proposed Office														
Office	710	36.0	kSF	75	10	85	20	99	119	604	8	7	15	105
Transit/Walk Reduction - 2% (Office Only)				*-2*	*0*	*-2*	*0*	*-2*	*-2*	*-12*	*0*	*0*	*0*	*-2*
Subtotal (w/ Transit/Walk Reduction)				*73*	*10*	*83*	*20*	*97*	*117*	*592*	*8*	*7*	*15*	*103*
Total Office Trips				*73*	*10*	*83*	*20*	*97*	*117*	*592*	*8*	*7*	*15*	*103*
Proposed Site Trips without Reductions				***365***	***355***	***720***	***472***	***466***	***938***	***9,424***	***595***	***562***	***1,157***	***13,306***
Proposed Site Trips with Reductions				***258***	***255***	***514***	***322***	***332***	***654***	***6,217***	***385***	***364***	***750***	***8,485***

Figure 1: Area Map, Study Intersections, and Direction of Approach

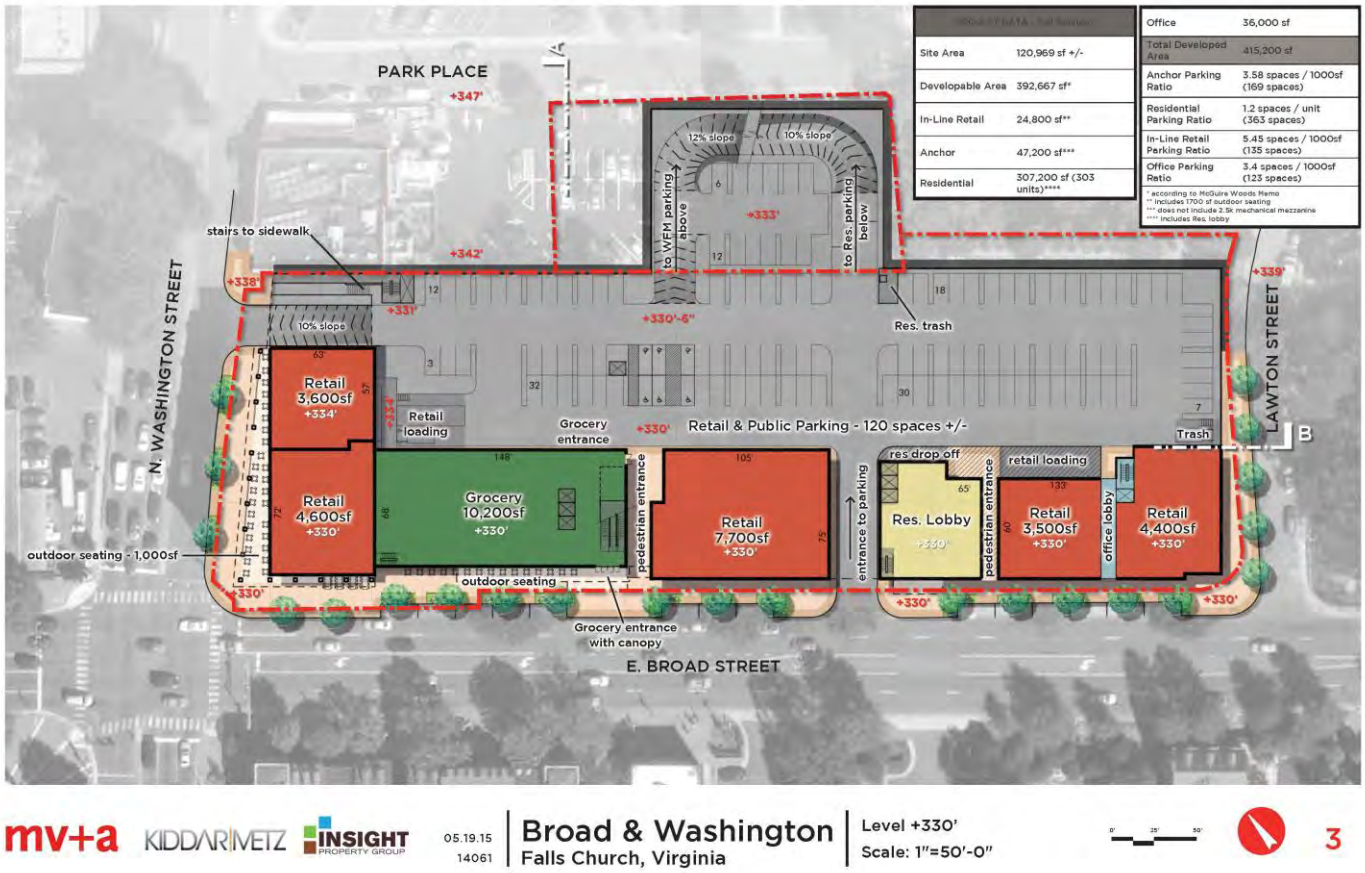


Figure 2: Ground Floor Site Plan

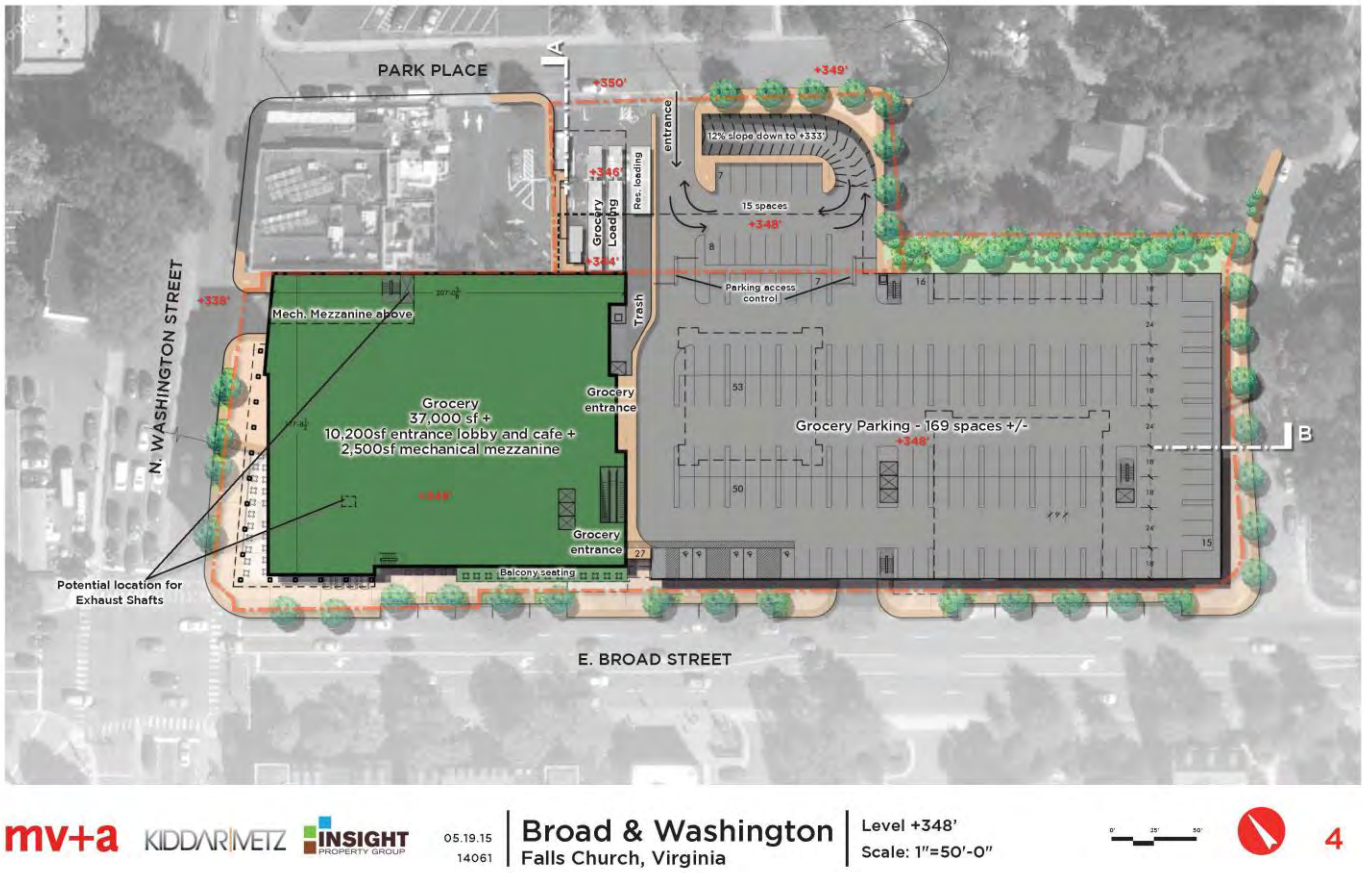


Figure 3: Site Plan (grocery and parking)

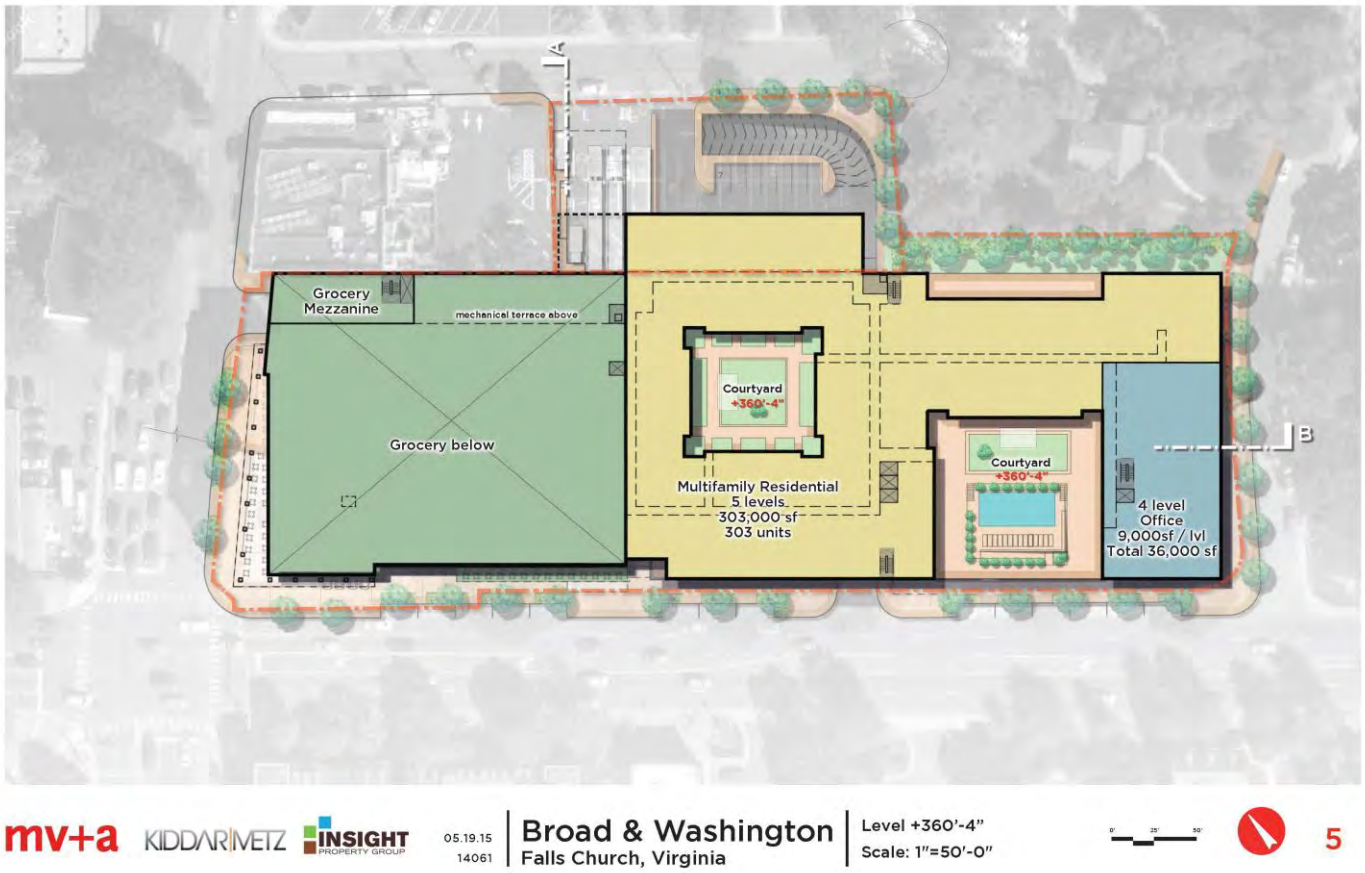


Figure 4: Site Plan (residential. grocery, office)

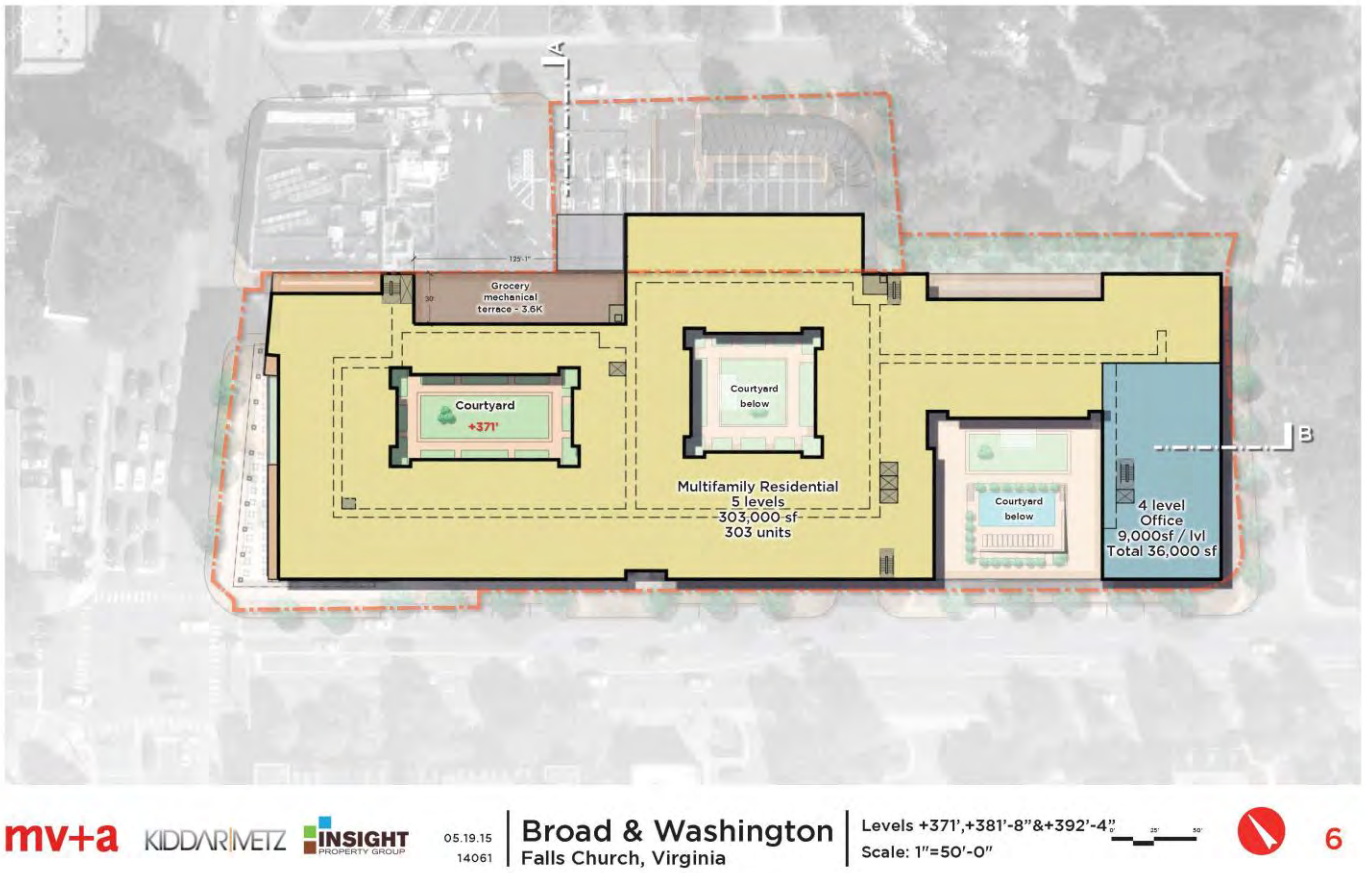


Figure 5: Site Plan (residential, office)

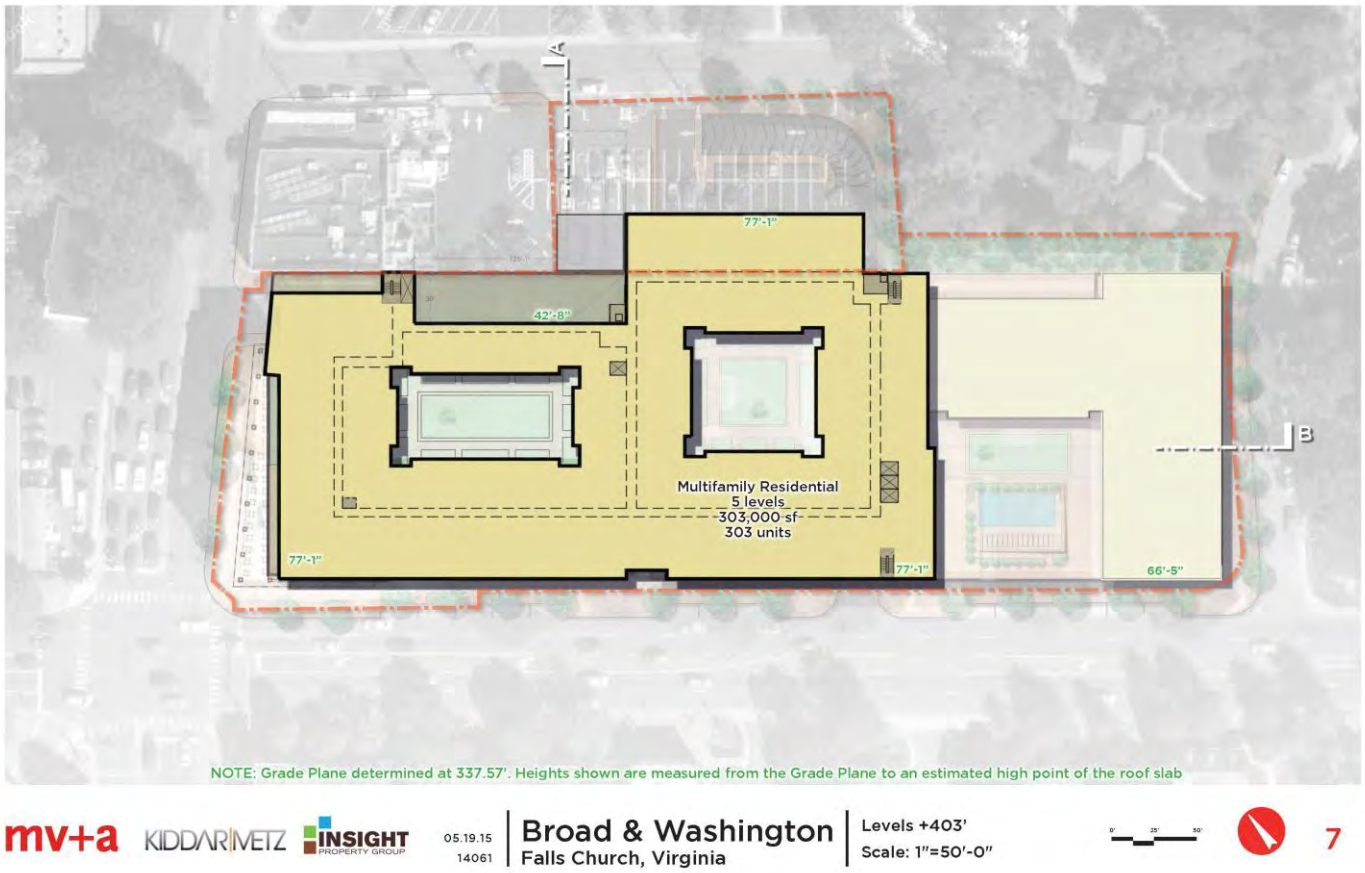


Figure 6: Site Plan (residential only)

APPENDIX B

EXISTING (2015) TRAFFIC VOLUMES & COUNT SHEETS

Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Intersection:			**Broad Street at Site Entrance**														
AM PEAK																	
		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Parking**				**Broad St.**				**Parking**				**Broad St.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:30 AM	to	6:45 AM	0	0	0	0	0	55	0	0	1	0	0	0	1	51	0	0
6:45 AM	to	7:00 AM	0	0	1	0	0	71	0	1	0	0	1	0	1	73	2	0
7:00 AM	to	7:15 AM	0	0	0	0	1	85	0	0	0	0	0	0	0	93	4	1
7:15 AM	to	7:30 AM	0	0	0	0	0	105	0	0	0	0	0	0	0	112	0	0
7:30 AM	to	7:45 AM	2	0	0	0	3	137	0	0	0	0	0	0	0	129	5	1
7:45 AM	to	8:00 AM	1	0	0	0	4	163	0	1	0	0	0	0	0	152	4	0
8:00 AM	to	8:15 AM	0	0	0	0	2	213	1	2	1	0	0	0	0	214	4	2
8:15 AM	to	8:30 AM	7	0	1	0	8	231	0	1	0	0	1	0	3	183	2	2
8:30 AM	to	8:45 AM	4	0	0	0	4	223	2	1	1	0	0	0	3	214	3	1
8:45 AM	to	9:00 AM	1	0	0	0	10	235	0	1	0	0	0	0	5	219	6	1
9:00 AM	to	9:15 AM	1	0	2	0	8	232	2	1	4	0	0	0	6	168	4	1
9:15 AM	to	9:30 AM	7	0	1	0	8	207	13	1	8	0	4	0	22	154	7	1
PM PEAK																		
		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Parking**				**Broad St.**				**Parking**				**Broad St.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM	to	4:15 PM	5	0	1	0	7	205	2	0	6	0	2	0	2	174	3	0
4:15 PM	to	4:30 PM	4	0	1	0	5	183	3	0	7	0	4	0	2	197	4	1
4:30 PM	to	4:45 PM	8	0	4	0	3	172	3	0	3	0	3	0	3	211	2	0
4:45 PM	to	5:00 PM	6	0	2	0	7	181	1	3	5	0	2	0	5	252	2	1
5:00 PM	to	5:15 PM	8	0	3	0	4	163	2	2	4	0	4	0	2	224	6	2
5:15 PM	to	5:30 PM	4	0	3	1	5	164	0	4	11	0	2	0	2	207	0	2
5:30 PM	to	5:45 PM	4	0	2	0	3	173	3	0	2	0	7	0	1	220	4	0
5:45 PM	to	6:00 PM	4	2	0	0	6	172	2	2	4	0	6	0	4	198	4	4
6:00 PM	to	6:15 PM	6	2	1	1	0	197	3	3	6	1	3	0	3	200	8	0
6:15 PM	to	6:30 PM	4	0	0	0	4	136	2	2	6	0	4	0	4	223	1	0
6:30 PM	to	6:45 PM	7	0	2	0	3	139	0	0	0	1	4	0	4	200	3	1
6:45 PM	to	7:00 PM	6	0	4	0	4	110	3	0	1	0	1	0	5	193	2	0
PEAK HOURS																		
		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Parking**				**Broad St.**				**Parking**				**Broad St.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																		
8:00 AM	to	9:00 AM	12	0	1	0	24	902	3	5	2	0	1	0	11	830	15	6
PM INTERSECTION PEAK HOUR																		
4:15 PM	to	5:15 PM	26	0	10	0	19	699	9	5	19	0	13	0	12	884	14	4
AM SYSTEM PEAK HOUR																		
8:15 AM	to	9:15 AM	13	0	3	0	30	921	4	4	5	0	1	0	17	784	15	5
PM SYSTEM PEAK HOUR																		
4:45 PM	to	5:45 PM	22	0	10	1	19	681	6	9	22	0	15	0	10	903	12	5

PEAK HOUR FACTORS	Southbound				Westbound				Northbound				Eastbound			
	Parking				**Broad St.**				**Parking**				**Broad St.**			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.46	0.00	0.38	**0.50**	0.75	0.98	0.50	**0.97**	0.31	0.00	0.25	**0.38**	0.71	0.89	0.63	**0.89**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.69	0.00	0.83	**0.73**	0.68	0.94	0.50	**0.93**	0.50	0.00	0.54	**0.71**	0.50	0.90	0.50	**0.89**

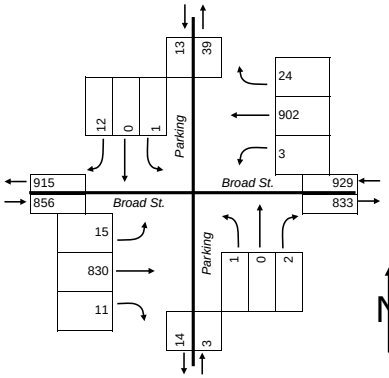
Overall AM PEAK HOUR FACTOR = **0.94** **Overall PM PEAK HOUR FACTOR** = **0.92**

AM Period Intersection Volume: 3916 **PM Period Intersection Volume:** 4837

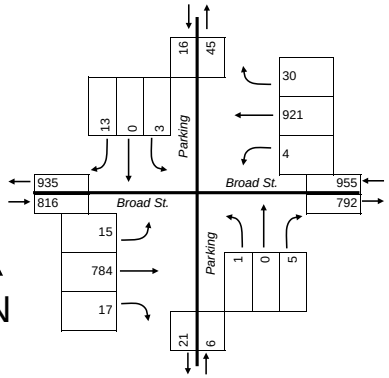
Date of Counts: Thursday, January 29, 2015

AM Weather Conditions: Clear **PM Weather Conditions:** Clear

AM INTERSECTION PEAK VOLUMES



AM SYSTEM PEAK VOLUMES



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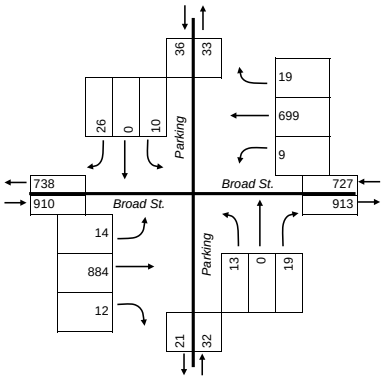
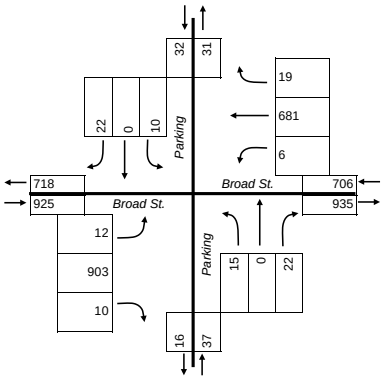
PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Intersection: Broad Street at Lawton Street

	Southbound				Westbound				Northbound				Eastbound			
AM PEAK																
Roadway:	Lawton St.				Broad St.				Lawton St.				Broad St.			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:30 AM to 6:45 AM	0	0	0	0	1	51	0	0	0	0	0	0	0	53	0	0
6:45 AM to 7:00 AM	0	0	0	0	0	71	0	1	0	0	0	0	0	66	0	0
7:00 AM to 7:15 AM	1	0	0	0	0	83	0	0	0	0	0	0	0	87	0	0
7:15 AM to 7:30 AM	0	0	0	0	0	101	0	0	0	0	1	0	0	112	0	0
7:30 AM to 7:45 AM	0	0	0	0	0	137	0	0	0	0	0	0	0	134	0	0
7:45 AM to 8:00 AM	0	0	0	0	3	161	0	0	0	0	0	1	0	149	0	0
8:00 AM to 8:15 AM	4	0	1	0	3	213	0	2	0	0	0	0	0	204	0	0
8:15 AM to 8:30 AM	1	0	0	0	2	238	0	1	0	0	0	0	0	175	1	0
8:30 AM to 8:45 AM	1	0	0	0	2	229	0	0	0	0	0	0	0	211	1	0
8:45 AM to 9:00 AM	1	0	0	0	6	268	0	1	0	0	0	0	0	206	2	0
9:00 AM to 9:15 AM	1	0	0	0	1	227	0	0	0	0	0	0	0	173	1	0
9:15 AM to 9:30 AM	2	0	2	0	2	223	0	0	0	0	0	0	0	165	5	0
PM PEAK																
Roadway:	Lawton St.				Broad St.				Lawton St.				Broad St.			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM to 4:15 PM	2	0	1	0	1	212	0	0	0	0	0	0	0	174	2	0
4:15 PM to 4:30 PM	3	0	1	0	5	180	0	0	0	0	1	0	0	202	0	1
4:30 PM to 4:45 PM	1	0	0	0	1	182	0	0	0	0	0	0	0	222	0	0
4:45 PM to 5:00 PM	4	0	2	0	2	175	0	3	0	0	0	0	0	251	1	0
5:00 PM to 5:15 PM	1	0	2	0	4	170	0	2	0	0	0	0	0	229	1	0
5:15 PM to 5:30 PM	7	0	2	0	2	177	0	3	0	0	0	0	0	216	2	0
5:30 PM to 5:45 PM	6	0	0	0	3	171	0	0	0	0	0	0	0	224	0	0
5:45 PM to 6:00 PM	2	0	1	0	0	170	0	1	1	0	0	0	0	204	1	1
6:00 PM to 6:15 PM	6	0	2	0	2	195	0	2	0	0	0	0	0	200	4	0
6:15 PM to 6:30 PM	3	0	2	2	0	137	0	0	0	0	0	0	0	227	1	0
6:30 PM to 6:45 PM	0	0	1	0	0	147	0	0	0	0	1	0	0	226	0	0
6:45 PM to 7:00 PM	0	0	2	0	0	138	0	1	1	0	0	0	0	201	0	0
PEAK HOURS																
Roadway:	Lawton St.				Broad St.				Lawton St.				Broad St.			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																
8:00 AM to 9:00 AM	7	0	1	0	13	948	0	4	0	0	0	0	0	796	4	0
PM INTERSECTION PEAK HOUR																
4:30 PM to 5:30 PM	13	0	6	0	9	704	0	8	0	0	0	0	0	918	4	0
AM SYSTEM PEAK HOUR																
8:15 AM to 9:15 AM	4	0	0	0	11	962	0	2	0	0	0	0	0	765	5	0
PM SYSTEM PEAK HOUR																
4:45 PM to 5:45 PM	18	0	6	0	11	693	0	8	0	0	0	1	0	920	4	0

PEAK HOUR FACTORS

	Southbound				Westbound				Northbound				Eastbound			
	Lawton St.				Broad St.				Lawton St.				Broad St.			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	1.00	0.00	0.00	**1.00**	0.46	0.90	0.00	**0.89**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.91	0.63	**0.91**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.64	0.00	0.75	**0.67**	0.69	0.98	0.00	**0.98**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.92	0.50	**0.92**

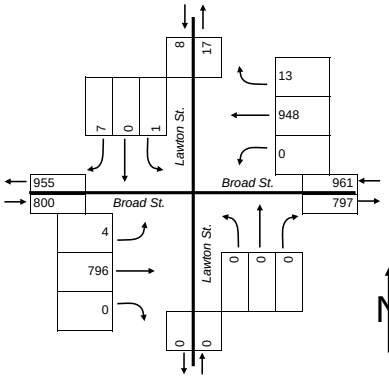
Overall AM PEAK HOUR FACTOR = **0.90** **Overall PM PEAK HOUR FACTOR** = **0.95**

AM Period Intersection Volume: 3782 **PM Period Intersection Volume:** 4717

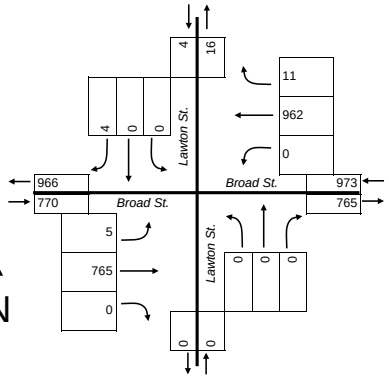
Date of Counts: Thursday, January 29, 2015

AM Weather Conditions: Clear **PM Weather Conditions:** Clear

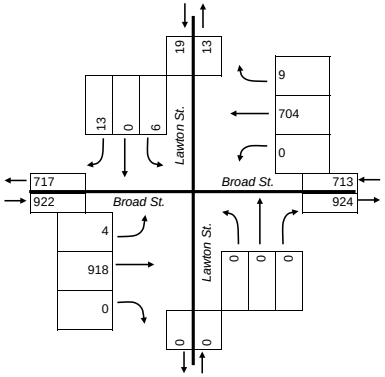
AM INTERSECTION PEAK VOLUMES



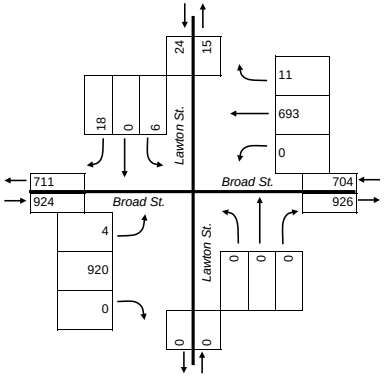
AM SYSTEM PEAK VOLUMES



PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Date of Counts: Tuesday, February 03, 2015

AM Weather Conditions: Clear

PM Weather Conditions: Clear

Intersection: **Lawton Street at Columbia Street**

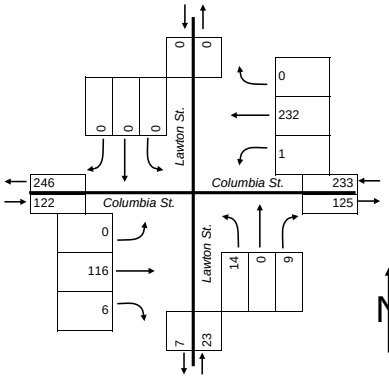
AM PEAK																
Direction:		Southbound				Westbound				Northbound				Eastbound			
Roadway:		**Lawton St.**				**Columbia St.**				**Lawton St.**				**Columbia St.**			
Movement:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:30 AM	to 6:45 AM	0	0	0	0	0	11	0	0	0	0	1	0	0	4	0	0
6:45 AM	to 7:00 AM	0	0	0	0	0	11	1	0	0	0	0	0	0	6	0	1
7:00 AM	to 7:15 AM	0	0	0	0	0	7	0	0	0	0	0	0	0	8	0	1
7:15 AM	to 7:30 AM	0	0	0	0	0	10	0	0	1	0	0	0	0	3	0	1
7:30 AM	to 7:45 AM	0	0	0	0	0	31	0	0	0	0	2	0	0	14	0	2
7:45 AM	to 8:00 AM	0	0	0	0	0	37	0	0	1	0	2	0	0	16	0	2
8:00 AM	to 8:15 AM	0	0	0	0	0	45	1	0	0	0	3	2	1	18	0	0
8:15 AM	to 8:30 AM	0	0	0	1	0	53	4	0	2	0	1	0	2	44	0	1
8:30 AM	to 8:45 AM	0	0	0	0	0	40	0	0	1	0	2	3	0	33	0	0
8:45 AM	to 9:00 AM	0	0	0	0	0	74	1	0	4	0	4	0	1	20	0	2
9:00 AM	to 9:15 AM	0	0	0	0	0	53	0	0	0	0	5	0	1	25	0	2
9:15 AM	to 9:30 AM	0	0	0	0	0	65	0	0	4	0	3	0	4	38	0	0
PM PEAK																	
Direction:		Southbound				Westbound				Northbound				Eastbound			
Roadway:		**Lawton St.**				**Columbia St.**				**Lawton St.**				**Columbia St.**			
Movement:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM	to 4:15 PM	0	0	0	0	0	32	0	0	0	0	2	2	2	41	0	5
4:15 PM	to 4:30 PM	0	0	0	0	0	29	1	0	1	0	1	0	5	45	0	1
4:30 PM	to 4:45 PM	0	0	0	0	0	27	0	0	1	0	1	0	2	34	0	3
4:45 PM	to 5:00 PM	0	0	0	0	0	34	0	0	3	0	1	0	0	34	0	2
5:00 PM	to 5:15 PM	0	0	0	0	0	30	1	0	2	0	2	0	3	58	0	4
5:15 PM	to 5:30 PM	0	0	0	0	0	29	2	0	2	0	0	0	4	43	0	1
5:30 PM	to 5:45 PM	0	0	0	0	0	48	5	0	1	0	1	0	3	48	0	1
5:45 PM	to 6:00 PM	0	0	0	0	0	34	1	0	1	0	4	0	0	57	0	2
6:00 PM	to 6:15 PM	0	0	0	0	0	36	1	0	0	0	1	0	3	61	0	2
6:15 PM	to 6:30 PM	0	0	0	0	0	30	1	0	2	0	1	0	1	47	0	1
6:30 PM	to 6:45 PM	0	0	0	0	0	20	1	0	0	0	1	0	4	47	0	2
6:45 PM	to 7:00 PM	0	0	0	0	0	26	0	0	0	0	1	0	2	29	0	1
PEAK HOURS																	
Direction:		Southbound				Westbound				Northbound				Eastbound			
Roadway:		**Lawton St.**				**Columbia St.**				**Lawton St.**				**Columbia St.**			
Movement:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																	
8:30 AM	to 9:30 AM	0	0	0	0	0	232	1	0	9	0	14	3	6	116	0	4
PM INTERSECTION PEAK HOUR																	
5:30 PM	to 6:30 PM	0	0	0	0	0	148	8	0	4	0	7	0	7	213	0	6
AM SYSTEM PEAK HOUR																	
8:15 AM	to 9:15 AM	0	0	0	1	0	220	5	0	7	0	12	3	4	122	0	5
PM SYSTEM PEAK HOUR																	
4:45 PM	to 5:45 PM	0	0	0	0	0	141	8	0	8	0	4	7	10	183	0	8

PEAK HOUR FACTORS	Southbound				Westbound				Northbound				Eastbound			
	Lawton St.				**Columbia St.**				**Lawton St.**				**Columbia St.**			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.00	0.00	0.00	**#DIV/0!**	0.00	0.74	0.31	**0.75**	0.44	0.00	0.60	**0.59**	0.50	0.69	0.00	**0.68**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.00	0.00	0.00	**#DIV/0!**	0.00	0.73	0.40	**0.70**	0.67	0.00	0.50	**0.75**	0.63	0.79	0.00	**0.79**

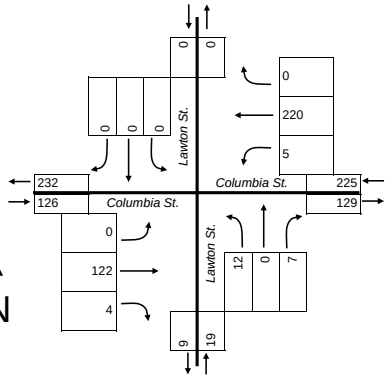
Overall AM PEAK HOUR FACTOR = **0.87** **Overall PM PEAK HOUR FACTOR** = **0.83**

AM Period Intersection Volume: 718 **PM Period Intersection Volume:** 990

AM INTERSECTION PEAK VOLUMES



AM SYSTEM PEAK VOLUMES



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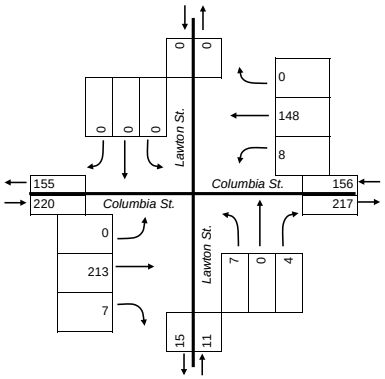
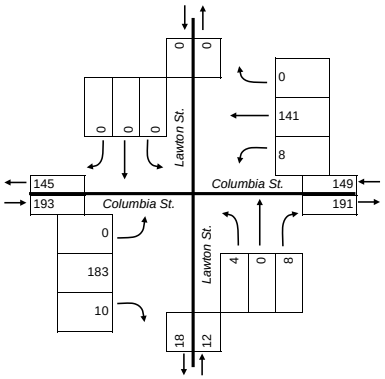
PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Date of Counts:	Tuesday, February 03, 2015		
AM Weather Conditions:	Clear	PM Weather Conditions:	Clear

Intersection: Washington Street and Columbia Street

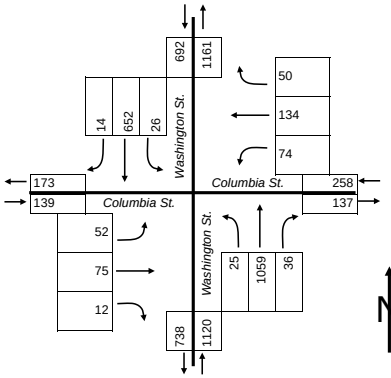
AM PEAK																
Direction:		Southbound				Westbound				Northbound				Eastbound			
Roadway:		Washington St.				Columbia St.				Washington St.				Columbia St.			
Movement:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:30 AM	to 6:45 AM	0	49	1	0	5	4	2	0	3	72	2	0	0	1	2	0
6:45 AM	to 7:00 AM	0	40	3	1	11	1	1	0	1	114	1	2	0	3	3	1
7:00 AM	to 7:15 AM	0	59	5	0	5	2	1	0	2	179	2	2	3	4	4	1
7:15 AM	to 7:30 AM	0	65	0	1	4	3	2	1	3	236	3	0	0	1	5	1
7:30 AM	to 7:45 AM	0	74	3	1	16	5	6	0	5	262	4	2	1	7	7	1
7:45 AM	to 8:00 AM	1	93	3	2	13	15	8	0	3	315	3	1	2	10	12	3
8:00 AM	to 8:15 AM	3	114	6	1	19	20	11	0	2	291	4	1	2	13	14	0
8:15 AM	to 8:30 AM	3	172	10	0	11	29	15	1	8	228	5	1	2	28	14	1
8:30 AM	to 8:45 AM	1	131	9	1	8	23	19	1	10	269	5	0	1	22	8	1
8:45 AM	to 9:00 AM	2	167	2	0	17	40	17	2	8	286	5	2	5	13	15	1
9:00 AM	to 9:15 AM	4	173	4	2	11	40	17	1	9	273	9	4	1	17	15	1
9:15 AM	to 9:30 AM	7	181	11	3	14	31	21	0	9	231	6	2	5	23	14	1
PM PEAK																	
Direction:		Southbound				Westbound				Northbound				Eastbound			
Roadway:		Washington St.				Columbia St.				Washington St.				Columbia St.			
Movement:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM	to 4:15 PM	8	248	9	1	11	18	8	1	13	148	5	1	6	49	11	1
4:15 PM	to 4:30 PM	4	287	18	1	11	23	6	0	8	176	7	2	4	21	13	1
4:30 PM	to 4:45 PM	4	284	12	0	9	9	9	3	15	196	5	1	0	19	15	0
4:45 PM	to 5:00 PM	10	274	12	0	3	15	7	2	9	202	7	2	3	21	12	0
5:00 PM	to 5:15 PM	3	241	5	0	7	26	9	0	16	237	5	2	9	26	17	0
5:15 PM	to 5:30 PM	3	301	8	2	8	16	9	0	20	212	11	0	2	32	22	0
5:30 PM	to 5:45 PM	10	303	12	3	6	28	6	3	12	231	11	1	8	28	22	2
5:45 PM	to 6:00 PM	22	303	10	3	7	23	13	2	20	232	1	1	1	29	21	0
6:00 PM	to 6:15 PM	5	257	17	3	8	27	12	0	14	209	6	2	4	43	23	1
6:15 PM	to 6:30 PM	4	247	8	4	4	23	5	1	17	181	4	2	1	26	11	3
6:30 PM	to 6:45 PM	4	215	9	1	5	12	11	1	12	208	12	3	2	38	14	0
6:45 PM	to 7:00 PM	2	179	34	1	2	15	10	0	11	166	4	3	6	15	15	2
PEAK HOURS																	
Direction:		Southbound				Westbound				Northbound				Eastbound			
Roadway:		Washington St.				Columbia St.				Washington St.				Columbia St.			
Movement:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																	
8:30 AM	to 9:30 AM	14	652	26	6	50	134	74	4	36	1059	25	8	12	75	52	4
PM INTERSECTION PEAK HOUR																	
5:15 PM	to 6:15 PM	40	1164	47	11	29	94	40	5	66	884	29	4	15	132	88	3
AM SYSTEM PEAK HOUR																	
8:15 AM	to 9:15 AM	10	643	25	3	47	132	68	5	35	1056	24	7	9	80	52	4
PM SYSTEM PEAK HOUR																	
4:45 PM	to 5:45 PM	26	1119	37	5	24	85	31	5	57	882	34	21	22	107	73	2

PEAK HOUR FACTORS	Southbound				Westbound				Northbound				Eastbound			
	Washington St.				Columbia St.				Washington St.				Columbia St.			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.63	0.93	0.63	**0.92**	0.69	0.83	0.89	**0.83**	0.88	0.92	0.67	**0.93**	0.45	0.71	0.87	**0.80**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.65	0.92	0.77	**0.91**	0.75	0.76	0.86	**0.83**	0.71	0.93	0.77	**0.94**	0.61	0.84	0.83	**0.87**

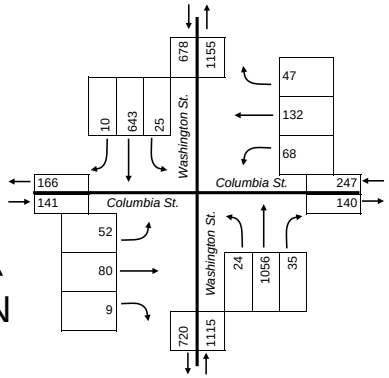
Overall AM PEAK HOUR FACTOR = **0.94** **Overall PM PEAK HOUR FACTOR** = **0.92**

AM Period Intersection Volume: 5008 **PM Period Intersection Volume:** 7025

AM INTERSECTION PEAK VOLUMES



AM SYSTEM PEAK VOLUMES



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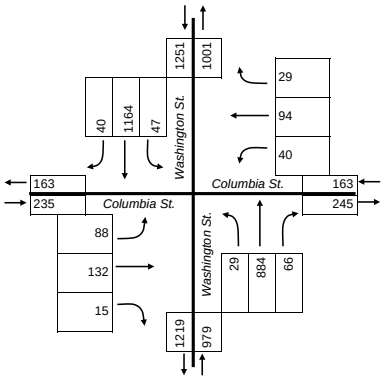
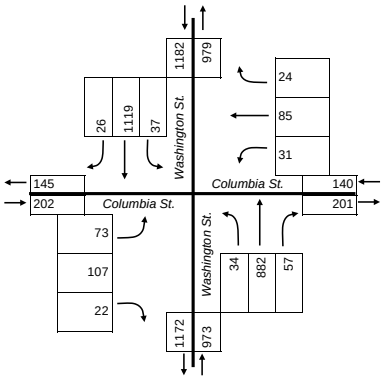
PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Intersection:			**Washington Street at Great Falls Street**															
AM PEAK																		
		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Washington St.**				**Great Falls St.**				**Washington St.**				**Great Falls St.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:30 AM	to	6:45 AM	2	52	0	0	0	0	0	0	0	79	8	0	3	0	2	0
6:45 AM	to	7:00 AM	1	35	0	0	0	0	0	0	0	114	5	0	6	0	1	0
7:00 AM	to	7:15 AM	0	62	0	0	0	0	0	0	0	188	10	0	5	0	6	0
7:15 AM	to	7:30 AM	1	66	0	0	0	0	0	0	0	242	23	0	7	0	6	1
7:30 AM	to	7:45 AM	2	76	0	0	0	0	0	0	0	287	20	0	10	0	7	0
7:45 AM	to	8:00 AM	6	95	0	2	0	0	0	1	0	317	17	0	22	0	2	1
8:00 AM	to	8:15 AM	9	114	0	1	0	0	0	0	0	307	15	0	16	0	8	1
8:15 AM	to	8:30 AM	21	175	0	1	0	0	0	1	0	255	24	0	25	0	3	0
8:30 AM	to	8:45 AM	8	165	0	2	0	0	0	1	0	301	26	0	19	0	1	0
8:45 AM	to	9:00 AM	16	151	0	0	0	0	0	1	0	303	22	0	25	0	2	0
9:00 AM	to	9:15 AM	14	168	0	2	0	1	0	0	0	298	25	0	25	0	6	0
9:15 AM	to	9:30 AM	11	175	0	3	0	0	0	0	0	236	20	0	31	3	4	0
PM PEAK																		
		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Washington St.**				**Great Falls St.**				**Washington St.**				**Great Falls St.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM	to	4:15 PM	10	263	0	1	0	0	0	2	0	166	17	0	20	0	4	0
4:15 PM	to	4:30 PM	17	281	0	0	0	0	0	1	0	185	21	0	24	0	3	0
4:30 PM	to	4:45 PM	15	280	0	0	0	0	0	0	0	214	16	0	17	0	4	0
4:45 PM	to	5:00 PM	8	268	0	1	0	0	0	0	0	217	31	0	20	0	4	0
5:00 PM	to	5:15 PM	8	271	0	0	0	0	3	0	0	251	19	0	15	0	8	0
5:15 PM	to	5:30 PM	10	293	0	2	0	0	0	0	0	241	14	0	32	0	7	0
5:30 PM	to	5:45 PM	24	298	0	2	0	0	0	2	0	240	19	0	20	0	2	0
5:45 PM	to	6:00 PM	25	284	0	1	0	0	0	0	0	233	29	0	27	0	5	0
6:00 PM	to	6:15 PM	11	272	0	5	0	0	0	0	1	222	21	0	22	0	6	0
6:15 PM	to	6:30 PM	10	243	0	3	0	0	0	1	0	202	14	0	36	0	7	0
6:30 PM	to	6:45 PM	5	229	0	1	0	0	0	0	0	216	10	0	33	0	5	0
6:45 PM	to	7:00 PM	1	223	0	1	1	0	0	0	0	173	16	0	19	0	6	0
PEAK HOURS																		
		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Washington St.**				**Great Falls St.**				**Washington St.**				**Great Falls St.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																		
8:15 AM	to	9:15 AM	59	659	0	5	0	1	0	3	0	1157	97	0	94	0	12	0
PM INTERSECTION PEAK HOUR																		
5:00 PM	to	6:00 PM	67	1146	0	5	0	0	3	2	0	965	81	0	94	0	22	0
AM SYSTEM PEAK HOUR																		
8:15 AM	to	9:15 AM	59	659	0	5	0	1	0	3	0	1157	97	0	94	0	12	0
PM SYSTEM PEAK HOUR																		
4:45 PM	to	5:45 PM	50	1130	0	5	0	0	3	2	0	949	83	0	87	0	21	0

PEAK HOUR FACTORS	Southbound				Westbound				Northbound				Eastbound			
	Washington St.				**Great Falls St.**				**Washington St.**				**Great Falls St.**			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.70	0.94	0.00	**0.92**	0.00	0.25	0.00	**0.25**	0.00	0.95	0.93	**0.96**	0.94	0.00	0.50	**0.85**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.52	0.95	0.00	**0.92**	0.00	0.00	0.25	**0.25**	0.00	0.95	0.67	**0.96**	0.68	0.00	0.66	**0.69**

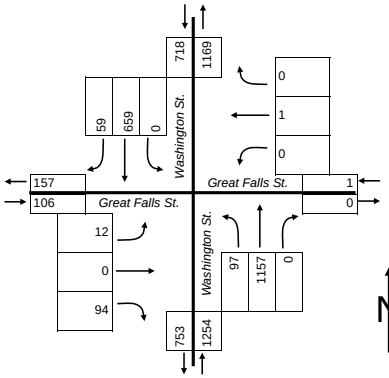
Overall AM PEAK HOUR FACTOR = **0.97** **Overall PM PEAK HOUR FACTOR** = **0.96**

AM Period Intersection Volume: 4813 **PM Period Intersection Volume:** 6487

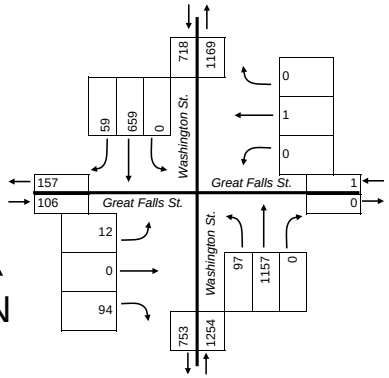
Date of Counts: Tuesday, February 03, 2015

AM Weather Conditions: Clear **PM Weather Conditions:** Clear

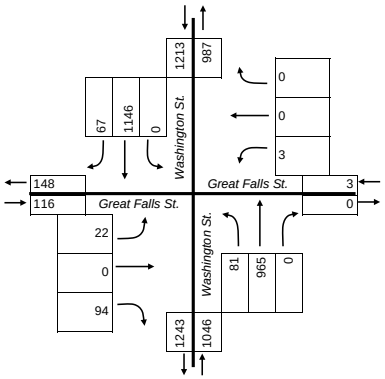
AM INTERSECTION PEAK VOLUMES



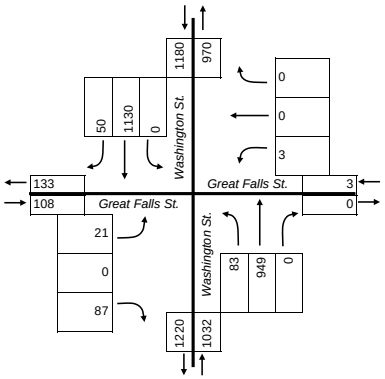
AM SYSTEM PEAK VOLUMES



PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES

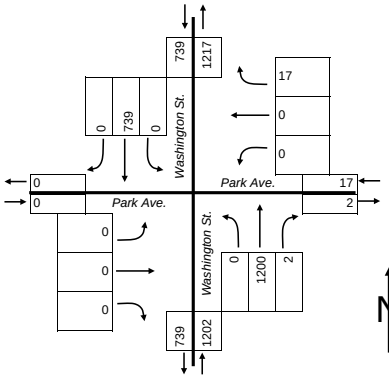


Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

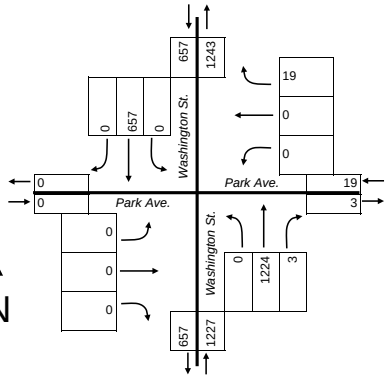
Intersection:			**Washington Street and Park Avenue**														
AM PEAK																	
		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Washington St.**				**Park Ave.**				**Washington St.**				**Park Ave.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:30 AM	to	6:45 AM	1	47	0	0	1	0	0	0	1	79	3	3	1	0	1	0
6:45 AM	to	7:00 AM	1	52	0	0	1	0	0	0	0	133	0	1	0	0	0	0
7:00 AM	to	7:15 AM	0	61	0	0	0	0	0	0	2	185	0	1	0	0	0	0
7:15 AM	to	7:30 AM	0	61	0	0	2	0	0	0	1	233	0	0	0	0	0	0
7:30 AM	to	7:45 AM	0	73	0	0	0	0	0	0	0	290	0	1	0	0	0	0
7:45 AM	to	8:00 AM	0	91	0	0	0	0	0	0	0	321	0	0	0	0	0	0
8:00 AM	to	8:15 AM	0	132	0	1	3	0	0	0	1	336	0	2	0	0	0	0
8:15 AM	to	8:30 AM	0	162	0	0	5	0	0	0	1	333	0	0	0	0	0	0
8:30 AM	to	8:45 AM	0	164	0	0	2	0	0	0	0	305	0	4	0	0	0	0
8:45 AM	to	9:00 AM	0	146	0	1	5	0	0	0	1	288	0	5	0	0	0	0
9:00 AM	to	9:15 AM	0	185	0	0	7	0	0	0	1	298	0	1	0	0	0	0
9:15 AM	to	9:30 AM	0	244	0	0	3	0	0	0	0	309	0	2	0	0	0	0
PM PEAK																		
		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Washington St.**				**Park Ave.**				**Washington St.**				**Park Ave.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM	to	4:15 PM	0	300	0	0	8	0	0	0	3	154	0	2	0	0	0	0
4:15 PM	to	4:30 PM	0	301	0	0	8	0	0	0	4	156	0	2	0	0	0	0
4:30 PM	to	4:45 PM	0	338	0	0	7	0	0	0	1	206	0	0	0	0	0	0
4:45 PM	to	5:00 PM	0	343	0	0	8	0	0	0	1	209	0	1	0	0	0	0
5:00 PM	to	5:15 PM	0	341	0	0	4	0	0	0	0	205	0	3	0	0	0	0
5:15 PM	to	5:30 PM	0	301	0	0	11	0	0	0	3	283	0	1	0	0	0	0
5:30 PM	to	5:45 PM	0	308	0	0	10	0	0	1	3	206	0	3	0	0	0	0
5:45 PM	to	6:00 PM	0	283	0	0	7	0	0	0	2	205	0	5	0	0	0	0
6:00 PM	to	6:15 PM	0	314	0	0	4	0	0	0	1	213	0	2	0	0	0	0
6:15 PM	to	6:30 PM	0	273	0	0	9	0	0	0	1	215	0	13	0	0	0	0
6:30 PM	to	6:45 PM	0	220	0	0	8	0	0	0	4	175	0	8	0	0	0	0
6:45 PM	to	7:00 PM	2	167	0	0	8	32	0	4	1	129	0	0	0	51	0	0
PEAK HOURS																		
		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Washington St.**				**Park Ave.**				**Washington St.**				**Park Ave.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																		
8:30 AM	to	9:30 AM	0	739	0	1	17	0	0	0	2	1200	0	12	0	0	0	0
PM INTERSECTION PEAK HOUR																		
4:30 PM	to	5:30 PM	0	1323	0	0	30	0	0	0	5	903	0	5	0	0	0	0
AM SYSTEM PEAK HOUR																		
8:15 AM	to	9:15 AM	0	657	0	1	19	0	0	0	3	1224	0	10	0	0	0	0
PM SYSTEM PEAK HOUR																		
4:45 PM	to	5:45 PM	0	1293	0	0	33	0	0	1	7	903	0	21	0	0	0	0
PEAK HOUR FACTORS			Southbound				Westbound				Northbound				Eastbound			
			Washington St.				**Park Ave.**				**Washington St.**				**Park Ave.**			
AM Peak Hour			Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR			0.00	0.89	0.00	**0.89**	0.68	0.00	0.00	**0.68**	0.75	0.92	0.00	**0.92**	0.00	0.00	0.00	**#DIV/0!**
			Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR			0.00	0.94	0.00	**0.94**	0.75	0.00	0.00	**0.75**	0.58	0.80	0.00	**0.80**	0.00	0.00	0.00	**#DIV/0!**
Overall AM PEAK HOUR FACTOR						=	**0.95**				**Overall PM PEAK HOUR FACTOR**						=	**0.93**
AM Period Intersection Volume:			4572				**PM Period Intersection Volume:**				6046							

Date of Counts:	Thursday, January 29, 2015		
AM Weather Conditions:	Clear	**PM Weather Conditions:**	Clear

AM INTERSECTION PEAK VOLUMES

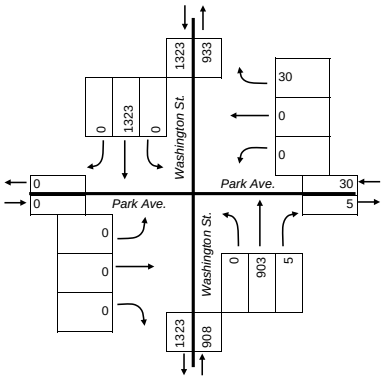


AM SYSTEM PEAK VOLUMES

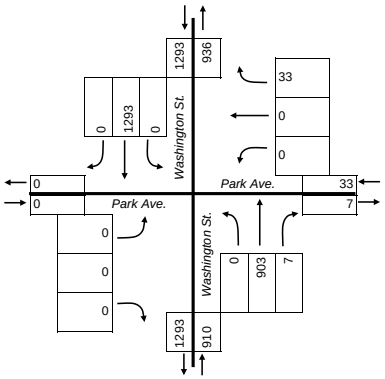


N

PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Date of Counts:	Thursday, January 29, 2015		
AM Weather Conditions:	Clear	PM Weather Conditions:	Clear

Intersection: Washington Street and Site Entrance North

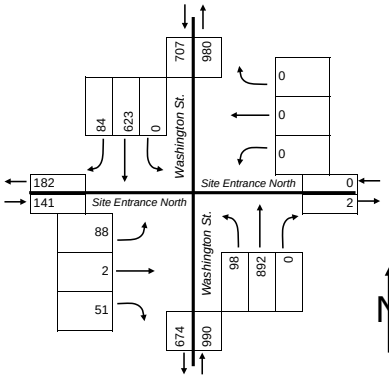
AM PEAK																	
		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	Washington St.				Site Entrance North				Washington St.				Site Entrance North			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:30 AM	to	6:45 AM	1	43	0	0	0	0	0	0	0	75	3	0	2	0	2	0
6:45 AM	to	7:00 AM	5	53	0	0	0	0	0	0	0	124	6	0	1	0	5	0
7:00 AM	to	7:15 AM	5	59	0	1	1	0	0	0	0	185	1	0	2	0	7	0
7:15 AM	to	7:30 AM	10	59	0	1	0	0	0	1	0	223	8	0	1	0	11	0
7:30 AM	to	7:45 AM	9	68	0	0	0	0	0	2	0	270	6	0	5	0	20	0
7:45 AM	to	8:00 AM	13	77	0	2	0	0	0	0	0	283	14	0	3	0	11	0
8:00 AM	to	8:15 AM	17	118	0	2	0	1	0	0	0	285	17	0	7	0	18	1
8:15 AM	to	8:30 AM	21	122	0	2	0	0	0	0	0	229	17	0	14	0	20	0
8:30 AM	to	8:45 AM	8	126	0	2	0	0	0	0	0	179	25	0	3	0	16	0
8:45 AM	to	9:00 AM	26	135	0	1	0	0	0	0	0	227	27	0	9	1	25	2
9:00 AM	to	9:15 AM	29	148	0	2	0	0	0	1	0	227	28	0	15	1	31	0
9:15 AM	to	9:30 AM	21	214	0	4	0	0	0	1	0	259	18	0	24	0	16	0
PM PEAK																		
		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	Washington St.				Site Entrance North				Washington St.				Site Entrance North			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM	to	4:15 PM	12	152	0	2	0	0	0	0	0	70	8	0	18	0	17	0
4:15 PM	to	4:30 PM	15	226	0	3	0	0	0	0	0	123	7	0	26	0	26	0
4:30 PM	to	4:45 PM	31	279	0	3	0	0	0	0	0	169	16	0	30	0	53	2
4:45 PM	to	5:00 PM	17	270	0	3	0	0	0	0	0	171	9	0	29	0	35	4
5:00 PM	to	5:15 PM	13	255	0	13	0	0	0	0	0	172	12	0	32	0	48	5
5:15 PM	to	5:30 PM	22	248	0	3	0	0	0	0	0	212	11	0	28	0	44	5
5:30 PM	to	5:45 PM	17	233	0	14	0	0	0	0	0	170	4	0	18	0	40	3
5:45 PM	to	6:00 PM	25	245	0	3	0	0	0	0	0	159	11	0	22	0	29	1
6:00 PM	to	6:15 PM	10	250	0	4	0	0	0	0	0	187	6	0	20	0	37	3
6:15 PM	to	6:30 PM	16	214	0	4	0	0	0	0	0	176	13	0	7	2	32	3
6:30 PM	to	6:45 PM	9	160	0	2	0	0	0	0	0	129	5	0	12	0	26	3
6:45 PM	to	7:00 PM	10	162	0	0	0	0	0	0	0	130	8	0	11	0	23	1
PEAK HOURS																		
		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	Washington St.				Site Entrance North				Washington St.				Site Entrance North			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																		
8:30 AM	to	9:30 AM	84	623	0	9	0	0	0	2	0	892	98	0	51	2	88	2
PM INTERSECTION PEAK HOUR																		
4:30 PM	to	5:30 PM	83	1052	0	22	0	0	0	0	0	724	48	0	119	0	180	16
AM SYSTEM PEAK HOUR																		
8:15 AM	to	9:15 AM	84	531	0	7	0	0	0	1	0	862	97	0	41	2	92	2
PM SYSTEM PEAK HOUR																		
4:45 PM	to	5:45 PM	69	1006	0	33	0	0	0	0	0	725	36	0	107	0	167	17

PEAK HOUR FACTORS	Southbound				Westbound				Northbound				Eastbound			
	Washington St.				Site Entrance North				Washington St.				Site Entrance North			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.72	0.90	0.00	**0.87**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.94	0.87	**0.94**	0.68	0.50	0.74	**0.72**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.78	0.93	0.00	**0.94**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.85	0.75	**0.85**	0.84	0.00	0.87	**0.86**

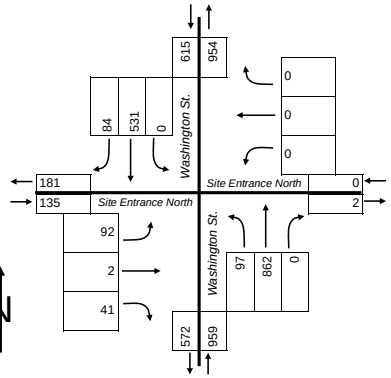
Overall AM PEAK HOUR FACTOR = **0.89** **Overall PM PEAK HOUR FACTOR** = **0.93**

AM Period Intersection Volume: 4395 **PM Period Intersection Volume:** 5534

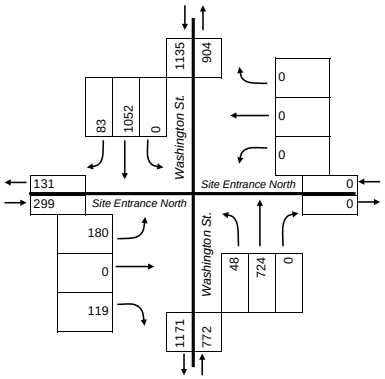
AM INTERSECTION PEAK VOLUMES



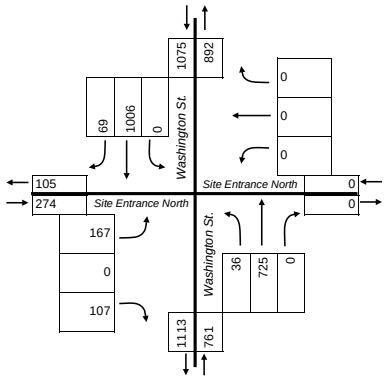
AM SYSTEM PEAK VOLUMES



PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Intersection: Washington Street and Site Entrance South

	Southbound				Westbound				Northbound				Eastbound			
Roadway:	Washington St.				Site Entrance South				Washington St.				Site Entrance South			
AM PEAK Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
6:30 AM to 6:45 AM	1	52	0	0	1	0	0	0	0	76	0	3	0	1	0	0
6:45 AM to 7:00 AM	0	50	0	0	0	0	0	0	0	121	0	1	0	0	0	0
7:00 AM to 7:15 AM	0	66	0	0	1	0	0	0	0	189	0	1	0	0	0	0
7:15 AM to 7:30 AM	0	54	0	0	0	0	0	0	0	213	0	0	0	0	0	0
7:30 AM to 7:45 AM	3	58	0	0	2	0	0	0	0	264	0	0	2	0	0	0
7:45 AM to 8:00 AM	0	95	0	0	1	0	0	0	1	317	0	0	3	0	0	0
8:00 AM to 8:15 AM	0	127	0	1	0	0	0	0	0	340	0	2	0	0	0	0
8:15 AM to 8:30 AM	2	157	0	0	4	0	0	0	1	321	0	0	4	0	0	0
8:30 AM to 8:45 AM	0	164	0	0	2	0	0	0	1	267	0	3	0	0	0	0
8:45 AM to 9:00 AM	0	149	0	3	3	0	0	0	2	284	0	5	4	0	0	0
9:00 AM to 9:15 AM	0	174	0	0	1	0	0	0	1	286	0	2	3	0	0	0
9:15 AM to 9:30 AM	0	170	0	0	2	0	0	0	2	282	0	0	2	0	0	0
PM PEAK Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM to 4:15 PM	4	281	0	0	5	0	0	0	6	146	0	3	3	0	0	0
4:15 PM to 4:30 PM	1	276	0	0	3	0	0	0	1	141	0	4	6	0	0	0
4:30 PM to 4:45 PM	0	308	0	0	3	0	0	0	2	184	0	2	1	0	0	0
4:45 PM to 5:00 PM	4	282	0	3	2	0	0	0	1	201	0	1	4	0	0	0
5:00 PM to 5:15 PM	1	306	0	1	2	0	0	0	3	192	0	1	5	0	0	0
5:15 PM to 5:30 PM	1	271	0	2	5	0	0	0	4	229	0	3	2	0	0	0
5:30 PM to 5:45 PM	4	277	0	0	2	0	0	0	3	189	0	0	2	0	0	0
5:45 PM to 6:00 PM	1	273	0	0	3	0	0	0	6	169	0	3	2	0	0	0
6:00 PM to 6:15 PM	0	231	0	0	2	0	0	0	1	170	0	2	0	0	0	0
6:15 PM to 6:30 PM	4	271	0	1	2	0	0	0	0	180	0	5	3	0	0	0
6:30 PM to 6:45 PM	2	163	0	0	0	0	0	0	2	163	0	6	9	0	0	0
6:45 PM to 7:00 PM	1	189	0	0	2	0	0	0	1	137	0	1	4	0	0	0
PEAK HOURS Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																
8:00 AM to 9:00 AM	2	597	0	4	9	0	0	0	4	1212	0	10	8	0	0	0
PM INTERSECTION PEAK HOUR																
4:30 PM to 5:30 PM	6	1167	0	6	12	0	0	0	10	806	0	7	12	0	0	0
AM SYSTEM PEAK HOUR																
8:15 AM to 9:15 AM	2	644	0	3	10	0	0	0	5	1158	0	10	11	0	0	0
PM SYSTEM PEAK HOUR																
4:45 PM to 5:45 PM	10	1136	0	6	11	0	0	0	11	811	0	23	13	0	0	0

PEAK HOUR FACTORS	Southbound				Westbound				Northbound				Eastbound			
	Washington St.				Site Entrance South				Washington St.				Site Entrance South			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.25	0.93	0.00	**0.93**	0.63	0.00	0.00	**0.63**	0.63	0.90	0.00	**0.90**	0.69	0.00	0.00	**0.69**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.63	0.93	0.00	**0.93**	0.55	0.00	0.00	**0.55**	0.69	0.89	0.00	**0.88**	0.65	0.00	0.00	**0.65**

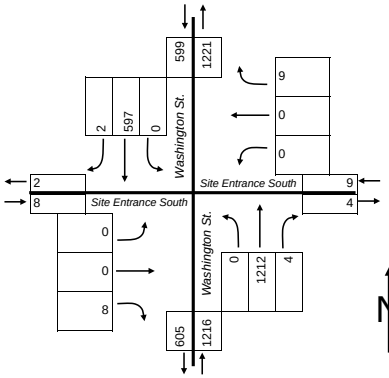
Overall AM PEAK HOUR FACTOR = **0.94** **Overall PM PEAK HOUR FACTOR** = **0.97**

AM Period Intersection Volume: 4326 **PM Period Intersection Volume:** 5354

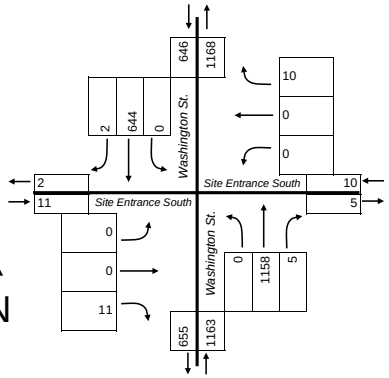
Date of Counts: Thursday, January 29, 2015

AM Weather Conditions: Clear **PM Weather Conditions:** Clear

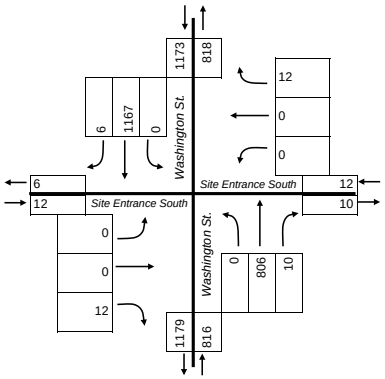
AM INTERSECTION PEAK VOLUMES



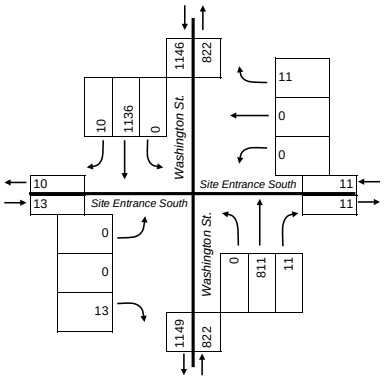
AM SYSTEM PEAK VOLUMES



PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Gorove/Slade Associates

Project Name :	Gum Spring Village
Project # :	0
Location	Loudoun County
Data Source:	Gorove/Slade Associates, Inc.

Intersection: Great Falls Street at Washington Street

AM PEAK

Time	Southbound Washington St. Right	Thru	Left	Peds	Westbound No Approach Right	Thru	Left	Peds	Northbound Washington St. Right	Thru	Left	Peds	Eastbound Great Falls St. Right	Thru	Left	Peds
11:00 AM to 11:15 AM	7	200	0	4	0	0	0	0	0	212	33	0	25	0	6	0
11:15 AM to 11:30 AM	8	209	0	1	0	0	0	0	0	183	19	12	26	0	11	0
11:30 AM to 11:45 AM	11	197	0	1	0	0	0	0	0	192	22	1	27	0	16	0
11:45 AM to 12:00 PM	4	205	0	2	0	0	0	0	0	172	20	2	29	0	6	0
12:00 PM to 12:15 PM	7	187	0	3	0	0	0	0	0	185	29	2	32	0	11	0
12:15 PM to 12:30 PM	8	196	0	0	0	0	0	0	0	171	13	0	42	0	11	0
12:30 PM to 12:45 PM	10	199	0	0	0	0	0	0	0	209	20	4	27	0	5	0
12:45 PM to 1:00 PM	8	219	0	4	0	0	0	0	0	190	18	6	24	0	5	2
1:00 PM to 1:15 PM	3	187	0	4	0	0	0	0	0	193	27	3	27	0	9	0
1:15 PM to 1:30 PM	4	180	0	5	0	0	0	0	1	194	19	2	19	0	7	0
1:30 PM to 1:45 PM	4	191	0	0	0	0	0	0	0	160	17	0	26	0	9	0
1:45 PM to 2:00 PM	4	191	0	5	0	0	0	0	0	197	26	0	15	0	8	1

PM PEAK

Time	Southbound Washington St. Right	Thru	Left	Peds	Westbound No Approach Right	Thru	Left	Peds	Northbound Washington St. Right	Thru	Left	Peds	Eastbound Great Falls St. Right	Thru	Left	Peds
4:00 PM to 4:15 PM																
4:15 PM to 4:30 PM																
4:30 PM to 4:45 PM																
4:45 PM to 5:00 PM																
5:00 PM to 5:15 PM																
5:15 PM to 5:30 PM																
5:30 PM to 5:45 PM																
5:45 PM to 6:00 PM																
6:00 PM to 6:15 PM																
6:15 PM to 6:30 PM																
6:30 PM to 6:45 PM																
6:45 PM to 7:00 PM																

PEAK HOURS

Time	Southbound Washington St. Right	Thru	Left	Peds	Westbound No Approach Right	Thru	Left	Peds	Northbound Washington St. Right	Thru	Left	Peds	Eastbound Great Falls St. Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																
11:00 AM to 12:00 PM	30	811	0	8	0	0	0	0	0	759	94	15	107	0	39	0
PM INTERSECTION PEAK HOUR																
4:00 PM to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM SYSTEM PEAK HOUR											13					
7:15 AM to 8:15 AM	15	749	0	14	0	0	0	0	1	744	89	5	87	0	33	1
PM SYSTEM PEAK HOUR																
#REF! to #REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!

PEAK HOUR FACTORS

	Southbound Washington St. Right	Thru	Left	Approach	Westbound No Approach Right	Thru	Left	Approach	Northbound Washington St. Right	Thru	Left	Approach	Eastbound Great Falls St. Right	Thru	Left	Approach
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	#REF!	#REF!	#REF!	**#REF!**	#REF!	#REF!	#REF!	**#REF!**	#REF!	#REF!	#REF!	**#REF!**	#REF!	#REF!	#REF!	**#REF!**

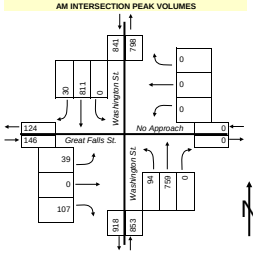
Overall AM PEAK HOUR FACTOR = **#DIV/0!** **Overall PM PEAK HOUR FACTOR** = **#REF!**

AM Period Intersection Volume: 5384 **PM Period Intersection Volume:** 0

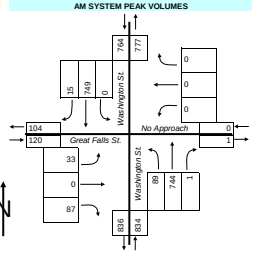
DATA COLLECTION NOTES :

Date of Counts: Saturday, May 30, 2015
AM Weather Conditions: Clear
PM Weather Conditions: Clear

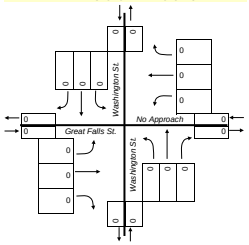
AM INTERSECTION PEAK VOLUMES



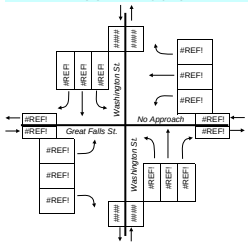
AM SYSTEM PEAK VOLUMES



PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES

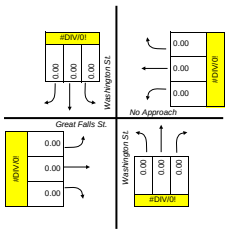


Gorove/Slade Associates

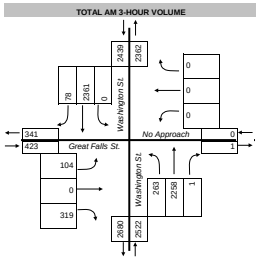
Project Name	Gum Spring Village
Project Number	0
Project Location	Loudoun County
Data Source:	Gorove/Slade Associates, I

Intersection: Great Falls Street at Washington Street

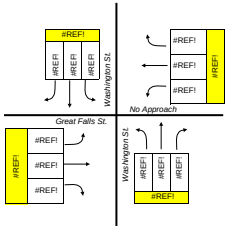
AM PHF FOR SYSTEM PEAK HOUR



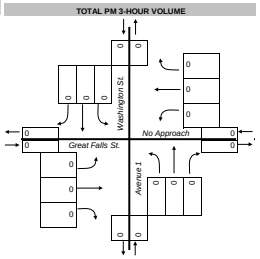
TOTAL AM 3-HOUR VOLUME



PM PHF FOR SYSTEM PEAK HOUR



TOTAL PM 3-HOUR VOLUME



Traffic Volume Departing Intersection (By Approach)

	Southbound Washington St. Totals Interval	Hourly	Westbound No Approach Totals Interval	Hourly	Northbound Washington St. Totals Interval	Hourly	Eastbound Great Falls St. Totals Interval	Hourly
11:00 AM	218	798	0	0	225	918	40	124
11:15 AM	194		0		235		27	
11:30 AM	208		0		224		33	
11:45 AM	178		0		234		24	
12:00 PM	196	787	0	0	219	926	36	113
12:15 PM	182		0		238		21	
12:30 PM	214		0		226		30	
12:45 PM	195		0		243		26	
1:00 PM	202	777	0	1	214	836	30	104
1:15 PM	201		1		199		23	
1:30 PM	169		0		217		21	
1:45 PM	205		0		206		30	
	Southbound Interval	Hourly	Westbound Interval	Hourly	Northbound Interval	Hourly	Eastbound Interval	Hourly
4:00 PM	0	0	0	0	0	0	0	0
4:15 PM	0		0		0		0	
4:30 PM	0		0		0		0	
4:45 PM	0		0		0		0	
5:00 PM	0	0	0	0	0	0	0	0
5:15 PM	0		0		0		0	
5:30 PM	0		0		0		0	
5:45 PM	0		0		0		0	
6:00 PM	0	0	0	0	0	0	0	0
6:15 PM	0		0		0		0	
6:30 PM	0		0		0		0	
6:45 PM	0		0		0		0	

1	6	11	16	21
2	7	12	17	22
3	8	13	18	23
4	9	14	19	24
5	10	15	20	25

Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Intersection: Broad Street and Washington Street

	Date of Counts:	Saturday, January 31, 2015		
	AM Weather Conditions:	Clear	PM Weather Conditions:	Clear

AM PEAK

Time	Southbound Right	Southbound Thru	Southbound Left	Southbound Peds	Westbound Right	Westbound Thru	Westbound Left	Westbound Peds	Northbound Right	Northbound Thru	Northbound Left	Northbound Peds	Eastbound Right	Eastbound Thru	Eastbound Left	Eastbound Peds
	Washington St.				Broad St.				Washington St.				Broad St.			
11:00 AM to 11:15 AM	27	106	32	3	19	79	10	3	7	80	20	0	11	98	24	2
11:15 AM to 11:30 AM	33	122	39	1	17	124	9	7	5	103	26	0	21	137	40	3
11:30 AM to 11:45 AM	52	127	25	3	16	129	17	6	10	116	38	1	24	107	34	3
11:45 AM to 12:00 PM	41	123	26	1	10	163	17	2	6	108	21	2	18	134	36	5
12:00 PM to 12:15 PM	25	139	53	4	4	193	13	1	6	123	35	2	18	131	34	4
12:15 PM to 12:30 PM	28	106	45	1	11	127	22	3	8	137	27	3	18	137	40	6
12:30 PM to 12:45 PM	25	120	62	0	20	139	9	1	6	151	25	2	17	120	31	2
12:45 PM to 1:00 PM	44	132	62	0	4	130	20	2	7	164	21	0	15	140	34	1
1:00 PM to 1:15 PM	36	111	57	3	21	142	18	5	6	134	28	0	22	141	40	2
1:15 PM to 1:30 PM	38	123	33	2	9	137	12	2	10	120	29	3	19	156	48	5
1:30 PM to 1:45 PM	46	72	31	0	1	124	8	0	9	125	20	3	17	137	37	4
1:45 PM to 2:00 PM	36	126	50	3	8	132	27	4	14	123	21	1	22	136	38	5

PM PEAK

Time	Southbound Right	Southbound Thru	Southbound Left	Southbound Peds	Westbound Right	Westbound Thru	Westbound Left	Westbound Peds	Northbound Right	Northbound Thru	Northbound Left	Northbound Peds	Eastbound Right	Eastbound Thru	Eastbound Left	Eastbound Peds
	Washington St.				Broad St.				Washington St.				Broad St.			
4:00 PM to 4:15 PM																
4:15 PM to 4:30 PM																
4:30 PM to 4:45 PM																
4:45 PM to 5:00 PM																
5:00 PM to 5:15 PM																
5:15 PM to 5:30 PM																
5:30 PM to 5:45 PM																
5:45 PM to 6:00 PM																
6:00 PM to 6:15 PM																
6:15 PM to 6:30 PM																
6:30 PM to 6:45 PM																
6:45 PM to 7:00 PM																

PEAK HOURS

Time	Southbound Right	Southbound Thru	Southbound Left	Southbound Peds	Westbound Right	Westbound Thru	Westbound Left	Westbound Peds	Northbound Right	Northbound Thru	Northbound Left	Northbound Peds	Eastbound Right	Eastbound Thru	Eastbound Left	Eastbound Peds
	Washington St.				Broad St.				Washington St.				Broad St.			
AM INTERSECTION PEAK HOUR																
12:30 PM to 1:30 PM	143	486	214	5	54	548	59	10	29	569	103	5	73	557	153	10
PM INTERSECTION PEAK HOUR																
4:00 PM to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM SYSTEM PEAK HOUR																
12:15 PM to 1:15 PM	133	469	226	4	56	538	69	11	27	586	101	5	72	538	145	11
PM SYSTEM PEAK HOUR																
4:00 PM to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

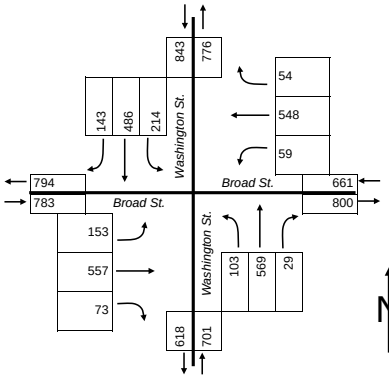
PEAK HOUR FACTORS

	Southbound Right	Southbound Thru	Southbound Left	Southbound Approach	Westbound Right	Westbound Thru	Westbound Left	Westbound Approach	Northbound Right	Northbound Thru	Northbound Left	Northbound Approach	Eastbound Right	Eastbound Thru	Eastbound Left	Eastbound Approach
	Washington St.				Broad St.				Washington St.				Broad St.			
AM PEAK HOUR	0.76	0.89	0.91	**0.87**	0.67	0.95	0.78	**0.92**	0.84	0.89	0.90	**0.93**	0.82	0.95	0.91	**0.93**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**

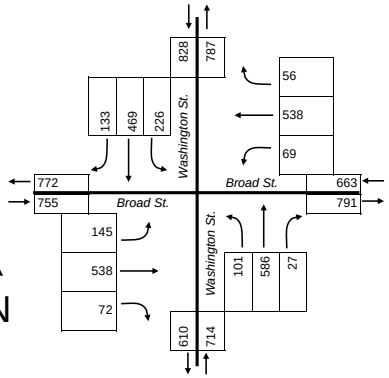
Overall AM PEAK HOUR FACTOR = **0.96** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

AM Period Intersection Volume: 8415 **PM Period Intersection Volume:** 0

AM INTERSECTION PEAK VOLUMES



AM SYSTEM PEAK VOLUMES



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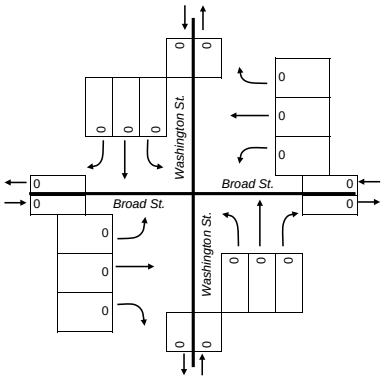
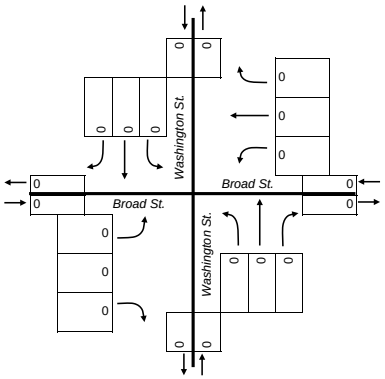
PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Intersection: Broad Street at Site Entrance

AM PEAK																
Direction:		Southbound				Westbound				Northbound				Eastbound			
Roadway:		**Parking**				**Broad St.**				**Parking**				**Broad St.**			
Movement:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
11:00 AM	to 11:15 AM	3	0	2	0	3	159	0	4	0	0	0	0	0	185	3	0
11:15 AM	to 11:30 AM	3	0	0	0	1	153	2	5	0	0	1	0	0	168	1	3
11:30 AM	to 11:45 AM	3	0	0	0	3	198	0	2	0	0	0	0	0	179	2	1
11:45 AM	to 12:00 PM	2	0	0	1	1	213	0	3	0	0	0	0	0	177	4	0
12:00 PM	to 12:15 PM	1	0	2	0	2	179	0	2	0	0	0	0	0	193	3	3
12:15 PM	to 12:30 PM	5	0	1	0	3	160	1	0	0	0	0	0	0	195	7	1
12:30 PM	to 12:45 PM	1	0	0	0	4	178	0	4	1	0	1	0	1	188	2	4
12:45 PM	to 1:00 PM	5	0	0	0	3	163	1	0	1	0	0	0	0	204	6	2
1:00 PM	to 1:15 PM	4	0	1	0	1	173	1	0	0	1	1	0	3	233	9	0
1:15 PM	to 1:30 PM	3	0	2	0	2	167	0	4	1	0	1	0	4	196	0	1
1:30 PM	to 1:45 PM	4	0	0	0	2	175	1	0	1	0	1	0	1	182	1	0
1:45 PM	to 2:00 PM	5	0	1	0	2	182	3	2	2	0	0	0	12	170	4	0
PM PEAK																	
Direction:		Southbound				Westbound				Northbound				Eastbound			
Roadway:		**Parking**				**Broad St.**				**Parking**				**Broad St.**			
Movement:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM	to 4:15 PM																
4:15 PM	to 4:30 PM																
4:30 PM	to 4:45 PM																
4:45 PM	to 5:00 PM																
5:00 PM	to 5:15 PM																
5:15 PM	to 5:30 PM																
5:30 PM	to 5:45 PM																
5:45 PM	to 6:00 PM																
6:00 PM	to 6:15 PM																
6:15 PM	to 6:30 PM																
6:30 PM	to 6:45 PM																
6:45 PM	to 7:00 PM																
PEAK HOURS																	
Direction:		Southbound				Westbound				Northbound				Eastbound			
Roadway:		**Parking**				**Broad St.**				**Parking**				**Broad St.**			
Movement:		Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																	
12:30 PM	to 1:30 PM	13	0	3	0	10	681	2	8	3	1	3	0	8	821	17	7
PM INTERSECTION PEAK HOUR																	
4:00 PM	to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM SYSTEM PEAK HOUR																	
12:15 PM	to 1:15 PM	15	0	2	0	11	674	3	4	2	1	2	0	4	820	24	7
PM SYSTEM PEAK HOUR																	
4:00 PM	to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PEAK HOUR FACTORS	Southbound				Westbound				Northbound				Eastbound			
	Parking				**Broad St.**				**Parking**				**Broad St.**			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.75	0.00	0.50	**0.71**	0.69	0.95	0.75	**0.95**	0.50	0.25	0.50	**0.63**	0.33	0.88	0.67	**0.87**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**

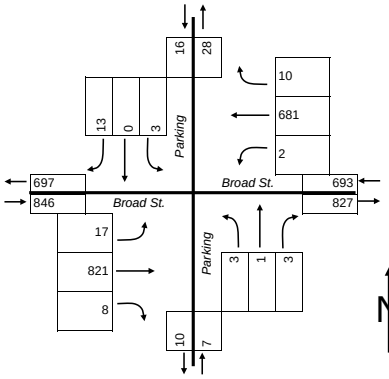
Overall AM PEAK HOUR FACTOR = **0.91** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

AM Period Intersection Volume: 4529 **PM Period Intersection Volume:** 0

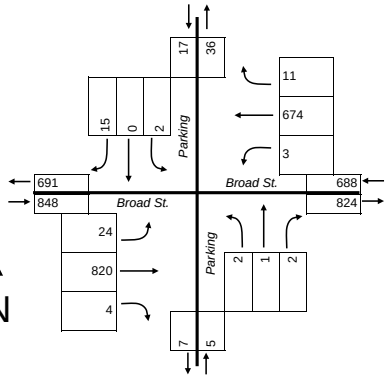
Date of Counts:

AM Weather Conditions: Clear **PM Weather Conditions:** Clear

AM INTERSECTION PEAK VOLUMES



AM SYSTEM PEAK VOLUMES



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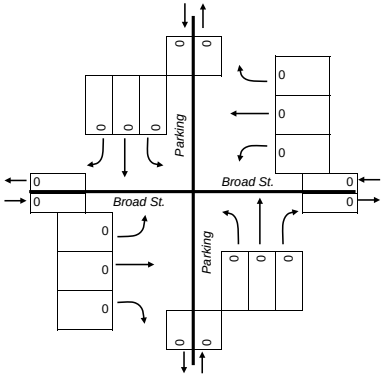
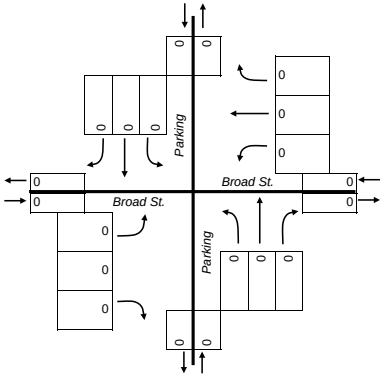
PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Date of Counts: Saturday, January 31, 2015

AM Weather Conditions: Clear

PM Weather Conditions: Clear

Intersection: **Broad Street at Lawton Street**

AM PEAK

		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Lawton St.**				**Broad St.**				**Lawton St.**				**Broad St.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
11:00 AM	to	11:15 AM	1	0	0	0	1	164	0	3	0	0	0	0	0	190	3	0
11:15 AM	to	11:30 AM	1	0	0	0	2	162	0	5	0	0	0	0	0	176	0	2
11:30 AM	to	11:45 AM	2	0	0	0	1	203	0	2	0	0	0	0	0	178	1	2
11:45 AM	to	12:00 PM	0	0	0	0	0	219	0	1	0	0	0	0	0	181	0	0
12:00 PM	to	12:15 PM	2	0	0	0	1	184	0	4	0	0	0	0	0	193	2	3
12:15 PM	to	12:30 PM	2	0	0	0	1	168	0	0	0	0	0	0	0	191	1	1
12:30 PM	to	12:45 PM	2	0	0	0	2	183	0	2	0	0	0	0	0	194	0	0
12:45 PM	to	1:00 PM	2	0	0	0	0	171	0	2	0	0	0	0	0	202	0	0
1:00 PM	to	1:15 PM	3	0	0	0	1	169	0	2	0	0	0	0	0	237	4	0
1:15 PM	to	1:30 PM	1	0	1	0	1	170	0	2	0	0	0	0	0	212	0	0
1:30 PM	to	1:45 PM	1	0	1	0	1	181	0	0	0	0	0	0	0	187	1	1
1:45 PM	to	2:00 PM	2	0	1	0	1	195	0	2	0	0	0	0	0	179	6	0

PM PEAK

		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Lawton St.**				**Broad St.**				**Lawton St.**				**Broad St.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM	to	4:15 PM																
4:15 PM	to	4:30 PM																
4:30 PM	to	4:45 PM																
4:45 PM	to	5:00 PM																
5:00 PM	to	5:15 PM																
5:15 PM	to	5:30 PM																
5:30 PM	to	5:45 PM																
5:45 PM	to	6:00 PM																
6:00 PM	to	6:15 PM																
6:15 PM	to	6:30 PM																
6:30 PM	to	6:45 PM																
6:45 PM	to	7:00 PM																

PEAK HOURS

		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Lawton St.**				**Broad St.**				**Lawton St.**				**Broad St.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																		
12:30 PM	to	1:30 PM	8	0	1	0	4	693	0	8	0	0	0	0	0	845	4	0
PM INTERSECTION PEAK HOUR																		
4:00 PM	to	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM SYSTEM PEAK HOUR																		
12:15 PM	to	1:15 PM	9	0	0	0	4	691	0	6	0	0	0	0	0	824	5	1
PM SYSTEM PEAK HOUR																		
4:00 PM	to	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

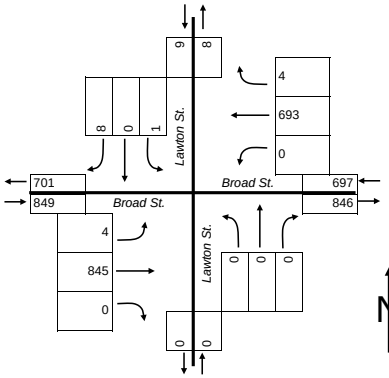
PEAK HOUR FACTORS

	Southbound				Westbound				Northbound				Eastbound			
	Lawton St.				**Broad St.**				**Lawton St.**				**Broad St.**			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.75	0.00	0.00	**0.75**	0.50	0.94	0.00	**0.94**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.87	0.31	**0.86**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**

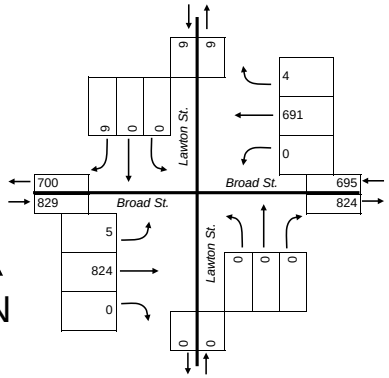
Overall AM PEAK HOUR FACTOR = **0.93** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

AM Period Intersection Volume: 4541 **PM Period Intersection Volume:** 0

AM INTERSECTION PEAK VOLUMES



AM SYSTEM PEAK VOLUMES



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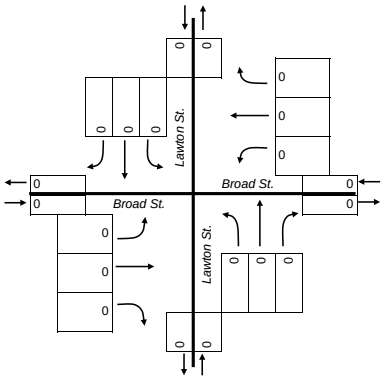
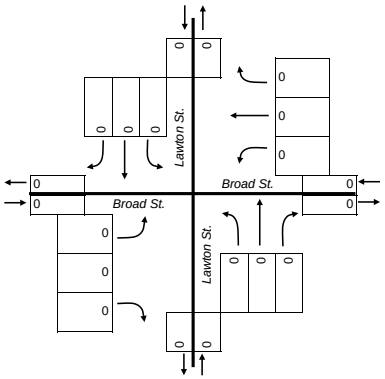
PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Date of Counts: Saturday, February 07, 2015

AM Weather Conditions: Clear

PM Weather Conditions: Clear

Intersection: **Lawton Street at Columbia Street**

AM PEAK

		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Lawton St.**				**Columbia St.**				**Lawton St.**				**Columbia St.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
11:00 AM	to	11:15 AM	0	0	0	0	0	26	0	0	0	0	1	0	0	33	0	7
11:15 AM	to	11:30 AM	0	0	0	0	0	31	3	0	0	0	0	0	0	34	0	1
11:30 AM	to	11:45 AM	0	0	0	0	0	30	1	0	0	0	2	0	0	26	1	2
11:45 AM	to	12:00 PM	0	0	0	0	0	26	0	0	1	0	0	0	0	21	0	1
12:00 PM	to	12:15 PM	0	0	0	0	2	31	1	0	0	0	1	0	1	25	0	1
12:15 PM	to	12:30 PM	0	0	0	1	0	34	1	0	0	0	1	0	3	25	0	1
12:30 PM	to	12:45 PM	0	0	0	0	0	31	1	0	1	0	0	0	1	21	0	1
12:45 PM	to	1:00 PM	0	0	0	1	0	30	0	0	1	0	0	0	2	27	0	2
1:00 PM	to	1:15 PM	1	0	0	0	0	30	1	0	2	0	0	0	2	30	0	0
1:15 PM	to	1:30 PM	1	0	0	1	0	20	0	0	1	0	0	0	1	25	0	3
1:30 PM	to	1:45 PM	0	0	0	0	0	17	0	0	1	0	1	0	1	27	0	0
1:45 PM	to	2:00 PM	1	0	0	0	0	22	0	0	0	0	1	0	2	41	0	0

PM PEAK

		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Lawton St.**				**Columbia St.**				**Lawton St.**				**Columbia St.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM	to	4:15 PM																
4:15 PM	to	4:30 PM																
4:30 PM	to	4:45 PM																
4:45 PM	to	5:00 PM																
5:00 PM	to	5:15 PM																
5:15 PM	to	5:30 PM																
5:30 PM	to	5:45 PM																
5:45 PM	to	6:00 PM																
6:00 PM	to	6:15 PM																
6:15 PM	to	6:30 PM																
6:30 PM	to	6:45 PM																
6:45 PM	to	7:00 PM																

PEAK HOURS

		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Lawton St.**				**Columbia St.**				**Lawton St.**				**Columbia St.**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																		
12:15 PM	to	1:15 PM	1	0	0	2	0	125	3	0	4	0	1	0	8	103	0	4
PM INTERSECTION PEAK HOUR																		
4:00 PM	to	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM SYSTEM PEAK HOUR																		
12:15 PM	to	1:15 PM	1	0	0	2	0	125	3	0	4	0	1	0	8	103	0	4
PM SYSTEM PEAK HOUR																		
4:00 PM	to	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

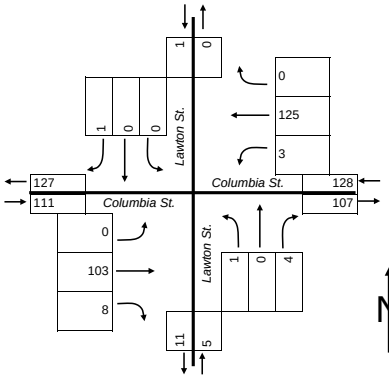
PEAK HOUR FACTORS

	Southbound				Westbound				Northbound				Eastbound			
	Lawton St.				**Columbia St.**				**Lawton St.**				**Columbia St.**			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.25	0.00	0.00	**0.25**	0.00	0.92	0.75	**0.91**	0.50	0.00	0.25	**0.63**	0.67	0.86	0.00	**0.87**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**

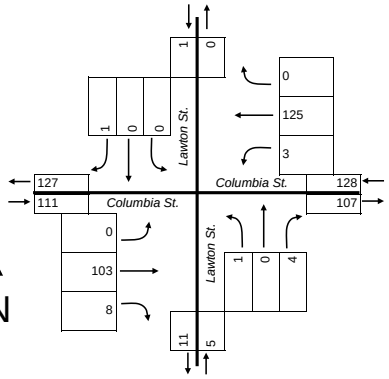
Overall AM PEAK HOUR FACTOR = **0.93** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

AM Period Intersection Volume: 704 **PM Period Intersection Volume:** 0

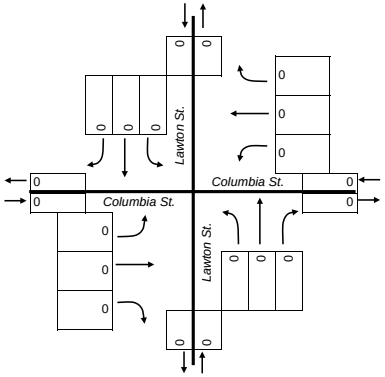
AM INTERSECTION PEAK VOLUMES



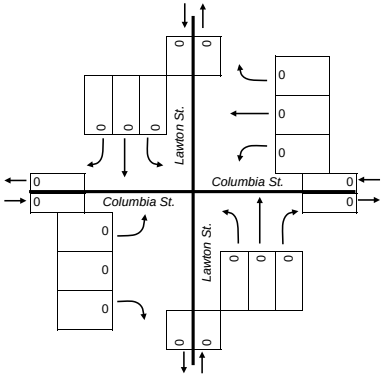
AM SYSTEM PEAK VOLUMES



PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Intersection: Washington Street and Columbia Street

Date of Counts: Saturday, February 07, 2015

AM Weather Conditions: Clear

PM Weather Conditions: Clear

AM PEAK

Direction:	Southbound				Westbound				Northbound				Eastbound			
Roadway:	Washington St.				Columbia St.				Washington St.				Columbia St.			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
11:00 AM to 11:15 AM	3	135	9	3	9	12	8	6	9	153	4	2	1	15	11	0
11:15 AM to 11:30 AM	4	166	15	2	10	16	10	2	10	157	4	1	2	19	6	4
11:30 AM to 11:45 AM	12	189	8	0	13	21	10	1	9	146	5	1	1	13	10	0
11:45 AM to 12:00 PM	4	187	3	0	13	13	7	4	6	163	6	1	3	14	22	2
12:00 PM to 12:15 PM	4	189	12	2	6	16	16	3	7	184	0	0	1	9	8	3
12:15 PM to 12:30 PM	3	187	21	2	10	15	11	2	13	198	2	6	3	8	11	3
12:30 PM to 12:45 PM	8	198	11	0	9	19	9	4	7	182	3	1	0	6	13	0
12:45 PM to 1:00 PM	4	207	12	2	11	13	9	2	10	225	5	4	4	10	9	2
1:00 PM to 1:15 PM	0	170	14	1	14	11	11	3	8	188	4	1	2	9	7	1
1:15 PM to 1:30 PM	3	184	10	1	11	10	6	4	10	174	4	2	1	6	10	1
1:30 PM to 1:45 PM	2	173	7	0	4	6	6	1	11	171	1	2	1	10	10	0
1:45 PM to 2:00 PM	2	173	13	2	11	8	4	0	23	150	2	2	2	29	15	0

PM PEAK

Direction:	Southbound				Westbound				Northbound				Eastbound			
Roadway:	Washington St.				Columbia St.				Washington St.				Columbia St.			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM to 4:15 PM																
4:15 PM to 4:30 PM																
4:30 PM to 4:45 PM																
4:45 PM to 5:00 PM																
5:00 PM to 5:15 PM																
5:15 PM to 5:30 PM																
5:30 PM to 5:45 PM																
5:45 PM to 6:00 PM																
6:00 PM to 6:15 PM																
6:15 PM to 6:30 PM																
6:30 PM to 6:45 PM																
6:45 PM to 7:00 PM																

PEAK HOURS

Direction:	Southbound				Westbound				Northbound				Eastbound			
Roadway:	Washington St.				Columbia St.				Washington St.				Columbia St.			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																
12:00 PM to 1:00 PM	19	781	56	6	36	63	45	11	37	789	10	11	8	33	41	8
PM INTERSECTION PEAK HOUR																
4:00 PM to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM SYSTEM PEAK HOUR																
12:15 PM to 1:15 PM	15	762	58	5	44	58	40	11	38	793	14	12	9	33	40	6
PM SYSTEM PEAK HOUR																
4:00 PM to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

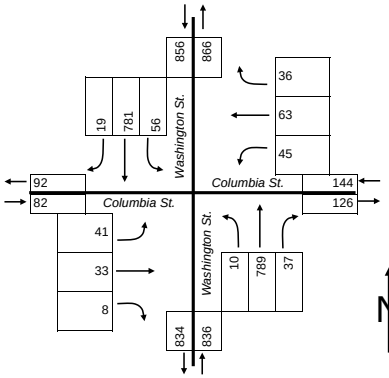
PEAK HOUR FACTORS

	Southbound				Westbound				Northbound				Eastbound			
	Washington St.				Columbia St.				Washington St.				Columbia St.			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.47	0.92	0.69	**0.94**	0.79	0.76	0.91	**0.96**	0.73	0.88	0.70	**0.88**	0.56	0.83	0.77	**0.89**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**

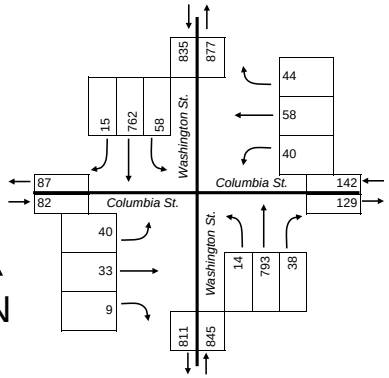
Overall AM PEAK HOUR FACTOR = **0.92** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

AM Period Intersection Volume: 5285 **PM Period Intersection Volume:** 0

AM INTERSECTION PEAK VOLUMES

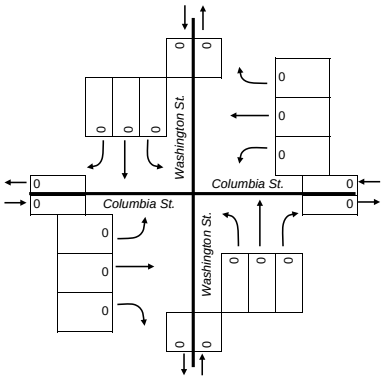


AM SYSTEM PEAK VOLUMES

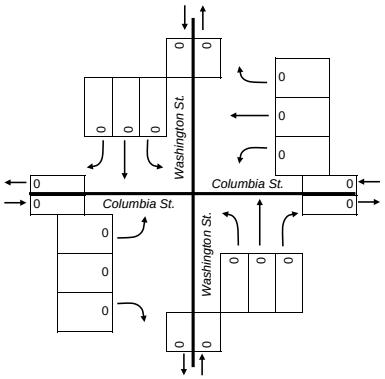


N

PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Intersection: Washington Street at Great Falls Street

	Southbound				Westbound				Northbound				Eastbound			
AM PEAK																
Roadway:	Washington St.				Great Falls St.				Washington St.				Great Falls St.			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
11:00 AM to 11:15 AM	7	200	0	4	0	0	0	0	0	212	33	0	25	0	6	0
11:15 AM to 11:30 AM	8	209	0	1	0	0	0	0	0	183	19	12	26	0	11	0
11:30 AM to 11:45 AM	11	197	0	1	0	0	0	0	0	192	22	1	27	0	16	0
11:45 AM to 12:00 PM	4	205	0	2	0	0	0	0	0	172	20	2	29	0	6	0
12:00 PM to 12:15 PM	7	187	0	3	0	0	0	0	0	185	29	2	32	0	11	0
12:15 PM to 12:30 PM	8	196	0	0	0	0	0	0	0	171	13	0	42	0	11	0
12:30 PM to 12:45 PM	10	199	0	0	0	0	0	0	0	209	20	4	27	0	5	0
12:45 PM to 1:00 PM	8	219	0	4	0	0	0	0	0	190	18	6	24	0	5	2
1:00 PM to 1:15 PM	3	187	0	4	0	0	0	0	0	193	27	3	27	0	9	0
1:15 PM to 1:30 PM	4	180	0	5	0	0	0	0	1	194	19	2	19	0	7	0
1:30 PM to 1:45 PM	4	191	0	0	0	0	0	0	0	160	17	0	26	0	9	0
1:45 PM to 2:00 PM	4	191	0	5	0	0	0	0	0	197	26	0	15	0	8	1
PM PEAK																
Roadway:	Washington St.				Great Falls St.				Washington St.				Great Falls St.			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM to 4:15 PM																
4:15 PM to 4:30 PM																
4:30 PM to 4:45 PM																
4:45 PM to 5:00 PM																
5:00 PM to 5:15 PM																
5:15 PM to 5:30 PM																
5:30 PM to 5:45 PM																
5:45 PM to 6:00 PM																
6:00 PM to 6:15 PM																
6:15 PM to 6:30 PM																
6:30 PM to 6:45 PM																
6:45 PM to 7:00 PM																
PEAK HOURS																
Roadway:	Washington St.				Great Falls St.				Washington St.				Great Falls St.			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																
11:00 AM to 12:00 PM	30	811	0	8	0	0	0	0	0	759	94	15	107	0	39	0
PM INTERSECTION PEAK HOUR																
4:00 PM to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM SYSTEM PEAK HOUR																
12:15 PM to 1:15 PM	29	801	0	8	0	0	0	0	0	763	78	13	120	0	30	2
PM SYSTEM PEAK HOUR																
4:00 PM to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PEAK HOUR FACTORS	Southbound				Westbound				Northbound				Eastbound			
	Washington St.				Great Falls St.				Washington St.				Great Falls St.			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.73	0.91	0.00	**0.91**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.91	0.72	**0.92**	0.71	0.00	0.68	**0.71**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**

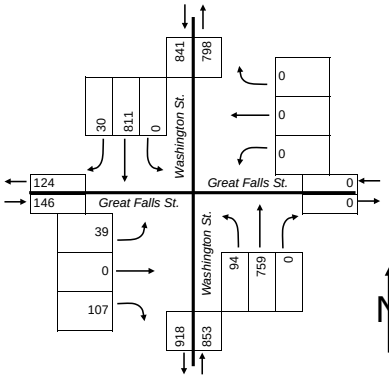
Overall AM PEAK HOUR FACTOR = **0.97** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

AM Period Intersection Volume: 5384 **PM Period Intersection Volume:** 0

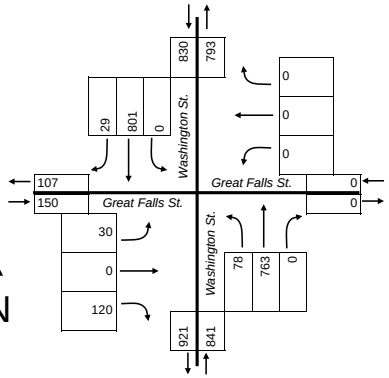
Date of Counts: Saturday, May 30, 2015

AM Weather Conditions: Clear **PM Weather Conditions:** Clear

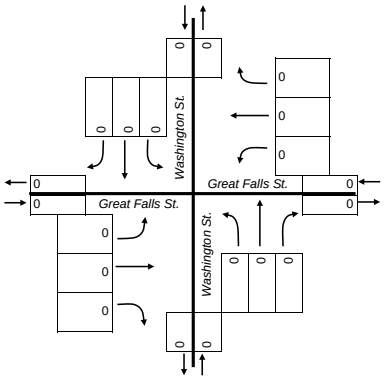
AM INTERSECTION PEAK VOLUMES



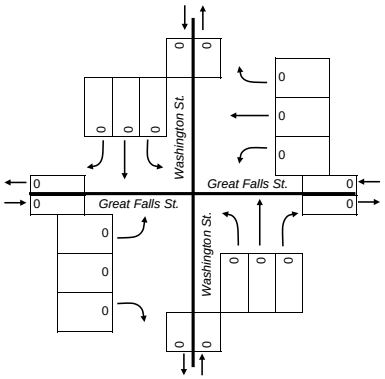
AM SYSTEM PEAK VOLUMES



PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Intersection: Washington Street and Park Avenue

	Date of Counts:	Saturday, January 31, 2015		
	AM Weather Conditions:	Clear	PM Weather Conditions:	Clear

AM PEAK

Direction:	Southbound				Westbound				Northbound				Eastbound			
Roadway:	Washington St.				Park Ave.				Washington St.				Park Ave.			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
11:00 AM to 11:15 AM	29	158	0	3	0	0	0	0	0	143	14	0	14	0	33	0
11:15 AM to 11:30 AM	24	192	0	0	0	0	0	0	0	155	10	0	12	0	28	1
11:30 AM to 11:45 AM	29	198	0	2	0	0	0	0	0	147	14	0	14	0	18	1
11:45 AM to 12:00 PM	34	194	0	0	0	0	0	0	0	152	18	2	15	0	31	1
12:00 PM to 12:15 PM	12	155	0	2	0	0	0	0	0	163	8	0	16	0	27	1
12:15 PM to 12:30 PM	23	162	0	1	0	0	0	0	0	169	12	1	13	0	39	2
12:30 PM to 12:45 PM	20	182	0	0	0	0	0	0	0	165	7	0	18	0	27	0
12:45 PM to 1:00 PM	14	158	0	1	0	0	0	0	0	159	9	0	13	0	32	0
1:00 PM to 1:15 PM	15	177	0	1	0	0	0	0	0	196	8	0	13	0	37	1
1:15 PM to 1:30 PM	13	169	0	2	0	0	0	0	0	181	5	0	13	0	41	1
1:30 PM to 1:45 PM	17	153	0	2	0	0	0	0	0	143	7	0	14	0	37	0
1:45 PM to 2:00 PM	13	157	0	0	0	0	0	0	0	141	6	0	6	0	29	0

PM PEAK

Direction:	Southbound				Westbound				Northbound				Eastbound			
Roadway:	Washington St.				Park Ave.				Washington St.				Park Ave.			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM to 4:15 PM																
4:15 PM to 4:30 PM																
4:30 PM to 4:45 PM																
4:45 PM to 5:00 PM																
5:00 PM to 5:15 PM																
5:15 PM to 5:30 PM																
5:30 PM to 5:45 PM																
5:45 PM to 6:00 PM																
6:00 PM to 6:15 PM																
6:15 PM to 6:30 PM																
6:30 PM to 6:45 PM																
6:45 PM to 7:00 PM																

PEAK HOURS

Direction:	Southbound				Westbound				Northbound				Eastbound			
Roadway:	Washington St.				Park Ave.				Washington St.				Park Ave.			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																
11:00 AM to 12:00 PM	116	742	0	5	0	0	0	0	0	597	56	2	55	0	110	3
PM INTERSECTION PEAK HOUR																
4:00 PM to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM SYSTEM PEAK HOUR																
12:15 PM to 1:15 PM	72	679	0	3	0	0	0	0	0	689	36	1	57	0	135	3
PM SYSTEM PEAK HOUR																
4:00 PM to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

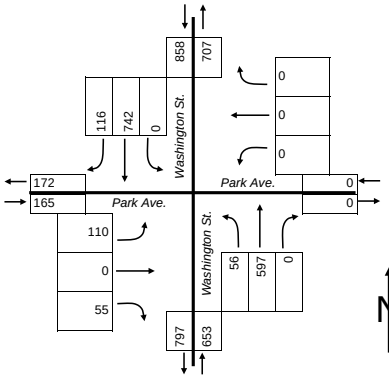
PEAK HOUR FACTORS

	Southbound				Westbound				Northbound				Eastbound			
	Washington St.				Park Ave.				Washington St.				Park Ave.			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.78	0.93	0.00	**0.93**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.88	0.75	**0.89**	0.79	0.00	0.87	**0.92**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**

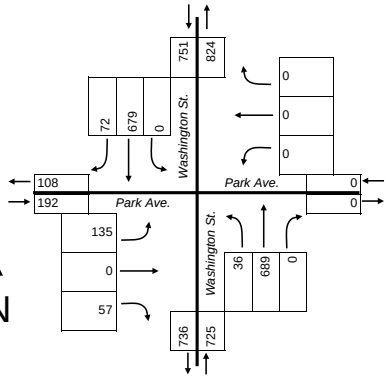
Overall AM PEAK HOUR FACTOR = **0.93** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

AM Period Intersection Volume: 4870 **PM Period Intersection Volume:** 0

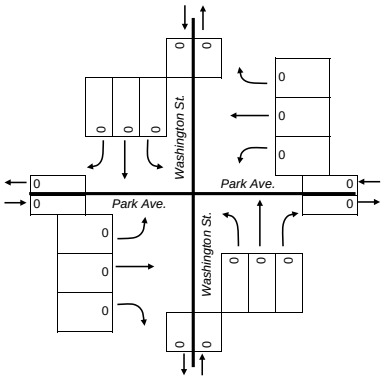
AM INTERSECTION PEAK VOLUMES



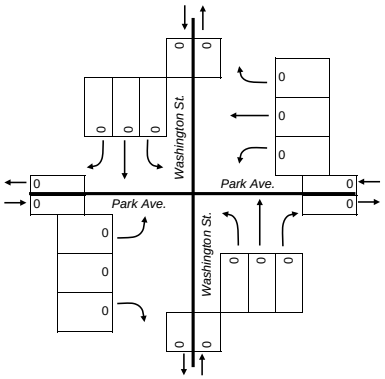
AM SYSTEM PEAK VOLUMES



PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Date of Counts: Saturday, January 31, 2015

AM Weather Conditions: Clear

PM Weather Conditions: Clear

Intersection: **Washington Street and Site Entrance North**

AM PEAK

		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Washington St.**				**Site Entrance North**				**Washington St.**				**Site Entrance North**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
11:00 AM	to	11:15 AM	0	189	0	0	3	0	0	0	1	186	0	0	0	0	0	0
11:15 AM	to	11:30 AM	0	218	0	0	0	0	0	0	2	170	0	1	0	0	0	0
11:30 AM	to	11:45 AM	1	215	0	0	1	0	0	0	3	170	0	2	0	0	0	0
11:45 AM	to	12:00 PM	0	212	0	0	0	0	0	0	1	176	0	2	0	0	0	0
12:00 PM	to	12:15 PM	0	200	0	0	1	0	0	0	1	181	0	1	0	0	0	0
12:15 PM	to	12:30 PM	0	202	0	0	0	0	0	0	2	193	0	0	0	0	0	0
12:30 PM	to	12:45 PM	0	212	0	0	5	0	0	0	0	204	0	2	0	0	0	0
12:45 PM	to	1:00 PM	0	234	0	0	3	0	0	0	1	208	0	0	0	0	0	0
1:00 PM	to	1:15 PM	0	209	0	0	0	0	0	0	2	214	0	0	0	0	0	0
1:15 PM	to	1:30 PM	0	193	0	0	2	0	0	0	1	186	0	3	0	0	0	0
1:30 PM	to	1:45 PM	0	174	0	0	5	0	0	0	3	178	0	3	0	0	0	0
1:45 PM	to	2:00 PM	0	189	0	0	2	0	0	0	1	193	0	1	0	0	0	0

PM PEAK

		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Washington St.**				**Site Entrance North**				**Washington St.**				**Site Entrance North**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM	to	4:15 PM																
4:15 PM	to	4:30 PM																
4:30 PM	to	4:45 PM																
4:45 PM	to	5:00 PM																
5:00 PM	to	5:15 PM																
5:15 PM	to	5:30 PM																
5:30 PM	to	5:45 PM																
5:45 PM	to	6:00 PM																
6:00 PM	to	6:15 PM																
6:15 PM	to	6:30 PM																
6:30 PM	to	6:45 PM																
6:45 PM	to	7:00 PM																

PEAK HOURS

		Direction:	Southbound				Westbound				Northbound				Eastbound			
		Roadway:	**Washington St.**				**Site Entrance North**				**Washington St.**				**Site Entrance North**			
		Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																		
12:15 PM	to	1:15 PM	0	857	0	0	8	0	0	0	5	819	0	2	0	0	0	0
PM INTERSECTION PEAK HOUR																		
4:00 PM	to	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM SYSTEM PEAK HOUR																		
12:15 PM	to	1:15 PM	0	857	0	0	8	0	0	0	5	819	0	2	0	0	0	0
PM SYSTEM PEAK HOUR																		
4:00 PM	to	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

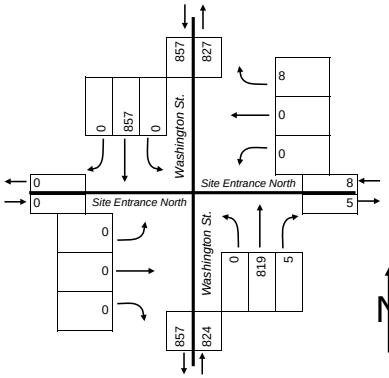
PEAK HOUR FACTORS

	Southbound				Westbound				Northbound				Eastbound			
	Washington St.				**Site Entrance North**				**Washington St.**				**Site Entrance North**			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.00	0.92	0.00	**0.92**	0.40	0.00	0.00	**0.40**	0.63	0.96	0.00	**0.95**	0.00	0.00	0.00	**#DIV/0!**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**

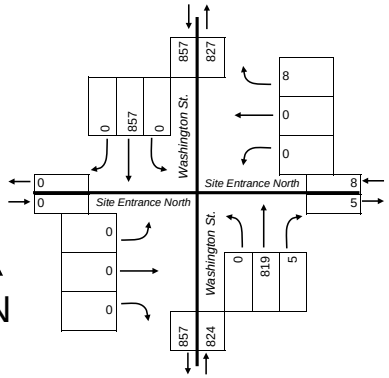
Overall AM PEAK HOUR FACTOR = **0.95** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

AM Period Intersection Volume: 4747 **PM Period Intersection Volume:** 0

AM INTERSECTION PEAK VOLUMES



AM SYSTEM PEAK VOLUMES



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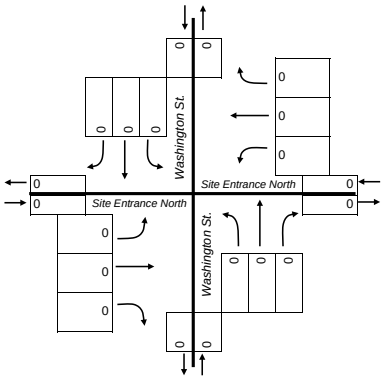
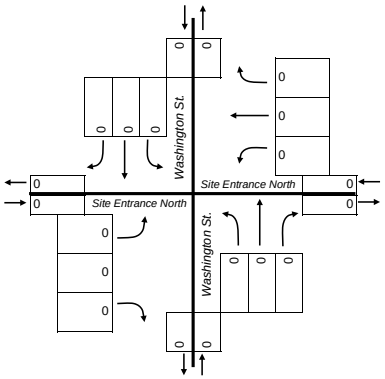
PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



Project Name :	Washington and Broad Street Redevlopment
Project # :	7301-1353
Location	City of Falls Church, Virginia
Data Source:	Gorove/Slade Associates, Inc.

Date of Counts: Saturday, January 31, 2015

AM Weather Conditions: Clear

PM Weather Conditions: Clear

Intersection: **Washington Street and Site Entrance South**

AM PEAK

	Southbound				Westbound				Northbound				Eastbound			
Roadway:	**Washington St.**				**Site Entrance South**				**Washington St.**				**Site Entrance South**			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
11:00 AM to 11:15 AM	6	161	0	0	2	0	0	0	1	132	0	0	9	1	0	0
11:15 AM to 11:30 AM	3	182	0	2	2	0	0	0	4	147	0	1	10	0	0	0
11:30 AM to 11:45 AM	0	192	0	0	0	0	0	0	5	153	0	1	10	0	0	0
11:45 AM to 12:00 PM	0	157	0	1	3	0	0	0	6	91	0	0	8	0	0	0
12:00 PM to 12:15 PM	0	169	0	1	1	0	0	0	4	151	0	0	5	0	0	0
12:15 PM to 12:30 PM	3	193	0	2	4	0	0	0	2	180	0	0	13	0	0	0
12:30 PM to 12:45 PM	1	190	0	0	0	0	0	0	3	174	0	5	14	0	0	0
12:45 PM to 1:00 PM	0	167	0	0	1	0	0	0	2	192	0	1	2	0	0	0
1:00 PM to 1:15 PM	0	134	0	1	0	0	0	0	2	125	0	0	3	0	0	0
1:15 PM to 1:30 PM	1	181	0	3	4	0	0	0	2	171	0	0	10	0	0	0
1:30 PM to 1:45 PM	1	149	0	1	2	0	0	0	2	175	0	0	8	0	0	0
1:45 PM to 2:00 PM	0	150	0	1	2	0	0	0	0	149	0	0	8	0	0	0

PM PEAK

	Southbound				Westbound				Northbound				Eastbound			
Roadway:	**Washington St.**				**Site Entrance South**				**Washington St.**				**Site Entrance South**			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
4:00 PM to 4:15 PM																
4:15 PM to 4:30 PM																
4:30 PM to 4:45 PM																
4:45 PM to 5:00 PM																
5:00 PM to 5:15 PM																
5:15 PM to 5:30 PM																
5:30 PM to 5:45 PM																
5:45 PM to 6:00 PM																
6:00 PM to 6:15 PM																
6:15 PM to 6:30 PM																
6:30 PM to 6:45 PM																
6:45 PM to 7:00 PM																

PEAK HOURS

	Southbound				Westbound				Northbound				Eastbound			
Roadway:	**Washington St.**				**Site Entrance South**				**Washington St.**				**Site Entrance South**			
Movement:	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
AM INTERSECTION PEAK HOUR																
12:00 PM to 1:00 PM	4	719	0	3	6	0	0	0	11	697	0	6	34	0	0	0
PM INTERSECTION PEAK HOUR																
4:00 PM to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AM SYSTEM PEAK HOUR																
12:15 PM to 1:15 PM	4	684	0	3	5	0	0	0	9	671	0	6	32	0	0	0
PM SYSTEM PEAK HOUR																
4:00 PM to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

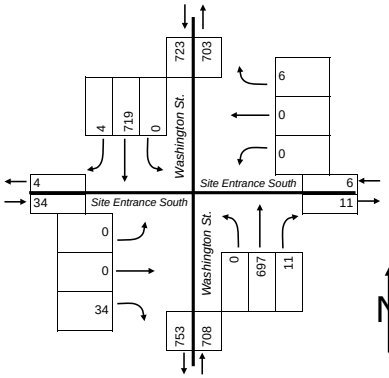
PEAK HOUR FACTORS

	Southbound				Westbound				Northbound				Eastbound			
	Washington St.				**Site Entrance South**				**Washington St.**				**Site Entrance South**			
AM Peak Hour	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
AM PEAK HOUR	0.33	0.89	0.00	**0.88**	0.31	0.00	0.00	**0.31**	0.75	0.87	0.00	**0.88**	0.57	0.00	0.00	**0.57**
	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach	Right	Thru	Left	Approach
PM PEAK HOUR	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**	0.00	0.00	0.00	**#DIV/0!**

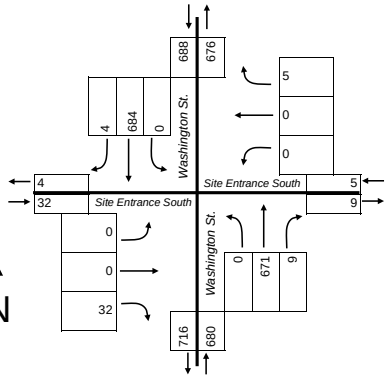
Overall AM PEAK HOUR FACTOR = **0.89** **Overall PM PEAK HOUR FACTOR** = **#DIV/0!**

AM Period Intersection Volume: 4035 **PM Period Intersection Volume:** 0

AM INTERSECTION PEAK VOLUMES



AM SYSTEM PEAK VOLUMES



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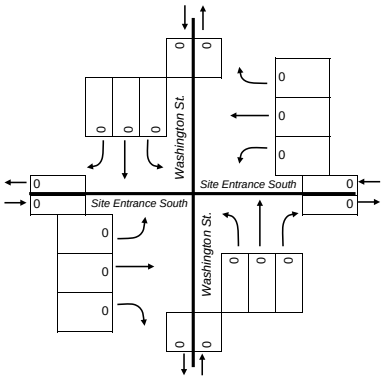
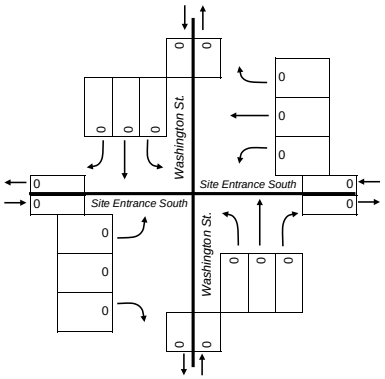
PM INTERSECTION PEAK VOLUMES



PM SYSTEM PEAK VOLUMES



APPENDIX C

LEVEL OF SERVICE DEFINITIONS

APPENDIX C: LEVEL OF SERVICE DEFINITIONS

All capacity analyses are based on the procedures specified by the Transportation Research Board, Special Report 209: *Highway Capacity Manual (HCM)*, 2010. Levels of service (LOS) range from A to F. A brief description of each level of service for signalized and unsignalized intersections is provided below.

Signalized Intersections: Level of service is based upon the traffic volume present in each lane on the roadway, the capacity of each lane at the intersection and the delay associated with each directional movement. The levels of service for signalized intersections are defined below:

- Level of Service A describes operations with very low average delay per vehicle, i.e., less than 10.0 seconds. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop. Short signal cycle lengths may also contribute to low delay.
- Level of Service B describes operations with average delay in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
- Level of Service C describes operations with delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level although many still pass through the intersection without stopping. This is generally considered the lower end of the range of the acceptable level of service in rural areas.
- Level of Service D describes operations with delay in the range of 35.1 to 55.0 seconds per vehicle. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and/or high traffic volumes as compared to the roadway capacity. Many vehicles are required to stop and the number of vehicles that do not have to stop declines. Individual signal cycle failures, where all waiting vehicles do not clear the intersection during a single green time, are noticeable. This is generally considered the lower end of the range of the acceptable level of service in urban areas.
- Level of Service E describes operations with delay in the range of 55.1 to 80.0 seconds per vehicle. These higher delay values generally indicate poor progression, long cycle lengths, and high traffic volumes. Individual cycle failures are frequent occurrences. LOS E has been set as the limit of acceptable conditions.
- Level of Service F describes operations with average delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when traffic arrives at a flow rate that exceeds the capacity of the intersection. It may also occur at high volumes with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such delays.

Unsignalized Intersections: At an unsignalized intersection, the major street through traffic and right-turns are assumed to operate unimpeded and therefore receive no level of service rating. The level of service for the minor street and the major street left-turn traffic is dependent on the volume and capacity of the available lanes, and, the number and frequency of acceptable gaps in the major street traffic to make a conflicting turn. The level of service grade is provided for each conflicting movement at an unsignalized intersection and is based on the total average delay experienced by each vehicle. The delay includes the time it takes a vehicle to move from the back of a queue through the intersection.

The unsignalized intersection level of service analysis does not account for variations in driver behavior or the effects of nearby traffic signals. Therefore, the results from this analysis usually indicate worse levels of service than may be experienced in the field. The unsignalized intersection level of service descriptions are provided below:

- Level of Service A. Describes operations where there is very little to no conflicting traffic for a minor side street movement, i.e., an average total delay of less than 10.0 seconds per vehicle.
- Level of Service B. Describes operations with average total delay in the range of 10.1 to 15.0 seconds per vehicle.
- Level of Service C. Describes operations with average total delay in the range of 15.1 to 25.0 second per vehicle.
- Level of Service D. Describes operations with average total delay in the range of 25.1 to 35.0 seconds per vehicle.
- Level of Service E. Describes operations with average total delay in the range of 35.1 to 50.0 seconds per vehicle.
- Level of Service F. Describes operations with average total delay of 50 seconds per vehicle. LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through or enter a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queuing on the minor approaches. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal driver behavior.

APPENDIX D

INTERSECTION CAPACITY ANALYSIS – EXISTING CONDITIONS (2015)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	122	581	42	767	67	1024	138	570
v/c Ratio	0.57	0.48	0.14	0.72	0.20	0.92	0.60	0.44
Control Delay	40.1	32.9	10.8	25.6	15.9	40.5	26.8	20.8
Queue Delay	0.1	0.0	0.0	0.0	0.0	12.1	0.0	0.0
Total Delay	40.2	32.9	10.8	25.6	15.9	52.6	26.8	20.8
Queue Length 50th (ft)	58	181	8	210	18	193	40	147
Queue Length 95th (ft)	m#110	167	m18	260	m47	#428	100	184
Internal Link Dist (ft)		453		384		503		124
Turn Bay Length (ft)	275		255		345		190	
Base Capacity (vph)	214	1216	310	1062	345	1111	254	1321
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	2	0	0	0	0	94	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.48	0.14	0.72	0.19	1.01	0.54	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	540	29	41	685	67	66	985	19	135	489	70
Future Volume (vph)	120	540	29	41	685	67	66	985	19	135	489	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			3%			-4%	
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	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	
Frt	1.00	0.99		1.00	0.99		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3390		1707	3367		1742	3474		1805	3535	
Flt Permitted	0.18	1.00		0.36	1.00		0.40	1.00		0.11	1.00	
Satd. Flow (perm)	325	3390		639	3367		731	3474		207	3535	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	122	551	30	42	699	68	67	1005	19	138	499	71
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	122	581	0	42	767	0	67	1024	0	138	570	0
Confl. Peds. (#/hr)	13		12	12		13	3		16	16		3
Bus Blockages (#/hr)	0	0	0	0	0	8	0	0	8	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	38.7	32.8		34.1	30.5		37.9	33.1		45.3	36.8	
Effective Green, g (s)	38.7	32.8		34.1	30.5		37.9	33.1		45.3	36.8	
Actuated g/C Ratio	0.39	0.33		0.34	0.30		0.38	0.33		0.45	0.37	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	207	1111		256	1026		325	1149		229	1300	
v/s Ratio Prot	c0.03	0.17		0.01	c0.23		0.01	c0.29		c0.05	0.16	
v/s Ratio Perm	0.19			0.05			0.07			0.22		
v/c Ratio	0.59	0.52		0.16	0.75		0.21	0.89		0.60	0.44	
Uniform Delay, d1	21.9	27.3		22.4	31.3		20.1	31.7		20.5	23.8	
Progression Factor	1.58	1.20		0.57	0.70		0.98	0.80		0.96	0.81	
Incremental Delay, d2	2.5	1.6		0.1	4.5		0.1	9.0		2.9	0.5	
Delay (s)	37.0	34.2		12.9	26.4		19.8	34.6		22.6	19.7	
Level of Service	D	C		B	C		B	C		C	B	
Approach Delay (s)		34.6			25.7			33.7			20.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	755	36	17	905	30	4	0	13	3	0	13
Future Volume (Veh/h)	20	755	36	17	905	30	4	0	13	3	0	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	21	803	38	18	963	32	4	0	14	3	0	14
Pedestrians								4			4	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		464										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	999			845			1400	1903	424	1476	1906	502
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	999			548			1179	1752	69	1266	1755	502
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			97	100	98	97	100	97
cM capacity (veh/h)	686			892			119	70	858	104	70	513

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	21	535	306	18	642	353	18	17
Volume Left	21	0	0	18	0	0	4	3
Volume Right	0	0	38	0	0	32	14	14
cSH	686	1700	1700	892	1700	1700	360	302
Volume to Capacity	0.03	0.31	0.18	0.02	0.38	0.21	0.05	0.06
Queue Length 95th (ft)	2	0	0	2	0	0	4	4
Control Delay (s)	10.4	0.0	0.0	9.1	0.0	0.0	15.5	17.6
Lane LOS	B			A			C	C
Approach Delay (s)	0.3			0.2			15.5	17.6
Approach LOS							C	C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	762	947	11	2	5
Future Volume (Veh/h)	9	762	947	11	2	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	10	856	1064	12	2	6
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		663	1202			
pX, platoon unblocked	0.93				0.93	0.93
vC, conflicting volume	1077				1519	539
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	935				1076	358
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	677				196	594

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	295	571	709	367	8
Volume Left	10	0	0	0	2
Volume Right	0	0	0	12	6
cSH	677	1700	1700	1700	394
Volume to Capacity	0.01	0.34	0.42	0.22	0.02
Queue Length 95th (ft)	1	0	0	0	2
Control Delay (s)	0.5	0.0	0.0	0.0	14.3
Lane LOS	A				B
Approach Delay (s)	0.2		0.0		14.3
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	116	6	1	232	14	9
Future Volume (Veh/h)	116	6	1	232	14	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	140	7	1	280	17	11
Pedestrians				3	4	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	507					
pX, platoon unblocked						
vC, conflicting volume			151		430	150
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			151		430	150
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1425		580	891

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	147	281	28
Volume Left	0	1	17
Volume Right	7	0	11
cSH	1700	1425	672
Volume to Capacity	0.09	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	10.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.0	10.6
Approach LOS			B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		

5: N. Washington St & W. Columbia St./E. Columbia St

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	145	269	26	1141	27	694
v/c Ratio	0.32	0.56	0.07	0.65	0.13	0.40
Control Delay	28.7	33.5	6.8	11.5	10.5	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	33.5	6.8	11.5	10.5	16.5
Queue Length 50th (ft)	69	137	3	147	7	148
Queue Length 95th (ft)	123	221	m8	286	18	196
Internal Link Dist (ft)	910	204		631		475
Turn Bay Length (ft)			70		125	
Base Capacity (vph)	448	479	366	1749	211	1753
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.56	0.07	0.65	0.13	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	75	12	74	134	50	25	1059	36	26	652	14
Future Volume (vph)	52	75	12	74	134	50	25	1059	36	26	652	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	12	12	12	10	11	11	10	11	11
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		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	
Frt		0.99			0.97		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1861			1779		1649	3399		1652	3407	
Flt Permitted		0.78			0.87		0.33	1.00		0.15	1.00	
Satd. Flow (perm)		1483			1568		577	3399		260	3407	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	54	78	12	77	140	52	26	1103	38	27	679	15
RTOR Reduction (vph)	0	4	0	0	8	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	142	0	0	261	0	26	1138	0	27	692	0
Confl. Peds. (#/hr)	4		4	4		4	6		8	8		6
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.0			30.0		52.0	49.0		52.0	49.0	
Effective Green, g (s)		30.0			30.0		52.0	49.0		52.0	49.0	
Actuated g/C Ratio		0.30			0.30		0.52	0.49		0.52	0.49	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		444			470		332	1665		176	1669	
v/s Ratio Prot							0.00	c0.33		c0.00	0.20	
v/s Ratio Perm		0.10			c0.17		0.04			0.07		
v/c Ratio		0.32			0.55		0.08	0.68		0.15	0.41	
Uniform Delay, d1		27.1			29.4		12.0	19.6		13.7	16.3	
Progression Factor		1.00			1.00		0.70	0.53		1.00	1.00	
Incremental Delay, d2		1.9			4.7		0.1	1.7		0.4	0.8	
Delay (s)		29.0			34.0		8.5	12.1		14.2	17.1	
Level of Service		C			C		A	B		B	B	
Approach Delay (s)		29.0			34.0			12.1			17.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	100	93	1138	659	49
Future Volume (Veh/h)	13	100	93	1138	659	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	14	104	97	1185	686	51
Pedestrians	7				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	1				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				483	711	
pX, platoon unblocked	0.93	0.89	0.89			
vC, conflicting volume	1507	376	744			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	863	49	464			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	88	90			
cM capacity (veh/h)	244	892	967			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	118	492	790	457	280
Volume Left	14	97	0	0	0
Volume Right	104	0	0	0	51
cSH	679	967	1700	1700	1700
Volume to Capacity	0.17	0.10	0.46	0.27	0.16
Queue Length 95th (ft)	16	8	0	0	0
Control Delay (s)	11.4	2.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	11.4	1.1		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	106	61	1434	876
v/c Ratio	0.53	0.27	0.70	0.32
Control Delay	50.9	13.3	7.5	2.8
Queue Delay	0.0	0.0	10.4	0.0
Total Delay	50.9	13.3	18.0	2.8
Queue Length 50th (ft)	65	0	201	48
Queue Length 95th (ft)	104	31	463	83
Internal Link Dist (ft)	437		43	403
Turn Bay Length (ft)	150			
Base Capacity (vph)	336	345	2058	2745
Starvation Cap Reductn	0	0	611	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.32	0.18	0.99	0.32

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	88	51	98	1092	643	84
Future Volume (vph)	88	51	98	1092	643	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Grade (%)	0%			3%	-3%	
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1559		3327	3394	
Flt Permitted	0.95	1.00		0.76	1.00	
Satd. Flow (perm)	1770	1559		2548	3394	
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	106	61	118	1316	775	101
RTOR Reduction (vph)	0	54	0	0	5	0
Lane Group Flow (vph)	106	7	0	1434	871	0
Confl. Peds. (#/hr)	2	2	9			9
Bus Blockages (#/hr)	0	0	0	4	0	4
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			
Actuated Green, G (s)	11.3	11.3		80.7	80.7	
Effective Green, g (s)	11.3	11.3		80.7	80.7	
Actuated g/C Ratio	0.11	0.11		0.81	0.81	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	200	176		2056	2738	
v/s Ratio Prot	c0.06				0.26	
v/s Ratio Perm		0.00		c0.56		
v/c Ratio	0.53	0.04		0.70	0.32	
Uniform Delay, d1	41.8	39.5		4.3	2.5	
Progression Factor	1.00	1.00		1.22	0.94	
Incremental Delay, d2	2.7	0.1		0.7	0.3	
Delay (s)	44.5	39.6		5.9	2.6	
Level of Service	D	D		A	A	
Approach Delay (s)	42.7			5.9	2.6	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	17	1173	2	0	694
Future Volume (Veh/h)	0	17	1173	2	0	694
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	19	1333	2	0	789
Pedestrians	12					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			340			123
pX, platoon unblocked	0.75	0.72			0.72	
vC, conflicting volume	1740	680			1347	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	969	0			707	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			100	
cM capacity (veh/h)	187	774			633	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	19	889	446	394	394
Volume Left	0	0	0	0	0
Volume Right	19	0	2	0	0
cSH	774	1700	1700	1700	1700
Volume to Capacity	0.02	0.52	0.26	0.23	0.23
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	9.8	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.8	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	9	1166	6	0	694
Future Volume (Veh/h)	0	9	1166	6	0	694
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	9	1202	6	0	715
Pedestrians	10					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			204			259
pX, platoon unblocked	0.74	0.72			0.72	
vC, conflicting volume	1572	614			1218	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	814	0			526	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	232	775			741	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	9	801	407	358	358
Volume Left	0	0	0	0	0
Volume Right	9	0	6	0	0
cSH	775	1700	1700	1700	1700
Volume to Capacity	0.01	0.47	0.24	0.21	0.21
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	9.7	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.7	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	167	723	97	794	83	675	167	1179
v/c Ratio	0.69	0.61	0.38	0.76	0.48	0.68	0.53	0.95
Control Delay	36.8	19.3	16.4	30.9	23.8	37.2	21.4	36.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2
Total Delay	36.8	19.3	16.4	30.9	23.8	37.2	21.4	39.6
Queue Length 50th (ft)	31	176	27	255	37	226	27	141
Queue Length 95th (ft)	m#126	178	50	#322	m56	291	97	#506
Internal Link Dist (ft)		453		384		503		124
Turn Bay Length (ft)	275		255		345		190	
Base Capacity (vph)	247	1188	257	1039	177	1032	360	1245
Starvation Cap Reductn	0	0	0	0	0	0	0	35
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.61	0.38	0.76	0.47	0.65	0.46	0.97

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	629	65	93	730	33	80	620	28	160	1030	102
Future Volume (vph)	160	629	65	93	730	33	80	620	28	160	1030	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			3%			-4%	
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	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	
Frt	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3356		1706	3394		1743	3458		1803	3556	
Flt Permitted	0.15	1.00		0.27	1.00		0.13	1.00		0.21	1.00	
Satd. Flow (perm)	271	3356		493	3394		245	3458		401	3556	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	167	655	68	97	760	34	83	646	29	167	1073	106
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	167	723	0	97	794	0	83	675	0	167	1179	0
Confl. Peds. (#/hr)	18		30	30		18	3		22	22		3
Bus Blockages (#/hr)	0	0	0	0	0	8	0	0	8	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	42.0	33.4		34.4	29.6		34.7	29.9		44.8	35.0	
Effective Green, g (s)	42.0	33.4		34.4	29.6		34.7	29.9		44.8	35.0	
Actuated g/C Ratio	0.42	0.33		0.34	0.30		0.35	0.30		0.45	0.35	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	237	1120		227	1004		156	1033		318	1244	
v/s Ratio Prot	c0.06	0.22		0.02	c0.23		0.03	0.20		c0.05	c0.33	
v/s Ratio Perm	0.23			0.13			0.16			0.18		
v/c Ratio	0.70	0.65		0.43	0.79		0.53	0.65		0.53	0.95	
Uniform Delay, d1	21.1	28.3		23.2	32.4		25.3	30.5		18.5	31.6	
Progression Factor	1.30	0.61		0.68	0.77		0.94	1.07		0.97	0.66	
Incremental Delay, d2	6.1	2.3		0.5	6.1		1.6	1.9		0.6	13.6	
Delay (s)	33.6	19.5		16.3	31.2		25.3	34.4		18.6	34.5	
Level of Service	C	B		B	C		C	C		B	C	
Approach Delay (s)		22.2			29.6			33.4			32.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	903	10	6	686	19	15	0	22	10	0	22
Future Volume (Veh/h)	12	903	10	6	686	19	15	0	22	10	0	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	13	982	11	7	746	21	16	0	24	11	0	24
Pedestrians		1						5			9	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		464										
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84	
vC, conflicting volume	776			998			1430	1808	502	1320	1804	394
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	776			611			1127	1578	19	996	1572	394
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			87	100	97	93	100	96
cM capacity (veh/h)	830			804			124	88	880	156	88	600

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	13	655	338	7	497	270	40	35
Volume Left	13	0	0	7	0	0	16	11
Volume Right	0	0	11	0	0	21	24	24
cSH	830	1700	1700	804	1700	1700	256	317
Volume to Capacity	0.02	0.39	0.20	0.01	0.29	0.16	0.16	0.11
Queue Length 95th (ft)	1	0	0	1	0	0	14	9
Control Delay (s)	9.4	0.0	0.0	9.5	0.0	0.0	21.7	17.7
Lane LOS	A			A			C	C
Approach Delay (s)	0.1			0.1			21.7	17.7
Approach LOS							C	C

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	35.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	931	693	11	6	18
Future Volume (Veh/h)	4	931	693	11	6	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	980	729	12	6	19
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		663	1202			
pX, platoon unblocked					0.86	
vC, conflicting volume	749				1241	378
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	749				944	378
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	97
cM capacity (veh/h)	850				220	615

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	331	653	486	255	25
Volume Left	4	0	0	0	6
Volume Right	0	0	0	12	19
cSH	850	1700	1700	1700	430
Volume to Capacity	0.00	0.38	0.29	0.15	0.06
Queue Length 95th (ft)	0	0	0	0	5
Control Delay (s)	0.2	0.0	0.0	0.0	13.9
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		13.9
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	183	10	8	141	4	8
Future Volume (Veh/h)	183	10	8	141	4	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	220	12	10	170	5	10
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	507					
pX, platoon unblocked						
vC, conflicting volume			240		424	234
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			240		424	234
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1318		578	800

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	232	180	15
Volume Left	0	10	5
Volume Right	12	0	10
cSH	1700	1318	709
Volume to Capacity	0.14	0.01	0.02
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.5	10.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	10.2
Approach LOS			B

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		

5: N. Washington St & W. Columbia St./E. Columbia St

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	219	152	37	1021	40	1244
v/c Ratio	0.48	0.32	0.18	0.58	0.15	0.70
Control Delay	32.7	28.1	6.6	15.8	10.2	22.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	28.1	6.6	15.8	10.2	22.1
Queue Length 50th (ft)	111	70	7	288	10	335
Queue Length 95th (ft)	184	126	m11	306	24	424
Internal Link Dist (ft)	910	204		631		475
Turn Bay Length (ft)			70		125	
Base Capacity (vph)	457	480	202	1756	264	1766
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.32	0.18	0.58	0.15	0.70

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	107	22	31	85	24	34	882	57	37	1119	26
Future Volume (vph)	73	107	22	31	85	24	34	882	57	37	1119	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	12	12	12	10	11	11	10	11	11
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		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	
Frt		0.99			0.98		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1855			1792		1652	3382		1652	3407	
Flt Permitted		0.83			0.90		0.12	1.00		0.19	1.00	
Satd. Flow (perm)		1565			1631		209	3382		335	3407	
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)	79	116	24	34	92	26	37	959	62	40	1216	28
RTOR Reduction (vph)	0	4	0	0	7	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	215	0	0	145	0	37	1016	0	40	1242	0
Confl. Peds. (#/hr)	5		2	2		5	5		5	5		5
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		29.0			29.0		53.0	49.4		53.0	49.4	
Effective Green, g (s)		29.0			29.0		53.0	49.4		53.0	49.4	
Actuated g/C Ratio		0.29			0.29		0.53	0.49		0.53	0.49	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		453			472		162	1670		224	1683	
v/s Ratio Prot							c0.01	0.30		0.01	c0.36	
v/s Ratio Perm		c0.14			0.09		0.11			0.09		
v/c Ratio		0.47			0.31		0.23	0.61		0.18	0.74	
Uniform Delay, d1		29.2			27.7		14.2	18.3		12.6	20.2	
Progression Factor		1.00			1.00		0.52	0.82		1.00	1.00	
Incremental Delay, d2		3.5			1.7		0.7	1.5		0.4	2.9	
Delay (s)		32.8			29.3		8.1	16.5		13.0	23.1	
Level of Service		C			C		A	B		B	C	
Approach Delay (s)		32.8			29.3			16.2			22.8	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	87	83	949	1130	50
Future Volume (Veh/h)	21	87	83	949	1130	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	22	91	86	989	1177	52
Pedestrians	5				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				483	711	
pX, platoon unblocked	0.76	0.71	0.71			
vC, conflicting volume	1876	620	1234			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	987	0	522			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	88	88			
cM capacity (veh/h)	163	769	739			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	113	416	659	785	444
Volume Left	22	86	0	0	0
Volume Right	91	0	0	0	52
cSH	445	739	1700	1700	1700
Volume to Capacity	0.25	0.12	0.39	0.46	0.26
Queue Length 95th (ft)	25	10	0	0	0
Control Delay (s)	15.8	3.4	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	15.8	1.3		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	180	115	905	1348
v/c Ratio	0.60	0.33	0.45	0.54
Control Delay	46.4	9.1	5.4	1.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	46.4	9.1	5.5	1.9
Queue Length 50th (ft)	104	0	52	33
Queue Length 95th (ft)	168	45	92	41
Internal Link Dist (ft)	437		43	403
Turn Bay Length (ft)	150			
Base Capacity (vph)	407	438	2028	2503
Starvation Cap Reductn	0	0	69	0
Spillback Cap Reductn	0	3	0	100
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.26	0.46	0.56

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	167	107	36	805	1185	69
Future Volume (vph)	167	107	36	805	1185	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Grade (%)	0%			3%	-3%	
Total Lost time (s)	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.96		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1523		3334	3420	
Flt Permitted	0.95	1.00		0.83	1.00	
Satd. Flow (perm)	1770	1523		2775	3420	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	180	115	39	866	1274	74
RTOR Reduction (vph)	0	96	0	0	2	0
Lane Group Flow (vph)	180	19	0	905	1346	0
Confl. Peds. (#/hr)		17	33			33
Bus Blockages (#/hr)	0	0	0	4	0	4
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			
Actuated Green, G (s)	16.9	16.9		73.1	73.1	
Effective Green, g (s)	16.9	16.9		73.1	73.1	
Actuated g/C Ratio	0.17	0.17		0.73	0.73	
Clearance Time (s)	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)	299	257		2028	2500	
v/s Ratio Prot	c0.10				c0.39	
v/s Ratio Perm		0.01		0.33		
v/c Ratio	0.60	0.08		0.45	0.54	
Uniform Delay, d1	38.4	35.0		5.4	6.0	
Progression Factor	1.00	1.00		0.81	0.18	
Incremental Delay, d2	3.9	0.2		0.1	0.7	
Delay (s)	42.4	35.1		4.5	1.7	
Level of Service	D	D		A	A	
Approach Delay (s)	39.5			4.5	1.7	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	33	808	7	0	1292
Future Volume (Veh/h)	0	33	808	7	0	1292
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	35	869	8	0	1389
Pedestrians	8					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			340			123
pX, platoon unblocked	0.91	0.84			0.84	
vC, conflicting volume	1576	448			885	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	622	0			476	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	376	902			901	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	35	579	298	694	694
Volume Left	0	0	0	0	0
Volume Right	35	0	8	0	0
cSH	902	1700	1700	1700	1700
Volume to Capacity	0.04	0.34	0.18	0.41	0.41
Queue Length 95th (ft)	3	0	0	0	0
Control Delay (s)	9.2	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.2	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	13	802	11	0	1292
Future Volume (Veh/h)	0	13	802	11	0	1292
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	13	827	11	0	1332
Pedestrians	5					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			204			259
pX, platoon unblocked	0.91	0.83			0.83	
vC, conflicting volume	1504	424			843	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	540	0			416	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	428	901			947	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	13	551	287	666	666
Volume Left	0	0	0	0	0
Volume Right	13	0	11	0	0
cSH	901	1700	1700	1700	1700
Volume to Capacity	0.01	0.32	0.17	0.39	0.39
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	9.1	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.1	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	151	635	72	618	105	638	235	628
v/c Ratio	0.46	0.58	0.25	0.75	0.35	0.75	0.70	0.64
Control Delay	23.8	32.6	21.6	42.4	22.2	42.3	30.7	35.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	32.6	21.6	42.4	22.2	42.3	30.7	35.5
Queue Length 50th (ft)	56	177	26	185	38	192	91	178
Queue Length 95th (ft)	125	304	66	323	88	333	185	302
Internal Link Dist (ft)		453		384		503		124
Turn Bay Length (ft)	275		255		345		190	
Base Capacity (vph)	441	2266	427	2103	485	2163	460	2172
Starvation Cap Reductn	0	31	0	0	0	0	2	76
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.28	0.17	0.29	0.22	0.29	0.51	0.30

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	538	72	69	538	56	101	586	27	226	469	133
Future Volume (vph)	145	538	72	69	538	56	101	586	27	226	469	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			3%			-4%	
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	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	
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1709	3350		1707	3365		1742	3460		1804	3475	
Flt Permitted	0.21	1.00		0.36	1.00		0.30	1.00		0.19	1.00	
Satd. Flow (perm)	371	3350		655	3365		556	3460		363	3475	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	151	560	75	72	560	58	105	610	28	235	489	139
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	151	635	0	72	618	0	105	638	0	235	628	0
Confl. Peds. (#/hr)	11		11	11		11	4		5	5		4
Bus Blockages (#/hr)	0	0	0	0	0	8	0	0	8	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	45.0	32.9		32.5	26.4		34.1	24.7		41.5	28.4	
Effective Green, g (s)	45.0	32.9		32.5	26.4		34.1	24.7		41.5	28.4	
Actuated g/C Ratio	0.45	0.33		0.32	0.26		0.34	0.25		0.41	0.28	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	332	1093		274	881		298	847		336	979	
v/s Ratio Prot	c0.06	c0.19		0.02	c0.18		0.03	0.18		c0.09	c0.18	
v/s Ratio Perm	0.15			0.07			0.09			c0.20		
v/c Ratio	0.45	0.58		0.26	0.70		0.35	0.75		0.70	0.64	
Uniform Delay, d1	18.6	28.2		24.2	33.6		23.7	35.2		21.7	31.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.5		0.2	2.1		0.3	3.4		5.1	1.1	
Delay (s)	19.0	28.7		24.4	35.7		24.0	38.6		26.8	32.8	
Level of Service	B	C		C	D		C	D		C	C	
Approach Delay (s)		26.9			34.5			36.6			31.2	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.8	Sum of lost time (s)	24.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	825	4	3	686	11	2	1	2	2	0	15
Future Volume (Veh/h)	24	825	4	3	686	11	2	1	2	2	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	26	907	4	3	754	12	2	1	2	2	0	16
Pedestrians								7			4	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		464										
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	770			918			1367	1744	462	1278	1740	387
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	770			607			1123	1556	83	1021	1552	387
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			98	99	100	99	100	97
cM capacity (veh/h)	837			837			131	93	830	158	94	609

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	26	605	306	3	503	263	5	18
Volume Left	26	0	0	3	0	0	2	2
Volume Right	0	0	4	0	0	12	2	16
cSH	837	1700	1700	837	1700	1700	176	463
Volume to Capacity	0.03	0.36	0.18	0.00	0.30	0.15	0.03	0.04
Queue Length 95th (ft)	2	0	0	0	0	0	2	3
Control Delay (s)	9.4	0.0	0.0	9.3	0.0	0.0	26.1	13.1
Lane LOS	A			A			D	B
Approach Delay (s)	0.3			0.0			26.1	13.1
Approach LOS							D	B

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	32.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	824	691	4	0	9
Future Volume (Veh/h)	5	824	691	4	0	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	5	886	743	4	0	10
Pedestrians					6	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		663	1202			
pX, platoon unblocked	0.99				0.89	0.99
vC, conflicting volume	753				1204	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	722				924	343
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	860				238	641

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	300	591	495	252	10
Volume Left	5	0	0	0	0
Volume Right	0	0	0	4	10
cSH	860	1700	1700	1700	641
Volume to Capacity	0.01	0.35	0.29	0.15	0.02
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.2	0.0	0.0	0.0	10.7
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		10.7
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	103	8	3	125	1	4
Future Volume (Veh/h)	103	8	3	125	1	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	111	9	3	134	1	4
Pedestrians	2				4	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	507					
pX, platoon unblocked						
vC, conflicting volume			124		262	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			124		262	120
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1458		722	929

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	120	137	5
Volume Left	0	3	1
Volume Right	9	0	4
cSH	1700	1458	879
Volume to Capacity	0.07	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.2	9.1
Lane LOS		A	A
Approach Delay (s)	0.0	0.2	9.1
Approach LOS			A

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		

5: N. Washington St & W. Columbia St./E. Columbia St

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	156	11	898	61	870
v/c Ratio	0.15	0.25	0.05	0.80	0.27	0.60
Control Delay	18.5	18.4	11.2	30.2	14.1	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.5	18.4	11.2	30.2	14.1	19.3
Queue Length 50th (ft)	27	46	3	213	16	153
Queue Length 95th (ft)	68	107	11	290	35	265
Internal Link Dist (ft)	910	204		631		475
Turn Bay Length (ft)			70		125	
Base Capacity (vph)	602	626	343	2655	300	2667
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.25	0.03	0.34	0.20	0.33

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	33	8	45	63	36	10	789	37	56	781	19
Future Volume (vph)	41	33	8	45	63	36	10	789	37	56	781	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	12	12	12	10	11	11	10	11	11
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1836			1753		1650	3391		1652	3406	
Flt Permitted		0.81			0.89		0.25	1.00		0.15	1.00	
Satd. Flow (perm)		1533			1583		433	3391		268	3406	
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)	45	36	9	49	68	39	11	858	40	61	849	21
RTOR Reduction (vph)	0	3	0	0	9	0	0	4	0	0	2	0
Lane Group Flow (vph)	0	87	0	0	147	0	11	894	0	61	868	0
Confl. Peds. (#/hr)	11		8	8		11	6		11	11		6
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.5			30.5		30.0	29.1		38.0	33.1	
Effective Green, g (s)		30.5			30.5		30.0	29.1		38.0	33.1	
Actuated g/C Ratio		0.37			0.37		0.36	0.35		0.46	0.40	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0		2.0	2.5	
Lane Grp Cap (vph)		566			585		170	1196		205	1366	
v/s Ratio Prot							0.00	c0.26		c0.02	c0.25	
v/s Ratio Perm		0.06			c0.09		0.02			0.12		
v/c Ratio		0.15			0.25		0.06	0.75		0.30	0.64	
Uniform Delay, d1		17.4			18.1		17.1	23.5		14.4	19.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6			1.0		0.1	2.3		0.3	0.9	
Delay (s)		17.9			19.1		17.2	25.7		14.7	20.7	
Level of Service		B			B		B	C		B	C	
Approach Delay (s)		17.9			19.1			25.6			20.3	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	82.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	120	78	763	801	29
Future Volume (Veh/h)	30	120	78	763	801	29
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	31	124	80	787	826	30
Pedestrians	8			2		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				483	711	
pX, platoon unblocked	0.84	0.82	0.82			
vC, conflicting volume	1402	438	864			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	805	0	383			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	86	92			
cM capacity (veh/h)	246	878	950			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	155	342	525	551	305
Volume Left	31	80	0	0	0
Volume Right	124	0	0	0	30
cSH	580	950	1700	1700	1700
Volume to Capacity	0.27	0.08	0.31	0.32	0.18
Queue Length 95th (ft)	27	7	0	0	0
Control Delay (s)	13.5	2.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	13.5	1.1		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	145	61	845	906
v/c Ratio	0.46	0.18	0.41	0.59
Control Delay	23.7	7.5	5.4	12.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.7	7.5	5.4	12.7
Queue Length 50th (ft)	37	0	51	98
Queue Length 95th (ft)	87	24	97	167
Internal Link Dist (ft)	437		43	403
Turn Bay Length (ft)	150			
Base Capacity (vph)	766	719	3049	3427
Starvation Cap Reductn	0	0	24	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.08	0.28	0.26

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	135	57	36	750	771	72
Future Volume (vph)	135	57	36	750	771	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Grade (%)	0%			3%	-3%	
Total Lost time (s)	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		3335	3428	
Flt Permitted	0.95	1.00		0.90	1.00	
Satd. Flow (perm)	1770	1583		3014	3428	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	145	61	39	806	829	77
RTOR Reduction (vph)	0	52	0	0	8	0
Lane Group Flow (vph)	145	9	0	845	898	0
Bus Blockages (#/hr)	0	0	0	4	0	4
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			
Actuated Green, G (s)	7.0	7.0		31.5	21.4	
Effective Green, g (s)	7.0	7.0		31.5	21.4	
Actuated g/C Ratio	0.14	0.14		0.65	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		1.5	1.5	
Lane Grp Cap (vph)	255	228		1991	1512	
v/s Ratio Prot	c0.08			c0.04	c0.26	
v/s Ratio Perm		0.01		0.23		
v/c Ratio	0.57	0.04		0.42	0.59	
Uniform Delay, d1	19.3	17.9		4.1	10.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.0		0.1	0.4	
Delay (s)	21.1	17.9		4.2	10.7	
Level of Service	C	B		A	B	
Approach Delay (s)	20.1			4.2	10.7	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	48.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	8	778	5	0	828
Future Volume (Veh/h)	0	8	778	5	0	828
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	8	819	5	0	872
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			340			123
pX, platoon unblocked	0.89	0.84			0.84	
vC, conflicting volume	1258	413			825	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	236	0			415	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	649	912			959	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	8	546	278	436	436
Volume Left	0	0	0	0	0
Volume Right	8	0	5	0	0
cSH	912	1700	1700	1700	1700
Volume to Capacity	0.01	0.32	0.16	0.26	0.26
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	9.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.0	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	778	9	0	828
Future Volume (Veh/h)	0	5	778	9	0	828
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	6	874	10	0	930
Pedestrians	6					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			204			259
pX, platoon unblocked	0.90	0.83			0.83	
vC, conflicting volume	1350	448			890	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	333	0			468	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	570	899			903	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	6	583	301	465	465
Volume Left	0	0	0	0	0
Volume Right	6	0	10	0	0
cSH	899	1700	1700	1700	1700
Volume to Capacity	0.01	0.34	0.18	0.27	0.27
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	9.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.0	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	31.8%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX E

INTERSECTION CAPACITY ANALYSIS –

FUTURE WITHOUT DEVELOPMENT CONDITION (2020)

1: S. Washington St/N. Washington St & W. Broad St/E. Broad St

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	140	615	42	789	67	1024	138	582
v/c Ratio	0.68	0.51	0.15	0.74	0.20	0.92	0.60	0.45
Control Delay	47.3	33.2	10.9	26.3	16.0	40.5	25.9	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	33.2	10.9	26.3	16.0	40.5	25.9	20.3
Queue Length 50th (ft)	68	192	8	225	18	193	37	151
Queue Length 95th (ft)	m#151	175	m18	275	m47	#428	98	186
Internal Link Dist (ft)		453		384		503		124
Turn Bay Length (ft)	275		255		345		190	
Base Capacity (vph)	206	1217	295	1060	340	1111	254	1318
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.51	0.14	0.74	0.20	0.92	0.54	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	573	29	41	707	67	66	985	19	135	489	81
Future Volume (vph)	137	573	29	41	707	67	66	985	19	135	489	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			3%			-4%	
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	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	
Frt	1.00	0.99		1.00	0.99		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3392		1708	3368		1742	3474		1805	3525	
Flt Permitted	0.17	1.00		0.33	1.00		0.39	1.00		0.11	1.00	
Satd. Flow (perm)	301	3392		596	3368		715	3474		207	3525	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	140	585	30	42	721	68	67	1005	19	138	499	83
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	140	615	0	42	789	0	67	1024	0	138	582	0
Confl. Peds. (#/hr)	13		12	12		13	3		16	16		3
Bus Blockages (#/hr)	0	0	0	0	0	8	0	0	8	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	38.8	32.8		34.0	30.4		37.9	33.1		45.3	36.8	
Effective Green, g (s)	38.8	32.8		34.0	30.4		37.9	33.1		45.3	36.8	
Actuated g/C Ratio	0.39	0.33		0.34	0.30		0.38	0.33		0.45	0.37	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	201	1112		242	1023		320	1149		229	1297	
v/s Ratio Prot	c0.04	0.18		0.01	c0.23		0.01	c0.29		c0.05	0.17	
v/s Ratio Perm	0.23			0.05			0.07			0.22		
v/c Ratio	0.70	0.55		0.17	0.77		0.21	0.89		0.60	0.45	
Uniform Delay, d1	22.3	27.6		22.5	31.6		20.1	31.7		20.5	23.9	
Progression Factor	1.59	1.19		0.57	0.70		0.98	0.80		0.90	0.78	
Incremental Delay, d2	7.4	1.8		0.1	5.1		0.1	9.0		3.0	0.5	
Delay (s)	42.9	34.5		13.0	27.3		19.8	34.6		21.5	19.2	
Level of Service	D	C		B	C		B	C		C	B	
Approach Delay (s)		36.1			26.6			33.7			19.6	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	788	36	17	927	30	4	0	13	3	0	13
Future Volume (Veh/h)	20	788	36	17	927	30	4	0	13	3	0	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	21	838	38	18	986	32	4	0	14	3	0	14
Pedestrians								4			4	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		464										
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	1022			880			1446	1961	442	1517	1964	513
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1022			557			1209	1803	52	1291	1806	513
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			96	100	98	97	100	97
cM capacity (veh/h)	673			873			111	64	869	98	64	505

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	21	559	317	18	657	361	18	17
Volume Left	21	0	0	18	0	0	4	3
Volume Right	0	0	38	0	0	32	14	14
cSH	673	1700	1700	873	1700	1700	346	291
Volume to Capacity	0.03	0.33	0.19	0.02	0.39	0.21	0.05	0.06
Queue Length 95th (ft)	2	0	0	2	0	0	4	5
Control Delay (s)	10.5	0.0	0.0	9.2	0.0	0.0	16.0	18.1
Lane LOS	B			A			C	C
Approach Delay (s)	0.2			0.2			16.0	18.1
Approach LOS							C	C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	795	969	11	2	5
Future Volume (Veh/h)	9	795	969	11	2	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	864	1053	12	2	5
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		663	1202			
pX, platoon unblocked	0.94				0.92	0.94
vC, conflicting volume	1066				1512	534
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	932				1058	363
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	682				198	592

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	298	576	702	363	7
Volume Left	10	0	0	0	2
Volume Right	0	0	0	12	5
cSH	682	1700	1700	1700	378
Volume to Capacity	0.01	0.34	0.41	0.21	0.02
Queue Length 95th (ft)	1	0	0	0	1
Control Delay (s)	0.5	0.0	0.0	0.0	14.7
Lane LOS	A				B
Approach Delay (s)	0.2		0.0		14.7
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	116	6	1	232	14	9
Future Volume (Veh/h)	116	6	1	232	14	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	126	7	1	252	15	10
Pedestrians				3	4	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	507					
pX, platoon unblocked						
vC, conflicting volume			137		388	136
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			137		388	136
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			1442		613	907

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	133	253	25
Volume Left	0	1	15
Volume Right	7	0	10
cSH	1700	1442	705
Volume to Capacity	0.08	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.0	10.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.0	10.3
Approach LOS			B

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	145	269	26	1161	27	710
v/c Ratio	0.32	0.56	0.07	0.66	0.13	0.41
Control Delay	28.7	33.5	5.2	9.8	10.6	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	33.5	5.2	9.8	10.6	16.6
Queue Length 50th (ft)	69	137	3	136	7	153
Queue Length 95th (ft)	123	221	m7	240	18	202
Internal Link Dist (ft)	910	204		631		475
Turn Bay Length (ft)			70		125	
Base Capacity (vph)	448	479	359	1749	205	1753
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.56	0.07	0.66	0.13	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	75	12	74	134	50	25	1078	36	26	667	14
Future Volume (vph)	52	75	12	74	134	50	25	1078	36	26	667	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	12	12	12	10	11	11	10	11	11
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		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	
Frt		0.99			0.97		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1861			1779		1649	3399		1652	3407	
Flt Permitted		0.78			0.87		0.32	1.00		0.14	1.00	
Satd. Flow (perm)		1483			1568		563	3399		249	3407	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	54	78	12	77	140	52	26	1123	38	27	695	15
RTOR Reduction (vph)	0	4	0	0	8	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	142	0	0	261	0	26	1158	0	27	708	0
Confl. Peds. (#/hr)	4		4	4		4	6		8	8		6
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.0			30.0		52.0	49.0		52.0	49.0	
Effective Green, g (s)		30.0			30.0		52.0	49.0		52.0	49.0	
Actuated g/C Ratio		0.30			0.30		0.52	0.49		0.52	0.49	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		444			470		325	1665		171	1669	
v/s Ratio Prot							0.00	c0.34		c0.00	0.21	
v/s Ratio Perm		0.10			c0.17		0.04			0.08		
v/c Ratio		0.32			0.55		0.08	0.70		0.16	0.42	
Uniform Delay, d1		27.1			29.4		12.0	19.7		13.9	16.4	
Progression Factor		1.00			1.00		0.53	0.42		1.00	1.00	
Incremental Delay, d2		1.9			4.7		0.1	2.0		0.4	0.8	
Delay (s)		29.0			34.0		6.4	10.4		14.3	17.2	
Level of Service		C			C		A	B		B	B	
Approach Delay (s)		29.0			34.0			10.3			17.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	100	93	1157	674	49
Future Volume (Veh/h)	13	100	93	1157	674	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	14	104	97	1205	702	51
Pedestrians	7				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	1				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				483	711	
pX, platoon unblocked	0.94	0.88	0.88			
vC, conflicting volume	1533	384	760			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	930	43	469			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	88	90			
cM capacity (veh/h)	222	895	958			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	118	499	803	468	285
Volume Left	14	97	0	0	0
Volume Right	104	0	0	0	51
cSH	659	958	1700	1700	1700
Volume to Capacity	0.18	0.10	0.47	0.28	0.17
Queue Length 95th (ft)	16	8	0	0	0
Control Delay (s)	11.7	2.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	11.7	1.1		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	99	55	1312	807
v/c Ratio	0.52	0.25	0.60	0.28
Control Delay	50.8	13.7	5.4	2.5
Queue Delay	0.0	0.0	2.6	0.0
Total Delay	50.8	13.7	8.0	2.5
Queue Length 50th (ft)	61	0	175	42
Queue Length 95th (ft)	108	34	m111	87
Internal Link Dist (ft)	437		43	403
Turn Bay Length (ft)	150			
Base Capacity (vph)	336	340	2201	2854
Starvation Cap Reductn	0	0	736	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.29	0.16	0.90	0.28

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	91	51	98	1109	654	88
Future Volume (vph)	91	51	98	1109	654	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Grade (%)	0%			3%	-3%	
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1559		3327	3391	
Flt Permitted	0.95	1.00		0.78	1.00	
Satd. Flow (perm)	1770	1559		2621	3391	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	55	107	1205	711	96
RTOR Reduction (vph)	0	50	0	0	5	0
Lane Group Flow (vph)	99	5	0	1312	802	0
Confl. Peds. (#/hr)	2	2	9			9
Bus Blockages (#/hr)	0	0	0	4	0	4
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			
Actuated Green, G (s)	9.6	9.6		82.4	82.4	
Effective Green, g (s)	9.6	9.6		82.4	82.4	
Actuated g/C Ratio	0.10	0.10		0.82	0.82	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	169	149		2159	2794	
v/s Ratio Prot	c0.06				0.24	
v/s Ratio Perm		0.00		c0.50		
v/c Ratio	0.59	0.04		0.61	0.29	
Uniform Delay, d1	43.3	41.0		3.1	2.0	
Progression Factor	1.00	1.00		1.22	0.98	
Incremental Delay, d2	5.1	0.1		0.3	0.2	
Delay (s)	48.4	41.1		4.1	2.2	
Level of Service	D	D		A	A	
Approach Delay (s)	45.8			4.1	2.2	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	17	1190	2	0	705
Future Volume (Veh/h)	0	17	1190	2	0	705
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	18	1293	2	0	766
Pedestrians	12					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			340			123
pX, platoon unblocked	0.75	0.72			0.72	
vC, conflicting volume	1689	660			1307	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	947	0			651	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			100	
cM capacity (veh/h)	191	774			664	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	18	862	433	383	383
Volume Left	0	0	0	0	0
Volume Right	18	0	2	0	0
cSH	774	1700	1700	1700	1700
Volume to Capacity	0.02	0.51	0.25	0.23	0.23
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	9.8	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.8	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	9	1183	6	0	705
Future Volume (Veh/h)	0	9	1183	6	0	705
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	9	1220	6	0	727
Pedestrians	10					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			204			259
pX, platoon unblocked	0.74	0.72			0.72	
vC, conflicting volume	1596	623			1236	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	867	0			551	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	214	775			725	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	9	813	413	364	364
Volume Left	0	0	0	0	0
Volume Right	9	0	6	0	0
cSH	775	1700	1700	1700	1700
Volume to Capacity	0.01	0.48	0.24	0.21	0.21
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	9.7	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.7	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

1: S. Washington St/N. Washington St & W. Broad St/E. Broad St

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	203	777	97	860	83	675	167	1213
v/c Ratio	0.89	0.65	0.41	0.84	0.48	0.68	0.53	0.98
Control Delay	62.5	20.2	17.5	34.9	23.8	37.2	21.3	42.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9
Total Delay	62.5	20.2	17.5	34.9	23.8	37.2	21.3	48.8
Queue Length 50th (ft)	65	196	27	282	37	226	30	169
Queue Length 95th (ft)	#213	205	49	#395	m56	291	96	#534
Internal Link Dist (ft)		453		384		503		124
Turn Bay Length (ft)	275		255		345		190	
Base Capacity (vph)	228	1189	237	1025	177	1032	360	1239
Starvation Cap Reductn	0	0	0	0	0	0	0	34
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.65	0.41	0.84	0.47	0.65	0.46	1.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	681	65	93	793	33	80	620	28	160	1030	134
Future Volume (vph)	195	681	65	93	793	33	80	620	28	160	1030	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			3%			-4%	
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	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	
Frt	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3361		1707	3396		1743	3458		1803	3541	
Flt Permitted	0.12	1.00		0.24	1.00		0.13	1.00		0.21	1.00	
Satd. Flow (perm)	216	3361		436	3396		245	3458		401	3541	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	203	709	68	97	826	34	83	646	29	167	1073	140
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	203	777	0	97	860	0	83	675	0	167	1213	0
Confl. Peds. (#/hr)	18		30	30		18	3		22	22		3
Bus Blockages (#/hr)	0	0	0	0	0	8	0	0	8	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	42.4	33.4		34.0	29.2		34.7	29.9		44.8	35.0	
Effective Green, g (s)	42.4	33.4		34.0	29.2		34.7	29.9		44.8	35.0	
Actuated g/C Ratio	0.42	0.33		0.34	0.29		0.35	0.30		0.45	0.35	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	226	1122		209	991		156	1033		318	1239	
v/s Ratio Prot	c0.08	0.23		0.02	0.25		0.03	0.20		c0.05	c0.34	
v/s Ratio Perm	c0.30			0.14			0.16			0.18		
v/c Ratio	0.90	0.69		0.46	0.87		0.53	0.65		0.53	0.98	
Uniform Delay, d1	22.4	28.9		23.6	33.6		25.6	30.5		18.5	32.1	
Progression Factor	1.42	0.62		0.69	0.78		0.94	1.07		0.97	0.69	
Incremental Delay, d2	27.9	2.8		0.6	9.8		1.6	1.9		0.6	18.9	
Delay (s)	59.6	20.6		16.8	35.9		25.6	34.4		18.6	41.0	
Level of Service	E	C		B	D		C	C		B	D	
Approach Delay (s)		28.7			34.0			33.5			38.3	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	955	10	6	749	19	15	0	22	10	0	22
Future Volume (Veh/h)	12	955	10	6	749	19	15	0	22	10	0	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	13	1038	11	7	814	21	16	0	24	11	0	24
Pedestrians		1						5			9	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		464										
pX, platoon unblocked				0.82			0.82	0.82	0.82	0.82	0.82	
vC, conflicting volume	844			1054			1520	1932	530	1416	1928	428
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	844			623			1193	1696	0	1066	1690	428
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			85	100	97	92	100	96
cM capacity (veh/h)	782			778			108	72	884	136	73	571

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	13	692	357	7	543	292	40	35
Volume Left	13	0	0	7	0	0	16	11
Volume Right	0	0	11	0	0	21	24	24
cSH	782	1700	1700	778	1700	1700	228	284
Volume to Capacity	0.02	0.41	0.21	0.01	0.32	0.17	0.18	0.12
Queue Length 95th (ft)	1	0	0	1	0	0	16	10
Control Delay (s)	9.7	0.0	0.0	9.7	0.0	0.0	24.1	19.4
Lane LOS	A			A			C	C
Approach Delay (s)	0.1			0.1			24.1	19.4
Approach LOS							C	C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	983	756	11	6	18
Future Volume (Veh/h)	4	983	756	11	6	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	1035	796	12	6	19
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		663	1202			
pX, platoon unblocked					0.83	
vC, conflicting volume	816				1336	412
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	816				1006	412
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	97
cM capacity (veh/h)	802				196	585

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	349	690	531	277	25
Volume Left	4	0	0	0	6
Volume Right	0	0	0	12	19
cSH	802	1700	1700	1700	396
Volume to Capacity	0.00	0.41	0.31	0.16	0.06
Queue Length 95th (ft)	0	0	0	0	5
Control Delay (s)	0.2	0.0	0.0	0.0	14.7
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		14.7
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	183	10	8	141	4	8
Future Volume (Veh/h)	183	10	8	141	4	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	199	11	9	153	4	9
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	507					
pX, platoon unblocked						
vC, conflicting volume			218		384	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			218		384	212
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1343		611	822

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	210	162	13
Volume Left	0	9	4
Volume Right	11	0	9
cSH	1700	1343	743
Volume to Capacity	0.12	0.01	0.02
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.5	9.9
Lane LOS		A	A
Approach Delay (s)	0.0	0.5	9.9
Approach LOS			A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		

5: N. Washington St & W. Columbia St./E. Columbia St

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	219	152	37	1060	40	1290
v/c Ratio	0.48	0.32	0.20	0.60	0.16	0.73
Control Delay	32.7	28.1	7.3	16.3	10.3	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	28.1	7.3	16.3	10.3	22.9
Queue Length 50th (ft)	111	70	7	292	10	356
Queue Length 95th (ft)	184	126	m12	331	24	448
Internal Link Dist (ft)	910	204		631		475
Turn Bay Length (ft)			70		125	
Base Capacity (vph)	457	480	190	1756	252	1766
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.32	0.19	0.60	0.16	0.73

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	107	22	31	85	24	34	918	57	37	1161	26
Future Volume (vph)	73	107	22	31	85	24	34	918	57	37	1161	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	12	12	12	10	11	11	10	11	11
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		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	
Frt		0.99			0.98		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1855			1792		1652	3384		1652	3407	
Flt Permitted		0.83			0.90		0.11	1.00		0.18	1.00	
Satd. Flow (perm)		1565			1631		187	3384		310	3407	
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)	79	116	24	34	92	26	37	998	62	40	1262	28
RTOR Reduction (vph)	0	4	0	0	7	0	0	4	0	0	2	0
Lane Group Flow (vph)	0	215	0	0	145	0	37	1056	0	40	1288	0
Confl. Peds. (#/hr)	5		2	2		5	5		5	5		5
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		29.0			29.0		53.0	49.4		53.0	49.4	
Effective Green, g (s)		29.0			29.0		53.0	49.4		53.0	49.4	
Actuated g/C Ratio		0.29			0.29		0.53	0.49		0.53	0.49	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		453			472		151	1671		212	1683	
v/s Ratio Prot							c0.01	0.31		0.01	c0.38	
v/s Ratio Perm		c0.14			0.09		0.12			0.09		
v/c Ratio		0.47			0.31		0.25	0.63		0.19	0.77	
Uniform Delay, d1		29.2			27.7		14.7	18.6		12.8	20.6	
Progression Factor		1.00			1.00		0.57	0.82		1.00	1.00	
Incremental Delay, d2		3.5			1.7		0.8	1.7		0.4	3.4	
Delay (s)		32.8			29.3		9.2	17.0		13.3	24.0	
Level of Service		C			C		A	B		B	C	
Approach Delay (s)		32.8			29.3			16.7			23.7	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	87	83	985	1172	50
Future Volume (Veh/h)	21	87	83	985	1172	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	22	91	86	1026	1221	52
Pedestrians	5				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				483	711	
pX, platoon unblocked	0.74	0.69	0.69			
vC, conflicting volume	1939	642	1278			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	988	0	517			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	88	88			
cM capacity (veh/h)	158	749	722			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	113	428	684	814	459
Volume Left	22	86	0	0	0
Volume Right	91	0	0	0	52
cSH	434	722	1700	1700	1700
Volume to Capacity	0.26	0.12	0.40	0.48	0.27
Queue Length 95th (ft)	26	10	0	0	0
Control Delay (s)	16.2	3.4	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	16.2	1.3		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	181	115	942	1395
v/c Ratio	0.61	0.33	0.47	0.56
Control Delay	46.4	9.0	6.1	1.9
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	46.4	9.1	6.1	1.9
Queue Length 50th (ft)	105	0	70	33
Queue Length 95th (ft)	169	45	m104	41
Internal Link Dist (ft)	437		43	403
Turn Bay Length (ft)	150			
Base Capacity (vph)	407	438	2022	2496
Starvation Cap Reductn	0	0	65	0
Spillback Cap Reductn	0	3	0	125
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.26	0.48	0.59

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	168	107	36	840	1217	80
Future Volume (vph)	168	107	36	840	1217	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Grade (%)	0%			3%	-3%	
Total Lost time (s)	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.96		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1523		3335	3413	
Flt Permitted	0.95	1.00		0.83	1.00	
Satd. Flow (perm)	1770	1523		2768	3413	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	181	115	39	903	1309	86
RTOR Reduction (vph)	0	96	0	0	3	0
Lane Group Flow (vph)	181	19	0	942	1392	0
Confl. Peds. (#/hr)		17	33			33
Bus Blockages (#/hr)	0	0	0	4	0	4
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			
Actuated Green, G (s)	16.9	16.9		73.1	73.1	
Effective Green, g (s)	16.9	16.9		73.1	73.1	
Actuated g/C Ratio	0.17	0.17		0.73	0.73	
Clearance Time (s)	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)	299	257		2023	2494	
v/s Ratio Prot	c0.10				c0.41	
v/s Ratio Perm		0.01		0.34		
v/c Ratio	0.61	0.08		0.47	0.56	
Uniform Delay, d1	38.5	35.0		5.5	6.1	
Progression Factor	1.00	1.00		0.90	0.17	
Incremental Delay, d2	4.0	0.2		0.1	0.7	
Delay (s)	42.4	35.1		5.0	1.8	
Level of Service	D	D		A	A	
Approach Delay (s)	39.6			5.0	1.8	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	33	843	7	0	1324
Future Volume (Veh/h)	0	33	843	7	0	1324
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	35	906	8	0	1424
Pedestrians	8					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			340			123
pX, platoon unblocked	0.89	0.84			0.84	
vC, conflicting volume	1630	466			922	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	654	0			520	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	355	902			868	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	35	604	310	712	712
Volume Left	0	0	0	0	0
Volume Right	35	0	8	0	0
cSH	902	1700	1700	1700	1700
Volume to Capacity	0.04	0.36	0.18	0.42	0.42
Queue Length 95th (ft)	3	0	0	0	0
Control Delay (s)	9.2	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.2	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	13	837	11	0	1324
Future Volume (Veh/h)	0	13	837	11	0	1324
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	13	863	11	0	1365
Pedestrians	5					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			204			259
pX, platoon unblocked	0.90	0.83			0.83	
vC, conflicting volume	1556	442			879	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	569	0			459	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	405	901			913	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	13	575	299	682	682
Volume Left	0	0	0	0	0
Volume Right	13	0	11	0	0
cSH	901	1700	1700	1700	1700
Volume to Capacity	0.01	0.34	0.18	0.40	0.40
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	9.1	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.1	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	189	692	72	680	105	638	235	659
v/c Ratio	0.56	0.58	0.26	0.78	0.38	0.76	0.72	0.68
Control Delay	25.9	32.6	21.9	45.5	25.1	45.9	34.8	39.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	32.6	21.9	45.5	25.1	45.9	34.8	39.5
Queue Length 50th (ft)	76	206	27	225	42	212	103	209
Queue Length 95th (ft)	156	340	67	369	95	349	198	338
Internal Link Dist (ft)		453		384		503		124
Turn Bay Length (ft)	275		255		345		190	
Base Capacity (vph)	414	2106	410	1952	446	2005	429	1999
Starvation Cap Reductn	0	62	0	0	0	0	0	77
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.34	0.18	0.35	0.24	0.32	0.55	0.34

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	592	72	69	597	56	101	586	27	226	469	163
Future Volume (vph)	181	592	72	69	597	56	101	586	27	226	469	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			3%			-4%	
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3355		1707	3369		1742	3460		1805	3453	
Flt Permitted	0.18	1.00		0.35	1.00		0.27	1.00		0.18	1.00	
Satd. Flow (perm)	318	3355		631	3369		495	3460		342	3453	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	189	617	75	72	622	58	105	610	28	235	489	170
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	189	692	0	72	680	0	105	638	0	235	659	0
Confl. Peds. (#/hr)	11		11	11		11	4		5	5		4
Bus Blockages (#/hr)	0	0	0	0	0	8	0	0	8	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	50.6	38.5		35.7	29.6		35.8	26.2		44.0	30.3	
Effective Green, g (s)	50.6	38.5		35.7	29.6		35.8	26.2		44.0	30.3	
Actuated g/C Ratio	0.47	0.35		0.33	0.27		0.33	0.24		0.41	0.28	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	340	1190		268	919		273	835		323	964	
v/s Ratio Prot	c0.08	c0.21		0.02	c0.20		0.03	0.18		c0.09	c0.19	
v/s Ratio Perm	0.18			0.07			0.09			c0.20		
v/c Ratio	0.56	0.58		0.27	0.74		0.38	0.76		0.73	0.68	
Uniform Delay, d1	19.8	28.5		25.5	35.9		26.3	38.3		23.9	34.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.5		0.2	2.7		0.3	3.8		6.8	1.6	
Delay (s)	20.9	28.9		25.7	38.7		26.6	42.1		30.7	36.4	
Level of Service	C	C		C	D		C	D		C	D	
Approach Delay (s)		27.2			37.4			39.9			34.9	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	108.5	Sum of lost time (s)	24.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	879	4	3	745	11	2	1	2	2	0	15
Future Volume (Veh/h)	24	879	4	3	745	11	2	1	2	2	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	26	955	4	3	810	12	2	1	2	2	0	16
Pedestrians								7			4	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		464										
pX, platoon unblocked				0.86			0.86	0.86	0.86	0.86	0.86	
vC, conflicting volume	826			966			1443	1848	486	1358	1844	415
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	826			622			1180	1653	62	1081	1649	415
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			98	99	100	99	100	97
cM capacity (veh/h)	798			812			116	80	842	140	80	584

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	26	637	322	3	540	282	5	18
Volume Left	26	0	0	3	0	0	2	2
Volume Right	0	0	4	0	0	12	2	16
cSH	798	1700	1700	812	1700	1700	156	432
Volume to Capacity	0.03	0.37	0.19	0.00	0.32	0.17	0.03	0.04
Queue Length 95th (ft)	3	0	0	0	0	0	2	3
Control Delay (s)	9.7	0.0	0.0	9.5	0.0	0.0	28.9	13.7
Lane LOS	A			A			D	B
Approach Delay (s)	0.3			0.0			28.9	13.7
Approach LOS							D	B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	878	750	4	0	9
Future Volume (Veh/h)	5	878	750	4	0	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	5	944	806	4	0	10
Pedestrians					6	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		663	1202			
pX, platoon unblocked	0.95				0.89	0.95
vC, conflicting volume	816				1296	411
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	712				858	288
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	99
cM capacity (veh/h)	839				261	673

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	320	629	537	273	10
Volume Left	5	0	0	0	0
Volume Right	0	0	0	4	10
cSH	839	1700	1700	1700	673
Volume to Capacity	0.01	0.37	0.32	0.16	0.01
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.2	0.0	0.0	0.0	10.4
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		10.4
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	103	8	3	125	1	4
Future Volume (Veh/h)	103	8	3	125	1	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	111	9	3	134	1	4
Pedestrians	2				4	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	507					
pX, platoon unblocked						
vC, conflicting volume			124		262	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			124		262	120
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1458		722	929

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	120	137	5
Volume Left	0	3	1
Volume Right	9	0	4
cSH	1700	1458	879
Volume to Capacity	0.07	0.00	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.2	9.1
Lane LOS		A	A
Approach Delay (s)	0.0	0.2	9.1
Approach LOS			A

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	91	156	11	939	61	913
v/c Ratio	0.15	0.25	0.05	0.81	0.28	0.62
Control Delay	19.3	19.1	11.0	30.4	14.1	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	19.1	11.0	30.4	14.1	19.3
Queue Length 50th (ft)	29	49	3	226	16	163
Queue Length 95th (ft)	71	110	11	305	35	281
Internal Link Dist (ft)	910	204		631		475
Turn Bay Length (ft)			70		125	
Base Capacity (vph)	592	616	335	2618	293	2631
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.25	0.03	0.36	0.21	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	33	9	45	63	36	10	827	37	56	821	19
Future Volume (vph)	41	33	9	45	63	36	10	827	37	56	821	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	12	12	12	10	11	11	10	11	11
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1834			1753		1651	3392		1652	3407	
Flt Permitted		0.82			0.89		0.23	1.00		0.14	1.00	
Satd. Flow (perm)		1532			1581		400	3392		249	3407	
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)	45	36	10	49	68	39	11	899	40	61	892	21
RTOR Reduction (vph)	0	3	0	0	9	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	88	0	0	147	0	11	936	0	61	911	0
Confl. Peds. (#/hr)	11		8	8		11	6		11	11		6
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.5			30.5		31.3	30.4		39.3	34.4	
Effective Green, g (s)		30.5			30.5		31.3	30.4		39.3	34.4	
Actuated g/C Ratio		0.36			0.36		0.37	0.36		0.47	0.41	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0		2.0	2.5	
Lane Grp Cap (vph)		557			575		162	1230		198	1398	
v/s Ratio Prot							0.00	c0.28		c0.02	c0.27	
v/s Ratio Perm		0.06			c0.09		0.02			0.13		
v/c Ratio		0.16			0.26		0.07	0.76		0.31	0.65	
Uniform Delay, d1		18.0			18.7		16.9	23.5		14.5	19.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6			1.1		0.1	2.5		0.3	1.0	
Delay (s)		18.6			19.8		17.0	26.0		14.8	20.9	
Level of Service		B			B		B	C		B	C	
Approach Delay (s)		18.6			19.8			25.9			20.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	83.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	120	78	801	841	29
Future Volume (Veh/h)	30	120	78	801	841	29
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	31	124	80	826	867	30
Pedestrians	8			2		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				483	711	
pX, platoon unblocked	0.84	0.80	0.80			
vC, conflicting volume	1463	458	905			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	799	0	395			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	86	91			
cM capacity (veh/h)	246	865	927			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	155	355	551	578	319
Volume Left	31	80	0	0	0
Volume Right	124	0	0	0	30
cSH	575	927	1700	1700	1700
Volume to Capacity	0.27	0.09	0.32	0.34	0.19
Queue Length 95th (ft)	27	7	0	0	0
Control Delay (s)	13.6	2.8	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	13.6	1.1		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	147	61	884	949
v/c Ratio	0.46	0.18	0.43	0.61
Control Delay	23.9	7.6	5.6	13.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.9	7.6	5.6	13.1
Queue Length 50th (ft)	38	0	55	105
Queue Length 95th (ft)	90	25	104	178
Internal Link Dist (ft)	437		43	403
Turn Bay Length (ft)	150			
Base Capacity (vph)	761	715	3046	3424
Starvation Cap Reductn	0	0	36	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.09	0.29	0.28

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	137	57	36	786	801	82
Future Volume (vph)	137	57	36	786	801	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Grade (%)	0%			3%	-3%	
Total Lost time (s)	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		3336	3424	
Flt Permitted	0.95	1.00		0.90	1.00	
Satd. Flow (perm)	1770	1583		3011	3424	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	147	61	39	845	861	88
RTOR Reduction (vph)	0	52	0	0	9	0
Lane Group Flow (vph)	147	9	0	884	940	0
Bus Blockages (#/hr)	0	0	0	4	0	4
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			
Actuated Green, G (s)	7.1	7.1		31.8	21.7	
Effective Green, g (s)	7.1	7.1		31.8	21.7	
Actuated g/C Ratio	0.15	0.15		0.65	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		1.5	1.5	
Lane Grp Cap (vph)	256	229		1991	1519	
v/s Ratio Prot	c0.08			c0.05	c0.27	
v/s Ratio Perm		0.01		0.24		
v/c Ratio	0.57	0.04		0.44	0.62	
Uniform Delay, d1	19.5	18.0		4.2	10.4	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.0		0.1	0.5	
Delay (s)	21.4	18.0		4.3	11.0	
Level of Service	C	B		A	B	
Approach Delay (s)	20.4			4.3	11.0	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	8	814	5	0	858
Future Volume (Veh/h)	0	8	814	5	0	858
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	8	857	5	0	903
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			340			123
pX, platoon unblocked	0.88	0.84			0.84	
vC, conflicting volume	1312	432			863	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	244	0			448	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	634	907			928	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	8	571	291	452	452
Volume Left	0	0	0	0	0
Volume Right	8	0	5	0	0
cSH	907	1700	1700	1700	1700
Volume to Capacity	0.01	0.34	0.17	0.27	0.27
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	9.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.0	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	814	9	0	858
Future Volume (Veh/h)	0	5	814	9	0	858
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	5	885	10	0	933
Pedestrians	6					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			204			259
pX, platoon unblocked	0.89	0.83			0.83	
vC, conflicting volume	1362	454			901	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	307	0			478	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	584	898			895	

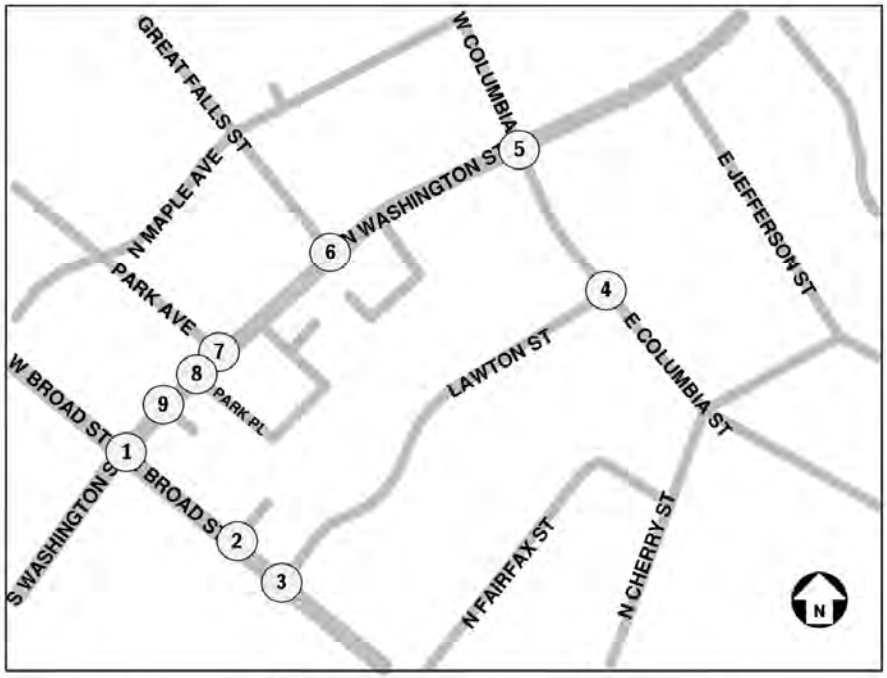
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	5	590	305	466	466
Volume Left	0	0	0	0	0
Volume Right	5	0	10	0	0
cSH	898	1700	1700	1700	1700
Volume to Capacity	0.01	0.35	0.18	0.27	0.27
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	9.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.0	0.0		0.0	
Approach LOS	A				

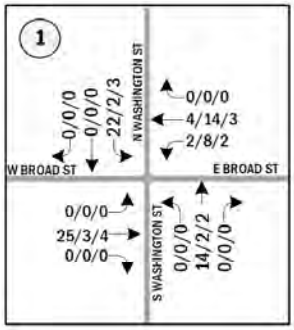
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

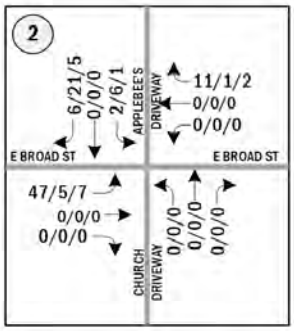
APPENDIX F

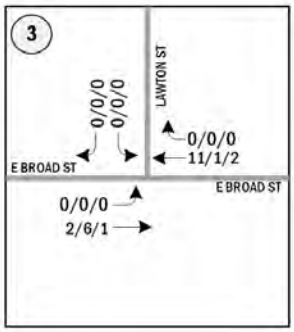
TRAFFIC VOLUMES FOR EACH USE AND PASS-BY TRIPS

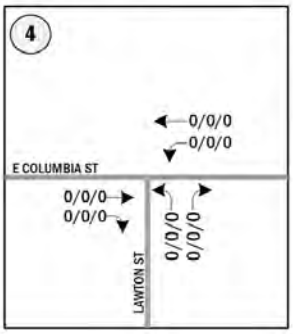
Office Use Trips

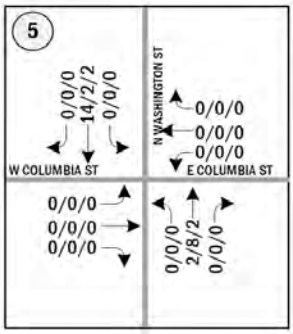


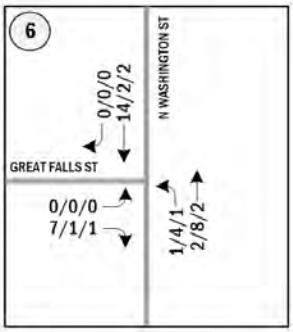


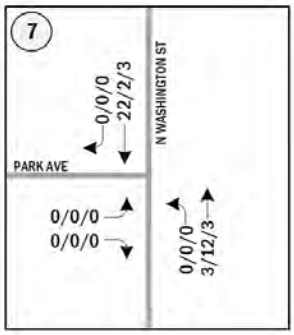


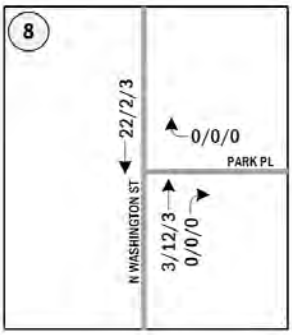


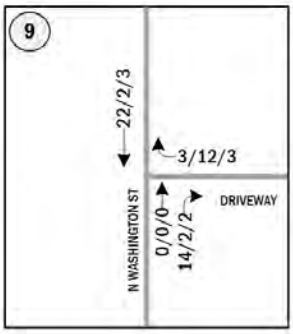












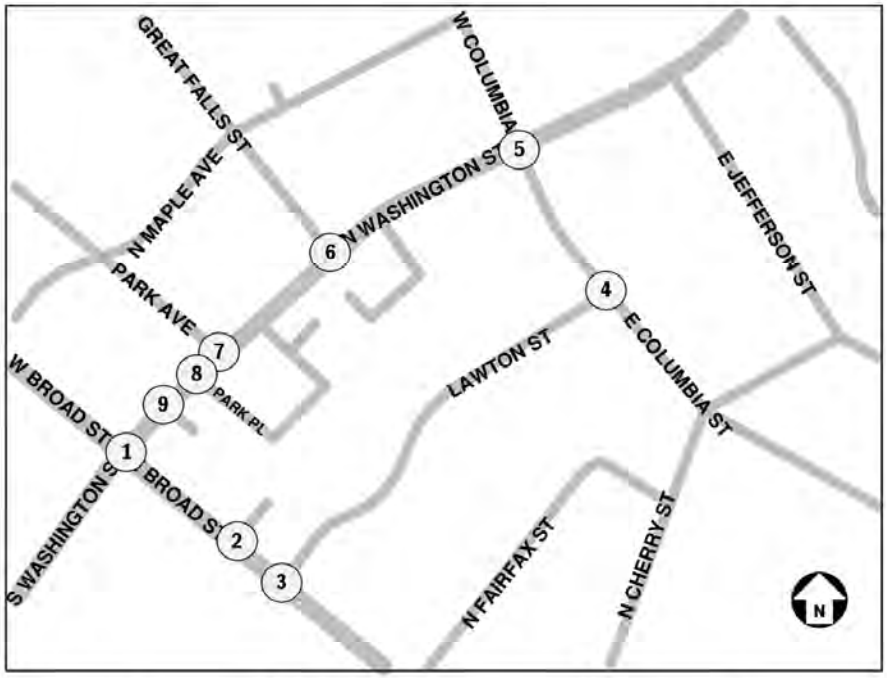
Legend

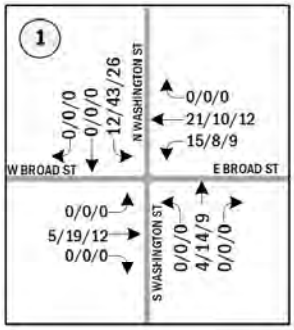
Existing Roadway Network

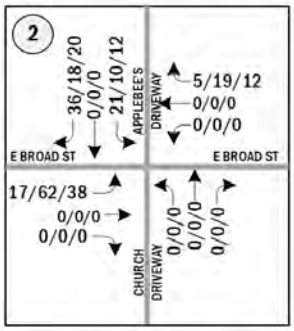
Peak Hour Traffic Volumes

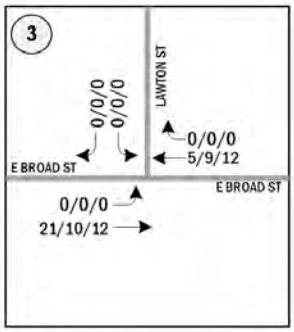
AM/PM/SAT
AM/PM/SAT
AM/PM/SAT

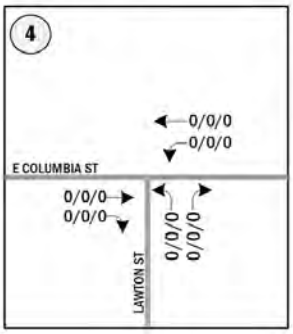
Residential Use Trips

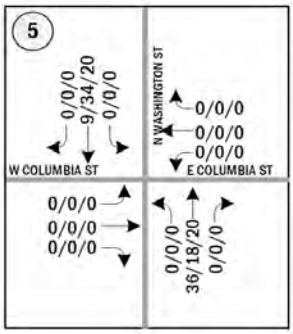


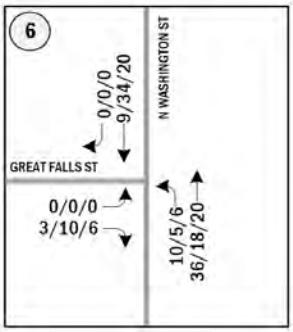


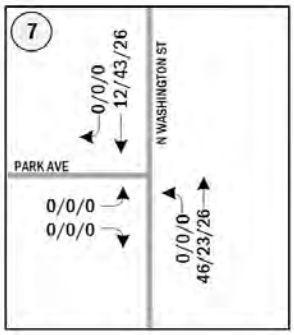


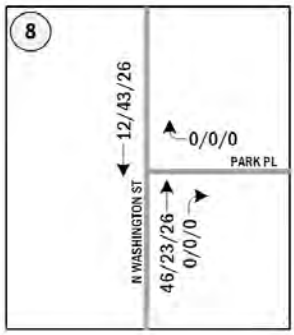


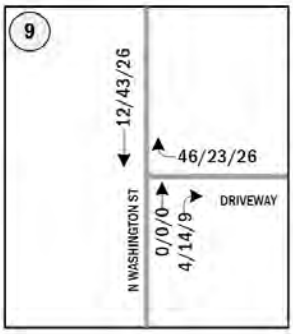












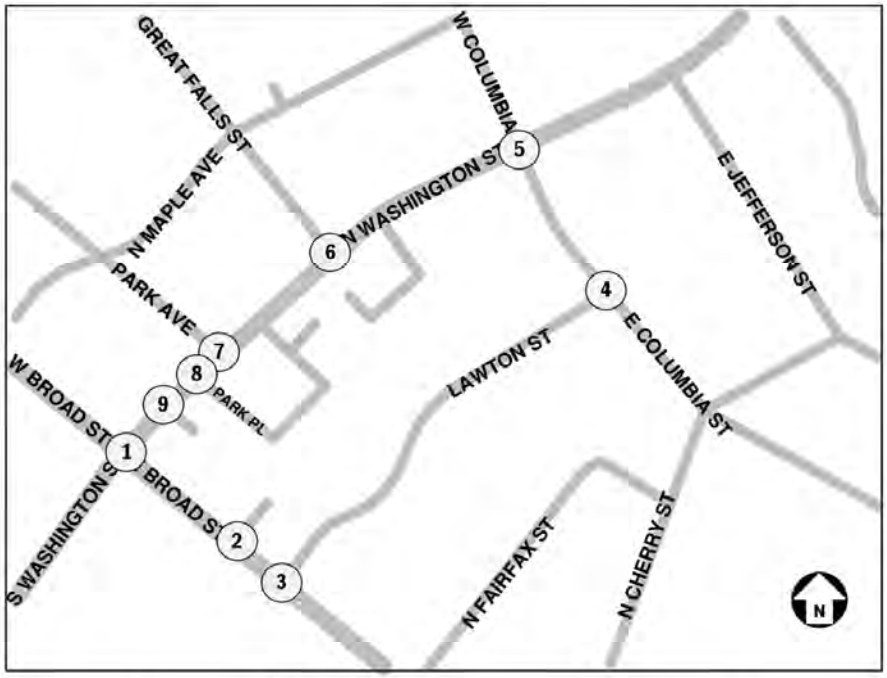
Legend

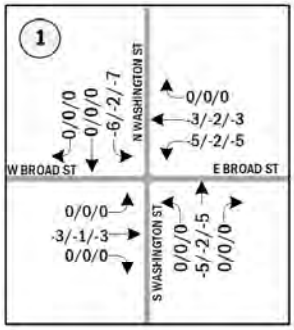
Existing Roadway Network

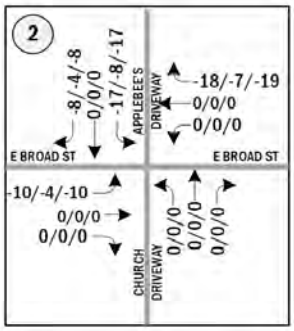
Peak Hour Traffic Volumes

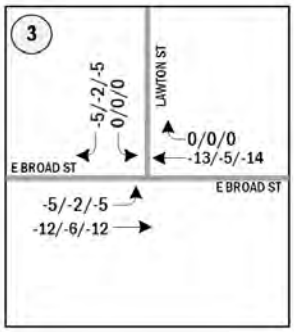
AM/PM/SAT
AM/PM/SAT
AM/PM/SAT

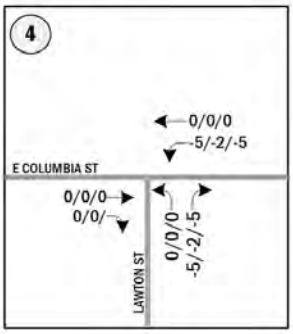
Retail Use Trips

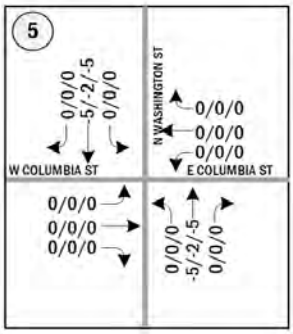


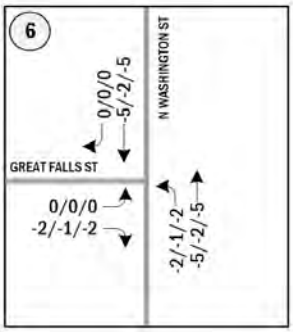


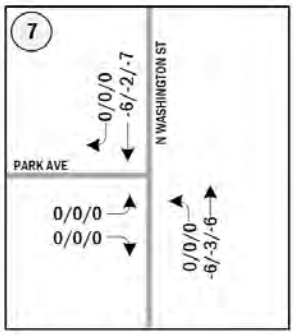


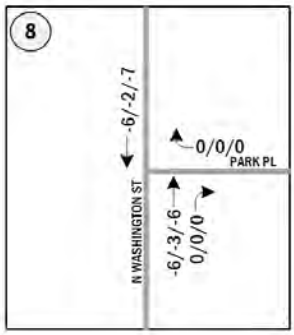


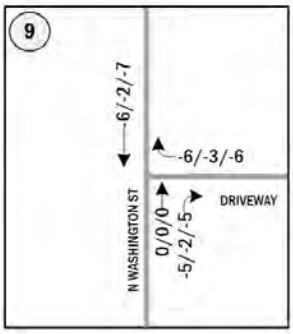












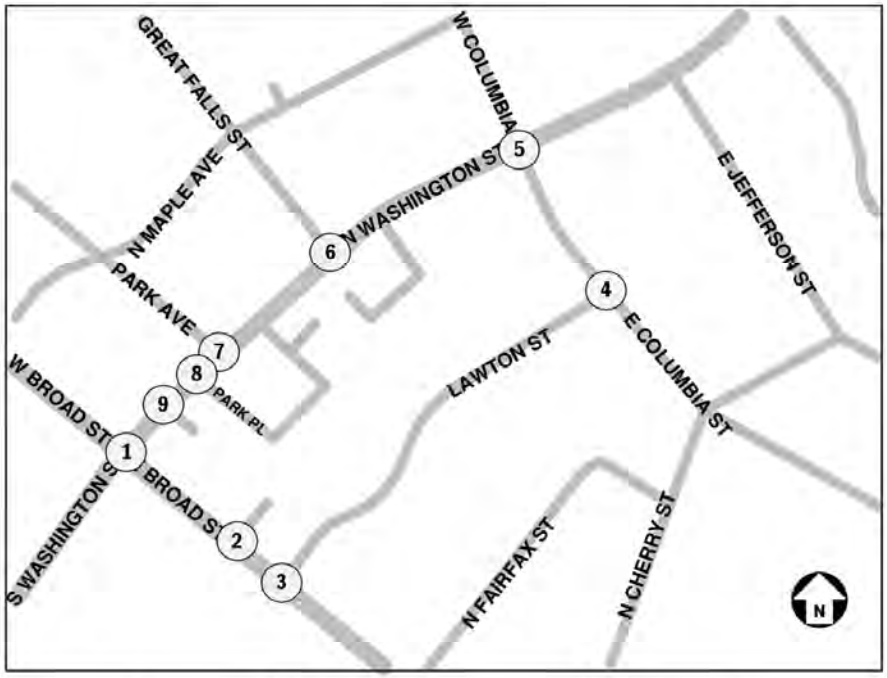
Legend

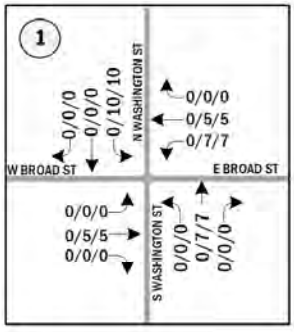
Existing Roadway Network

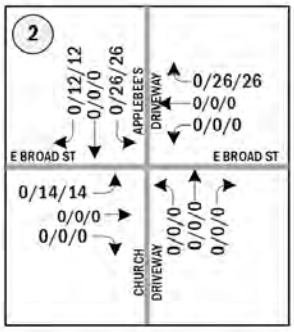
Peak Hour Traffic Volumes

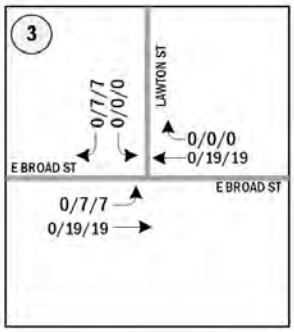
AM/PM/SAT
AM/PM/SAT
AM/PM/SAT

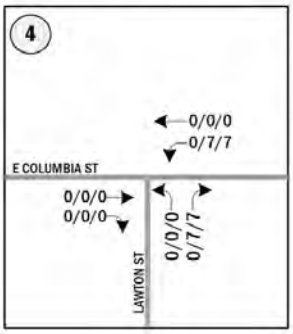
Theater Use Trips

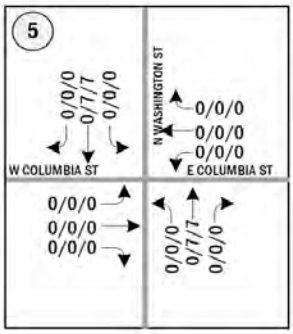


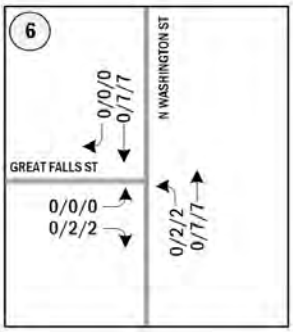


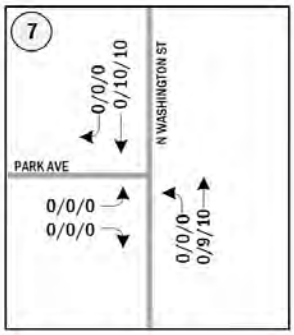


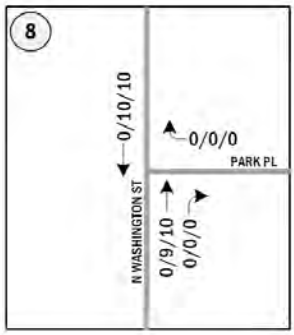


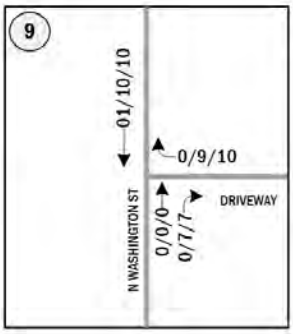












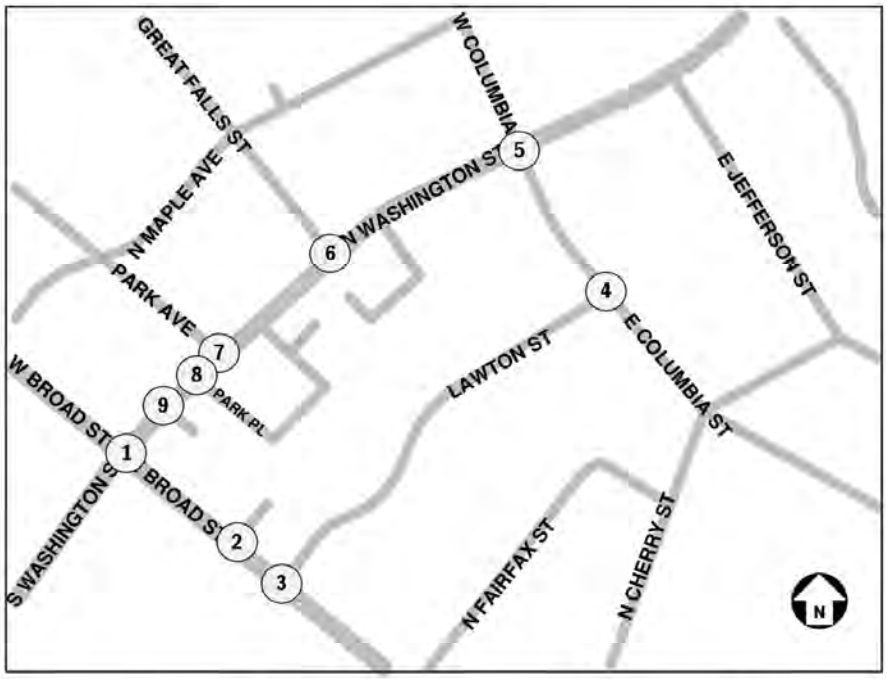
Legend

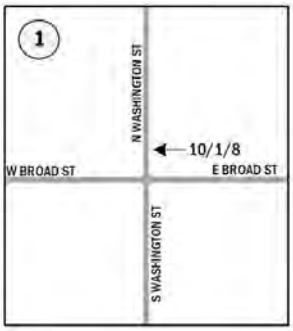
Existing Roadway Network

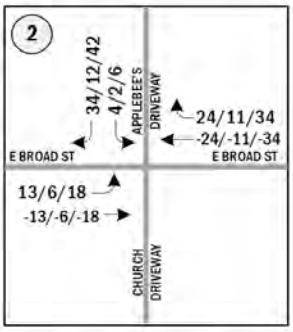
Peak Hour Traffic Volumes

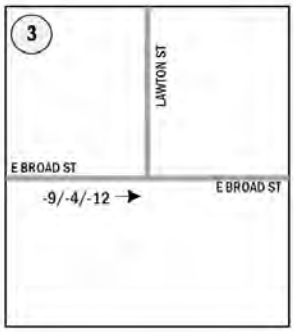
AM/PM/SAT
AM/PM/SAT
AM/PM/SAT

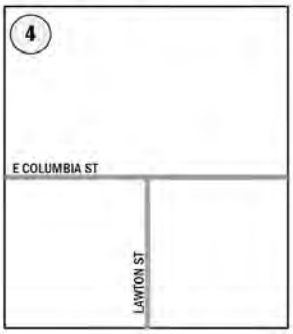
Pass-by Trips

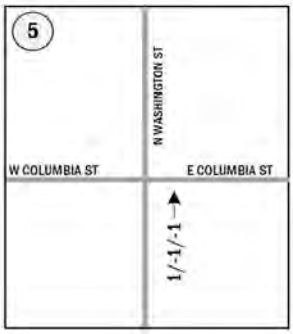


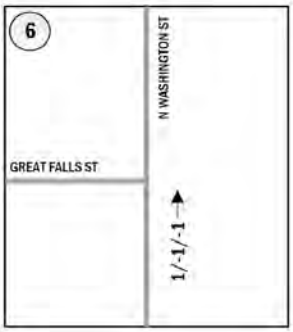


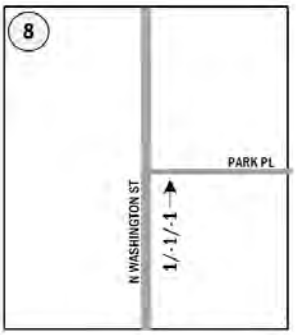












Legend

Existing Roadway Network

Peak Hour Traffic Volumes

AM/PM/SAT
AM/PM/SAT
AM/PM/SAT

APPENDIX G

INTERSECTION CAPACITY ANALYSIS –

FUTURE WITH DEVELOPMENT CONDITION (2020)

1: S. Washington St/N. Washington St & W. Broad St/E. Broad St

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	140	642	55	821	67	1038	165	582
v/c Ratio	0.73	0.57	0.21	0.78	0.20	0.93	0.70	0.44
Control Delay	52.4	34.9	12.3	29.1	15.8	42.2	32.9	19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	34.9	12.3	29.1	15.8	42.2	32.9	19.8
Queue Length 50th (ft)	69	201	12	257	18	195	52	150
Queue Length 95th (ft)	m#129	182	m26	302	m47	#440	#135	182
Internal Link Dist (ft)		453		384		503		124
Turn Bay Length (ft)	275		255		345		190	
Base Capacity (vph)	193	1130	269	1046	345	1111	254	1323
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.57	0.20	0.78	0.19	0.93	0.65	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	600	29	54	738	67	66	999	19	162	489	81
Future Volume (vph)	137	600	29	54	738	67	66	999	19	162	489	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			3%			-4%	
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	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	
Frt	1.00	0.99		1.00	0.99		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3393		1708	3371		1742	3474		1805	3525	
Flt Permitted	0.15	1.00		0.29	1.00		0.40	1.00		0.11	1.00	
Satd. Flow (perm)	275	3393		525	3371		731	3474		204	3525	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	140	612	30	55	753	68	67	1019	19	165	499	83
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	140	642	0	55	821	0	67	1038	0	165	582	0
Confl. Peds. (#/hr)	13		12	12		13	3		16	16		3
Bus Blockages (#/hr)	0	0	0	0	0	8	0	0	8	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	37.4	31.4		34.8	30.1		37.6	32.9		46.2	37.2	
Effective Green, g (s)	37.4	31.4		34.8	30.1		37.6	32.9		46.2	37.2	
Actuated g/C Ratio	0.37	0.31		0.35	0.30		0.38	0.33		0.46	0.37	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	188	1065		238	1014		322	1142		238	1311	
v/s Ratio Prot	c0.04	0.19		0.01	c0.24		0.01	c0.30		c0.06	0.17	
v/s Ratio Perm	0.23			0.07			0.07			0.26		
v/c Ratio	0.74	0.60		0.23	0.81		0.21	0.91		0.69	0.44	
Uniform Delay, d1	23.3	29.0		22.4	32.3		20.3	32.1		20.7	23.6	
Progression Factor	1.63	1.15		0.60	0.73		0.98	0.80		0.98	0.77	
Incremental Delay, d2	11.8	2.3		0.2	6.4		0.1	10.6		6.7	0.5	
Delay (s)	49.8	35.6		13.7	30.0		20.0	36.5		26.9	18.8	
Level of Service	D	D		B	C		B	D		C	B	
Approach Delay (s)		38.2			29.0			35.5			20.6	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	775	36	17	903	52	4	0	13	12	0	81
Future Volume (Veh/h)	87	775	36	17	903	52	4	0	13	12	0	81
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	93	824	38	18	961	55	4	0	14	13	0	86
Pedestrians								4			4	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		464										
pX, platoon unblocked				0.87			0.87	0.87	0.87	0.87	0.87	
vC, conflicting volume	1020			866			1636	2089	435	1640	2080	512
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1020			535			1424	1948	37	1429	1938	512
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			98			93	100	98	82	100	83
cM capacity (veh/h)	674			888			60	46	886	71	47	505

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	93	549	313	18	641	375	18	99
Volume Left	93	0	0	18	0	0	4	13
Volume Right	0	0	38	0	0	55	14	86
cSH	674	1700	1700	888	1700	1700	219	280
Volume to Capacity	0.14	0.32	0.18	0.02	0.38	0.22	0.08	0.35
Queue Length 95th (ft)	12	0	0	2	0	0	7	38
Control Delay (s)	11.2	0.0	0.0	9.1	0.0	0.0	22.9	24.8
Lane LOS	B			A			C	C
Approach Delay (s)	1.1			0.2			22.9	24.8
Approach LOS							C	C

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	796	972	11	2	1
Future Volume (Veh/h)	4	796	972	11	2	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	865	1057	12	2	1
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		663	1202			
pX, platoon unblocked	0.93				0.92	0.93
vC, conflicting volume	1070				1504	536
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	933				1049	361
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	100
cM capacity (veh/h)	680				204	593

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	292	577	705	364	3
Volume Left	4	0	0	0	2
Volume Right	0	0	0	12	1
cSH	680	1700	1700	1700	261
Volume to Capacity	0.01	0.34	0.41	0.21	0.01
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.2	0.0	0.0	0.0	19.0
Lane LOS	A				C
Approach Delay (s)	0.1		0.0		19.0
Approach LOS					C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	116	6	0	232	14	4
Future Volume (Veh/h)	116	6	0	232	14	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	126	7	0	252	15	4
Pedestrians				3	4	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	507					
pX, platoon unblocked						
vC, conflicting volume			137		386	136
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			137		386	136
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1442		616	907

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	133	252	19
Volume Left	0	0	15
Volume Right	7	0	4
cSH	1700	1442	660
Volume to Capacity	0.08	0.00	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	10.6
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.6
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	23.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	145	269	26	1197	27	730
v/c Ratio	0.32	0.56	0.07	0.68	0.14	0.42
Control Delay	28.7	33.5	5.7	10.7	10.8	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	33.5	5.7	10.7	10.8	16.7
Queue Length 50th (ft)	69	137	3	135	7	158
Queue Length 95th (ft)	123	221	m7	277	18	208
Internal Link Dist (ft)	910	204		631		475
Turn Bay Length (ft)			70		125	
Base Capacity (vph)	448	479	350	1749	195	1753
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.56	0.07	0.68	0.14	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	75	12	74	134	50	25	1113	36	26	686	14
Future Volume (vph)	52	75	12	74	134	50	25	1113	36	26	686	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	12	12	12	10	11	11	10	11	11
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		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	
Frt		0.99			0.97		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1861			1779		1649	3400		1652	3408	
Flt Permitted		0.78			0.87		0.31	1.00		0.13	1.00	
Satd. Flow (perm)		1483			1568		546	3400		230	3408	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	54	78	12	77	140	52	26	1159	38	27	715	15
RTOR Reduction (vph)	0	4	0	0	8	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	142	0	0	261	0	26	1195	0	27	728	0
Confl. Peds. (#/hr)	4		4	4		4	6		8	8		6
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.0			30.0		52.0	49.0		52.0	49.0	
Effective Green, g (s)		30.0			30.0		52.0	49.0		52.0	49.0	
Actuated g/C Ratio		0.30			0.30		0.52	0.49		0.52	0.49	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		444			470		317	1666		162	1669	
v/s Ratio Prot							0.00	c0.35		c0.00	0.21	
v/s Ratio Perm		0.10			c0.17		0.04			0.08		
v/c Ratio		0.32			0.55		0.08	0.72		0.17	0.44	
Uniform Delay, d1		27.1			29.4		12.0	20.1		14.2	16.5	
Progression Factor		1.00			1.00		0.58	0.46		1.00	1.00	
Incremental Delay, d2		1.9			4.7		0.1	2.2		0.5	0.8	
Delay (s)		29.0			34.0		7.1	11.3		14.7	17.4	
Level of Service		C			C		A	B		B	B	
Approach Delay (s)		29.0			34.0			11.2			17.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	108	103	1192	693	49
Future Volume (Veh/h)	13	108	103	1192	693	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	14	113	107	1242	722	51
Pedestrians	7				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	1				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				483	711	
pX, platoon unblocked	0.94	0.88	0.88			
vC, conflicting volume	1592	394	780			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	947	36	475			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	87	89			
cM capacity (veh/h)	214	900	947			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	127	521	828	481	292
Volume Left	14	107	0	0	0
Volume Right	113	0	0	0	51
cSH	665	947	1700	1700	1700
Volume to Capacity	0.19	0.11	0.49	0.28	0.17
Queue Length 95th (ft)	18	10	0	0	0
Control Delay (s)	11.7	3.0	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	11.7	1.2		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	99	55	1360	836
v/c Ratio	0.52	0.25	0.62	0.29
Control Delay	50.8	13.7	5.8	2.6
Queue Delay	0.0	0.0	3.6	0.0
Total Delay	50.8	13.7	9.4	2.6
Queue Length 50th (ft)	61	0	136	44
Queue Length 95th (ft)	108	34	m117	98
Internal Link Dist (ft)	437		43	403
Turn Bay Length (ft)	150			
Base Capacity (vph)	336	340	2196	2857
Starvation Cap Reductn	0	0	724	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.29	0.16	0.92	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	91	51	98	1153	681	88
Future Volume (vph)	91	51	98	1153	681	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Grade (%)	0%			3%	-3%	
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1559		3328	3394	
Flt Permitted	0.95	1.00		0.78	1.00	
Satd. Flow (perm)	1770	1559		2614	3394	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	55	107	1253	740	96
RTOR Reduction (vph)	0	50	0	0	5	0
Lane Group Flow (vph)	99	5	0	1360	831	0
Confl. Peds. (#/hr)	2	2	9			9
Bus Blockages (#/hr)	0	0	0	4	0	4
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			
Actuated Green, G (s)	9.6	9.6		82.4	82.4	
Effective Green, g (s)	9.6	9.6		82.4	82.4	
Actuated g/C Ratio	0.10	0.10		0.82	0.82	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	169	149		2153	2796	
v/s Ratio Prot	c0.06				0.24	
v/s Ratio Perm		0.00		c0.52		
v/c Ratio	0.59	0.04		0.63	0.30	
Uniform Delay, d1	43.3	41.0		3.2	2.1	
Progression Factor	1.00	1.00		1.24	1.02	
Incremental Delay, d2	5.1	0.1		0.4	0.3	
Delay (s)	48.4	41.1		4.4	2.4	
Level of Service	D	D		A	A	
Approach Delay (s)	45.8			4.4	2.4	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	17	1234	2	0	732
Future Volume (Veh/h)	0	17	1234	2	0	732
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	18	1341	2	0	796
Pedestrians	12					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			340			123
pX, platoon unblocked	0.74	0.72			0.72	
vC, conflicting volume	1752	684			1355	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1004	0			702	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			100	
cM capacity (veh/h)	175	768			632	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	18	894	449	398	398
Volume Left	0	0	0	0	0
Volume Right	18	0	2	0	0
cSH	768	1700	1700	1700	1700
Volume to Capacity	0.02	0.53	0.26	0.23	0.23
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	9.8	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.8	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	59	1177	26	0	732
Future Volume (Veh/h)	0	59	1177	26	0	732
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	61	1213	27	0	755
Pedestrians	10					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			204			259
pX, platoon unblocked	0.73	0.71			0.71	
vC, conflicting volume	1614	630			1250	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	857	0			549	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	92			100	
cM capacity (veh/h)	216	768			720	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	61	809	431	378	378
Volume Left	0	0	0	0	0
Volume Right	61	0	27	0	0
cSH	768	1700	1700	1700	1700
Volume to Capacity	0.08	0.48	0.25	0.22	0.22
Queue Length 95th (ft)	6	0	0	0	0
Control Delay (s)	10.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	93	862	18	1016	18	99
v/c Ratio	0.21	0.29	0.03	0.34	0.14	0.51
Control Delay	2.9	1.9	0.3	0.5	9.1	21.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	2.9	2.0	0.3	0.5	9.1	21.8
Queue Length 50th (ft)	10	50	0	2	0	8
Queue Length 95th (ft)	m19	m63	m0	5	12	56
Internal Link Dist (ft)		384		119	137	115
Turn Bay Length (ft)	75					
Base Capacity (vph)	439	2983	519	2980	323	410
Starvation Cap Reductn	0	824	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.40	0.03	0.34	0.06	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	775	36	17	903	52	4	0	13	12	0	81
Future Volume (vph)	87	775	36	17	903	52	4	0	13	12	0	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	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	
Frt	1.00	0.99		1.00	0.99			0.90			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1769	3512		1768	3506			1649			1634	
Flt Permitted	0.28	1.00		0.33	1.00			0.81			0.95	
Satd. Flow (perm)	517	3512		612	3506			1354			1562	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	93	824	38	18	961	55	4	0	14	13	0	86
RTOR Reduction (vph)	0	2	0	0	2	0	0	17	0	0	81	0
Lane Group Flow (vph)	93	860	0	18	1014	0	0	1	0	0	18	0
Confl. Peds. (#/hr)	4		4	4		4						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	82.7	82.7		82.7	82.7			6.3			6.3	
Effective Green, g (s)	82.7	82.7		82.7	82.7			6.3			6.3	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.06			0.06	
Clearance Time (s)	6.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	427	2904		506	2899			85			98	
v/s Ratio Prot		0.24			c0.29							
v/s Ratio Perm	0.18			0.03				0.00			c0.01	
v/c Ratio	0.22	0.30		0.04	0.35			0.01			0.19	
Uniform Delay, d1	1.8	2.0		1.5	2.1			43.9			44.4	
Progression Factor	0.76	0.77		0.09	0.11			1.00			1.00	
Incremental Delay, d2	1.0	0.2		0.1	0.3			0.1			0.9	
Delay (s)	2.4	1.7		0.3	0.5			44.0			45.4	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		1.8			0.5			44.0			45.4	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	3.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

1: S. Washington St/N. Washington St & W. Broad St/E. Broad St

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	203	804	118	890	83	697	222	1213
v/c Ratio	0.88	0.72	0.55	0.87	0.48	0.73	0.69	0.98
Control Delay	60.4	22.4	23.6	37.9	23.9	39.8	34.9	43.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6
Total Delay	60.4	22.4	23.6	37.9	23.9	39.8	34.9	49.6
Queue Length 50th (ft)	62	207	34	295	37	244	74	200
Queue Length 95th (ft)	#210	223	64	#418	m56	300	151	#535
Internal Link Dist (ft)		453		384		503		124
Turn Bay Length (ft)	275		255		345		190	
Base Capacity (vph)	230	1118	218	1023	178	996	347	1241
Starvation Cap Reductn	0	0	0	0	0	0	0	38
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.72	0.54	0.87	0.47	0.70	0.64	1.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	707	65	113	822	33	80	641	28	213	1030	134
Future Volume (vph)	195	707	65	113	822	33	80	641	28	213	1030	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			3%			-4%	
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	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	
Frt	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	3363		1708	3397		1743	3458		1803	3541	
Flt Permitted	0.12	1.00		0.21	1.00		0.14	1.00		0.19	1.00	
Satd. Flow (perm)	224	3363		373	3397		257	3458		357	3541	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	203	736	68	118	856	34	83	668	29	222	1073	140
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	203	804	0	118	890	0	83	697	0	222	1213	0
Confl. Peds. (#/hr)	18		30	30		18	3		22	22		3
Bus Blockages (#/hr)	0	0	0	0	0	8	0	0	8	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	41.2	32.2		35.0	29.1		33.4	28.6		44.9	35.1	
Effective Green, g (s)	41.2	32.2		35.0	29.1		33.4	28.6		44.9	35.1	
Actuated g/C Ratio	0.41	0.32		0.35	0.29		0.33	0.29		0.45	0.35	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	226	1082		209	988		157	988		323	1242	
v/s Ratio Prot	c0.08	0.24		0.03	0.26		0.03	0.20		c0.08	c0.34	
v/s Ratio Perm	c0.29			0.16			0.15			0.23		
v/c Ratio	0.90	0.74		0.56	0.90		0.53	0.71		0.69	0.98	
Uniform Delay, d1	23.0	30.2		23.5	34.1		26.1	31.9		19.5	32.0	
Progression Factor	1.42	0.63		0.76	0.80		0.94	1.07		1.48	0.71	
Incremental Delay, d2	27.9	3.7		2.0	12.5		1.4	2.7		4.1	18.2	
Delay (s)	60.6	22.8		19.8	39.6		25.8	36.8		32.9	40.9	
Level of Service	E	C		B	D		C	D		C	D	
Approach Delay (s)		30.4			37.3			35.6			39.7	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	949	10	6	738	70	15	0	22	46	0	82
Future Volume (Veh/h)	96	949	10	6	738	70	15	0	22	46	0	82
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	104	1032	11	7	802	76	16	0	24	50	0	89
Pedestrians		1						5			9	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		464										
pX, platoon unblocked				0.82			0.82	0.82	0.82	0.82	0.82	
vC, conflicting volume	887			1048			1756	2152	526	1611	2119	449
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	887			610			1476	1961	0	1299	1921	449
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			99			70	100	97	39	100	84
cM capacity (veh/h)	753			785			53	43	882	83	46	553

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	104	688	355	7	535	343	40	139
Volume Left	104	0	0	7	0	0	16	50
Volume Right	0	0	11	0	0	76	24	89
cSH	753	1700	1700	785	1700	1700	121	181
Volume to Capacity	0.14	0.40	0.21	0.01	0.31	0.20	0.33	0.77
Queue Length 95th (ft)	12	0	0	1	0	0	33	126
Control Delay (s)	10.5	0.0	0.0	9.6	0.0	0.0	48.8	70.4
Lane LOS	B			A			E	F
Approach Delay (s)	1.0			0.1			48.8	70.4
Approach LOS							E	F

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	1008	791	11	6	23
Future Volume (Veh/h)	9	1008	791	11	6	23
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	1061	833	12	6	24
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		663	1202			
pX, platoon unblocked	1.00				0.84	1.00
vC, conflicting volume	853				1396	430
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	844				1068	420
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	96
cM capacity (veh/h)	780				179	576

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	363	707	555	290	30
Volume Left	9	0	0	0	6
Volume Right	0	0	0	12	24
cSH	780	1700	1700	1700	399
Volume to Capacity	0.01	0.42	0.33	0.17	0.08
Queue Length 95th (ft)	1	0	0	0	6
Control Delay (s)	0.4	0.0	0.0	0.0	14.8
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		14.8
Approach LOS					B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	183	10	13	141	4	13
Future Volume (Veh/h)	183	10	13	141	4	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	199	11	14	153	4	14
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	507					
pX, platoon unblocked						
vC, conflicting volume			218		394	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			218		394	212
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1343		601	822

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	210	167	18
Volume Left	0	14	4
Volume Right	11	0	14
cSH	1700	1343	760
Volume to Capacity	0.12	0.01	0.02
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.7	9.9
Lane LOS		A	A
Approach Delay (s)	0.0	0.7	9.9
Approach LOS			A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	28.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	219	152	37	1092	40	1335
v/c Ratio	0.48	0.32	0.21	0.62	0.17	0.76
Control Delay	32.7	28.1	7.9	16.4	10.4	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	28.1	7.9	16.4	10.4	23.7
Queue Length 50th (ft)	111	70	6	300	10	376
Queue Length 95th (ft)	184	126	m14	351	24	473
Internal Link Dist (ft)	910	204		631		475
Turn Bay Length (ft)			70		125	
Base Capacity (vph)	457	480	180	1756	243	1766
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.32	0.21	0.62	0.16	0.76

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	107	22	31	85	24	34	948	57	37	1202	26
Future Volume (vph)	73	107	22	31	85	24	34	948	57	37	1202	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	12	12	12	10	11	11	10	11	11
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		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	
Frt		0.99			0.98		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1855			1792		1652	3385		1652	3408	
Flt Permitted		0.83			0.90		0.10	1.00		0.17	1.00	
Satd. Flow (perm)		1565			1631		166	3385		291	3408	
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)	79	116	24	34	92	26	37	1030	62	40	1307	28
RTOR Reduction (vph)	0	4	0	0	7	0	0	4	0	0	2	0
Lane Group Flow (vph)	0	215	0	0	145	0	37	1088	0	40	1333	0
Confl. Peds. (#/hr)	5		2	2		5	5		5	5		5
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		29.0			29.0		53.0	49.4		53.0	49.4	
Effective Green, g (s)		29.0			29.0		53.0	49.4		53.0	49.4	
Actuated g/C Ratio		0.29			0.29		0.53	0.49		0.53	0.49	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		453			472		141	1672		203	1683	
v/s Ratio Prot							c0.01	0.32		0.01	c0.39	
v/s Ratio Perm		c0.14			0.09		0.13			0.10		
v/c Ratio		0.47			0.31		0.26	0.65		0.20	0.79	
Uniform Delay, d1		29.2			27.7		15.2	18.9		13.0	21.0	
Progression Factor		1.00			1.00		0.61	0.81		1.00	1.00	
Incremental Delay, d2		3.5			1.7		0.9	1.8		0.5	3.9	
Delay (s)		32.8			29.3		10.2	17.1		13.5	25.0	
Level of Service		C			C		B	B		B	C	
Approach Delay (s)		32.8			29.3			16.9			24.6	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	99	94	1015	1213	50
Future Volume (Veh/h)	21	99	94	1015	1213	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	22	103	98	1057	1264	52
Pedestrians	5				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				483	711	
pX, platoon unblocked	0.73	0.67	0.67			
vC, conflicting volume	2022	663	1321			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1009	0	510			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	86	86			
cM capacity (veh/h)	147	728	706			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	125	450	705	843	473
Volume Left	22	98	0	0	0
Volume Right	103	0	0	0	52
cSH	430	706	1700	1700	1700
Volume to Capacity	0.29	0.14	0.41	0.50	0.28
Queue Length 95th (ft)	30	12	0	0	0
Control Delay (s)	16.8	3.9	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	16.8	1.5		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	181	115	985	1452
v/c Ratio	0.61	0.33	0.49	0.58
Control Delay	46.4	9.0	6.3	1.9
Queue Delay	0.0	0.0	0.0	0.1
Total Delay	46.4	9.1	6.3	2.0
Queue Length 50th (ft)	105	0	73	34
Queue Length 95th (ft)	169	45	m117	43
Internal Link Dist (ft)	437		43	403
Turn Bay Length (ft)	150			
Base Capacity (vph)	407	438	2017	2497
Starvation Cap Reductn	0	0	97	0
Spillback Cap Reductn	0	4	0	133
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.44	0.26	0.51	0.61

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	168	107	36	880	1270	80
Future Volume (vph)	168	107	36	880	1270	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Grade (%)	0%			3%	-3%	
Total Lost time (s)	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.96		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1523		3335	3416	
Flt Permitted	0.95	1.00		0.83	1.00	
Satd. Flow (perm)	1770	1523		2760	3416	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	181	115	39	946	1366	86
RTOR Reduction (vph)	0	96	0	0	3	0
Lane Group Flow (vph)	181	19	0	985	1449	0
Confl. Peds. (#/hr)		17	33			33
Bus Blockages (#/hr)	0	0	0	4	0	4
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			
Actuated Green, G (s)	16.9	16.9		73.1	73.1	
Effective Green, g (s)	16.9	16.9		73.1	73.1	
Actuated g/C Ratio	0.17	0.17		0.73	0.73	
Clearance Time (s)	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)	299	257		2017	2497	
v/s Ratio Prot	c0.10				c0.42	
v/s Ratio Perm		0.01		0.36		
v/c Ratio	0.61	0.08		0.49	0.58	
Uniform Delay, d1	38.5	35.0		5.6	6.3	
Progression Factor	1.00	1.00		0.89	0.17	
Incremental Delay, d2	4.0	0.2		0.1	0.8	
Delay (s)	42.4	35.1		5.2	1.8	
Level of Service	D	D		A	A	
Approach Delay (s)	39.6			5.2	1.8	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	33	883	7	0	1377
Future Volume (Veh/h)	0	33	883	7	0	1377
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	35	949	8	0	1481
Pedestrians	8					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	1					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			340			123
pX, platoon unblocked	0.89	0.83			0.83	
vC, conflicting volume	1702	488			965	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	667	0			547	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	345	893			839	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	35	633	324	740	740
Volume Left	0	0	0	0	0
Volume Right	35	0	8	0	0
cSH	893	1700	1700	1700	1700
Volume to Capacity	0.04	0.37	0.19	0.44	0.44
Queue Length 95th (ft)	3	0	0	0	0
Control Delay (s)	9.2	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.2	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	57	834	35	0	1377
Future Volume (Veh/h)	0	57	834	35	0	1377
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	59	860	36	0	1420
Pedestrians	5					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			204			259
pX, platoon unblocked	0.89	0.82			0.82	
vC, conflicting volume	1593	453			901	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	533	0			453	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	93			100	
cM capacity (veh/h)	423	890			906	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	59	573	323	710	710
Volume Left	0	0	0	0	0
Volume Right	59	0	36	0	0
cSH	890	1700	1700	1700	1700
Volume to Capacity	0.07	0.34	0.19	0.42	0.42
Queue Length 95th (ft)	5	0	0	0	0
Control Delay (s)	9.3	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.3	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	104	1043	7	878	40	139
v/c Ratio	0.27	0.43	0.02	0.36	0.12	0.39
Control Delay	7.5	6.4	1.5	2.5	15.0	19.4
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	7.5	6.7	1.5	2.5	15.0	19.4
Queue Length 50th (ft)	16	86	0	19	4	32
Queue Length 95th (ft)	m39	167	m1	23	32	87
Internal Link Dist (ft)		384		119	137	115
Turn Bay Length (ft)	75					
Base Capacity (vph)	386	2437	313	2411	325	360
Starvation Cap Reductn	0	677	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.59	0.02	0.36	0.12	0.39

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	949	10	6	738	70	15	0	22	46	0	82
Future Volume (vph)	96	949	10	6	738	70	15	0	22	46	0	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.92			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1766	3533		1768	3485			1678			1657	
Flt Permitted	0.30	1.00		0.24	1.00			0.87			0.88	
Satd. Flow (perm)	560	3533		455	3485			1497			1481	
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)	104	1032	11	7	802	76	16	0	24	50	0	89
RTOR Reduction (vph)	0	1	0	0	7	0	0	26	0	0	64	0
Lane Group Flow (vph)	104	1042	0	7	871	0	0	14	0	0	75	0
Confl. Peds. (#/hr)	9		5	5		9	1					1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	69.0	69.0		69.0	69.0			20.0			20.0	
Effective Green, g (s)	69.0	69.0		69.0	69.0			20.0			20.0	
Actuated g/C Ratio	0.69	0.69		0.69	0.69			0.20			0.20	
Clearance Time (s)	6.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	386	2437		313	2404			299			296	
v/s Ratio Prot		c0.30			0.25							
v/s Ratio Perm	0.19			0.02				0.01			c0.05	
v/c Ratio	0.27	0.43		0.02	0.36			0.05			0.25	
Uniform Delay, d1	5.9	6.8		4.9	6.4			32.3			33.7	
Progression Factor	0.97	0.87		0.29	0.33			1.00			1.00	
Incremental Delay, d2	1.4	0.4		0.1	0.4			0.3			0.5	
Delay (s)	7.1	6.3		1.5	2.5			32.6			34.2	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		6.4			2.5			32.6			34.2	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	189	709	85	705	105	652	269	659
v/c Ratio	0.60	0.65	0.32	0.80	0.37	0.77	0.79	0.65
Control Delay	28.6	36.7	23.8	47.5	25.3	47.9	41.0	38.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Delay	28.6	36.7	23.8	47.5	25.3	47.9	41.1	38.9
Queue Length 50th (ft)	81	227	34	249	44	231	125	215
Queue Length 95th (ft)	159	357	78	389	96	363	#273	345
Internal Link Dist (ft)		453		384		503		124
Turn Bay Length (ft)	275		255		345		190	
Base Capacity (vph)	390	2019	375	1873	451	1924	414	1916
Starvation Cap Reductn	0	65	0	0	0	0	5	119
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.36	0.23	0.38	0.23	0.34	0.66	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	609	72	82	621	56	101	599	27	258	469	163
Future Volume (vph)	181	609	72	82	621	56	101	599	27	258	469	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			3%			-4%	
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3357		1708	3371		1742	3460		1805	3453	
Flt Permitted	0.15	1.00		0.29	1.00		0.30	1.00		0.17	1.00	
Satd. Flow (perm)	277	3357		528	3371		551	3460		316	3453	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	189	634	75	85	647	58	105	624	28	269	489	170
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	189	709	0	85	705	0	105	652	0	269	659	0
Confl. Peds. (#/hr)	11		11	11		11	4		5	5		4
Bus Blockages (#/hr)	0	0	0	0	0	8	0	0	8	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	50.6	36.4		37.8	29.6		37.2	27.5		48.8	33.3	
Effective Green, g (s)	50.6	36.4		37.8	29.6		37.2	27.5		48.8	33.3	
Actuated g/C Ratio	0.45	0.33		0.34	0.27		0.33	0.25		0.44	0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	318	1094		265	894		287	852		344	1030	
v/s Ratio Prot	c0.08	c0.21		0.02	c0.21		0.03	0.19		c0.11	0.19	
v/s Ratio Perm	0.19			0.08			0.09			c0.23		
v/c Ratio	0.59	0.65		0.32	0.79		0.37	0.77		0.78	0.64	
Uniform Delay, d1	21.5	32.1		25.9	38.1		26.6	39.1		23.4	33.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	1.0		0.3	4.3		0.3	3.7		10.2	1.0	
Delay (s)	23.5	33.1		26.2	42.4		26.9	42.8		33.6	34.9	
Level of Service	C	C		C	D		C	D		C	C	
Approach Delay (s)		31.1			40.7			40.6			34.5	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	111.6	Sum of lost time (s)	24.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	861	4	3	711	66	2	1	2	30	0	87
Future Volume (Veh/h)	91	861	4	3	711	66	2	1	2	30	0	87
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	99	936	4	3	773	72	2	1	2	33	0	95
Pedestrians								7			4	
Lane Width (ft)								12.0			12.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		464										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	849			947			1630	1998	477	1488	1964	426
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	849			588			1391	1823	35	1223	1783	426
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			100			97	98	100	67	100	83
cM capacity (veh/h)	782			832			64	56	871	101	59	574

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	99	624	316	3	515	330	5	128
Volume Left	99	0	0	3	0	0	2	33
Volume Right	0	0	4	0	0	72	2	95
cSH	782	1700	1700	832	1700	1700	98	260
Volume to Capacity	0.13	0.37	0.19	0.00	0.30	0.19	0.05	0.49
Queue Length 95th (ft)	11	0	0	0	0	0	4	63
Control Delay (s)	10.3	0.0	0.0	9.3	0.0	0.0	43.9	31.5
Lane LOS	B			A			E	D
Approach Delay (s)	1.0			0.0			43.9	31.5
Approach LOS							E	D

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	886	768	4	0	11
Future Volume (Veh/h)	8	886	768	4	0	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	9	953	826	4	0	12
Pedestrians					6	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		663	1202			
pX, platoon unblocked	0.95				0.89	0.95
vC, conflicting volume	836				1328	421
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	733				891	299
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	824				247	663

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	327	635	551	279	12
Volume Left	9	0	0	0	0
Volume Right	0	0	0	4	12
cSH	824	1700	1700	1700	663
Volume to Capacity	0.01	0.37	0.32	0.16	0.02
Queue Length 95th (ft)	1	0	0	0	1
Control Delay (s)	0.4	0.0	0.0	0.0	10.5
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		10.5
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	103	8	5	125	1	7
Future Volume (Veh/h)	103	8	5	125	1	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	111	9	5	134	1	8
Pedestrians	2				4	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	507					
pX, platoon unblocked						
vC, conflicting volume			124		266	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			124		266	120
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1458		718	929

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	120	139	9
Volume Left	0	5	1
Volume Right	9	0	8
cSH	1700	1458	900
Volume to Capacity	0.07	0.00	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.3	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	0.3	9.0
Approach LOS			A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	91	156	11	964	61	941
v/c Ratio	0.15	0.25	0.05	0.82	0.28	0.63
Control Delay	19.7	19.5	10.9	30.6	14.1	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	19.5	10.9	30.6	14.1	19.5
Queue Length 50th (ft)	29	50	3	235	16	170
Queue Length 95th (ft)	72	112	11	315	34	292
Internal Link Dist (ft)	910	204		631		475
Turn Bay Length (ft)			70		125	
Base Capacity (vph)	588	612	329	2598	289	2610
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.25	0.03	0.37	0.21	0.36

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	33	9	45	63	36	10	850	37	56	846	19
Future Volume (vph)	41	33	9	45	63	36	10	850	37	56	846	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	12	12	12	10	11	11	10	11	11
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1834			1753		1651	3393		1652	3407	
Flt Permitted		0.82			0.89		0.22	1.00		0.14	1.00	
Satd. Flow (perm)		1532			1581		378	3393		236	3407	
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)	45	36	10	49	68	39	11	924	40	61	920	21
RTOR Reduction (vph)	0	3	0	0	9	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	88	0	0	147	0	11	961	0	61	939	0
Confl. Peds. (#/hr)	11		8	8		11	6		11	11		6
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.6			30.6		31.9	31.0		39.9	35.0	
Effective Green, g (s)		30.6			30.6		31.9	31.0		39.9	35.0	
Actuated g/C Ratio		0.36			0.36		0.38	0.37		0.47	0.41	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0		2.0	2.5	
Lane Grp Cap (vph)		554			572		156	1244		193	1411	
v/s Ratio Prot							0.00	c0.28		c0.02	c0.28	
v/s Ratio Perm		0.06			c0.09		0.03			0.13		
v/c Ratio		0.16			0.26		0.07	0.77		0.32	0.67	
Uniform Delay, d1		18.2			19.0		16.9	23.6		14.6	20.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6			1.1		0.1	2.8		0.3	1.1	
Delay (s)		18.8			20.0		17.0	26.4		15.0	21.1	
Level of Service		B			C		B	C		B	C	
Approach Delay (s)		18.8			20.0			26.3			20.7	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	84.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	128	86	824	866	29
Future Volume (Veh/h)	30	128	86	824	866	29
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	31	132	89	849	893	30
Pedestrians	8			2		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				483	711	
pX, platoon unblocked	0.83	0.80	0.80			
vC, conflicting volume	1518	472	931			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	803	0	399			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	85	90			
cM capacity (veh/h)	240	855	914			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	163	372	566	595	328
Volume Left	31	89	0	0	0
Volume Right	132	0	0	0	30
cSH	575	914	1700	1700	1700
Volume to Capacity	0.28	0.10	0.33	0.35	0.19
Queue Length 95th (ft)	29	8	0	0	0
Control Delay (s)	13.7	3.1	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	13.7	1.2		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	147	61	917	984
v/c Ratio	0.46	0.18	0.45	0.63
Control Delay	24.2	7.7	5.7	13.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.2	7.7	5.7	13.3
Queue Length 50th (ft)	38	0	58	111
Queue Length 95th (ft)	92	25	111	188
Internal Link Dist (ft)	437		43	403
Turn Bay Length (ft)	150			
Base Capacity (vph)	755	710	3043	3427
Starvation Cap Reductn	0	0	46	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.09	0.31	0.29

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	137	57	36	817	833	82
Future Volume (vph)	137	57	36	817	833	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Grade (%)	0%			3%	-3%	
Total Lost time (s)	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		3336	3426	
Flt Permitted	0.95	1.00		0.90	1.00	
Satd. Flow (perm)	1770	1583		3009	3426	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	147	61	39	878	896	88
RTOR Reduction (vph)	0	52	0	0	9	0
Lane Group Flow (vph)	147	9	0	917	975	0
Bus Blockages (#/hr)	0	0	0	4	0	4
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		1	6	2	
Permitted Phases		4	6			
Actuated Green, G (s)	7.2	7.2		32.2	22.0	
Effective Green, g (s)	7.2	7.2		32.2	22.0	
Actuated g/C Ratio	0.15	0.15		0.65	0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		1.5	1.5	
Lane Grp Cap (vph)	257	230		1995	1525	
v/s Ratio Prot	c0.08			c0.05	c0.28	
v/s Ratio Perm		0.01		0.25		
v/c Ratio	0.57	0.04		0.46	0.64	
Uniform Delay, d1	19.7	18.1		4.3	10.6	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.0		0.1	0.7	
Delay (s)	21.6	18.2		4.3	11.3	
Level of Service	C	B		A	B	
Approach Delay (s)	20.6			4.3	11.3	
Approach LOS	C			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	49.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	8	845	5	0	890
Future Volume (Veh/h)	0	8	845	5	0	890
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	8	889	5	0	937
Pedestrians	1					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			340			123
pX, platoon unblocked	0.87	0.84			0.84	
vC, conflicting volume	1361	448			895	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260	0			481	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	613	905			900	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	8	593	301	468	468
Volume Left	0	0	0	0	0
Volume Right	8	0	5	0	0
cSH	905	1700	1700	1700	1700
Volume to Capacity	0.01	0.35	0.18	0.28	0.28
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	9.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.0	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	45	805	31	0	890
Future Volume (Veh/h)	0	45	805	31	0	890
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	49	875	34	0	967
Pedestrians	6					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			204			259
pX, platoon unblocked	0.88	0.83			0.83	
vC, conflicting volume	1382	460			915	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	281	0			484	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	95			100	
cM capacity (veh/h)	599	894			886	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	49	583	326	484	484
Volume Left	0	0	0	0	0
Volume Right	49	0	34	0	0
cSH	894	1700	1700	1700	1700
Volume to Capacity	0.05	0.34	0.19	0.28	0.28
Queue Length 95th (ft)	4	0	0	0	0
Control Delay (s)	9.3	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.3	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	99	940	3	845	5	128
v/c Ratio	0.24	0.40	0.01	0.37	0.02	0.38
Control Delay	6.9	5.5	4.3	5.2	13.8	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	5.5	4.3	5.2	13.8	10.6
Queue Length 50th (ft)	9	53	0	44	1	6
Queue Length 95th (ft)	33	100	3	86	7	44
Internal Link Dist (ft)		384		119	137	115
Turn Bay Length (ft)	75					
Base Capacity (vph)	622	3535	560	3486	809	840
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.27	0.01	0.24	0.01	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	861	4	3	711	66	2	1	2	30	0	87
Future Volume (vph)	91	861	4	3	711	66	2	1	2	30	0	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	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	
Frt	1.00	1.00		1.00	0.99			0.95			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1768	3537		1767	3487			1728			1655	
Flt Permitted	0.33	1.00		0.30	1.00			0.88			0.91	
Satd. Flow (perm)	622	3537		560	3487			1553			1526	
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)	99	936	4	3	773	72	2	1	2	33	0	95
RTOR Reduction (vph)	0	0	0	0	9	0	0	2	0	0	83	0
Lane Group Flow (vph)	99	940	0	3	836	0	0	3	0	0	45	0
Confl. Peds. (#/hr)	4		7	7		4						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	25.5	25.5		25.5	25.5			5.5			5.5	
Effective Green, g (s)	25.5	25.5		25.5	25.5			5.5			5.5	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.13			0.13	
Clearance Time (s)	6.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	377	2147		340	2117			203			199	
v/s Ratio Prot		c0.27			0.24							
v/s Ratio Perm	0.16			0.01				0.00			c0.03	
v/c Ratio	0.26	0.44		0.01	0.40			0.02			0.23	
Uniform Delay, d1	3.9	4.4		3.3	4.3			15.9			16.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.4	0.1		0.0	0.1			0.0			0.6	
Delay (s)	4.2	4.6		3.3	4.4			15.9			16.9	
Level of Service	A	A		A	A			B			B	
Approach Delay (s)		4.5			4.4			15.9			16.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	42.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX H

INTERSECTION CAPACITY ANALYSIS –

FUTURE WITH DEVELOPMENT CONDITION (2020) (ADDITIONAL SCENARIO)

1: S. Washington St/N. Washington St & W. Broad St/E. Broad St

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	140	642	55	821	67	1038	165	590
v/c Ratio	0.73	0.57	0.21	0.78	0.20	0.93	0.70	0.45
Control Delay	52.4	34.9	12.4	29.4	15.8	42.2	28.2	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Total Delay	52.4	34.9	12.4	29.4	15.8	42.2	28.2	11.9
Queue Length 50th (ft)	69	201	12	257	18	195	7	176
Queue Length 95th (ft)	m#129	182	27	307	m47	#440	#86	237
Internal Link Dist (ft)		453		384		503		124
Turn Bay Length (ft)	275		255		345		190	
Base Capacity (vph)	193	1130	269	1046	342	1111	254	1319
Starvation Cap Reductn	0	0	0	0	0	0	0	353
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.57	0.20	0.78	0.20	0.93	0.65	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	600	29	54	738	67	66	999	19	162	489	89
Future Volume (vph)	137	600	29	54	738	67	66	999	19	162	489	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			3%			-4%	
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	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	
Frt	1.00	0.99		1.00	0.99		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3393		1708	3371		1742	3474		1805	3518	
Flt Permitted	0.15	1.00		0.29	1.00		0.39	1.00		0.11	1.00	
Satd. Flow (perm)	275	3393		525	3371		720	3474		204	3518	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	140	612	30	55	753	68	67	1019	19	165	499	91
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	140	642	0	55	821	0	67	1038	0	165	590	0
Confl. Peds. (#/hr)	13		12	12		13	3		16	16		3
Bus Blockages (#/hr)	0	0	0	0	0	8	0	0	8	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	37.4	31.4		34.8	30.1		37.6	32.9		46.2	37.2	
Effective Green, g (s)	37.4	31.4		34.8	30.1		37.6	32.9		46.2	37.2	
Actuated g/C Ratio	0.37	0.31		0.35	0.30		0.38	0.33		0.46	0.37	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	188	1065		238	1014		318	1142		238	1308	
v/s Ratio Prot	c0.04	0.19		0.01	c0.24		0.01	c0.30		c0.06	0.17	
v/s Ratio Perm	0.23			0.07			0.07			0.26		
v/c Ratio	0.74	0.60		0.23	0.81		0.21	0.91		0.69	0.45	
Uniform Delay, d1	23.3	29.0		22.4	32.3		20.3	32.1		20.7	23.7	
Progression Factor	1.63	1.15		0.61	0.73		0.98	0.81		0.73	0.42	
Incremental Delay, d2	11.8	2.3		0.2	6.7		0.1	10.6		6.5	0.5	
Delay (s)	49.8	35.6		13.7	30.3		20.0	36.5		21.6	10.5	
Level of Service	D	D		B	C		B	D		C	B	
Approach Delay (s)		38.2			29.3			35.5			12.9	
Approach LOS		D			C			D			B	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	93	862	18	1016	18	99
v/c Ratio	0.21	0.29	0.03	0.34	0.14	0.51
Control Delay	2.7	1.7	0.3	0.5	9.1	21.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	2.7	1.8	0.3	0.5	9.1	21.8
Queue Length 50th (ft)	7	36	0	2	0	8
Queue Length 95th (ft)	m19	m63	m0	5	12	56
Internal Link Dist (ft)		384		119	137	115
Turn Bay Length (ft)	75					
Base Capacity (vph)	439	2983	519	2980	323	410
Starvation Cap Reductn	0	824	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.40	0.03	0.34	0.06	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	775	36	17	903	52	4	0	13	12	0	81
Future Volume (vph)	87	775	36	17	903	52	4	0	13	12	0	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	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	
Frt	1.00	0.99		1.00	0.99			0.90			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1769	3512		1768	3506			1649			1634	
Flt Permitted	0.28	1.00		0.33	1.00			0.81			0.95	
Satd. Flow (perm)	517	3512		612	3506			1354			1562	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	93	824	38	18	961	55	4	0	14	13	0	86
RTOR Reduction (vph)	0	2	0	0	2	0	0	17	0	0	81	0
Lane Group Flow (vph)	93	860	0	18	1014	0	0	1	0	0	18	0
Confl. Peds. (#/hr)	4		4	4		4						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	82.7	82.7		82.7	82.7			6.3			6.3	
Effective Green, g (s)	82.7	82.7		82.7	82.7			6.3			6.3	
Actuated g/C Ratio	0.83	0.83		0.83	0.83			0.06			0.06	
Clearance Time (s)	6.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	427	2904		506	2899			85			98	
v/s Ratio Prot		0.24			c0.29							
v/s Ratio Perm	0.18			0.03				0.00			c0.01	
v/c Ratio	0.22	0.30		0.04	0.35			0.01			0.19	
Uniform Delay, d1	1.8	2.0		1.5	2.1			43.9			44.4	
Progression Factor	0.69	0.68		0.09	0.11			1.00			1.00	
Incremental Delay, d2	1.0	0.2		0.1	0.3			0.1			0.9	
Delay (s)	2.3	1.6		0.3	0.5			44.0			45.4	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		1.7			0.5			44.0			45.4	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	3.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	796	972	11	2	1
Future Volume (Veh/h)	4	796	972	11	2	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	865	1057	12	2	1
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		199	1202			
pX, platoon unblocked	0.93				0.96	0.93
vC, conflicting volume	1070				1504	536
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	933				1196	361
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	100
cM capacity (veh/h)	680				170	593

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	292	577	705	364	3
Volume Left	4	0	0	0	2
Volume Right	0	0	0	12	1
cSH	680	1700	1700	1700	224
Volume to Capacity	0.01	0.34	0.41	0.21	0.01
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.2	0.0	0.0	0.0	21.3
Lane LOS	A				C
Approach Delay (s)	0.1		0.0		21.3
Approach LOS					C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	116	6	0	232	14	4
Future Volume (Veh/h)	116	6	0	232	14	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	126	7	0	252	15	4
Pedestrians				3	4	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	507					
pX, platoon unblocked						
vC, conflicting volume			137		386	136
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			137		386	136
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			1442		616	907

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	133	252	19
Volume Left	0	0	15
Volume Right	7	0	4
cSH	1700	1442	660
Volume to Capacity	0.08	0.00	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	10.6
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.6
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	23.2%	ICU Level of Service	A
Analysis Period (min)	15		

5: N. Washington St & W. Columbia St./E. Columbia St

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	145	269	26	1197	27	730
v/c Ratio	0.32	0.56	0.07	0.68	0.14	0.42
Control Delay	28.7	33.5	3.1	9.5	10.8	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	33.5	3.1	9.5	10.8	16.7
Queue Length 50th (ft)	69	137	1	200	7	158
Queue Length 95th (ft)	123	221	m2	337	18	208
Internal Link Dist (ft)	910	204		631		475
Turn Bay Length (ft)			70		125	
Base Capacity (vph)	448	479	350	1749	195	1753
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.56	0.07	0.68	0.14	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	75	12	74	134	50	25	1113	36	26	686	14
Future Volume (vph)	52	75	12	74	134	50	25	1113	36	26	686	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	12	12	12	10	11	11	10	11	11
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		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	
Frt		0.99			0.97		1.00	1.00		1.00	1.00	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1861			1779		1649	3400		1652	3408	
Flt Permitted		0.78			0.87		0.31	1.00		0.13	1.00	
Satd. Flow (perm)		1483			1568		546	3400		230	3408	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	54	78	12	77	140	52	26	1159	38	27	715	15
RTOR Reduction (vph)	0	4	0	0	8	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	142	0	0	261	0	26	1195	0	27	728	0
Confl. Peds. (#/hr)	4		4	4		4	6		8	8		6
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.0			30.0		52.0	49.0		52.0	49.0	
Effective Green, g (s)		30.0			30.0		52.0	49.0		52.0	49.0	
Actuated g/C Ratio		0.30			0.30		0.52	0.49		0.52	0.49	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		444			470		317	1666		162	1669	
v/s Ratio Prot							0.00	c0.35		c0.00	0.21	
v/s Ratio Perm		0.10			c0.17		0.04			0.08		
v/c Ratio		0.32			0.55		0.08	0.72		0.17	0.44	
Uniform Delay, d1		27.1			29.4		12.0	20.1		14.2	16.5	
Progression Factor		1.00			1.00		0.30	0.42		1.00	1.00	
Incremental Delay, d2		1.9			4.7		0.1	1.7		0.5	0.8	
Delay (s)		29.0			34.0		3.7	10.0		14.7	17.4	
Level of Service		C			C		A	B		B	B	
Approach Delay (s)		29.0			34.0			9.9			17.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	108	103	1192	693	49
Future Volume (Veh/h)	13	108	103	1192	693	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	14	113	107	1242	722	51
Pedestrians	7				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	1				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				483	711	
pX, platoon unblocked	0.76	0.88	0.88			
vC, conflicting volume	1592	394	780			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	424	36	475			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	87	89			
cM capacity (veh/h)	372	900	947			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	127	521	828	481	292
Volume Left	14	107	0	0	0
Volume Right	113	0	0	0	51
cSH	778	947	1700	1700	1700
Volume to Capacity	0.16	0.11	0.49	0.28	0.17
Queue Length 95th (ft)	15	10	0	0	0
Control Delay (s)	10.5	3.0	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	10.5	1.2		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	99	55	1353	838
v/c Ratio	0.62	0.29	0.78	0.51
Control Delay	61.9	16.2	5.1	13.5
Queue Delay	0.0	0.0	2.9	0.0
Total Delay	61.9	16.2	7.9	13.5
Queue Length 50th (ft)	62	0	34	215
Queue Length 95th (ft)	#130	37	25	278
Internal Link Dist (ft)	437		43	403
Turn Bay Length (ft)	150			
Base Capacity (vph)	159	189	1742	1639
Starvation Cap Reductn	0	0	275	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.62	0.29	0.92	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	91	51	92	1153	683	88
Future Volume (vph)	91	51	92	1153	683	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Grade (%)	0%			3%	-3%	
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1554		3329	3394	
Flt Permitted	0.95	1.00		0.80	1.00	
Satd. Flow (perm)	1770	1554		2676	3394	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	55	100	1253	742	96
RTOR Reduction (vph)	0	50	0	0	10	0
Lane Group Flow (vph)	99	5	0	1353	828	0
Confl. Peds. (#/hr)	2	2	9			9
Bus Blockages (#/hr)	0	0	0	4	0	4
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	3		5 4	2 4	6	
Permitted Phases		3	2 4			
Actuated Green, G (s)	9.0	9.0		59.0	48.0	
Effective Green, g (s)	9.0	9.0		55.0	48.0	
Actuated g/C Ratio	0.09	0.09		0.55	0.48	
Clearance Time (s)	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0	
Lane Grp Cap (vph)	159	139		1608	1629	
v/s Ratio Prot	c0.06			c0.18	c0.24	
v/s Ratio Perm		0.00		c0.29		
v/c Ratio	0.62	0.04		0.84	0.51	
Uniform Delay, d1	43.9	41.5		18.8	17.9	
Progression Factor	1.00	1.00		0.17	0.70	
Incremental Delay, d2	7.4	0.1		2.5	1.1	
Delay (s)	51.2	41.6		5.8	13.6	
Level of Service	D	D		A	B	
Approach Delay (s)	47.8			5.8	13.6	
Approach LOS	D			A	B	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	21	1343	798
v/c Ratio	0.22	0.80	0.36
Control Delay	34.7	11.6	1.2
Queue Delay	0.0	0.9	0.3
Total Delay	34.7	12.5	1.5
Queue Length 50th (ft)	6	104	10
Queue Length 95th (ft)	30	m129	7
Internal Link Dist (ft)	168	56	43
Turn Bay Length (ft)			
Base Capacity (vph)	95	1673	2219
Starvation Cap Reductn	0	6	697
Spillback Cap Reductn	0	125	17
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.22	0.87	0.52

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	8	11	1234	2	2	732
Future Volume (vph)	8	11	1234	2	2	732
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		3%			-4%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		0.95			0.95
Frpb, ped/bikes	1.00		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.92		1.00			1.00
Flt Protected	0.98		1.00			1.00
Satd. Flow (prot)	1683		3485			3610
Flt Permitted	0.98		1.00			0.95
Satd. Flow (perm)	1683		3485			3448
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	12	1341	2	2	796
RTOR Reduction (vph)	11	0	0	0	0	0
Lane Group Flow (vph)	10	0	1343	0	0	798
Confl. Peds. (#/hr)				12		
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	4		2		1 3	3 6
Permitted Phases					3 6	
Actuated Green, G (s)	5.0		48.0			63.0
Effective Green, g (s)	5.0		48.0			63.0
Actuated g/C Ratio	0.05		0.48			0.63
Clearance Time (s)	6.0		6.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	84		1672			2222
v/s Ratio Prot	c0.01		c0.39			c0.11
v/s Ratio Perm						0.11
v/c Ratio	0.11		0.80			0.36
Uniform Delay, d1	45.4		22.0			8.8
Progression Factor	1.00		0.41			0.09
Incremental Delay, d2	0.6		2.4			0.1
Delay (s)	46.0		11.4			0.9
Level of Service	D		B			A
Approach Delay (s)	46.0		11.4			0.9
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	59	1177	26	0	740
Future Volume (Veh/h)	0	59	1177	26	0	740
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	61	1213	27	0	763
Pedestrians	10					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			204			136
pX, platoon unblocked	0.77	0.71			0.71	
vC, conflicting volume	1618	630			1250	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	587	0			549	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	92			100	
cM capacity (veh/h)	335	768			720	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	61	809	431	382	382
Volume Left	0	0	0	0	0
Volume Right	61	0	27	0	0
cSH	768	1700	1700	1700	1700
Volume to Capacity	0.08	0.48	0.25	0.22	0.22
Queue Length 95th (ft)	6	0	0	0	0
Control Delay (s)	10.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.1	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

1: S. Washington St/N. Washington St & W. Broad St/E. Broad St

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	203	804	118	890	83	697	222	1226
v/c Ratio	0.88	0.72	0.55	0.87	0.48	0.73	0.69	0.99
Control Delay	60.4	22.4	22.3	37.3	23.9	39.8	26.7	38.8
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	28.9
Total Delay	60.4	22.4	22.3	37.5	23.9	39.8	26.7	67.8
Queue Length 50th (ft)	62	207	36	297	37	244	74	213
Queue Length 95th (ft)	#210	223	64	#419	m56	300	147	#545
Internal Link Dist (ft)		453		384		503		124
Turn Bay Length (ft)	275		255		345		190	
Base Capacity (vph)	230	1118	218	1023	178	996	347	1238
Starvation Cap Reductn	0	0	0	0	0	0	1	101
Spillback Cap Reductn	0	0	0	6	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.72	0.54	0.88	0.47	0.70	0.64	1.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	707	65	113	822	33	80	641	28	213	1030	147
Future Volume (vph)	195	707	65	113	822	33	80	641	28	213	1030	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			3%			-4%	
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	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	
Frt	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1711	3363		1708	3397		1743	3458		1803	3535	
Flt Permitted	0.12	1.00		0.21	1.00		0.14	1.00		0.19	1.00	
Satd. Flow (perm)	224	3363		373	3397		257	3458		357	3535	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	203	736	68	118	856	34	83	668	29	222	1073	153
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	203	804	0	118	890	0	83	697	0	222	1226	0
Confl. Peds. (#/hr)	18		30	30		18	3		22	22		3
Bus Blockages (#/hr)	0	0	0	0	0	8	0	0	8	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	41.2	32.2		35.0	29.1		33.4	28.6		44.9	35.1	
Effective Green, g (s)	41.2	32.2		35.0	29.1		33.4	28.6		44.9	35.1	
Actuated g/C Ratio	0.41	0.32		0.35	0.29		0.33	0.29		0.45	0.35	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	6.0		5.0	6.0	
Vehicle Extension (s)	2.0	5.0		2.0	5.0		2.0	5.0		2.0	5.0	
Lane Grp Cap (vph)	226	1082		209	988		157	988		323	1240	
v/s Ratio Prot	c0.08	0.24		0.03	0.26		0.03	0.20		c0.08	c0.35	
v/s Ratio Perm	c0.29			0.16			0.15			0.23		
v/c Ratio	0.90	0.74		0.56	0.90		0.53	0.71		0.69	0.99	
Uniform Delay, d1	23.0	30.2		23.5	34.1		26.3	31.9		19.5	32.3	
Progression Factor	1.42	0.63		0.68	0.78		0.94	1.07		1.00	0.48	
Incremental Delay, d2	27.9	3.7		2.0	12.4		1.4	2.7		4.0	20.6	
Delay (s)	60.6	22.8		18.1	39.0		26.0	36.8		23.5	36.0	
Level of Service	E	C		B	D		C	D		C	D	
Approach Delay (s)		30.4			36.6			35.6			34.1	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	104	1043	7	878	40	139
v/c Ratio	0.27	0.43	0.02	0.36	0.12	0.39
Control Delay	7.5	6.3	1.5	2.5	15.0	19.4
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	7.5	6.6	1.5	2.5	15.0	19.4
Queue Length 50th (ft)	16	86	0	19	4	32
Queue Length 95th (ft)	m39	167	m1	23	32	87
Internal Link Dist (ft)		384		119	137	115
Turn Bay Length (ft)	75					
Base Capacity (vph)	386	2437	313	2411	325	360
Starvation Cap Reductn	0	677	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.59	0.02	0.36	0.12	0.39

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	949	10	6	738	70	15	0	22	46	0	82
Future Volume (vph)	96	949	10	6	738	70	15	0	22	46	0	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.92			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1766	3533		1768	3485			1678			1657	
Flt Permitted	0.30	1.00		0.24	1.00			0.87			0.88	
Satd. Flow (perm)	560	3533		455	3485			1497			1481	
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)	104	1032	11	7	802	76	16	0	24	50	0	89
RTOR Reduction (vph)	0	1	0	0	7	0	0	26	0	0	64	0
Lane Group Flow (vph)	104	1042	0	7	871	0	0	14	0	0	75	0
Confl. Peds. (#/hr)	9		5	5		9	1					1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	69.0	69.0		69.0	69.0			20.0			20.0	
Effective Green, g (s)	69.0	69.0		69.0	69.0			20.0			20.0	
Actuated g/C Ratio	0.69	0.69		0.69	0.69			0.20			0.20	
Clearance Time (s)	6.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	386	2437		313	2404			299			296	
v/s Ratio Prot		c0.30			0.25							
v/s Ratio Perm	0.19			0.02				0.01			c0.05	
v/c Ratio	0.27	0.43		0.02	0.36			0.05			0.25	
Uniform Delay, d1	5.9	6.8		4.9	6.4			32.3			33.7	
Progression Factor	0.97	0.85		0.29	0.33			1.00			1.00	
Incremental Delay, d2	1.4	0.4		0.1	0.4			0.3			0.5	
Delay (s)	7.1	6.2		1.5	2.5			32.6			34.2	
Level of Service	A	A		A	A			C			C	
Approach Delay (s)		6.3			2.5			32.6			34.2	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	1008	791	11	6	23
Future Volume (Veh/h)	9	1008	791	11	6	23
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	1061	833	12	6	24
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		199	1202			
pX, platoon unblocked	1.00				0.87	1.00
vC, conflicting volume	853				1396	430
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	844				1140	420
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				96	96
cM capacity (veh/h)	780				167	576

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	363	707	555	290	30
Volume Left	9	0	0	0	6
Volume Right	0	0	0	12	24
cSH	780	1700	1700	1700	386
Volume to Capacity	0.01	0.42	0.33	0.17	0.08
Queue Length 95th (ft)	1	0	0	0	6
Control Delay (s)	0.4	0.0	0.0	0.0	15.1
Lane LOS	A				C
Approach Delay (s)	0.1		0.0		15.1
Approach LOS					C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	183	10	13	141	4	13
Future Volume (Veh/h)	183	10	13	141	4	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	199	11	14	153	4	14
Pedestrians					8	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	507					
pX, platoon unblocked						
vC, conflicting volume			218		394	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			218		394	212
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1343		601	822

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	210	167	18
Volume Left	0	14	4
Volume Right	11	0	14
cSH	1700	1343	760
Volume to Capacity	0.12	0.01	0.02
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.7	9.9
Lane LOS		A	A
Approach Delay (s)	0.0	0.7	9.9
Approach LOS			A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	28.2%	ICU Level of Service	A
Analysis Period (min)	15		

5: N. Washington St & W. Columbia St./E. Columbia St

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	219	152	37	1092	40	1335
v/c Ratio	0.48	0.32	0.21	0.62	0.17	0.76
Control Delay	32.7	28.1	8.6	14.3	10.4	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	28.1	8.6	14.3	10.4	23.7
Queue Length 50th (ft)	111	70	6	218	10	376
Queue Length 95th (ft)	184	126	m16	276	24	473
Internal Link Dist (ft)	910	204		631		475
Turn Bay Length (ft)			70		125	
Base Capacity (vph)	457	480	180	1756	243	1766
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.32	0.21	0.62	0.16	0.76

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	107	22	31	85	24	34	948	57	37	1202	26
Future Volume (vph)	73	107	22	31	85	24	34	948	57	37	1202	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	12	12	12	10	11	11	10	11	11
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		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	
Frt		0.99			0.98		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1855			1792		1652	3385		1652	3408	
Flt Permitted		0.83			0.90		0.10	1.00		0.17	1.00	
Satd. Flow (perm)		1565			1631		166	3385		291	3408	
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)	79	116	24	34	92	26	37	1030	62	40	1307	28
RTOR Reduction (vph)	0	4	0	0	7	0	0	4	0	0	2	0
Lane Group Flow (vph)	0	215	0	0	145	0	37	1088	0	40	1333	0
Confl. Peds. (#/hr)	5		2	2		5	5		5	5		5
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		29.0			29.0		53.0	49.4		53.0	49.4	
Effective Green, g (s)		29.0			29.0		53.0	49.4		53.0	49.4	
Actuated g/C Ratio		0.29			0.29		0.53	0.49		0.53	0.49	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		453			472		141	1672		203	1683	
v/s Ratio Prot							c0.01	0.32		0.01	c0.39	
v/s Ratio Perm		c0.14			0.09		0.13			0.10		
v/c Ratio		0.47			0.31		0.26	0.65		0.20	0.79	
Uniform Delay, d1		29.2			27.7		15.2	18.9		13.0	21.0	
Progression Factor		1.00			1.00		0.70	0.70		1.00	1.00	
Incremental Delay, d2		3.5			1.7		0.9	1.8		0.5	3.9	
Delay (s)		32.8			29.3		11.5	14.9		13.5	25.0	
Level of Service		C			C		B	B		B	C	
Approach Delay (s)		32.8			29.3			14.8			24.6	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	99	94	1015	1213	50
Future Volume (Veh/h)	21	99	94	1015	1213	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	22	103	98	1057	1264	52
Pedestrians	5				2	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				483	711	
pX, platoon unblocked	0.74	0.67	0.67			
vC, conflicting volume	2022	663	1321			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	909	0	510			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	86	86			
cM capacity (veh/h)	173	728	706			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	125	450	705	843	473
Volume Left	22	98	0	0	0
Volume Right	103	0	0	0	52
cSH	465	706	1700	1700	1700
Volume to Capacity	0.27	0.14	0.41	0.50	0.28
Queue Length 95th (ft)	27	12	0	0	0
Control Delay (s)	15.6	3.9	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	15.6	1.5		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	181	115	973	1454
v/c Ratio	0.73	0.37	0.48	0.70
Control Delay	59.8	11.2	2.4	10.0
Queue Delay	0.0	0.2	0.1	0.0
Total Delay	59.8	11.4	2.5	10.0
Queue Length 50th (ft)	112	0	45	117
Queue Length 95th (ft)	#212	50	27	211
Internal Link Dist (ft)	437		43	403
Turn Bay Length (ft)	150			
Base Capacity (vph)	247	310	2025	2087
Starvation Cap Reductn	0	0	148	0
Spillback Cap Reductn	0	21	0	21
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.73	0.40	0.52	0.70

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	168	107	25	880	1272	80
Future Volume (vph)	168	107	25	880	1272	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Grade (%)	0%			3%	-3%	
Total Lost time (s)	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.95		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1508		3338	3417	
Flt Permitted	0.95	1.00		0.88	1.00	
Satd. Flow (perm)	1770	1508		2937	3417	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	181	115	27	946	1368	86
RTOR Reduction (vph)	0	99	0	0	3	0
Lane Group Flow (vph)	181	16	0	973	1451	0
Confl. Peds. (#/hr)		17	33			33
Bus Blockages (#/hr)	0	0	0	4	0	4
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	3		5 4	2 4	6	
Permitted Phases		3	2 4			
Actuated Green, G (s)	14.0	14.0		68.0	61.0	
Effective Green, g (s)	14.0	14.0		68.0	61.0	
Actuated g/C Ratio	0.14	0.14		0.68	0.61	
Clearance Time (s)	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0			3.0	
Lane Grp Cap (vph)	247	211		2025	2084	
v/s Ratio Prot	c0.10			c0.03	c0.42	
v/s Ratio Perm		0.01		0.29		
v/c Ratio	0.73	0.08		0.48	0.70	
Uniform Delay, d1	41.2	37.4		7.6	13.2	
Progression Factor	1.00	1.00		0.31	0.63	
Incremental Delay, d2	10.7	0.2		0.2	1.5	
Delay (s)	51.9	37.5		2.6	9.8	
Level of Service	D	D		A	A	
Approach Delay (s)	46.3			2.6	9.8	
Approach LOS	D			A	A	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	38	957	1483
v/c Ratio	0.28	0.45	0.57
Control Delay	29.0	12.8	1.7
Queue Delay	0.0	1.4	0.3
Total Delay	29.1	14.2	1.9
Queue Length 50th (ft)	9	141	38
Queue Length 95th (ft)	41	m235	34
Internal Link Dist (ft)	168	56	43
Turn Bay Length (ft)			
Base Capacity (vph)	138	2123	2608
Starvation Cap Reductn	0	911	434
Spillback Cap Reductn	1	94	270
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.28	0.79	0.68

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	13	22	883	7	2	1377
Future Volume (vph)	13	22	883	7	2	1377
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		3%			-4%
Total Lost time (s)	6.0		6.0			6.0
Lane Util. Factor	1.00		0.95			0.95
Frpb, ped/bikes	0.99		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.91		1.00			1.00
Flt Protected	0.98		1.00			1.00
Satd. Flow (prot)	1656		3480			3610
Flt Permitted	0.98		1.00			0.95
Satd. Flow (perm)	1656		3480			3448
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	14	24	949	8	2	1481
RTOR Reduction (vph)	22	0	0	0	0	0
Lane Group Flow (vph)	16	0	957	0	0	1483
Confl. Peds. (#/hr)		1		8		
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	4		2		1 3	3 6
Permitted Phases					3 6	
Actuated Green, G (s)	7.0		61.0			75.0
Effective Green, g (s)	7.0		61.0			75.0
Actuated g/C Ratio	0.07		0.61			0.75
Clearance Time (s)	6.0		6.0			
Vehicle Extension (s)	4.0		3.0			
Lane Grp Cap (vph)	115		2122			2608
v/s Ratio Prot	c0.01		0.27			c0.08
v/s Ratio Perm						c0.35
v/c Ratio	0.14		0.45			0.57
Uniform Delay, d1	43.7		10.5			5.4
Progression Factor	1.00		1.16			0.27
Incremental Delay, d2	0.7		0.5			0.2
Delay (s)	44.4		12.6			1.7
Level of Service	D		B			A
Approach Delay (s)	44.4		12.6			1.7
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	57	834	35	0	1390
Future Volume (Veh/h)	0	57	834	35	0	1390
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	59	860	36	0	1433
Pedestrians	5					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			204			136
pX, platoon unblocked	0.91	0.82			0.82	
vC, conflicting volume	1600	453			901	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	588	0			453	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	93			100	
cM capacity (veh/h)	398	890			906	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	59	573	323	716	716
Volume Left	0	0	0	0	0
Volume Right	59	0	36	0	0
cSH	890	1700	1700	1700	1700
Volume to Capacity	0.07	0.34	0.19	0.42	0.42
Queue Length 95th (ft)	5	0	0	0	0
Control Delay (s)	9.3	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.3	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	189	709	85	705	105	652	269	664
v/c Ratio	0.60	0.65	0.32	0.80	0.37	0.77	0.79	0.65
Control Delay	28.6	36.7	23.8	47.5	25.4	47.9	41.0	39.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1
Total Delay	28.6	36.7	23.8	47.5	25.4	47.9	41.1	39.2
Queue Length 50th (ft)	81	227	34	249	44	231	125	217
Queue Length 95th (ft)	159	357	78	389	96	363	#273	347
Internal Link Dist (ft)		453		384		503		124
Turn Bay Length (ft)	275		255		345		190	
Base Capacity (vph)	390	2019	375	1873	449	1924	414	1914
Starvation Cap Reductn	0	65	0	54	0	0	8	353
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.36	0.23	0.39	0.23	0.34	0.66	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	181	609	72	82	621	56	101	599	27	258	469	168
Future Volume (vph)	181	609	72	82	621	56	101	599	27	258	469	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			3%			-4%	
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1710	3357		1708	3371		1742	3460		1805	3449	
Flt Permitted	0.15	1.00		0.29	1.00		0.30	1.00		0.17	1.00	
Satd. Flow (perm)	277	3357		528	3371		544	3460		316	3449	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	189	634	75	85	647	58	105	624	28	269	489	175
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	189	709	0	85	705	0	105	652	0	269	664	0
Confl. Peds. (#/hr)	11		11	11		11	4		5	5		4
Bus Blockages (#/hr)	0	0	0	0	0	8	0	0	8	0	0	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	50.6	36.4		37.8	29.6		37.2	27.5		48.8	33.3	
Effective Green, g (s)	50.6	36.4		37.8	29.6		37.2	27.5		48.8	33.3	
Actuated g/C Ratio	0.45	0.33		0.34	0.27		0.33	0.25		0.44	0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	318	1094		265	894		285	852		344	1029	
v/s Ratio Prot	c0.08	c0.21		0.02	c0.21		0.03	0.19		c0.11	0.19	
v/s Ratio Perm	0.19			0.08			0.09			c0.23		
v/c Ratio	0.59	0.65		0.32	0.79		0.37	0.77		0.78	0.65	
Uniform Delay, d1	21.5	32.1		25.9	38.1		26.7	39.1		23.4	34.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	1.0		0.3	4.3		0.3	3.7		10.2	1.0	
Delay (s)	23.5	33.1		26.2	42.4		26.9	42.8		33.6	35.1	
Level of Service	C	C		C	D		C	D		C	D	
Approach Delay (s)		31.1			40.7			40.6			34.6	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	111.6	Sum of lost time (s)	24.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	99	940	3	845	5	128
v/c Ratio	0.24	0.40	0.01	0.37	0.02	0.38
Control Delay	6.9	5.5	4.3	5.2	13.8	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	5.5	4.3	5.2	13.8	10.6
Queue Length 50th (ft)	9	53	0	44	1	6
Queue Length 95th (ft)	33	100	3	86	7	44
Internal Link Dist (ft)		384		119	137	115
Turn Bay Length (ft)	75					
Base Capacity (vph)	622	3535	560	3486	809	840
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.27	0.01	0.24	0.01	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	861	4	3	711	66	2	1	2	30	0	87
Future Volume (vph)	91	861	4	3	711	66	2	1	2	30	0	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	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	
Frt	1.00	1.00		1.00	0.99			0.95			0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1768	3537		1767	3487			1728			1655	
Flt Permitted	0.33	1.00		0.30	1.00			0.88			0.91	
Satd. Flow (perm)	622	3537		560	3487			1553			1526	
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)	99	936	4	3	773	72	2	1	2	33	0	95
RTOR Reduction (vph)	0	0	0	0	9	0	0	2	0	0	83	0
Lane Group Flow (vph)	99	940	0	3	836	0	0	3	0	0	45	0
Confl. Peds. (#/hr)	4		7	7		4						
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	25.5	25.5		25.5	25.5			5.5			5.5	
Effective Green, g (s)	25.5	25.5		25.5	25.5			5.5			5.5	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.13			0.13	
Clearance Time (s)	6.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	377	2147		340	2117			203			199	
v/s Ratio Prot		c0.27			0.24							
v/s Ratio Perm	0.16			0.01				0.00			c0.03	
v/c Ratio	0.26	0.44		0.01	0.40			0.02			0.23	
Uniform Delay, d1	3.9	4.4		3.3	4.3			15.9			16.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.4	0.1		0.0	0.1			0.0			0.6	
Delay (s)	4.2	4.6		3.3	4.4			15.9			16.9	
Level of Service	A	A		A	A			B			B	
Approach Delay (s)		4.5			4.4			15.9			16.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	42.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	886	768	4	0	11
Future Volume (Veh/h)	8	886	768	4	0	11
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	9	953	826	4	0	12
Pedestrians					6	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		199	1202			
pX, platoon unblocked	0.95				0.88	0.95
vC, conflicting volume	836				1328	421
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	733				874	299
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	824				251	663

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	327	635	551	279	12
Volume Left	9	0	0	0	0
Volume Right	0	0	0	4	12
cSH	824	1700	1700	1700	663
Volume to Capacity	0.01	0.37	0.32	0.16	0.02
Queue Length 95th (ft)	1	0	0	0	1
Control Delay (s)	0.4	0.0	0.0	0.0	10.5
Lane LOS	A				B
Approach Delay (s)	0.1		0.0		10.5
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	103	8	5	125	1	7
Future Volume (Veh/h)	103	8	5	125	1	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	111	9	5	134	1	8
Pedestrians	2				4	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	507					
pX, platoon unblocked						
vC, conflicting volume			124		266	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			124		266	120
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1458		718	929

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	120	139	9
Volume Left	0	5	1
Volume Right	9	0	8
cSH	1700	1458	900
Volume to Capacity	0.07	0.00	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.3	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	0.3	9.0
Approach LOS			A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		

5: N. Washington St & W. Columbia St./E. Columbia St

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	91	156	11	964	61	941
v/c Ratio	0.15	0.25	0.05	0.82	0.28	0.63
Control Delay	19.7	19.5	10.9	30.6	14.1	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	19.5	10.9	30.6	14.1	19.5
Queue Length 50th (ft)	29	50	3	235	16	170
Queue Length 95th (ft)	72	112	11	315	34	292
Internal Link Dist (ft)	910	204		631		475
Turn Bay Length (ft)			70		125	
Base Capacity (vph)	588	612	329	2598	289	2610
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.25	0.03	0.37	0.21	0.36

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	33	9	45	63	36	10	850	37	56	846	19
Future Volume (vph)	41	33	9	45	63	36	10	850	37	56	846	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	13	12	12	12	10	11	11	10	11	11
Total Lost time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1834			1753		1651	3393		1652	3407	
Flt Permitted		0.82			0.89		0.22	1.00		0.14	1.00	
Satd. Flow (perm)		1532			1581		378	3393		236	3407	
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)	45	36	10	49	68	39	11	924	40	61	920	21
RTOR Reduction (vph)	0	3	0	0	9	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	88	0	0	147	0	11	961	0	61	939	0
Confl. Peds. (#/hr)	11		8	8		11	6		11	11		6
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	4	0	0	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		30.6			30.6		31.9	31.0		39.9	35.0	
Effective Green, g (s)		30.6			30.6		31.9	31.0		39.9	35.0	
Actuated g/C Ratio		0.36			0.36		0.38	0.37		0.47	0.41	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		2.0			2.0		2.0	2.0		2.0	2.5	
Lane Grp Cap (vph)		554			572		156	1244		193	1411	
v/s Ratio Prot							0.00	c0.28		c0.02	c0.28	
v/s Ratio Perm		0.06			c0.09		0.03			0.13		
v/c Ratio		0.16			0.26		0.07	0.77		0.32	0.67	
Uniform Delay, d1		18.2			19.0		16.9	23.6		14.6	20.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6			1.1		0.1	2.8		0.3	1.1	
Delay (s)		18.8			20.0		17.0	26.4		15.0	21.1	
Level of Service		B			C		B	C		B	C	
Approach Delay (s)		18.8			20.0			26.3			20.7	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	84.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	128	86	824	866	29
Future Volume (Veh/h)	30	128	86	824	866	29
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	31	132	89	849	893	30
Pedestrians	8			2		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				483	711	
pX, platoon unblocked	0.86	0.80	0.80			
vC, conflicting volume	1518	472	931			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	615	0	399			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	85	90			
cM capacity (veh/h)	325	855	914			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	163	372	566	595	328
Volume Left	31	89	0	0	0
Volume Right	132	0	0	0	30
cSH	653	914	1700	1700	1700
Volume to Capacity	0.25	0.10	0.33	0.35	0.19
Queue Length 95th (ft)	25	8	0	0	0
Control Delay (s)	12.3	3.1	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	12.3	1.2		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBR	NBT	SBT
Lane Group Flow (vph)	147	61	913	986
v/c Ratio	0.46	0.18	0.47	0.68
Control Delay	43.8	11.6	1.9	27.2
Queue Delay	0.0	0.0	0.2	0.0
Total Delay	43.8	11.6	2.1	27.2
Queue Length 50th (ft)	83	0	26	301
Queue Length 95th (ft)	159	37	18	335
Internal Link Dist (ft)	437		43	403
Turn Bay Length (ft)	150			
Base Capacity (vph)	321	337	1947	1525
Starvation Cap Reductn	0	0	295	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.46	0.18	0.55	0.65

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	137	57	33	817	835	82
Future Volume (vph)	137	57	33	817	835	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	11	11
Grade (%)	0%			3%	-3%	
Total Lost time (s)	6.0	6.0		5.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	1770	1583		3337	3426	
Flt Permitted	0.95	1.00		0.91	1.00	
Satd. Flow (perm)	1770	1583		3034	3426	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	147	61	35	878	898	88
RTOR Reduction (vph)	0	50	0	0	7	0
Lane Group Flow (vph)	147	11	0	913	979	0
Bus Blockages (#/hr)	0	0	0	4	0	4
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	3		5 4	2 4	6	
Permitted Phases		3	2 4			
Actuated Green, G (s)	19.1	19.1		64.9	44.4	
Effective Green, g (s)	19.1	19.1		64.9	44.4	
Actuated g/C Ratio	0.18	0.18		0.62	0.42	
Clearance Time (s)	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0			1.5	
Lane Grp Cap (vph)	321	287		1946	1448	
v/s Ratio Prot	c0.08			c0.11	c0.29	
v/s Ratio Perm		0.01		0.18		
v/c Ratio	0.46	0.04		0.47	0.68	
Uniform Delay, d1	38.3	35.4		10.8	24.5	
Progression Factor	1.00	1.00		0.11	1.00	
Incremental Delay, d2	1.0	0.1		0.1	2.6	
Delay (s)	39.4	35.4		1.2	27.0	
Level of Service	D	D		A	C	
Approach Delay (s)	38.2			1.2	27.0	
Approach LOS	D			A	C	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	10	894	939
v/c Ratio	0.09	0.50	0.40
Control Delay	37.6	18.3	1.7
Queue Delay	0.0	2.4	0.8
Total Delay	37.6	20.7	2.4
Queue Length 50th (ft)	3	226	17
Queue Length 95th (ft)	21	232	16
Internal Link Dist (ft)	168	56	43
Turn Bay Length (ft)			
Base Capacity (vph)	109	1773	2355
Starvation Cap Reductn	0	716	1013
Spillback Cap Reductn	0	90	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.09	0.85	0.70

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	5	5	845	5	2	890
Future Volume (vph)	5	5	845	5	2	890
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	0%		3%			-4%
Total Lost time (s)	5.0		5.0			6.0
Lane Util. Factor	1.00		0.95			0.95
Frpb, ped/bikes	1.00		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.93		1.00			1.00
Flt Protected	0.98		1.00			1.00
Satd. Flow (prot)	1695		3483			3610
Flt Permitted	0.98		1.00			0.95
Satd. Flow (perm)	1695		3483			3448
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	5	889	5	2	937
RTOR Reduction (vph)	5	0	0	0	0	0
Lane Group Flow (vph)	5	0	894	0	0	939
Confl. Peds. (#/hr)				1	1	
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	4		2		1 3	3 6
Permitted Phases					3 6	
Actuated Green, G (s)	6.5		53.4			69.5
Effective Green, g (s)	6.5		53.4			69.5
Actuated g/C Ratio	0.06		0.51			0.66
Clearance Time (s)	5.0		5.0			
Vehicle Extension (s)	2.0		1.5			
Lane Grp Cap (vph)	104		1771			2328
v/s Ratio Prot	c0.00		c0.26			c0.12
v/s Ratio Perm						0.15
v/c Ratio	0.05		0.50			0.40
Uniform Delay, d1	46.3		17.1			8.2
Progression Factor	1.00		1.00			0.15
Incremental Delay, d2	0.1		1.0			0.1
Delay (s)	46.4		18.1			1.3
Level of Service	D		B			A
Approach Delay (s)	46.4		18.1			1.3
Approach LOS	D		B			A

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	45	805	31	0	895
Future Volume (Veh/h)	0	45	805	31	0	895
Sign Control	Stop		Free			Free
Grade	0%		3%			-4%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	49	875	34	0	973
Pedestrians	6					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			204			136
pX, platoon unblocked	0.89	0.83			0.83	
vC, conflicting volume	1384	460			915	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	574	0			484	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	95			100	
cM capacity (veh/h)	397	894			886	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	49	583	326	486	486
Volume Left	0	0	0	0	0
Volume Right	49	0	34	0	0
cSH	894	1700	1700	1700	1700
Volume to Capacity	0.05	0.34	0.19	0.29	0.29
Queue Length 95th (ft)	4	0	0	0	0
Control Delay (s)	9.3	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	9.3	0.0		0.0	
Approach LOS	A				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		