



June 22, 2023

Mr. Gregory Rondeau, Chairman  
Franklin Planning Board  
355 East Central Street  
Franklin, MA 02038

Re: Warehouse/Industrial Development  
100 Financial Park  
Site Plan Application – Traffic Peer Review

Dear Mr. Rondeau:

BETA Group, Inc. (BETA) has received the additional documents dated June 7, 2023 for traffic-related items for the proposed project entitled "Warehouse / Industrial Development" located at 100 Financial Park in response to BETA's preliminary review comments in a memorandum dated June 1, 2023. This letter provides BETA's comprehensive findings, comments and recommendations.

## BASIS OF REVIEW

The following documents were received by BETA and formed the basis of the review:

- Plans (45 sheets) entitled: Warehouse Industrial Development Site Development Plans 100/200 Financial Park Franklin Massachusetts, dated May 11, 2023, prepared by Highpoint.
- Traffic Impact and Access Study (TIA), dated April 2023, prepared by MDM Transportation Consultants, Inc. (MDM).
- Response to Comments – Peer Review of Traffic Memorandum, 100/200 Financial Park, dated June 7, 2023, prepared by MDM Transportation Consultants, Inc.

## INTRODUCTION

The project site includes two parcels, located at 100 Financial Park in the Town of Franklin (the "Site"). The Site and all the surrounding lots are located within the Industrial zoning district.

The existing Site is the location of a 1-story office building with a footprint area of 180,000± sq. ft. and a 2-story warehouse building with a footprint area of 57,570± sq. ft. Paved parking areas are located to the north and south of the buildings. Access to the Site is provided within Financial Park, a private roadway which connects to Washington Street from the west.

The project proposes to construct two new warehouse buildings with 300,000± sq. ft of warehouse space. The existing 180,500± sq. ft office building will be demolished, and the existing warehouse building will be retained. The existing parking layout will be replaced with new areas of paved parking proposed and existing areas either retained, removed, or reconfigured. A new loading area with heavy duty pavement is proposed in the central area of the Site between the two new buildings.

## COMPILED REVIEW LETTER KEY

BETA preliminarily reviewed this project previously and provided review comments in a letter to the Board dated June 1, 2023 (original comments in standard text), MDM Transportation Consultants, Inc. (MDM) provided responses (responses in italic text), and BETA has provided response comments (status in standard bold text). All other comments shown in standard text are original comments for this more comprehensive review.

## FINDINGS, COMMENTS, AND RECOMMENDATIONS

The study area includes the following intersections in the vicinity of the site:

- Washington Street at King Street (signalized)
- Washington Street at Union Street and Arlington Street (unsignalized)
- Washington Street at Financial Park Drive (unsignalized)

The study area was found to be adequate, and the study methodology follows MassDOT Transportation Impact Assessment (TIA) guidelines.

Manual turning movement counts (TMCs) were collected on Thursday, January 26, 2023, from 7:00 AM to 9:30 AM and 2:00 PM to 6:00 PM. These time periods were chosen because they are representative of the combination of peak generator times of Franklin Park Campus and adjacent roadways. BETA concurs with the traffic data collection time periods.

Traffic volume data were also collected via a 24-hour automatic traffic recorder (ATR) count on Thursday, January 26, 2023 on Washington Street, just south of Financial Park Drive.

Data indicates the weekday AM peak period occurs from 7:30 – 8:30 AM and the PM peak period occurs from 2:45 – 3:45 PM which coincides with the Benjamin Franklin Classical Charter peak periods.

The TIA states that the existing campus is fully leased. The TIA states that baseline trip generation data was collected via ATR in January 2023 and was provided graphically and in table form (Table 2) for each existing site. The backup data is broken down by hour in the Appendix.

The peak hour and total daily volumes provided in the TIA differ from the backup data provided in the Appendix.

- T1. The peak hour and total daily volumes provided in the TIA differ slightly from the backup data provided in the Appendix. Please clarify the difference in volumes in addition to the difference in truck trips between the existing site and the proposed site.

Historical permanent count station data from I-495 and Route 1 were reviewed to determine the need for seasonal adjustment. Traffic volumes in January were found to be below average-month conditions, therefore, the volumes were increased by the average of the two stations which is 10 percent to provide baseline existing volume data.

Crash data were obtained from the MassDOT database for the most recent three-year period from 2020 to 2022. The highest crash rate, quantified as crashes per million entering vehicles, was found to be 0.25 Million Entering Vehicles (MEV) which is lower than both the statewide and District 3 average crash rates for unsignalized and signalized intersections.

- T2. Crash data for the years 2020-2022 from the MassDOT database were summarized in the TIA for the three study area intersections. At this time, our understanding is that MassDOT has not

“accepted” their crash data later than the year 2020 and crash data may be lower than normal due to the COVID-19 impacts on travel during 2020. Consideration should be given to providing crash data for the study area intersections for the years 2018-2019. MDM: The safety analysis has been expanded to include crash data for the years 2018-2022. The updated crash data from 2018 and 2019 is consistent with the 2020-2022 data, indicating no significant crash history at the study locations. No further review of crash analysis is required based on the crash history at the study locations. The expanded crash data for the study intersections is provided in the Attachments. BETA: The information has been provided. No further comment.

T3. Provide updated crash data worksheets with the correct intersection streets.

Background development-related traffic growth that may increase traffic within the study area was identified. The 160 Grove Street, 200 Grove Street, 585 King Street, 00-712 Union Street and 275 Washington Street development projects were identified as new developments. The projected trips for these projects were directly applied to the future volumes. It is our understanding that the 200 (206) Grove Street FedEx facility was operational during the data collection period, however, the trips added to the study area were minimal. BETA finds this overall approach acceptable.

MassDOT permanent count station data indicated an overall average traffic growth rate of 0.4 percent. No-Build traffic volumes were determined by applying a 1 percent per year growth rate over a seven-year period to 2030 to account for traffic growth. This growth rate is consistent with studies prepared for recent developments in Franklin.

The project-generated traffic volumes were determined by utilizing trip-generation statistics published by the Institute of Transportation Engineers (ITE) for Land Use Code (LUC) 150 Warehousing. The land use is appropriate. The project site is estimated to generate a total of 514 new trips on an average weekday with 51 (39 entering, 12 exiting) during the weekday morning peak hour, and 69 (19 entering, 50 exiting) during the weekday afternoon peak hour. Of these trips, the estimated number of trucks generated during the morning peak are six (11% of trips) and 18 (26% of trips) during the afternoon peak. Approximately 180 truck trips are anticipated daily.

T4. Provide the trip generation backup data for reference.

T5. Clarify the size of trucks the site will be generating.

T6. Although the TIA states that access to and from the site will not be permitted via the gated Grove Street driveway on the western side of the site based on preliminary discussions, we recommend that the existing number of vehicles accessing and egressing the Grove Street driveway be provided for reference. MDM: Detailed traffic count data by vehicle type for the Financial Park Drive near Grove Street is provided in the Attachments. The data indicates that approximately 20 daily passenger vehicle trips (10 entering and 10 exiting) through the gate, 45 daily school buses trips (22 entering and 23 exiting), and no articulated trucks used the gated driveway. BETA: Information has been provided. Verify that additional vehicles from the proposed warehouse will not utilize the gated driveway.

A trip generation comparison was provided between the ITE-based site trips for the proposed developments and the existing 300,000 sf warehouse (Imperial Dade). The empirical data revealed that the weekday morning (4:00 AM) and afternoon peaks (1:00 PM) are earlier than the peak hours used for the analysis which coincides with the peak periods for Financial Park and Washington Street. The TIA also included a comparison between the proposed warehouse use and the “by-right” office use which would

generate approximately 200 additional trips during the morning peak hour, 95 during the afternoon peak hour, and 1,442 more on a daily basis. This information is noted.

- T7. Journey to Work data and existing travel patterns were used to determine the distribution of trips. Please provide the Journey to Work backup data for reference.

Traffic operations analysis was performed with Synchro software based on the Highway Capacity Manual 6<sup>th</sup> Edition methodologies.

- T8. Synchro backup traffic data sheets for the Baseline (Existing), No-Build, and Build morning and afternoon peak periods are missing in the Appendix for the Financial Parkway and Washington Street intersection and the Washington Street and Union Avenue intersection. Provide backup data sheets for review and reference. MDM: The Synchro backup traffic data sheets for the Baseline, No-Build, and Build weekday morning and weekday evening peak periods are provided in the Attachments. BETA: Information has been provided. No further comment.

Capacity analysis results show that all intersections currently operate and would operate during the Build condition at acceptable Level of Service (LOS), with most movements operating at LOS C or better during the weekday morning and afternoon peak hours. The Washington Street southbound left turn movement onto King Street operates at a LOS D under existing conditions but would operate at a LOS C during the morning peak and maintain LOS D during the afternoon peak during the 2030 Build condition.

- T9. Journey to Work data and existing travel patterns were used to determine the distribution of trips. Please provide the Journey to Work backup data for reference.

- T10. The truck percentage was not increased for the Build condition analysis. Please clarify if reflecting the increase in truck trips would degrade the traffic operations at the King Street at Washington Street intersection.

Queue analysis indicates that the 95<sup>th</sup> percentile queue during the afternoon peak hour for the Washington Street southbound left turn lane extends beyond the 100-foot storage length by up to 50 feet.

The off-site mitigation consisted of the developer working with the Town of Franklin to “diagnose and repair” the vehicle detection system issues at the King Street and Washington Street intersection. BETA agrees with this mitigation.

#### FIELD VISIT & OBSERVATIONS

BETA conducted field site visits on Thursday, June 8, 2023, during the morning and afternoon peak periods to review existing traffic operations.

Tractor Trailers were observed to have a challenging time turning left into and out of Financial Park due to the tight geometry and must slow down entering the driveway which causes traffic to back up as they are trying to take the left.



Figure 1: Truck turning right out of Financial Park

Trucks turning left from Washington Street onto King Street were observed taking up both Washington Street lanes to make the turn which queues up vehicles or getting stuck within the intersection and then backing up in order to renegotiate the movement (shown Figure 2 photo).

BETA's understanding is that residents on Ivy Lane experience trucks on their street related to the Financial Park Drive development. Although BETA did not observe this type of activity during the field

observations, we kept this feedback in mind during observations. During our field observations we noticed that the Financial Park Drive development is not clearly defined with signs on Washington Street approaching the driveway in both the northbound and southbound directions. It is possible trucks miss the entrance to Financial Park due to not being able to see the sign, so they turn around on Ivy Lane. In addition, exiting Financial Park Drive there is a "Trucks Right Turn Only" sign (shown in the Figure photo). This could also impact Ivy Lane such that trucks may turn right from the driveway and then turn around on Ivy Lane to travel northbound.

T11. Consideration should be given to installing signage for Franklin Park approaching the driveway on Washington Street in both directions.

T12. Consideration should be given to providing a sign near Ivy Lane to deter truck traffic.

#### ADDITIONAL COMMENTS

T13. Recommend providing recent speed data for Washington Street near Financial Park Drive.

T14. Recommend providing sight distance analysis for Financial Park Drive at Washington Street.

If we can be of any further assistance regarding this matter, please contact us at our office.

Very truly yours,  
BETA Group, Inc.



Jaklyn Centracchio, PE, PTOE  
Project Manager/Senior Traffic Engineer

cc: Amy Love, Town Planner  
Job No: 10519.05



Figure 2: Truck stuck in the intersection while taking a left turn from Washington Street onto King Street.



Figure 3: Financial Park Drive approach to Washington Street

# Town of Franklin

355 East Central Street  
Franklin, Massachusetts 02038-1352



Phone: (508) 520-4907  
www.franklinma.gov

## DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT

**DATE:** June 21, 2023  
**TO:** Franklin Planning Board  
**FROM:** Department of Planning and Community Development  
**RE:** 100-200 Financial Way  
Site Plan Modification

---

The DPCD has reviewed the above referenced Site Plan Modification application for the Monday, June 26, 2023 Planning Board meeting and offers the following commentary:

### **General:**

1. The site is located at 100-200 Financial Way, and located in the Industrial Zoning District.
2. The proposed project includes the construction of a 220,000 sq/ft warehouse and a 65,000 sq/ft warehouse.
3. The Applicant has filed a NOI with the Conservation Commission.

### **Waivers:**

- §185-21 – Parking, reduce from the required amount of 350 spaces to 262 spaces.


### **Comments:**

1. The intent of tonight's meeting is to discuss traffic.
2. BETA has provided a traffic review letter.
3. The Applicant should consider re-designing the entrance/exit on Washington Street so that the trucks can turn in and out.

## MEMORANDUM

**DATE:** June 7, 2023

**TO:** Mr. Gregory Rondeau, Chairman  
Franklin Planning Board  
355 E Central Street  
Franklin, MA 02038

**FROM:** Daniel J. Mills, P.E., PTOE – Principal   
Daniel A. Dumais, P.E. – Senior Project Manager

**RE:** **Response to Comments - Peer Review of Traffic Memorandum**  
Proposed Warehouse Facilities  
100/200 Financial Park, Franklin, MA

---

MDM Transportation Consultants, Inc. (MDM) has prepared the following responses to initial transportation-related comments as issued in a letter to you by BETA Group, Inc. dated June 1, 2023. To facilitate review, specific comments are paraphrased with corresponding responses.

**Comment 1:** *“Synchro backup traffic data sheets for the Baseline (Existing), No-Build, and Build morning and afternoon peak periods are missing in the Appendix for the Financial Parkway and Washington Street intersection and the Washington Street and Union Avenue intersection. Provide backup data sheets for review and reference.”*

**Response:** The Synchro backup traffic data sheets for the Baseline, No-Build, and Build weekday morning and weekday evening peak periods are provided in the **Attachments**.

**Comment 2:** *“Crash data for the years 2020-2022 from the MassDOT database were summarized in the TIA for the three study area intersections. At this time, our understanding is that MassDOT has not “accepted” their crash data later than the year 2020 and crash data may be lower than normal due to the COVID-19 impacts on travel during 2020. Consideration should be given to providing crash data for the study area intersection for the years 2018-2019.”*

**Response:** The safety analysis has been expanded to include crash data for the years 2018-2022. The updated crash data from 2018 and 2019 is consistent with the 2020-2022 data, indicating no significant crash history at the study locations. No further review of crash analysis is required based on the crash history at the study locations. The expanded crash data for the study intersections is provided in the **Attachments**.

**Comment 3:** *“Although the TIA states that access to and from the site will not be permitted via the gated Grove Street driveway on the western side of the site based on preliminary discussions, we recommend that the existing number of vehicles accessing and egressing the Grove Street driveway be provided for reference.”*

**Response:** Detailed traffic count data by vehicle type for the Financial Park Drive near Grove Street is provided in the **Attachments**. The data indicates that approximately 20 daily passenger vehicle trips (10 entering and 10 exiting) through the gate, 45 daily school buses trips (22 entering and 23 exiting), and no articulated trucks used the gated driveway.














# ATTACHMENTS

- Capacity Analysis
- Crash Data
- Traffic Volume Data

□ Capacity Analysis

Lanes, Volumes, Timings  
1: Washington Street & King Street

2023 Existing Conditions - Max Recall  
Weekday Morning Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	251	625	318	125	48	117
Future Volume (vph)	251	625	318	125	48	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	50	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1736	0	1736	1583
Flt Permitted	0.324				0.950	
Satd. Flow (perm)	604	1863	1736	0	1736	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			27			126
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	500		500	
Travel Time (s)		22.7	11.4		11.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	5%	6%	4%	2%
Adj. Flow (vph)	270	672	342	134	52	126
Shared Lane Traffic (%)						
Lane Group Flow (vph)	270	672	476	0	52	126
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Turn Type	pm+pt	NA	NA		Prot	pt+ov
Protected Phases	5	2	6		4	4 5
Permitted Phases	2					
Minimum Split (s)	13.0	16.0	16.0		13.0	
Total Split (s)	26.0	82.0	56.0		21.0	
Total Split (%)	25.2%	79.6%	54.4%		20.4%	
Maximum Green (s)	20.0	76.0	50.0		15.0	
Yellow Time (s)	4.0	4.0	4.0		4.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Act Effct Green (s)	76.0	76.0	50.0		15.0	41.0
Actuated g/C Ratio	0.74	0.74	0.49		0.15	0.40
v/c Ratio	0.40	0.49	0.56		0.21	0.18
Control Delay	6.0	7.0	20.6		41.2	4.3
Queue Delay	0.0	0.0	0.0		0.0	0.0

Lanes, Volumes, Timings  
 1: Washington Street & King Street

2023 Existing Conditions - Max Recall  
 Weekday Morning Peak Hour

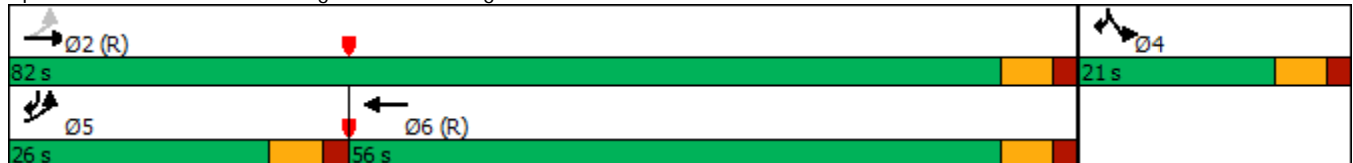
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Delay	6.0	7.0	20.6		41.2	4.3
LOS	A	A	C		D	A
Approach Delay		6.7	20.6		15.1	
Approach LOS		A	C		B	
Queue Length 50th (ft)	46	153	201		31	0
Queue Length 95th (ft)	72	219	299		67	35
Internal Link Dist (ft)		920	420		420	
Turn Bay Length (ft)	200				50	
Base Capacity (vph)	672	1374	856		252	705
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.40	0.49	0.56		0.21	0.18

Intersection Summary

Area Type: Other  
 Cycle Length: 103  
 Actuated Cycle Length: 103  
 Offset: 13 (13%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.56  
 Intersection Signal Delay: 11.8  
 Intersection Capacity Utilization 59.1%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 1: Washington Street & King Street



HCM 6th AWSC  
 3: Washington Street/Arlington Street & Union Street

2023 Baseline Conditions  
 Weekday Morning Peak Hour

Intersection

Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	7	238	178	12	202	18	235	24	10	1	17	7
Future Vol, veh/h	7	238	178	12	202	18	235	24	10	1	17	7
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	11	1	8	0	2	0	2	0	0	11	0	13
Mvmt Flow	9	294	220	15	249	22	290	30	12	1	21	9
Number of Lanes	0	1	1	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			2			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			2			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			2		
HCM Control Delay	13.9			14.1			17.1			10.3		
HCM LOS	B			B			C			B		

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	87%	3%	0%	5%	4%
Vol Thru, %	9%	97%	0%	87%	68%
Vol Right, %	4%	0%	100%	8%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	269	245	178	232	25
LT Vol	235	7	0	12	1
Through Vol	24	238	0	202	17
RT Vol	10	0	178	18	7
Lane Flow Rate	332	302	220	286	31
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.568	0.531	0.331	0.469	0.059
Departure Headway (Hd)	6.157	6.325	5.427	5.891	6.9
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	584	569	659	607	522
Service Time	4.216	4.089	3.19	3.958	4.9
HCM Lane V/C Ratio	0.568	0.531	0.334	0.471	0.059
HCM Control Delay	17.1	16.1	10.9	14.1	10.3
HCM Lane LOS	C	C	B	B	B
HCM 95th-tile Q	3.5	3.1	1.4	2.5	0.2

HCM 6th TWSC  
 3: Washington Street/Arlington Street & Union Street

2023 Existing Conditions - Max Recall  
 Weekday Morning Peak Hour

Intersection												
Int Delay, s/veh	15.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	7	238	178	12	202	18	235	24	10	1	17	7
Future Vol, veh/h	7	238	178	12	202	18	235	24	10	1	17	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	11	1	8	0	2	0	2	0	0	11	0	13
Mvmt Flow	9	294	220	15	249	22	290	30	12	1	21	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	271	0	0	514	0	0	617	613	294	733	822	260
Stage 1	-	-	-	-	-	-	312	312	-	290	290	-
Stage 2	-	-	-	-	-	-	305	301	-	443	532	-
Critical Hdwy	4.21	-	-	4.1	-	-	7.12	6.5	6.2	7.21	6.5	6.33
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.5	-	6.21	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.5	-	6.21	5.5	-
Follow-up Hdwy	2.299	-	-	2.2	-	-	3.518	4	3.3	3.599	4	3.417
Pot Cap-1 Maneuver	1242	-	-	1062	-	-	402	410	750	325	311	753
Stage 1	-	-	-	-	-	-	699	661	-	699	676	-
Stage 2	-	-	-	-	-	-	705	669	-	577	529	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1242	-	-	1062	-	-	369	399	750	295	303	753
Mov Cap-2 Maneuver	-	-	-	-	-	-	369	399	-	295	303	-
Stage 1	-	-	-	-	-	-	692	654	-	692	665	-
Stage 2	-	-	-	-	-	-	663	658	-	536	524	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.4			53.9			15.8		
HCM LOS							F			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	379	1242	-	-	1062	-	-	363
HCM Lane V/C Ratio	0.876	0.007	-	-	0.014	-	-	0.085
HCM Control Delay (s)	53.9	7.9	0	-	8.4	0	-	15.8
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	8.6	0	-	-	0	-	-	0.3

HCM 6th TWSC  
4: Washington Street & Financial Park

2023 Baseline Conditions  
Weekday Morning Peak Hour

Intersection

Int Delay, s/veh 4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	86	74	171	171	119	97
Future Vol, veh/h	86	74	171	171	119	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	0	0	0	2	5	0
Mvmt Flow	115	99	228	228	159	129












Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	908	224	288	0	-	0
Stage 1	224	-	-	-	-	-
Stage 2	684	-	-	-	-	-
Critical Hdwy	4.2	3.3	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	537	983	1286	-	-	-
Stage 1	818	-	-	-	-	-
Stage 2	505	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	428	983	1286	-	-	-
Mov Cap-2 Maneuver	428	-	-	-	-	-
Stage 1	652	-	-	-	-	-
Stage 2	505	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	4.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1286	-	428	983	-	-
HCM Lane V/C Ratio	0.177	-	0.268	0.1	-	-
HCM Control Delay (s)	8.4	0	16.5	9.1	-	-
HCM Lane LOS	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.6	-	1.1	0.3	-	-

Lanes, Volumes, Timings  
1: Washington Street & King Street

2023 Existing Conditions - Max Recall  
Weekday Evening Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	138	426	584	43	103	201
Future Volume (vph)	138	426	584	43	103	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	50	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.991			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1827	1792	0	1736	1583
Flt Permitted	0.211				0.950	
Satd. Flow (perm)	393	1827	1792	0	1736	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			6			218
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	500		500	
Travel Time (s)		22.7	11.4		11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	5%	6%	4%	2%
Adj. Flow (vph)	150	463	635	47	112	218
Shared Lane Traffic (%)						
Lane Group Flow (vph)	150	463	682	0	112	218
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Turn Type	pm+pt	NA	NA		Prot	pt+ov
Protected Phases	5	2	6		4	4 5
Permitted Phases	2					
Minimum Split (s)	13.0	16.0	16.0		13.0	
Total Split (s)	21.0	82.0	61.0		21.0	
Total Split (%)	20.4%	79.6%	59.2%		20.4%	
Maximum Green (s)	15.0	76.0	55.0		15.0	
Yellow Time (s)	4.0	4.0	4.0		4.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Act Effect Green (s)	76.0	76.0	55.0		15.0	36.0
Actuated g/C Ratio	0.74	0.74	0.53		0.15	0.35
v/c Ratio	0.31	0.34	0.71		0.44	0.31
Control Delay	5.5	5.6	23.0		46.5	4.6
Queue Delay	0.0	0.0	0.0		0.0	0.0



Lanes, Volumes, Timings  
 1: Washington Street & King Street

2023 Existing Conditions - Max Recall  
 Weekday Evening Peak Hour

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Total Delay	5.5	5.6	23.0		46.5	4.6
LOS	A	A	C		D	A
Approach Delay		5.6	23.0		18.8	
Approach LOS		A	C		B	
Queue Length 50th (ft)	24	91	318		68	0
Queue Length 95th (ft)	41	132	460		124	49
Internal Link Dist (ft)		920	420		420	
Turn Bay Length (ft)	200				50	
Base Capacity (vph)	490	1348	959		252	695
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.31	0.34	0.71		0.44	0.31

Intersection Summary

Area Type: Other  
 Cycle Length: 103  
 Actuated Cycle Length: 103  
 Offset: 12 (12%), Referenced to phase 2:EBTL and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 15.6  
 Intersection Capacity Utilization 61.8%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 1: Washington Street & King Street



HCM 6th AWSC  
3: Washington Street/Arlington Street & Union Street

2023 Existing Conditions  
Weekday Evening Peak Hour

Intersection

Intersection Delay, s/veh 13.6  
Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	7	276	179	10	234	8	194	18	18	4	21	17
Future Vol, veh/h	7	276	179	10	234	8	194	18	18	4	21	17
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	13	0	1	9	2	8	0	0	0	0	0	8
Mvmt Flow	8	310	201	11	263	9	218	20	20	4	24	19
Number of Lanes	0	1	1	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			2			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			2			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			2		
HCM Control Delay	13.6			13.8			13.9			10		
HCM LOS	B			B			B			A		

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	84%	2%	0%	4%	10%
Vol Thru, %	8%	98%	0%	93%	50%
Vol Right, %	8%	0%	100%	3%	40%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	230	283	179	252	42
LT Vol	194	7	0	10	4
Through Vol	18	276	0	234	21
RT Vol	18	0	179	8	17
Lane Flow Rate	258	318	201	283	47
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.438	0.54	0.289	0.458	0.083
Departure Headway (Hd)	6.097	6.114	5.168	5.827	6.301
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	589	588	694	617	565
Service Time	4.15	3.864	2.917	3.882	4.378
HCM Lane V/C Ratio	0.438	0.541	0.29	0.459	0.083
HCM Control Delay	13.9	15.9	10	13.8	10
HCM Lane LOS	B	C	A	B	A
HCM 95th-tile Q	2.2	3.2	1.2	2.4	0.3

HCM 6th TWSC  
 3: Washington Street/Arlington Street & Union Street

2023 Existing Conditions - Max Recall  
 Weekday Evening Peak Hour

Intersection												
Int Delay, s/veh	8.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	7	276	179	10	234	8	194	18	18	4	21	17
Future Vol, veh/h	7	276	179	10	234	8	194	18	18	4	21	17
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	13	0	1	9	2	8	0	0	0	0	0	8
Mvmt Flow	8	310	201	11	263	9	218	20	20	4	24	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	272	0	0	511	0	0	637	620	310	737	817	268
Stage 1	-	-	-	-	-	-	326	326	-	290	290	-
Stage 2	-	-	-	-	-	-	311	294	-	447	527	-
Critical Hdwy	4.23	-	-	4.19	-	-	7.1	6.5	6.2	7.1	6.5	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.317	-	-	2.281	-	-	3.5	4	3.3	3.5	4	3.372
Pot Cap-1 Maneuver	1230	-	-	1019	-	-	393	407	735	337	313	756
Stage 1	-	-	-	-	-	-	691	652	-	722	676	-
Stage 2	-	-	-	-	-	-	704	673	-	595	532	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1230	-	-	1019	-	-	354	398	735	310	306	756
Mov Cap-2 Maneuver	-	-	-	-	-	-	354	398	-	310	306	-
Stage 1	-	-	-	-	-	-	685	646	-	716	667	-
Stage 2	-	-	-	-	-	-	653	664	-	555	527	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.3			34			15.1		
HCM LOS							D			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	372	1230	-	-	1019	-	-	404
HCM Lane V/C Ratio	0.695	0.006	-	-	0.011	-	-	0.117
HCM Control Delay (s)	34	7.9	0	-	8.6	0	-	15.1
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	5	0	-	-	0	-	-	0.4

HCM 6th TWSC  
4: Washington Street & Financial Park

2023 Existing Conditions  
Weekday Evening Peak Hour

Intersection

Int Delay, s/veh 4.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
----------	-----	-----	-----	-----	-----	-----

Lane Configurations						
Traffic Vol, veh/h	87	137	41	130	151	25
Future Vol, veh/h	87	137	41	130	151	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	110	173	52	165	191	32

Major/Minor	Minor2	Major1	Major2
-------------	--------	--------	--------

Conflicting Flow All	476	207	223	0	-	0
Stage 1	207	-	-	-	-	-
Stage 2	269	-	-	-	-	-
Critical Hdwy	4.2	3.3	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	737	991	1358	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	781	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	706	991	1358	-	-	-
Mov Cap-2 Maneuver	706	-	-	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	781	-	-	-	-	-

Approach	EB	NB	SB
----------	----	----	----












HCM Control Delay, s	10	1.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
-----------------------	-----	-----	-------	-------	-----	-----

Capacity (veh/h)	1358	-	706	991	-	-
HCM Lane V/C Ratio	0.038	-	0.156	0.175	-	-
HCM Control Delay (s)	7.8	0	11	9.4	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	0.6	-	-







Lanes, Volumes, Timings  
1: Washington Street & King Street

2030 No-Build Conditions  
Weekday Morning Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	285	696	379	134	51	128
Future Volume (vph)	285	696	379	134	51	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	50	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.965			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1742	0	1736	1583
Flt Permitted	0.208				0.950	
Satd. Flow (perm)	387	1863	1742	0	1736	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			24			138
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	500		500	
Travel Time (s)		22.7	11.4		11.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	5%	6%	4%	2%
Adj. Flow (vph)	306	748	408	144	55	138
Shared Lane Traffic (%)						
Lane Group Flow (vph)	306	748	552	0	55	138
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	pt+ov
Protected Phases	5	2	6		4	4 5

Lanes, Volumes, Timings  
1: Washington Street & King Street

2030 No-Build Conditions  
Weekday Morning Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					
Detector Phase	5	2	6		4	4 5
Switch Phase						
Minimum Initial (s)	7.0	10.0	10.0		7.0	
Minimum Split (s)	13.0	16.0	16.0		13.0	
Total Split (s)	26.0	82.0	56.0		21.0	
Total Split (%)	25.2%	79.6%	54.4%		20.4%	
Maximum Green (s)	20.0	76.0	50.0		15.0	
Yellow Time (s)	4.0	4.0	4.0		4.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	Min	Min		None	
Act Effct Green (s)	47.0	49.2	25.3		8.6	25.7
Actuated g/C Ratio	0.73	0.77	0.39		0.13	0.40
v/c Ratio	0.50	0.52	0.79		0.24	0.19
Control Delay	7.7	6.1	26.8		33.7	3.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	7.7	6.1	26.8		33.7	3.8
LOS	A	A	C		C	A
Approach Delay		6.6	26.8		12.3	
Approach LOS		A	C		B	
90th %ile Green (s)	20.0	65.9	39.9		11.0	
90th %ile Term Code	Max	Hold	Gap		Gap	
70th %ile Green (s)	17.8	53.1	29.3		8.7	
70th %ile Term Code	Gap	Hold	Gap		Gap	
50th %ile Green (s)	15.0	45.2	24.2		7.5	
50th %ile Term Code	Gap	Hold	Gap		Gap	
30th %ile Green (s)	12.4	38.4	20.0		7.0	
30th %ile Term Code	Gap	Hold	Gap		Min	
10th %ile Green (s)	9.5	30.1	14.6		0.0	
10th %ile Term Code	Gap	Hold	Gap		Skip	
Queue Length 50th (ft)	35	117	184		20	0
Queue Length 95th (ft)	92	220	351		64	33
Internal Link Dist (ft)		920	420		420	
Turn Bay Length (ft)	200				50	
Base Capacity (vph)	755	1809	1358		444	863
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.41	0.41	0.41		0.12	0.16

Intersection Summary

Area Type: Other  
Cycle Length: 103  
Actuated Cycle Length: 64.2

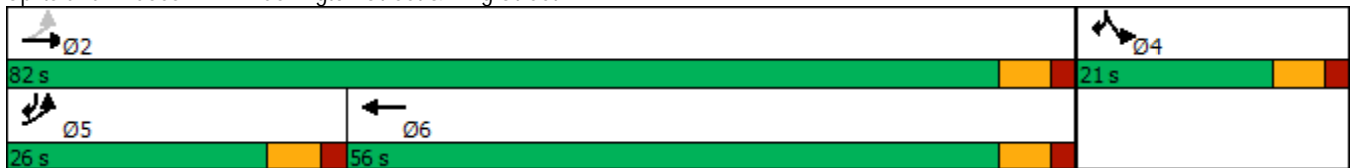
Lanes, Volumes, Timings  
 1: Washington Street & King Street

2030 No-Build Conditions  
 Weekday Morning Peak Hour

Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.79  
 Intersection Signal Delay: 13.4  
 Intersection Capacity Utilization 64.7%  
 Analysis Period (min) 15  
 90th %ile Actuated Cycle: 88.9  
 70th %ile Actuated Cycle: 73.8  
 50th %ile Actuated Cycle: 64.7  
 30th %ile Actuated Cycle: 57.4  
 10th %ile Actuated Cycle: 36.1

Intersection LOS: B  
 ICU Level of Service C

Splits and Phases: 1: Washington Street & King Street



HCM 6th AWSC  
 3: Washington Street/Arlington Street & Union Street

2030 No-Build Conditions  
 Weekday Morning Peak Hour

Intersection

Intersection Delay, s/veh	17.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	8	255	207	31	217	19	255	26	14	1	20	8
Future Vol, veh/h	8	255	207	31	217	19	255	26	14	1	20	8
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	11	1	8	0	2	0	2	0	0	11	0	13
Mvmt Flow	10	315	256	38	268	23	315	32	17	1	25	10
Number of Lanes	0	1	1	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			2			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			2			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			2		
HCM Control Delay	16			17.2			20.8			11		
HCM LOS	C			C			C			B		

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	86%	3%	0%	12%	3%
Vol Thru, %	9%	97%	0%	81%	69%
Vol Right, %	5%	0%	100%	7%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	295	263	207	267	29
LT Vol	255	8	0	31	1
Through Vol	26	255	0	217	20
RT Vol	14	0	207	19	8
Lane Flow Rate	364	325	256	330	36
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.65	0.597	0.406	0.567	0.074
Departure Headway (Hd)	6.424	6.618	5.715	6.189	7.418
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	557	542	624	577	486
Service Time	4.51	4.413	3.51	4.285	5.418
HCM Lane V/C Ratio	0.654	0.6	0.41	0.572	0.074
HCM Control Delay	20.8	18.9	12.4	17.2	11
HCM Lane LOS	C	C	B	C	B
HCM 95th-tile Q	4.7	3.9	2	3.5	0.2



HCM 6th TWSC  
 3: Washington Street/Arlington Street & Union Street

2030 No-Build Conditions  
 Weekday Morning Peak Hour

Intersection												
Int Delay, s/veh	37.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	8	255	207	31	217	19	255	26	14	1	20	8
Future Vol, veh/h	8	255	207	31	217	19	255	26	14	1	20	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	11	1	8	0	2	0	2	0	0	11	0	13
Mvmt Flow	10	315	256	38	268	23	315	32	17	1	25	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	291	0	0	571	0	0	708	702	315	844	947	280
Stage 1	-	-	-	-	-	-	335	335	-	356	356	-
Stage 2	-	-	-	-	-	-	373	367	-	488	591	-
Critical Hdwy	4.21	-	-	4.1	-	-	7.12	6.5	6.2	7.21	6.5	6.33
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.5	-	6.21	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.5	-	6.21	5.5	-
Follow-up Hdwy	2.299	-	-	2.2	-	-	3.518	4	3.3	3.599	4	3.417
Pot Cap-1 Maneuver	1221	-	-	1012	-	-	350	365	730	273	263	733
Stage 1	-	-	-	-	-	-	679	646	-	643	633	-
Stage 2	-	-	-	-	-	-	648	626	-	545	498	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1221	-	-	1012	-	-	~ 305	344	730	237	248	733
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 305	344	-	237	248	-
Stage 1	-	-	-	-	-	-	670	638	-	635	605	-
Stage 2	-	-	-	-	-	-	586	598	-	499	492	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	133.5	18.5
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	317	1221	-	-	1012	-	-	303
HCM Lane V/C Ratio	1.149	0.008	-	-	0.038	-	-	0.118
HCM Control Delay (s)	133.5	8	0	-	8.7	0	-	18.5
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	15	0	-	-	0.1	-	-	0.4

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

HCM 6th TWSC  
4: Washington Street & Financial Park

2030 No-Build Conditions  
Weekday Morning Peak Hour

Intersection

Int Delay, s/veh 4.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	86	74	171	199	131	97
Future Vol, veh/h	86	74	171	199	131	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	0	0	0	2	5	0
Mvmt Flow	115	99	228	265	175	129












Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	961	240	304	0	-	0
Stage 1	240	-	-	-	-	-
Stage 2	721	-	-	-	-	-
Critical Hdwy	4.2	3.3	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	516	975	1268	-	-	-
Stage 1	805	-	-	-	-	-
Stage 2	485	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	407	975	1268	-	-	-
Mov Cap-2 Maneuver	407	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	485	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	3.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1268	-	407	975	-	-
HCM Lane V/C Ratio	0.18	-	0.282	0.101	-	-
HCM Control Delay (s)	8.5	0	17.3	9.1	-	-
HCM Lane LOS	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.7	-	1.1	0.3	-	-







Lanes, Volumes, Timings  
1: Washington Street & King Street

2030 No-Build Conditions  
Weekday Evening Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	152	485	644	46	110	227
Future Volume (vph)	152	485	644	46	110	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	50	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.991			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1827	1792	0	1736	1583
Flt Permitted	0.126				0.950	
Satd. Flow (perm)	235	1827	1792	0	1736	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			5			196
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	500		500	
Travel Time (s)		22.7	11.4		11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	5%	6%	4%	2%
Adj. Flow (vph)	165	527	700	50	120	247
Shared Lane Traffic (%)						
Lane Group Flow (vph)	165	527	750	0	120	247
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	pt+ov
Protected Phases	5	2	6		4	4 5

Lanes, Volumes, Timings  
1: Washington Street & King Street

2030 No-Build Conditions  
Weekday Evening Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					
Detector Phase	5	2	6		4	4 5
Switch Phase						
Minimum Initial (s)	7.0	10.0	10.0		7.0	
Minimum Split (s)	13.0	16.0	16.0		13.0	
Total Split (s)	21.0	82.0	61.0		21.0	
Total Split (%)	20.4%	79.6%	59.2%		20.4%	
Maximum Green (s)	15.0	76.0	55.0		15.0	
Yellow Time (s)	4.0	4.0	4.0		4.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	Min	Min		None	
Act Effct Green (s)	55.2	55.2	37.0		10.9	29.0
Actuated g/C Ratio	0.70	0.70	0.47		0.14	0.37
v/c Ratio	0.42	0.41	0.89		0.50	0.35
Control Delay	8.4	5.9	32.6		43.4	7.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	8.4	5.9	32.6		43.4	7.3
LOS	A	A	C		D	A
Approach Delay		6.5	32.6		19.1	
Approach LOS		A	C		B	
90th %ile Green (s)	15.0	76.0	55.0		15.0	
90th %ile Term Code	Max	Hold	Max		Max	
70th %ile Green (s)	15.0	67.4	46.4		13.4	
70th %ile Term Code	Max	Hold	Gap		Gap	
50th %ile Green (s)	12.1	54.8	36.7		10.8	
50th %ile Term Code	Gap	Hold	Gap		Gap	
30th %ile Green (s)	9.9	45.7	29.8		8.8	
30th %ile Term Code	Gap	Hold	Gap		Gap	
10th %ile Green (s)	7.4	34.8	21.4		7.0	
10th %ile Term Code	Gap	Hold	Gap		Min	
Queue Length 50th (ft)	21	87	310		54	16
Queue Length 95th (ft)	58	156	541		132	79
Internal Link Dist (ft)		920	420		420	
Turn Bay Length (ft)	200				50	
Base Capacity (vph)	472	1657	1314		348	758
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.35	0.32	0.57		0.34	0.33

Intersection Summary

Area Type: Other  
Cycle Length: 103  
Actuated Cycle Length: 78.7

Lanes, Volumes, Timings  
 1: Washington Street & King Street

2030 No-Build Conditions  
 Weekday Evening Peak Hour

Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 19.9  
 Intersection Capacity Utilization 66.2%  
 Analysis Period (min) 15  
 90th %ile Actuated Cycle: 103  
 70th %ile Actuated Cycle: 92.8  
 50th %ile Actuated Cycle: 77.6  
 30th %ile Actuated Cycle: 66.5  
 10th %ile Actuated Cycle: 53.8

Intersection LOS: B  
 ICU Level of Service C

Splits and Phases: 1: Washington Street & King Street



HCM 6th AWSC  
 3: Washington Street/Arlington Street & Union Street

2030 No-Build Conditions  
 Weekday Evening Peak Hour

Intersection

Intersection Delay, s/veh	15.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	8	296	196	16	251	9	220	21	34	4	24	18
Future Vol, veh/h	8	296	196	16	251	9	220	21	34	4	24	18
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	13	0	1	9	2	8	0	0	0	0	0	8
Mvmt Flow	9	333	220	18	282	10	247	24	38	4	27	20
Number of Lanes	0	1	1	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			2			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			2			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			2		
HCM Control Delay	15.7			16			16.6			10.6		
HCM LOS	C			C			C			B		

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	80%	3%	0%	6%	9%
Vol Thru, %	8%	97%	0%	91%	52%
Vol Right, %	12%	0%	100%	3%	39%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	275	304	196	276	46
LT Vol	220	8	0	16	4
Through Vol	21	296	0	251	24
RT Vol	34	0	196	9	18
Lane Flow Rate	309	342	220	310	52
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.54	0.609	0.335	0.53	0.098
Departure Headway (Hd)	6.289	6.421	5.471	6.148	6.842
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	569	560	652	583	527
Service Time	4.367	4.198	3.248	4.23	4.842
HCM Lane V/C Ratio	0.543	0.611	0.337	0.532	0.099
HCM Control Delay	16.6	18.8	11	16	10.6
HCM Lane LOS	C	C	B	C	B
HCM 95th-tile Q	3.2	4.1	1.5	3.1	0.3

HCM 6th TWSC  
 3: Washington Street/Arlington Street & Union Street

2030 No-Build Conditions  
 Weekday Evening Peak Hour

Intersection												
Int Delay, s/veh	16.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	8	296	196	16	251	9	220	21	34	4	24	18
Future Vol, veh/h	8	296	196	16	251	9	220	21	34	4	24	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	13	0	1	9	2	8	0	0	0	0	0	8
Mvmt Flow	9	333	220	18	282	10	247	24	38	4	27	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	292	0	0	553	0	0	698	679	333	815	894	287
Stage 1	-	-	-	-	-	-	351	351	-	323	323	-
Stage 2	-	-	-	-	-	-	347	328	-	492	571	-
Critical Hdwy	4.23	-	-	4.19	-	-	7.1	6.5	6.2	7.1	6.5	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.317	-	-	2.281	-	-	3.5	4	3.3	3.5	4	3.372
Pot Cap-1 Maneuver	1209	-	-	983	-	-	358	376	713	298	283	738
Stage 1	-	-	-	-	-	-	670	636	-	693	654	-
Stage 2	-	-	-	-	-	-	673	651	-	562	508	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1209	-	-	983	-	-	314	364	713	261	274	738
Mov Cap-2 Maneuver	-	-	-	-	-	-	314	364	-	261	274	-
Stage 1	-	-	-	-	-	-	663	629	-	685	640	-
Stage 2	-	-	-	-	-	-	613	637	-	506	502	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.5			63.4			16.6		
HCM LOS							F			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	341	1209	-	-	983	-	-	361
HCM Lane V/C Ratio	0.906	0.007	-	-	0.018	-	-	0.143
HCM Control Delay (s)	63.4	8	0	-	8.7	0	-	16.6
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	8.9	0	-	-	0.1	-	-	0.5

HCM 6th TWSC  
4: Washington Street & Financial Park

2030 No-Build Conditions  
Weekday Evening Peak Hour

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	87	137	41	143	174	25
Future Vol, veh/h	87	137	41	143	174	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	110	173	52	181	220	32

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	521	236	252	0	0
Stage 1	236	-	-	-	-
Stage 2	285	-	-	-	-
Critical Hdwy	4.2	3.3	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	714	977	1325	-	-
Stage 1	808	-	-	-	-
Stage 2	768	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	683	977	1325	-	-
Mov Cap-2 Maneuver	683	-	-	-	-
Stage 1	772	-	-	-	-
Stage 2	768	-	-	-	-












Approach	EB	NB	SB
HCM Control Delay, s	10.2	1.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1325	-	683	977	-	-
HCM Lane V/C Ratio	0.039	-	0.161	0.178	-	-
HCM Control Delay (s)	7.8	0	11.3	9.5	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	0.6	-	-









Lanes, Volumes, Timings  
1: Washington Street & King Street

2030 Build Conditions  
Weekday Morning Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	297	696	379	146	54	132
Future Volume (vph)	297	696	379	146	54	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	50	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.962			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1863	1736	0	1736	1583
Flt Permitted	0.201				0.950	
Satd. Flow (perm)	374	1863	1736	0	1736	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			26			142
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	500		500	
Travel Time (s)		22.7	11.4		11.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	5%	6%	4%	2%
Adj. Flow (vph)	319	748	408	157	58	142
Shared Lane Traffic (%)						
Lane Group Flow (vph)	319	748	565	0	58	142
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	pt+ov
Protected Phases	5	2	6		4	4 5

Lanes, Volumes, Timings  
1: Washington Street & King Street

2030 Build Conditions  
Weekday Morning Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					
Detector Phase	5	2	6		4	4 5
Switch Phase						
Minimum Initial (s)	7.0	10.0	10.0		7.0	
Minimum Split (s)	13.0	16.0	16.0		13.0	
Total Split (s)	26.0	82.0	56.0		21.0	
Total Split (%)	25.2%	79.6%	54.4%		20.4%	
Maximum Green (s)	20.0	76.0	50.0		15.0	
Yellow Time (s)	4.0	4.0	4.0		4.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	Min	Min		None	
Act Effct Green (s)	48.9	51.0	26.5		8.8	26.5
Actuated g/C Ratio	0.74	0.77	0.40		0.13	0.40
v/c Ratio	0.52	0.52	0.80		0.25	0.20
Control Delay	8.6	6.1	27.4		34.9	3.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	8.6	6.1	27.4		34.9	3.9
LOS	A	A	C		C	A
Approach Delay		6.8	27.4		12.9	
Approach LOS		A	C		B	
90th %ile Green (s)	20.0	67.7	41.7		11.4	
90th %ile Term Code	Max	Hold	Gap		Gap	
70th %ile Green (s)	19.1	56.6	31.5		9.0	
70th %ile Term Code	Gap	Hold	Gap		Gap	
50th %ile Green (s)	15.8	46.9	25.1		7.7	
50th %ile Term Code	Gap	Hold	Gap		Gap	
30th %ile Green (s)	13.0	39.6	20.6		7.0	
30th %ile Term Code	Gap	Hold	Gap		Min	
10th %ile Green (s)	9.9	30.9	15.0		0.0	
10th %ile Term Code	Gap	Hold	Gap		Skip	
Queue Length 50th (ft)	37	119	196		22	0
Queue Length 95th (ft)	109	224	364		68	34
Internal Link Dist (ft)		920	420		420	
Turn Bay Length (ft)	200				50	
Base Capacity (vph)	739	1793	1324		432	847
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.43	0.42	0.43		0.13	0.17

Intersection Summary

Area Type: Other  
Cycle Length: 103  
Actuated Cycle Length: 66.2

Lanes, Volumes, Timings  
 1: Washington Street & King Street

2030 Build Conditions  
 Weekday Morning Peak Hour

Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 13.9  
 Intersection Capacity Utilization 66.1%  
 Analysis Period (min) 15  
 90th %ile Actuated Cycle: 91.1  
 70th %ile Actuated Cycle: 77.6  
 50th %ile Actuated Cycle: 66.6  
 30th %ile Actuated Cycle: 58.6  
 10th %ile Actuated Cycle: 36.9

Intersection LOS: B  
 ICU Level of Service C

Splits and Phases: 1: Washington Street & King Street



HCM 6th AWSC  
 3: Washington Street/Arlington Street & Union Street

2030 Build Conditions  
 Weekday Morning Peak Hour

Intersection

Intersection Delay, s/veh	17.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	8	255	218	33	217	19	255	27	15	1	22	8
Future Vol, veh/h	8	255	218	33	217	19	255	27	15	1	22	8
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	11	1	8	0	2	0	2	0	0	11	0	13
Mvmt Flow	10	315	269	41	268	23	315	33	19	1	27	10
Number of Lanes	0	1	1	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			2			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			2			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			2		
HCM Control Delay	16.3			17.8			21.3			11.2		
HCM LOS	C			C			C			B		

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	86%	3%	0%	12%	3%
Vol Thru, %	9%	97%	0%	81%	71%
Vol Right, %	5%	0%	100%	7%	26%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	297	263	218	269	31
LT Vol	255	8	0	33	1
Through Vol	27	255	0	217	22
RT Vol	15	0	218	19	8
Lane Flow Rate	367	325	269	332	38
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.658	0.6	0.43	0.584	0.08
Departure Headway (Hd)	6.563	6.762	5.859	6.333	7.486
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	554	536	619	575	480
Service Time	4.563	4.462	3.559	4.333	5.506
HCM Lane V/C Ratio	0.662	0.606	0.435	0.577	0.079
HCM Control Delay	21.3	19.1	12.9	17.8	11.2
HCM Lane LOS	C	C	B	C	B
HCM 95th-tile Q	4.8	3.9	2.2	3.7	0.3

HCM 6th TWSC  
 3: Washington Street/Arlington Street & Union Street

2030 Build Conditions  
 Weekday Morning Peak Hour

Intersection												
Int Delay, s/veh	40.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	8	255	218	33	217	19	255	27	15	1	22	8
Future Vol, veh/h	8	255	218	33	217	19	255	27	15	1	22	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	11	1	8	0	2	0	2	0	0	11	0	13
Mvmt Flow	10	315	269	41	268	23	315	33	19	1	27	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	291	0	0	584	0	0	715	708	315	858	966	280
Stage 1	-	-	-	-	-	-	335	335	-	362	362	-
Stage 2	-	-	-	-	-	-	380	373	-	496	604	-
Critical Hdwy	4.21	-	-	4.1	-	-	7.12	6.5	6.2	7.21	6.5	6.33
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.5	-	6.21	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.5	-	6.21	5.5	-
Follow-up Hdwy	2.299	-	-	2.2	-	-	3.518	4	3.3	3.599	4	3.417
Pot Cap-1 Maneuver	1221	-	-	1001	-	-	346	362	730	267	257	733
Stage 1	-	-	-	-	-	-	679	646	-	638	629	-
Stage 2	-	-	-	-	-	-	642	622	-	539	491	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1221	-	-	1001	-	-	~ 298	340	730	230	241	733
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 298	340	-	230	241	-
Stage 1	-	-	-	-	-	-	670	638	-	630	598	-
Stage 2	-	-	-	-	-	-	575	592	-	491	485	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.1	145	19.2
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	311	1221	-	-	1001	-	-	291
HCM Lane V/C Ratio	1.179	0.008	-	-	0.041	-	-	0.132
HCM Control Delay (s)	145	8	0	-	8.7	0	-	19.2
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	15.7	0	-	-	0.1	-	-	0.4

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

HCM 6th TWSC  
4: Washington Street & Financial Park

2030 Build Conditions  
Weekday Morning Peak Hour

Intersection

Int Delay, s/veh 5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	91	81	195	199	131	112
Future Vol, veh/h	91	81	195	199	131	112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	0	0	0	2	5	0
Mvmt Flow	121	108	260	265	175	149












Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1035	250	324	0	-	0
Stage 1	250	-	-	-	-	-
Stage 2	785	-	-	-	-	-
Critical Hdwy	4.2	3.3	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	488	971	1247	-	-	-
Stage 1	796	-	-	-	-	-
Stage 2	453	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	368	971	1247	-	-	-
Mov Cap-2 Maneuver	368	-	-	-	-	-
Stage 1	601	-	-	-	-	-
Stage 2	453	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	4.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1247	-	368	971	-	-
HCM Lane V/C Ratio	0.209	-	0.33	0.111	-	-
HCM Control Delay (s)	8.6	0	19.5	9.2	-	-
HCM Lane LOS	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.8	-	1.4	0.4	-	-







Lanes, Volumes, Timings  
1: Washington Street & King Street

2030 Build Conditions  
Weekday Evening Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	158	485	644	52	125	242
Future Volume (vph)	158	485	644	52	125	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200			0	50	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.990			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1827	1790	0	1736	1583
Flt Permitted	0.122				0.950	
Satd. Flow (perm)	227	1827	1790	0	1736	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			6			196
Link Speed (mph)		30	30		30	
Link Distance (ft)		1000	500		500	
Travel Time (s)		22.7	11.4		11.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	4%	5%	6%	4%	2%
Adj. Flow (vph)	172	527	700	57	136	263
Shared Lane Traffic (%)						
Lane Group Flow (vph)	172	527	757	0	136	263
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		12	12		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	pt+ov
Protected Phases	5	2	6		4	4 5

Lanes, Volumes, Timings  
1: Washington Street & King Street

2030 Build Conditions  
Weekday Evening Peak Hour

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2					
Detector Phase	5	2	6		4	4 5
Switch Phase						
Minimum Initial (s)	7.0	10.0	10.0		7.0	
Minimum Split (s)	13.0	16.0	16.0		13.0	
Total Split (s)	21.0	82.0	61.0		21.0	
Total Split (%)	20.4%	79.6%	59.2%		20.4%	
Maximum Green (s)	15.0	76.0	55.0		15.0	
Yellow Time (s)	4.0	4.0	4.0		4.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Recall Mode	None	Min	Min		None	
Act Effct Green (s)	56.4	56.4	38.1		11.4	29.8
Actuated g/C Ratio	0.70	0.70	0.47		0.14	0.37
v/c Ratio	0.44	0.41	0.89		0.55	0.37
Control Delay	9.6	6.1	33.4		45.2	8.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	9.6	6.1	33.4		45.2	8.2
LOS	A	A	C		D	A
Approach Delay		6.9	33.4		20.8	
Approach LOS		A	C		C	
90th %ile Green (s)	15.0	76.0	55.0		15.0	
90th %ile Term Code	Max	Hold	Max		Max	
70th %ile Green (s)	15.0	69.0	48.0		14.6	
70th %ile Term Code	Max	Hold	Gap		Gap	
50th %ile Green (s)	12.6	56.8	38.2		11.7	
50th %ile Term Code	Gap	Hold	Gap		Gap	
30th %ile Green (s)	10.3	47.2	30.9		9.5	
30th %ile Term Code	Gap	Hold	Gap		Gap	
10th %ile Green (s)	7.6	35.7	22.1		7.0	
10th %ile Term Code	Gap	Hold	Gap		Min	
Queue Length 50th (ft)	24	91	328		64	22
Queue Length 95th (ft)	68	156	552		146	91
Internal Link Dist (ft)		920	420		420	
Turn Bay Length (ft)	200				50	
Base Capacity (vph)	461	1636	1288		340	746
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.37	0.32	0.59		0.40	0.35

Intersection Summary

Area Type: Other  
Cycle Length: 103  
Actuated Cycle Length: 80.5



Lanes, Volumes, Timings  
 1: Washington Street & King Street

2030 Build Conditions  
 Weekday Evening Peak Hour

Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 20.7  
 Intersection Capacity Utilization 67.7%  
 Analysis Period (min) 15  
 90th %ile Actuated Cycle: 103  
 70th %ile Actuated Cycle: 95.6  
 50th %ile Actuated Cycle: 80.5  
 30th %ile Actuated Cycle: 68.7  
 10th %ile Actuated Cycle: 54.7

Intersection LOS: C  
 ICU Level of Service C

Splits and Phases: 1: Washington Street & King Street



HCM 6th AWSC  
3: Washington Street/Arlington Street & Union Street

2030 Build Conditions  
Weekday Evening Peak Hour

Intersection

Intersection Delay, s/veh	16.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	8	296	201	17	251	9	235	24	36	4	25	18
Future Vol, veh/h	8	296	201	17	251	9	235	24	36	4	25	18
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	13	0	1	9	2	8	0	0	0	0	0	8
Mvmt Flow	9	333	226	19	282	10	264	27	40	4	28	20
Number of Lanes	0	1	1	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			2			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			2			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			2		
HCM Control Delay	16.3			16.6			18			10.8		
HCM LOS	C			C			C			B		

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	80%	3%	0%	6%	9%
Vol Thru, %	8%	97%	0%	91%	53%
Vol Right, %	12%	0%	100%	3%	38%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	295	304	201	277	47
LT Vol	235	8	0	17	4
Through Vol	24	296	0	251	25
RT Vol	36	0	201	9	18
Lane Flow Rate	331	342	226	311	53
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.583	0.619	0.35	0.541	0.102
Departure Headway (Hd)	6.33	6.529	5.579	6.262	6.973
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	567	550	639	573	517
Service Time	4.413	4.317	3.366	4.354	4.973
HCM Lane V/C Ratio	0.584	0.622	0.354	0.543	0.103
HCM Control Delay	18	19.5	11.4	16.6	10.8
HCM Lane LOS	C	C	B	C	B
HCM 95th-tile Q	3.7	4.2	1.6	3.2	0.3

HCM 6th TWSC  
 3: Washington Street/Arlington Street & Union Street

2030 Build Conditions  
 Weekday Evening Peak Hour

Intersection												
Int Delay, s/veh	21.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔			↔			↔	
Traffic Vol, veh/h	8	296	201	17	251	9	235	24	36	4	25	18
Future Vol, veh/h	8	296	201	17	251	9	235	24	36	4	25	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	13	0	1	9	2	8	0	0	0	0	0	8
Mvmt Flow	9	333	226	19	282	10	264	27	40	4	28	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	292	0	0	559	0	0	700	681	333	823	902	287
Stage 1	-	-	-	-	-	-	351	351	-	325	325	-
Stage 2	-	-	-	-	-	-	349	330	-	498	577	-
Critical Hdwy	4.23	-	-	4.19	-	-	7.1	6.5	6.2	7.1	6.5	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.317	-	-	2.281	-	-	3.5	4	3.3	3.5	4	3.372
Pot Cap-1 Maneuver	1209	-	-	978	-	-	357	375	713	295	280	738
Stage 1	-	-	-	-	-	-	670	636	-	692	653	-
Stage 2	-	-	-	-	-	-	671	649	-	558	505	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1209	-	-	978	-	-	311	362	713	256	270	738
Mov Cap-2 Maneuver	-	-	-	-	-	-	311	362	-	256	270	-
Stage 1	-	-	-	-	-	-	663	629	-	684	638	-
Stage 2	-	-	-	-	-	-	610	634	-	498	499	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.5			80			16.9		
HCM LOS							F			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	338	1209	-	-	978	-	-	354
HCM Lane V/C Ratio	0.981	0.007	-	-	0.02	-	-	0.149
HCM Control Delay (s)	80	8	0	-	8.8	0	-	16.9
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	10.7	0	-	-	0.1	-	-	0.5

HCM 6th TWSC  
4: Washington Street & Financial Park

2030 Build Conditions  
Weekday Evening Peak Hour

Intersection

Int Delay, s/veh 4.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
----------	-----	-----	-----	-----	-----	-----

Lane Configurations						
Traffic Vol, veh/h	107	167	53	143	174	32
Future Vol, veh/h	107	167	53	143	174	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	150	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	135	211	67	181	220	41

Major/Minor	Minor2	Major1	Major2
-------------	--------	--------	--------

Conflicting Flow All	556	241	261	0	-	0
Stage 1	241	-	-	-	-	-
Stage 2	315	-	-	-	-	-
Critical Hdwy	4.2	3.3	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	696	975	1315	-	-	-
Stage 1	804	-	-	-	-	-
Stage 2	744	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	656	975	1315	-	-	-
Mov Cap-2 Maneuver	656	-	-	-	-	-
Stage 1	758	-	-	-	-	-
Stage 2	744	-	-	-	-	-

Approach	EB	NB	SB
----------	----	----	----

HCM Control Delay, s	10.6	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
-----------------------	-----	-----	-------	-------	-----	-----

Capacity (veh/h)	1315	-	656	975	-	-
HCM Lane V/C Ratio	0.051	-	0.206	0.217	-	-
HCM Control Delay (s)	7.9	0	11.9	9.7	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.8	0.8	-	-

□ Crash Data

**TABLE R3  
INTERSECTION CRASH SUMMARY  
2018 THROUGH 2022<sup>1</sup>**

Data Category	Washington St at King Street	Washington St at Union Street/Arlington Street
Traffic Control	Signalized	Unsignalized
Crash Rate <sup>2</sup>	<b>0.10</b>	<b>0.30</b>
District 3 Avg <sup>3</sup>	0.89	0.61
<i>Year:</i>		
2018	1	1
2019	0	0
2020	0	1
2021	2	3
<u>2022</u>	<u>0</u>	<u>1</u>
Total	<b>3</b>	<b>6</b>
<i>Type:</i>		
Angle	0	3
Rear-End	2	1
Head-On	0	0
Sideswipe	0	2
Single Vehicle	1	0
Other/Unknown	0	0
<i>Severity:</i>		
P. Damage Only	3	6
Personal Injury	0	0
Other/Unknown	0	0
<i>Conditions:</i>		
Dry	2	4
Wet	1	2
Snow	0	0
Other/Unknown	0	0
<i>Time:</i>		
7:00 to 9:00 AM	0	3
4:00 to 6:00 PM	1	1
Rest of Day	2	2

<sup>1</sup> Source: MassDOT Crash Portal Database.

<sup>2</sup> Crashes per million entering vehicles.

<sup>3</sup> District 3 averages = 0.89 (signalized) and 0.61 (unsignalized).







Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	Number of Vehicles	Driver Contributing Circumstances (All Drivers)	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Most Harmful Event (All Vehicles)	X	Y	Roadway
<b>Washington Street at King Street</b>																	
4486260	FRANKLIN	01/17/2018	Property damage only (none injured)	5:12 PM	2	D1: (No improper driving),(No improper driving) / D2: (Inattention),(Inattention)	Dark - lighted roadway	Rear-end	Wet	T-intersection	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: S / V2: S	Snow/Cloudy	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	206953.658	867635.928	WASHINGTON
4990915	FRANKLIN	07/30/2021	Property damage only (none injured)	9:39 PM	2	D1: (No improper driving) / D2: (Inattention)	Dark - lighted roadway	Rear-end	Dry	T-intersection	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1: S / V2: S	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	206954.496	867589.209	KING STREET / WASHINGTON STREET
5025360	FRANKLIN	10/15/2021	Property damage only (none injured)	12:34 PM	1	D1: (Unknown)	Daylight	Single vehicle crash	Dry	T-intersection	V1: Turning left	V1: E	Clear/Clear	V1:(Collision with utility pole)	206954.496	867589.209	KING STREET / WASHINGTON STREET
<b>Washington Street at Union Street/Arlington Street</b>																	
4514304	FRANKLIN	03/07/2018	Property damage only (none injured)	2:03 PM	2	D1: (No improper driving) / D2: (Failed to yield right of way)	Daylight	Angle	Wet	Four-way intersection	V1: Travelling straight ahead / V2: Entering traffic lane	V1: S / V2: E	Rain	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	207983.624	869415.046	UNION
4852520	FRANKLIN	06/19/2020	Property damage only (none injured)	5:32 PM	2	D1: (No improper driving),(No improper driving) / D2: (No improper driving),(Disregarded traffic signs, signals, road markings)	Daylight	Front to Rear	Dry	Four-way intersection	V1: Travelling straight ahead / V2: Turning left	V1: S / V2: E	Clear/Clear	V1:(Collision with other moveable object) / V2:(Collision with other moveable object)	207985.45	869392.983	WASHINGTON ST/ UNION ST / WASHINGTON STREET / UNION STREET
4950453	FRANKLIN	03/26/2021	Property damage only (none injured)	8:52 AM	2	D1: (Disregarded traffic signs, signals, road markings) / D2: (No improper driving)	Daylight	Sideswipe, opposite direction	Dry	T-intersection	V1: Turning left / V2: Travelling straight ahead	V1: E / V2: S	Clear/Other	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	207985.45	869392.983	UNION STREET / WASHINGTON STREET
5002043	FRANKLIN	08/24/2021	Property damage only (none injured)	7:20 AM	2	D1: (No improper driving) / D2: (Failed to yield right of way)	Daylight	Angle	Wet	Four-way intersection	V1: Travelling straight ahead / V2: Turning left	V1: S / V2: E	Cloudy	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	207985.45	869392.983	UNION STREET / WASHINGTON STREET
5035725	FRANKLIN	11/17/2021	Property damage only (none injured)	7:13 AM	2	D1: (No improper driving) / D2: (Failed to yield right of way)	Daylight	Angle	Dry	Four-way intersection	V1: Travelling straight ahead / V2: Turning right	V1: N / V2: N	Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	207985.45	869392.983	UNION STREET / ARLINGTON STREET
5072367	FRANKLIN	02/15/2022	Property damage only (none injured)	2:28 PM	2	D1: (Disregarded traffic signs, signals, road markings),(Failed to yield right of way) / D2: (No improper driving)	Daylight	Sideswipe, same direction	Dry	Not at junction	V1: Turning left / V2: Travelling straight ahead	V1: E / V2: S	Clear/Clear	V1:(Collision with motor vehicle in traffic) / V2:(Collision with motor vehicle in traffic)	207985.45	869392.983	UNION STREET / WASHINGTON STREET

□ Traffic Volume Data

# MDM Transportation Consultants, Inc.

E/W: Financial Park  
 Just East of the Gate at Grove Street  
 Franklin, MA  
 PASSENGER CARS ONLY

28 Lord Road, Suite 280  
 Marlborough, MA, 01752

Site Code: 1259  
 Station ID:  
 1259

Start Time	26-Jan-23 Thu	Eastbound		Hour Totals		Westbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	1			0	1				
12:15		0	0			0	1				
12:30		0	0			0	0				
12:45		0	0	0	1	0	0	0	2	0	3
01:00		0	0			0	0				
01:15		0	0			0	0				
01:30		0	0			0	2				
01:45		0	1	0	1	0	1	0	3	0	4
02:00		0	1			0	0				
02:15		0	0			0	0				
02:30		0	0			0	0				
02:45		0	0	0	1	0	0	0	0	0	1
03:00		0	0			0	0				
03:15		0	1			0	0				
03:30		0	0			0	0				
03:45		0	0	0	1	0	0	0	0	0	1
04:00		0	0			0	0				
04:15		0	0			0	0				
04:30		0	0			0	0				
04:45		0	0	0	0	0	0	0	0	0	0
05:00		0	0			0	0				
05:15		0	0			0	0				
05:30		0	0			0	3				
05:45		0	0	0	0	0	0	0	3	0	3
06:00		0	0			0	0				
06:15		0	0			0	0				
06:30		1	0			0	0				
06:45		0	0	1	0	0	0	0	0	1	0
07:00		0	0			0	0				
07:15		1	0			0	0				
07:30		0	0			0	0				
07:45		0	0	1	0	0	0	0	0	1	0
08:00		0	0			0	0				
08:15		0	0			0	0				
08:30		1	0			0	0				
08:45		0	0	1	0	0	0	0	0	1	0
09:00		1	0			0	0				
09:15		1	0			0	0				
09:30		0	0			0	0				
09:45		1	0	3	0	0	0	0	0	3	0
10:00		0	0			0	0				
10:15		0	0			0	0				
10:30		0	0			0	0				
10:45		0	0	0	0	0	1	0	1	0	1
11:00		0	0			0	0				
11:15		0	0			1	0				
11:30		0	0			0	0				
11:45		0	0	0	0	0	0	1	0	1	0
<b>Total</b>		<b>6</b>	<b>4</b>			<b>1</b>	<b>9</b>			<b>7</b>	<b>13</b>
<b>Percent</b>		<b>60.0%</b>	<b>40.0%</b>			<b>10.0%</b>	<b>90.0%</b>			<b>35.0%</b>	<b>65.0%</b>
<b>Total</b>		<b>6</b>	<b>4</b>			<b>1</b>	<b>9</b>			<b>7</b>	<b>13</b>
<b>Percent</b>		<b>60.0%</b>	<b>40.0%</b>			<b>10.0%</b>	<b>90.0%</b>			<b>35.0%</b>	<b>65.0%</b>
<b>Combined Total</b>		<b>10</b>				<b>10</b>				<b>20</b>	

# MDM Transportation Consultants, Inc.

E/W: Financial Park  
 Just East of the Gate at Grove Street  
 Franklin, MA  
 BUSES ONLY

28 Lord Road, Suite 280  
 Marlborough, MA, 01752

Site Code: 1259  
 Station ID:  
 1259

Start Time	26-Jan-23 Thu	Eastbound		Hour Totals		Westbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	0			0	0				
12:15		0	0			0	0				
12:30		0	0			0	0				
12:45		0	0	0	0	0	0	0	0	0	0
01:00		0	0			0	0				
01:15		0	0			0	0				
01:30		0	0			0	0				
01:45		0	0	0	0	0	0	0	0	0	0
02:00		0	0			0	0				
02:15		0	0			0	0				
02:30		0	0			0	0				
02:45		0	0	0	0	0	0	0	0	0	0
03:00		0	2			0	4				
03:15		0	9			0	8				
03:30		0	0			0	1				
03:45		0	0	0	11	0	0	0	13	0	24
04:00		0	0			0	0				
04:15		0	0			0	0				
04:30		0	0			0	0				
04:45		0	0	0	0	0	0	0	0	0	0
05:00		0	0			0	0				
05:15		0	0			0	0				
05:30		0	0			0	0				
05:45		0	0	0	0	0	0	0	0	0	0
06:00		0	0			0	0				
06:15		0	0			0	0				
06:30		0	0			0	0				
06:45		0	0	0	0	0	0	0	0	0	0
07:00		0	0			0	0				
07:15		1	0			0	0				
07:30		1	0			2	0				
07:45		0	0	2	0	0	0	2	0	4	0
08:00		1	0			1	0				
08:15		0	0			0	0				
08:30		1	0			0	0				
08:45		7	0	9	0	7	0	8	0	17	0
09:00		0	0			0	0				
09:15		0	0			0	0				
09:30		0	0			0	0				
09:45		0	0	0	0	0	0	0	0	0	0
10:00		0	0			0	0				
10:15		0	0			0	0				
10:30		0	0			0	0				
10:45		0	0	0	0	0	0	0	0	0	0
11:00		0	0			0	0				
11:15		0	0			0	0				
11:30		0	0			0	0				
11:45		0	0	0	0	0	0	0	0	0	0
<b>Total</b>		11	11			10	13			21	24
<b>Percent</b>		50.0%	50.0%			43.5%	56.5%			46.7%	53.3%
<b>Total</b>		11	11			10	13			21	24
<b>Percent</b>		50.0%	50.0%			43.5%	56.5%			46.7%	53.3%
<b>Combined Total</b>		22				23				45	

# MDM Transportation Consultants, Inc.

E/W: Financial Park  
 Just East of the Gate at Grove Street  
 Franklin, MA  
 TRUCKS ONLY

28 Lord Road, Suite 280  
 Marlborough, MA, 01752

Site Code: 1259  
 Station ID:  
 1259

Start Time	26-Jan-23 Thu	Eastbound		Hour Totals		Westbound		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		0	0			0	0				
12:15		0	0			0	0				
12:30		0	0			0	0				
12:45		0	0	0	0	0	0	0	0	0	0
01:00		0	0			0	0				
01:15		0	0			0	0				
01:30		0	0			0	0				
01:45		0	0	0	0	0	0	0	0	0	0
02:00		0	0			0	0				
02:15		0	0			0	0				
02:30		0	0			0	0				
02:45		0	0	0	0	0	0	0	0	0	0
03:00		0	0			0	0				
03:15		0	0			0	0				
03:30		0	0			0	0				
03:45		0	0	0	0	0	0	0	0	0	0
04:00		0	0			0	0				
04:15		0	0			0	0				
04:30		0	0			0	0				
04:45		0	0	0	0	0	0	0	0	0	0
05:00		0	0			0	0				
05:15		0	0			0	0				
05:30		0	0			0	0				
05:45		0	0	0	0	0	0	0	0	0	0
06:00		0	0			0	0				
06:15		0	0			0	0				
06:30		0	0			0	0				
06:45		0	0	0	0	0	0	0	0	0	0
07:00		0	0			0	0				
07:15		0	0			0	0				
07:30		0	0			0	0				
07:45		0	0	0	0	0	0	0	0	0	0
08:00		0	0			0	0				
08:15		0	0			0	0				
08:30		0	0			0	0				
08:45		0	0	0	0	0	0	0	0	0	0
09:00		0	0			0	0				
09:15		0	0			0	0				
09:30		0	0			0	0				
09:45		0	0	0	0	0	0	0	0	0	0
10:00		0	0			0	0				
10:15		0	0			0	0				
10:30		0	0			0	0				
10:45		0	0	0	0	0	0	0	0	0	0
11:00		0	0			0	0				
11:15		0	0			0	0				
11:30		0	0			0	0				
11:45		0	0	0	0	0	0	0	0	0	0
Total		0	0			0	0			0	0
Percent		0.0%	0.0%			0.0%	0.0%			0.0%	0.0%
Total		0	0			0	0			0	0
Percent		0.0%	0.0%			0.0%	0.0%			0.0%	0.0%
Combined Total		0				0				0	