TRAFFIC IMPACT AND ACCESS STUDY

PROPOSED WAREHOUSING DEVELOPMENT
55 CONSTITUTION BOULEVARD
FRANKLIN, MASSACHUSETTS

GPI

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SUBMITTED TO:

Beals Associates, Inc.
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Boston, MA 02116

August 2024

(GPI Project No.: NEX-2400058.00)

Proposed Warehousing Development
Franklin, Massachusetts
Traffic Impact and Access Study
August 12, 2024

TECHNICAL MEMORANDUM

REF: NEX-2400058.00

DATE: August 12, 2024

TO: Mr. Todd Morey, P.E.
Beals Associates, Inc.
2 Park Plaza, Suite 200
Boston, Massachusetts 02116

FROM: Ms. Rebecca L. Brown, P.E., Senior Project Manager
Ms. Cecilia Donaldson, Assistant Designer

RE: Traffic Impact and Access Study
Proposed Warehousing Development
55 Constitution Boulevard – Franklin, Massachusetts

INTRODUCTION

Greenman-Pedersen, Inc. (GPI) has prepared this *Traffic Impact and Access Study* (TIAS) for a proposed warehouse development to be located at 55 Constitution Boulevard in Franklin, Massachusetts. The site currently contains a 209,000 square foot (SF) office building that was formerly occupied by Dell/EMC. Access and Egress are currently provided via a full-access/egress driveway on Constitution Boulevard at the northerly end of the site, opposite the Dell Technologies employee entrance, and a right-in/right-out driveway on Constitution Boulevard at the southerly end of the site. The project consists of razing the existing structures on the site and constructing two warehousing buildings, totally ±185,175 SF. Access would be provided via a reconstructed full-access/egress driveway at the approximate location of the existing northerly site driveway, as well as via a new right-in/right-out driveway at the southerly end of the site. The existing right-in/right-out driveway would be closed as part of the project.

The site location in relation to the surrounding roadways is shown on the map on Figure 1. This TIAS evaluates the traffic impacts and access/egress requirements for the proposed development.

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FIGURE 1
SITE LOCATION MAP

EXISTING CONDITIONS

Study Area

Evaluation of the traffic impacts associated with the proposed project requires an evaluation of existing and projected traffic volumes on the adjacent streets, the volume of traffic expected to be generated by the project, and the impact that this traffic will have on the adjacent streets. In preparing the TIAS for the proposed site, the following intersections have been analyzed and evaluated:

- King Street at Constitution Boulevard – signalized
- Constitution Boulevard at Upper Union Street – unsignalized
- Constitution Boulevard at North Site Driveway / Dell Technologies North Employee Driveway – unsignalized
- Constitution Boulevard at South Site Driveway

Constitution Boulevard

Constitution Boulevard is under the jurisdiction of the Town of Franklin. Constitution Blvd is classified as a local roadway and provides one lane in each direction with directional flow separated by a 17-foot grassy median. In the vicinity of the site, one to two foot shoulders are provided on either side of the roadway with a sidewalk provided on the eastern side of the roadway. No bicycle accommodations are provided. Constitution Boulevard is posted for a 20 mile per hour (MPH) speed limit; however, the only legal Manual on Uniform Traffic Control Devices (MUTCD) compliant speed limit sign is located between #115 (Plansee USA) and #125 (Gardner) Constitution Boulevard facing eastbound traffic. A non-compliant sign is located within the grass median just south of the existing northern Dell EMC driveway. Land uses along Constitution Blvd consist of industrial and office uses.

King Street at Constitution Boulevard

Constitution Boulevard intersects King Street from the south to form a three-way 'T' intersection under signal control. The King Street eastbound approach provides a through lane and through/right-turn lane. The King Steet westbound approach provides two exclusive left-turn lanes and a through lane, with the left-turn movements operating under protected-only phasing. The Constitution Boulevard approach provides an exclusive left turn lane, and two exclusive right-turn lanes. There is a No Right Turn on Red restriction on the Constitution Boulevard northbound right-turn movement. This movement operates in overlap with the King Street westbound left-turn phase. Crosswalks are provided across the southern and western legs of the intersection, with pedestrian push buttons at the sides of each crosswalk operating under an exclusive pedestrian phase.

It should be noted that this intersection will be undergoing construction as a result of a new warehouse development that will add a leg to this intersection during the summer of 2024. Under the new geometry, this intersection will be a four-leg intersection with the new development driveway intersecting from the north. A full description of the future geometry changes can be found in the *Planned Roadway Improvements* section of this report.

Constitution Boulevard at Upper Union Street

Upper Union Street intersects Constitution Boulevard from the east to form a three-way 'T' intersection under STOP control. The Constitution Boulevard northbound approach provides an exclusive through lane and a through/right-turn lane. The Constitution Boulevard southbound approach provides an exclusive left-turn lane operating under YIELD conditions and two through lanes. The Upper Union Street westbound

approach contains a single travel lane and is restricted to right-turns only onto Constitution Boulevard. A sidewalk is provided on the southern side of Upper Union Street and easterly side of Constitution Boulevard, with a crosswalk on the Upper Union Street leg. There are no bicycle accommodations provided at this intersection.

Constitution Boulevard at Dell EMC Site Driveway / Dell Technologies Driveway

The Dell EMC and Dell Technologies driveways intersect Constitution Boulevard from the west and east, respectively, to form this unsignalized four-way intersection. The driveways operate under STOP control, while Constitution Boulevard traffic operates free-flowing. The Constitution Boulevard northbound approach is striped for a single 16-foot travel lane, while the southbound approach provides an exclusive left-turn lane and a shared through/right-turn lane. The Dell EMC and Dell Technologies driveways both provide a single general-purpose travel lane. Sidewalks are provided along the easterly side of Constitution Boulevard and the southern side of the Dell EMC and Dell Technologies driveways. A crosswalk is striped across the Constitution Boulevard southerly leg and Dell Technologies driveway. A small white sign with black lettering that reads “PED XING” is posted on Constitution Boulevard at the crosswalk; however, this sign is not Manual on Uniform Traffic Control Devices (MUTCD) compliant and is barely visible / legible to drivers approaching the crosswalk. There are no bicycle accommodations provided at this intersection. There is a speed limit sign posted within the median island at this intersection that reads “SPEED LIMIT 20”; however, this sign is not MUTCD-compliant and is unlikely to be recognized as a speed limit sign by drivers. The sign also obscures visibility of pedestrians in the median.

Public Transportation

The Massachusetts Bay Transportation Authority (MBTA) Franklin/Foxboro commuter rail line provides service between Boston, Franklin, and Foxboro with two stops within a 10-minute drive from the site. The Franklin station is located 2.1 miles northeast of the site, and the Forge Park/I-495 station is located 3.7 miles northwest of the site. The Franklin/Foxboro line runs from approximately 5:05 AM to 11:55 PM (every 45 minutes) on the weekdays and 5:12 AM to 11:45 PM (every two hours) on the weekends. The cost to ride on a weekday ranges from $2.40 to $13.25 depending on points of origin and destination. A weekend pass may be obtained for $10.00.

The Greater Attleboro Taunton Regional Transit Authority (GATRA) provides GATRA GO service, which is an on-demand, same day, accessible transit service that operates in the communities of Foxborough, Franklin, Mansfield, Norton, Norfolk, and Wrentham. Riders can be picked up or dropped off anywhere within these towns, as well as the Plainville Commons Marketplace. This service operates on weekdays from 6:30 AM to 8:00 PM, on Saturdays from 9:00 AM to 8:00 PM, and on Sundays from 9:00 AM to 6:00 PM. Riders can order a ride via the mobile application or by calling the dispatcher. This service may be utilized for transportation between the commuter rail stations and the site.

All public transportation information is provided in the Appendix.

Traffic Volumes

Base traffic conditions within the study area were developed by conducting manual-turning movement counts (TMCs), vehicle classification counts, and automatic traffic recorder (ATR) counts in March 2024. The TMCs and vehicle classification counts were performed during the weekday AM peak period (7:00 to 9:00 AM) and weekday PM peak period (4:00 to 6:00 PM). The ATRs were used to obtain weekday daily traffic volumes along Constitution Boulevard adjacent to the site. All traffic-count data are provided in the Appendix.

Traffic on a given roadway typically fluctuates throughout the year depending on the area and the type of roadway. To determine if the March traffic-volume data needed to be adjusted to account for this fluctuation, historical traffic-volume data were reviewed from the MassDOT records.[1] Data from the MassDOT seasonal factors were reviewed. This information revealed that March traffic volumes are higher than average-month conditions. Accordingly, the March traffic volumes were not seasonally adjusted. The MassDOT seasonal adjustment data is provided in the Appendix.

Table 1 summarizes the existing daily and peak-hour traffic volumes on Constitution Boulevard adjacent to the site. The 2024 Existing traffic-flow networks for the weekday AM and weekday PM peak hours are shown graphically on Figure 2.

[1] *MassDOT Weekday Seasonal and Axle Correction Factors*, 2014-2019.

TABLE 1
Existing Traffic Volume Summary

Location/Time Period	Daily Volume (vpd) [a]	Peak Hour Volume (vph) [b]	K Factor (%) [c]	Directional Distribution [d]
Constitution Boulevard south of Northern Site Driveway:				
Weekday Daily	3,110			
Weekday AM Peak Hour		277	8.9	80% SB
Weekday PM Peak Hour		229	7.4	83% NB

[a] In vehicles per day.

[b] In vehicles per hour. Volumes obtained from Figure 2.

[c] Percentage of daily traffic occurring during the peak hour.

[d] SB = southbound; NB = northbound. Percentages from volumes on Figure 2.

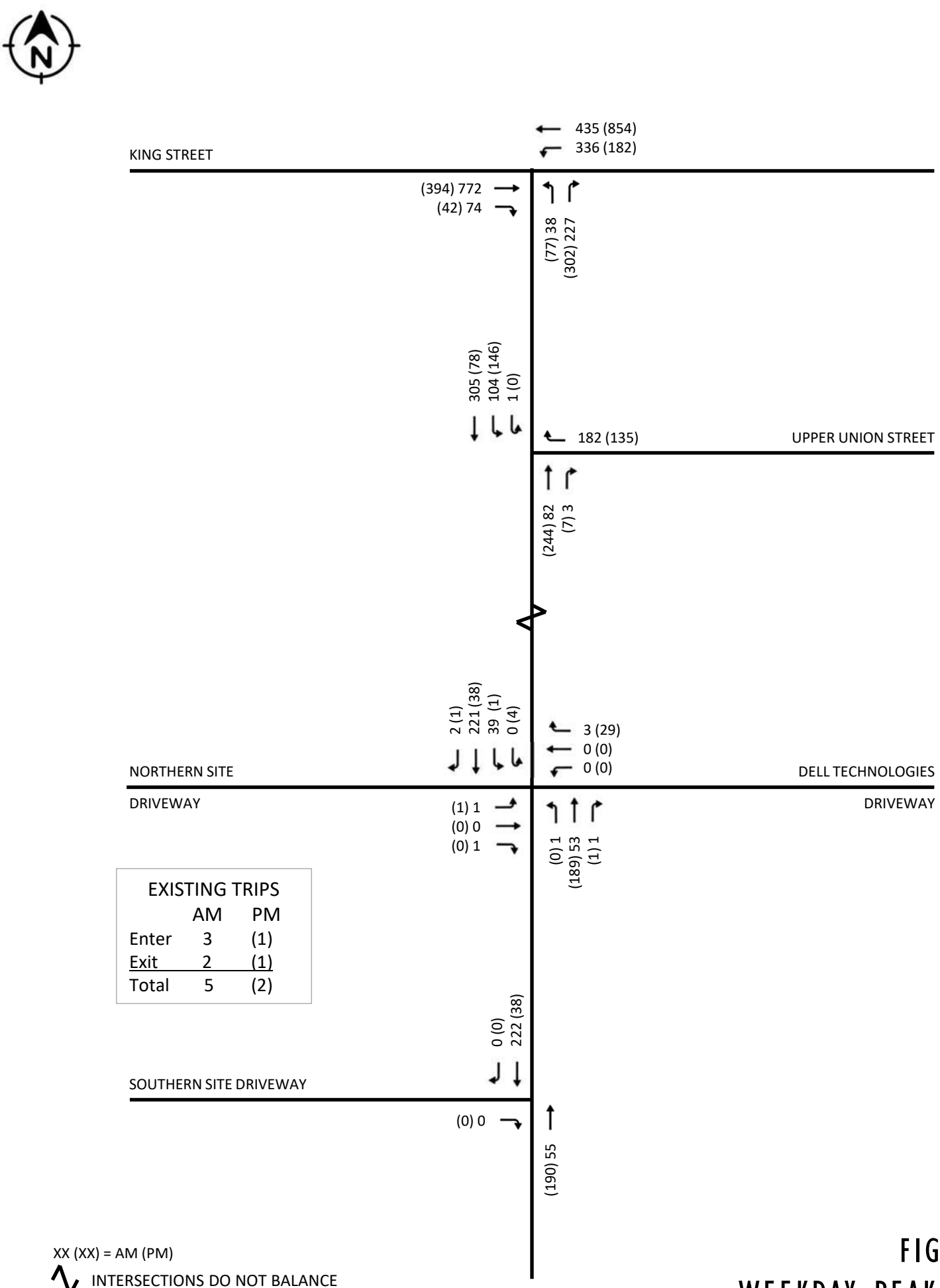

FIGURE 2
WEEKDAY PEAK HOUR
2024 EXISTING TRAFFIC VOLUMES

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Collisions

Collision data for the study area intersections were obtained from MassDOT for the latest five years available prior to the COVID-19 pandemic (2015-2019). Although collision data for the 2020 year is available, collision data from this year was not included due to the COVID-19 restrictions that resulted in uncharacteristically low traffic volumes during this year. Table 2 summarizes the data.

In addition to the collision summary, crash occurrence also should be compared to the volume of traffic through a particular intersection to determine any significance. Accordingly, the crash rates were calculated for the study area intersections and compared with the statewide and district-wide averages. An intersection crash rate is a measure of the frequency of collisions compared to the volume of traffic through an intersection and is presented in crashes per million entering vehicles (c/mev). For unsignalized intersections, the statewide average is 0.57 c/mev and district-wide (District 3) average is 0.61 c/mev. For signalized intersections, the statewide average is 0.78 c/mev and the district-wide (District 3) average is 0.89 c/mev. A comparison of the calculated crash rate to these averages can be used to establish the significance of collision occurrence and whether or not potential safety problems exist. The crash rate worksheets are provided in the Appendix.

The signalized intersection of King Street at Constitution Boulevard experienced 25 collisions over the five-year study period for an average of 5 collisions per year. The majority (48 percent) of the collisions were rear-end collisions, which are typical of signalized intersections. Approximately 36 percent of the collisions occurred during the weekday AM and PM peak commuter periods, indicating traffic congestion may be a contributing factor. The crash rate at this intersection (0.55 c/mev) was significantly lower than the statewide and District 3 averages for signalized intersections, indicating a safety issue does not exist.

The intersection of Constitution Boulevard at Upper Union Street experienced five collisions over the five-year study period for an average of one collision per year. All five of the collisions resulted in property damage only. The collisions varied in type and did not indicate any particular collision patterns. The crash rate of 0.33 c/mev was significantly lower than the statewide and District 3 average for unsignalized intersections, indicating a safety issue does not exist.

The intersection of Constitution Boulevard at the site driveway and Dell Technologies Employee Driveway experienced no collisions over the five-year study period. Due to the low crash rate at each study area intersection, there is no safety concern that requires further investigation.

TABLE 2
Collision Summary

Location	Number of Collisions			Severity [a]				Collision Type [b]						Percent During	
	Total	Average per Year	Crash Rate [c]	PD	PI	F	NR	SS	RE	CM	SV	HO	NR	Commuter Peak [d]	Wet/Icy Conditions [e]
King Street at Constitution Boulevard	25	5	0.55	15	9	--	1	3	12	6	3	1	--	36%	20%
Constitution Boulevard at Upper Union Street	5	1	0.33	5	--	--	--	2	1	1	1	--	--	20%	20%
Constitution Boulevard at Site Driveway / Dell Technologies Employee Driveway	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Source: MassDOT (2015-2019).

[a] PD = property damage only; PI = personal injury; F = fatality, NR = not reported.

[b] SS = sideswipe; RE = rear end; CM = cross movement/angle; SV = single vehicle; HO = head on; NR = not reported.

[c] Measured in crashes per million entering vehicles for intersections and in crashes per million vehicle miles traveled for roadway segments.

[d] Percent of vehicle incidents that occurred during the weekday AM (7:00 AM-9:00 AM) and weekday PM (4:00 PM -6:00 PM) commuter peak periods.

[e] Represents the percentage of only "known" collisions occurring during inclement weather conditions.

Vehicle Speeds

Vehicle speed measurements were conducted along Constitution Boulevard in March 2024 by use of radar. The primary use of this information is explained in the *Sight Distance* section where the speeds are correlated to sight distance measurements taken at the location of the site driveways to assure that adequate sight distances exist at the driveways to provide safe operation. The results of the speed measurements are summarized in Table 3.

TABLE 3
Observed Travel Speeds

Location/Direction	Posted Speed Limit [a]	Average Speed [b]	85th Percentile Speed [c]
Constitution Boulevard, adjacent to the site:			
Northbound	20	32	38
Southbound	20	32	38

[a] In miles per hour (mph).

[b] Average speed of all observed vehicles.

[c] Speed at, or below which 85 percent of all observed vehicles travel.

As shown in Table 3, the average speeds along Constitution Boulevard, adjacent to the site, were found to be 32 mph in both directions and the 85th percentile speeds were found to be 38 mph in both directions. The average speeds were found to be higher than the posted speed limit of 20 mph. This is likely due to the non-MUTCD-compliant speed limit signage that is not recognizable to drivers.

Sight Distance

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveways to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO)[2]. AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. The Massachusetts Department of Transportation (MassDOT) and the Executive Office of Energy and Environmental Affairs (EEA) require the use of AASHTO sight distance standards when preparing traffic impact assessments and studies, as stated in their guidelines for traffic impact assessments.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height

[2] *A Policy on Geometric Design of Highways and Streets*; American Association of State Highway and Transportation Officials (AASHTO); 2018.

of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. The ISD, however, must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

The available SSD and ISD were measured and compared to minimum requirements as established by AASHTO. Based on the posted and observed speeds, the SSD and ISD requirements at the site driveways were calculated. The required minimum sight distances were compared to the available distances, as shown in Table 4. The sight distance calculations and sight line plans are provided in the Appendix.

TABLE 4
Sight Distance Summary

Location/Direction	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)		
	Measured	Minimum Required [a]	Measured	Minimum Required [b]	Desirable [c]
Constitution Boulevard at Northern Site Driveway					
North of intersection (SB)	450	280	450	280	280 (310)
South of intersection (NB)	343[d]	280	340[d]	280	280 (340)
Constitution Boulevard at Southern Site Driveway:					
North of intersection (SB)	427	280	332	280	280 (310)

[a] Values based on AASHTO requirements for minimum SSD based on 85th percentile speed of 38 mph on Constitution Boulevard.

[b] Values based on AASHTO requirements for SSD.

[c] XX (XX) = Values based on AASHTO requirements for SSD for 85th percentile speed of 38 mph on Constitution Boulevard for cars (Values based on AASHTO requirements for ISD for speed limit of 20 mph on Constitution Boulevard for trucks).

[d] Assumes trimming of lower foliage in the median.

As shown in Table 4, available sight distances exceed the minimum and desirable SSD and ISD requirements for safe operations as established by AASHTO. It is recommended that additional trimming on the property, to the south of the northern site driveway and the north of the southern site driveway, be performed to further enhance sight distances in those directions. In addition, regular maintenance of the trees within the median on Constitution Boulevard south of the northerly site driveway will be required to ensure that foliage on the lower branches is trimmed so as not to fall to less than 6.5 feet above the roadway surface. In addition, regular mowing and clearing of snow will be required within the median within the clear zones designated on the sight line plans included in the Appendix to maintain the minimum required sight lines in all seasons.

In order to maintain the sight distances at the driveway after development of the site, it is recommended that any proposed plantings, vegetation, landscaping, and signing along the site frontage be kept low to the ground (no more than 3.0 feet above street level) or set back sufficiently from Constitution Boulevard so as not to inhibit the available sight lines.

FUTURE CONDITIONS

To estimate the impact of site-generated traffic within the study area, existing traffic volumes were projected to the year 2031, representing a seven-year design horizon in accordance with state requirements. The proposed development is expected to be completed and fully operational well within this time frame. Traffic volumes on the roadway network at that time will include existing traffic and new traffic due to normal traffic growth. Consideration of these factors resulted in the development of 2031 No-Build traffic volumes, which assume that the proposed development is not built. The incremental impacts of the proposed project may then be determined by adding site-generated traffic volumes (Build conditions) and making comparisons to the No-Build conditions.

Traffic Growth

To develop the 2031 No-Build forecast volumes, two components of traffic growth were considered. First, an annual growth percentage was determined. Based on historic traffic-volume data provided by MassDOT, traffic volumes in the area have been decreasing, on average, at a rate of approximately 0.10 percent per year.[3] Therefore, to provide a conservative (worse than expected) analysis scenario, a 1 percent compounded annual growth was assumed for the project area. The growth calculations are provided in the Appendix.

Second, any planned or approved specific developments in the area that would generate a significant volume of traffic on study area roadways within the next seven years were considered. Based on correspondence with the Town officials in Franklin, there is a proposed Warehouse Development to be located at 585 King Street in Franklin, Massachusetts. The project site in approximately 33.5 acres of undeveloped land located directly across from Constitution Boulevard to the north of King Street. The project would be accessed via a new driveway that would intersect King Street across from Constitution Boulevard to form a four-way signalized intersection. This new intersection will provide crosswalks across the western and southern legs with an exclusive pedestrian phase upon activation. As this development will drastically change the geometry and operations of the existing intersection, the traffic volumes generated by the project, as well as the proposed signal timings and geometric modifications associated with the development at 585 King Street have been included in the 2031 No-Build and 2031 Build analysis. The traffic volumes to be generated by the proposed development were obtained from the *Transportation Impact Assessment*[4] prepared for the development and are included in the Appendix.

In addition, the existing site is currently occupied by the former Dell EMC building, which was previously generating traffic. This building could be reoccupied by another office tenant in the future without any additional project permitting. Therefore, GPI has estimated the trips associated with the reoccupancy of the existing 209,000 SF office building based on Institute of Transportation Engineers (ITE)[5] trip generation rates for Land Use Code (LUC) 710 (General Office Building) and distributed these trips to the adjacent roadway network based on a Journey-to-Work model prepared using US Census data on place of residency for employees working in Franklin, MA. The detailed trip generations and trip distribution calculations are provided in the Appendix. GPI has prepared two 2031 No-Build analysis scenarios: one without the reoccupancy of the former Dell EMC space, and one assuming reoccupancy of the former Dell EMC space with a similar office tenant.

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3 *MassDOT Transportation Data Management System (2012-2019).*

4 *Transportation Impact Assessment – Proposed Warehouse – Franklin, Massachusetts*; prepared by Vanasse & Associates, Inc.; dated October 2021.

5 ITE *Trip Generation Manual, 11th Edition*. Institute of Transportation Engineers; Washington, DC; 2021.

Planned Roadway Improvements

Based on the MassDOT Projects website, no roadway improvement projects in the vicinity of the project area were identified other than the improvements that we be completed as part of the 585 King Street development to add a driveway as the fourth leg of the King Street / Constitution Boulevard intersection. The improvements associated with this development have been included in the 2031 No-Build and Build analysis. The signal plans for the proposed development have been included in the Appendix.

No-Build Conditions

The 2031 No-Build without Reoccupancy peak-hour traffic volumes were accordingly developed by applying a 1 percent compounded annual traffic growth rate (7.2 percent over seven years) to the 2024 Existing traffic volumes and adding the traffic associated with the development at 585 King Street. The 2031 No-Build without Reoccupancy traffic volumes are shown graphically on Figure 3 for the weekday AM and weekday PM peak hours. The 2031 No-Build with Reoccupancy traffic volumes were similarly developed by applying a 1 percent compounded annual traffic growth rate to the 2024 Existing traffic volumes and adding the traffic associated with the development at 585 King Street and the reoccupancy of the former Dell EMC building with an office tenant. The 2031 No-Build with Reoccupancy traffic volumes are shown graphically on Figure 4 for the weekday AM and weekday PM peak hours.

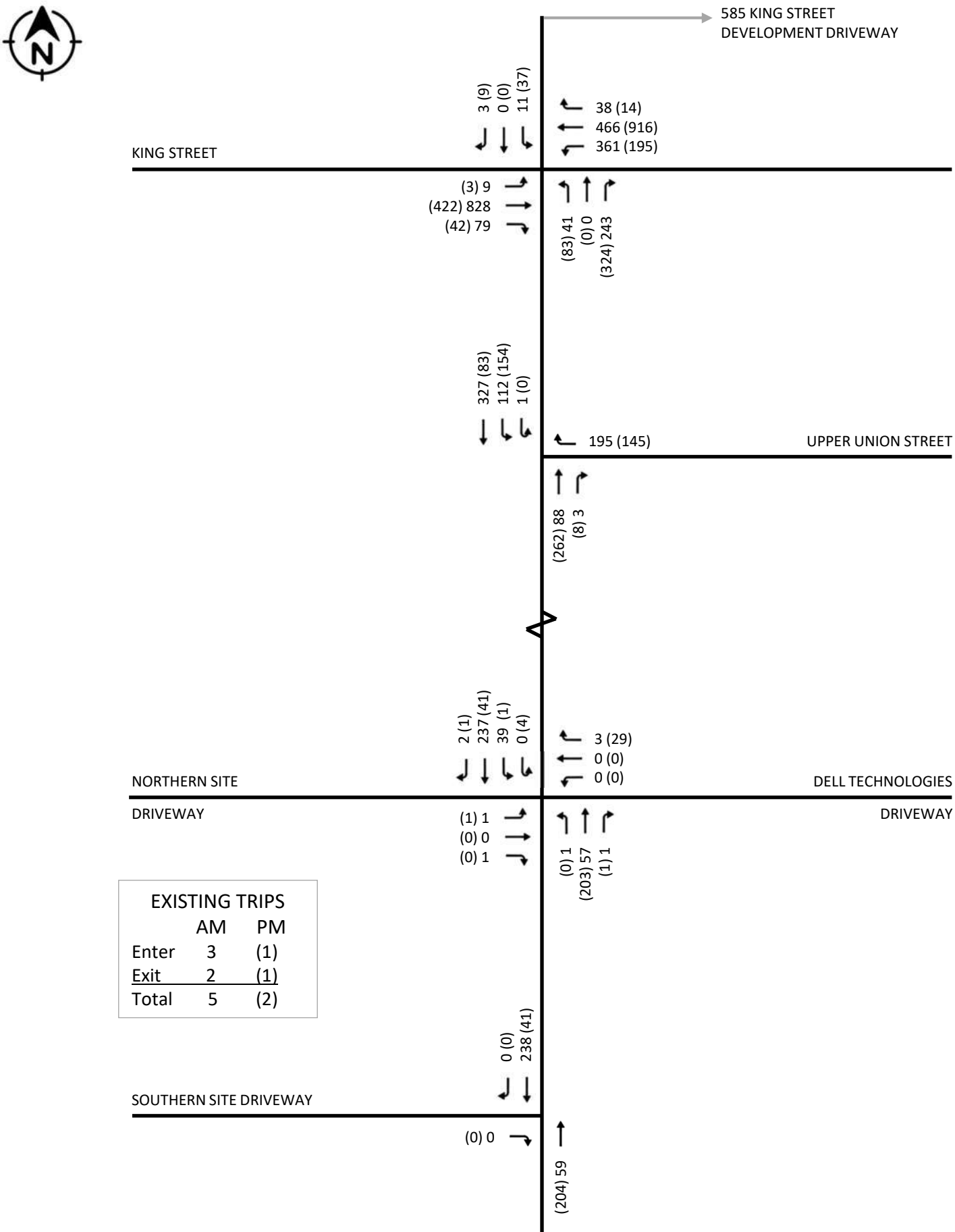

FIGURE 3
WEEKDAY PEAK HOUR TRAFFIC VOLUMES
2031 NO-BUILD W/O REOCCUPANCY

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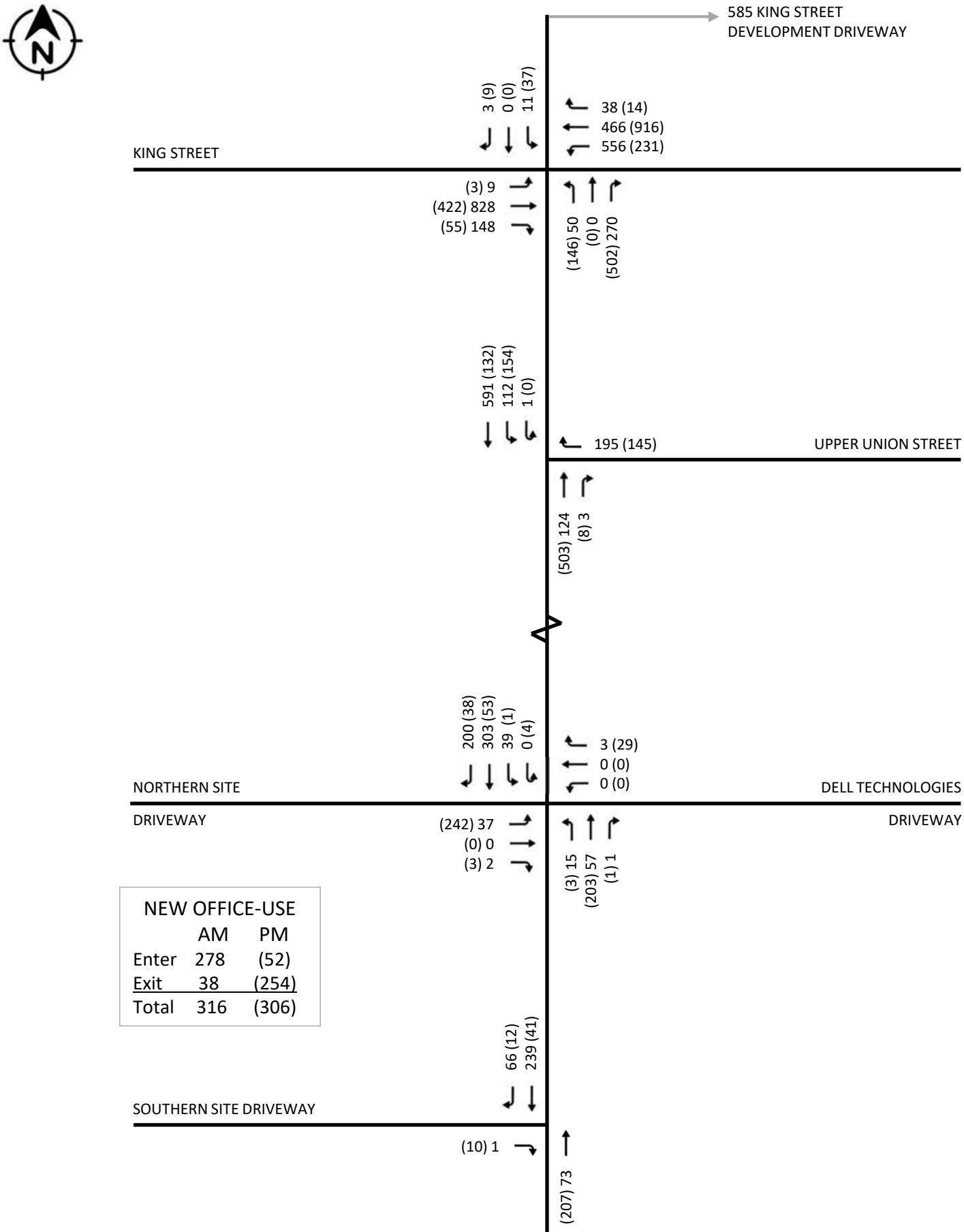
WAREHOUSING DEVELOPMENT – FRANKLIN, MASSACHUSETTS



NEW OFFICE-USE	AM	PM
Enter	278	(52)
Exit	38	(254)
Total	316	(306)

* EXISTING TRAFFIC WAS REDISTRIBUTED ONTO NEW DRIVEWAYS

XX (XX) = AM (PM)

INTERSECTIONS DO NOT BALANCE

FIGURE 4
WEEKDAY PEAK HOUR TRAFFIC VOLUMES
2031 NO-BUILD WITH REOCCUPANCY

Trip Generation

The site currently contains a 209,000 SF office building that is currently vacant, but was formerly occupied by Dell EMC. The proposed development consists of razing the existing structures on site and constructing two warehouse buildings, totaling 185,175 SF. Traffic to be generated by the proposed facility was estimated using trip rates contained in the ITE *Trip Generation Manual, 11th Edition*[6] for Land Use Code (LUC) 150 (Warehousing) for both "total vehicles" and "trucks". All trip-generation data are provided in the Appendix. Table 5 summarizes the results of the trip-generation estimates.

TABLE 5
Trip-Generation Summary

Peak Hour/Direction	Total Trips [a]	Truck Trips	Passenger Vehicle Trips
Weekday Daily	331	108	223
Weekday AM Peak Hour:			
Enter	35	2	33
Exit	11	2	9
Total	46	4	42
Weekday PM Peak Hour:			
Enter	14	3	11
Exit	35	3	32
Total	49	6	43

[a] Based on ITE LUC 150 (Warehousing) for 185,175 SF.

As shown in Table 5, the proposed warehouse development is expected to generate 46 vehicle trips (35 entering and 11 exiting) during the weekday AM peak hour and 49 vehicle trips (14 entering and 35 exiting) during the weekday PM peak hour.

It should be noted that the site was previously occupied by the 209,000 SF Dell EMC office building, which was formerly generating traffic. GPI has prepared a comparison of the trips to be generated by the currently proposed warehouse development to the trips that were previously generated by the former Dell EMC based ITE trip rates for LUC 710 (General Office Building). The detailed trip generation calculations are included in the Appendix and the results are summarized in Table 6.

6 ITE *Trip Generation Manual, 11th Edition*. Institute of Transportation Engineers; Washington, DC; 2021.

TABLE 6
Trip-Generation Comparison

Peak Hour/Direction	Existing Trips (LUC 710) [a]	Proposed Trips (LUC 150) [b]	Net Change in Trips [c]
Weekday Daily	2,204	331	-1,873
Weekday AM Peak Hour:			
Enter	278	35	-243
Exit	38	11	-27
Total	316	46	-270
Weekday PM Peak Hour:			
Enter	52	14	-38
Exit	254	35	-219
Total	306	49	-257

[a] Based on ITE LUC 710 (General Office Building) for 209,000 SF.
[b] Based on ITE LUC 150 (Warehousing) for 185,175 SF.
[c] Proposed Trips minus Existing Trips.

As shown in Table 6, the proposed warehouse is anticipated to result in a substantial reduction in site-generated vehicle trips as compared to the former Dell EMC use. However, to provide a conservative (worse case) analysis condition, GPI assumed that all trips generated by the proposed warehouse development would be new to the study area.

Trip Distribution

Having estimated project-generated vehicle trips, the next step is to determine the distribution of the traffic and assign these trips to the local roadway network. The distribution of passenger vehicle traffic on the area roadways is based on United States Census Bureau 2011-2015 Journey-to-Work information. Accordingly, approximately 5 percent of traffic is expected to and from the south along Constitution Boulevard, 70 percent is expected to and from the east along King Street and 25 percent is expected to and from the west along King Street. The Journey-to-Work data is provided in the Appendix.

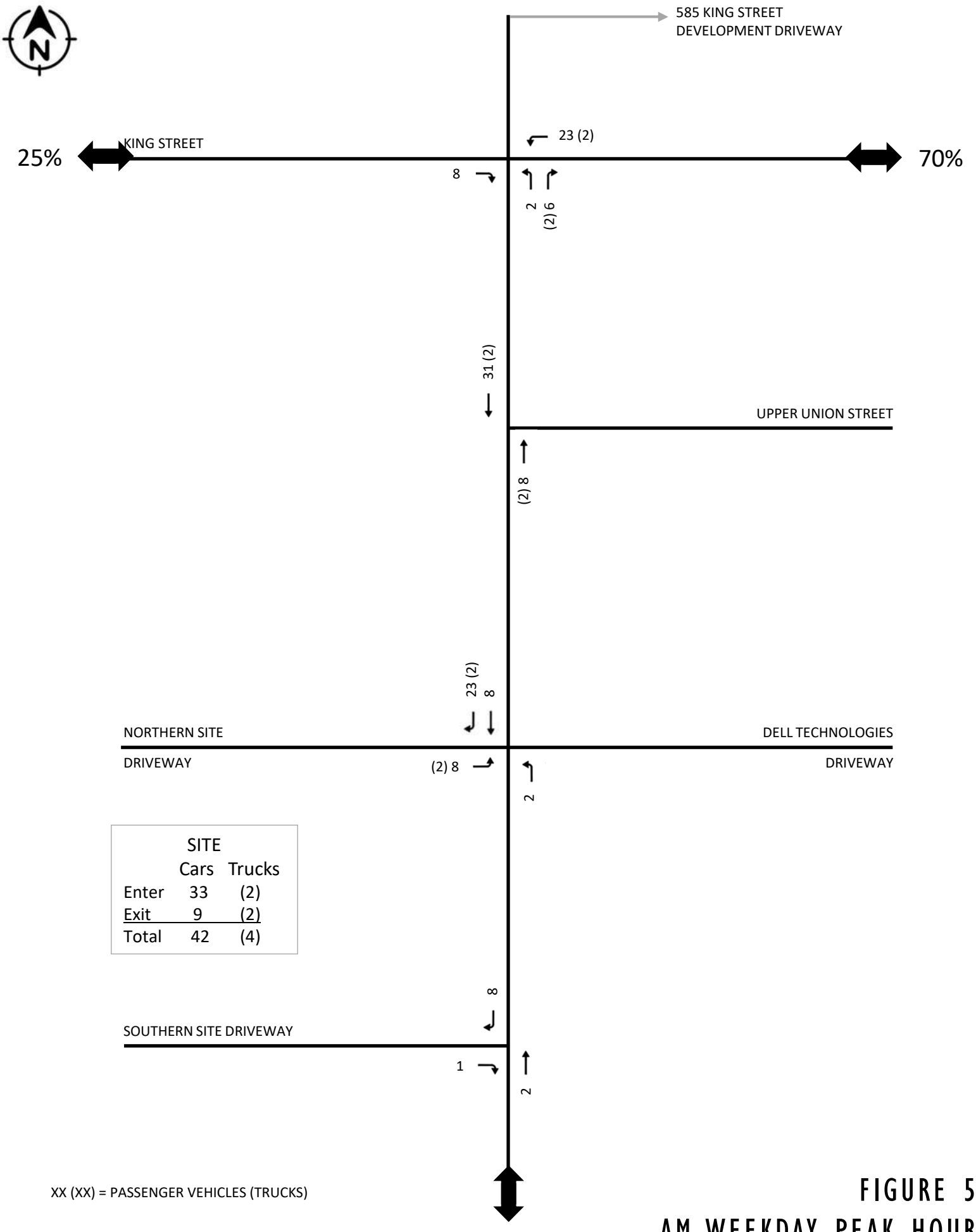
Build Traffic Volumes

Based on the traffic generation and distribution estimates for the warehousing facility, the traffic volumes associated with the proposed development were assigned to the roadway network. The site-generated traffic networks are shown on Figures 5 and 6 for the weekday AM and weekday PM peak hours, respectively. The site-generated traffic volumes were then combined with the 2031 No-Build without Reoccupancy traffic volumes to develop the 2031 Build peak-hour traffic-volume networks. The 2031 Build weekday AM and weekday PM peak hour traffic volumes are illustrated on Figure 7.

Traffic Increases

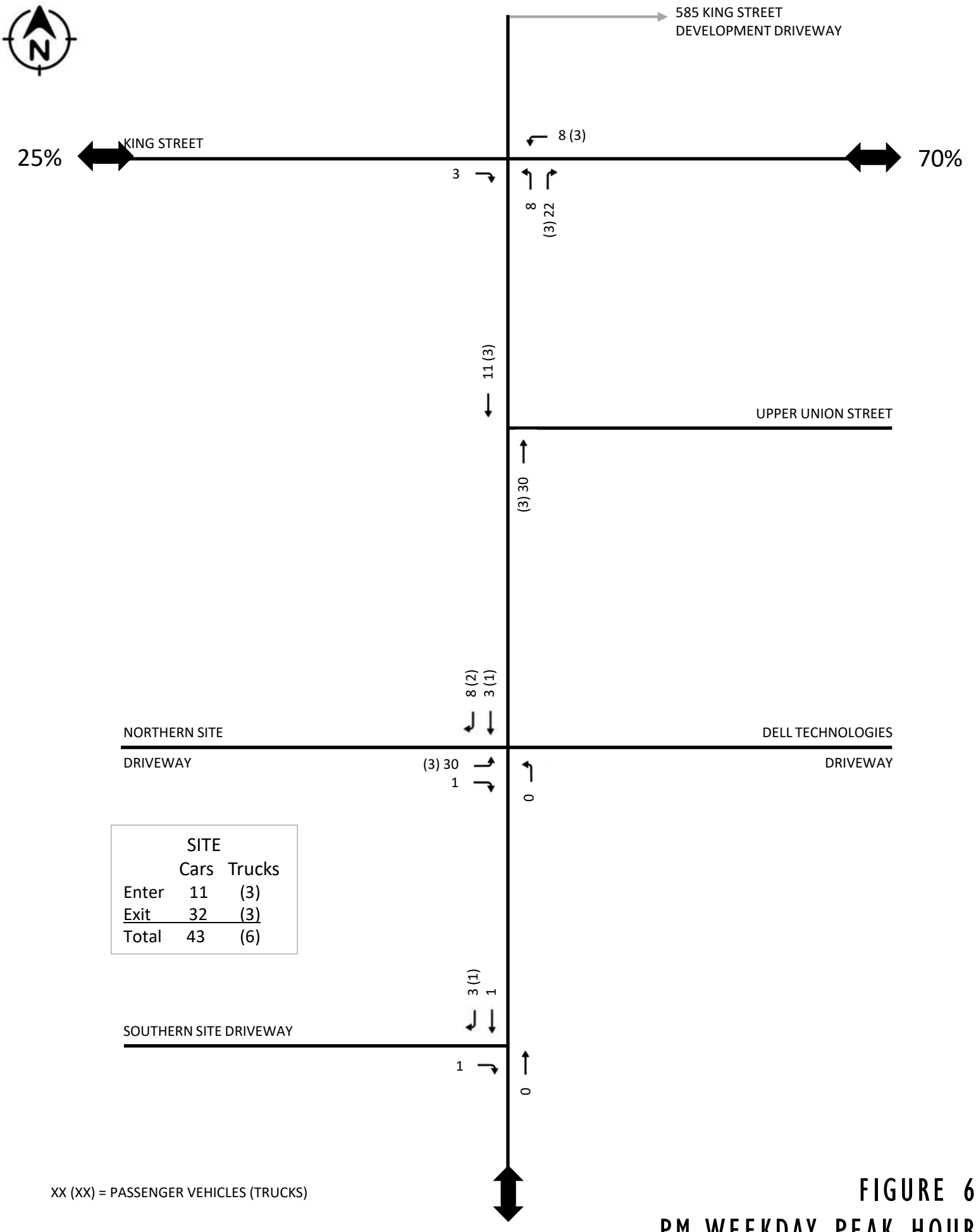
The proposed development will result in increases in traffic on the study area roadways. As shown on Figures 5 and 6, traffic-volume increases beyond the study area during the peak hours are expected to be

in the range of 2 to 36 vehicles trips. These increases represent, on average, one additional vehicle trip approximately every 1.5 minutes to 30 minutes during the peak hours.



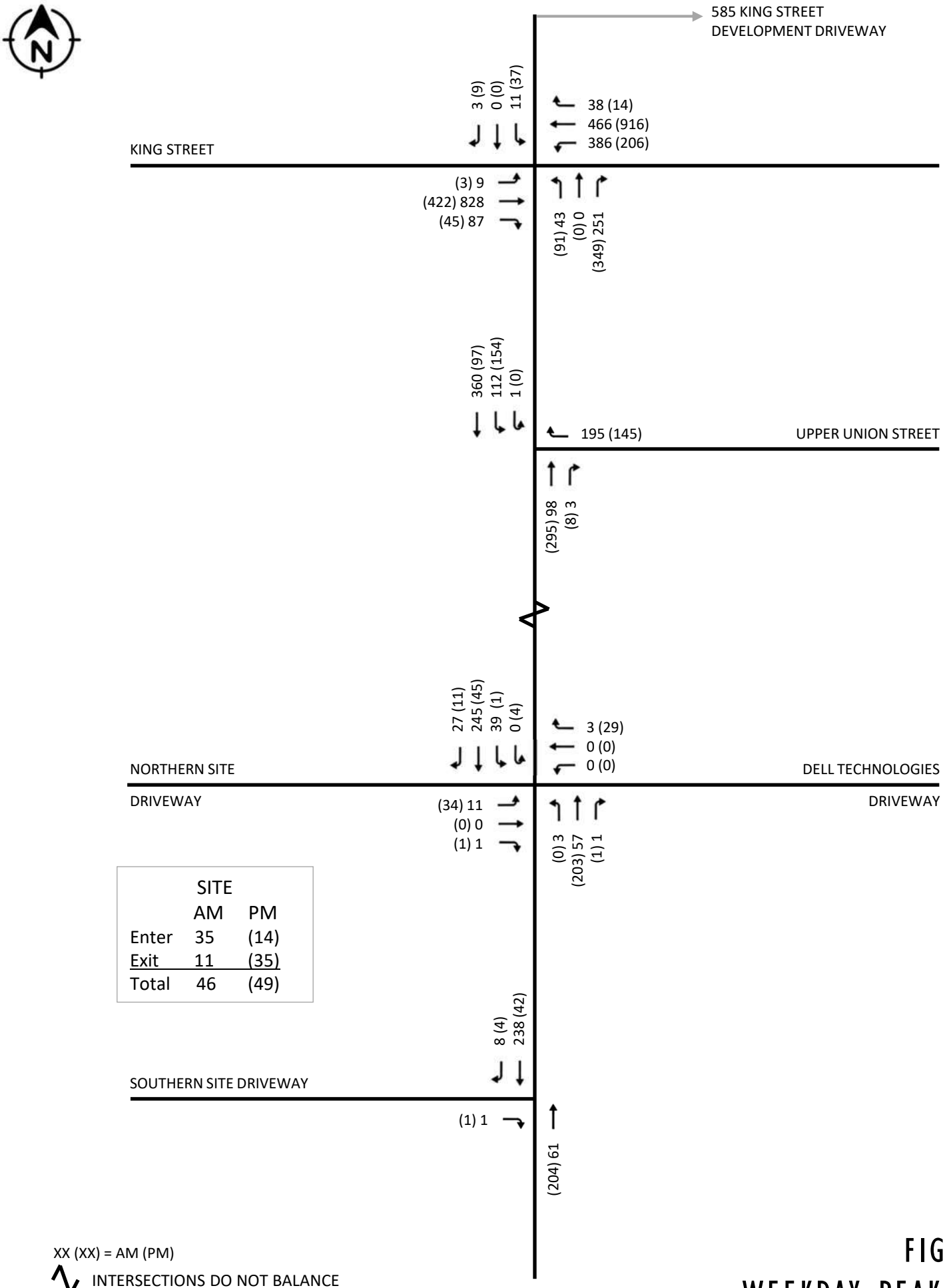
XX (XX) = PASSENGER VEHICLES (TRUCKS)

FIGURE 5
AM WEEKDAY PEAK HOUR
SITE GENERATED TRAFFIC VOLUMES



XX (XX) = PASSENGER VEHICLES (TRUCKS)

FIGURE 6
PM WEEKDAY PEAK HOUR
SITE GENERATED TRAFFIC VOLUMES



XX (XX) = AM (PM)

INTERSECTIONS DO NOT BALANCE

FIGURE 7
WEEKDAY PEAK HOUR
2031 BUILD TRAFFIC VOLUMES

CAPACITY AND QUEUE ANALYSIS

Capacity and queue analyses were conducted at all study area locations under 2024 Existing, 2031 No-Build without Reoccupancy, 2031 No-Build with Reoccupancy, and 2031 Build traffic-volume conditions. The impact of site-generated traffic can be measured by comparing 2031 No-Build conditions to 2031 Build conditions.

Methodology

The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM)7 and is described in the Appendix. HCM 2000 was utilized for the signalized intersections because HCM 6 and HCM 2010 do not analyze exclusive pedestrian phases. It was also utilized for the unsignalized intersections for consistency.

For signalized intersections, the maximum back of queue during a typical (average) signal cycle and a 95th percentile signal cycle were calculated for each lane group during the peak periods studied. The back of queue is the length of a backup of vehicles from the stop line of a signalized intersection to the last vehicle in the queue that is required to stop, regardless of the signal indication. The length of this queue depends on a number of factors including signal timing, vehicle arrival patterns, and the saturation flow rate. For unsignalized intersections, the 95th percentile queue represents the length of queue of the critical minor-street movement that is not expected to be exceeded 95 percent of the time during the analysis period (typically one hour). In this case, the queue length is a function of the capacity of the movement and the movement's degree of saturation.

Analysis Results

The results of the level-of-service (LOS) and queue analyses are shown in Table 7 and are discussed below. Capacity and queue analyses were conducted at the study area intersections utilizing *Synchro* software.[8] The capacity and queue analysis worksheets for all conditions are provided in the Appendix.

King Street at Constitution Boulevard

As shown in Table 7, all movements at the signalized intersection of King Street / Constitution Boulevard are anticipated to operate at level-of-service (LOS) D or better under 2031 No-Build without Reoccupancy and 2031 Build conditions during all analysis time periods. Additionally, the volume-to-capacity (v/c) ratios are expected to be well below 1.00, indicating there will be more than adequate capacity to accommodate the anticipated traffic volumes. The additional traffic generated by the proposed development is no expected to increase delay on any given movement by more than two seconds per vehicle or increase queues in any lane by more than one vehicle as compared to the No-Build without Reoccupancy condition. It should be noted that this represents a significant improvement in traffic operations over the reoccupancy of the former Dell EMC building with a similar office development.

All movements at all other study area intersections are anticipated to operate at LOS B or better under all analysis conditions. The additional traffic generated by the proposed warehousing development is not anticipated to increase delay on any movement through any intersection by more than two seconds per vehicle and will have negligible impacts to queues.

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7 *Highway Capacity Manual 2000*, Transportation Research Board; Washington, D.C.; 2000.

8 *Synchro plus SimTraffic 11*; Trafficware LLC.; Sugar Land, TX; 2019.

TABLE 7
Intersection Capacity Analysis Summary

Intersection/Peak Hour/Lane Group	2024 Existing				2031 No-Build without Re-occupancy				2031 No-Build with Re-occupancy				2031 Build			
	V/C [a]	Del. [b]	LOS [c]	Queue [d]	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
King Street at Constitution Boulevard																
Weekday AM:																
King Street EB approach	0.67	24.7	C	171/545	0.89	24.6	C	219/527	1.04	72.4	F	301/581	0.73	26.9	C	234/534
King Street WB left-turn	0.53	30.7	C	87/238	0.64	39.8	D	116/219	0.58	28.8	C	163/379	0.63	38.0	D	121/241
King Street WB through	0.46	7.2	A	79/375	0.47	8.7	A	91/408	0.46	8.2	A	84/408	0.47	8.8	A	91/408
Constitution Boulevard NB left-turn	0.19	34.4	D	<25/80	0.29	40.6	D	26/64	0.37	42.3	D	32/76	0.30	40.6	D	27/67
Constitution Boulevard NB right-turn	0.24	16.1	B	40/143	0.29	23.6	C	63/119	0.24	15.4	B	57/132	0.28	22.3	C	62/123
585 King St SB left-turn	--	--	--	--/--	0.07	38.7	D	<25/25	0.08	39.5	D	<25/25	0.07	38.6	D	<25/25
585 King St SB through/right-turn	--	--	--	--/--	0.00	38.1	D	<25/<25	0.00	38.9	D	<25/<25	0.00	38.0	D	<25/<25
Overall Intersection	**0.52**	**20.6**	**C**	**--/--**	**0.57**	**23.7**	**C**	**--/--**	**0.68**	**41.4**	**D**	**--/--**	**0.59**	**24.4**	**C**	**--/--**
Weekday PM:																
King Street EB approach	0.38	14.7	B	63/134	0.26	10.0	B	81/78	0.28	11.4	B	88/80	0.27	10.2	B	84/78
King Street WB left-turn	0.30	22.0	C	28/92	0.54	42.8	D	64/105	0.67	46.6	D	80/131	0.59	43.8	D	68/111
King Street WB through	0.76	11.3	B	184/483	0.75	10.6	B	338/302	0.78	13.2	B	426/302	0.75	10.9	B	352/302
Constitution Boulevard NB left-turn	0.28	19.9	B	33/80	0.41	38.9	D	50/130	0.61	41.0	D	87/249	0.44	38.9	D	55/145
Constitution Boulevard NB right-turn	0.35	9.7	A	49/105	0.41	27.0	C	90/160	0.59	28.0	C	148/275	0.44	27.1	C	97/173
585 King St SB left-turn	--	--	--	--/--	0.21	37.0	D	<25/58	0.23	34.9	C	<25/60	0.21	36.7	D	<25/58
585 King St SB through/right-turn	--	--	--	--/--	0.01	35.2	D	<25/<25	0.01	32.8	C	<25/<25	0.01	34.9	C	<25/<25
Overall Intersection	**0.71**	**13.1**	**B**	**--/--**	**0.73**	**17.8**	**B**	**--/--**	**0.79**	**21.5**	**C**	**--/--**	**0.74**	**18.5**	**B**	**--/--**
Constitution Boulevard at Upper Union Street																
Weekday AM:																
Upper Union Street WB right-turn	0.21	9.7	A	--/<25	0.21	9.6	A	--/<25	0.22	9.8	A	--/<25	0.21	9.6	A	--/<25
Constitution Boulevard SB left-turn	0.09	7.8	A	--/<25	0.08	7.7	A	--/<25	0.09	7.8	A	--/<25	0.08	7.7	A	--/<25
Weekday PM:																
Upper Union Street WB right-turn	0.23	10.9	B	--/<25	0.18	10.1	B	--/<25	0.22	11.5	B	--/<25	0.19	10.2	B	--/<25
Constitution Boulevard SB left-turn	0.14	8.6	A	--/<25	0.13	8.3	A	--/<25	0.17	9.3	A	--/<25	0.14	8.4	A	--/<25
Constitution Boulevard at Northern Site Driveway / Dell Technologies Employee Driveway																
Weekday AM:																
Northern Site Driveway EB approach	0.01	11.0	B	--/<25	0.00	10.7	B	--/<25	0.11	15.3	C	--/<25	0.02	12.0	B	--/<25
Dell Tech. Driveway WB approach	0.01	9.0	A	--/<25	0.00	8.9	A	--/<25	0.00	8.9	A	--/<25	0.00	8.9	A	--/<25
Constitution Boulevard NB approach	0.00	0.1	A	--/<25	0.00	0.1	A	--/<25	0.02	1.8	A	--/<25	0.00	0.4	A	--/<25
Constitution Boulevard SB left-turn	0.03	7.4	A	--/<25	0.03	7.4	A	--/<25	0.03	7.4	A	--/<25	0.03	7.4	A	--/<25
Weekday PM:																
Northern Site Driveway EB approach	0.01	12.1	B	--/<25	0.00	10.8	B	--/56	0.45	16.0	C	--/56	0.06	11.2	B	--/<25
Dell Tech. Driveway WB approach	0.05	10.4	B	--/<25	0.04	9.6	A	--/<25	0.04	9.6	A	--/<25	0.04	9.6	A	--/<25
Constitution Boulevard NB approach	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25	0.00	0.1	A	--/<25	0.00	0.0	A	--/<25
Constitution Boulevard SB left-turn	0.00	9.4	A	--/<25	0.00	8.9	A	--/<25	0.00	8.9	A	--/<25	0.00	8.9	A	--/<25
Constitution Boulevard at Southern Site Driveway																
Weekday AM:																
Southern Site Driveway EB right-turn	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25	0.00	9.8	A	--/<25	0.00	9.7	A	--/<25
Weekday PM:																
Southern Site Driveway EB right-turn	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25	0.01	8.6	A	--/<25	0.00	8.5	A	--/<25

[a] Volume-to-capacity ratio.
[b] Average control delay in seconds per vehicle.
[c] Level of service.
[d] 95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

CONCLUSIONS

Existing and future conditions in the study area have been described, analyzed, and evaluated with respect to traffic operations and the impact of the proposed development. Conclusions of this effort are presented below.

- The proposed warehouse development is to be located at 55 Constitution Boulevard in Franklin, Massachusetts. The site currently contains a 209,000 square foot (SF) office building that was formerly occupied by Dell/EMC. The project consists of razing the existing structures on the site and constructing two warehousing buildings, totally ±185,175 SF.

  Access and Egress are currently provided via a full-access/egress driveway on Constitution Boulevard at the northerly end of the site, opposite the Dell Technologies employee entrance, and a right-in/right-out driveway on Constitution Boulevard at the southerly end of the site. Access would be provided via a reconstructed full-access/egress driveway at the approximate location of the existing northerly site driveway, as well as via a new right-in/right-out driveway at the southerly end of the site. The existing right-in/right-out driveway would be closed as part of the project.

- All of the study area intersections experienced crash rates well below the state and District-wide averages during the five-year study period (2018 – 2022), indicating no significant safety issue exists at any of the study area intersections.

- It is recommended that additional trimming on the property, to the south of the northern site driveway and the north of the southern site driveway, be performed to further enhance sight distances in those directions. In addition, regular maintenance of the trees within the median on Constitution Boulevard south of the northerly site driveway will be required to ensure that foliage on the lower branches is trimmed so as not to fall to less than 6.5 feet above the roadway surface. In addition, regular mowing and clearing of snow will be required within the median within the clear zones designated on the sight line plans included in the Appendix to maintain the minimum required sight lines in all seasons.

  In order to maintain the sight distances at the driveway after development of the site, it is recommended that any proposed plantings, vegetation, landscaping, and signing along the site frontage be kept low to the ground (no more than 3.0 feet above street level) or set back sufficiently from Constitution Boulevard so as not to inhibit the available sight lines.

- The proposed warehouse development is expected to generate 46 vehicle trips (35 entering and 11 exiting) during the weekday AM peak hour and 49 vehicle trips (14 entering and 35 exiting) during the weekday PM peak hour. Traffic-volume increases beyond the study area during the peak hours are expected to be in the range of range of 2 to 36 vehicles trips. These increases represent, on average, one additional vehicle trip approximately every 1.5 minutes to 30 minutes during the peak hours.

- All movements at the signalized intersection of King Street / Constitution Boulevard are anticipated to operate at level-of-service (LOS) D or better under 2031 No-Build without Reoccupancy and 2031 Build conditions during all analysis time periods. Additionally, the volume-to-capacity (v/c) ratios are expected to be well below 1.00, indicating there will be more than adequate capacity to accommodate the anticipated traffic volumes. The additional traffic generated by the proposed development is no expected to increase delay on any given movement by more than two seconds per vehicle or increase queues in any lane by more than one vehicle as compared to the No-Build without Reoccupancy condition. It should be noted that this represents a significant improvement

in traffic operations over the reoccupancy of the former Dell EMC building with a similar office development.

- All movements at all other study area intersections are anticipated to operate at LOS B or better under all analysis conditions. The additional traffic generated by the proposed warehousing development is not anticipated to increase delay on any movement through any intersection by more than two seconds per vehicle and will have negligible impacts to queues.

Based on the findings above, the proposed warehousing development can be safely and efficiently accommodated along the existing roadway network with minor clearing and trimming of vegetation near the site driveways to enhance sight lines. No additional project-specific mitigation is warranted based on the incremental impacts of the development.

- APPENDIX

- ***Public Transportation Information***
- ***Traffic Count Data***
- ***Traffic-Volume Adjustment Data***
- ***MassDOT Crash Rate Worksheets***
- ***Sight Distance Calculations and Sight Line Plans***
- ***Background Development Data***
- ***Trip Generation Calculations***
- ***Trip Distribution Data***
- ***Capacity Analysis Methodology***
- ***Capacity and Queue Analysis Worksheets***

PUBLIC TRANSPORTATION INFORMATION

FRANKLIN/FOXBORO LINE

FALL/WINTER SCHEDULE
Effective January 8, 2024

Monday to Friday

Inbound to Boston

ZONE	STATION	TRAIN #	AM											PM													
	Bikes Allowed																										
6	Forge Park/495	♿	5:05	-	5:55	6:33	-	7:23	8:10	-	9:20	-	11:15	-	1:15	-	3:25	-	4:51	-	-	-	8:00	-	9:28	-	11:48
6	Franklin/Dean College		5:12	-	6:02	6:40	-	7:30	8:17	-	9:27	-	11:22	-	1:22	-	3:32	-	4:58	-	-	7:04	8:07	-	9:35	-	11:55
5	Norfolk	♿	5:19	-	6:09	6:47	-	7:37	8:24	-	9:34	-	11:29	-	1:29	-	3:39	-	5:05	-	-	7:11	8:14	-	9:42	-	12:02
4	Foxboro	♿	-	5:53	-	-	7:15	-	-	8:45	-	10:36	-	12:31	-	2:21	-	4:23	-	5:50	6:48	-	-	8:53	-	10:43	-
4	Walpole		5:26	-	6:16	6:54	-	7:45	8:31	-	9:41	-	11:36	-	1:36	-	3:46	-	5:21	-	-	7:27	8:21	-	9:49	-	12:09
4	Windsor Gardens		5:30	6:06	6:20	6:58	7:28	7:49	8:35	8:58	f 9:44	f 10:49	f 11:39	f 12:44	f 1:39	f 2:34	f 3:49	f 4:36	f 5:24	-	f 7:01	f 7:30	f 8:24	f 9:06	f 9:52	-	f 12:12
3	Norwood Central	♿	5:34	6:10	6:24	7:02	7:32	7:53	8:39	9:02	9:48	10:53	11:43	12:48	1:43	2:38	3:53	4:40	5:28	6:05	7:05	7:34	8:28	9:10	9:55	10:58	12:15
3	Norwood Depot	♿	5:36	6:12	6:26	7:05	7:35	7:56	8:41	9:04	9:50	10:55	11:45	12:50	1:45	2:40	3:55	4:42	5:30	6:07	7:07	7:36	8:30	9:12	9:57	-	12:17
3	Islington		5:39	6:15	6:29	7:08	7:38	7:59	8:44	9:07	9:53	10:58	11:48	12:53	1:48	2:43	3:58	4:45	5:34	6:11	7:11	7:40	8:33	9:15	10:00	-	12:20
2	Dedham Corp. Center	♿	5:42	6:18	6:32	7:11	7:41	8:02	8:47	9:10	9:56	11:01	11:51	12:56	1:51	2:46	4:01	4:48	5:36	6:13	7:13	7:42	8:36	9:18	10:03	11:03	12:23
2	Endicott		5:45	6:21	6:35	7:14	7:44	8:05	8:50	9:13	9:59	11:04	11:54	12:59	1:54	2:49	4:04	4:51	5:39	6:16	7:16	7:45	8:39	9:21	10:06	-	12:26
2	Readville	♿	5:49	VIA	6:39	7:19	7:48	8:10	8:54	9:17	10:03	11:08	11:58	1:03	1:58	2:53	4:08	4:56	5:43	6:20	7:20	VIA	8:43	VIA	VIA	VIA	12:30
1	Hyde Park	♿	-	FAIR-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	FAIR-	-	FAIR-	FAIR-	FAIR-	-
1A	Forest Hills	♿	L 5:59	MOUNT	L 6:49	-	L 7:58	-	L 9:05	-	L 10:12	-	-	-	-	-	-	-	-	-	-	MOUNT	-	MOUNT	MOUNT	MOUNT	-
1A	Ruggles	♿	L 6:04	LINE	L 6:54	L 7:31	L 8:03	L 8:22	L 9:10	L 9:29	L 10:17	L 11:19	L 12:09	L 1:14	L 2:09	L 3:04	L 4:19	L 5:09	L 5:54	L 6:31	L 7:31	LINE	L 8:54	LINE	LINE	LINE	L 12:41
1A	Back Bay	♿	L 6:08	-	L 6:58	L 7:35	L 8:07	L 8:26	L 9:14	L 9:33	L 10:21	L 11:23	L 12:13	L 1:18	L 2:13	L 3:08	L 4:23	L 5:13	L 6:00	L 6:35	L 7:35	-	L 8:58	-	-	-	L 12:45
1A	South Station	♿	6:16	6:57	7:06	7:43	8:15	8:34	9:22	9:41	10:29	11:31	12:21	1:26	2:21	3:16	4:31	5:21	6:06	6:43	7:43	8:22	9:06	9:57	10:42	11:42	12:53

Monday to Friday

Outbound from Boston

ZONE	STATION	TRAIN #	AM							PM														
	Bikes Allowed																							
1A	South Station	♿	5:45	7:20	7:40	8:48	9:35	10:35	11:28	12:30	1:30	2:20	3:20	4:05	4:27	5:05	5:32	5:50	6:35	7:10	8:10	9:25	10:30	11:55
1A	Back Bay	♿	VIA	7:25	7:45	8:53	9:40	10:40	11:33	12:35	1:35	2:25	3:25	4:10	4:32	5:10	5:37	5:55	6:40	VIA	8:15	VIA	10:35	VIA
1A	Ruggles	♿	FAIR-	7:28	7:48	8:56	9:43	10:43	11:36	12:38	1:38	2:28	3:28	4:14	4:36	5:14	5:41	5:59	6:43	FAIR-	8:18	FAIR-	10:38	FAIR-
1A	Forest Hills	♿	MOUNT	-	-	-	-	-	-	-	-	2:33	3:33	-	4:41	-	5:46	-	6:48	MOUNT	-	MOUNT	-	MOUNT
1	Hyde Park	♿	LINE	-	-	-	-	10:51	-	-	-	2:38	3:38	4:22	4:46	5:22	5:51	6:07	6:53	LINE	-	LINE	-	LINE
2	Readville	♿	-	7:37	7:58	9:05	9:52	10:55	11:45	12:47	1:47	2:42	3:42	4:26	4:50	5:26	5:55	6:11	6:57	-	8:27	-	10:47	-
2	Endicott		6:19	7:41	8:02	9:09	9:56	10:59	11:49	12:51	1:51	2:46	3:46	4:30	4:54	5:30	5:59	6:15	7:01	7:44	8:31	9:59	10:51	12:29
3	Dedham Corp. Center	♿	6:21	7:43	8:05	9:11	9:58	11:01	11:51	12:53	1:53	2:48	3:48	4:33	4:57	5:33	6:02	6:18	7:03	7:46	8:33	10:01	10:53	12:31
3	Islington		6:24	7:46	8:08	9:14	10:01	11:04	11:54	12:56	1:56	2:51	3:51	4:36	5:00	5:36	6:05	6:21	7:06	7:49	8:36	10:04	10:56	12:34
3	Norwood Depot	♿	6:27	7:49	8:11	9:17	10:04	11:07	11:57	12:59	1:59	2:54	3:55	4:39	5:03	5:39	6:08	6:24	7:09	7:52	8:39	10:07	10:59	12:37
3	Norwood Central	♿	6:29	7:53	8:13	9:19	10:06	11:09	11:59	1:01	2:01	2:56	3:58	4:43	5:07	5:43	6:12	6:28	7:13	7:55	8:41	10:09	11:01	12:41
4	Windsor Gardens		f 6:31	f 7:58	f 8:16	f 9:22	f 10:09	f 11:12	f 12:02	f 1:04	f 2:04	f 2:59	f 4:02	4:47	5:11	5:47	6:16	6:32	7:17	f 7:58	f 8:44	f 10:11	f 11:04	f 12:44
4	Walpole		-	-	8:22	-	10:14	-	12:07	-	2:09	-	4:06	-	5:15	5:51	-	6:36	7:21	-	8:49	-	11:09	12:49
5	Foxboro	♿	6:50	8:17	-	9:41	-	11:31	-	1:23	-	3:18	-	5:06	-	-	6:35	-	-	8:17	-	10:30	-	-
5	Norfolk	♿	-	-	8:37	-	10:21	-	12:14	-	2:16	-	4:13	-	5:22	5:58	-	6:43	7:28	-	8:56	--	11:16	12:56
6	Franklin/Dean College		-	-	8:44	-	10:28	-	12:21	-	2:23	-	4:20	-	5:29	6:05	-	6:50	7:35	-	9:03	-	11:23	1:03
6	Forge Park/495	♿	-	-	8:58	-	10:40	-	12:33	-	2:35	-	4:32	-	5:41	6:17	-	7:02	7:47	-	9:15	-	11:35	1:15

Weekend

Inbound to Boston

ZONE	STATION	SATURDAY TRAIN # / SUNDAY TRAIN #	AM			PM						
			1700 / 2700	1702 / 2702	1704 / 2704	1706 / 2706	1708 / 2708	1710 / 2710	1712 / 2712	1714 / 2714	1716 / 2716
	Bikes Allowed										
6	Forge Park/495	♿	5:12	8:12	10:12	12:12	2:12	4:12	6:12	8:12	10:12
6	Franklin/Dean Coll.		5:19	8:19	10:19	12:19	2:19	4:19	6:19	8:19	10:19
5	Norfolk	♿	5:26	8:26	10:26	12:26	2:26	4:26	6:26	8:26	10:26
4	Walpole		5:33	8:33	10:33	12:33	2:33	4:33	6:33	8:33	10:33
4	Windsor Gardens		f 5:36	f 8:36	f 10:36	f 12:36	f 2:36	f 4:36	f 6:36	f 8:36	f 10:36
3	Norwood Central	♿	5:40	8:40	10:40	12:40	2:40	4:40	6:40	8:40	10:40
3	Norwood Depot	♿	5:42	8:42	10:42	12:42	2:42	4:42	6:42	8:42	10:42
3	Islington		5:45	8:45	10:45	12:45	2:45	4:45	6:45	8:45	10:45
2	Dedham Corp. Ctr.	♿	5:48	8:48	10:48	12:48	2:48	4:48	6:48	8:48	10:48
2	Endicott		5:51	8:51	10:51	12:51	2:51	4:51	6:51	8:51	10:51
2	Readville	♿	5:55	8:55	10:55	12:55	2:55	4:55	6:55	8:55	10:55
1A	Ruggles	♿	L 6:06	L 9:06	L 11:06	L 1:06	L 3:06	L 5:06	L 7:06	L 9:06	L 11:06
1A	Back Bay	♿	L 6:10	L 9:10	L 11:10	L 1:10	L 3:10	L 5:10	L 7:10	L 9:10	L 11:10
1A	South Station	♿	6:18	9:18	11:18	1:18	3:18	5:18	7:18	9:18	11:18

Weekend

Outbound from Boston

ZONE	STATION	SATURDAY TRAIN # / SUNDAY TRAIN #	AM			PM					
			1701 / 2701	1703 / 2703	1705 / 2705	1707 / 2707	1709 / 2709	1711 / 2711	1713 / 2713	1715 / 2715	1717 / 2717
	Bikes Allowed										
1A	South Station	♿	6:45	8:45	10:45	12:45	2:45	4:45	6:45	8:45	11:45
1A	Back Bay	♿	6:50	8:50	10:50	12:50	2:50	4:50	6:50	8:50	11:50
1A	Ruggles	♿	6:53	8:53	10:53	12:53	2:53	4:53	6:53	8:53	11:53
2	Readville	♿	7:02	9:02	11:02	1:02	3:02	5:02	7:02	9:02	12:02
2	Endicott		7:06	9:06	11:06	1:06	3:06	5:06	7:06	9:06	12:06
2	Dedham Corp. Ctr.	♿	7:08	9:08	11:08	1:08	3:08	5:08	7:08	9:08	12:08
3	Islington		7:11	9:11	11:11	1:11	3:11	5:11	7:11	9:11	12:11
3	Norwood Depot	♿	7:14	9:14	11:14	1:14	3:14	5:14	7:14	9:14	12:14
3	Norwood Central	♿	7:16	9:16	11:16	1:16	3:16	5:16	7:16	9:16	12:16
4	Windsor Gardens		f 7:19	f 9:19	f 11:19	f 1:19	f 3:19	f 5:19	f 7:19	f 9:19	f 12:19
4	Walpole		7:24	9:24	11:24	1:24	3:24	5:24	7:24	9:24	12:23
5	Norfolk	♿	7:31	9:31	11:31	1:31	3:31	5:31	7:31	9:31	12:31
6	Franklin/Dean Coll.		7:38	9:38	11:38	1:38	3:38	5:38	7:38	9:38	12:38
6	Forge Park/495	♿	7:50	9:50	11:50	1:50	3:50	5:50	7:50	9:50	12:50

VIA FAIRMOUNT LINE: Operates via the Fairmount Line between Readville and South Station. See the Fairmount Line schedule for all stops.

For additional service to Readville Station, refer to the Fairmount Line schedule for particular trains.

For additional service to Hyde Park, Forest Hills, Ruggles or Back Bay stations, refer to the dedicated Hyde Park – Back Bay – South Station schedule.

Keep in Mind:

This schedule will be effective from January 8, 2024 and will replace the schedule of October 2, 2023.

Holiday Service
On Monday, February 19th, 2024 (President's Day) all lines will operate on a weekend schedule.

On Monday, January 15th, 2024 (Martin Luther King Jr. Day), and on Monday, April 15th, 2024 (Patriots' Day), all lines will operate on a regular weekday schedule.

For all holiday schedules, please check MBTA.com/holidays or call 617-222-3200.

Schedules may change in the event of severe weather

During weather events, these symbols will communicate service level and impact on passengers. Service level for the following day will be announced mid afternoon the prior day.

REGULAR SERVICE
Trains will operate on a normal schedule

STORM SERVICE
Trains will operate on a reduced schedule. It will be available on MBTA.com and in Boston stations.

NO SERVICE
No passenger service on Commuter Rail.

Times in purple with "f" indicate a flag stop: Passengers must tell the conductor that they wish to leave. Passengers waiting to board must be visible on the platform for the train to stop.

Times in blue with "L" indicate an early departure: The train may leave ahead of schedule at these stops.

Bikes: Bicycles are allowed on trains with the bicycle symbol shown below the train number.

High level platform and bridge plate available. Visit **mbta.com/accessibility** for more information.

Home / Routes / GATRA GO United

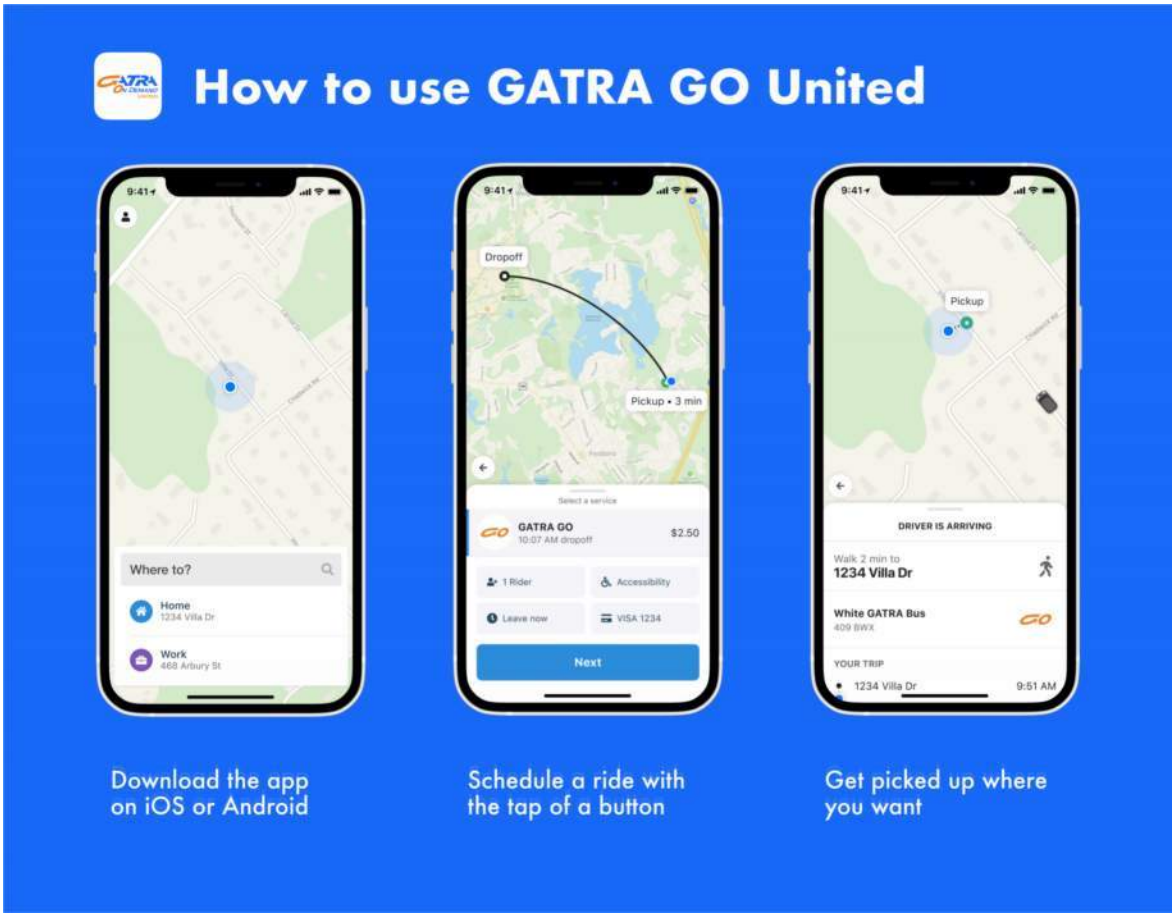
GATRA GO United

GATRA GO United is an on-demand, same day, affordable, and accessible public transit service serving the communities of Foxborough, Franklin, Mansfield, Norton, Norfolk, and Wrentham.

Riders can be picked up/dropped off anywhere within the towns of Foxborough, Franklin, Mansfield, Norton, Norfolk, and Wrentham. Service is also available to Plainville Commons Marketplace (Target, Stop & Shop, TJ Maxx).

Hours
Monday-Friday, 6:30am-8:00pm
Saturday, 9:00am-8:00pm
Sunday 9:00am-6:00pm

To request a pick up, riders can download the GATRA GO mobile app on their smartphone or call 800-698-7676, where they will be assisted by a dispatcher.



Service not provided on: New Years Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Thanksgiving Day, Christmas Day

Fares

Connections

Regular Fare	$2.00
Children under 6 (with paying Adult)	Free
Verified Wheaton College Community Members	Free

ROUTE 14 ROUTE 18

Enter address or location

Stop Zone Legend

Flag stop zone: Flag down the bus anywhere along this segment to ride.

No stop zone: Bus will only stop at marked, designated stops in this area.

About GATRA

GATRA's service area consists of 30 communities, including of the cities of Attleboro and Taunton and the towns of Bellingham, Berkley, Carver, Dighton, Duxbury, Foxborough, Franklin, Halifax, Hanover, Kingston, Lakeville, Mansfield, Marshfield, Medway, Middleborough, Norfolk, North Attleborough, Norton, Pembroke, Plainville, Plymouth, Plympton, Raynham, Rehoboth, Scituate, Seekonk, Wareham, and Wrentham.

Contact Us
800-483-2500
TTY: 711
10 Oak Street Taunton, MA 02780

Requests For Information In Alternate Formats
All documents and information available on this website are available in alternate formats upon request.

How to Ride
About Us
MassHealth/PT-1 Rides
Employment
GATRA Advisory Board
Open Government
Procurement
Reports and Policies
Safety Reporting & Protocols
Title VI
Attleboro Commuter Parking Lot

TRAFFIC COUNT DATA

Prepared by National Data & Surveying Services

SPEED

Constitution Blvd S/O Northern Site Dwy/Dell Technologies Employee Dwy

Day: Wednesday
Date: 3/13/2024

City: Franklin
Project #: MA24_430011_001

HOURLY BREAKDOWN

NORTHBOUND

Time	5-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-99	Total
0:00	2	0	0	0	6	2	1	1	0	0	0	0	0	12
1:00	0	0	1	5	8	6	1	1	0	0	0	0	0	22
2:00	3	2	0	0	1	1	0	0	0	0	0	0	0	7
3:00	4	0	0	1	0	1	0	0	0	0	0	0	0	6
4:00	1	2	1	1	0	1	0	0	0	0	0	0	0	6
5:00	6	0	0	0	4	1	0	0	0	0	0	0	0	11
6:00	2	2	1	9	5	4	1	0	0	0	0	0	0	24
7:00	2	3	8	7	9	10	1	0	0	0	0	0	0	40
8:00	0	6	8	14	11	12	2	0	0	0	0	0	0	53
9:00	1	7	4	15	15	11	4	0	0	0	0	0	0	57
10:00	2	4	4	12	12	10	3	1	0	0	0	0	0	48
11:00	5	5	12	35	38	22	6	3	0	0	0	0	0	126
12:00	5	11	24	39	56	37	1	0	0	0	0	0	0	173
13:00	1	4	12	25	27	18	7	0	0	0	0	0	0	94
14:00	9	4	14	24	47	26	8	5	0	0	0	0	0	137
15:00	3	7	33	64	71	53	17	3	0	0	0	0	0	251
16:00	0	9	24	54	60	48	13	3	0	0	0	0	0	211
17:00	1	3	22	33	38	32	8	2	0	0	0	0	0	139
18:00	0	1	6	9	16	13	3	0	0	0	0	0	0	48
19:00	2	0	2	6	6	2	0	1	0	0	0	0	0	19
20:00	1	0	1	1	5	1	1	0	0	0	0	0	0	10
21:00	0	0	2	3	10	3	0	0	0	0	0	0	0	18
22:00	0	0	0	4	10	7	2	0	0	0	0	0	0	23
23:00	0	0	5	8	10	10	5	0	0	0	0	0	0	38
Totals	**50**	**70**	**184**	**369**	**465**	**331**	**84**	**20**	**0**	**0**	**0**	**0**	**0**	**1,573**
% of Totals	3%	4%	12%	23%	30%	21%	5%	1%						100%

SOUTHBOUND

Time	5-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-99	Total
0:00	0	0	0	1	2	1	0	0	0	0	0	0	0	4
1:00	0	0	0	0	2	2	0	0	0	0	0	0	0	4
2:00	0	0	0	0	0	2	0	0	0	0	0	0	0	2
3:00	0	0	0	0	5	2	0	0	0	0	0	0	0	7
4:00	0	0	2	5	10	13	2	0	0	0	0	0	0	32
5:00	0	1	3	10	52	29	8	2	0	0	0	0	0	105
6:00	0	0	6	20	115	63	8	1	0	0	0	0	0	213
7:00	0	2	7	32	122	40	5	0	0	0	0	0	0	208
8:00	1	2	14	48	82	36	6	0	0	0	0	0	0	189
9:00	0	1	4	19	58	22	3	0	0	0	0	0	0	107
10:00	1	1	8	30	19	3	1	1	0	0	0	0	0	64
11:00	0	2	5	19	28	14	1	0	0	0	0	0	0	69
12:00	1	0	7	34	76	24	3	0	0	0	0	0	0	145
13:00	0	7	6	30	42	21	2	0	0	0	0	0	0	108
14:00	1	4	6	29	42	17	7	0	0	0	0	0	0	106
15:00	0	0	4	16	25	5	1	0	0	0	0	0	0	51
16:00	0	0	2	8	20	2	2	0	0	0	0	0	0	34
17:00	0	1	2	6	9	0	0	0	0	0	0	0	0	18
18:00	0	0	0	4	10	3	1	0	0	0	0	0	0	18
19:00	0	0	0	3	4	4	0	0	0	0	0	0	0	11
20:00	0	2	1	3	3	2	0	0	0	0	0	0	0	11
21:00	0	0	0	1	5	1	0	0	0	0	0	0	0	7
22:00	0	0	0	1	5	5	0	0	0	0	0	0	0	11
23:00	0	0	0	0	6	1	0	0	0	0	0	0	0	7
Totals	**4**	**23**	**77**	**319**	**742**	**312**	**50**	**4**	**0**	**0**	**0**	**0**	**0**	**1,531**
% of Totals	0%	2%	5%	21%	48%	20%	3%	0%						100%

TOTALS

Time	5-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-99	Total
0:00	2	0	0	1	8	3	1	1	0	0	0	0	0	16
1:00	0	0	1	5	10	8	1	1	0	0	0	0	0	26
2:00	3	2	0	0	1	3	0	0	0	0	0	0	0	9
3:00	4	0	0	1	5	3	0	0	0	0	0	0	0	13
4:00	1	2	3	6	10	14	2	0	0	0	0	0	0	38
5:00	6	1	3	10	56	30	8	2	0	0	0	0	0	116
6:00	2	2	7	29	120	67	9	1	0	0	0	0	0	237
7:00	2	5	15	39	131	50	6	0	0	0	0	0	0	248
8:00	1	8	22	62	93	48	8	0	0	0	0	0	0	242
9:00	1	8	8	34	73	33	7	0	0	0	0	0	0	164
10:00	3	5	12	42	31	13	4	2	0	0	0	0	0	112
11:00	5	7	17	54	66	36	7	3	0	0	0	0	0	195
12:00	6	11	31	73	132	61	4	0	0	0	0	0	0	318
13:00	1	11	18	55	69	39	9	0	0	0	0	0	0	202
14:00	10	8	20	53	89	43	15	5	0	0	0	0	0	243
15:00	3	7	37	80	96	58	18	3	0	0	0	0	0	302
16:00	0	9	26	62	80	50	15	3	0	0	0	0	0	245
17:00	1	4	24	39	47	32	8	2	0	0	0	0	0	157
18:00	0	1	6	13	26	16	4	0	0	0	0	0	0	66
19:00	2	0	2	9	10	6	0	1	0	0	0	0	0	30
20:00	1	2	2	4	8	3	1	0	0	0	0	0	0	21
21:00	0	0	2	4	15	4	0	0	0	0	0	0	0	25
22:00	0	0	0	5	15	12	2	0	0	0	0	0	0	34
23:00	0	0	5	8	16	11	5	0	0	0	0	0	0	45
Totals	**54**	**93**	**261**	**688**	**1,207**	**643**	**134**	**24**	**0**	**0**	**0**	**0**	**0**	**3,104**
% of Totals	2%	3%	8%	22%	39%	21%	4%	1%						100%

STATISTICS

NORTHBOUND

	5-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-99	Total
00:00 - 12:00	28	31	39	99	109	81	19	6	0	0	0	0	0	412
%	2%	2%	2%	6%	7%	5%	1%	0%	0%	0%	0%	0%	0%	26%
Peak Hour	5:00	9:00	11:45	11:30	11:30	11:30	11:00	11:00	0:00	0:00	0:00	0:00	0:00	11:30
Peak Volume	6	7	20	47	64	43	6	3	0	0	0	0	0	189
12:00 - 24:00	22	39	145	270	356	250	65	14	0	0	0	0	0	1161
%	1%	2%	9%	17%	23%	16%	4%	1%	0%	0%	0%	0%	0%	74%
Peak Hour	14:30	12:15	14:45	15:15	14:45	15:15	15:15	14:00	12:00	12:00	12:00	12:00	12:00	15:15
Peak Volume	10	12	33	66	78	67	18	5	0	0	0	0	0	275
07:00 - 09:00	2	9	16	21	20	22	3	0	0	0	0	0	0	93
%	0%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	6%
Peak Hour	7:00	7:45	7:00	8:00	8:00	8:00	7:45	7:00	7:00	7:00	7:00	7:00	7:00	8:00
Peak Volume	2	6	8	14	11	12	3	0	0	0	0	0	0	53
16:00 - 18:00	1	12	46	87	98	80	21	5	0	0	0	0	0	350
%	0%	1%	3%	6%	6%	5%	1%	0%	0%	0%	0%	0%	0%	22%
Peak Hour	16:15	16:00	16:15	16:00	16:00	16:00	16:00	16:15	16:00	16:00	16:00	16:00	16:00	16:00
Peak Volume	1	9	26	54	60	48	13	4	0	0	0	0	0	211

SOUTHBOUND

	5-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-99	Total
00:00 - 12:00	2	9	49	184	495	227	34	4	0	0	0	0	0	1004
%	0%	1%	3%	12%	31%	14%	2%	0%	0%	0%	0%	0%	0%	64%
Peak Hour	7:45	7:45	8:00	7:45	7:15	6:15	5:30	5:15	0:00	0:00	0:00	0:00	0:00	7:30
Peak Volume	1	3	14	51	125	64	11	3	0	0	0	0	0	232
12:00 - 24:00	2	14	28	135	247	85	16	0	0	0	0	0	0	527
%	0%	1%	2%	9%	16%	5%	1%	0%	0%	0%	0%	0%	0%	34%
Peak Hour	12:00	13:30	12:15	12:15	12:00	12:45	13:45	12:00	12:00	12:00	12:00	12:00	12:00	12:15
Peak Volume	1	9	8	38	76	31	8	0	0	0	0	0	0	152
07:00 - 09:00	1	4	21	80	204	76	11	0	0	0	0	0	0	397
%	0%	0%	1%	5%	13%	5%	1%	0%	0%	0%	0%	0%	0%	25%
Peak Hour	7:45	7:45	8:00	7:45	7:15	7:30	7:45	7:00	7:00	7:00	7:00	7:00	7:00	7:30
Peak Volume	1	3	14	51	125	49	8	0	0	0	0	0	0	232
16:00 - 18:00	0	1	4	14	29	2	2	0	0	0	0	0	0	52
%	0%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	3%
Peak Hour	16:00	16:15	16:15	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00
Peak Volume	0	1	4	8	20	2	2	0	0	0	0	0	0	34

TOTALS

	5-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-99	Total
00:00 - 12:00	30	40	88	283	604	308	53	10	0	0	0	0	0	1416
%	2%	3%	6%	18%	38%	20%	3%	1%	0%	0%	0%	0%	0%	90%
Peak Hour	5:00	7:45	11:45	11:45	11:45	6:15	5:30	5:15	0:00	0:00	0:00	0:00	0:00	11:45
Peak Volume	6	9	26	74	136	70	12	3	0	0	0	0	0	317
12:00 - 24:00	24	53	173	405	603	335	81	14	0	0	0	0	0	1688
%	2%	3%	11%	26%	38%	21%	5%	1%	0%	0%	0%	0%	0%	107%
Peak Hour	13:45	12:45	14:45	14:45	12:00	15:15	15:15	14:00	12:00	12:00	12:00	12:00	12:00	14:45
Peak Volume	10	14	40	80	132	69	21	5	0	0	0	0	0	322
07:00 - 09:00	3	13	37	101	224	98	14	0	0	0	0	0	0	490
%	0%	1%	2%	6%	14%	6%	1%	0%	0%	0%	0%	0%	0%	31%
Peak Hour	7:00	7:45	8:00	8:00	7:15	7:15	7:45	7:00	7:00	7:00	7:00	7:00	7:00	7:30
Peak Volume	2	9	22	62	134	59	11	0	0	0	0	0	0	273
16:00 - 18:00	1	13	50	101	127	82	23	5	0	0	0	0	0	402
%	0%	1%	3%	6%	8%	5%	1%	0%	0%	0%	0%	0%	0%	26%
Peak Hour	16:15	16:00	16:15	16:00	16:00	16:00	16:00	16:15	16:00	16:00	16:00	16:00	16:00	16:00
Peak Volume	1	9	30	62	80	50	15	4	0	0	0	0	0	245

Direction	Percentiles 15th	50th	Average	85th	95th	ADT
NORTHBOUND	23	31	31	38	42	1573
SOUTHBOUND	27	32	32	37	40	1531
TOTALS	25	32	31	38	40	3104

15-MINUTE BREAKDOWN

NORTHBOUND

Time	5-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-99	Total
0:00	0	0	0	0	4	2	1	1	0	0	0	0	0	8
0:15	2	0	0	0	0	0	0	0	0	0	0	0	0	2
0:30	0	0	0	0	1	0	0	0	0	0	0	0	0	1
0:45	0	0	0	0	1	0	0	0	0	0	0	0	0	1
1:00	0	0	1	4	8	4	0	1	0	0	0	0	0	18
1:15	0	0	0	0	0	1	1	0	0	0	0	0	0	2
1:30	0	0	0	1	0	1	0	0	0	0	0	0	0	2
1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	1	1	0	0	1	1	0	0	0	0	0	0	0	4
2:15	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30	1	1	0	0	0	0	0	0	0	0	0	0	0	2
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
3:15	1	0	0	0	0	1	0	0	0	0	0	0	0	2
3:30	2	0	0	0	0	0	0	0	0	0	0	0	0	2
3:45	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:30	0	1	0	0	0	1	0	0	0	0	0	0	0	2
4:45	0	0	1	1	0	0	0	0	0	0	0	0	0	2
5:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2
5:15	3	0	0	0	1	0	0	0	0	0	0	0	0	4
5:30	0	0	0	0	1	0	0	0	0	0	0	0	0	1
5:45	3	0	0	0	1	0	0	0	0	0	0	0	0	4
6:00	0	1	0	3	1	1	0	0	0	0	0	0	0	6
6:15	1	0	1	1	0	1	1	0	0	0	0	0	0	5
6:30	1	1	0	2	1	0	0	0	0	0	0	0	0	5
6:45	0	0	0	3	3	2	0	0	0	0	0	0	0	8
7:00	0	1	1	3	3	3	0	0	0	0	0	0	0	11
7:15	1	1	2	0	1	2	0	0	0	0	0	0	0	7
7:30	0	0	2	2	3	3	0	0	0	0	0	0	0	10
7:45	1	1	3	2	2	2	1	0	0	0	0	0	0	12
8:00	0	1	1	5	3	4	0	0	0	0	0	0	0	14
8:15	0	0	1	1	2	0	1	0	0	0	0	0	0	5
8:30	0	4	2	1	1	3	1	0	0	0	0	0	0	12
8:45	0	1	4	7	5	5	0	0	0	0	0	0	0	22
9:00	0	0	1	6	4	4	1	0	0	0	0	0	0	16
9:15	0	1	0	0	2	0	1	0	0	0	0	0	0	4
9:30	1	3	2	5	6	3	2	0	0	0	0	0	0	22
9:45	0	3	1	4	3	4	0	0	0	0	0	0	0	15
10:00	0	0	1	3	3	2	1	0	0	0	0	0	0	10
10:15	0	1	2	0	1	2	1	1	0	0	0	0	0	8
10:30	1	1	1	4	4	4	1	0	0	0	0	0	0	16
10:45	1	2	0	5	4	2	0	0	0	0	0	0	0	14
11:00	2	1	3	6	6	2	1	0	0	0	0	0	0	21
11:15	1	2	3	7	6	3	1	1	0	0	0	0	0	24
11:30	1	0	3	8	15	8	1	1	0	0	0	0	0	37
11:45	1	2	3	14	11	9	3	1	0	0	0	0	0	44
12:00	2	1	8	12	15	15	0	0	0	0	0	0	0	53
12:15	0	2	5	13	23	11	1	0	0	0	0	0	0	55
12:30	1	1	4	7	12	8	0	0	0	0	0	0	0	33
12:45	2	7	7	7	6	3	0	0	0	0	0	0	0	32
13:00	0	2	2	8	8	4	3	0	0	0	0	0	0	27
13:15	0	1	3	5	4	5	2	0	0	0	0	0	0	20
13:30	0	1	2	8	11	5	1	0	0	0	0	0	0	28
13:45	1	0	5	4	4	4	1	0	0	0	0	0	0	19
14:00	1	0	3	6	11	6	2	1	0	0	0	0	0	30
14:15	0	1	3	2	6	4	1	2	0	0	0	0	0	19
14:30	7	2	4	7	12	7	2	0	0	0	0	0	0	41
14:45	1	1	4	9	18	9	3	2	0	0	0	0	0	47
15:00	1	3	11	19	19	12	3	1	0	0	0	0	0	69
15:15	1	0	8	13	21	12	5	0	0	0	0	0	0	60
15:30	0	4	10	23	20	21	6	2	0	0	0	0	0	86
15:45	1	0	4	9	11	8	3	0	0	0	0	0	0	36
16:00	0	4	11	21	26	26	4	1	0	0	0	0	0	93
16:15	0	4	6	10	11	9	3	1	0	0	0	0	0	44
16:30	0	1	4	11	11	6	4	1	0	0	0	0	0	38
16:45	0	0	3	12	12	7	2	0	0	0	0	0	0	36
17:00	1	1	13	15	17	24	4	2	0	0	0	0	0	77
17:15	0	0	3	6	9	3	2	0	0	0	0	0	0	23
17:30	0	0	6	5	8	3	1	0	0	0	0	0	0	23
17:45	0	2	0	7	4	2	1	0	0	0	0	0	0	16
18:00	0	0	2	3	5	4	1	0	0	0	0	0	0	15
18:15	0	0	1	3	3	3	1	0	0	0	0	0	0	11
18:30	0	0	2	2	3	3	0	0	0	0	0	0	0	10
18:45	0	1	1	1	5	3	1	0	0	0	0	0	0	12
19:00	0	0	0	1	4	0	0	0	0	0	0	0	0	5
19:15	2	0	0	3	1	1	0	1	0	0	0	0	0	8
19:30	0	0	1	2	1	0	0	0	0	0	0	0	0	4
19:45	0	0	1	0	0	1	0	0	0	0	0	0	0	2
20:00	1	0	0	0	1	0	0	0	0	0	0	0	0	2
20:15	0	0	0	1	2	1	1	0	0	0	0	0	0	5
20:30	0	0	1	0	1	0	0	0	0	0	0	0	0	2
20:45	0	0	0	0	1	0	0	0	0	0	0	0	0	1
21:00	0	0	1	1	1	0	0	0	0	0	0	0	0	3
21:15	0	0	1	0	4	0	0	0	0	0	0	0	0	5
21:30	0	0	0	2	3	1	0	0	0	0	0	0	0	6
21:45	0	0	0	0	2	2	0	0	0	0	0	0	0	4
22:00	0	0	0	0	1	3	1	0	0	0	0	0	0	5
22:15	0	0	0	1	0	2	0	0	0	0	0	0	0	3
22:30	0	0	0	1	3	1	1	0	0	0	0	0	0	6
22:45	0	0	0	2	6	1	0	0	0	0	0	0	0	9
23:00	0	0	1	2	2	2	2	0	0	0	0	0	0	9
23:15	0	0	3	4	6	5	2	0	0	0	0	0	0	20
23:30	0	0	0	1	2	1	0	0	0	0	0	0	0	4
23:45	0	0	1	1	0	2	1	0	0	0	0	0	0	5
Totals	**50**	**70**	**184**	**369**	**465**	**331**	**84**	**20**	**0**	**0**	**0**	**0**	**0**	**1,573**
% of Totals	3%	4%	12%	23%	30%	21%	5%	1%	0%	0%	0%	0%	0%	100%

SOUTHBOUND

Time	5-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-99	Total
0:00	0	0	0	1	1	1	0	0	0	0	0	0	0	3
0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0:45	0	0	0	0	1	0	0	0	0	0	0	0	0	1
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15	0	0	0	0	1	1	0	0	0	0	0	0	0	2
1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45	0	0	0	0	1	1	0	0	0	0	0	0	0	2
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2:30	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
3:15	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3:30	0	0	0	0	1	1	0	0	0	0	0	0	0	2
3:45	0	0	0	0	3	0	0	0	0	0	0	0	0	3
4:00	0	0	0	1	1	2	1	0	0	0	0	0	0	5
4:15	0	0	1	0	0	0	0	0	0	0	0	0	0	1
4:30	0	0	0	1	5	5	1	0	0	0	0	0	0	12
4:45	0	0	1	3	4	6	0	0	0	0	0	0	0	14
5:00	0	0	0	1	9	4	0	0	0	0	0	0	0	14
5:15	0	0	0	2	10	4	0	0	0	0	0	0	0	16
5:30	0	1	2	3	7	7	3	1	0	0	0	0	0	24
5:45	0	0	1	4	26	14	5	1	0	0	0	0	0	51
6:00	0	0	1	0	26	7	2	1	0	0	0	0	0	37
6:15	0	0	0	7	27	21	1	0	0	0	0	0	0	56
6:30	0	0	1	2	29	20	2	0	0	0	0	0	0	54
6:45	0	0	4	11	33	15	3	0	0	0	0	0	0	66
7:00	0	1	3	6	32	8	1	0	0	0	0	0	0	51
7:15	0	0	0	4	23	10	1	0	0	0	0	0	0	38
7:30	0	0	0	9	28	11	0	0	0	0	0	0	0	48
7:45	0	1	4	13	39	11	3	0	0	0	0	0	0	71
8:00	0	0	1	10	35	16	1	0	0	0	0	0	0	63
8:15	0	0	3	12	22	11	2	0	0	0	0	0	0	50
8:30	1	2	3	16	7	4	2	0	0	0	0	0	0	35
8:45	0	0	7	10	18	5	1	0	0	0	0	0	0	41
9:00	0	0	1	7	18	9	1	0	0	0	0	0	0	36
9:15	0	1	0	5	11	6	0	0	0	0	0	0	0	23
9:30	0	0	0	1	14	2	2	0	0	0	0	0	0	19
9:45	0	0	3	6	15	5	0	0	0	0	0	0	0	29
10:00	1	1	1	7	5	1	0	0	0	0	0	0	0	16
10:15	0	0	2	6	4	1	0	0	0	0	0	0	0	13
10:30	0	0	1	7	2	1	1	1	0	0	0	0	0	13
10:45	0	0	4	10	8	0	0	0	0	0	0	0	0	22
11:00	0	0	2	3	5	2	0	0	0	0	0	0	0	12
11:15	0	1	2	5	10	3	0	0	0	0	0	0	0	21
11:30	0	0	0	3	3	4	0	0	0	0	0	0	0	10
11:45	0	1	1	8	10	5	1	0	0	0	0	0	0	26
12:00	0	0	1	8	14	7	0	0	0	0	0	0	0	30
12:15	1	0	3	5	23	0	1	0	0	0	0	0	0	33
12:30	0	0	1	7	28	7	0	0	0	0	0	0	0	43
12:45	0	0	2	14	11	10	2	0	0	0	0	0	0	39
13:00	0	1	2	12	13	8	1	0	0	0	0	0	0	37
13:15	0	0	1	5	14	3	0	0	0	0	0	0	0	23
13:30	0	2	1	4	6	10	0	0	0	0	0	0	0	23
13:45	0	4	2	9	9	0	1	0	0	0	0	0	0	25
14:00	1	1	0	9	12	1	2	0	0	0	0	0	0	26
14:15	0	2	2	8	14	5	3	0	0	0	0	0	0	34
14:30	0	0	0	8	11	6	2	0	0	0	0	0	0	27
14:45	0	1	4	4	5	5	0	0	0	0	0	0	0	19
15:00	0	0	1	4	10	3	0	0	0	0	0	0	0	18
15:15	0	0	1	4	7	0	0	0	0	0	0	0	0	12
15:30	0	0	1	4	4	1	1	0	0	0	0	0	0	11
15:45	0	0	1	4	4	1	0	0	0	0	0	0	0	10
16:00	0	0	0	1	7	0	2	0	0	0	0	0	0	10
16:15	0	0	1	2	6	0	0	0	0	0	0	0	0	9
16:30	0	0	1	4	5	1	0	0	0	0	0	0	0	11
16:45	0	0	0	1	2	1	0	0	0	0	0	0	0	4
17:00	0	1	2	1	1	0	0	0	0	0	0	0	0	5
17:15	0	0	0	0	1	0	0	0	0	0	0	0	0	1
17:30	0	0	0	4	3	0	0	0	0	0	0	0	0	7
17:45	0	0	0	1	4	0	0	0	0	0	0	0	0	5
18:00	0	0	0	1	2	1	0	0	0	0	0	0	0	4
18:15	0	0	0	2	3	1	0	0	0	0	0	0	0	6
18:30	0	0	0	1	3	1	0	0	0	0	0	0	0	5
18:45	0	0	0	0	2	0	1	0	0	0	0	0	0	3
19:00	0	0	0	0	1	1	0	0	0	0	0	0	0	2
19:15	0	0	0	1	2	3	0	0	0	0	0	0	0	6
19:30	0	0	0	1	1	0	0	0	0	0	0	0	0	2
19:45	0	0	0	1	0	0	0	0	0	0	0	0	0	1
20:00	0	1	0	1	1	1	0	0	0	0	0	0	0	4
20:15	0	0	1	0	0	0	0	0	0	0	0	0	0	1
20:30	0	0	0	1	2	1	0	0	0	0	0	0	0	4
20:45	0	1	0	1	0	0	0	0	0	0	0	0	0	2
21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:15	0	0	0	1	3	1	0	0	0	0	0	0	0	5
21:30	0	0	0	0	1	0	0	0	0	0	0	0	0	1
21:45	0	0	0	0	1	0	0	0	0	0	0	0	0	1
22:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
22:15	0	0	0	0	0	1	0	0	0	0	0	0	0	1
22:30	0	0	0	1	2	3	0	0	0	0	0	0	0	6
22:45	0	0	0	0	2	1	0	0	0	0	0	0	0	3
23:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
23:15	0	0	0	0	1	0	0	0	0	0	0	0	0	1
23:30	0	0	0	0	1	1	0	0	0	0	0	0	0	2
23:45	0	0	0	0	3	0	0	0	0	0	0	0	0	3
Totals	**4**	**23**	**77**	**319**	**742**	**312**	**50**	**4**	**0**	**0**	**0**	**0**	**0**	**1,531**
% of Totals	0%	2%	5%	21%	48%	20%	3%	0%	0%	0%	0%	0%	0%	100%

TOTALS

Time	5-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-99	Total
0:00	0	0	0	1	5	3	1	1	0	0	0	0	0	11
0:15	2	0	0	0	0	0	0	0	0	0	0	0	0	2
0:30	0	0	0	0	1	0	0	0	0	0	0	0	0	1
0:45	0	0	0	0	2	0	0	0	0	0	0	0	0	2
1:00	0	0	1	4	8	4	0	1	0	0	0	0	0	18
1:15	0	0	0	0	1	2	1	0	0	0	0	0	0	4
1:30	0	0	0	1	0	1	0	0	0	0	0	0	0	2
1:45	0	0	0	0	1	1	0	0	0	0	0	0	0	2
2:00	1	1	0	0	1	1	0	0	0	0	0	0	0	4
2:15	1	0	0	0	0	1	0	0	0	0	0	0	0	2
2:30	1	1	0	0	0	1	0	0	0	0	0	0	0	3
2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2
3:15	1	0	0	0	0	2	0	0	0	0	0	0	0	3
3:30	2	0	0	0	1	1	0	0	0	0	0	0	0	4
3:45	1	0	0	0	3	0	0	0	0	0	0	0	0	4
4:00	1	0	0	1	1	2	1	0	0	0	0	0	0	6
4:15	0	1	1	0	0	0	0	0	0	0	0	0	0	2
4:30	0	1	0	1	5	6	1	0	0	0	0	0	0	14
4:45	0	0	2	4	4	6	0	0	0	0	0	0	0	16
5:00	0	0	0	1	10	5	0	0	0	0	0	0	0	16
5:15	3	0	0	2	11	4	0	0	0	0	0	0	0	20
5:30	0	1	2	3	8	7	3	1	0	0	0	0	0	25
5:45	3	0	1	4	27	14	5	1	0	0	0	0	0	55
6:00	0	1	1	3	27	8	2	1	0	0	0	0	0	43
6:15	1	0	1	8	27	22	2	0	0	0	0	0	0	61
6:30	1	1	1	4	30	20	2	0	0	0	0	0	0	59
6:45	0	0	4	14	36	17	3	0	0	0	0	0	0	74
7:00	0	2	4	9	35	11	1	0	0	0	0	0	0	62
7:15	1	1	2	4	24	12	1	0	0	0	0	0	0	45
7:30	0	0	2	11	31	14	0	0	0	0	0	0	0	58
7:45	1	2	7	15	41	13	4	0	0	0	0	0	0	83
8:00	0	1	2	15	38	20	1	0	0	0	0	0	0	77
8:15	0	0	4	13	24	11	3	0	0	0	0	0	0	55
8:30	1	6	5	17	8	7	3	0	0	0	0	0	0	47
8:45	0	1	11	17	23	10	1	0	0	0	0	0	0	63
9:00	0	0	2	13	22	13	2	0	0	0	0	0	0	52
9:15	0	2	0	5	13	6	1	0	0	0	0	0	0	27
9:30	1	3	2	6	20	5	4	0	0	0	0	0	0	41
9:45	0	3	4	10	18	9	0	0	0	0	0	0	0	44
10:00	1	1	2	10	8	3	1	0	0	0	0	0	0	26
10:15	0	1	4	6	5	3	1	1	0	0	0	0	0	21
10:30	1	1	2	11	6	5	2	1	0	0	0	0	0	29
10:45	1	2	4	15	12	2	0	0	0	0	0	0	0	36
11:00	2	1	5	9	11	4	1	0	0	0	0	0	0	33
11:15	1	3	5	12	16	6	1	1	0	0	0	0	0	45
11:30	1	0	3	11	18	12	1	1	0	0	0	0	0	47
11:45	1	3	4	22	21	14	4	1	0	0	0	0	0	70
12:00	2	1	9	20	29	22	0	0	0	0	0	0	0	83
12:15	1	2	8	18	46	11	2	0	0	0	0	0	0	88
12:30	1	1	5	14	40	15	0	0	0	0	0	0	0	76
12:45	2	7	9	21	17	13	2	0	0	0	0	0	0	71
13:00	0	3	4	20	21	12	4	0	0	0	0	0	0	64
13:15	0	1	4	10	18	8	2	0	0	0	0	0	0	43
13:30	0	3	3	12	17	15	1	0	0	0	0	0	0	51
13:45	1	4	7	13	13	4	2	0	0	0	0	0	0	44
14:00	2	1	3	15	23	7	4	1	0	0	0	0	0	56
14:15	0	3	5	10	20	9	4	2	0	0	0	0	0	53
14:30	7	2	4	15	23	13	4	0	0	0	0	0	0	68
14:45	1	2	8	13	23	14	3	2	0	0	0	0	0	66
15:00	1	3	12	23	29	15	3	1	0	0	0	0	0	87
15:15	1	0	9	17	28	12	5	0	0	0	0	0	0	72
15:30	0	4	11	27	24	22	7	2	0	0	0	0	0	97
15:45	1	0	5	13	15	9	3	0	0	0	0	0	0	46
16:00	0	4	11	22	33	26	6	1	0	0	0	0	0	103
16:15	0	4	7	12	17	9	3	1	0	0	0	0	0	53
16:30	0	1	5	15	16	7	4	1	0	0	0	0	0	49
16:45	0	0	3	13	14	8	2	0	0	0	0	0	0	40
17:00	1	2	15	16	18	24	4	2	0	0	0	0	0	82
17:15	0	0	3	6	10	3	2	0	0	0	0	0	0	24
17:30	0	0	6	9	11	3	1	0	0	0	0	0	0	30
17:45	0	2	0	8	8	2	1	0	0	0	0	0	0	21
18:00	0	0	2	4	7	5	1	0	0	0	0	0	0	19
18:15	0	0	1	5	6	4	1	0	0	0	0	0	0	17
18:30	0	0	2	3	6	4	0	0	0	0	0	0	0	15
18:45	0	1	1	1	7	3	2	0	0	0	0	0	0	15
19:00	0	0	0	1	5	1	0	0	0	0	0	0	0	7
19:15	2	0	0	4	3	4	0	1	0	0	0	0	0	14
19:30	0	0	1	3	2	0	0	0	0	0	0	0	0	6
19:45	0	0	1	1	0	1	0	0	0	0	0	0	0	3
20:00	1	1	0	1	2	1	0	0	0	0	0	0	0	6
20:15	0	0	1	1	2	1	1	0	0	0	0	0	0	6
20:30	0	0	1	1	3	1	0	0	0	0	0	0	0	6
20:45	0	1	0	1	1	0	0	0	0	0	0	0	0	3
21:00	0	0	1	1	1	0	0	0	0	0	0	0	0	3
21:15	0	0	1	1	7	1	0	0	0	0	0	0	0	10
21:30	0	0	0	2	4	1	0	0	0	0	0	0	0	7
21:45	0	0	0	0	3	2	0	0	0	0	0	0	0	5
22:00	0	0	0	0	2	3	1	0	0	0	0	0	0	6
22:15	0	0	0	1	0	3	0	0	0	0	0	0	0	4
22:30	0	0	0	2	5	4	1	0	0	0	0	0	0	12
22:45	0	0	0	2	8	2	0	0	0	0	0	0	0	12
23:00	0	0	1	2	3	2	2	0	0	0	0	0	0	10
23:15	0	0	3	4	7	5	2	0	0	0	0	0	0	21
23:30	0	0	0	1	3	2	0	0	0	0	0	0	0	6
23:45	0	0	1	1	3	2	1	0	0	0	0	0	0	8
Totals	**54**	**93**	**261**	**688**	**1,207**	**643**	**134**	**24**	**0**	**0**	**0**	**0**	**0**	**3,104**
% of Totals	2%	3%	8%	22%	39%	21%	4%	1%	0%	0%	0%	0%	0%	100%

Prepared by National Data & Surveying Services

VOLUME

Constitution Blvd S/O Northern Site Dwy/Dell Technologies Employee Dwy

Day: Wednesday
Date: 3/13/2024

City: Franklin
Project #: MA24_430011_001

DAILY TOTALS	NB	SB	EB	WB	Total
	1,573	1,531	0	0	3,104

DAILY TOTALS

15-Minutes Interval

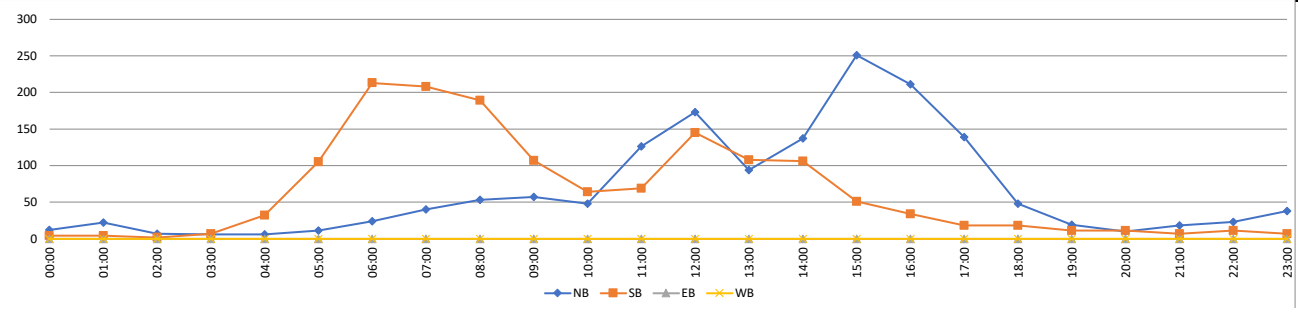
TIME	NB	SB	EB	WB	TOTAL	TIME	NB	SB	EB	WB	TOTAL
0:00	8	3			11	12:00	53	30			83
0:15	2	0			2	12:15	55	33			88
0:30	1	0			1	12:30	33	43			76
0:45	1	1			2	12:45	32	39			71
1:00	18	0			18	13:00	27	37			64
1:15	2	2			4	13:15	20	23			43
1:30	2	0			2	13:30	28	23			51
1:45	0	2			2	13:45	19	25			44
2:00	4	0			4	14:00	30	26			56
2:15	1	1			2	14:15	19	34			53
2:30	2	1			3	14:30	41	27			68
2:45	0	0			0	14:45	47	19			66
3:00	1	1			2	15:00	69	18			87
3:15	2	1			3	15:15	60	12			72
3:30	2	2			4	15:30	86	11			97
3:45	1	3			4	15:45	36	10			46
4:00	1	5			6	16:00	93	10			103
4:15	1	1			2	16:15	44	9			53
4:30	2	12			14	16:30	38	11			49
4:45	2	14			16	16:45	36	4			40
5:00	2	14			16	17:00	77	5			82
5:15	4	16			20	17:15	23	1			24
5:30	1	24			25	17:30	23	7			30
5:45	4	51			55	17:45	16	5			21
6:00	6	37			43	18:00	15	4			19
6:15	5	56			61	18:15	11	6			17
6:30	5	54			59	18:30	10	5			15
6:45	8	66			74	18:45	12	3			15
7:00	11	51			62	19:00	5	2			7
7:15	7	38			45	19:15	8	6			14
7:30	10	48			58	19:30	4	2			6
7:45	12	71			83	19:45	2	1			3
8:00	14	63			77	20:00	2	4			6
8:15	5	50			55	20:15	5	1			6
8:30	12	35			47	20:30	2	4			6
8:45	22	41			63	20:45	1	2			3
9:00	16	36			52	21:00	3	0			3
9:15	4	23			27	21:15	5	5			10
9:30	22	19			41	21:30	6	1			7
9:45	15	29			44	21:45	4	1			5
10:00	10	16			26	22:00	5	1			6
10:15	8	13			21	22:15	3	1			4
10:30	16	13			29	22:30	6	6			12
10:45	14	22			36	22:45	9	3			12
11:00	21	12			33	23:00	9	1			10
11:15	24	21			45	23:15	20	1			21
11:30	37	10			47	23:30	4	2			6
11:45	44	26			70	23:45	5	3			8
TOTALS	412	1004	0	0	1416	TOTALS	1161	527	0	0	1688
SPLIT %	29%	71%	0%	0%	46%	SPLIT %	69%	31%	0%	0%	54%

Hourly Intervals

TIME		NB	SB	EB	WB	TOTAL
00:00	01:00	12	4			16
01:00	02:00	22	4			26
02:00	03:00	7	2			9
03:00	04:00	6	7			13
04:00	05:00	6	32			38
05:00	06:00	11	105			116
06:00	07:00	24	213			237
07:00	08:00	40	208			248
08:00	09:00	53	189			242
09:00	10:00	57	107			164
10:00	11:00	48	64			112
11:00	12:00	126	69			195
12:00	13:00	173	145			318
13:00	14:00	94	108			202
14:00	15:00	137	106			243
15:00	16:00	251	51			302
16:00	17:00	211	34			245
17:00	18:00	139	18			157
18:00	19:00	48	18			66
19:00	20:00	19	11			30
20:00	21:00	10	11			21
21:00	22:00	18	7			25
22:00	23:00	23	11			34
23:00	00:00	38	7			45

STATISTICS

	NB	SB	EB	WB	TOTAL
Peak Period	00:00	to	12:00		
Volume	412	1004			1416
Peak Hour	11:00	7:30			7:30
Peak Volume	126	232			273
Peak Hour Factor	0.716	0.817			0.822
Peak Period	12:00	to	00:00		
Volume	1161	527			1688
Peak Hour	15:15	12:15			14:45
Peak Volume	275	152			322
Peak Hour Factor	0.739	0.884			0.830
Peak Period	07:00	to	09:00		
Volume	93	397			490
Peak Hour	8:00	7:30			7:30
Peak Volume	53	232			273
Peak Hour Factor	0.602	0.817			0.822
Peak Period	16:00	to	18:00		
Volume	350	52			402
Peak Hour	16:00	16:00			16:00
Peak Volume	211	34			245
Peak Hour Factor	0.567	0.773			0.595



Prepared by National Data & Surveying Services

SPEED

Constitution Blvd S/O Northern Site Dwy/Dell Technologies Employee Dwy

Day: Thursday **City:** Franklin
Date: 3/14/2024 **Project #:** MA24_430011_001

HOURLY BREAKDOWN

Time	NORTHBOUND													Total	SOUTHBOUND													Total	TOTALS													Total
	5 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 99		5 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 99		5 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 99	
0:00	1	1	0	1	2	0	1	1	0	0	0	0	0	7	0	0	0	0	2	0	0	0	0	0	0	0	0	2	1	1	0	1	4	0	1	1	0	0	0	0	0	9
1:00	0	0	1	2	10	8	1	0	0	0	0	0	0	22	0	0	0	0	2	0	1	0	0	0	0	0	0	3	0	0	1	2	12	8	2	0	0	0	0	0	0	25
2:00	3	2	0	1	0	1	1	0	0	0	0	0	0	8	0	0	0	0	1	2	0	0	0	0	0	0	0	3	3	2	0	1	1	3	1	0	0	0	0	0	0	11
3:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	4	0	0	0	0	0	0	0	0	5	1	0	0	1	4	0	0	0	0	0	0	0	0	6
4:00	0	0	1	1	0	0	0	0	0	0	0	0	0	2	0	0	1	6	7	6	3	1	0	0	0	0	0	24	0	0	2	7	7	6	3	1	0	0	0	0	0	26
5:00	2	1	0	1	2	1	0	0	0	0	0	0	0	7	0	1	5	13	37	33	9	2	0	0	0	0	0	100	2	2	5	14	39	34	9	2	0	0	0	0	0	107
6:00	0	0	4	4	7	2	0	1	0	0	0	0	0	18	0	3	6	35	102	55	12	2	0	0	0	0	0	215	0	3	10	39	109	57	12	3	0	0	0	0	0	233
7:00	0	2	6	11	15	12	2	0	0	0	0	0	0	48	0	0	7	41	93	53	8	0	0	0	0	0	0	202	0	2	13	52	108	65	10	0	0	0	0	0	0	250
8:00	0	4	3	17	19	6	3	0	0	0	0	0	0	52	0	1	8	47	65	34	3	0	1	0	0	0	0	159	0	5	11	64	84	40	6	0	1	0	0	0	0	211
9:00	0	10	5	6	17	11	4	0	0	0	0	0	0	53	1	2	12	25	33	16	5	1	0	0	0	0	0	95	1	12	17	31	50	27	9	1	0	0	0	0	0	148
10:00	0	6	11	8	14	18	1	1	0	0	0	0	0	59	0	2	5	14	26	6	2	0	0	0	0	0	0	55	0	8	16	22	40	24	3	1	0	0	0	0	0	114
11:00	2	2	7	24	43	28	7	1	0	0	0	0	0	114	1	3	5	21	20	17	3	0	0	0	0	0	0	70	3	5	12	45	63	45	10	1	0	0	0	0	0	184
12:00	3	9	8	29	49	45	4	0	0	0	0	0	0	147	0	2	6	39	72	26	5	1	0	0	0	0	0	151	3	11	14	68	121	71	9	1	0	0	0	0	0	298
13:00	4	9	3	22	25	24	3	0	0	0	0	0	0	90	1	2	6	28	38	15	6	1	0	0	0	0	0	97	5	11	9	50	63	39	9	1	0	0	0	0	0	187
14:00	5	6	17	20	62	29	7	2	0	0	0	0	0	148	1	1	5	27	39	24	5	0	0	0	0	0	0	102	6	7	22	47	101	53	12	2	0	0	0	0	0	250
15:00	3	5	8	37	95	73	11	3	0	0	0	0	0	235	0	1	5	11	16	10	1	0	1	0	0	0	0	45	3	6	13	48	111	83	12	3	1	0	0	0	0	280
16:00	4	10	6	38	91	63	6	1	0	0	0	0	0	219	0	0	4	9	10	4	4	0	0	0	0	0	0	31	4	10	10	47	101	67	10	1	0	0	0	0	0	250
17:00	0	3	3	25	69	37	4	0	0	0	0	0	0	141	0	0	4	5	10	1	0	0	0	0	0	0	0	20	0	3	7	30	79	38	4	0	0	0	0	0	0	161
18:00	0	3	5	10	21	5	2	1	0	0	0	0	0	47	0	0	2	7	5	2	1	0	0	0	0	0	0	17	0	3	7	17	26	7	3	1	0	0	0	0	0	64
19:00	0	0	2	5	6	2	0	0	0	0	0	0	0	15	0	1	1	3	4	2	0	0	0	0	0	0	0	11	0	1	3	8	10	4	0	0	0	0	0	0	0	26
20:00	0	0	0	4	4	3	1	0	0	0	0	0	0	12	0	0	1	1	6	1	0	0	0	0	0	0	0	9	0	0	1	5	10	4	1	0	0	0	0	0	0	21
21:00	0	1	2	1	6	3	0	0	0	0	0	0	0	13	0	0	0	2	3	1	0	0	0	0	0	0	0	6	0	1	2	3	9	4	0	0	0	0	0	0	0	19
22:00	0	0	1	2	9	10	1	1	0	0	0	0	0	24	0	0	1	3	3	3	0	0	0	0	0	0	0	10	0	0	2	5	12	13	1	1	0	0	0	0	0	34
23:00	1	0	0	9	15	9	2	2	0	0	0	0	0	38	0	0	0	2	6	3	0	0	0	0	0	0	0	11	1	0	0	11	21	12	2	2	0	0	0	0	0	49
Totals	29	74	93	278	581	390	61	14	0	0	0	0	0	1,520	4	19	84	340	604	314	68	8	2	0	0	0	0	1,443	33	93	177	618	1,185	704	129	22	2	0	0	0	0	2,963
% of Totals	2%	5%	6%	18%	38%	26%	4%	1%						100%	0%	1%	6%	24%	42%	22%	5%	1%	0%					100%	1%	3%	6%	21%	40%	24%	4%	1%	0%					100%

STATISTICS

	NB 5 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 99	Total	SB 5 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 99	Total	TOTALS 5 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 99	Total
00:00 - 12:00	9	28	38	76	129	87	20	4	0	0	0	0	0	391	2	12	49	203	392	222	46	6	1	0	0	0	0	933	11	40	87	279	521	309	66	10	1	0	0	0	0	1324
%	1%	2%	3%	5%	8%	6%	1%	0%	0%	0%	0%	0%	0%	26%	0%	1%	3%	13%	26%	15%	3%	0%	0%	0%	0%	0%	0%	61%	1%	3%	6%	18%	34%	20%	4%	1%	0%	0%	0%	0%	0%	87%
Peak Hour	11:45	9:00	10:00	11:45	11:30	11:30	11:15	0:00	0:00	0:00	0:00	0:00	0:00	11:30	8:15	11:30	9:15	7:45	6:15	6:15	5:45	5:15	7:15	0:00	0:00	0:00	0:00	6:15	11:45	9:00	9:15	7:45	6:15	11:45	5:45	5:15	7:15	0:00	0:00	0:00	0:00	11:45
Peak Volume	4	10	11	35	62	45	9	1	0	0	0	0	0	165	1	4	13	59	123	61	14	4	1	0	0	0	0	244	4	12	20	77	129	68	14	4	1	0	0	0	0	291
12:00 - 24:00	20	46	55	202	452	303	41	10	0	0	0	0	0	1129	2	7	35	137	212	92	22	2	1	0	0	0	0	510	22	53	90	339	664	395	63	12	1	0	0	0	0	1639
%	1%	3%	4%	13%	30%	20%	3%	1%	0%	0%	0%	0%	0%	74%	0%	0%	2%	9%	14%	6%	1%	0%	0%	0%	0%	0%	0%	34%	1%	3%	6%	22%	44%	26%	4%	1%	0%	0%	0%	0%	0%	108%
Peak Hour	14:00	13:15	14:30	14:45	15:30	15:15	14:30	14:30	12:00	12:00	12:00	12:00	12:00	15:30	12:30	12:00	12:45	12:00	12:00	12:00	12:15	12:00	15:00	12:00	12:00	12:00	12:00	12:00	14:00	12:00	14:30	12:00	15:30	14:45	14:30	14:30	15:00	12:00	12:00	12:00	12:00	14:45
Peak Volume	5	10	19	47	112	75	16	3	0	0	0	0	0	255	1	2	8	39	72	26	6	1	1	0	0	0	0	151	6	11	27	68	131	83	21	3	1	0	0	0	0	310
07:00 - 09:00	0	6	9	28	34	18	5	0	0	0	0	0	0	100	0	1	15	88	158	87	11	0	1	0	0	0	0	361	0	7	24	116	192	105	16	0	1	0	0	0	0	461
%	0%	0%	1%	2%	2%	1%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	1%	6%	10%	6%	1%	0%	0%	0%	0%	0%	0%	24%	0%	0%	2%	8%	13%	7%	1%	0%	0%	0%	0%	0%	0%	30%
Peak Hour	7:00	7:45	7:00	7:45	7:15	7:00	7:15	7:00	7:00	7:00	7:00	7:00	7:00	7:30	7:00	8:00	7:45	7:45	7:30	7:00	7:00	7:00	7:15	7:00	7:00	7:00	7:00	7:30	7:00	8:00	7:45	7:45	7:30	7:00	7:00	7:00	7:15	7:00	7:00	7:00	7:00	7:30
Peak Volume	0	4	6	18	21	12	3	0	0	0	0	0	0	55	0	1	12	59	103	53	8	0	1	0	0	0	0	225	0	5	16	77	123	65	10	0	1	0	0	0	0	280
16:00 - 18:00	4	13	9	63	160	100	10	1	0	0	0	0	0	360	0	0	8	14	20	5	4	0	0	0	0	0	0	51	4	13	17	77	180	105	14	1	0	0	0	0	0	411
%	0%	1%	1%	4%	11%	7%	1%	0%	0%	0%	0%	0%	0%	24%	0%	0%	1%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	1%	1%	5%	12%	7%	1%	0%	0%	0%	0%	0%	0%	27%
Peak Hour	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:15	16:00	16:45	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00
Peak Volume	4	10	6	38	91	63	6	1	0	0	0	0	0	219	0	0	6	9	13	4	4	0	0	0	0	0	0	31	4	10	10	47	101	67	10	1	0	0	0	0	0	250

Direction	Percentiles 15th	50th	Average	85th	95th	ADT
NORTHBOUND	26	32	32	38	40	1520
SOUTHBOUND	27	32	32	38	40	1443
TOTALS	26	32	32	38	40	2963

15-MINUTE BREAKDOWN

Time	NB 5 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 99	Total	SB 5 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 99	Total	TOTALS 5 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 99	Total
0:00	0	0	0	0	2	0	1	1	0	0	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	1	1	0	0	0	0	0	5
0:15	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
0:30	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1
1:00	0	0	0	2	10	6	1	0	0	0	0	0	0	19	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	2	11	6	1	0	0	0	0	0	0	20
1:15	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
1:30	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	2
1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1
2:00	1	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	3
2:15	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30	1	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	3
2:45	0	1	0	1	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	1	0	2	0	0	0	0	0	0	0	4
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	2
3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	2
3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	2
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	2
4:15	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	1	0	0	0	0	0	4	0	0	1	1	1	1	0	1	0	0	0	0	0	5
4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	3	2	0	0	0	0	0	0	8	0	0	1	0	2	3	2	0	0	0	0	0	0	8
4:45	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	3	4	2	1	0	0	0	0	0	0	10	0	0	0	4	4	2	1	0	0	0	0	0	0	11
5:00	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	3	2	0	0	0	0	0	0	0	7	1	0	1	1	3	2	0	0	0	0	0	0	0	8
5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	6	2	1	0	0	0	0	0	14	0	0	1	3	1	6	2	1	0	0	0	0	0	14
5:30	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	2	1	6	11	2	0	0	0	0	0	0	23	0	1	2	1	6	12	2	0	0	0	0	0	0	24
5:45	1	1	0	1	2	0	0	0	0	0	0	0	0	5	0	0	1	8	27	14	5	1	0	0	0	0	0	56	1	1	1	9	29	14	5	1	0	0	0	0	0	61
6:00	0	0	0	2	1	0	0	0	0	0	0	0	0	3	0	0	1	4	10	11	2	2	0	0	0	0	0	30	0	0	1	6	11	11	2	2	0	0	0	0	0	33
6:15	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	6	26	21	3	0	0	0	0	0	0	57	0	0	1	7	26	21	3	0	0	0	0	0	0	58
6:30	0	0	2	1	3	2	0	0	0	0	0	0	0	8	0	0	2	14	28	9	4	0	0	0	0	0	0	57	0	0	4	15	31	11	4	0	0	0	0	0	0	65
6:45	0	0	2	0	3	0	0	1	0	0	0	0	0	6	0	3	2	11	38	14	3	0	0	0	0	0	0	71	0	3	4	11	41	14	3	1	0	0	0	0	0	77
7:00	0	1	1	3	0	3	0	0	0	0	0	0	0	8	0	0	1	8	31	17	2	0	0	0	0	0	0	59	0	1	2	11	31	20	2	0	0	0	0	0	0	67
7:15	0	1	1	2	5	3	1	0	0	0	0	0	0	13	0	0	1	1	13	8	4	0	0	0	0	0	0	27	0	1	2	3	18	11	5	0	0	0	0	0	0	40
7:30	0	0	2	1	6	3	1	0	0	0	0	0	0	13	0	0	0	13	24	13	1	0	0	0	0	0	0	51	0	0	2	14	30	16	2	0	0	0	0	0	0	64
7:45	0	0	2	5	4	3	0	0	0	0	0	0	0	14	0	0	5	19	25	15	1	0	0	0	0	0	0	65	0	0	7	24	29	18	1	0	0	0	0	0	0	79
8:00	0	1	1	3	6	2	1	0	0	0	0	0	0	14	0	0	2	17	24	9	0	0	1	0	0	0	0	53	0	1	3	20	30	11	1	0	1	0	0	0	0	67
8:15	0	1	0	7	4	1	1	0	0	0	0	0	0	14	0	0	1	9	30	15	1	0	0	0	0	0	0	56	0	1	1	16	34	16	2	0	0	0	0	0	0	70
8:30	0	2	1	3	3	1	1	0	0	0	0	0	0	11	0	0	4	14	4	4	0	0	0	0	0	0	0	26	0	2	5	17	7	5	1	0	0	0	0	0	0	37
8:45	0	0	1	4	6	2	0	0	0	0	0	0	0	13	0	1	1	7	7	6	2	0	0	0	0	0	0	24	0	1	2	11	13	8	2	0	0	0	0	0	0	37
9:00	0	1	0	0	3	5	2	0	0	0	0	0	0	11	1	1	4	11	10	6	1	0	0	0	0	0	0	34	1	2	4	11	13	11	3	0	0	0	0	0	0	45
9:15	0	5	3	1	3	1	0	0	0	0	0	0	0	13	0	1	3	5	7	3	2	0	0	0	0	0	0	21	0	6	6	6	10	4	2	0	0	0	0	0	0	34
9:30	0	2	2	3	5	2	1	0	0	0	0	0	0	15	0	0	4	0	8	6	0	1	0	0	0	0	0	19	0	2	6	3	13	8	1	1	0	0	0	0	0	34
9:45	0	2	0	2	6	3	1	0	0	0	0	0	0	14	0	0	1	9	8	1	2	0	0	0	0	0	0	21	0	2	1	11	14	4	3	0	0	0	0	0	0	35
10:00	0	1	2	0	5	3	1	1	0	0	0	0	0	13	0	1	5	6	7	1	0	0	0	0	0	0	0	20	0	2	7	6	12	4	1	1	0	0	0	0	0	33
10:15	0	3	2	1	2	5	0	0	0	0	0	0	0	13	0	0	0	5	8	2	0	0	0	0	0	0	0	15	0	3	2	6	10	7	0	0	0	0	0	0	0	28
10:30	0	0	4	4	3	7	0	0	0	0	0	0	0	18	0	0	0	0	2	2	2	0	0	0	0	0	0	6	0	0	4	4	5	9	2	0	0	0	0	0	0	24
10:45	0	2	3	3	4	3	0	0	0	0	0	0	0	15	0	1	0	3	9	1	0	0	0	0	0	0	0	14	0	3	3	6	13	4	0	0	0	0	0	0	0	29
11:00	0	1	1	4	6	3	0	1	0	0	0	0	0	16	1	1	2	4	1	1	1	0	0	0	0	0	0	11	1	2	3	8	7	4	1	1	0	0	0	0	0	27
11:15	1	0	2	4	7	9	3	0	0	0	0	0	0	26	0	0	0	5	7	7	1	0	0	0	0	0	0	20	1	0	2	9	14	16	4	0	0	0	0	0	0	46
11:30	0	0	1	7	16	8	2	0	0	0	0	0	0	34	0	0	3	6	5	4	1	0	0	0	0	0	0	19	0	0	4	13	21	12	3	0	0	0	0	0	0	53
11:45	1	1	3	9	14	8	2	0	0	0	0	0	0	38	0	2	0	6	7	5	0	0	0	0	0	0	0	20	1	3	3	15	21	13	2	0	0	0	0	0	0	58
12:00	1	2	2	6	19	15	2	0	0	0	0	0	0	47	0	1	0	7	18	7	1	0	0	0	0	0	0	34	1	3	2	13	37	22	3	0	0	0	0	0	0	81
12:15	1	4	3	10	13	14	1	0	0	0	0	0	0	46	0	1	1	8	18	4	2	0	0	0	0	0	0	34	1	5	4	18	31	18	3	0	0	0	0	0	0	80
12:30	1	1	3	10	11	7	1	0	0	0	0	0	0	34	0	0	3	8	17	8	1	1	0	0	0	0	0	38	1	1	6	18	28	15	2	1	0	0	0	0	0	72
12:45	0	2	0	3	6	9	0	0	0	0	0	0	0	20	0	0	2	16	19	7	1	0	0	0	0	0	0	45	0	2	2	19	25	16	1	0	0	0	0	0	0	65
13:00	2	1	1	6	5	7	0	0	0	0	0	0	0	22	0	1	1	7	14	6	2	0	0	0	0	0	0	31	2	2	2	13	19	13	2	0	0	0	0	0	0	53
13:15	1	3	1	5	7	4	2	0	0	0	0	0	0	23	1	1	1	7	9	3	1	0	0	0	0	0	0	23	2	4	2	12	16	7	3	0	0	0	0	0	0	46
13:30	1	3	1	4	9	5	0	0	0	0	0	0	0	23	0	0	4	6	4	4	2	1	0	0	0	0	0	21	1	3	5	10	13	9	2	1	0	0	0	0	0	44
13:45	0	2	0	7	4	8	1	0	0	0	0	0	0	22	0	0	0	8	11	2	1	0	0	0	0	0	0	22	0	2	0	15	15	10	2	0	0	0	0	0	0	44
14:00	2	2	3	0	13	9	0	1	0	0	0	0	0	30	0	0	0	3	6	7	0	0	0	0	0	0	0	16	2	2	3	3	19	16	0	1	0	0	0	0	0	46
14:15	1	1	2	5	7	5	1	0	0	0	0	0	0	22	0	0	1	13	10	3	1	0	0	0	0	0	0	28	1	1	3	18	17	8	2	0	0	0	0	0	0	50
14:30	0	2	2	2	23	11	3	1	0	0	0	0	0	44	1	1	1	4	11	9	3	0	0	0	0	0	0	30	1	3	3	6	34	20	6	1	0	0	0	0	0	74
14:45	2	1	10	13	19	4	3	0	0	0	0	0	0	52	0	0	3	7	12	5	1	0	0	0	0	0	0	28	2	1	13	20	31	9	4	0	0	0	0	0	0	80
15:00	1	3	4	14	25	24	6	1	0	0	0	0	0	78	0	0	2	1	1	5	1	0	0	0	0	0	0	10	1	3	6	15	26	29	7	1	0	0	0	0	0	88
15:15	1	0	3	1	14	14	4	1	0	0	0	0	0	38	0	0	2	3	1	2	0	0	0	0	0	0	0	8	1	0	5	4	15	16	4	1	0	0	0	0	0	46
15:30	1	1	0	19	34	27	0	1	0	0	0	0	0	83	0	1	1	4	5	2	0	0	0	0	0	0	0	13	1	2	1	23	39	29	0	1	0	0	0	0	0	96
15:45	0	1	1	3	22	8	1	0	0	0	0	0	0	36	0	0	0	3	9	1	0	0	1	0	0	0	0	14	0	1	1	6	31	9	1	0	1	0	0	0	0	50
16:00	1	3	3	14	39	26	2	1	0	0	0	0	0	89	0	0	0	2	2	1	2	0	0	0	0	0	0	7	1	3	3	16	41	27	4	1	0	0	0	0	0	96
16:15	3	1	1	9	17	14	2	0	0	0	0	0	0	47	0	0	1	2	3	1	2	0	0	0	0	0	0	9	3	1	2	11	20	15	4	0	0	0	0	0	0	56
16:30	0	3	0	8	14	8	0	0	0	0	0	0	0	33	0	0	2	2	0	2	0	0	0	0	0	0	0	6	0	3	2	10	14	10	0	0	0	0	0	0	0	39
16:45	0	3	2	7	21	15	2	0	0	0	0	0	0	50	0	0	1	3	5	0	0	0	0	0	0	0	0	9	0	3	3	10	26	15	2	0	0	0	0	0	0	59
17:00	0	0	0	6	34	20	2	0	0	0	0	0	0	62	0	0	2	0	1	0	0	0	0	0	0	0	0	3	0	0	2	6	35	20	2	0	0	0	0	0	0	65
17:15	0	0	1	6	13	9	1	0	0	0	0	0	0	30	0	0	1	1	2	1	0	0	0	0	0	0	0	5	0	0	2	7	15	10	1	0	0	0	0	0	0	35
17:30	0	2	1	7	6	5	1	0	0	0	0	0	0	22	0	0	0	1	5	0	0	0	0	0	0	0	0	6	0	2	1	8	11	5	1	0	0	0	0	0	0	28
17:45	0	1	1	6	16	3	0	0	0	0	0	0	0	27	0	0	1	3	2	0	0	0	0	0	0	0	0	6	0	1	2	9	18	3	0	0	0	0	0	0	0	33
18:00	0	0	1	5	7	2	0	1	0	0	0	0	0	16	0	0	2	2	1	1	0	0	0	0	0	0	0	6	0	0	3	7	8	3	0	1	0	0	0	0	0	22
18:15	0	2	1	1	4	2	0	0	0	0	0	0	0	10	0	0	0	2	1	1	0	0	0	0	0	0	0	4	0	2	1	3	5	3	0	0	0	0	0	0	0	14
18:30	0	1	2	1	6	0	0	0	0	0	0	0	0	10	0	0	0	2	1	0	1	0	0	0	0	0	0	4	0	1	2	3	7	0	1	0	0	0	0	0	0	14
18:45	0	0	1	3	4	1	2	0	0	0	0	0	0	11	0	0	0	1	2	0	0	0	0	0	0	0	0	3	0	0	1	4	6	1	2	0	0	0	0	0	0	14
19:00	0	0	1	2	3	0	0	0	0	0	0	0	0	6	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0	1	1	2	3	1	0	0	0	0	0	0	0	8
19:15	0	0	0	0	1	2	0	0	0	0	0	0	0	3	0	0	1	0	3	0	0	0	0	0	0	0	0	4	0	0	1	0	4	2	0	0	0	0	0	0	0	7
19:30	0	0	0	1	2	0	0	0	0	0	0	0	0	3	0	0	0	3	1	1	0	0	0	0	0	0	0	5	0	0	0	4	3	1	0	0	0	0	0	0	0	8
19:45	0	0	1	2	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	3
20:00	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	0	0	0	0	0	0	0	0	3	0	0	0	2	3	0	0	0	0	0	0	0	0	5
20:15	0	0	0	2	1	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3
20:30	0	0	0	0	1	3	0	0	0	0	0	0	0	4	0	0	1	0	1	0	0	0	0	0	0	0	0	2	0	0	1	0	2	3	0	0	0	0	0	0	0	6
20:45	0	0	0	0	2	0	1	0	0	0	0	0	0	3	0	0	0	1	2	1	0	0	0	0	0	0	0	4	0	0	0	1	4	1	1	0	0	0	0	0	0	7
21:00	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	2	0	0	0	0	0	0	0	0	3	0	0	1	1	2	1	0	0	0	0	0	0	0	5
21:15	0	1	1	0	2	0	0	0	0	0	0	0	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	1	1	0	3	0	0	0	0	0	0	0	0	5
21:30	0	0	0	0	3	1	0	0	0	0	0	0	0	4	0	0	0	1	0	1	0	0	0	0	0	0	0	2	0	0	0	1	3	2	0	0	0	0	0	0	0	6
21:45	0	0	0	1	1	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	3
22:00	0	0	1	0	2	3	0	0	0	0	0	0	0	6	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	1	2	3	0	0	0	0	0	0	0	7
22:15	0	0	0	0	0	4	0	0	0	0	0	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	4	0	0	0	0	0	0	0	5
22:30	0	0	0	0	3	1	1	0	0	0	0	0	0	5	0	0	0	1	1	1	0	0	0	0	0	0	0	3	0	0	0	1	4	2	1	0	0	0	0	0	0	8
22:45	0	0	0	2	4	2	0	1	0	0	0	0	0	9	0	0	0	1	2	2	0	0	0	0	0	0	0	5	0	0	0	3	6	4	0	1	0	0	0	0	0	14
23:00	0	0	0	4	4	1	1	0	0	0	0	0	0	10	0	0	0	1	2	0	0	0	0	0	0	0	0	3	0	0	0	5	6	1	1	0	0	0	0	0	0	13
23:15	0	0	0	2	4	6	1	1	0	0	0	0	0	14	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	2	5	6	1	1	0	0	0	0	0	15
23:30	0	0	0	1	5	2	0	0	0	0	0	0	0	8	0	0	0	1	1	1	0	0	0	0	0	0	0	3	0	0	0	2	6	3	0	0	0	0	0	0	0	11
23:45	1	0	0	2	2	0	0	1	0	0	0	0	0	6	0	0	0	0	2	2	0	0	0	0	0	0	0	4	1	0	0	2	4	2	0	1	0	0	0	0	0	10
Totals	29	74	93	278	581	390	61	14	0	0	0	0	0	1,520	4	19	84	340	604	314	68	8	2	0	0	0	0	1,443	33	93	177	618	1,185	704	129	22	2	0	0	0	0	2,963
% of Totals	2%	5%	6%	18%	38%	26%	4%	1%	0%	0%	0%	0%	0%	100%	0%	1%	6%	24%	42%	22%	5%	1%	0%	0%	0%	0%	0%	100%	1%	3%	6%	21%	40%	24%	4%	1%	0%	0%	0%	0%	0%	100%

Prepared by National Data & Surveying Services

VOLUME

Constitution Blvd S/O Northern Site Dwy/Dell Technologies Employee Dwy

Day: Thursday
Date: 3/14/2024

City: Franklin
Project #: MA24_430011_001

DAILY TOTALS	NB	SB	EB	WB	Total
	1,520	1,443	0	0	2,963

DAILY TOTALS

15-Minutes Interval

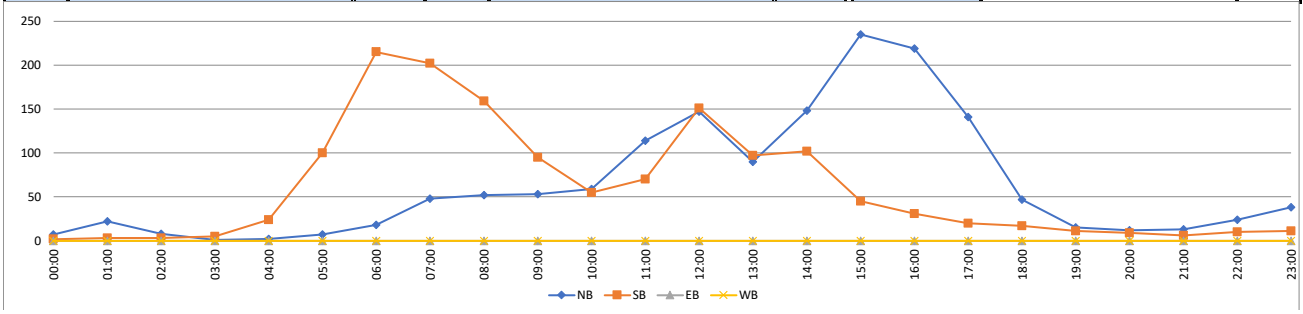
TIME	NB	SB	EB	WB	TOTAL	TIME	NB	SB	EB	WB	TOTAL
0:00	4	1			5	12:00	47	34			81
0:15	2	0			2	12:15	46	34			80
0:30	1	0			1	12:30	34	38			72
0:45	0	1			1	12:45	20	45			65
1:00	19	1			20	13:00	22	31			53
1:15	2	0			2	13:15	23	23			46
1:30	1	1			2	13:30	23	21			44
1:45	0	1			1	13:45	22	22			44
2:00	2	1			3	14:00	30	16			46
2:15	1	0			1	14:15	22	28			50
2:30	2	1			3	14:30	44	30			74
2:45	3	1			4	14:45	52	28			80
3:00	0	2			2	15:00	78	10			88
3:15	0	0			0	15:15	38	8			46
3:30	1	1			2	15:30	83	13			96
3:45	0	2			2	15:45	36	14			50
4:00	0	2			2	16:00	89	7			96
4:15	1	4			5	16:15	47	9			56
4:30	0	8			8	16:30	33	6			39
4:45	1	10			11	16:45	50	9			59
5:00	1	7			8	17:00	62	3			65
5:15	0	14			14	17:15	30	5			35
5:30	1	23			24	17:30	22	6			28
5:45	5	56			61	17:45	27	6			33
6:00	3	30			33	18:00	16	6			22
6:15	1	57			58	18:15	10	4			14
6:30	8	57			65	18:30	10	4			14
6:45	6	71			77	18:45	11	3			14
7:00	8	59			67	19:00	6	2			8
7:15	13	27			40	19:15	3	4			7
7:30	13	51			64	19:30	3	5			8
7:45	14	65			79	19:45	3	0			3
8:00	14	53			67	20:00	2	3			5
8:15	14	56			70	20:15	3	0			3
8:30	11	26			37	20:30	4	2			6
8:45	13	24			37	20:45	3	4			7
9:00	11	34			45	21:00	2	3			5
9:15	13	21			34	21:15	4	1			5
9:30	15	19			34	21:30	4	2			6
9:45	14	21			35	21:45	3	0			3
10:00	13	20			33	22:00	6	1			7
10:15	13	15			28	22:15	4	1			5
10:30	18	6			24	22:30	5	3			8
10:45	15	14			29	22:45	9	5			14
11:00	16	11			27	23:00	10	3			13
11:15	26	20			46	23:15	14	1			15
11:30	34	19			53	23:30	8	3			11
11:45	38	20			58	23:45	6	4			10
TOTALS	391	933	0	0	1324	TOTALS	1129	510	0	0	1639
SPLIT %	30%	70%	0%	0%	45%	SPLIT %	69%	31%	0%	0%	55%

Hourly Intervals

TIME		NB	SB	EB	WB	TOTAL
00:00	01:00	7	2			9
01:00	02:00	22	3			25
02:00	03:00	8	3			11
03:00	04:00	1	5			6
04:00	05:00	2	24			26
05:00	06:00	7	100			107
06:00	07:00	18	215			233
07:00	08:00	48	202			250
08:00	09:00	52	159			211
09:00	10:00	53	95			148
10:00	11:00	59	55			114
11:00	12:00	114	70			184
12:00	13:00	147	151			298
13:00	14:00	90	97			187
14:00	15:00	148	102			250
15:00	16:00	235	45			280
16:00	17:00	219	31			250
17:00	18:00	141	20			161
18:00	19:00	47	17			64
19:00	20:00	15	11			26
20:00	21:00	12	9			21
21:00	22:00	13	6			19
22:00	23:00	24	10			34
23:00	00:00	38	11			49

STATISTICS

	NB	SB	EB	WB	TOTAL
Peak Period	00:00	to	12:00		
Volume	391	933			1324
Peak Hour	11:00	6:15			7:30
Peak Volume	114	244			280
Peak Hour Factor	0.750	0.859			0.886
Peak Period	12:00	to	00:00		
Volume	1129	510			1639
Peak Hour	15:30	12:00			14:45
Peak Volume	255	151			310
Peak Hour Factor	0.716	0.839			0.807
Peak Period	07:00	to	09:00		
Volume	100	361			461
Peak Hour	7:30	7:30			7:30
Peak Volume	55	225			280
Peak Hour Factor	0.982	0.865			0.886
Peak Period	16:00	to	18:00		
Volume	360	51			411
Peak Hour	16:00	16:00			16:00
Peak Volume	219	31			250
Peak Hour Factor	0.615	0.861			0.651



National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & King St
City: Franklin
Control: Signalized

Project ID: 24-430010-001
Date: 3/5/2024

Data - Total

NS/EW Streets:	Constitution Blvd				Constitution Blvd				King St				King St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	2	0	0	0	0	0	0	2	0	0	2	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	13	0	42	0	0	0	0	0	0	199	23	0	62	87	0	0	426
7:15 AM	4	0	62	0	0	0	0	0	0	233	12	0	50	75	0	0	436
7:30 AM	6	0	64	0	0	0	0	0	0	201	24	0	77	86	0	0	458
7:45 AM	6	0	61	0	0	0	0	0	0	190	19	0	114	132	0	0	522
8:00 AM	15	0	66	0	0	0	0	0	0	193	18	0	72	115	0	0	479
8:15 AM	11	0	36	0	0	0	0	0	0	188	12	0	71	102	0	0	420
8:30 AM	9	0	63	0	0	0	0	0	0	173	15	0	62	100	0	0	422
8:45 AM	11	0	41	0	0	0	0	0	0	186	13	0	58	109	0	0	418
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	75	0	435	0	0	0	0	0	0	1563	136	0	566	806	0	0	3581
APPROACH %'s :	14.71%	0.00%	85.29%	0.00%					0.00%	92.00%	8.00%	0.00%	41.25%	58.75%	0.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	31	0	253	0	0	0	0	0	0	817	73	0	313	408	0	0	1895
PEAK HR FACTOR :	0.517	0.000	0.958	0.000	0.000	0.000	0.000	0.000	0.000	0.877	0.760	0.000	0.686	0.773	0.000	0.000	0.908
	0.877								0.908				0.733				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	2	0	0	0	0	0	0	2	0	0	2	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	44	0	101	0	0	0	0	0	0	86	8	0	43	187	0	0	469
4:15 PM	16	0	60	0	0	0	0	0	0	118	7	0	55	212	0	0	468
4:30 PM	14	0	59	0	0	0	0	0	0	96	8	0	44	213	0	0	434
4:45 PM	17	0	67	0	0	0	0	0	0	92	9	0	39	202	0	0	426
5:00 PM	30	0	116	0	0	0	0	0	0	88	18	0	44	227	0	0	523
5:15 PM	11	0	67	0	0	0	0	0	0	106	10	0	55	200	0	0	449
5:30 PM	17	0	63	0	0	0	0	0	0	100	5	0	48	204	0	0	437
5:45 PM	10	0	52	0	0	0	0	0	0	88	7	0	54	165	0	0	376
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	159	0	585	0	0	0	0	0	0	774	72	0	382	1610	0	0	3582
APPROACH %'s :	21.37%	0.00%	78.63%	0.00%					0.00%	91.49%	8.51%	0.00%	19.18%	80.82%	0.00%	0.00%	
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	77	0	302	0	0	0	0	0	0	394	42	0	182	854	0	0	1851
PEAK HR FACTOR :	0.642	0.000	0.651	0.000	0.000	0.000	0.000	0.000	0.000	0.835	0.583	0.000	0.827	0.941	0.000	0.000	0.885
	0.649								0.872				0.956				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & King St
City: Franklin
Control: Signalized

Project ID: 24-430010-001
Date: 3/5/2024

Data - Cars

NS/EW Streets:	Constitution Blvd				Constitution Blvd				King St				King St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	2	0	0	0	0	0	0	2	0	0	2	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	9	0	41	0	0	0	0	0	0	198	22	0	58	80	0	0	408
7:15 AM	4	0	55	0	0	0	0	0	0	224	12	0	49	68	0	0	412
7:30 AM	6	0	59	0	0	0	0	0	0	197	24	0	74	82	0	0	442
7:45 AM	6	0	56	0	0	0	0	0	0	181	18	0	107	125	0	0	493
8:00 AM	11	0	58	0	0	0	0	0	0	185	18	0	68	110	0	0	450
8:15 AM	9	0	34	0	0	0	0	0	0	181	11	0	69	94	0	0	398
8:30 AM	7	0	55	0	0	0	0	0	0	165	11	0	54	91	0	0	383
8:45 AM	11	0	36	0	0	0	0	0	0	172	11	0	51	103	0	0	384
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	63	0	394	0	0	0	0	0	0	1503	127	0	530	753	0	0	3370
APPROACH %'s :	13.79%	0.00%	86.21%	0.00%					0.00%	92.21%	7.79%	0.00%	41.31%	58.69%	0.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	27	0	228	0	0	0	0	0	0	787	72	0	298	385	0	0	1797
PEAK HR FACTOR :	0.614	0.000	0.966	0.000	0.000	0.000	0.000	0.000	0.000	0.878	0.750	0.000	0.696	0.770	0.000	0.000	0.911
	0.924								0.910				0.736				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	2	0	0	0	0	0	0	2	0	0	2	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	41	0	100	0	0	0	0	0	0	82	7	0	42	182	0	0	454
4:15 PM	16	0	53	0	0	0	0	0	0	117	5	0	52	203	0	0	446
4:30 PM	14	0	54	0	0	0	0	0	0	94	5	0	38	209	0	0	414
4:45 PM	16	0	64	0	0	0	0	0	0	89	9	0	36	196	0	0	410
5:00 PM	28	0	113	0	0	0	0	0	0	86	17	0	43	222	0	0	509
5:15 PM	11	0	67	0	0	0	0	0	0	103	10	0	50	197	0	0	438
5:30 PM	16	0	59	0	0	0	0	0	0	99	5	0	46	201	0	0	426
5:45 PM	9	0	51	0	0	0	0	0	0	87	7	0	50	164	0	0	368
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	151	0	561	0	0	0	0	0	0	757	65	0	357	1574	0	0	3465
APPROACH %'s :	21.21%	0.00%	78.79%	0.00%					0.00%	92.09%	7.91%	0.00%	18.49%	81.51%	0.00%	0.00%	
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	74	0	284	0	0	0	0	0	0	386	36	0	169	830	0	0	1779
PEAK HR FACTOR :	0.661	0.000	0.628	0.000	0.000	0.000	0.000	0.000	0.000	0.825	0.529	0.000	0.813	0.935	0.000	0.000	0.874
	0.635								0.865				0.942				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & King St
City: Franklin
Control: Signalized

Project ID: 24-430010-001
Date: 3/5/2024

Data - HT

NS/EW Streets:	Constitution Blvd				Constitution Blvd				King St				King St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	2	0	0	0	0	0	0	2	0	0	2	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	4	0	1	0	0	0	0	0	0	1	1	0	4	7	0	0	18
7:15 AM	0	0	7	0	0	0	0	0	0	9	0	0	1	7	0	0	24
7:30 AM	0	0	5	0	0	0	0	0	0	4	0	0	3	4	0	0	16
7:45 AM	0	0	5	0	0	0	0	0	0	9	1	0	7	7	0	0	29
8:00 AM	4	0	8	0	0	0	0	0	0	8	0	0	4	5	0	0	29
8:15 AM	2	0	2	0	0	0	0	0	0	7	1	0	2	8	0	0	22
8:30 AM	2	0	8	0	0	0	0	0	0	8	4	0	8	9	0	0	39
8:45 AM	0	0	5	0	0	0	0	0	0	14	2	0	7	6	0	0	34
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	12	0	41	0	0	0	0	0	0	60	9	0	36	53	0	0	211
APPROACH %'s :	22.64%	0.00%	77.36%	0.00%					0.00%	86.96%	13.04%	0.00%	40.45%	59.55%	0.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	4	0	25	0	0	0	0	0	0	30	1	0	15	23	0	0	98
PEAK HR FACTOR :	0.250	0.000	0.781	0.000	0.000	0.000	0.000	0.000	0.000	0.833	0.250	0.000	0.536	0.821	0.000	0.000	0.845
	0.604								0.775				0.679				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	2	0	0	0	0	0	0	2	0	0	2	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	3	0	1	0	0	0	0	0	0	4	1	0	1	5	0	0	15
4:15 PM	0	0	7	0	0	0	0	0	0	1	2	0	3	9	0	0	22
4:30 PM	0	0	5	0	0	0	0	0	0	2	3	0	6	4	0	0	20
4:45 PM	1	0	3	0	0	0	0	0	0	3	0	0	3	6	0	0	16
5:00 PM	2	0	3	0	0	0	0	0	0	2	1	0	1	5	0	0	14
5:15 PM	0	0	0	0	0	0	0	0	0	3	0	0	5	3	0	0	11
5:30 PM	1	0	4	0	0	0	0	0	0	1	0	0	2	3	0	0	11
5:45 PM	1	0	1	0	0	0	0	0	0	1	0	0	4	1	0	0	8
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	8	0	24	0	0	0	0	0	0	17	7	0	25	36	0	0	117
APPROACH %'s :	25.00%	0.00%	75.00%	0.00%					0.00%	70.83%	29.17%	0.00%	40.98%	59.02%	0.00%	0.00%	
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	3	0	18	0	0	0	0	0	0	8	6	0	13	24	0	0	72
PEAK HR FACTOR :	0.375	0.000	0.643	0.000	0.000	0.000	0.000	0.000	0.000	0.667	0.500	0.000	0.542	0.667	0.000	0.000	0.818
	0.750								0.700				0.771				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & King St
City: Franklin
Control: Signalized

Project ID: 24-430010-001
Date: 3/5/2024

Data - Bikes

NS/EW Streets:	Constitution Blvd				Constitution Blvd				King St				King St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	2	0	0	0	0	0	0	2	0	0	2	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %'s :																	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	2	0	0	0	0	0	0	2	0	0	2	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %'s :																	
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & King St
City: Franklin

Project ID: 24-430010-001
Date: 3/5/2024

Data - Pedestrians (Crosswalks)

NS/EW Streets:	Constitution Blvd		Constitution Blvd		King St		King St		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	2	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	2	0	0	0	0	0	2
APPROACH %'s :			100.00%	0.00%					
PEAK HR :	**07:15 AM - 08:15 AM**								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	**04:15 PM - 05:15 PM**								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

Prepared by National Data & Surveying Services

Constitution Blvd & King St

Peak Hour Turning Movement Count

ID: 24-430010-001
City: Franklin

Day: Tuesday
Date: 3/5/2024

	PEAK HOURS	COUNT PERIODS
AM	07:15 AM - 08:15 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:15 PM - 05:15 PM	4:00 PM - 06:00 PM

Constitution Blvd — SOUTHBOUND

	Right	Thru	Left	U-Turn	Departure
AM	0	0	0	0	0
NOON	0	0	0	0	0
PM	0	0	0	0	0
(red)	0	0	0	0	

King St — EASTBOUND

	AM	NOON	PM	(red)
Departure	439	0	931	
U-Turn	0	0	0	0
Left	0	0	0	0
Thru	817	0	394	2
Right	73	0	42	0

King St — WESTBOUND

	(red)	PM	NOON	AM
Right	0	0	0	0
Thru	1	854	0	408
Left	2	182	0	313
U-Turn	0	0	0	0
Departure		696	0	1070

Constitution Blvd — NORTHBOUND

	Departure	U-Turn	Left	Thru	Right
(red)		0	1	0	2
PM	224	0	77	0	302
NOON	0	0	0	0	0
AM	386	0	31	0	253

CONTROL

Signalized

	AM	NOON	PM
TEV	1895	0	1851
PHF	0.91		0.88

Cars and HT

Movement	Cars (AM)	Cars (NOON)	Cars (PM)	HT (AM)	HT (NOON)	HT (PM)
SB Right	0	0	0	0	0	0
SB Thru	0	0	0	0	0	0
SB Left	0	0	0	0	0	0
EB U-Turn/Left	0	0	0	0	0	0
EB Thru	787	0	386	30	0	8
EB Right	72	0	36	1	0	6
WB Right	0	0	0	0	0	0
WB Thru	385	0	830	23	0	24
WB Left	298	0	169	15	0	13
NB Left	27	0	74	4	0	3
NB Thru	0	0	0	0	0	0
NB Right	228	0	284	25	0	18

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North (each direction)	0	0	0
South (each direction)	0	0	0
East (each direction)	0	0	0
West (each direction)	0	0	0
Diagonals	0	0	0

Project ID: 24-430010-001
Location: Constitution Blvd & King St
City: Franklin

Day: Tuesday
Date: 3/5/2024

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Constitution Blvd Southbound						King St Westbound						Constitution Blvd Northbound						King St Eastbound						
Start Time	Rgt	Thru	Left	Uturn	Peds	App. Total	Rgt	Thru	Left	Uturn	Peds	App. Total	Rgt	Thru	Left	Uturn	Peds	App. Total	Rgt	Thru	Left	Uturn	Peds	App. Total	Int. Total
7:00 AM	0	0	0	0	0	0	0	87	62	0	0	149	42	0	13	0	0	55	23	199	0	0	0	222	426
7:15 AM	0	0	0	0	0	0	0	75	50	0	0	125	62	0	4	0	0	66	12	233	0	0	0	245	436
7:30 AM	0	0	0	0	0	0	0	86	77	0	0	163	64	0	6	0	0	70	24	201	0	0	0	225	458
7:45 AM	0	0	0	0	0	0	0	132	114	0	0	246	61	0	6	0	0	67	19	190	0	0	0	209	522
Total	0	0	0	0	0	0	0	380	303	0	0	683	229	0	29	0	0	258	78	823	0	0	0	901	1842
8:00 AM	0	0	0	0	0	0	0	115	72	0	0	187	66	0	15	0	0	81	18	193	0	0	0	211	479
8:15 AM	0	0	0	0	0	0	0	102	71	0	0	173	36	0	11	0	2	47	12	188	0	0	0	200	420
8:30 AM	0	0	0	0	0	0	0	100	62	0	0	162	63	0	9	0	0	72	15	173	0	0	0	188	422
8:45 AM	0	0	0	0	0	0	0	109	58	0	0	167	41	0	11	0	0	52	13	186	0	0	0	199	418
Total	0	0	0	0	0	0	0	426	263	0	0	689	206	0	46	0	2	252	58	740	0	0	0	798	1739
BREAK																									
4:00 PM	0	0	0	0	0	0	0	187	43	0	0	230	101	0	44	0	0	145	8	86	0	0	0	94	469
4:15 PM	0	0	0	0	0	0	0	212	55	0	0	267	60	0	16	0	0	76	7	118	0	0	0	125	468
4:30 PM	0	0	0	0	0	0	0	213	44	0	0	257	59	0	14	0	0	73	8	96	0	0	0	104	434
4:45 PM	0	0	0	0	0	0	0	202	39	0	0	241	67	0	17	0	0	84	9	92	0	0	0	101	426
Total	0	0	0	0	0	0	0	814	181	0	0	995	287	0	91	0	0	378	32	392	0	0	0	424	1797
5:00 PM	0	0	0	0	0	0	0	227	44	0	0	271	116	0	30	0	0	146	18	88	0	0	0	106	523
5:15 PM	0	0	0	0	0	0	0	200	55	0	0	255	67	0	11	0	0	78	10	106	0	0	0	116	449
5:30 PM	0	0	0	0	0	0	0	204	48	0	0	252	63	0	17	0	0	80	5	100	0	0	0	105	437
5:45 PM	0	0	0	0	0	0	0	165	54	0	0	219	52	0	10	0	0	62	7	88	0	0	0	95	376
Total	0	0	0	0	0	0	0	796	201	0	0	997	298	0	68	0	0	366	40	382	0	0	0	422	1785
Grand Total	0	0	0	0	0	0	0	2416	948	0	0	3364	1020	0	234	0	2	1254	208	2337	0	0	0	2545	7163
Apprch %	0.0	0.0	0.0	0.0	0.0		0.0	71.8	28.2	0.0	0.0		81.3	0.0	18.7	0.0	0.2		8.2	91.8	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.7	13.2	0.0	0.0	47.0	14.2	0.0	3.3	0.0	0.0	17.5	2.9	32.6	0.0	0.0	0.0	35.5	
Cars, PU, Vans	0	0	0	0		0	0	2327	887	0		3214	955	0	214	0		1169	192	2260	0	0		2452	6835
% Cars, PU, Vans	0.0	0.0	0.0	0.0		0.0	0.0	96.3	93.6	0.0		95.5	93.6	0.0	91.5	0.0		93.2	92.3	96.7	0.0	0.0		96.3	95.4
Heavy trucks	0	0	0	0		0	0	89	61	0		150	65	0	20	0		85	16	77	0	0		93	328
%Heavy trucks	0.0	0.0	0.0	0.0		0.0	0.0	3.7	6.4	0.0		4.5	6.4	0.0	8.5	0.0		6.8	7.7	3.3	0.0	0.0		3.7	4.6

Project ID: 24-430010-001
Location: Constitution Blvd & King St
City: Franklin

PEAK HOURS

Day: Tuesday
Date: 3/5/2024

AM

	Constitution Blvd Southbound					King St Westbound					Constitution Blvd Northbound					King St Eastbound					
Start Time	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Int. Total
Peak Hour Analysis from 07:00 AM - 09:00 AM																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
7:15 AM	0	0	0	0	0	0	75	50	0	125	62	0	4	0	66	12	233	0	0	245	436
7:30 AM	0	0	0	0	0	0	86	77	0	163	64	0	6	0	70	24	201	0	0	225	458
7:45 AM	0	0	0	0	0	0	132	114	0	246	61	0	6	0	67	19	190	0	0	209	522
8:00 AM	0	0	0	0	0	0	115	72	0	187	66	0	15	0	81	18	193	0	0	211	479
Total Volume	0	0	0	0	0	0	408	313	0	721	253	0	31	0	284	73	817	0	0	890	1895
% App. Total	0.0	0.0	0.0	0.0	0	0.0	56.6	43.4	0.0	100	89.1	0.0	10.9	0.0	100	8.2	91.8	0.0	0.0	100	
PHF										0.733					0.877					0.908	0.908
Cars, PU, Vans	0	0	0	0	0	0	385	298	0	683	228	0	27	0	255	72	787	0	0	859	1797
% Cars, PU, Vans	0.0	0.0	0.0	0.0	0.0	0.0	94.4	95.2	0.0	94.7	90.1	0.0	87.1	0.0	89.8	98.6	96.3	0.0	0.0	96.5	94.8
Heavy trucks	0	0	0	0	0	0	23	15	0	38	25	0	4	0	29	1	30	0	0	31	98
%Heavy trucks	0.0	0.0	0.0	0.0	0.0	0.0	5.6	4.8	0.0	5.3	9.9	0.0	12.9	0.0	10.2	1.4	3.7	0.0	0.0	3.5	5.2

PM

	Constitution Blvd Southbound					King St Westbound					Constitution Blvd Northbound					King St Eastbound					
Start Time	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Int. Total
Peak Hour Analysis from 04:00 PM - 06:00 PM																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
4:15 PM	0	0	0	0	0	0	212	55	0	267	60	0	16	0	76	7	118	0	0	125	468
4:30 PM	0	0	0	0	0	0	213	44	0	257	59	0	14	0	73	8	96	0	0	104	434
4:45 PM	0	0	0	0	0	0	202	39	0	241	67	0	17	0	84	9	92	0	0	101	426
5:00 PM	0	0	0	0	0	0	227	44	0	271	116	0	30	0	146	18	88	0	0	106	523
Total Volume	0	0	0	0	0	0	854	182	0	1036	302	0	77	0	379	42	394	0	0	436	1851
% App. Total	0.0	0.0	0.0	0.0	0	0.0	82.4	17.6	0.0	100	79.7	0.0	20.3	0.0	100	9.6	90.4	0.0	0.0	100	
PHF										0.956					0.649					0.872	0.885
Cars, PU, Vans	0	0	0	0	0	0	830	169	0	999	284	0	74	0	358	36	386	0	0	422	1779
% Cars, PU, Vans	0.0	0.0	0.0	0.0	0.0	0.0	97.2	92.9	0.0	96.4	94.0	0.0	96.1	0.0	94.5	85.7	98.0	0.0	0.0	96.8	96.1
Heavy trucks	0	0	0	0	0	0	24	13	0	37	18	0	3	0	21	6	8	0	0	14	72
%Heavy trucks	0.0	0.0	0.0	0.0	0.0	0.0	2.8	7.1	0.0	3.6	6.0	0.0	3.9	0.0	5.5	14.3	2.0	0.0	0.0	3.2	3.9

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & Upper Union St
City: Franklin
Control: 1-Way Stop(WB)

Project ID: 24-430010-002
Date: 3/5/2024

Data - Total

NS/EW Streets:	Constitution Blvd				Constitution Blvd				Upper Union St				Upper Union St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	1	2	0	0	0	0	0	0	0	0	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	14	0	0	23	64	0	0	0	0	0	0	0	0	49	0	150
7:15 AM	0	10	0	0	14	46	0	0	0	0	0	0	0	0	52	0	122
7:30 AM	0	20	0	0	29	75	0	0	0	0	0	0	0	0	49	0	173
7:45 AM	0	18	0	0	38	94	0	0	0	0	0	0	0	0	46	0	196
8:00 AM	0	28	1	0	20	68	0	1	0	0	0	0	0	0	52	0	170
8:15 AM	0	15	2	0	17	68	0	0	0	0	0	0	0	0	34	0	136
8:30 AM	0	29	3	0	18	59	0	0	0	0	0	0	0	0	44	0	153
8:45 AM	0	22	0	0	19	49	0	0	0	0	0	0	0	0	28	0	118
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	156	6	0	178	523	0	1	0	0	0	0	0	0	354	0	1218
APPROACH %'s :	0.00%	96.30%	3.70%	0.00%	25.36%	74.50%	0.00%	0.14%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	81	3	0	104	305	0	1	0	0	0	0	0	0	181	0	675
PEAK HR FACTOR :	0.000	0.723	0.375	0.000	0.684	0.811	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.870	0.000	0.861
		0.724				0.777									0.870		

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	1	2	0	0	0	0	0	0	0	0	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	108	0	0	39	11	0	0	0	0	0	0	0	0	32	0	190
4:15 PM	0	39	0	0	43	18	0	2	0	0	0	0	0	0	36	0	138
4:30 PM	0	51	5	0	31	20	0	1	0	0	0	0	0	0	20	0	128
4:45 PM	0	52	0	0	31	16	0	1	0	0	0	0	0	0	32	0	132
5:00 PM	0	101	2	0	38	23	0	1	0	0	0	0	0	0	46	0	211
5:15 PM	0	46	0	0	49	14	0	1	0	0	0	0	0	0	29	0	139
5:30 PM	0	48	4	0	35	18	0	1	0	0	0	0	0	0	30	0	136
5:45 PM	0	32	0	0	50	9	0	1	0	0	0	0	0	0	30	0	122
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	477	11	0	316	129	0	8	0	0	0	0	0	0	255	0	1196
APPROACH %'s :	0.00%	97.75%	2.25%	0.00%	69.76%	28.48%	0.00%	1.77%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	0	247	6	0	153	71	0	4	0	0	0	0	0	0	137	0	618
PEAK HR FACTOR :	0.000	0.611	0.375	0.000	0.781	0.772	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.745	0.000	0.732
		0.614				0.891									0.745		

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & Upper Union St
City: Franklin
Control: 1-Way Stop(WB)

Project ID: 24-430010-002
Date: 3/5/2024

Data - Cars

NS/EW Streets:	Constitution Blvd				Constitution Blvd				Upper Union St				Upper Union St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	1	2	0	0	0	0	0	0	0	0	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	12	0	0	22	60	0	0	0	0	0	0	0	0	46	0	140
7:15 AM	0	6	0	0	14	45	0	0	0	0	0	0	0	0	50	0	115
7:30 AM	0	15	0	0	29	72	0	0	0	0	0	0	0	0	49	0	165
7:45 AM	0	16	0	0	34	90	0	0	0	0	0	0	0	0	43	0	183
8:00 AM	0	22	1	0	19	65	0	1	0	0	0	0	0	0	46	0	154
8:15 AM	0	11	2	0	16	66	0	0	0	0	0	0	0	0	34	0	129
8:30 AM	0	21	3	0	16	49	0	0	0	0	0	0	0	0	42	0	131
8:45 AM	0	18	0	0	16	43	0	0	0	0	0	0	0	0	26	0	103
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	121	6	0	166	490	0	1	0	0	0	0	0	0	336	0	1120
APPROACH %'s :	0.00%	95.28%	4.72%	0.00%	25.27%	74.58%	0.00%	0.15%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	64	3	0	98	293	0	1	0	0	0	0	0	0	172	0	631
PEAK HR FACTOR :	0.000	0.727	0.375	0.000	0.721	0.814	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.878	0.000	0.862
		0.728				0.790									0.878		

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	1	2	0	0	0	0	0	0	0	0	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	105	0	0	39	9	0	0	0	0	0	0	0	0	32	0	185
4:15 PM	0	36	0	0	42	14	0	2	0	0	0	0	0	0	32	0	126
4:30 PM	0	47	5	0	29	13	0	1	0	0	0	0	0	0	19	0	114
4:45 PM	0	48	0	0	31	13	0	1	0	0	0	0	0	0	32	0	125
5:00 PM	0	96	2	0	38	21	0	1	0	0	0	0	0	0	46	0	204
5:15 PM	0	46	0	0	46	12	0	1	0	0	0	0	0	0	29	0	134
5:30 PM	0	45	4	0	35	16	0	1	0	0	0	0	0	0	28	0	129
5:45 PM	0	30	0	0	48	7	0	1	0	0	0	0	0	0	30	0	116
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	453	11	0	308	105	0	8	0	0	0	0	0	0	248	0	1133
APPROACH %'s :	0.00%	97.63%	2.37%	0.00%	73.16%	24.94%	0.00%	1.90%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	0	235	6	0	150	62	0	4	0	0	0	0	0	0	135	0	592
PEAK HR FACTOR :	0.000	0.612	0.375	0.000	0.815	0.738	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.734	0.000	0.725
		0.615				0.900									0.734		

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & Upper Union St
City: Franklin
Control: 1-Way Stop(WB)

Project ID: 24-430010-002
Date: 3/5/2024

Data - HT

NS/EW Streets:	Constitution Blvd				Constitution Blvd				Upper Union St				Upper Union St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	1	2	0	0	0	0	0	0	0	0	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	2	0	0	1	4	0	0	0	0	0	0	0	0	3	0	10
7:15 AM	0	4	0	0	0	1	0	0	0	0	0	0	0	0	2	0	7
7:30 AM	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	8
7:45 AM	0	2	0	0	4	4	0	0	0	0	0	0	0	0	3	0	13
8:00 AM	0	6	0	0	1	3	0	0	0	0	0	0	0	0	6	0	16
8:15 AM	0	4	0	0	1	2	0	0	0	0	0	0	0	0	0	0	7
8:30 AM	0	8	0	0	2	10	0	0	0	0	0	0	0	0	2	0	22
8:45 AM	0	4	0	0	3	6	0	0	0	0	0	0	0	0	2	0	15
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	35	0	0	12	33	0	0	0	0	0	0	0	0	18	0	98
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	26.67%	73.33%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	17	0	0	6	12	0	0	0	0	0	0	0	0	9	0	44
PEAK HR FACTOR :	0.000	0.708	0.000	0.000	0.375	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.688
		0.708				0.563									0.375		

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	1	2	0	0	0	0	0	0	0	0	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5
4:15 PM	0	3	0	0	1	4	0	0	0	0	0	0	0	0	4	0	12
4:30 PM	0	4	0	0	2	7	0	0	0	0	0	0	0	0	1	0	14
4:45 PM	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0	0	7
5:00 PM	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	7
5:15 PM	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	5
5:30 PM	0	3	0	0	0	2	0	0	0	0	0	0	0	0	2	0	7
5:45 PM	0	2	0	0	2	2	0	0	0	0	0	0	0	0	0	0	6
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	24	0	0	8	24	0	0	0	0	0	0	0	0	7	0	63
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	25.00%	75.00%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	0	12	0	0	3	9	0	0	0	0	0	0	0	0	2	0	26
PEAK HR FACTOR :	0.000	0.600	0.000	0.000	0.250	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.929
		0.600				0.600									0.250		

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & Upper Union St
City: Franklin
Control: 1-Way Stop(WB)

Project ID: 24-430010-002
Date: 3/5/2024

Data - Bikes

NS/EW Streets:	Constitution Blvd				Constitution Blvd				Upper Union St				Upper Union St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	1	2	0	0	0	0	0	0	0	0	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %'s :																	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	1	2	0	0	0	0	0	0	0	0	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %'s :																	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & Upper Union St
City: Franklin

Project ID: 24-430010-002
Date: 3/5/2024

Data - Pedestrians (Crosswalks)

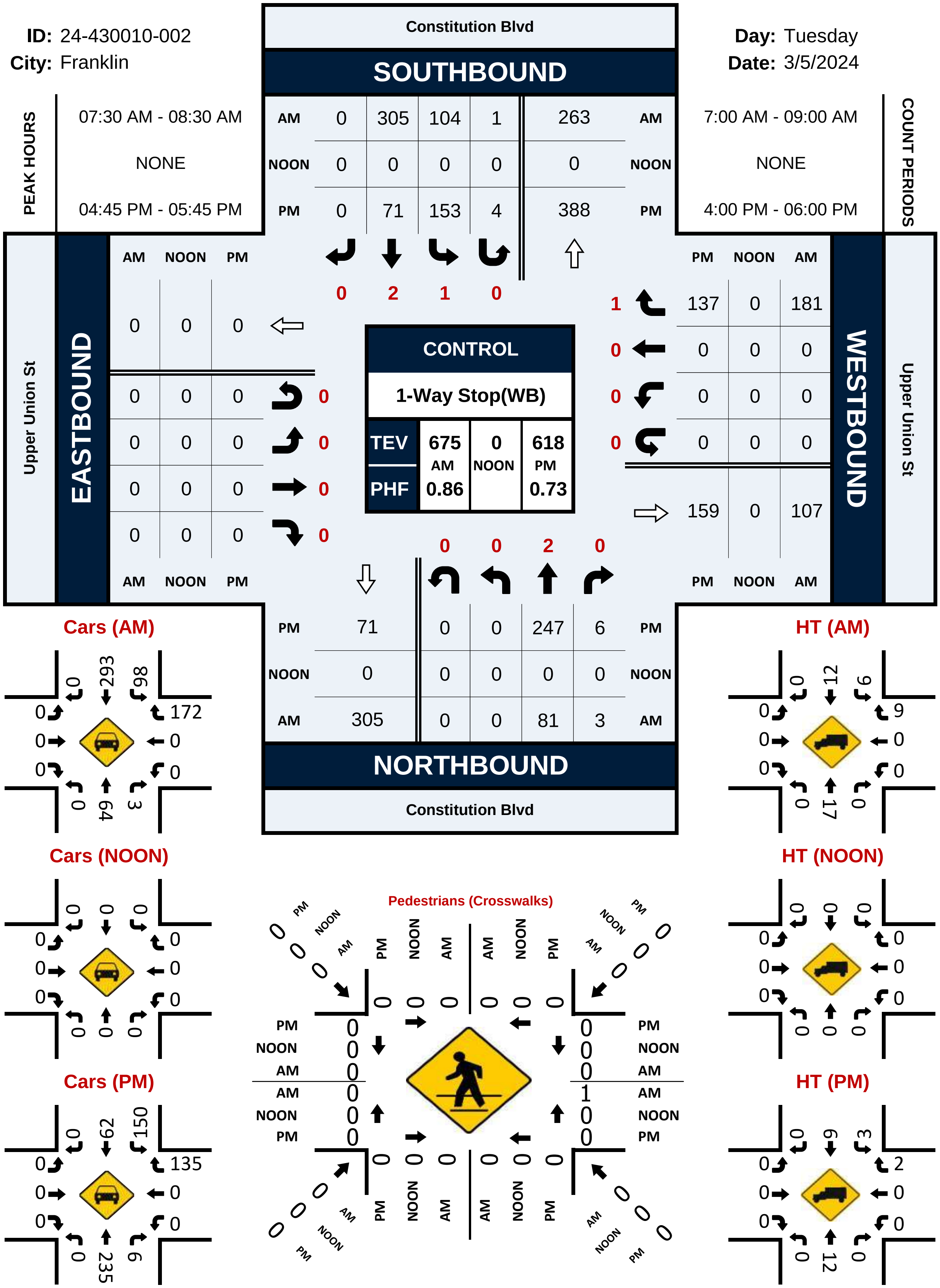
NS/EW Streets:	Constitution Blvd		Constitution Blvd		Upper Union St		Upper Union St		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	1	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	1	0	0	0	1
APPROACH %'s :					100.00%	0.00%			
PEAK HR :	07:30 AM - 08:30 AM								TOTAL
PEAK HR VOL :	0	0	0	0	1	0	0	0	1
PEAK HR FACTOR :					0.250				0.250
					0.250				

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	04:45 PM - 05:45 PM								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

Prepared by National Data & Surveying Services

Constitution Blvd & Upper Union St

Peak Hour Turning Movement Count



Project ID: 24-430010-002
Location: Constitution Blvd & Upper Union St
City: Franklin

Day: Tuesday
Date: 3/5/2024

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Constitution Blvd Southbound						Upper Union St Westbound						Constitution Blvd Northbound						Upper Union St Eastbound						
Start Time	Rgt	Thru	Left	Uturn	Peds	App. Total	Rgt	Thru	Left	Uturn	Peds	App. Total	Rgt	Thru	Left	Uturn	Peds	App. Total	Rgt	Thru	Left	Uturn	Peds	App. Total	Int. Total
7:00 AM	0	64	23	0	0	87	49	0	0	0	0	49	0	14	0	0	0	14	0	0	0	0	0	0	150
7:15 AM	0	46	14	0	0	60	52	0	0	0	0	52	0	10	0	0	0	10	0	0	0	0	0	0	122
7:30 AM	0	75	29	0	0	104	49	0	0	0	0	49	0	20	0	0	0	20	0	0	0	0	0	0	173
7:45 AM	0	94	38	0	0	132	46	0	0	0	0	46	0	18	0	0	0	18	0	0	0	0	0	0	196
Total	0	279	104	0	0	383	196	0	0	0	0	196	0	62	0	0	0	62	0	0	0	0	0	0	641
8:00 AM	0	68	20	1	0	89	52	0	0	0	1	52	1	28	0	0	0	29	0	0	0	0	0	0	170
8:15 AM	0	68	17	0	0	85	34	0	0	0	0	34	2	15	0	0	0	17	0	0	0	0	0	0	136
8:30 AM	0	59	18	0	0	77	44	0	0	0	0	44	3	29	0	0	0	32	0	0	0	0	0	0	153
8:45 AM	0	49	19	0	0	68	28	0	0	0	0	28	0	22	0	0	0	22	0	0	0	0	0	0	118
Total	0	244	74	1	0	319	158	0	0	0	1	158	6	94	0	0	0	100	0	0	0	0	0	0	577
BREAK																									
4:00 PM	0	11	39	0	0	50	32	0	0	0	0	32	0	108	0	0	0	108	0	0	0	0	0	0	190
4:15 PM	0	18	43	2	0	63	36	0	0	0	0	36	0	39	0	0	0	39	0	0	0	0	0	0	138
4:30 PM	0	20	31	1	0	52	20	0	0	0	0	20	5	51	0	0	0	56	0	0	0	0	0	0	128
4:45 PM	0	16	31	1	0	48	32	0	0	0	0	32	0	52	0	0	0	52	0	0	0	0	0	0	132
Total	0	65	144	4	0	213	120	0	0	0	0	120	5	250	0	0	0	255	0	0	0	0	0	0	588
5:00 PM	0	23	38	1	0	62	46	0	0	0	0	46	2	101	0	0	0	103	0	0	0	0	0	0	211
5:15 PM	0	14	49	1	0	64	29	0	0	0	0	29	0	46	0	0	0	46	0	0	0	0	0	0	139
5:30 PM	0	18	35	1	0	54	30	0	0	0	0	30	4	48	0	0	0	52	0	0	0	0	0	0	136
5:45 PM	0	9	50	1	0	60	30	0	0	0	0	30	0	32	0	0	0	32	0	0	0	0	0	0	122
Total	0	64	172	4	0	240	135	0	0	0	0	135	6	227	0	0	0	233	0	0	0	0	0	0	608
Grand Total	0	652	494	9	0	1155	609	0	0	0	1	609	17	633	0	0	0	650	0	0	0	0	0	0	2414
Apprch %	0.0	56.5	42.8	0.8	0.0		100.0	0.0	0.0	0.0	0.2		2.6	97.4	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	27.0	20.5	0.4	0.0	47.8	25.2	0.0	0.0	0.0	0.0	25.2	0.7	26.2	0.0	0.0	0.0	26.9	0.0	0.0	0.0	0.0	0.0	0.0	
Cars, PU, Vans	0	595	474	9		1078	584	0	0	0		584	17	574	0	0		591	0	0	0	0		0	2253
% Cars, PU, Vans	0.0	91.3	96.0	100.0		93.3	95.9	0.0	0.0	0.0		95.9	100.0	90.7	0.0	0.0		90.9	0.0	0.0	0.0	0.0		0.0	93.3
Heavy trucks	0	57	20	0		77	25	0	0	0		25	0	59	0	0		59	0	0	0	0		0	161
%Heavy trucks	0.0	8.7	4.0	0.0		6.7	4.1	0.0	0.0	0.0		4.1	0.0	9.3	0.0	0.0		9.1	0.0	0.0	0.0	0.0		0.0	6.7

Project ID: 24-430010-002
Location: Constitution Blvd & Upper Union St
City: Franklin

PEAK HOURS

Day: Tuesday
Date: 3/5/2024

AM

	Constitution Blvd Southbound					Upper Union St Westbound					Constitution Blvd Northbound					Upper Union St Eastbound					
Start Time	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Int. Total
Peak Hour Analysis from 07:00 AM - 09:00 AM																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
7:30 AM	0	75	29	0	104	49	0	0	0	49	0	20	0	0	20	0	0	0	0	0	173
7:45 AM	0	94	38	0	132	46	0	0	0	46	0	18	0	0	18	0	0	0	0	0	196
8:00 AM	0	68	20	1	89	52	0	0	0	52	1	28	0	0	29	0	0	0	0	0	170
8:15 AM	0	68	17	0	85	34	0	0	0	34	2	15	0	0	17	0	0	0	0	0	136
Total Volume	0	305	104	1	410	181	0	0	0	181	3	81	0	0	84	0	0	0	0	0	675
% App. Total	0.0	74.4	25.4	0.2	100	100.0	0.0	0.0	0.0	100	3.6	96.4	0.0	0.0	100	0.0	0.0	0.0	0.0	0	
PHF					0.777					0.870					0.724						0.861
Cars, PU, Vans	0	293	98	1	392	172	0	0	0	172	3	64	0	0	67	0	0	0	0	0	631
% Cars, PU, Vans	0.0	96.1	94.2	100.0	95.6	95.0	0.0	0.0	0.0	95.0	100.0	79.0	0.0	0.0	79.8	0.0	0.0	0.0	0.0	0.0	93.5
Heavy trucks	0	12	6	0	18	9	0	0	0	9	0	17	0	0	17	0	0	0	0	0	44
%Heavy trucks	0.0	3.9	5.8	0.0	4.4	5.0	0.0	0.0	0.0	5.0	0.0	21.0	0.0	0.0	20.2	0.0	0.0	0.0	0.0	0.0	6.5

PM

	Constitution Blvd Southbound					Upper Union St Westbound					Constitution Blvd Northbound					Upper Union St Eastbound					
Start Time	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Int. Total
Peak Hour Analysis from 04:00 PM - 06:00 PM																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
4:45 PM	0	16	31	1	48	32	0	0	0	32	0	52	0	0	52	0	0	0	0	0	132
5:00 PM	0	23	38	1	62	46	0	0	0	46	2	101	0	0	103	0	0	0	0	0	211
5:15 PM	0	14	49	1	64	29	0	0	0	29	0	46	0	0	46	0	0	0	0	0	139
5:30 PM	0	18	35	1	54	30	0	0	0	30	4	48	0	0	52	0	0	0	0	0	136
Total Volume	0	71	153	4	228	137	0	0	0	137	6	247	0	0	253	0	0	0	0	0	618
% App. Total	0.0	31.1	67.1	1.8	100	100.0	0.0	0.0	0.0	100	2.4	97.6	0.0	0.0	100	0.0	0.0	0.0	0.0	0	
PHF					0.891					0.745					0.614						0.732
Cars, PU, Vans	0	62	150	4	216	135	0	0	0	135	6	235	0	0	241	0	0	0	0	0	592
% Cars, PU, Vans	0.0	87.3	98.0	100.0	94.7	98.5	0.0	0.0	0.0	98.5	100.0	95.1	0.0	0.0	95.3	0.0	0.0	0.0	0.0	0.0	95.8
Heavy trucks	0	9	3	0	12	2	0	0	0	2	0	12	0	0	12	0	0	0	0	0	26
%Heavy trucks	0.0	12.7	2.0	0.0	5.3	1.5	0.0	0.0	0.0	1.5	0.0	4.9	0.0	0.0	4.7	0.0	0.0	0.0	0.0	0.0	4.2

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & 55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy
City: Franklin
Control: 2-Way Stop(EB/WB)

Project ID: 24-430010-003
Date: 3/5/2024

Data - Total

NS/EW Streets:	Constitution Blvd				Constitution Blvd				55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy				55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	9	0	0	13	52	0	0	0	0	0	0	0	0	5	0	79
7:15 AM	0	8	0	0	9	31	0	0	0	0	0	0	1	0	0	0	49
7:30 AM	0	14	0	0	13	52	1	0	0	0	0	0	0	0	1	0	81
7:45 AM	0	13	1	0	12	71	0	0	0	0	0	0	0	0	0	0	97
8:00 AM	1	15	0	0	5	52	1	0	0	0	1	0	0	0	2	0	77
8:15 AM	0	11	0	0	9	46	0	0	1	0	0	0	0	0	0	0	67
8:30 AM	0	14	0	0	8	32	1	1	2	0	0	0	0	0	1	0	59
8:45 AM	0	11	0	0	4	35	0	0	0	0	0	0	2	0	2	0	54
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	95	1	0	73	371	3	1	3	0	1	0	3	0	11	0	563
APPROACH %'s :	1.03%	97.94%	1.03%	0.00%	16.29%	82.81%	0.67%	0.22%	75.00%	0.00%	25.00%	0.00%	21.43%	0.00%	78.57%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	1	53	1	0	39	221	2	0	1	0	1	0	0	0	3	0	322
PEAK HR FACTOR :	0.250	0.883	0.250	0.000	0.750	0.778	0.500	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.375	0.000	0.830
	0.859				0.789				0.500				0.375				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	86	0	0	0	4	0	1	0	0	0	0	1	0	14	0	106
4:15 PM	0	30	0	0	1	12	0	0	0	0	0	0	0	0	4	0	47
4:30 PM	0	40	0	0	0	13	1	2	0	0	0	0	0	0	9	0	65
4:45 PM	0	34	1	0	0	6	0	2	1	0	0	0	0	0	9	0	53
5:00 PM	0	85	0	0	0	7	0	0	0	0	0	0	0	0	7	0	99
5:15 PM	0	28	1	0	0	3	0	0	0	0	0	0	1	0	6	0	39
5:30 PM	0	27	0	0	1	6	0	1	0	0	0	0	0	0	7	0	42
5:45 PM	0	19	0	0	0	5	0	0	0	0	0	0	0	0	3	0	27
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	349	2	0	2	56	1	6	1	0	0	0	2	0	59	0	478
APPROACH %'s :	0.00%	99.43%	0.57%	0.00%	3.08%	86.15%	1.54%	9.23%	100.00%	0.00%	0.00%	0.00%	3.28%	0.00%	96.72%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	190	1	0	1	35	1	5	1	0	0	0	1	0	36	0	271
PEAK HR FACTOR :	0.000	0.552	0.250	0.000	0.250	0.673	0.250	0.625	0.250	0.000	0.000	0.000	0.250	0.000	0.643	0.000	0.639
	0.555				0.656				0.250				0.617				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & 55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy
City: Franklin
Control: 2-Way Stop(EB/WB)

Project ID: 24-430010-003
Date: 3/5/2024

Data - Cars

NS/EW Streets:	Constitution Blvd				Constitution Blvd				55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy				55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	7	0	0	13	48	0	0	0	0	0	0	0	0	5	0	73
7:15 AM	0	3	0	0	9	30	0	0	0	0	0	0	1	0	0	0	43
7:30 AM	0	9	0	0	13	49	1	0	0	0	0	0	0	0	1	0	73
7:45 AM	0	11	0	0	12	67	0	0	0	0	0	0	0	0	0	0	90
8:00 AM	1	10	0	0	5	49	1	0	0	0	1	0	0	0	1	0	68
8:15 AM	0	7	0	0	9	44	0	0	1	0	0	0	0	0	0	0	61
8:30 AM	0	7	0	0	7	24	0	1	1	0	0	0	0	0	1	0	41
8:45 AM	0	7	0	0	4	30	0	0	0	0	0	0	0	0	2	0	43
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	61	0	0	72	341	2	1	2	0	1	0	1	0	10	0	492
APPROACH %'s :	1.61%	98.39%	0.00%	0.00%	17.31%	81.97%	0.48%	0.24%	66.67%	0.00%	33.33%	0.00%	9.09%	0.00%	90.91%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	1	37	0	0	39	209	2	0	1	0	1	0	0	0	2	0	292
PEAK HR FACTOR :	0.250	0.841	0.000	0.000	0.750	0.780	0.500	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.500	0.000	0.811
		0.864				0.791				0.500				0.500			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	83	0	0	0	2	0	1	0	0	0	0	1	0	14	0	101
4:15 PM	0	27	0	0	0	9	0	0	0	0	0	0	0	0	4	0	40
4:30 PM	0	36	0	0	0	6	1	2	0	0	0	0	0	0	9	0	54
4:45 PM	0	30	1	0	0	3	0	2	1	0	0	0	0	0	9	0	46
5:00 PM	0	80	0	0	0	6	0	0	0	0	0	0	0	0	7	0	93
5:15 PM	0	28	0	0	0	1	0	0	0	0	0	0	0	0	6	0	35
5:30 PM	0	24	0	0	1	4	0	1	0	0	0	0	0	0	7	0	37
5:45 PM	0	17	0	0	0	3	0	0	0	0	0	0	0	0	3	0	23
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	325	1	0	1	34	1	6	1	0	0	0	1	0	59	0	429
APPROACH %'s :	0.00%	99.69%	0.31%	0.00%	2.38%	80.95%	2.38%	14.29%	100.00%	0.00%	0.00%	0.00%	1.67%	0.00%	98.33%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	176	1	0	0	20	1	5	1	0	0	0	1	0	36	0	241
PEAK HR FACTOR :	0.000	0.530	0.250	0.000	0.000	0.556	0.250	0.625	0.250	0.000	0.000	0.000	0.250	0.000	0.643	0.000	0.597
		0.533				0.722				0.250				0.617			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & 55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy
City: Franklin
Control: 2-Way Stop(EB/WB)

Project ID: 24-430010-003
Date: 3/5/2024

Data - HT

NS/EW Streets:	Constitution Blvd				Constitution Blvd				55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy				55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0	0	6
7:15 AM	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	6
7:30 AM	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	8
7:45 AM	0	2	1	0	0	4	0	0	0	0	0	0	0	0	0	0	7
8:00 AM	0	5	0	0	0	3	0	0	0	0	0	0	0	0	1	0	9
8:15 AM	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0	0	6
8:30 AM	0	7	0	0	1	8	1	0	1	0	0	0	0	0	0	0	18
8:45 AM	0	4	0	0	0	5	0	0	0	0	0	0	2	0	0	0	11
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	34	1	0	1	30	1	0	1	0	0	0	2	0	1	0	71
APPROACH %'s :	0.00%	97.14%	2.86%	0.00%	3.13%	93.75%	3.13%	0.00%	100.00%	0.00%	0.00%	0.00%	66.67%	0.00%	33.33%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	16	1	0	0	12	0	0	0	0	0	0	0	0	1	0	30
PEAK HR FACTOR :	0.000	0.800	0.250	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.833
		0.850				0.750									0.250		

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5
4:15 PM	0	3	0	0	1	3	0	0	0	0	0	0	0	0	0	0	7
4:30 PM	0	4	0	0	0	7	0	0	0	0	0	0	0	0	0	0	11
4:45 PM	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0	0	7
5:00 PM	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0	0	6
5:15 PM	0	0	1	0	0	2	0	0	0	0	0	0	1	0	0	0	4
5:30 PM	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5
5:45 PM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	24	1	0	1	22	0	0	0	0	0	0	1	0	0	0	49
APPROACH %'s :	0.00%	96.00%	4.00%	0.00%	4.35%	95.65%	0.00%	0.00%					100.00%	0.00%	0.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	14	0	0	1	15	0	0	0	0	0	0	0	0	0	0	30
PEAK HR FACTOR :	0.000	0.875	0.000	0.000	0.250	0.536	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.682
		0.875				0.571											

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & 55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy
City: Franklin
Control: 2-Way Stop(EB/WB)

Project ID: 24-430010-003
Date: 3/5/2024

Data - Bikes

NS/EW Streets:	Constitution Blvd				Constitution Blvd				55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy				55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %'s :																	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
APPROACH %'s :																	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services

Intersection Turning Movement Count

Location: Constitution Blvd & 55 Constitution Blvd Northern Dwy/Dell Technolo **Project ID:** 24-430010-003
City: Franklin **Date:** 3/5/2024

Data - Pedestrians (Crosswalks)

NS/EW Streets:	Constitution Blvd		Constitution Blvd		55 Constitution Blvd Northern Dwy/Dell		55 Constitution Blvd Northern Dwy/Dell		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	1	0	0	0	1
7:15 AM	0	0	0	0	1	0	0	0	1
7:30 AM	0	0	0	0	1	0	0	0	1
7:45 AM	0	0	0	0	0	1	0	0	1
8:00 AM	0	0	0	0	0	1	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	1	0	0	0	1	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	1	0	0	3	3	0	0	7
APPROACH %'s :	0.00%	100.00%			50.00%	50.00%			
PEAK HR :	**07:30 AM - 08:30 AM**								TOTAL
PEAK HR VOL :	0	0	0	0	1	2	0	0	3
PEAK HR FACTOR :					0.250	0.500			0.750
					0.750				

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	**04:00 PM - 05:00 PM**								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

Prepared by National Data & Surveying Services

Constitution Blvd & 55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy

Peak Hour Turning Movement Count

ID: 24-430010-003
City: Franklin

Day: Tuesday
Date: 3/5/2024

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	NONE
PM	04:00 PM - 05:00 PM

COUNT PERIODS

AM	7:00 AM - 09:00 AM
NOON	NONE
PM	4:00 PM - 06:00 PM

SOUTHBOUND — Constitution Blvd

AM	2	221	39	0	57	AM
NOON	0	0	0	0	0	NOON
PM	1	35	1	5	232	PM
	0	2	0	0		

EASTBOUND — 55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy

AM	NOON	PM	
3	0	1	
0	0	0	0
1	0	1	0
0	0	0	1
1	0	0	0
AM	NOON	PM	

WESTBOUND — 55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy

PM	NOON	AM	
36	0	3	0
0	0	0	1
1	0	0	0
0	0	0	0
2	0	40	
PM	NOON	AM	

CONTROL

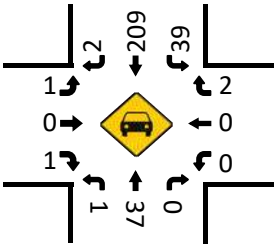
2-Way Stop(EB/WB)

TEV	322 AM	0 NOON	271 PM
PHF	0.83		0.64

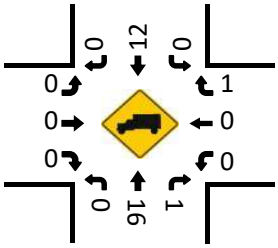
NORTHBOUND — Constitution Blvd

	0	0	1	0		
PM	36	0	0	190	1	PM
NOON	0	0	0	0	0	NOON
AM	222	0	1	53	1	AM

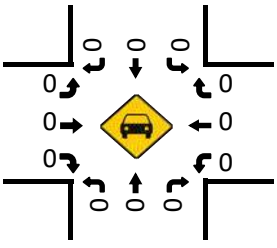
Cars (AM)



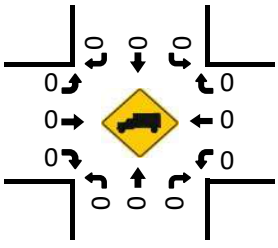
HT (AM)



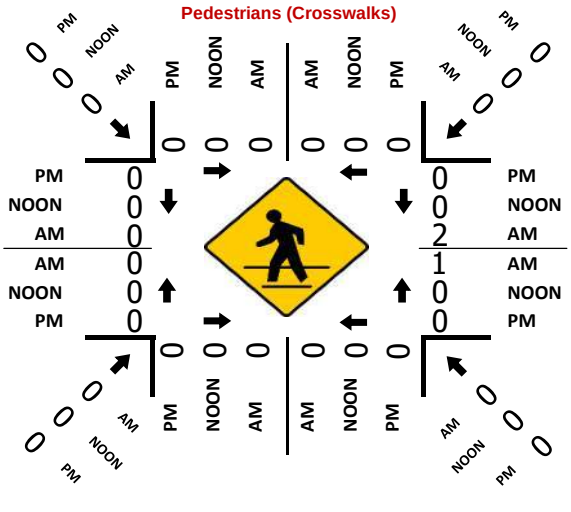
Cars (NOON)



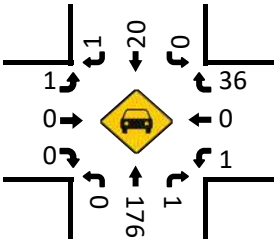
HT (NOON)



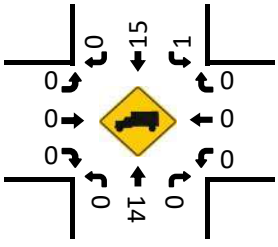
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Project ID: 24-430010-003
Location: Constitution Blvd & 55 Constitution Blvd Northern Dwy/Dell Technologies Employee Dwy
City: Franklin

Day: Tuesday
Date: 3/5/2024

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Constitution Blvd Southbound						ion Blvd Northern Dwy/Dell Technologies Em Westbound						Constitution Blvd Northbound						ution Blvd Northern Dwy/Dell Technologies Emp Eastbound						
Start Time	Rgt	Thru	Left	Uturn	Peds	App. Total	Rgt	Thru	Left	Uturn	Peds	App. Total	Rgt	Thru	Left	Uturn	Peds	App. Total	Rgt	Thru	Left	Uturn	Peds	App. Total	Int. Total
7:00 AM	0	52	13	0	0	65	5	0	0	0	1	5	0	9	0	0	0	9	0	0	0	0	0	0	79
7:15 AM	0	31	9	0	0	40	0	0	1	0	1	1	0	8	0	0	0	8	0	0	0	0	0	0	49
7:30 AM	1	52	13	0	0	66	1	0	0	0	1	1	0	14	0	0	0	14	0	0	0	0	0	0	81
7:45 AM	0	71	12	0	0	83	0	0	0	0	1	0	1	13	0	0	0	14	0	0	0	0	0	0	97
Total	1	206	47	0	0	254	6	0	1	0	4	7	1	44	0	0	0	45	0	0	0	0	0	0	306
8:00 AM	1	52	5	0	0	58	2	0	0	0	1	2	0	15	1	0	0	16	1	0	0	0	0	1	77
8:15 AM	0	46	9	0	0	55	0	0	0	0	0	0	0	11	0	0	0	11	0	0	1	0	0	1	67
8:30 AM	1	32	8	1	1	42	1	0	0	0	1	1	0	14	0	0	0	14	0	0	2	0	0	2	59
8:45 AM	0	35	4	0	0	39	2	0	2	0	0	4	0	11	0	0	0	11	0	0	0	0	0	0	54
Total	2	165	26	1	1	194	5	0	2	0	2	7	0	51	1	0	0	52	1	0	3	0	0	4	257
BREAK																									
4:00 PM	0	4	0	1	0	5	14	0	1	0	0	15	0	86	0	0	0	86	0	0	0	0	0	0	106
4:15 PM	0	12	1	0	0	13	4	0	0	0	0	4	0	30	0	0	0	30	0	0	0	0	0	0	47
4:30 PM	1	13	0	2	0	16	9	0	0	0	0	9	0	40	0	0	0	40	0	0	0	0	0	0	65
4:45 PM	0	6	0	2	0	8	9	0	0	0	0	9	1	34	0	0	0	35	0	0	1	0	0	1	53
Total	1	35	1	5	0	42	36	0	1	0	0	37	1	190	0	0	0	191	0	0	1	0	0	1	271
5:00 PM	0	7	0	0	0	7	7	0	0	0	0	7	0	85	0	0	0	85	0	0	0	0	0	0	99
5:15 PM	0	3	0	0	0	3	6	0	1	0	0	7	1	28	0	0	0	29	0	0	0	0	0	0	39
5:30 PM	0	6	1	1	0	8	7	0	0	0	0	7	0	27	0	0	0	27	0	0	0	0	0	0	42
5:45 PM	0	5	0	0	0	5	3	0	0	0	0	3	0	19	0	0	0	19	0	0	0	0	0	0	27
Total	0	21	1	1	0	23	23	0	1	0	0	24	1	159	0	0	0	160	0	0	0	0	0	0	207
Grand Total	4	427	75	7	1	513	70	0	5	0	6	75	3	444	1	0	0	448	1	0	4	0	0	5	1041
Apprch %	0.8	83.2	14.6	1.4	0.2		93.3	0.0	6.7	0.0	8.0		0.7	99.1	0.2	0.0	0.0		20.0	0.0	80.0	0.0	0.0		
Total %	0.4	41.0	7.2	0.7	0.1	49.3	6.7	0.0	0.5	0.0	0.6	7.2	0.3	42.7	0.1	0.0	0.0	43.0	0.1	0.0	0.4	0.0	0.0	0.5	
Cars, PU, Vans	3	375	73	7		458	69	0	2	0		71	1	386	1	0		388	1	0	3	0		4	921
% Cars, PU, Vans	75.0	87.8	97.3	100.0		89.3	98.6	0.0	40.0	0.0		94.7	33.3	86.9	100.0	0.0		86.6	100.0	0.0	75.0	0.0		80.0	88.5
Heavy trucks	1	52	2	0		55	1	0	3	0		4	2	58	0	0		60	0	0	1	0		1	120
%Heavy trucks	25.0	12.2	2.7	0.0		10.7	1.4	0.0	60.0	0.0		5.3	66.7	13.1	0.0	0.0		13.4	0.0	0.0	25.0	0.0		20.0	11.5

Project ID: 24-430010-003
Location: Constitution Blvd & 55 Constitution Blvd Northern D
City: Franklin

PEAK HOURS

Day: Tuesday
Date: 3/5/2024

AM

	Constitution Blvd Southbound					Blvd Northern Dwy/Dell Technologies Westbound					Constitution Blvd Northbound					Blvd Northern Dwy/Dell Technologies Eastbound					
Start Time	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Int. Total
Peak Hour Analysis from 07:00 AM - 09:00 AM																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
7:30 AM	1	52	13	0	66	1	0	0	0	1	0	14	0	0	14	0	0	0	0	0	81
7:45 AM	0	71	12	0	83	0	0	0	0	0	1	13	0	0	14	0	0	0	0	0	97
8:00 AM	1	52	5	0	58	2	0	0	0	2	0	15	1	0	16	1	0	0	0	1	77
8:15 AM	0	46	9	0	55	0	0	0	0	0	0	11	0	0	11	0	0	1	0	1	67
Total Volume	2	221	39	0	262	3	0	0	0	3	1	53	1	0	55	1	0	1	0	2	322
% App. Total	0.8	84.4	14.9	0.0	100	100.0	0.0	0.0	0.0	100	1.8	96.4	1.8	0.0	100	50.0	0.0	50.0	0.0	100	
PHF					0.789					0.375					0.859					0.500	0.830
Cars, PU, Vans	2	209	39	0	250	2	0	0	0	2	0	37	1	0	38	1	0	1	0	2	292
% Cars, PU, Vans	100.0	94.6	100.0	0.0	95.4	66.7	0.0	0.0	0.0	66.7	0.0	69.8	100.0	0.0	69.1	100.0	0.0	100.0	0.0	100.0	90.7
Heavy trucks	0	12	0	0	12	1	0	0	0	1	1	16	0	0	17	0	0	0	0	0	30
%Heavy trucks	0.0	5.4	0.0	0.0	4.6	33.3	0.0	0.0	0.0	33.3	100.0	30.2	0.0	0.0	30.9	0.0	0.0	0.0	0.0	0.0	9.3

PM

	Constitution Blvd Southbound					Blvd Northern Dwy/Dell Technologies Westbound					Constitution Blvd Northbound					Blvd Northern Dwy/Dell Technologies Eastbound					
Start Time	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Rgt	Thru	Left	Uturn	App. Total	Int. Total
Peak Hour Analysis from 04:00 PM - 06:00 PM																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
4:00 PM	0	4	0	1	5	14	0	1	0	15	0	86	0	0	86	0	0	0	0	0	106
4:15 PM	0	12	1	0	13	4	0	0	0	4	0	30	0	0	30	0	0	0	0	0	47
4:30 PM	1	13	0	2	16	9	0	0	0	9	0	40	0	0	40	0	0	0	0	0	65
4:45 PM	0	6	0	2	8	9	0	0	0	9	1	34	0	0	35	0	0	1	0	1	53
Total Volume	1	35	1	5	42	36	0	1	0	37	1	190	0	0	191	0	0	1	0	1	271
% App. Total	2.4	83.3	2.4	11.9	100	97.3	0.0	2.7	0.0	100	0.5	99.5	0.0	0.0	100	0.0	0.0	100.0	0.0	100	
PHF					0.656					0.617					0.555					0.250	0.639
Cars, PU, Vans	1	20	0	5	26	36	0	1	0	37	1	176	0	0	177	0	0	1	0	1	241
% Cars, PU, Vans	100.0	57.1	0.0	100.0	61.9	100.0	0.0	100.0	0.0	100.0	100.0	92.6	0.0	0.0	92.7	0.0	0.0	100.0	0.0	100.0	88.9
Heavy trucks	0	15	1	0	16	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	30
%Heavy trucks	0.0	42.9	100.0	0.0	38.1	0.0	0.0	0.0	0.0	0.0	0.0	7.4	0.0	0.0	7.3	0.0	0.0	0.0	0.0	0.0	11.1

TRAFFIC-VOLUME ADJUSTMENT DATA

Massachusetts Highway Department

Statewide Traffic Data Collection

2019 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.22	1.14	1.12	1.06	1.00	0.96	0.87	0.85	0.96	0.99	1.04	1.12	0.85
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.15	1.06	1.07	1.00	0.89	0.88	0.89	0.89	0.95	0.92	1.02	1.01	0.97
R4-R7	1.09	1.09	1.11	1.02	0.96	0.92	0.89	0.89	0.99	0.98	1.09	1.13	0.98
U1-Boston	1.03	1.01	0.98	0.94	0.94	0.92	0.95	0.93	0.94	0.94	0.97	1.04	0.96
U1-Essex	1.09	1.06	1.03	0.99	0.94	0.90	0.88	0.86	0.93	0.94	0.99	1.06	0.93
U1-Southeast	1.06	1.05	1.01	0.97	0.95	0.93	0.93	0.90	0.94	0.94	0.98	1.04	0.98
U1-West	1.19	1.14	1.09	0.95	0.92	0.89	0.89	0.86	0.91	0.95	0.97	1.07	0.84
U1-Worcester	1.02	1.04	0.97	0.94	0.93	0.91	0.95	0.91	0.93	0.92	0.95	1.10	0.88
U2	1.01	1.00	0.94	0.93	0.91	0.89	0.93	0.90	0.90	0.91	0.94	1.02	0.99
U3	1.06	1.03	0.98	0.94	0.93	0.91	0.95	0.91	0.92	0.93	0.97	1.00	0.98
U4-U7	1.01	1.00	0.95	0.92	0.88	0.86	0.92	0.91	0.92	0.94	0.99	1.04	0.99
Rec - East	1.04	1.16	1.12	0.98	0.92	0.88	0.77	0.81	0.94	1.02	1.08	1.12	0.99
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.98

Round off:
0-999 = 10
>1000 = 100

Average 2017-2019 = 0.98

U = Urban
R = Rural

1 - Interstate
2 - Freeway and Expressway
3 - Other Principal Arterial
4 - Minor Arterial
5 - Major Collector
6 - Minor Collector
7 - Local Road and Street

Recreational - East Group - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.

5/26/2020

Massachusetts Highway Department

Statewide Traffic Data Collection

2018 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.37	1.26	1.30	1.08	0.97	0.93	0.87	0.83	0.96	0.98	1.05	1.13	0.78
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.15	1.06	1.07	1.00	0.89	0.88	0.89	0.89	0.95	0.92	1.02	1.01	0.98
R4-R7	1.10	1.07	1.03	1.00	0.90	0.92	0.94	0.94	0.96	0.94	1.03	1.02	0.93
U1-Boston	1.05	0.98	1.01	0.93	0.92	0.91	0.95	0.93	0.94	0.92	0.96	0.99	0.96
U1-Essex	1.05	1.01	1.04	0.93	0.92	0.89	0.90	0.90	0.94	0.93	0.98	1.01	0.91
U1-Southeast	1.11	1.05	1.07	0.99	0.93	0.89	0.88	0.87	0.93	0.95	1.01	1.05	0.98
U1-West	1.15	1.08	1.07	0.98	0.94	0.92	0.92	0.88	0.92	0.91	1.00	1.06	0.83
U1-Worcester	1.18	1.11	1.09	0.99	0.95	0.94	0.95	0.91	0.97	0.97	1.01	1.05	0.87
U2	1.04	0.99	0.99	0.94	0.92	0.90	0.93	0.91	0.94	0.92	0.96	0.98	0.99
U3	0.99	1.00	1.02	0.96	0.91	0.89	0.92	0.90	0.95	0.92	1.01	0.97	0.97
U4-U7	1.03	1.02	0.97	0.95	0.88	0.89	0.96	0.93	0.94	0.93	1.00	1.00	0.99
Rec - East	1.22	1.15	1.09	1.12	0.90	0.89	0.82	0.83	0.92	0.98	1.06	1.08	0.99
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.97

Round off:
0-999 = 10
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U = Urban
R = Rural

1 - Interstate
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Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.

5/26/2020

Massachusetts Highway Department

Statewide Traffic Data Collection

2017 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.30	1.23	1.21	1.04	0.98	0.92	0.86	0.81	0.95	0.99	1.03	1.10	0.80
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.05	1.01	1.04	0.99	0.94	0.93	0.91	0.92	0.96	0.94	1.01	1.03	0.97
R4-R7	1.10	1.07	1.09	1.00	0.95	0.89	0.88	0.87	0.92	0.95	1.04	1.09	0.93
U1-Boston	1.01	1.04	0.99	0.94	0.93	0.92	0.96	0.93	0.94	0.93	0.95	0.98	0.95
U1-Essex	1.04	1.05	1.00	0.96	0.93	0.89	0.90	0.90	0.93	0.93	0.98	1.03	0.90
U1-Southeast	1.07	1.05	1.02	0.97	0.95	0.90	0.89	0.88	0.92	0.94	0.98	1.01	0.97
U1-West	1.00	0.96	0.94	0.92	0.93	0.92	0.95	0.93	0.92	0.92	0.97	0.97	0.89
U1-Worcester	1.10	1.10	1.04	0.97	0.95	0.94	0.93	0.91	0.95	0.96	0.98	1.04	0.89
U2	1.01	1.03	0.98	0.95	0.93	0.91	0.94	0.92	0.95	0.95	0.95	0.97	0.98
U3	1.03	1.05	1.01	0.95	0.92	0.90	0.94	0.93	0.93	0.92	0.96	0.99	0.96
U4-U7	1.06	1.05	1.02	0.96	0.92	0.89	0.95	0.95	0.92	0.92	0.98	1.03	0.98
Rec - East	1.18	1.17	1.08	1.03	0.95	0.87	0.83	0.83	0.97	0.98	1.19	1.19	0.98
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.95

Round off:
0-999 = 10
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1 - Interstate
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Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.

5/26/2020

Traffic Growth Rate[a]

Location	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Annual Rate
STATION 6219 - BELLINGHAM - CENTER STREET SOUTH OF CROSS STREET			4,759			4,102			4,361		-1.38%
STATION 6264 - FRANKLIN - UNION STREET BETWEEN HUTCHINSON STREET AND ARLINGTON STREET	11,942	8,301			7,867			8,395			-4.18%
STATION 6230 - WRENTHAM - WEST STREET SOUTH OF ROUTE I-495	7,256		9,706			7,952					2.41%
STATION 86353 - BELLINGHAM - PULASKI BLVD SOUTH OF SOUTH MAIN STREET			17,411						18,321		0.85%
STATION 6211 - FRANKLIN - PLEASANT STREET AT NORFOLK TOWN LINE	11,828		10,232			9,519			11,724		0.06%
STATION 6127 - WRENTHAM - INTERSTATE 495 NORTH OF ROUTE 1A	75,510	78307	79636	80,993	82671	88821	91,048			87,332	1.67%
										Average Annual Growth Rate =	**-0.10%**
										USE	**1%**

[a] Source: Based upon historical data; MassDOT Transportation Data Management System.

Data filtered based on similar months over the years

MASSDOT CRASH RATE WORKSHEETS

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Franklin COUNT DATE : 3/14/2024

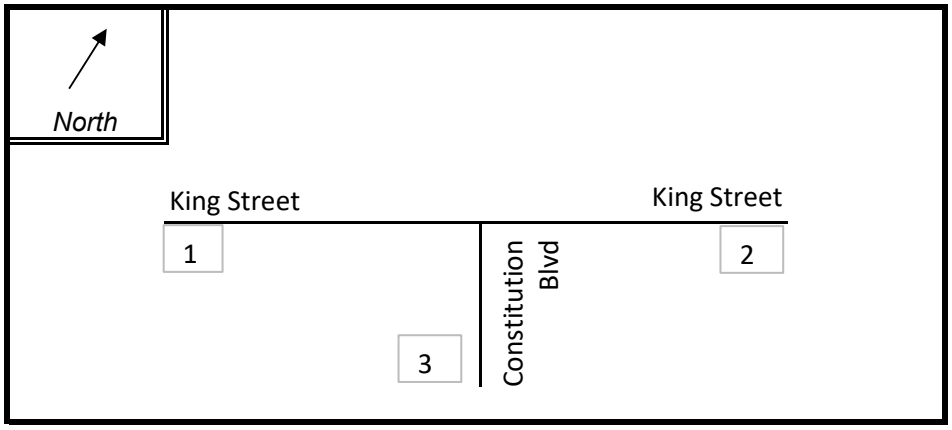
DISTRICT : 3 UNSIGNALIZED : SIGNALIZED : X

~ INTERSECTION DATA ~

MAJOR STREET : King Street

MINOR STREET(S) : Constitution Boulevard

INTERSECTION DIAGRAM (Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	NB			
PEAK HOURLY VOLUMES (AM/PM) :	436	1,036	379			**1,851**

" K " FACTOR : **0.074** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **25,014**

TOTAL # OF CRASHES : 25 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **5.00**

CRASH RATE CALCULATION : **0.55** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Thursday PM volumes used

Project Title & Date: NEX-2400058 - Franklin, MA

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Franklin COUNT DATE : 3/14/2024

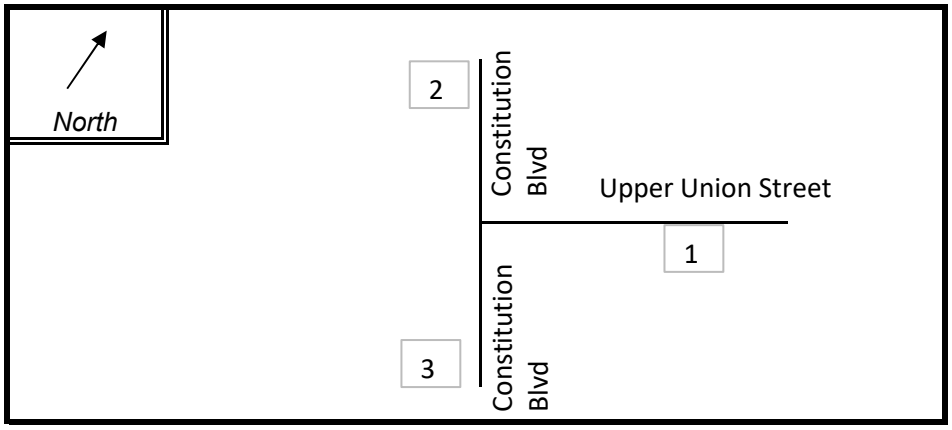
DISTRICT : 3 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Constitution Boulevard

MINOR STREET(S) : Upper Union Street

INTERSECTION DIAGRAM
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	WB	SB	NB			
PEAK HOURLY VOLUMES (AM/PM) :	135	224	251			**610**

" K " FACTOR : **0.074** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **8,243**

TOTAL # OF CRASHES : 5 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.00**

CRASH RATE CALCULATION : **0.33** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : Thursday PM volumes used

Project Title & Date: NEX-2400058 - Franklin, MA

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	Max Injury Severity Reported	Number of Vehicles	Driver Contributing Circumstances (All Drivers)	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Traffic Control Device Type	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Road Contributing Circumstance	Speed Limit	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude	Street Number	Roadway	Near Intersection Roadway	Distance and Direction From Intersection	Landmark	Distance and Direction From Landmark
4012528	FRANKLIN	02/11/2015	Non-fatal injury	11:40 AM	Non-fatal injury - Possible	2		Daylight	Angle	Wet	T-intersection	Traffic control signal	V1: Travelling straight ahead / V2: Turning left	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: N / V2: S	Snow	Road surface condition (wet, icy, snow, slush, etc.)	40	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06284	-71.40349	600	KING STREET				
4071568	FRANKLIN	08/04/2015	Not Reported	9:18 AM	Not reported	2		Daylight	Rear-end	Dry	Not at junction	No controls	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: E	Clear	None	30	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06284	-71.40349	600	KING				
4095046	FRANKLIN	10/06/2015	Property damage only (none injured)	8:11 AM	No injury	2	D1: (Failure to keep in proper lane or running off road),(Made an improper turn) / D2: (No improper driving)	Daylight	Angle	Dry	Not at junction	Traffic control signal	V1: Making U-turn / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Not Reported	None		V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06288	-71.40339		KING STREET / CONSTITUTION BOULEVARD				
4116981	FRANKLIN	10/16/2015	Non-fatal injury	10:43 AM	Non-fatal injury - Incapacitating	2	D1: (No improper driving) / D2: (No improper driving)	Daylight	Single vehicle crash	Dry	Not reported	Traffic control signal	V1: Travelling straight ahead / V2: Changing lanes	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Motorcycle)	V1: E / V2: E	Clear	None	30	V1:(Other)	42.0632	-71.40283	550	KING				
4140162	FRANKLIN	01/24/2016	Non-fatal injury	2:11 PM	Non-fatal injury - Possible	4	D1: (Unknown) / D2: (Unknown) / D3: (Unknown) / D4: (Unknown)	Daylight	Rear-end	Dry	On-ramp	Traffic control signal	V1: Travelling straight ahead / V2: Travelling straight ahead / V3: Travelling straight ahead / V4: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Light truck(van, mini-van, pickup, sport utility)) / V3:(Passenger car) / V4:(Light truck(van, mini-van, pickup, sport utility))	V1: E / V2: E / V3: E / V4: E	Clear	None	35	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic) V3:(Collision with motor vehicle in traffic) V4:(Collision with motor vehicle in traffic)	42.06305	-71.40303	570	KING		1000 feet E of		
4142883	FRANKLIN	01/27/2016	Property damage only (none injured)	6:50 PM	No injury	2	D1: (No improper driving) / D2: (Physical impairment),(Inattention)	Dark - lighted roadway	Rear-end	Dry	Driveway	Traffic control signal	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: E / V2: E	Clear	None		V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06284	-71.40349	600	KING			FRANKLIN FIRE DEPAR	
4149361	FRANKLIN	02/06/2016	Non-fatal injury	1:37 PM	Non-fatal injury - Possible	2	D1: (No improper driving) / D2: (Failed to yield right of way),(Inattention)	Daylight	Angle	Dry	On-ramp	Traffic control signal	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: N	Clear	None		V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06292	-71.40329	595	KING				
4193869	FRANKLIN	05/17/2016	Non-fatal injury	7:36 AM	Non-fatal injury - Possible	2	D1: (No improper driving) / D2: (Inattention)	Daylight	Rear-end	Dry	Not at junction	Traffic control signal	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: N	Clear/Clear	None		V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06284	-71.40349	600	KING				
4203618	FRANKLIN	05/21/2016	Property damage only (none injured)	2:32 PM	No injury	2	D1: (No improper driving) / D2: (),(Failure to keep in proper lane or running off road)	Daylight	Angle	Dry	T-intersection	Traffic control signal	V1: Turning left / V2: Turning left	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: E / V2: E	Cloudy	Not reported		V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06288	-71.40339		KING STREET / UNION STREET				
4207161	FRANKLIN	06/16/2016	Property damage only (none injured)	7:37 AM	No injury	3	D1: (No improper driving) / D2: (No improper driving)	Daylight	Sideswipe, same direction	Dry	T-intersection	Traffic control signal	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Changing lanes	V1:(Passenger car) / V2:(Passenger car) / V3:(Passenger car)	V1: E / V2: E / V3: E	Clear	None	35	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic) V3:(Collision with motor vehicle in traffic)	42.06284	-71.40349	600	KING				
4246259	FRANKLIN	09/10/2016	Property damage only (none injured)	12:22 PM	No injury	2	D1: (Followed too closely),(Inattention) / D2: (No improper driving)	Daylight	Rear-end	Dry	T-intersection	Traffic control signal	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: E	Cloudy	None	30	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06284	-71.40349	600	KING				

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	Max Injury Severity Reported	Number of Vehicles	Driver Contributing Circumstances (All Drivers)	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Traffic Control Device Type	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Road Contributing Circumstance	Speed Limit	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude	Street Number	Roadway	Near Intersection Roadway	Distance and Direction From Intersection	Landmark	Distance and Direction From Landmark
4283036	FRANKLIN	11/11/2016	Property damage only (none injured)	10:18 PM	No injury	1	D1: (No improper driving),(No improper driving)	Dark - lighted roadway	Single vehicle crash	Dry	T-intersection	Traffic control signal	V1: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility))	V1: W	Clear	None	35	V1:(Collision with animal - deer)	42.06302	-71.40309		KING / CONSTITUTION BLVD / KING STREET	UNION STREET			
4293374	FRANKLIN	11/27/2016	Property damage only (none injured)	5:51 PM	No injury	2	D1: (Unknown) / D2: (Unknown)	Dark - unknown roadway lighting	Angle	Dry	On-ramp	Traffic control signal	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: S	Clear	None	30	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.0632	-71.40283	550	KING				
4384438	FRANKLIN	06/26/2017	Property damage only (none injured)	6:42 AM	No injury	2	D1: (No improper driving) / D2: (Failed to yield right of way)	Daylight	Angle	Dry	On-ramp	Traffic control signal	V1: Travelling straight ahead / V2: Turning left	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1: N / V2: W	Clear	None		V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06284	-71.40349	600	KING				
4392679	FRANKLIN	07/18/2017	Non-fatal injury	8:13 PM	Non-fatal injury - Possible	2	D1: (Inattention),(Inattention) / D2: (No improper driving),(No improper driving)	Dusk	Rear-end	Dry	Four-way intersection	Traffic control signal	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1: E / V2: E	Cloudy	None	35	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06283	-71.40349		KING STREET	CONSTITUTION BOULEVARD	100 feet W of		
4443872	FRANKLIN	10/24/2017	Property damage only (none injured)	4:07 PM	No injury	2	D1: (No improper driving) / D2: (No improper driving)	Daylight	Sideswipe, same direction	Wet	T-intersection	Traffic control signal	V1: Turning left / V2: Turning left	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Single-unit truck (2-axle, 6-tires))	V1: S / V2: S	Cloudy/Rain	None	30	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06269	-71.40313		UNION STREET / KING STREET				
4510057	FRANKLIN	03/02/2018	Non-fatal injury	5:30 PM	Non-fatal injury - Possible	3	D1: (No improper driving) / D2: (No improper driving) / D3: (Inattention)	Dark - lighted roadway	Rear-end	Wet	T-intersection	Traffic control signal	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car) / V3:(Passenger car)	V1: W / V2: W / V3: W	Rain/Sleet, hail (freezing rain or drizzle)	None	30	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic) V3:(Collision with motor vehicle in traffic)	42.06283	-71.40349	600	KING				
4540017	FRANKLIN	05/16/2018	Property damage only (none injured)	5:09 PM	No injury	2	D1: (Other improper action) / D2: (No improper driving)	Daylight	Rear-end	Dry	T-intersection	Not reported	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: W	Clear	None	35	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.0629	-71.40333		KING / KING STREET / CONSTITUTION BLVD				
4593663	FRANKLIN	09/07/2018	Property damage only (none injured)	4:24 PM	No injury	2	D1: (No improper driving) / D2: (No improper driving)	Daylight	Rear-end	Dry	T-intersection	Traffic control signal	V1: Travelling straight ahead / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Cloudy	None	40	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06283	-71.40348	600	KING		100 feet S of		
4620932	FRANKLIN	11/10/2018	Non-fatal injury	12:01 AM	Non-fatal injury - Possible	2	D1: (No improper driving),(No improper driving)	Dark - lighted roadway	Head-on	Wet	Not reported	No controls	V1: Travelling straight ahead / V2: Entering traffic lane	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1: E / V2: W	Rain/Rain	None	40	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06283	-71.40348	600	KING				
4709933	FRANKLIN	06/03/2019	Property damage only (none injured)	6:19 PM	No Apparent Injury (O)	3	D1: (No improper driving),(No improper driving) / D3: (No improper driving),(No improper driving)	Daylight	Sideswipe, same direction	Dry	Four-way intersection	Traffic control signal	V1: Turning left / V2: Turning left / V3: Turning left	V1:(Passenger car) / V2:(Truck/trailer) / V3:(Truck/trailer)	V1: W / V2: W / V3: W	Clear	None		V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic) V3:(Collision with motor vehicle in traffic)	42.06283	-71.40348	600	KING STREET				
4720788	FRANKLIN	06/27/2019	Property damage only (none injured)	3:30 PM	No Apparent Injury (O)	3	D1: (No improper driving) / D2: (No improper driving) / D3: (Unknown)	Daylight	Rear-end	Dry	Four-way intersection	Traffic control signal	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car) / V3:(Passenger car)	V1: N / V2: N / V3: N	Clear	None		V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic) V3:(Collision with motor vehicle in traffic)	42.06289	-71.40337	600	KING			FRANKLIN FIRE DEPAR	10 feet N of

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	Max Injury Severity Reported	Number of Vehicles	Driver Contributing Circumstances (All Drivers)	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Traffic Control Device Type	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Road Contributing Circumstance	Speed Limit	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude	Street Number	Roadway	Near Intersection Roadway	Distance and Direction From Intersection	Landmark	Distance and Direction From Landmark
4747177	FRANKLIN	09/04/2019	Non-fatal injury	4:04 PM	Possible Injury (C)	1	D1: (Driving too fast for conditions)	Daylight	Single vehicle crash	Dry	T-intersection	Traffic control signal	V1: Turning left	V1:(Tractor/semi-trailer)	V1: S	Clear	None	35	V1:(Overturn/rollover)	42.0629	-71.40333		KING / CONSTITUTION BLVD				
4780304	FRANKLIN	11/22/2019	Property damage only (none injured)	7:18 AM	No Apparent Injury (O)	2	D1: (No improper driving) / D2: (Inattention)	Daylight	Rear-end	Wet	Not at junction	No controls	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: E / V2: E	Cloudy	None		V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06283	-71.40348	600	KING				
4782775	FRANKLIN	12/01/2019	Property damage only (none injured)	1:28 PM	No Apparent Injury (O)	2	D1: (No improper driving) / D2: (Inattention),(Distracted)	Daylight	Rear-end	Dry	Not at junction	No controls	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1: N / V2: N	Cloudy	None		V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06283	-71.40348	600	KING				

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Time	Max Injury Severity Reported	Number of Vehicles	Driver Contributing Circumstances (All Drivers)	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Traffic Control Device Type	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Road Contributing Circumstance	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude	Street Number	Roadway	Near Intersection Roadway
4005357	FRANKLIN	02/06/2015	Property damage only (none injured)	8:27 AM	No injury	1	D1: (Physical impairment)	Daylight	Single vehicle crash	Dry	Not at junction	No controls	V1: Travelling straight ahead	V1:(Passenger car)	V1: E	Clear/Clear	None	V1:(Collision with curb),(Other)	42.06226	-71.402329	2	CONSTITUTION BLVD	
4033604	FRANKLIN	04/14/2015	Property damage only (none injured)	3:44 PM	No injury	2	D1: (Unknown) / D2: (Unknown)	Daylight	Sideswipe, same direction	Dry	T-intersection	No controls	V1: Making U-turn / V2: Travelling straight ahead	V1:(Light truck(van, mini-van, pickup, sport utility)) / V2:(Passenger car)	V1: Not Reported / V2: Not Reported	Cloudy	Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06226	-71.402329	1	CONSTITUTION BLVD Rte	
4326718	FRANKLIN	02/01/2017	Property damage only (none injured)	10:09 AM	No injury	2	D1: (No improper driving) / D2: (),(Inattention)	Daylight	Rear-end	Dry	T-intersection	Stop signs	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic	V1:(Passenger car) / V2:(Light truck(van, mini-van, pickup, sport utility))	V1: W / V2: W	Cloudy	None	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06247	-71.402316		CONSTITUTION BOULEVARD / UNION STREET	
4449710	FRANKLIN	10/27/2017	Property damage only (none injured)	2:39 PM	No injury	2	D1: (No improper driving) / D2: (Followed too closely)	Daylight	Sideswipe, same direction	Dry	T-intersection	Traffic control signal	V1: Turning left / V2: Turning left	V1:(Tractor/semi-trailer) / V2:(Passenger car)	V1: S / V2: S	Clear	None	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06226	-71.402329	1	CONSTITUTION BLVD	
4488756	FRANKLIN	01/22/2018	Property damage only (none injured)	3:00 PM	No injury	2	D1: (No improper driving),(No improper driving) / D2: (Unknown),(Unknown)	Dusk	Angle	Wet	Not at junction	No controls	V1: Travelling straight ahead / V2: Turning right	V1:(Passenger car) / V2:(Single-unit truck (2-axle, 6-tires))	V1: S / V2: S	Rain/Fog, smog, smoke		V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.06226	-71.402334	1	CONSTITUTION BOULEVARD	

SIGHT DISTANCE CALCULATIONS AND SIGHT LINE PLANS

AASHTO Recommended Sight Distance Summary
(Passenger Vehicles)

LOCATION: Constitution Blvd at Northern Site Driveway

Side Street Direction:	EB
Number of Lanes on Mainline =	2
Median Width (Feet) =	0

STOPPING SIGHT DISTANCE

Mainline Direction:	SB	
85th Percentile Speed (V) =	38	MPH
Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Brake Reaction Time (T) =	2.5	seconds
Deceleration Rate (A) =	11.2	ft/s^2
SSD = 1.47 V * T +1.075 V^2/A =	279	FT
SSD =	**280**	**FT**

Mainline Direction:	NB	
85th Percentile Speed (V) =	38	MPH
Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Brake Reaction Time (T) =	2.5	seconds
Deceleration Rate (A) =	11.2	ft/s^2
SSD = 1.47 V * T +1.075 V^2/A =	279	FT
SSD =	**280**	**FT**

INTERSECTION SIGHT DISTANCE

RIGHT TURN FROM STOP:	North	of Driveway
Posted Speed (V) =	20	MPH
Minor Street Approach Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Time Gap (t_g) =	6.5	seconds
ISD (Right Turn from Stop) = 1.47 * t_g * V =	192	FT
ISD (Right Turn from Stop) =	**195**	**FT**

LEFT TURN FROM STOP:	South	of Driveway
Posted Speed (V) =	20	MPH
Minor Street Approach Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Time Gap (t_g) =	7.5	seconds
ISD (Left Turn from Stop) = 1.47 * t_g * V =	221	FT
ISD (Left Turn from Stop) =	**225**	**FT**

AASHTO Recommended Sight Distance Summary
(Combination Trucks)

LOCATION: Constitution Blvd at Northern Site Driveway

Side Street Direction:	EB
Number of Lanes on Mainline =	2
Median Width (Feet) =	0

STOPPING SIGHT DISTANCE

Mainline Direction:	SB	
85th Percentile Speed (V) =	38	MPH
Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Brake Reaction Time (T) =	2.5	seconds
Deceleration Rate (A) =	11.2	ft/s^2
SSD = 1.47 V * T +1.075 V^2/A =	279	FT
SSD =	**280**	**FT**

Mainline Direction:	NB	
85th Percentile Speed (V) =	38	MPH
Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Brake Reaction Time (T) =	2.5	seconds
Deceleration Rate (A) =	11.2	ft/s^2
SSD = 1.47 V * T +1.075 V^2/A =	279	FT
SSD =	**280**	**FT**

INTERSECTION SIGHT DISTANCE

RIGHT TURN FROM STOP:	North	of Driveway
Posted Speed (V) =	20	MPH
Minor Street Approach Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Time Gap (t_g) =	10.5	seconds
ISD (Right Turn from Stop) = 1.47 * t_g * V =	309	FT
ISD (Right Turn from Stop) =	**310**	**FT**

LEFT TURN FROM STOP:	South	of Driveway
Posted Speed (V) =	20	MPH
Minor Street Approach Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Time Gap (t_g) =	11.5	seconds
ISD (Left Turn from Stop) = 1.47 * t_g * V =	339	FT
ISD (Left Turn from Stop) =	**340**	**FT**

AASHTO Recommended Sight Distance Summary
(Passenger Vehicles)

LOCATION: Constitution Blvd at Southern Site Driveway

Side Street Direction:	EB
Number of Lanes on Mainline =	2
Median Width (Feet) =	0

STOPPING SIGHT DISTANCE

Mainline Direction:	SB	
85th Percentile Speed (V) =	38	MPH
Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Brake Reaction Time (T) =	2.5	seconds
Deceleration Rate (A) =	11.2	ft/s^2
SSD = 1.47 V * T +1.075 V^2/A =	279	FT
SSD =	**280**	**FT**

Mainline Direction:	NB	
85th Percentile Speed (V) =	0	MPH
Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Brake Reaction Time (T) =	2.5	seconds
Deceleration Rate (A) =	11.2	ft/s^2
SSD = 1.47 V * T +1.075 V^2/A =	0	FT
SSD =	**0**	**FT**

INTERSECTION SIGHT DISTANCE

RIGHT TURN FROM STOP:	North	of Driveway
Posted Speed (V) =	20	MPH
Minor Street Approach Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Time Gap (t_g) =	6.5	seconds
ISD (Right Turn from Stop) = 1.47 * t_g * V =	192	FT
ISD (Right Turn from Stop) =	**195**	**FT**

LEFT TURN FROM STOP:	South	of Driveway
Posted Speed (V) =	0	MPH
Minor Street Approach Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Time Gap (t_g) =	7.5	seconds
ISD (Left Turn from Stop) = 1.47 * t_g * V =	0	FT
ISD (Left Turn from Stop) =	**0**	**FT**

AASHTO Recommended Sight Distance Summary
(Combination Trucks)

LOCATION: Constitution Blvd at Southern Site Driveway

Side Street Direction:	EB
Number of Lanes on Mainline =	2
Median Width (Feet) =	0

STOPPING SIGHT DISTANCE

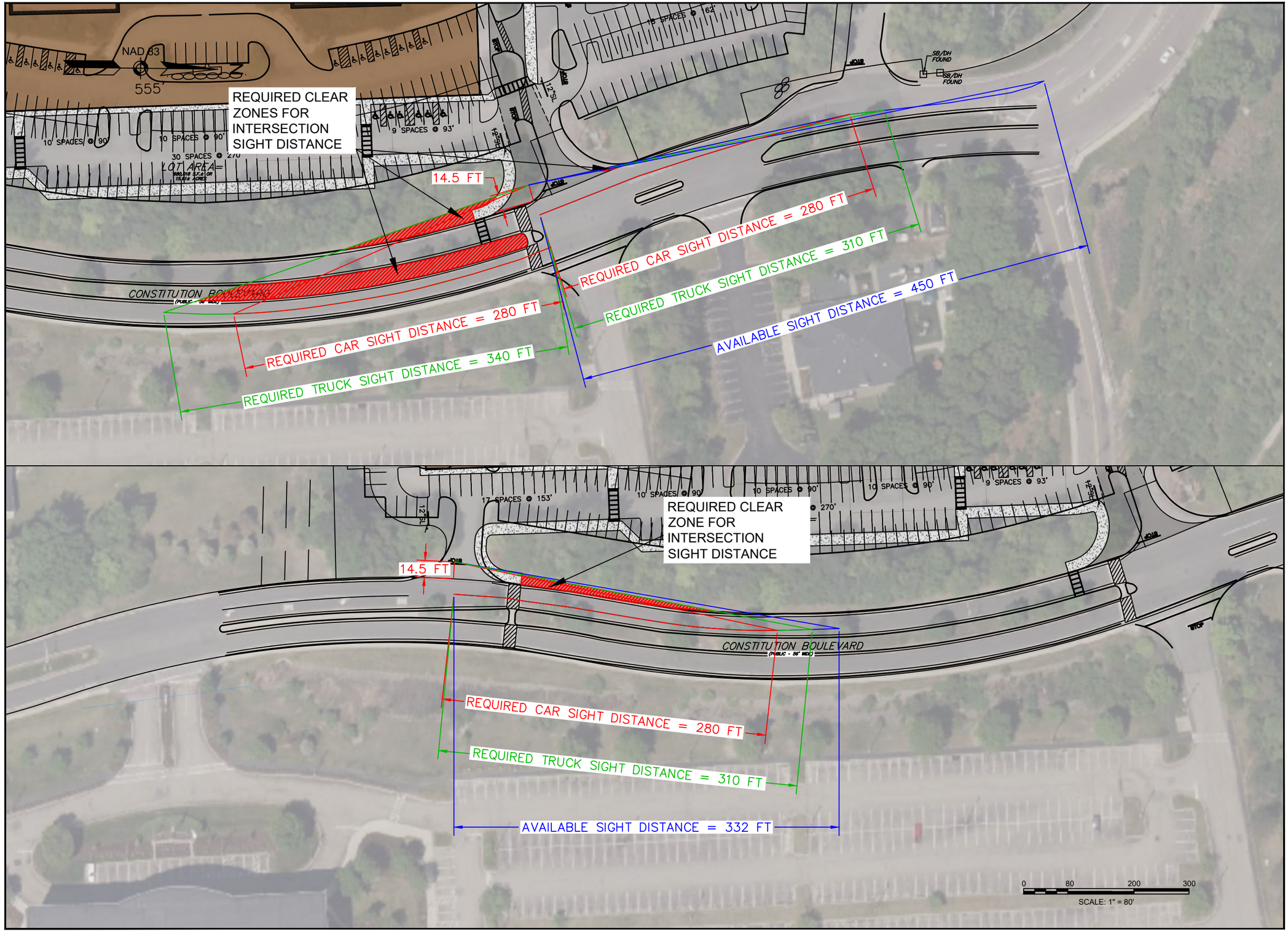
Mainline Direction:	SB	
85th Percentile Speed (V) =	38	MPH
Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Brake Reaction Time (T) =	2.5	seconds
Deceleration Rate (A) =	11.2	ft/s^2
SSD = 1.47 V * T +1.075 V^2/A =	279	FT
SSD =	**280**	**FT**

Mainline Direction:	NB	
85th Percentile Speed (V) =	0	MPH
Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Brake Reaction Time (T) =	2.5	seconds
Deceleration Rate (A) =	11.2	ft/s^2
SSD = 1.47 V * T +1.075 V^2/A =	0	FT
SSD =	**0**	**FT**

INTERSECTION SIGHT DISTANCE

RIGHT TURN FROM STOP:	North	of Driveway
Posted Speed (V) =	20	MPH
Minor Street Approach Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Time Gap (t_g) =	10.5	seconds
ISD (Right Turn from Stop) = 1.47 * t_g * V =	309	FT
ISD (Right Turn from Stop) =	**310**	**FT**

LEFT TURN FROM STOP:	South	of Driveway
Posted Speed (V) =	0	MPH
Minor Street Approach Grade (G) =	0.0%	
Apply Grade Adjustment	No	
Time Gap (t_g) =	11.5	seconds
ISD (Left Turn from Stop) = 1.47 * t_g * V =	0	FT
ISD (Left Turn from Stop) =	**0**	**FT**



GPI Engineering Design Planning Construction Management
978.570.2999 GPINET.COM
Greenman-Pedersen, Inc.
181 Ballardvale Street, Suite 202
Wilmington, MA 01887

PREPARED FOR
Beals Associates, Inc.
2 Park Plaza, Suite 200
Boston, Massachusetts

SIGHT LINE PLAN
WAREHOUSING DEVELOPMENT
FRANKLIN, MASSACHUSETTS

REVISIONS

NO.	REVISION	DATE

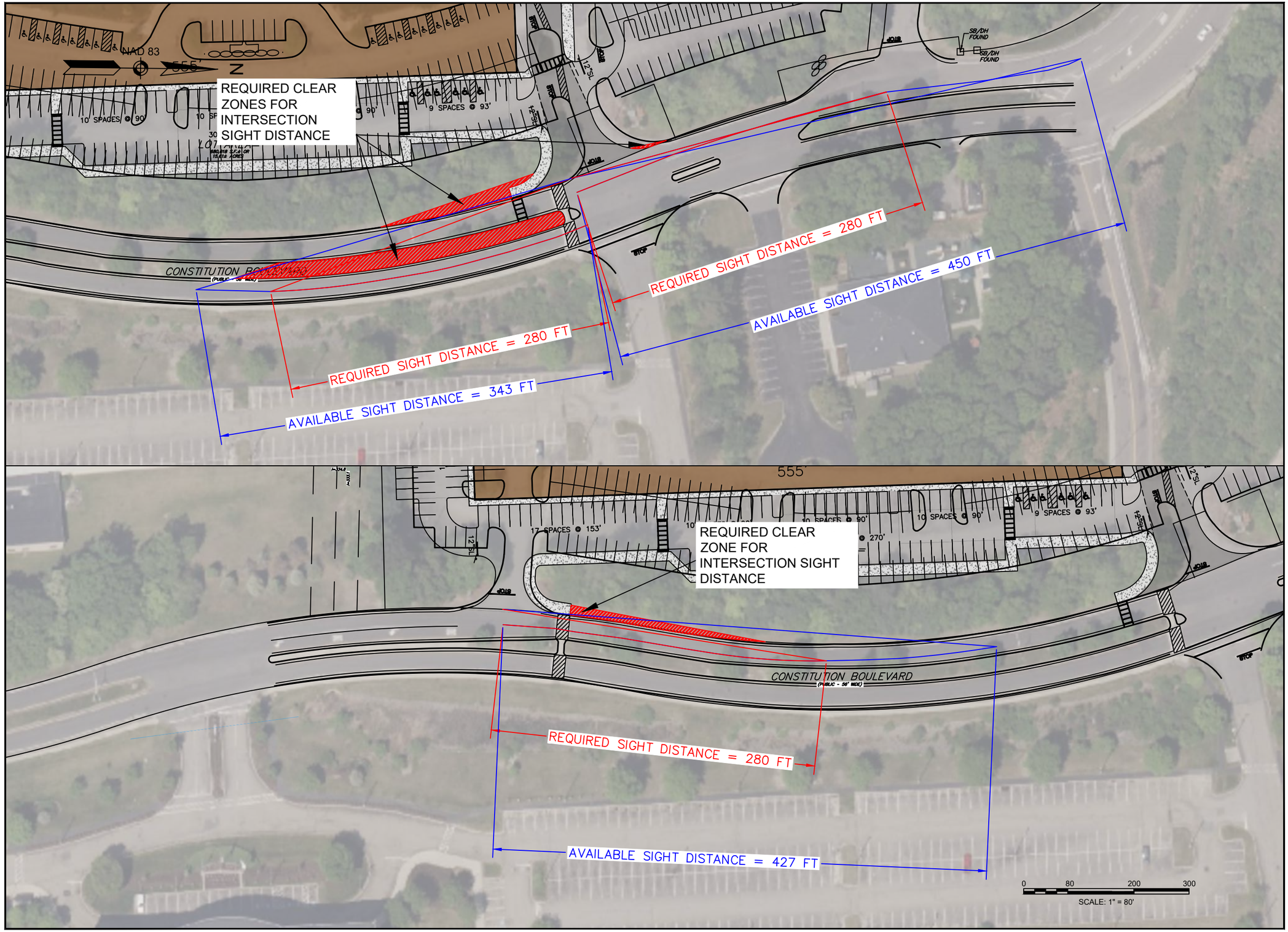
MAY 29, 2024

DRAWN/DESIGN BY	CHECKED BY
CJD	RLB

INTERSECTION SIGHT DISTANCE PLAN

SCALE: 1"=80'

NEX-2400058



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MAY 29, 2024

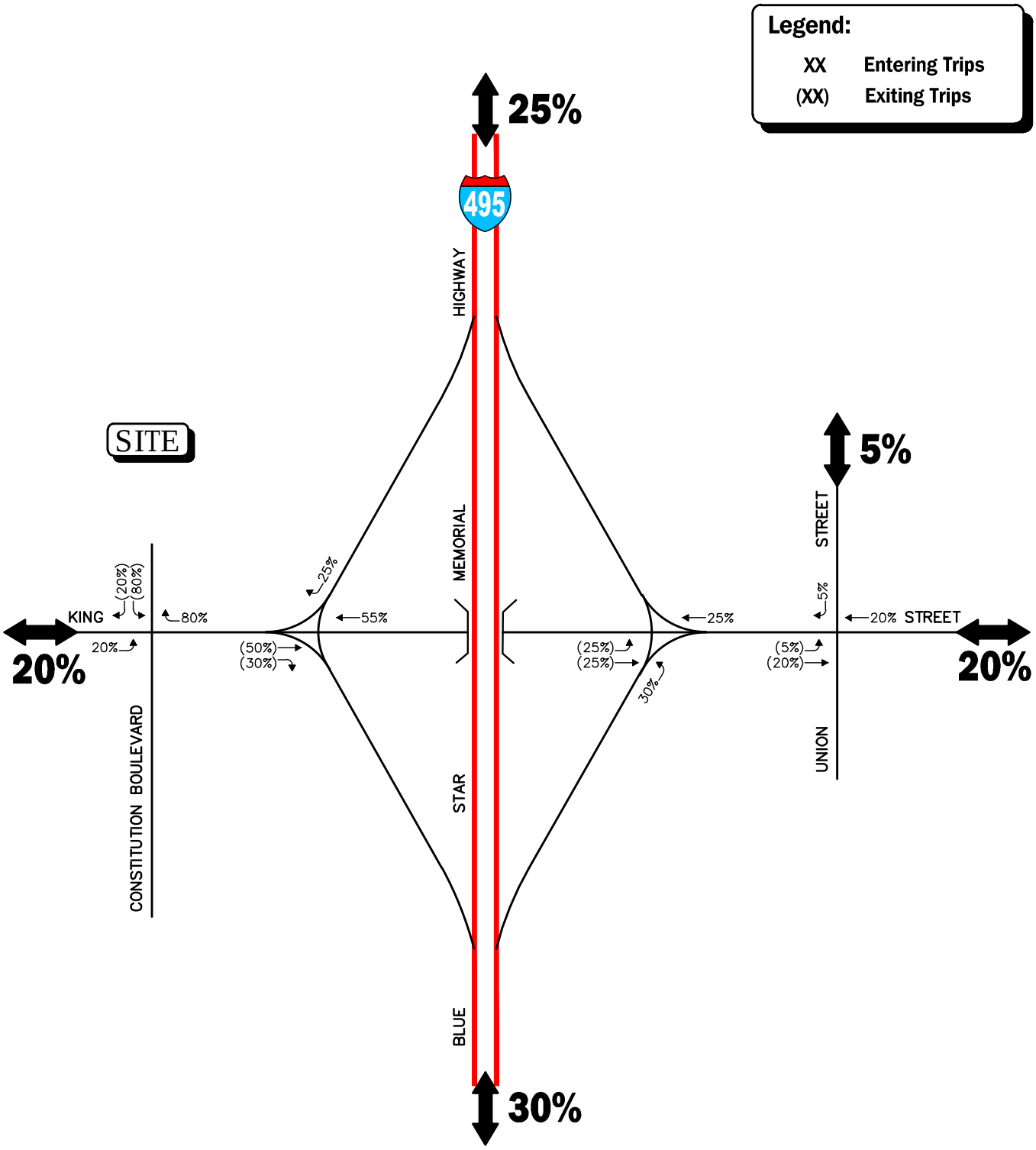
DRAWN/DESIGN BY	CHECKED BY
CJD	RLB

STOPPING SIGHT DISTANCE PLAN

SCALE: 1"=80'

NEX-2400058

BACKGROUND DEVELOPMENT DATA

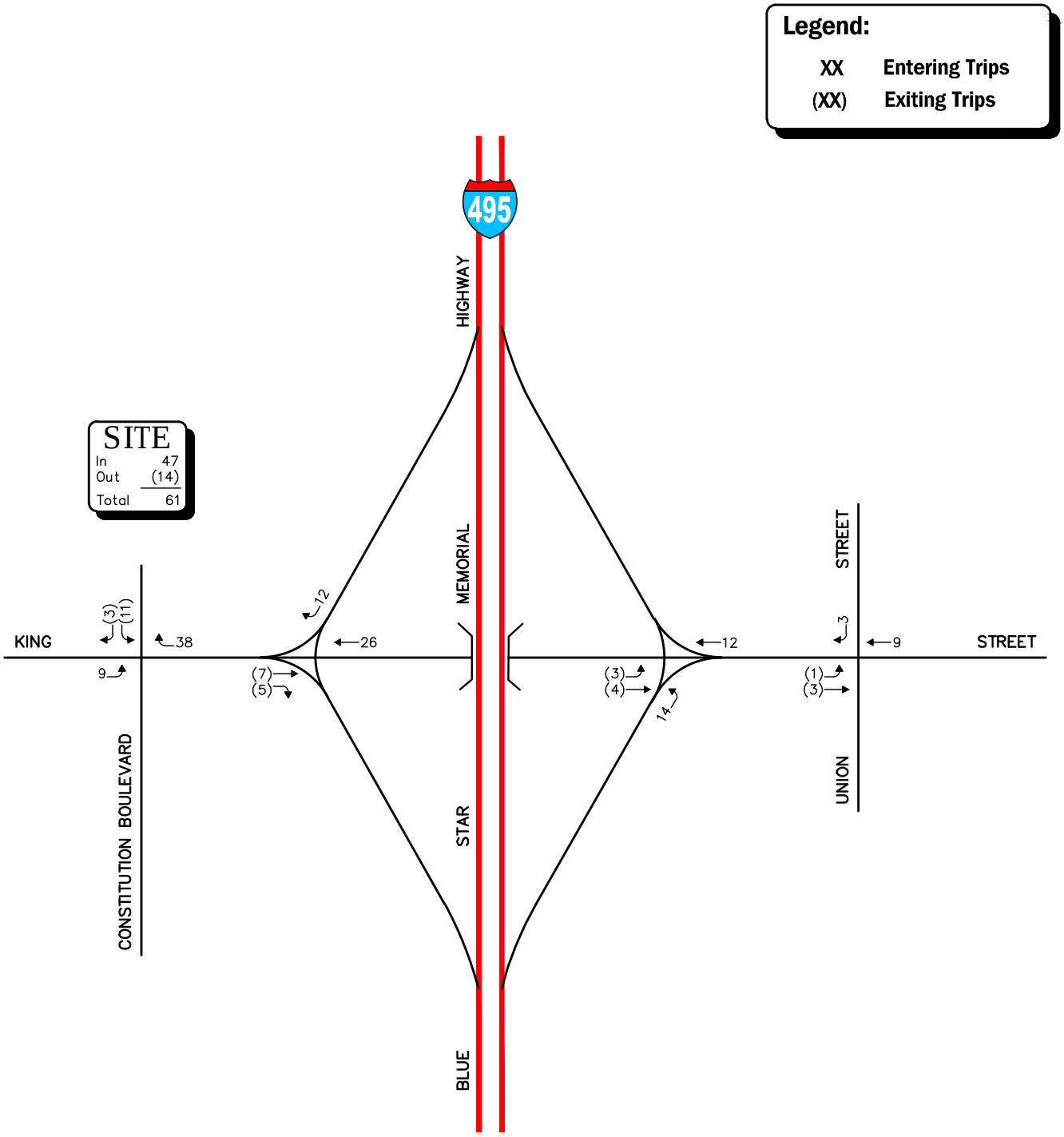


Not To Scale

Figure 7

Trip Distribution Map

Vanasse & Associates inc



Not To Scale

Figure 8

Project-Generated Weekday Morning Peak-Hour Traffic Volumes

Vanasse & Associates inc

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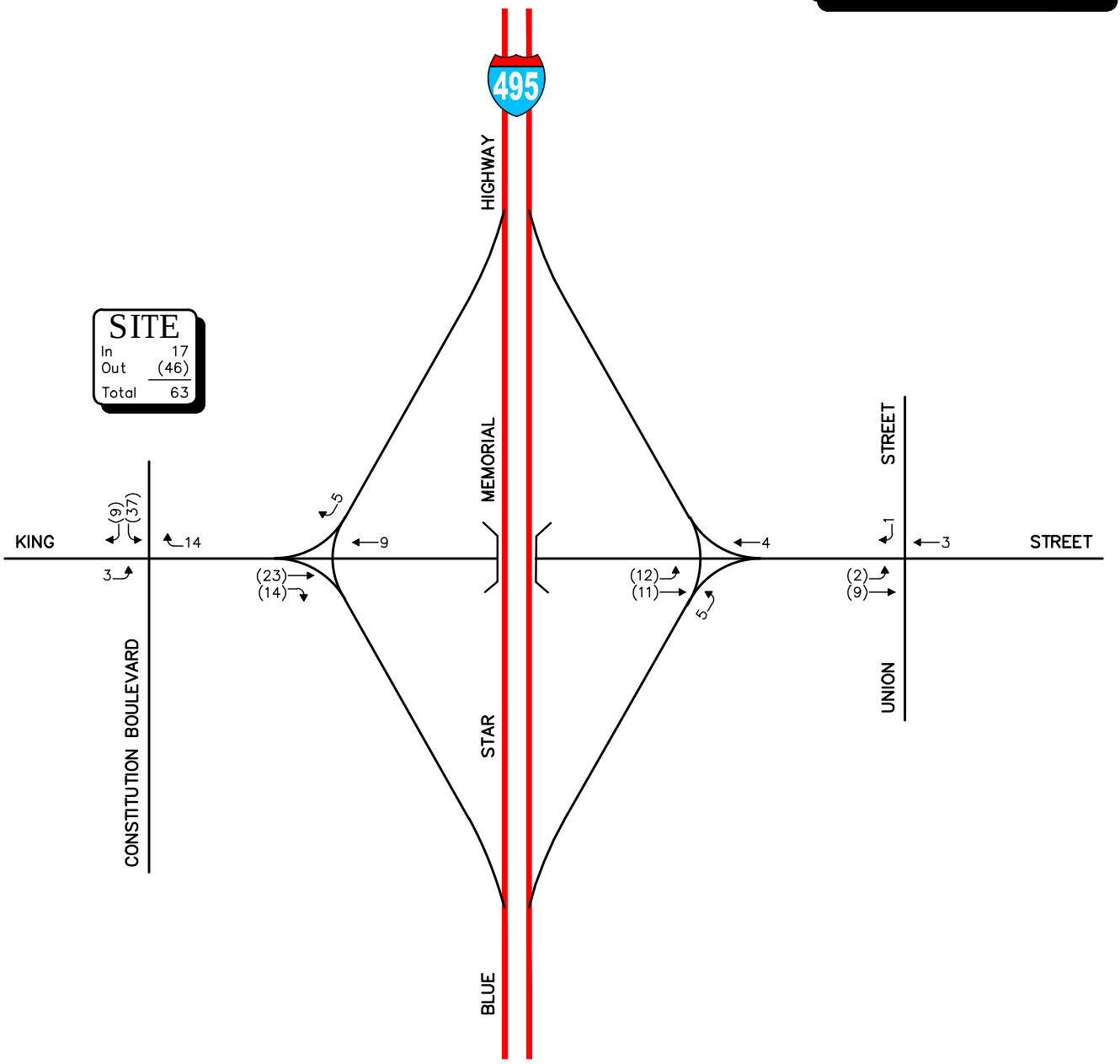


Not To Scale

Figure 9

Project-Generated Weekday Evening Peak-Hour Traffic Volumes

Vanasse & Associates inc

Institute of Transportation Engineers (ITE)

Land Use Code (LUC) 710 - General Office Building

General Urban/Suburban

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 209.000

AVERAGE WEEKDAY DAILY

Ln(T) = 0.87 Ln (X) + 3.05
Ln(T) = 0.87 Ln (######) + 3.05
Ln(T) = 7.70
T = 2203.56
T = 2,204 vehicle trips
with 50% (1,102 vpd) entering and 50% (1,102 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

Ln(T) = 0.86 Ln (X) + 1.16
Ln(T) = 0.86 Ln (######) + 1.16
Ln(T) = 5.75
T = 315.58
T = 316 vehicle trips
with 88% (278 vph) entering and 12% (38 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

Ln(T) = 0.83 Ln (X) + 1.29
Ln(T) = 0.83 Ln (######) + 1.29
Ln(T) = 5.72
T = 306.17
T = 306 vehicle trips
with 17% (52 vph) entering and 83% (254 vph) exiting.

TRANSPORTATION IMPROVEMENT PROJECT

PLAN OF

KING STREET & CONSTITUTION BOULEVARD

IN THE TOWN OF

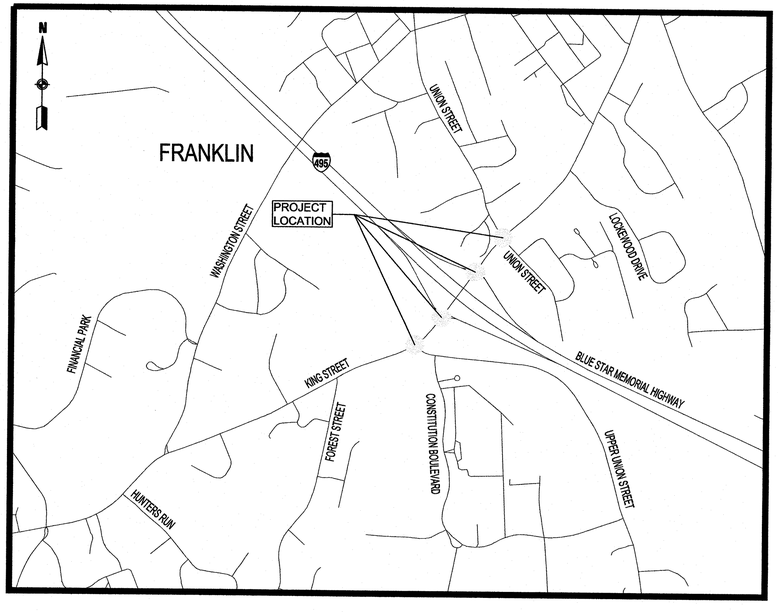
FRANKLIN

NORFOLK COUNTY

THE COMMONWEALTH OF MASSACHUSETTS

ISSUED FOR CONSTRUCTION

INDEX



0 100 200 300 400

SCALE: 1" = 100'

LENGTH OF PROJECT= 655.00 FEET = 0.124 MILES (KING STREET)

ALL WORK DONE UNDER THIS CONTRACT SHALL BE IN CONFORMANCE WITH THE MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES 2023 EDITION; THE SUPPLEMENTAL SPECIFICATIONS DATED MARCH 2023; THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS; THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS; THE MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS; THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS; THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS; THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING; THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK; AND ALL RULES AND REGULATIONS OF THE ARCHITECTURAL ACCESS BOARD (521 CMR 1.00 ET. SEQ.); OR LATEST EDITIONS, ALL AS AMENDED, THE SPECIAL PROVISIONS, AND THESE PLANS.

DESIGN DESIGNATION

	KING STREET
DESIGN SPEED	40 MPH
ADT (2023)	20,820 vpd
ADT (2030)	22,680 vpd
K	8.0 %
D	52% EB
T (PEAK HOUR)	2.0%
T (AVERAGE DAY)	5.0%
DHV	1,820 vph
DDHV	945 vph
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL

NOVEMBER 2023

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PROJECT TITLE

King Street at
Constitution Boulevard
Off-site Improvements

Franklin,
Massachusetts

PREPARED FOR

Marcus Partners

Boston,
Massachusetts

Vanasse & Associates inc
Transportation Engineers & Planners

35 N.E. BUSINESS CENTER DRIVE
ANDOVER, MA 01810-1071
TEL: (978) 474-8800
www.rdva.com

DESIGNED BY	TWO
DRAWN BY	TWO
CHECKED BY	SMB
DATE	SEPTEMBER 2023
SCALE	AS NOTED

STAMP

COMMONWEALTH OF MASSACHUSETTS
STEPHEN M. BOUDREAU
CIVIL
No. 36136
REGISTERED PROFESSIONAL ENGINEER

REVISIONS

NO.	DESCRIPTION	DATE

DRAWING TITLE

Title Sheet

SHEET 1 OF 21	DRAWING NUMBER
JOB NO. 9353	1
CAD 9353DS	

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
x	x	CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		EDGE OF PAVEMENT
		LIMIT OF MICROMILLING AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
		EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
	20'	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE
	CW	CROSSWALK
	SWL	SOLID WHITE LINE
	SYL	SOLID YELLOW LINE
	BWL	BROKEN WHITE LINE
	BYL	BROKEN YELLOW LINE
	DWL	DOTTED WHITE LINE (3' LINE WITH 9' GAP)
	DYL	DOTTED YELLOW LINE (3' LINE WITH 9' GAP)
	DWLEx	DOTTED WHITE LINE EXTENSION (2' LINE WITH 6' GAP)
	DYLEx	DOTTED YELLOW LINE EXTENSION (2' LINE WITH 6' GAP)
	DBWL	DOUBLE WHITE LINE
	DBYL	DOUBLE YELLOW LINE

PAVEMENT MARKING NOTES:
1. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
2. ALL LONGITUDINAL PAVEMENT MARKINGS SHALL BE 6" WIDE, UNLESS OTHERWISE NOTED.

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King Street at Constitution Boulevard Off-site Improvements

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Boston, Massachusetts

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DESIGNED BY	---
DRAWN BY	---
CHECKED BY	SMB
DATE	SEPTEMBER 2023
SCALE	N.T.S.

STAMP

COMMONWEALTH OF MASSACHUSETTS
STEPHEN M. BOUDREAU
CIVIL
No. 36136
REGISTERED PROFESSIONAL ENGINEER

11/13/23

REVISIONS

NO.	DESCRIPTION	DATE

DRAWING TITLE

Legend

SHEET 2 OF 21	DRAWING NUMBER
JOB NO. 9353	2
CAD 9353DS	

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GENERAL NOTES

1. TOPOGRAPHICAL INFORMATION OBTAINED FROM SURVEY CONDUCTED BY CONTROL POINT ASSOCIATES, COORDINATES ARE IN MASSACHUSETTS STATE PLANE (NAD '83). VERTICAL DATUM IS REFERENCED TO NAVD '88.
2. THE CONTRACTOR SHALL NOTIFY DIGSAFE (888-344-7233) AND PROCURE A DIGSAFE NUMBER PRIOR TO DISTURBING GROUND IN ANY WAY.
3. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
4. WHERE AN EXISTING UNDERGROUND UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
5. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS WITH PRIVATE UTILITY COMPANIES FOR THE ALTERATION/ADJUSTMENT OF MANHOLES, GATE BOXES AND SERVICE BOXES OWNED/MAINTAINED BY GAS, ELECTRIC, COMMUNICATION, AND ANY OTHER PRIVATE UTILITY COMPANIES.
6. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. GRASS AREAS SHALL BE RESTORED WITH 4-INCHES OF LOAM AND SEEDED.
7. THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).
8. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS NOTED OTHERWISE.
9. ALL PROPOSED PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
10. ALL EXISTING STATE, COUNTY, CITY, AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATIONS ARE NOT GUARANTEED.
11. A MINIMUM 4 FOOT WIDE CLEAR PATH OF TRAVEL (EXCLUDING CURB WIDTH) SHALL BE MAINTAINED ON ALL SIDEWALKS PAST ALL SIGNAL EQUIPMENT, UTILITIES, OR OTHER OBSTRUCTIONS.
12. DIMENSIONS RELATIVE TO EXISTING CURB LINES SHALL CONTROL. THE EXACT LOCATION OF TRAFFIC SIGNAL POLES, POSTS, CONTROLLERS, PULL BOXES, SIGNS, AND PAVEMENT MARKINGS SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.
13. JOINTS BETWEEN NEW HOT MIX ASPHALT ROADWAY PAVEMENT AND EXISTING PAVEMENT SHALL BE SEALED WITH HOT POURED JOINT
14. SEALER.
15. ALL EXISTING GRANITE CURB AND EDGING THAT MEETS SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER SHALL BE RE-USED IN THE PROPOSED WORK, EXCEPT CURVED STONES OF A DIFFERENT RADIUS THAN PROPOSED CURB.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION STAKING AT NO ADDITIONAL COST.
17. ALL VERTICAL GRANITE CURB (VGC) SHALL TRANSITION AT THE LIMITS OF WORK WITH A 6' TRANSITION PIECE.
18. ALL TRENCH CUTS WITHIN THE PAVED SURFACE HAVING A DEPTH OF 4' OR LESS SHALL BE BACKFILLED WITH CONTROLLED DENSITY FILL AS SHOWN IN THE TYPICAL TRENCH DETAILS.
19. ALL NEW CATCH BASIN GRATES WITHIN THE LIMITS OF WORK AND WITHIN THE PAVED SURFACE SHALL BE HOOK LOCK CASCADE GRATES. THE CONTRACTOR SHALL ALSO REPLACE EXISTING GRATES DESIGNATED ON THE PLANS WHICH DO NOT MEET THESE CRITERIA.
20. ALL EXISTING SEWER, DRAINAGE, ELECTRIC MANHOLE COVERS, GAS AND WATER GATES, ETC. SHALL BE ADJUSTED TO FINISHED GRADE.
21. THE CONTRACTOR SHALL REVIEW WITH THE ENGINEER THE CONDITION OF ALL EXISTING DRAINAGE STRUCTURES WITHIN LIMITS OF PAVING THAT ARE TO BE RETAINED. FRAMES, GRATES AND COVERS FOUND TO BE BROKEN, CRACKED OR COMPROMISED SHALL BE REPLACED. STRUCTURES FOUND TO BE COLLAPSED, WEAKENED OR COMPROMISED IN ANY WAY SHALL BE REBUILT IN ACCORDANCE WITH ALL RELEVANT STANDARDS. THIS INCLUDES STRUCTURES THAT CONTAIN COVERS OR GRATES THAT DO NOT SIT FIRMLY IN THEIR FRAMES. COVERS AND GRATES THAT NOTICEABLY (BY SIGHT OR SOUND) ROCK OR SHIFT WHEN IMPACTED BY A MOTOR VEHICLE SHALL BE REMOVED, CLEANED (INCLUDING THE FRAME) AND RESET. COVERS AND GRATES THAT CONTINUE TO ROCK OR SHIFT AFTER THIS PROCEDURE SHALL BE REPLACED.
22. ALL PROPOSED PEDESTRIAN ACCOMMODATIONS (I.E. SIDEWALKS, WHEELCHAIR RAMPS, ETC.) SHALL COMPLY WITH CURRENT ADA & AAB RULES AND REGULATIONS AND MUNICIPAL STANDARDS.
23. ALL DRAINAGE STRUCTURES WITHIN THE LIMITS OF WORK SHALL BE CLEANED PRIOR TO CONCLUSION OF THE PROJECT UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
24. THE MINIMUM MOUNTING HEIGHT OF POST MOUNTED SIGNS, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE TOP OF CURB OR SIDEWALK OR NEAREST EDGE OF TRAVELED WAY, SHALL BE 7 FT EXCEPT FOR OM1-1 OBJECT MARKERS WHICH SHALL BE 4 FT.

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWP	DETECTABLE WARNING PANEL
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
OL	OVERLAY
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION

ABBREVIATIONS (cont.)

GENERAL

PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
R	RADIUS OF CURVATURE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
R&D	REMOVE AND DISPOSE
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
VGC	VERTICAL GRANITE CURB
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL ABBREVIATIONS

CAB	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY UPRAISED HAND
FDW	FLASHING UPRAISED HAND
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR YELLOW
FYL	FLASHING YELLOW LEFT ARROW
FYR	FLASHING YELLOW RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
HH	HAND HOLE
MA	MAST ARM
OL	OVERLAP
PB	PULL BOX
PED	PEDESTRIAN
PTZ	PAN, TILT, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TS	TRAFFIC SIGNAL/ TRAFFIC SIGNAL POST
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALKING PERSON
Y	STEADY CIRCULAR YELLOW
YL	STEADY YELLOW LEFT ARROW

T:\9353 Franklin (JSD 8863)\Design\DWG\9353DS.dwg 8/17/2023 1:55 PM EDT

PROJECT TITLE

King Street at Constitution Boulevard Off-site Improvements

Franklin, Massachusetts

PREPARED FOR

Marcus Partners

Boston, Massachusetts

Vanasse & Associates inc
Transportation Engineers & Planners
35 N.E. BUSINESS CENTER DRIVE
ANDOVER, MA 01810-1071
TEL: (978) 474-8800
www.rdva.com

DESIGNED BY	---
DRAWN BY	---
CHECKED BY	SMB
DATE	SEPTEMBER 2023
SCALE	N.T.S.

STAMP

COMMONWEALTH OF MASSACHUSETTS
STEPHEN M. BOUDREAU
CIVIL
No. 36196
REGISTERED
PROFESSIONAL ENGINEER

11/13/23

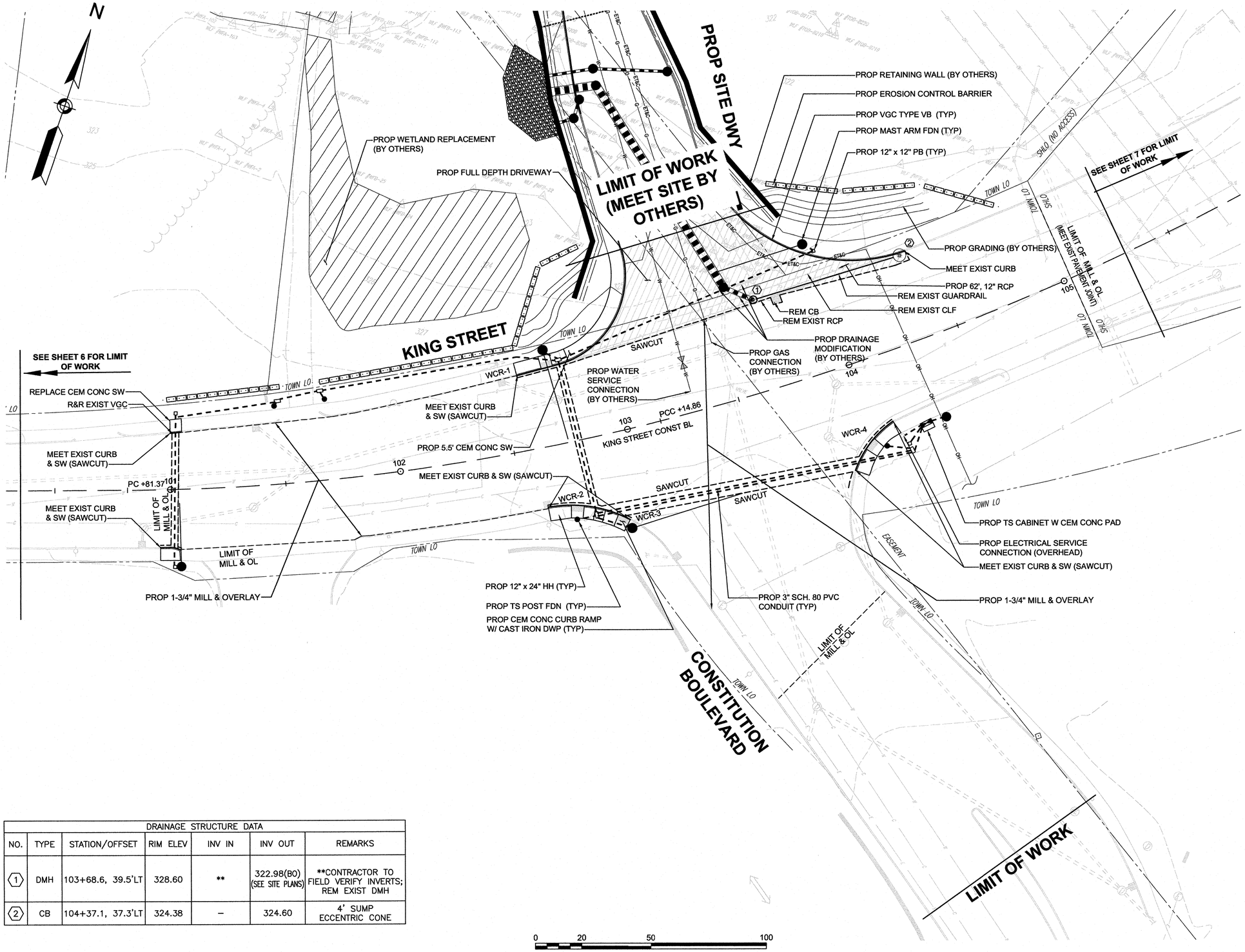
REVISIONS

NO.	DESCRIPTION	DATE

DRAWING TITLE

Notes

SHEET 3 OF 21	DRAWING NUMBER
JOB NO. 9353	3
CAD 9353DS	



DRAINAGE STRUCTURE DATA						
NO.	TYPE	STATION/OFFSET	RIM ELEV	INV IN	INV OUT	REMARKS
1	DMH	103+68.6, 39.5'LT	328.60	**	322.98(BO) (SEE SITE PLANS)	**CONTRACTOR TO FIELD VERIFY INVERTS; REM EXIST DMH
2	CB	104+37.1, 37.3'LT	324.38	–	324.60	4' SUMP ECCENTRIC CONE

T:\9353 Franklin (JSD 8863)\Design\DWG\9353GN.dwg 8/10/2023 10:38 AM EDT

PROJECT TITLE

King Street at Constitution Boulevard Off-site Improvements

Franklin, Massachusetts

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35 N.E. BUSINESS CENTER DRIVE
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COMMONWEALTH OF MASSACHUSETTS
STEPHEN M. BOUDREAU
CIVIL
No. 36136
REGISTERED PROFESSIONAL ENGINEER
11/13/23

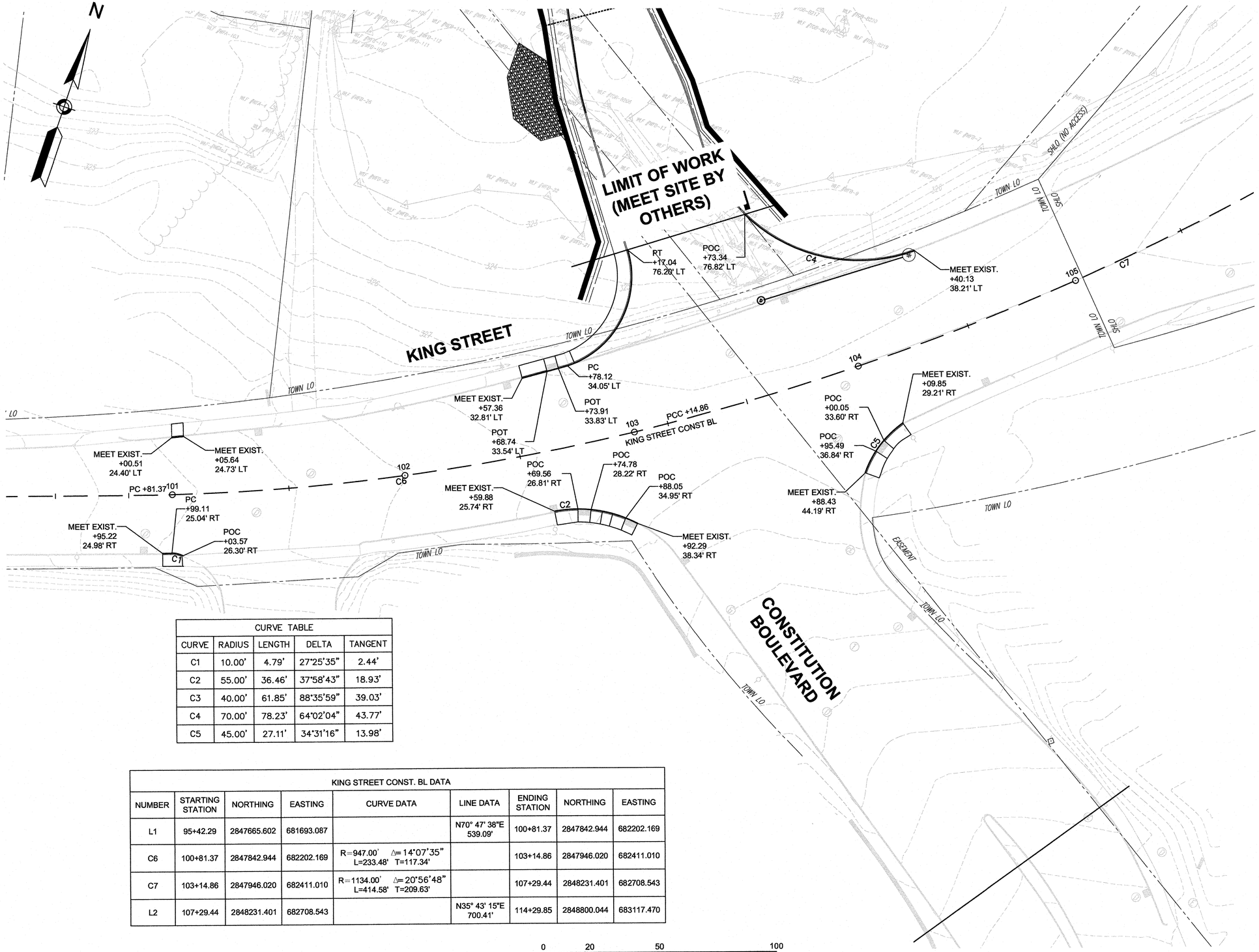
REVISIONS

NO.	DESCRIPTION	DATE
1.	LIMITS OF MILL & OL	11/03/23

DRAWING TITLE

Construction Plan

SHEET 4 OF 21	DRAWING NUMBER
JOB NO. 9353	4
CAD 9353GN	



CURVE TABLE				
CURVE	RADIUS	LENGTH	DELTA	TANGENT
C1	10.00'	4.79'	27°25'35"	2.44'
C2	55.00'	36.46'	37°58'43"	18.93'
C3	40.00'	61.85'	88°35'59"	39.03'
C4	70.00'	78.23'	64°02'04"	43.77'
C5	45.00'	27.11'	34°31'16"	13.98'

KING STREET CONST. BL DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	95+42.29	2847665.602	681693.087		N70° 47' 38"E 539.09'	100+81.37	2847842.944	682202.169
C6	100+81.37	2847842.944	682202.169	R=947.00' Δ=14°07'35" L=233.48' T=117.34'		103+14.86	2847946.020	682411.010
C7	103+14.86	2847946.020	682411.010	R=1134.00' Δ=20°56'48" L=414.58' T=209.63'		107+29.44	2848231.401	682708.543
L2	107+29.44	2848231.401	682708.543		N35° 43' 15"E 700.41'	114+29.85	2848800.044	683117.470

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No. 36136
REGISTERED PROFESSIONAL ENGINEER

11/13/23

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NO.	DESCRIPTION	DATE

DRAWING TITLE

Curb Tie & Alignment Plan

SHEET 5 OF 21	DRAWING NUMBER
JOB NO. 9353	5
CAD 9353CT	

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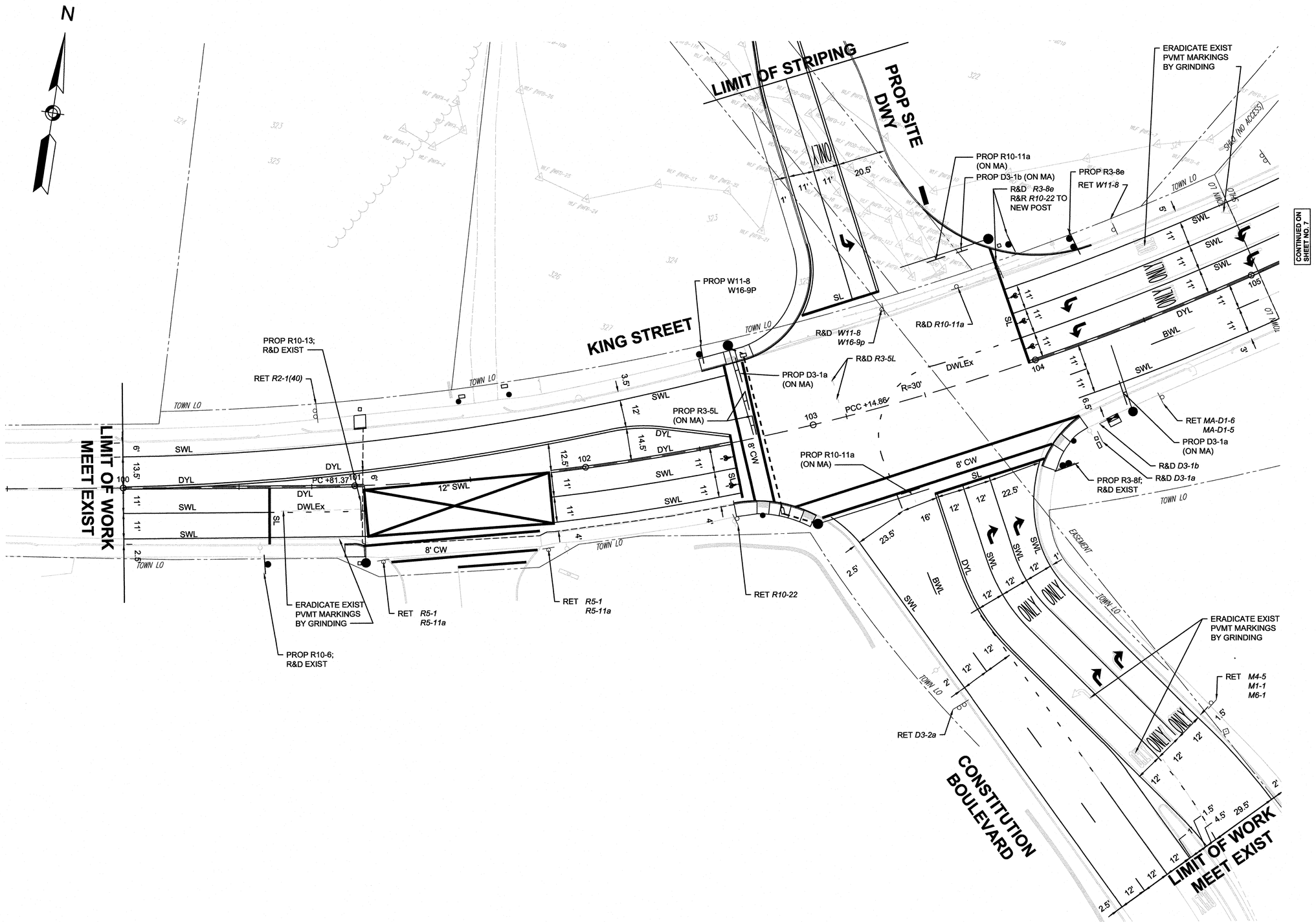

PROJECT TITLE

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REGISTERED PROFESSIONAL ENGINEER

11/13/23

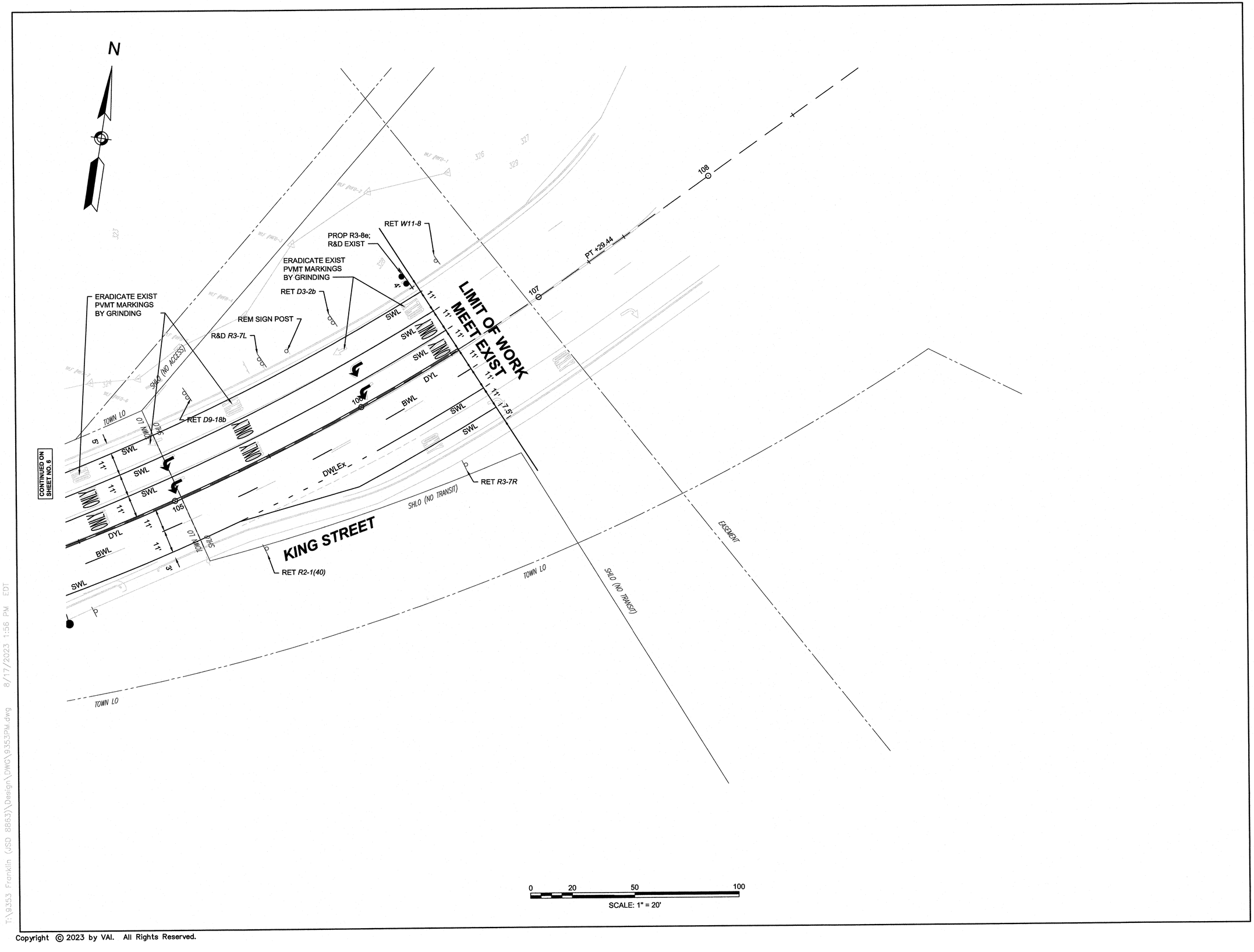
REVISIONS

NO.	DESCRIPTION	DATE

DRAWING TITLE

Pavement Marking & Signing Plan

SHEET 6 OF 21	DRAWING NUMBER
JOB NO. 9353	6
CAD 9353PM	



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PROJECT TITLE

King Street at
Constitution Boulevard
Off-site Improvements

Franklin,
Massachusetts

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Marcus Partners

Boston,
Massachusetts

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CIVIL
No. 36136
REGISTERED
PROFESSIONAL ENGINEER

11/13/23

REVISIONS

NO.	DESCRIPTION	DATE

DRAWING TITLE

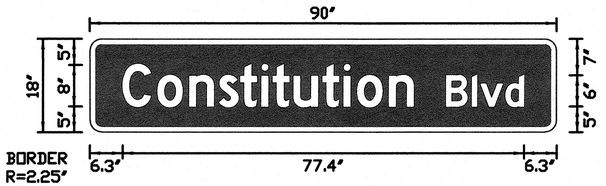
Pavement Marking
& Signing Plan

SHEET 7 OF 21	DRAWING NUMBER
JOB NO. 9353	7
CAD 9353PM	

IDENTIFI-CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCH)			NUMBER OF SIGNS REQUIRED	COLOR			POST TYPE AND NUMBER REQUIRED	AREA PER SIGN	TOTAL AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	RTE. MKR. ARROW		BACK-GROUND	LEGEND	BORDER			
R3-5L	30"	36"		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			2	WHITE	BLACK	BLACK	MOUNT ON MAST ARM	7.50	15.00
R3-8e	48"	30"		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			2	WHITE	BLACK	BLACK	P-5 4 (2 PER SIGN)	10.00	20.00
R3-8f	48"	30"		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			2	WHITE	BLACK	BLACK	P-5 4 (2 PER SIGN)	10.00	20.00
R10-6	24"	36"		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			1	WHITE	BLACK	BLACK	P-5 1	6.00	6.00
R10-11a	24"	30"		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			2	WHITE	BLACK	BLACK	MOUNT ON MAST ARM	5.00	10.00
R10-13	36"	24"		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			1	WHITE	BLACK	BLACK	MOUNT ON MAST ARM	6.00	6.00
W11-8	36"	36"		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			1	YELLOW	YELLOW	BLACK	P-5 1	9.00	9.00
W16-9P	24"	12"		SEE FHWA STANDARD HIGHWAY SIGNS 2012 SUPPLEMENT			1	YELLOW	BLACK	BLACK	MOUNT BELOW W11-8	2.00	2.00
D3-1(a)	90"	18"	SEE DETAIL	8D/6D	5" 5"	–	2	GREEN	WHITE	WHITE	MOUNT ON MAST ARM	11.25	22.50
D3-1(b) (PBS)	48"	18"	SEE DETAIL	8D/6D	5" 5"	–	1	GREEN	WHITE	WHITE	MOUNT ON MAST ARM	6.00	6.00

EXISTING SIGN LEGEND

D3-2a		R3-5L		R10-6	
D9-18b		R3-7L		R10-11a	
MA-D1-6		R3-7R		R10-13	
MA-D1-5		R3-8e		R10-22	
M1-1		R3-8f		W11-8	
M4-5		R5-1		W16-9P	
M6-1		R2-1(40)		R5-11a	



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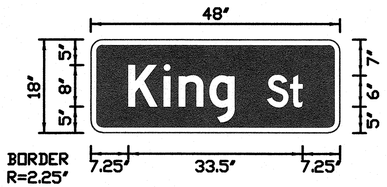

D3-1(b)

PROJECT TITLE

King Street at Constitution Boulevard Off-site Improvements

Franklin, Massachusetts

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STEPHEN M. BOUDREAU
CIVIL
No. 38136
REGISTERED PROFESSIONAL ENGINEER

11/13/23

REVISIONS

NO.	DESCRIPTION	DATE

DRAWING TITLE

Sign Summary Sheet

SHEET 8 OF 21	DRAWING NUMBER
JOB NO. 9353	8
CAD 9353PM	

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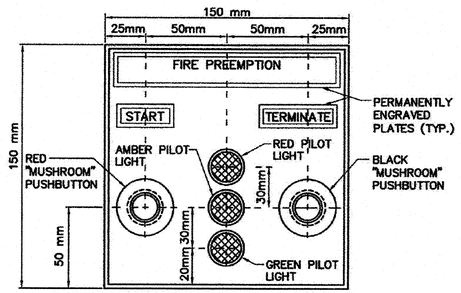

EXISTING FIRE STATION PUSHBUTTON PREEMPTION PANEL DETAIL
(NEMA ENCLOSURE)
NOT TO SCALE

NOTE: ALL EXIST SIGNAL EQUIPMENT TO BE R&D UNLESS OTHERWISE NOTED

0 20 50 100
SCALE: 1" = 20'

T:\9353 Franklin (JSD 8863)\Design\DWG\9353TS.dwg 7/25/2023 9:42 AM EDT

PROJECT TITLE

King Street at Constitution Boulevard Off-site Improvements

Franklin, Massachusetts

PREPARED FOR

Marcus Partners

Boston, Massachusetts

Vanasse & Associates inc
Transportation Engineers & Planners
35 N.E. BUSINESS CENTER DRIVE
ANDOVER, MA 01810-1071
TEL: (978) 474-8800
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DATE	SEPTEMBER 2023
SCALE	AS NOTED

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COMMONWEALTH OF MASSACHUSETTS
STEPHEN M. BOUDREAU
CIVIL
No. 36136
REGISTERED PROFESSIONAL ENGINEER
11/13/23

REVISIONS

NO.	DESCRIPTION	DATE

DRAWING TITLE

Traffic Signal Plan

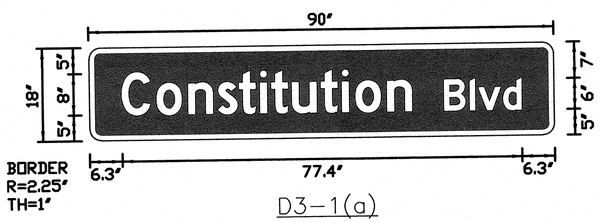
King Street at Constitution Blvd

SHEET 9 OF 21	DRAWING NUMBER
JOB NO. 9353	9
CAD 9353TS	

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCH)			NUMBER OF SIGNS REQUIRED	COLOR			POST TYPE AND NUMBER REQUIRED	AREA PER SIGN	TOTAL AREA IN SQUARE FEET
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	RTE. MKR. ARROW		BACK-GROUND	LEGEND	BORDER			
R3-5L	30"	36"	ONLY	SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			2	WHITE	BLACK	BLACK	MOUNT ON MAST ARM	7.50	15.00
R3-8e	48"	30"	ONLY ONLY	SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			2	WHITE	BLACK	BLACK	P-5 4 (2 PER SIGN)	10.00	20.00
R3-8f	48"	30"	ONLY ONLY	SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			2	WHITE	BLACK	BLACK	P-5 4 (2 PER SIGN)	10.00	20.00
R10-6	24"	36"	STOP HERE ON RED	SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			1	WHITE	BLACK	BLACK	P-5 1	6.00	6.00
R10-11a	24"	30"	NO TURN ON RED	SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			2	WHITE	BLACK	BLACK	MOUNT ON MAST ARM	5.00	10.00
R10-13	36"	24"	EMERGENCY SIGNAL	SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			1	WHITE	BLACK	BLACK	MOUNT ON MAST ARM	6.00	6.00
W11-8	36"	36"		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			1	YELLOW	YELLOW	BLACK	P-5 1	9.00	9.00
W16-9P	24"	12"	AHEAD	SEE FHWA STANDARD HIGHWAY SIGNS 2012 SUPPLEMENT			1	YELLOW	BLACK	BLACK	MOUNT BELOW W11-8	2.00	2.00
D3-1(a)	90"	18"	SEE DETAIL	8D/6D	5" 5"	–	2	GREEN	WHITE	WHITE	MOUNT ON MAST ARM	11.25	22.50
D3-1(b) (PBS)	48"	18"	SEE DETAIL	8D/6D	5" 5"	–	1	GREEN	WHITE	WHITE	MOUNT ON MAST ARM	6.00	6.00

EXISTING SIGN LEGEND

D3-2a	CONSTITUTION BOULEVARD NEXT LEFT	R3-5L	ONLY	R10-6	STOP HERE ON RED
D9-18b	LODGING	R3-7L	LEFT LANE MUST TURN LEFT	R10-11a	NO TURN ON RED
MA-D1-6	495 South TAUNTON CAPECOD NEXT RIGHT	R3-7R	RIGHT LANE MUST TURN RIGHT	R10-13	EMERGENCY SIGNAL
MA-D1-5	North 495 495 LOWELL	R3-8e	ONLY ONLY ONLY	R10-22	TO REQUEST SIGNAL WAIT ON
M1-1	495	R3-8f	ONLY ONLY ONLY	W11-8	
M4-5	TO	R5-1	DO NOT ENTER	W16-9P	AHEAD
M6-1		R2-1(40)	SPEED LIMIT 40	R5-11a	EXCEPT EMERGENCY VEHICLES



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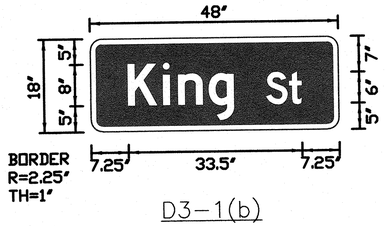

D3-1(b)

PROJECT TITLE

King Street at Constitution Boulevard Off-site Improvements

Franklin, Massachusetts

PREPARED FOR

Marcus Partners

Boston, Massachusetts

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Transportation Engineers & Planners

35 N.E. BUSINESS CENTER DRIVE
ANDOVER, MA 01810-1071
TEL: (978) 474-8800
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CHECKED BY	SMB
DATE	SEPTEMBER 2023
SCALE	N.T.S.

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COMMONWEALTH OF MASSACHUSETTS
STEPHEN M. BOUDREAU
CIVIL
No. 36136
REGISTERED PROFESSIONAL ENGINEER
11/13/23

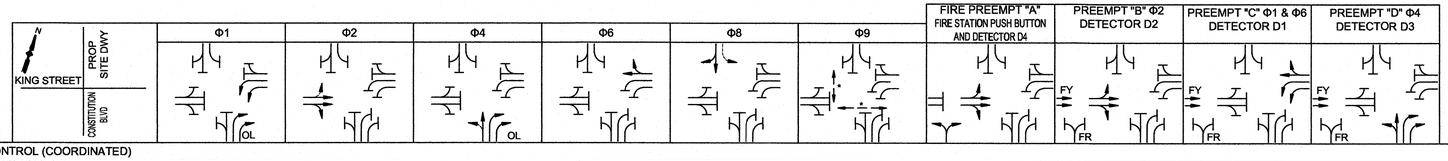
REVISIONS

NO.	DESCRIPTION	DATE

DRAWING TITLE

Sign Summary Sheet

SHEET 8 OF 21	DRAWING NUMBER 8
JOB NO. 9353	
CAD 9353PM	



SEQUENCE AND TIMING FOR FULL ACTUATED CONTROL (COORDINATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	FLASH
KING STREET	WB	A,B	GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL	FRL
KING STREET	WB	C,D	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FY
KING STREET	EB	E,F	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	G	G	G	Y	R	G	Y	R	R	R	R	R	R	R	FY
CONSTITUTION BLVD.	NB	G,H	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	FR
CONSTITUTION BLVD.	NB	J,K	GR	YR	RR	RR	RR	RR	GR	YR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	GR	YR	RR	FRR
SITE DRIVEWAY	SB	L,M,N	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
KING STREET	EB	P,Q	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY	Y	R	R	R	R	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY
FIREHOUSE DRIVEWAY	NB	R,S	FR	FR	FR	FR	FR	FR	FR	FR	FR	FR	FR	FR	FR	FR	FR	FR	FR	FR	R	R	G	Y	R	FR	FR	FR	FR	FR	FR	FR	FR	FR	FR
PEDESTRIAN	ALL	P1-P4	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OUT
TIMING IN SECONDS																																			
MINIMUM GREEN (INITIAL)			7			7			7			5			7								15												
PASSAGE TIME (VEHICLE)			3			3			3			3			3																				
MAXIMUM 1 (FREE OPERATION)			15			40			11			62			11								50												
MAXIMUM 2 (DURING COORDINATION)			11			62			11			80			11																				
YELLOW CLEARANCE				3.5			4.5			4			4.5			4								4.5			4.5			4.5			4		
RED CLEARANCE					3			3			2			3			2			4					3			5			3			2	
WALK (W)																		7																	
PEDESTRIAN CLEARANCE																			28																
FIRE PREEMPTION CLEARANCE																					4.5	3													
HOLD																										**			**			**			
RECALL			OFF			SOFT			OFF			SOFT			OFF			OFF			-					-			-			-			
MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			LOCK			-					-			-			-			

EMERGENCY ONLY

TIMING PLAN	CYCLE LENGTH	REF/OFFSET	COORDINATION PHASE TIMING (WITH/WITHOUT PEDESTRIANS)																	
			SEC.			SEC.			SEC.			SEC.			SEC.			SEC.		
CYCLE 1: M-F 6 AM-10 AM	**100**	**BOG/39**	**17/17**			**31/70**			**13/13**			**48/87**			**13/13**			**39/0**		
CYCLE 2: M-F 3 PM-7 PM	**100**	**BOG/47**	**15/15**			**32/71**			**14/14**			**47/86**			**14/14**			**39/0**		

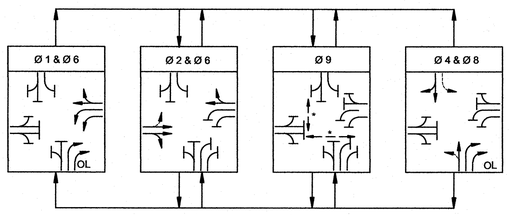
* UPON PEDESTRIAN PUSHBUTTON ACTUATION ONLY

**TIMING SHALL BE VARIABLE AND BASED ON DURATION OF FLASHING OPTICAL SIGNAL FROM APPROACHING EMERGENCY VEHICLE TRANSMITTER.

NOTES:

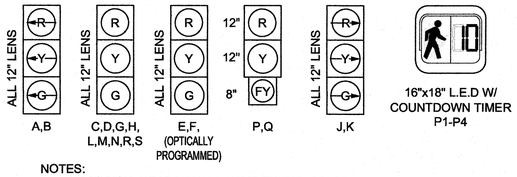
1. FLASHING OPERATION PER MUTCD.
2. OFFSET REFERENCED TO BEGINNING OF GREEN (BOG) OF PHASES 2&6 (COORDINATED PHASES).

PREFERENTIAL PHASING SEQUENCE



NOTES: 1. ANY PHASE OR PHASE COMBINATION NOT CALLED SHALL BE SKIPPED.
2. VEHICLE TURNING MOVEMENTS NOT SUPPORTED BY ARROW INDICATIONS SHOWN AS DASHED ARROWS ON PLAN
* UPON PEDESTRIAN PUSHBUTTON ACTUATION ONLY

PROPOSED SIGNAL IDENTIFICATION



NOTES:
1. ALL SIGNAL HEADS SHALL HAVE TUNNEL VISORS
2. ALL SIGNAL HEADS SHALL HAVE A 5" FLAT BACKPLATE W/ 3" YELLOW RETROREFLECTIVE BORDER.
3. SIGNAL HEADS P AND Q SHALL HAVE 8' LENS FOR FLASHING OPERATION AND 12" LENS FOR STEADY OPERATION
4. SIGNAL HEADS E AND F SHALL BE OPTICALLY PROGRAMMED

VIDEO DETECTOR DATA					
DETECTION ZONE	CAMERA	DIRECTION	CALL PHASE	EXTEND PHASE	DELAY/EXTEND
1	V1	EBLT	2	2	0/0
2	V1	EBTR	2	2	0/0
3	V1	WBTR	6	6	0/0
4	V1	WBL	1	1	0/0
5	V1	WBL	1	1	0/0
6	V1	NBLT	4	4	0/0
7	V1	NBR	4	4	0/0
8	V1	NBR	4	4	0/0
9	V1	SBL	8	8	0/0
10	V1	SBTR	8	8	0/0
NOTES:					
1. THE VIDEO DETECTION SHALL BE CAPABLE OF BICYCLE DETECTION.					

FIRE PREEMPTION NOTES

1. FIRE PREEMPTION MODE A SHALL BE ACTIVATED BY THE RED PUSHBUTTON LOCATED ON THE PREEMPTION PANEL IN THE FIRE STATION OR ACTUATED BY AN OPTICAL SIGNAL WHILE PREEMPTION MODES B, C, AND D SHALL BE ACTUATED BY AN OPTICAL SIGNAL FROM AN OPTICAL EMITTER MOUNTED ON AN EMERGENCY VEHICLE AND RECEIVED BY AN OPTICAL DETECTOR LOCATED AT THE INTERSECTION. A SEPARATE RECEIVING DETECTOR IS REQUIRED FOR EACH DETECTED APPROACH. MINIMUM GREEN AND NORMAL CLEARANCE PERIODS SHALL BE PROVIDED TO THE INTERRUPTED PHASE.
2. FIRE PREEMPTION MODE A SHALL BE ASSIGNED THE HIGHEST PRIORITY PREEMPTION MODE. PREEMPTION MODES B, C, AND D SHALL BE ON A FIRST COME FIRST SERVE BASIS.
3. PUSHBUTTON FIRE PREEMPTION MODE A MAY BE TERMINATED AT ANY TIME BY ACTIVATION OF THE BLACK PUSHBUTTON, PROVIDED THE PREEMPTION CLEARANCE AND MINIMUM GREEN TIMES HAVE BEEN SERVED. IF THE BLACK PUSHBUTTON IS NOT ACTIVATED, FIRE PREEMPTION MODE A SHALL BE TERMINATED BY THE MAXIMUM GREEN.
4. IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED AT AN INTERSECTION BY AN OPTICAL DETECTOR, THE CONTROLLER SHALL TIME THE CLEARANCE INTERVALS OF THE ACTIVE PHASE (IF DIFFERENT THAN THAT TO BE SERVICED) AND ADVANCE TO AN/OR HOLD IN EMERGENCY VEHICLE PREEMPTION PHASE UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME THE CLEARANCES AND SIMILARLY SERVICE OTHER EMERGENCY VEHICLE PREEMPTION SEQUENCES IN THE ORDER RECEIVED (IF RECEIVED) OTHERWISE RESUME NORMAL PREFERENTIAL PHASE SEQUENCE.
5. PREEMPTION MODE A MINIMUM GREEN SHALL BE 15 SECONDS WHILE THE MINIMUM GREEN FOR PREEMPTION MODES B, C, AND D SHALL BE 10 SECONDS.
6. UPON ACTIVATION OF THE PREEMPTION MODE, THE CONFIRMATION BEACON SHALL BE ILLUMINATED
7. UPON TERMINATION OF THE PREEMPTION MODE, THE SIGNAL SHALL RETURN TO THE BEGINNING OF PHASES 2 & 6.
8. ACTUAL TIMING FOR PREEMPTION SHALL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE FIRE DEPARTMENT AND SHALL BE APPROVED BY THE TOWN PRIOR TO OPERATION.

	MAJOR ITEMS LIST	
ITEM	**QTY**	**DESCRIPTION**
816.01	1	NEMA TS2 TYPE 1 SIGNAL CONTROLLER W/ VIDEO DETECTION SYSTEM AND FULL INPUT SUPPRESSION PACKAGE IN P SIZE CABINET W/ FOUNDATION AND CONCRETE PAD
	1	50 FT TYPE II GALV. STEEL MAST ARM W/ FDN
	2	40 FT TYPE II GALV. STEEL MAST ARM W/ FDN
	2	30 FT TYPE II GALV. STEEL MAST ARM W/ FDN
	2	8 FT PEDESTAL POLE, STEEL, W/ FDN
	2	10 FT PEDESTAL POLE, STEEL, W/ FDN
	13	SIGNAL HEAD 3-SECTION 12" LED W/ 5" FLAT BACKPLATE AND 3" YELLOW RETROREFLECTIVE BORDER
	2	SIGNAL HEAD 3-SECTION 2-12" & 1-8" LED W/ 5" FLAT BACKPLATE AND 3" YELLOW RETROREFLECTIVE BORDER
	2	SIGNAL HEAD 3-SECTION 12" LED (OPTICALLY PROGRAMMED) W/ 5" FLAT BACKPLATE AND 3" YELLOW RETROREFLECTIVE BORDER (SIGNAL HEADS E AND F)
	4	PEDESTRIAN SIGNAL HEAD, LED, W/ COUNTDOWN TIMER AND CAP VISOR
	4	APS PUSHBUTTON AND SIGN W/ AUDIBLE AND VISIBLE INDICATOR, VIBRO-TACTILE ARROW AND SPEECH-WALK MESSAGE
	1	360° VIDEO DETECTION CAMERA WITH MOUNTING HARDWARE
	1	VIDEO DETECTION PROCESSOR 360° CAMERA
	4	EMERGENCY PREEMPTION OPTICAL DETECTOR
	1	EMERGENCY PREEMPTION STROBE (WHITE LENS)
	1	EMERGENCY PREEMPTION PHASE SELECTOR (4 CHANNEL) W/ RACK
804.3	700 '	3" SCHEDULE 80 PVC CONDUIT
811.31	4	PULLBOX 12"X12"
811.22	5	HANDHOLE 12"X24"
Plus all neccesary duct, cable, labor, miscellaneous material, and equipment to complete the installation and provided a fully functional traffic control signal.		

NOTES:

1. ALL EXISTING TRAFFIC SIGNAL EQUIPMENT TO BE REMOVED UNLESS OTHERWISE NOTED.

T:\9353 Franklin (JSD 8863)\Design\DWG\9353TS.dwg 7/25/2023 9:42 AM EDT

PROJECT TITLE

King Street at Constitution Boulevard Off-site Improvements

Franklin, Massachusetts

PREPARED FOR

Marcus Partners

Boston, Massachusetts

Vanasse & Associates inc
Transportation Engineers & Planners
35 N.E. BUSINESS CENTER DRIVE
ANDOVER, MA 01810-1071
TEL: (978) 474-8800
www.rdva.com

DESIGNED BY	TWO
DRAWN BY	TWO
CHECKED BY	SMB
DATE	SEPTEMBER 2023
SCALE	AS NOTED

STAMP

COMMONWEALTH OF MASSACHUSETTS
STEPHEN M. BOUDREAU
CIVIL
No. 36136
REGISTERED PROFESSIONAL ENGINEER
11/13/23

REVISIONS

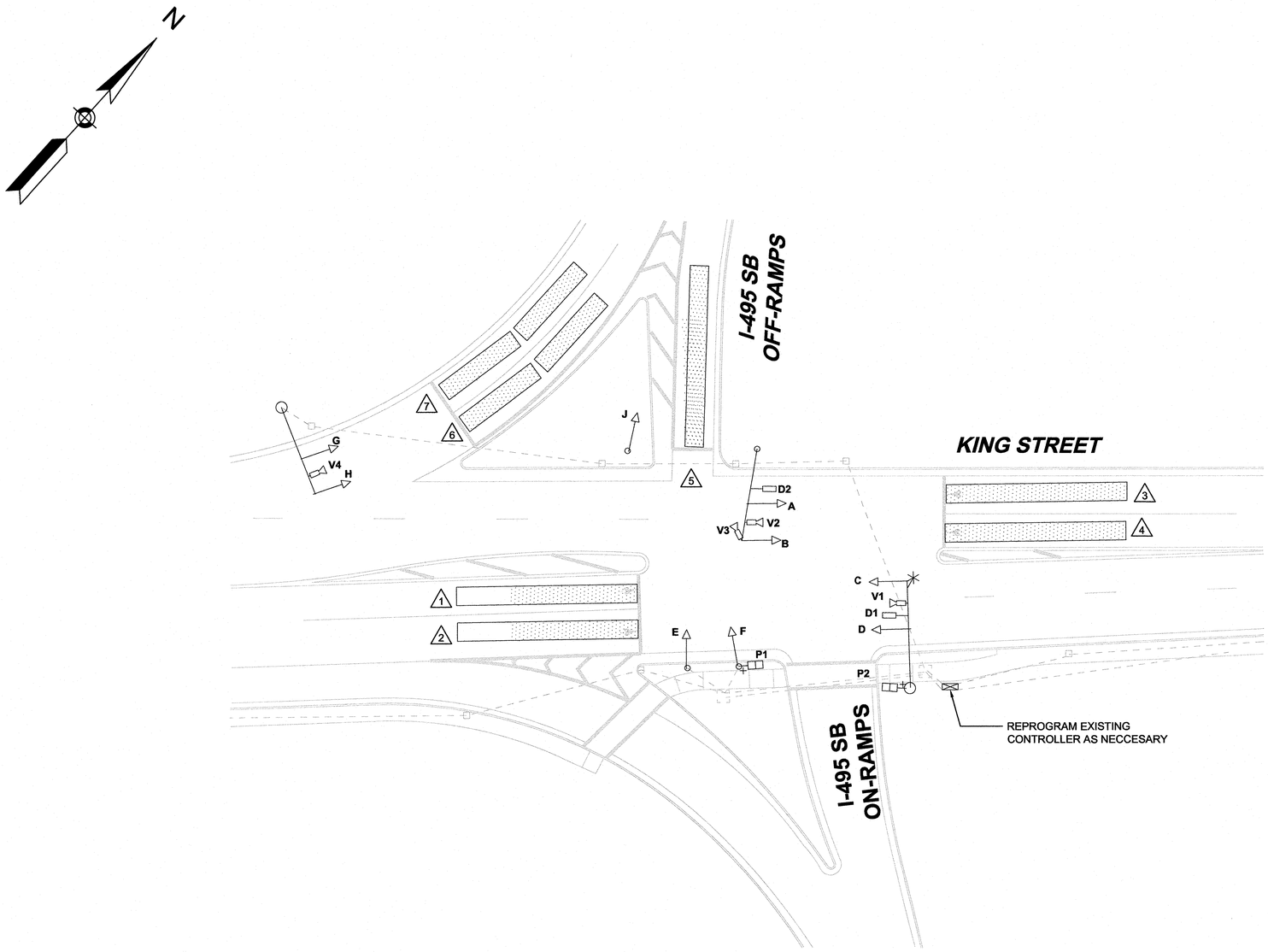
NO.	DESCRIPTION	DATE

DRAWING TITLE

Traffic Signal Data

King Street at Constitution Blvd

SHEET 10 OF 21	DRAWING NUMBER
JOB NO. 9353	**10**
CAD 9353TS	



NOTE: ALL EXIST SIGNAL EQUIPMENT TO BE RETAINED
UNLESS OTHERWISE NOTED

0 20 50 100
SCALE: 1" = 20'

T:\9353 Franklin (JSD 8863)\Design\DWG\9353TS.dwg 7/25/2023 9:42 AM EDT

PROJECT TITLE

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Constitution Boulevard
Off-site Improvements

Franklin,
Massachusetts

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COMMONWEALTH OF MASSACHUSETTS
STEPHEN M. BOUDREAU
CIVIL
No. 36136
REGISTERED PROFESSIONAL ENGINEER

11/13/23

REVISIONS

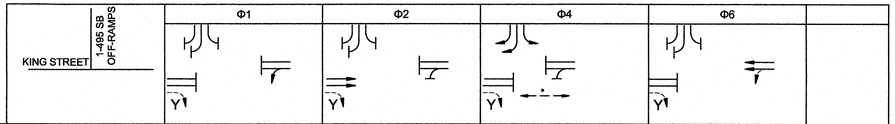
NO.	DESCRIPTION	DATE

DRAWING TITLE

Traffic Signal Plan

King Street at
I-495 SB
Off-Ramps

SHEET 11 OF 21	DRAWING NUMBER 11
JOB NO. 9353	
CAD 9353TS	



SEQUENCE AND TIMING FOR FULL ACTUATED CONTROL (COORDINATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	FLASH
KING STREET	WBT	A	R	R	R	R	R	R	R	R	R	GT	Y	R	FY
KING STREET	WBLT	B	GL	YL	R	R	R	R	R	R	R	G	Y	R	FY
KING STREET	EBT	C,D	R	R	R	GT	Y	R	R	R	R	R	R	R	FY
I-495 SB OFF-RAMP	SBL	E,F	RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL	FRL
I-495 SB OFF-RAMP	SBR	G,H,J	RR	RR	RR	RR	RR	RR	GR	YR	RR	RR	RR	RR	FRR
PEDESTRIAN	E-W	P1-P2	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW	DW	DW	DW	OUT

TIMING IN SECONDS

MINIMUM GREEN (INITIAL)	5			7			7			7			
PASSAGE TIME (VEHICLE)	3			3			3			3			
MAXIMUM 1 (FREE OPERATION)	**15**			**25**			**20**			**45**			
MAXIMUM 2 (DURING COORDINATION)	**24**			**39**			**23**			**68**			
YELLOW CLEARANCE		**3.5**			**4.5**			**3**			**4.5**		
RED CLEARANCE			**2**			**2.5**			**3**			**2.5**	
WALK (W)							7						
PEDESTRIAN CLEARANCE							**6**						
RECALL	OFF			SOFT			OFF			SOFT			
MEMORY	NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			

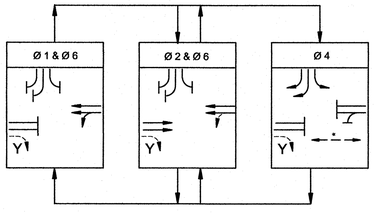
TIMING PLAN	CYCLE LENGTH	REF/OFFSET	COORDINATION PHASE TIMING			
			SEC.	SEC.	SEC.	SEC.
CYCLE 1: M-F 6 AM-10 AM	100	**BOG/41**	29	42	29	71
CYCLE 2: M-F 3 PM-7 PM	100	**BOG/47**	25	46	29	71

* UPON PEDESTRIAN PUSHBUTTON ACTUATION ONLY

NOTES:

1. FLASHING OPERATION PER MUTCD.
2. OFFSET REFERENCED TO BEGINNING OF GREEN (BOG) OF PHASES 2&6 (COORDINATED PHASES).

PREFERENTIAL PHASING SEQUENCE



NOTES: 1. ANY PHASE OR PHASE COMBINATION NOT CALLED SHALL BE SKIPPED.
2. VEHICLE TURNING MOVEMENTS NOT SUPPORTED BY ARROW INDICATIONS SHOWN AS DASHED ARROWS ON PLAN
* UPON PEDESTRIAN PUSHBUTTON ACTUATION ONLY

	MAJOR ITEMS LIST	
ITEM	QTY	DESCRIPTION
816.02	1	REPROGRAM EXISTING CONTROLLER AS NECESSARY
Plus all neccesary duct, cable, labor, miscellaneous material, and equipment to complete the installation and provided a fully functional traffic control signal.		
NOTES:		
1. ALL EXISTING TRAFFIC SIGNAL EQUIPMENT SHALL BE RETAINED UNLESS OTHERWISE NOTED.		

FIRE PREEMPTION SCHEDULE

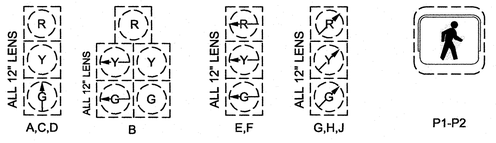
DETECTOR	APPROACH	PREEMPTION PHASE	NEXT PHASE CALLED
D1	EASTBOUND	2	2+6
D2	WESTBOUND	1+6	2 + 6

EMERGENCY VEHICLE PREEMPTION OPERATION:

1. EMERGENCY VEHICLE PREEMPTION SHALL BE ACTUATED BY AN OPTICAL SIGNAL FROM AN OPTICAL EMITTER MOUNTED ON AN EMERGENCY VEHICLE AND RECEIVED BY AN OPTICAL DETECTOR LOCATED AT INTERSECTION. A SEPARATE RECEIVING DETECTOR IS REQUIRED FOR EACH DETECTED APPROACH.
2. PREEMPTION SIGNALS FROM MULTIPLE APPROACHES SHALL BE SERVICED ON A FIRST DETECTED FIRST SERVED BASIS.
3. IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED AT AN INTERSECTION BY AN OPTICAL DETECTOR, THE CONTROLLER SHALL TIME THE CLEARANCE INTERVALS OF THE ACTIVE PHASE (IF DIFFERENT THAN TO BE SERVICED) AND ADVANCE TO AND/OR HOLD IN EMERGENCY VEHICLE PREEMPTION PHASE UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME CLEARANCES AND SIMILARLY SERVICE OTHER EMERGENCY VEHICLE PREEMPTION SEQUENCES IN THE ORDER RECEIVED (IF RECEIVED) OTHERWISE, RESUME NORMAL PREFERENTIAL PHASE SEQUENCE.
4. PREEMPTION MINIMUM GREENS SHALL BE TEN SECONDS.
5. NORMAL CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TERMINATED BY PREEMPTION DEMAND.
6. ACTUAL TIMING FOR PREEMPTION AND THE LOCATION OF THE DETECTORS SHALL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE FIRE DEPARTMENT AND SHALL BE APPROVED BY MASSDOT PRIOR TO OPERATION.

VIDEO DETECTOR DATA					
DETECTION ZONE	CAMERA	DIRECTION	CALL PHASE	EXTEND PHASE	CALL DELAY (SEC)
1	V1	EBT	2	2	0
2	V1	EBT	2	2	0
3	V2	WBT	6	6	0
4	V2	WBLT	1	1/6	5
5	V3	SBL	4	4	0
6	V4	SBR	4	4	0
7	V4	SBR	4	4	0
NOTES:					
1. EXISTING VIDEO DETECTION TO BE RETAINED.					

EXISTING SIGNAL IDENTIFICATION



PROJECT TITLE

King Street at Constitution Boulevard Off-site Improvements

Franklin, Massachusetts

PREPARED FOR

Marcus Partners

Boston, Massachusetts

Vanasse & Associates inc
Transportation Engineers & Planners
35 N.E. BUSINESS CENTER DRIVE
ANDOVER, MA 01810-1071
TEL: (978) 474-8800
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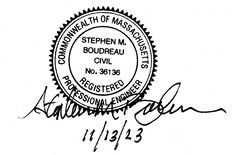
CHECKED BY	SMB
DATE	SEPTEMBER 2023
SCALE	AS NOTED

STAMP



REVISIONS

NO.	DESCRIPTION	DATE

DRAWING TITLE

Traffic Signal Data

King Street at I-495 SB Off-Ramps

SHEET 12 OF 21	DRAWING NUMBER 12
JOB NO. 9353	
CAD 9353TS	

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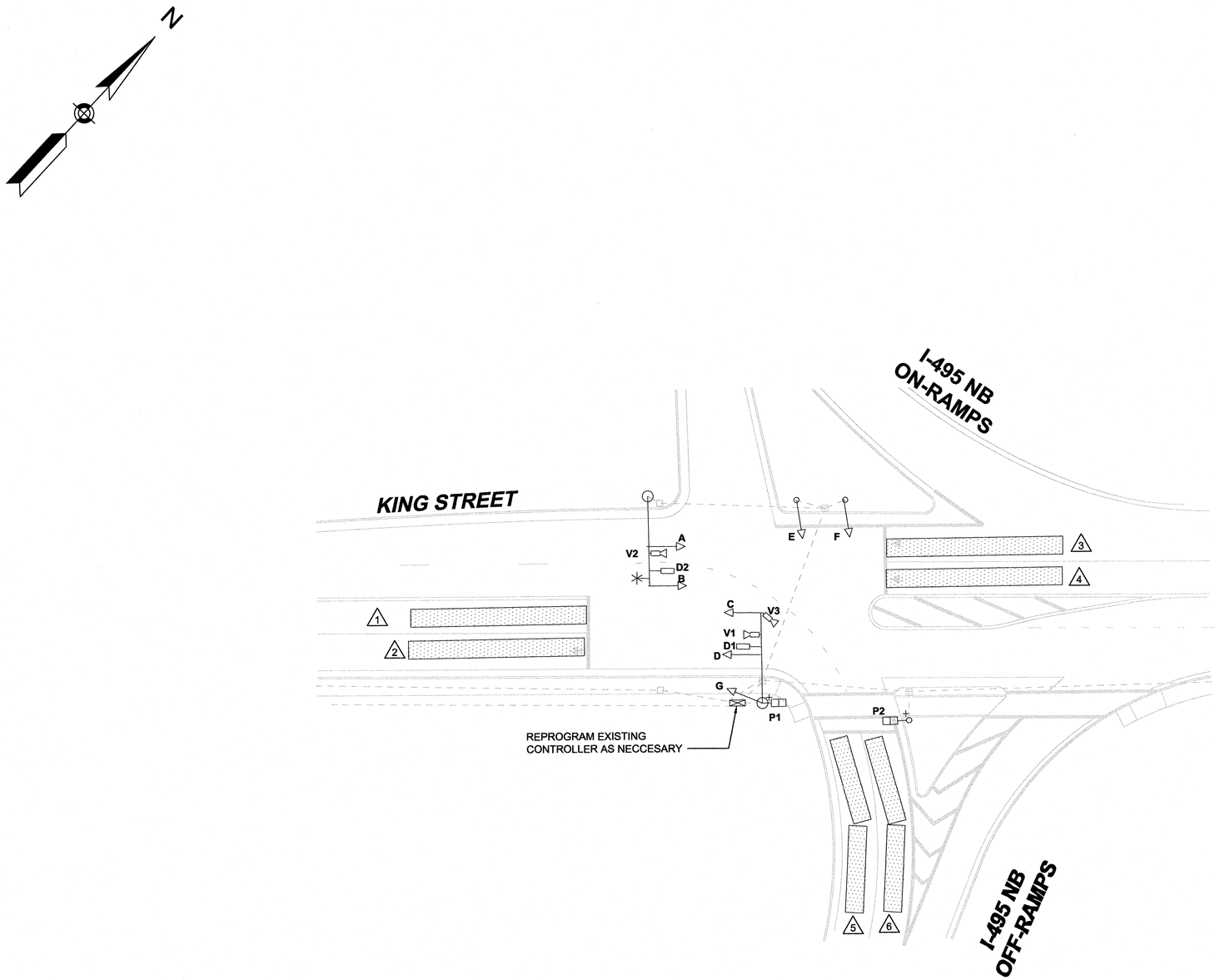

NOTE: ALL EXIST SIGNAL EQUIPMENT TO BE RETAINED
UNLESS OTHERWISE NOTED

0 20 50 100

SCALE: 1" = 20'

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PROJECT TITLE

King Street at
Constitution Boulevard
Off-site Improvements

Franklin,
Massachusetts

PREPARED FOR

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COMMONWEALTH OF MASSACHUSETTS
STEPHEN M. BOUDREAU
CIVIL
No. 36136
REGISTERED PROFESSIONAL ENGINEER

11/13/23

REVISIONS

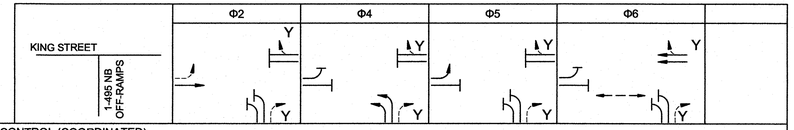
NO.	DESCRIPTION	DATE

DRAWING TITLE

Traffic Signal Plan

King Street at
I-495 NB Off-Ramps

SHEET 13 OF 21	DRAWING NUMBER
JOB NO. 9353	13
CAD 9353TS	



SEQUENCE AND TIMING FOR FULL ACTUATED CONTROL (COORDINATED)															
STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	FLASH
KING STREET	WBT	A,B	R	R	R	R	R	R	R	R	R	GT	Y	R	FY
KING STREET	EBL	C	FYL	YL	RL	RL	RL	RL	GL	YL	**	RL	RL	RL	FRL
KING STREET	EBT	D	GT	Y	R	R	R	R	R	R	R	R	R	R	FY
KING STREET	EBT	G	G	Y	R	R	R	R	R	R	R	R	R	R	FY
I-495 NB OFF-RAMP	NBL	E,F	RL	RL	RL	GL	YL	RL	RL	RL	RL	RL	RL	RL	FRL
PEDESTRIAN	E-W	P1-P2	DW	DW	DW	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW	OUT
TIMING IN SECONDS															
MINIMUM GREEN (INITIAL)			7			7			5			7			
PASSAGE TIME (VEHICLE)			3			3			3			3			
MAXIMUM 1 (FREE OPERATION)			**45**			**19**			20			**20**			
MAXIMUM 2 (DURING COORDINATION)			**81**			**20**			**34**			**42**			
YELLOW CLEARANCE				**4.5**			**3**			**3.5**			**4.5**		
RED CLEARANCE					**1.5**			**3**			**1.5**			**1.5**	
WALK (W)												7			
PEDESTRIAN CLEARANCE												**6**			
RECALL			SOFT			OFF			OFF			SOFT			
MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			

			COORDINATION PHASE TIMING			
TIMING PLAN	CYCLE LENGTH	REF/OFFSET	SEC.	SEC.	SEC.	SEC.
CYCLE 1: M-F 6 AM-10 AM	100	**BOG/0**	**74**	**26**	**39**	**35**
CYCLE 2: M-F 3 PM-7 PM	100	**BOG/0**	**86**	**14**	**38**	**48**

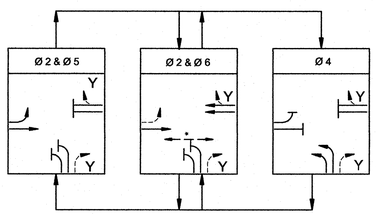
* UPON PEDESTRIAN PUSHBUTTON ACTUATION ONLY

NOTES:

1. FLASHING OPERATION PER MUTCD.
2. OFFSET REFERENCED TO BEGINNING OF GREEN (BOG) OF PHASES 2 & 6 (COORDINATED PHASES).

** FYL IF Ø2 FOLLOWS, RL ALL OTHER PHASES

PREFERENTIAL PHASING SEQUENCE



NOTES: 1. ANY PHASE OR PHASE COMBINATION NOT CALLED SHALL BE SKIPPED.
2. VEHICLE TURNING MOVEMENTS NOT SUPPORTED BY ARROW INDICATIONS SHOWN AS DASHED ARROWS ON PLAN
* UPON PEDESTRIAN PUSHBUTTON ACTUATION ONLY

MAJOR ITEMS LIST		
ITEM	QTY	DESCRIPTION
816.03	1	REPROGRAM EXISTING CONTROLLER AS NECESSARY
Plus all neccesary duct, cable, labor, miscellaneous material, and equipment to complete the installation and provided a fully functional traffic control signal.		
NOTES:		
1. ALL EXISTING TRAFFIC SIGNAL EQUIPMENT SHALL BE RETAINED UNLESS OTHERWISE NOTED.		

VIDEO DETECTOR DATA					
DETECTION ZONE	CAMERA	DIRECTION	CALL PHASE	EXTEND PHASE	CALL DELAY (SEC)
1	V1	EBL	5	2/5	0
2	V1	EBT	2	2	0
3	V2	WBT	6	6	0
4	V2	WBT	6	6	0
5	V3	NBL	4	4	0
6	V3	NBL	4	4	0
NOTES:					
1. EXISTING VIDEO DETECTION TO BE RETAINED.					

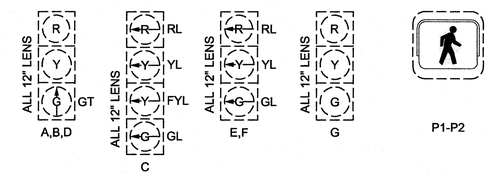
FIRE PREEMPTION SCHEDULE

DETECTOR	APPROACH	PREEMPTION PHASE	NEXT PHASE CALLED
D1	EASTBOUND	2+5	2+6
D2	WESTBOUND	6	2 + 6

EMERGENCY VEHICLE PREEMPTION OPERATION:

1. EMERGENCY VEHICLE PREEMPTION SHALL BE ACTUATED BY AN OPTICAL SIGNAL FROM AN OPTICAL EMITTER MOUNTED ON AN EMERGENCY VEHICLE AND RECEIVED BY AN OPTICAL DETECTOR LOCATED AT INTERSECTION. A SEPARATE RECEIVING DETECTOR IS REQUIRED FOR EACH DETECTED APPROACH.
2. PREEMPTION SIGNALS FROM MULTIPLE APPROACHES SHALL BE SERVICED ON A FIRST DETECTED FIRST SERVED BASIS.
3. IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED AT AN INTERSECTION BY AN OPTICAL DETECTOR, THE CONTROLLER SHALL TIME THE CLEARANCE INTERVALS OF THE ACTIVE PHASE (IF DIFFERENT THAN TO BE SERVICED) AND ADVANCE TO AND/OR HOLD IN EMERGENCY VEHICLE PREEMPTION PHASE UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME CLEARANCES AND SIMILARLY SERVICE OTHER EMERGENCY VEHICLE PREEMPTION SEQUENCES IN THE ORDER RECEIVED (IF RECEIVED) OTHERWISE, RESUME NORMAL PREFERENTIAL PHASE SEQUENCE.
4. PREEMPTION MINIMUM GREENS SHALL BE TEN SECONDS.
5. NORMAL CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TERMINATED BY PREEMPTION DEMAND.
6. ACTUAL TIMING FOR PREEMPTION AND THE LOCATION OF THE DETECTORS SHALL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE FIRE DEPARTMENT AND SHALL BE APPROVED BY MASSDOT PRIOR TO OPERATION.

EXIST SIGNAL IDENTIFICATION



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Boston, Massachusetts

DESIGNED BY	TWO
DRAWN BY	TWO
CHECKED BY	SMB
DATE	SEPTEMBER 2023
SCALE	AS NOTED

STAMP

COMMONWEALTH OF MASSACHUSETTS
STEPHEN M. BOUDREAU
CIVIL
No. 36136
REGISTERED PROFESSIONAL ENGINEER
11/13/23

REVISIONS

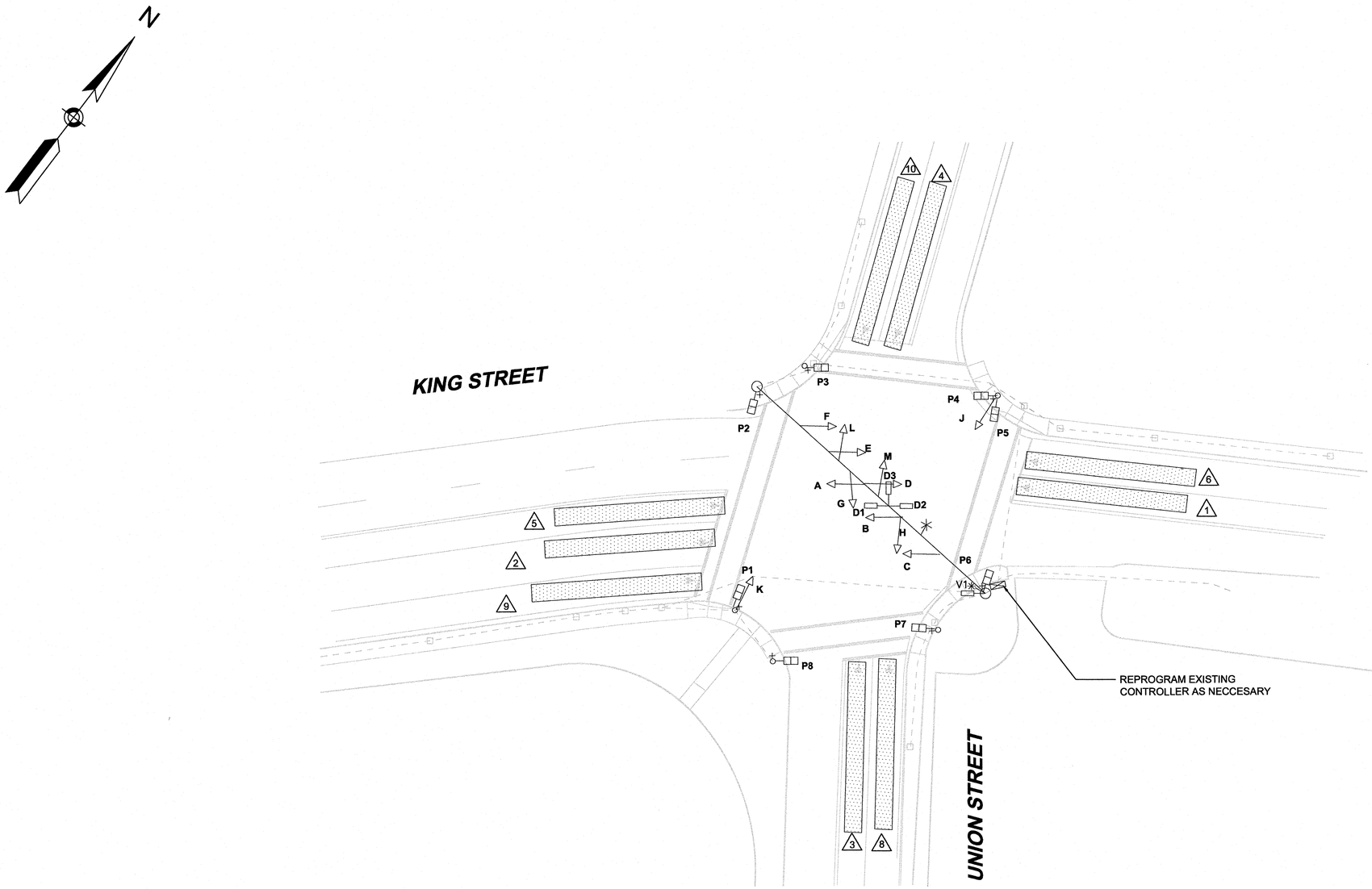
NO.	DESCRIPTION	DATE

DRAWING TITLE

Traffic Signal Data

King Street at I-495 NB Off-Ramps

SHEET 14 OF 21	DRAWING NUMBER
JOB NO. 9353	**14**
CAD 9353TS	



NOTE: ALL EXIST SIGNAL EQUIPMENT TO BE RETAINED
UNLESS OTHERWISE NOTED

0 20 50 100

SCALE: 1" = 20'

T:\9353 Franklin (JSD 8863)\Design\DWG\9353TS.dwg 7/25/2023 9:42 AM EDT

PROJECT TITLE

King Street at
Constitution Boulevard
Off-site Improvements

Franklin,
Massachusetts

PREPARED FOR

Marcus Partners

Boston,
Massachusetts

Vanasse & Associates inc
Transportation Engineers & Planners

35 N.E. BUSINESS CENTER DRIVE
ANDOVER, MA 01810-1071
TEL: (978) 474-8800
www.rdva.com

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11/13/23

REVISIONS

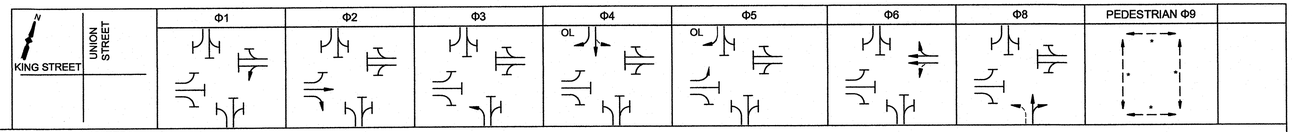
NO.	DESCRIPTION	DATE

DRAWING TITLE

Traffic Signal Plan

King Street at
Union Street

SHEET 15 OF 21	DRAWING NUMBER
JOB NO. 9353	15
CAD 9353TS	



SEQUENCE AND TIMING FOR FULL ACTUATED CONTROL (COORDINATED)

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH
KING STREET	EB	A	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	FRL
KING STREET	EB	B,C	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
KING STREET	WB	D	GL	YL	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	FY
KING STREET	WB	E,F	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	FY
UNION STREET	NB	G	R	R	R	R	R	R	GL	YL	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FR
UNION STREET	NB	H,J	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FR
UNION STREET	SB	K	R	R	R	R	R	R	R	R	R	G	Y	R	GR/R	YR/R	R	R	R	R	R	R	R	R	R	R	FR
UNION STREET	SB	L,M	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
PEDESTRIAN	ALL	P1-P8	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	OUT

TIMING IN SECONDS

MINIMUM GREEN (INITIAL)	5			7			5			7			10			7			7						
PASSAGE TIME (VEHICLE)	2			3			3			3			3			3			3						
MAXIMUM 1 (FREE OPERATION)	**11**			**50**			**11**			**11**			**20**			**42**			**27**						
MAXIMUM 2 (DURING COORDINATION)	**11**			**59**			**11**			**11**			**15**			**56**			**27**						
YELLOW CLEARANCE		4			4			**3**			4			**3.5**			4			4						
RED CLEARANCE			2			2			2			**1.5**			2			2			**1.5**			**4**		
WALK (W)																							**7**			
PEDESTRIAN CLEARANCE																								**18**		
RECALL	OFF			**SOFT**			OFF			OFF			OFF			**SOFT**			OFF			OFF			
MEMORY	NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK			LOCK			

COORDINATION PHASE TIMING (WITH/WITHOUT PEDESTRIANS)

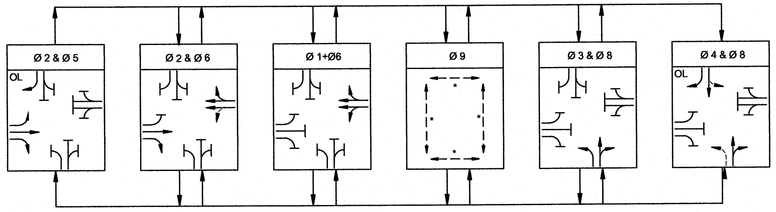
TIMING PLAN	CYCLE LENGTH	REF/OFFSET	SEC.	SEC.	SEC.	SEC.	SEC.	SEC.	SEC.	SEC.
CYCLE 1: M-F 6 AM-10 AM	**100**	**BOG/88**	**11/11**	**36/65**	**11/11**	**13/13**	**16/16**	**31/60**	**24/24**	**29/0**
CYCLE 2: M-F 3 PM-7 PM	**100**	**BOG/0**	**11/11**	**36/65**	**11/11**	**13/13**	**19/19**	**28/57**	**24/24**	**29/0**

* UPON PEDESTRIAN PUSHBUTTON ACTUATION ONLY

NOTES:

1. FLASHING OPERATION PER MUTCD.
2. OFFSET REFERENCED TO BEGINNING OF GREEN (BOG) OF PHASES 2&6 (COORDINATED PHASES).

PREFERENTIAL PHASING SEQUENCE



NOTES: 1. ANY PHASE OR PHASE COMBINATION NOT CALLED SHALL BE SKIPPED.
2. VEHICLE TURNING MOVEMENTS NOT SUPPORTED BY ARROW INDICATIONS SHOWN AS DASHED ARROWS ON PLAN
* UPON PEDESTRIAN PUSHBUTTON ACTUATION ONLY

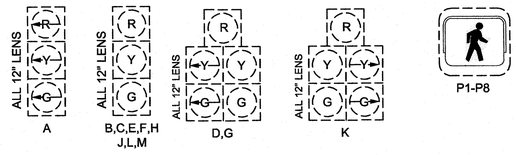
FIRE PREEMPTION SCHEDULE

DETECTOR	APPROACH	PREEMPTION PHASE	NEXT PHASE CALLED
D1	EASTBOUND	2 + 5	2 + 6
D2	WESTBOUND	1 + 6	2 + 6
D3	SOUTHBOUND	4	2 + 6

EMERGENCY VEHICLE PREEMPTION OPERATION:

1. EMERGENCY VEHICLE PREEMPTION SHALL BE ACTUATED BY AN OPTICAL SIGNAL FROM AN OPTICAL EMITTER MOUNTED ON AN EMERGENCY VEHICLE AND RECEIVED BY AN OPTICAL DETECTOR LOCATED AT INTERSECTED. A SEPARATE RECEIVING DETECTOR IS REQUIRED FOR EACH DETECTED APPROACH.
2. PREEMPTION SIGNALS FROM MULTIPLE APPROACHES SHALL BE SERVICED ON A FIRST DETECTED FIRST SERVED BASIS.
3. IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED AT AN INTERSECTION BY AN OPTICAL DETECTOR, THE CONTROLLER SHALL TIME THE CLEARANCE INTERVALS OF THE ACTIVE PHASE (IF DIFFERENT THAN TO BE SERVICED) AND ADVANCE TO AND/OR HOLD IN EMERGENCY VEHICLE PREEMPTION PHASE UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME CLEARANCES AND SIMILARLY SERVICE OTHER EMERGENCY VEHICLE PREEMPTION SEQUENCES IN THE ORDER RECEIVED (IF RECEIVED) OTHERWISE, RESUME NORMAL PREFERENTIAL PHASE SEQUENCE.
4. PREEMPTION MINIMUM GREENS SHALL BE TEN SECONDS.
5. NORMAL CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TERMINATED BY PREEMPTION DEMAND.
6. ACTUAL TIMING FOR PREEMPTION AND THE LOCATION OF THE DETECTORS SHALL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE FIRE DEPARTMENT AND SHALL BE APPROVED BY THE TOWN PRIOR TO OPERATION.

EXISTING SIGNAL IDENTIFICATION



MAJOR ITEMS LIST		
ITEM	QTY	DESCRIPTION
816.04	1	REPROGRAM EXISTING CONTROLLER AS NECESSARY
Plus all neccesary duct, cable, labor, miscellaneous material, and equipment to complete the installation and provided a fully functional traffic control signal.		

NOTES:

1. ALL EXISTING TRAFFIC SIGNAL EQUIPMENT SHALL BE RETAINED UNLESS OTHERWISE NOTED.

VIDEO DETECTOR DATA

DETECTION ZONE	CAMERA	DIRECTION	CALL PHASE	EXTEND PHASE	CALL DELAY (SEC)
1	V1	WBL	1	1/6	20
2	V1	EBT	2	2	0
3	V1	NBL	3	3/8	0
4	V1	SBT	4	4	0
5	V1	EBLT	5	5	0
6	V1	WBT	6	6	0
8	V1	NBT	8	8	0
9	V1	EBR	2	2	3
10	V1	SBR	4	4	3

NOTES:

1. EXISTING VIDEO DETECTION TO BE RETAINED.

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Franklin, Massachusetts

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Boston, Massachusetts

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11/13/23

REVISIONS

NO.	DESCRIPTION	DATE

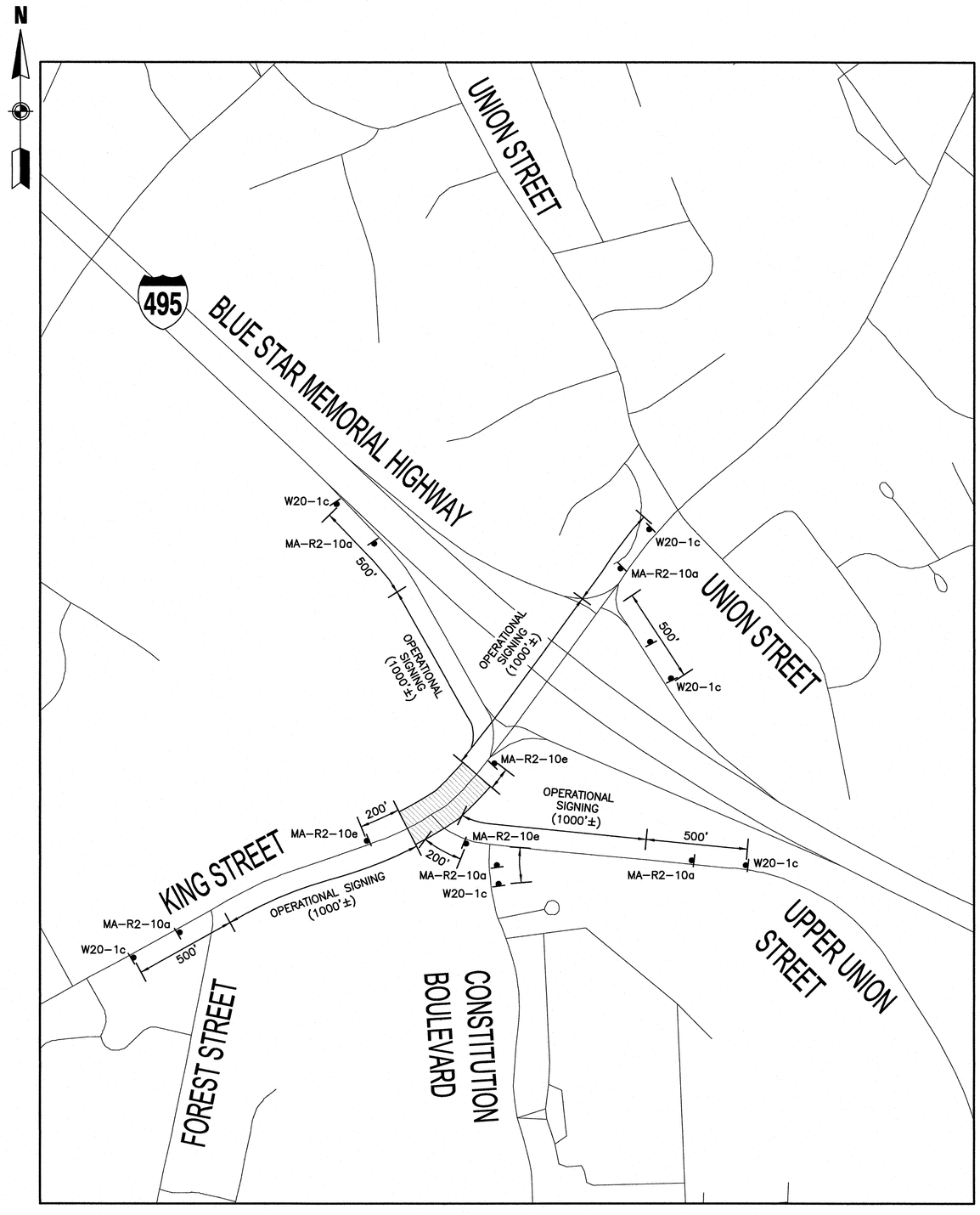
DRAWING TITLE

Traffic Signal Data

King Street at Union Street

SHEET 16 OF 21	DRAWING NUMBER
JOB NO. 9353	**16**
CAD 9353TS	

T:\9353 Franklin (JSD 8863)\Design\DWG\93531TS.dwg 7/25/2023 9:42 AM EDT

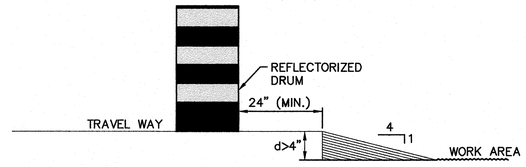


ADVANCE SIGNING SCHEMATIC

NOT TO SCALE

ADVANCE SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCH)			COLOR			POST TYPE & NUMBER PER SIGN	AREA PER SIGN (SF)
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	RTE. MKR. ARROW	BACKGROUND	LEGEND	BORDER		
MA-R2-10a	48"	36"	WORK ZONE SPEEDING FINES DOUBLED	MASSDOT STANDARD			FLUORESCENT ORANGE/ WHITE	BLACK/ BLACK	BLACK/ BLACK	P-5 (2)	12.00
MA-R2-10e	36"	48"	END ROAD WORK / DOUBLE FINES END	MASSDOT STANDARD			FLUORESCENT ORANGE/ WHITE	BLACK/ BLACK	BLACK/ BLACK	P-5 (2)	12.00
W20-1c	36"	36"	ROAD WORK AHEAD	SEE 2009 MUTCD			FLUORESCENT ORANGE	BLACK	BLACK	P-5 (1)	9.00



LATERAL DROP-OFF DETAIL

NOT TO SCALE

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REVISIONS

NO.	DESCRIPTION	DATE

DRAWING TITLE

Temporary Traffic Control Plan

SHEET 17 OF 21	DRAWING NUMBER 17
JOB NO. 9353	
CAD 9353DS	

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TRAFFIC MANAGEMENT NOTES

1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
2. ALL SIGN LEGENDS, BORDERS AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
4. TEMPORARY CONSTRUCTION SIGNING, BARRICADES AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR THE AASHTO 2009 OR 2016 "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
6. CONTRACTORS SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT AND SIMILAR OPERATIONS.
7. THE FIRST TEN PLASTIC, RETRORFLECTIVE DRUMS OF A TAPER SHALL BE MOUNTED WITH SEQUENTIAL FLASHING LIGHTS.
8. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE RESIDENT ENGINEER AND APPROVED BY THE GOVERNING JURISDICTION PRIOR TO POSTING.
9. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
10. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
11. MINIMUM LANE WIDTH IS TO BE 11 FEET. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
12. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
13. ADA/AAB COMPLIANT PEDESTRIAN ACCESS SHALL BE MAINTAINED AT ALL TIMES.

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES

Type of Taper	Taper Length (L)*
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE–LANE, TWO–WAY TRAFFIC TAPER	50 FT MIN, 100 FT MAXIMUM
DOWNSTREAM TAPER	50 FT MIN, 100 FT MAX PER LANE

FORMULAS FOR DETERMINING TAPER LENGTHS

Speed Limit (S)	Taper Length (L) Feet
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	$L = WS$

WHERE: L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = POSTED SPEED LIMIT, OR OFF–PEAK 85TH–PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH

SUGGESTED WORK ZONE WARNING SIGN SPACING

Road Type	Distance Between Signs**		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350	350	350
MOST OTHER ROADWAYS*	500	500	500
EXPRESSWAY/FREEWAY*	1,000	1,500	2,640

* SPEED CATEGORY TO BE DETERMINED BY HIGHWAY AGENCY. DISTANCES ARE SHOWN IN FEET.

** THE COLUMN HEADINGS A, B, AND C ARE THE DIMENSIONS SHOWN IN THE DETAIL/TYPICAL SETUP FIGURES. THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE.)

THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCED WARNING" SIGN ON THE TTCP SETUPS. THESE ADVANCED WARNING SIGNS ARE LOCATED PRIOR TO THE PROJECT LIMITS ON ALL APPROACHES (i.e. THE W20–1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT. ADDITIONAL SIGNS (i.e. "RIGHT LANE CLOSED 1 MILE" AND "LEFT LANE CLOSED 1 MILE") HAVE BEEN SHOWN IN SOME FIGURES AS EXAMPLES OF REINFORCEMENT SIGN PLACEMENT BUT ARE USED IN RARE OCCASIONS.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERENCED TO AS THE OPERATIONAL (DAY–TO–DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

MA–R2–10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS AS DESCRIBED ABOVE.

MA–R2–10a, MA–R2–10e, AND W20–1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAILS/TYPICAL SETUPS.

LEGEND:

- REFLECTORIZED PLASTIC DRUM
- P POLICE DETAIL
- TYPE III BARRICADE
- FLASHING ARROW BOARD
- WORK ZONE
- DIRECTION OF TRAFFIC
- IMPACT ATTENUATOR
- MEDIAN BARRIER
- MEDIAN BARRIER WITH WARNING LIGHTS
- WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR
- TRAFFIC OR PEDESTRIAN SIGNAL
- SIGN

TEMPORARY SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCH)			COLOR			POST TYPE & NUMBER PER SIGN	AREA PER SIGN
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	RTE. MKR. ARROW	BACKGROUND	LEGEND	BORDER		
R3–7R	30"	30"	RIGHT LANE MUST TURN RIGHT	SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			WHITE	BLACK	BLACK	P–5 (1)	6.25
W4–2R	36"	36"		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			FLUORESCENT ORANGE	BLACK	BLACK	P–5 (1)	9.00
W9–2L	36"	36"	LANE ENDS MERGE LEFT	SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			FLUORESCENT ORANGE	BLACK	BLACK	P–5 (1)	9.00
W9–3	36"	36"	CENTER LANE CLOSED XXX FT	SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			FLUORESCENT ORANGE	BLACK	BLACK	P–5 (1)	9.00
W12–1	36"	36"		SEE FHWA STANDARD HIGHWAY SIGNS 2004 EDITION			FLUORESCENT ORANGE	BLACK	BLACK	P–5 (2)	9.00
W20–5L	36"	36"	LEFT LANE CLOSED XXX FT	SEE FHWA STANDARD HIGHWAY SIGNS 2012 SUPPLEMENT			FLUORESCENT ORANGE	BLACK	BLACK	P–5 (1)	9.00
W20–5R	36"	36"	RIGHT LANE CLOSED XXX FT	SEE FHWA STANDARD HIGHWAY SIGNS 2012 SUPPLEMENT			FLUORESCENT ORANGE	BLACK	BLACK	P–5 (1)	9.00

STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

SPEED* (mph)	DISTANCE (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

*POSTED SPEED, OFF–PEAK 85TH–PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED

THESE VALUES MAY BE USED TO DETERMINE THE LENGTH OF LONGITUDINAL BUFFER SPACES.

THE DISTANCES IN THE ABOVE CHART REPRESENT THE MINIMAL VALUES FOR BUFFER SPACING.

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DRAWING TITLE

Temporary Traffic Control Plan

SHEET 18 OF 21	DRAWING NUMBER 18
JOB NO. 9353	
CAD 9353DS	

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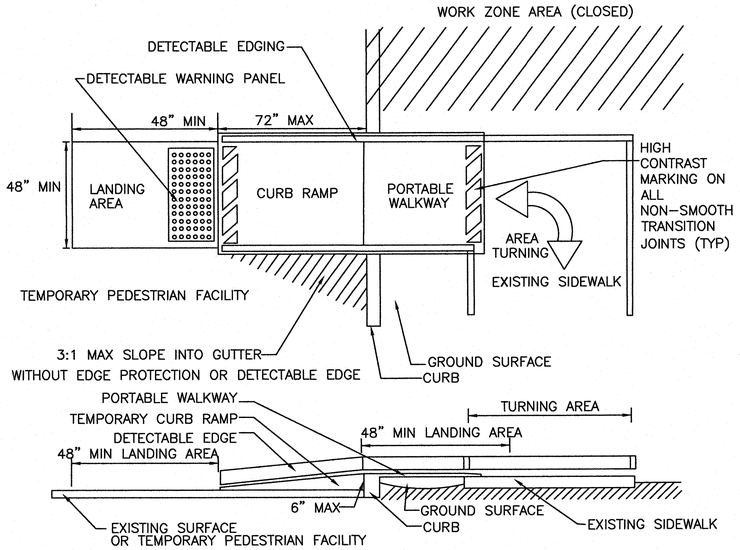
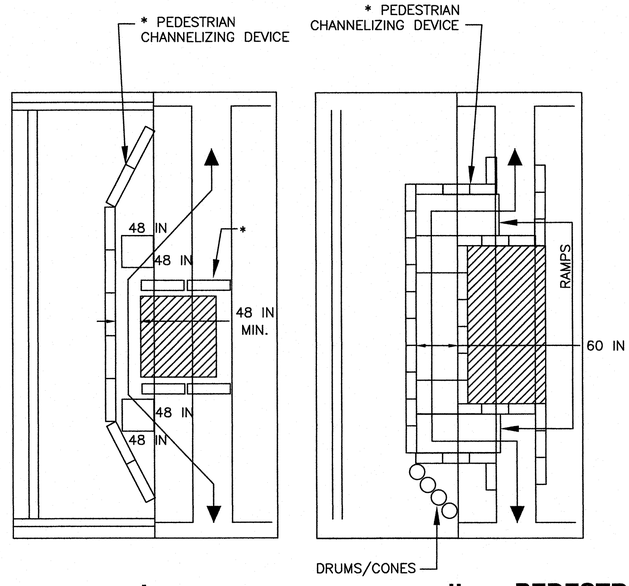


TEMPORARY CURB RAMP-TYPE 2

PEDESTRIAN DETAILS

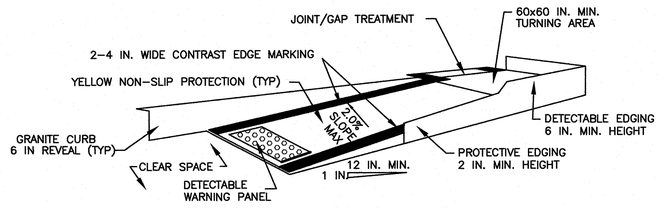


PEDESTRIAN DETOUR

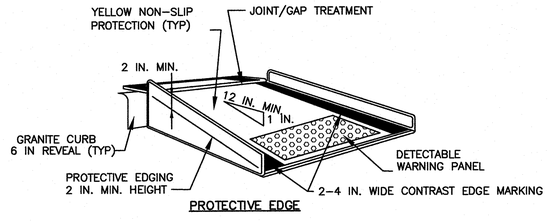
- DETAIL I IS CONSIDERED AN EXAMPLE OF A SHORT TERM CLOSURE AND PEDESTRIAN ASSISTANCE (PERSONEL) TO NAVIGATE AROUND THE CLOSURE/WORK AREA COULD BE CONSIDERED AS AN OPTION IN PLACE OF PROVIDING ADA/AAB DEVICES. DETAIL II IS CONSIDERED AN EXAMPLE OF A LONG TERM CLOSURE THAT WOULD REQUIRE ADDITIONAL ADA/AAB COMPLIANT DEVICES. IF A SIDEWALK CLOSURE OR RESTRICTION LASTS FOR MORE THAN ONE (1) WORK SHIFT THEN ADA/AAB COMPLIANCE SHALL BE FOLLOWED.
- WHEN EXISTING PEDESTRIAN FACILITIES ARE DISRUPTED, CLOSED, OR RELOCATED IN A TTC ZONE, TEMPORARY FACILITIES SHALL BE PROVIDED AND THEY SHALL BE DETECTABLE AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH THE FEATURES PRESENT IN THE EXISTING PEDESTRIAN FACILITY.
- A PEDESTRIAN CHANNELIZING DEVICE THAT IS DETECTABLE BY A PERSON WITH A VISUAL DISABILITY TRAVELING WITH THE AID OF A LONG CAN SHALL BE PLACED ACROSS THE FULL WIDTH OF THE CLOSED SIDEWALK.
- WHEN USED, TEMPORARY RAMPS SHALL COMPLY WITH THE AMERICANS WITH DISABILITIES ACT (SEE FIGURES PED-1 & PED-2).
- THE ALTERNATE PATHWAY SHOULD HAVE A SMOOTH CONTINUOUS HARD SURFACE FOR THE ENTIRE LENGTH OF THE TEMPORARY PEDESTRIAN FACILITY.
- THE TEMPORARY SIDEWALK SHOULD BE A MINIMUM OF 4 FEET WIDE. IF THE SIDEWALK EXCEEDS 200 FEET THEN A 5 FOOT BY 5 FOOT PASSING ZONE SHALL BE PROVIDED.
- THE PROTECTIVE REQUIREMENTS OF A TTC WORK ZONE MAY HAVE AN IMPACT IN DETERMINING THE NEED FOR TEMPORARY TRAFFIC BARRIERS AND THEIR USE IN PROVIDING PEDESTRIAN DELINEATION SHOULD BE BASED ON ENGINEERING JUDGMENT.
- CONTROLS ONLY FOR PEDESTRIAN TRAFFIC ARE SHOWN; VEHICULAR TRAFFIC SHOULD BE HANDLED AS SHOWN ELSEWHERE. THESE DETAILS ARE USED IN CONJUNCTIONS FOR THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING, AS DETERMINED BY THE ENGINEER.
- AUDIBLE INFORMATION DEVICES SHOULD BE CONSIDEREED WHERE MIDBLOCK CLOSINGS AND CHANGED CROSSWALK AREAS CAUSE INADEQUATE COMMUNICATION TO BE PROVIDED TO PEDESTRIANS WHO HAVE VISUAL DISABILITIES.
- EXISTING AUDIBLE DEVICES NO LONGER APPLICABLE DUE TO CONSTRUCTION SHALL BE DISABLED.

AUDIBLE DEVICES

FOR LONG TERM SIDEWALK CLOSURES (AT A MINIMUM OVERNIGHT) A FORM OF SPEECH MESSAGING FOR PEDESTRIANS WITH VISUAL DISABILITIES SHALL BE PROVIDED. AUDIBLE INFORMATION DEVICES SUCH AS DETECTABLE BARRIERS OR BARRICADES AND OTHER PASSIVE PEDESTRIAN ACTIVATION (MOTION ACTIVATED) DEVICES SHOULD BE CONSIDERED FOR THESE CASES. THESE AUDIBLE DEVICES CAN BE MOUNTABLE OF STAND ALONE.



TEMPORARY CURB RAMP-PARALLEL TO CURB

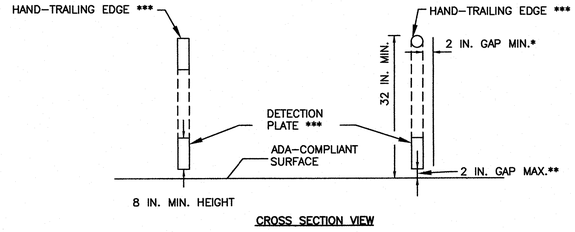


PROTECTIVE EDGE

TEMPORARY CURB RAMP-PERPENDICULAR TO CURB

NOTES:

1. CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE AND NON-SLIP SURFACE.
2. PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOP STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
3. DETECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
4. THE CURB RAMP WALKWAY AND LANDING AREA SURFACE SHALL BE OF A SOLID CONTINUOUS CONTRASTING COLOR ABUTTING UP TO THE EXISTING SIDEWALK.
5. CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
6. CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
7. WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
8. LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5 IN. WIDTH.
9. CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5 IN. LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25 IN. HIGH, AND BEVELED AT 1:2 BETWEEN 0.25 IN. AND 0.5 IN. HEIGHT.
10. IF A TEMPORARY PEDESTRIAN RAMP LEADS TO A CROSSWALK, THEN A DETECTABLE WARNING PAD MUST BE ADHERED TO THE BASE OF THE RAMP. IF IT LEADS TO A PROTECTED PEDESTRIAN BYPASS THAT DOES NOT CONFLICT WITH VEHICULAR TRAFFIC, THEN A PAD SHALL NOT BE INSTALLED ON THE RAMP.

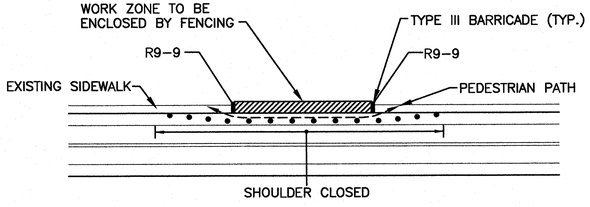


CROSS SECTION VIEW

PEDESTRIAN CHANNELIZING DEVICE

NOTES:

* THERE SHALL BE A 2 INCH GAP BETWEEN THE HAND-TRAILING EDGE AND ITS SUPPORT.
** A MAXIMUM 2 INCH GAP BETWEEN THE BOTTOM OF THE BOTTOM RAIL AND THE SURFACE MAY BE USED TO PROVIDE DRAINAGE.
*** THE HAND-TRAILING EDGE AND DETECTION PLATE SHALL BE CONTINUOUS THROUGHOUT THE LENGTH OF THE PATH SUCH THAT A PEDESTRIAN USER WITH A LONG CANE CAN FOLLOW IT.



PEDESTRIAN BYPASS

NOT TO SCALE

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PROJECT TITLE

King Street at Constitution Boulevard Off-site Improvements

Franklin, Massachusetts

PREPARED FOR

Marcus Partners

Boston, Massachusetts

Vanasse & Associates inc
Transportation Engineers & Planners
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CHECKED BY	SMB
DATE	SEPTEMBER 2023
SCALE	N.T.S.

STAMP

COMMONWEALTH OF MASSACHUSETTS
STEPHEN M. BOUDREAU
CIVIL
No. 38136
REGISTERED PROFESSIONAL ENGINEER

11/13/23

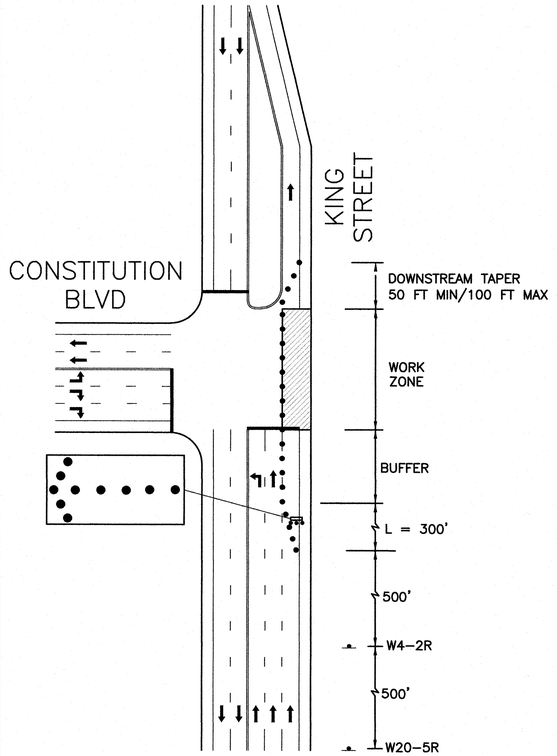
REVISIONS

NO.	DESCRIPTION	DATE

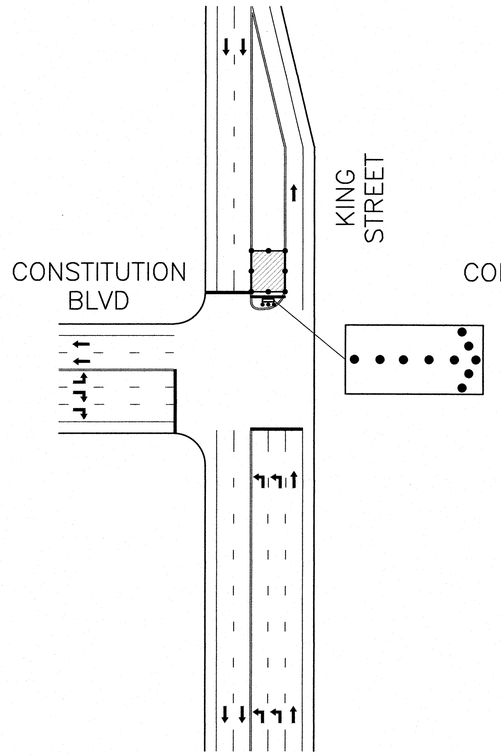
DRAWING TITLE

Temporary Traffic Control Plan

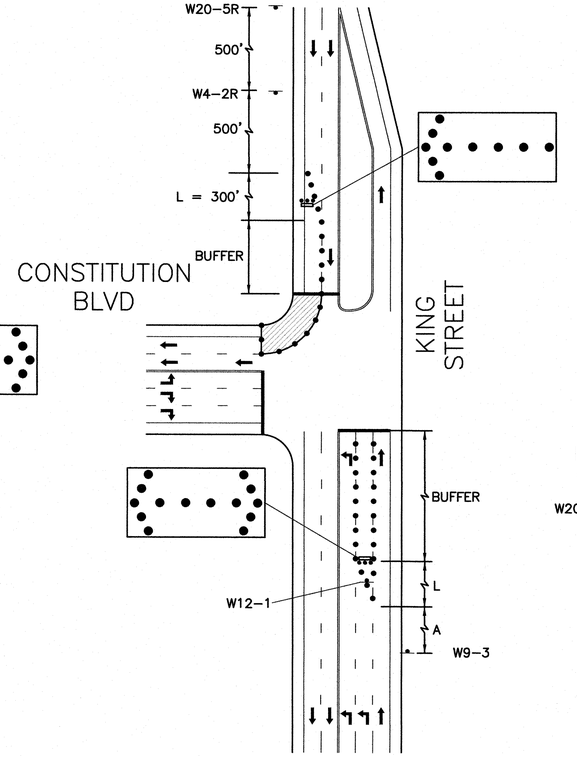
SHEET 19 OF 21	DRAWING NUMBER 19
JOB NO. 9353	
CAD 9353DS	



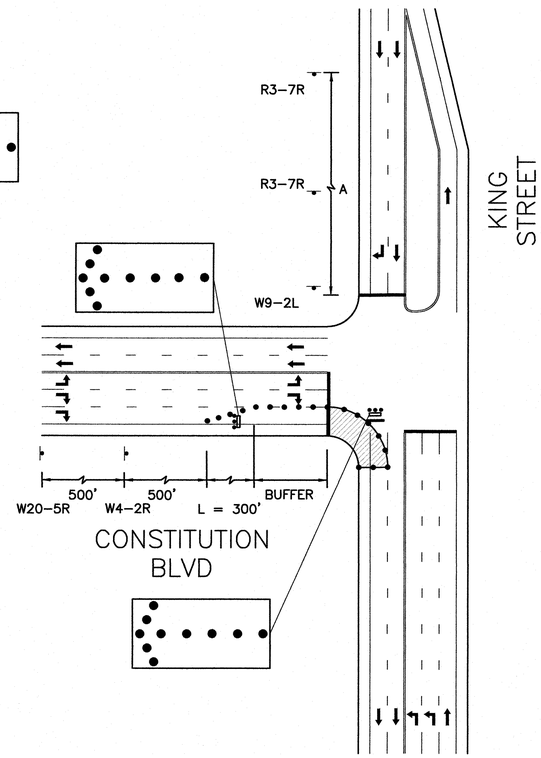
KING STREET
NORTH SIDE
NOT TO SCALE



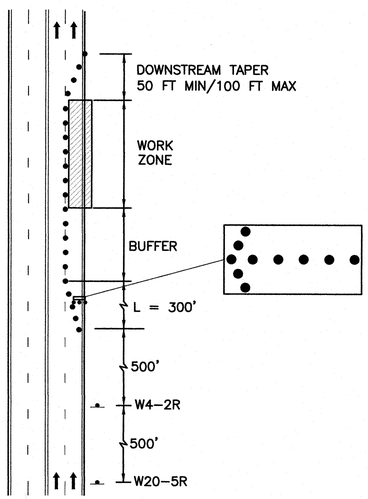
KING STREET
PAINTED MEDIAN CLOSURE
NOT TO SCALE



KING STREET AT CONSTITUTION BLVD
SOUTHWEST CORNER CLOSURE
NOT TO SCALE



KING STREET AT CONSTITUTION BLVD
SOUTHEAST CORNER CLOSURE
NOT TO SCALE



MULTI LANE ROAD -
RIGHT LANE CLOSURE (SHORT TERM)
NOT TO SCALE

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STEPHEN M. BOUDREAU
CIVIL
No. 36136
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11/13/23

REVISIONS

NO.	DESCRIPTION	DATE

DRAWING TITLE

Temporary Traffic Control Plan

SHEET 20 OF 21	DRAWING NUMBER 20
JOB NO. 9353	
CAD 9353DS	

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PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT

SURFACE: 1-3/4" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5)
1-3/4" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC-19.0)

4" SUPERPAVE BASE COURSE - 37.5 (SBC-37.5)

SUBBASE: 4" DENSE GRADED CRUSHED STONE OVER
8" GRAVEL BORROW (MASSDOT M1.03.0 TYPE b)

NOTE: IN FULL DEPTH AREAS < 4' WIDE USE 8" HIGH EARLY STRENGTH CEMENT CONCRETE IN LIEU OF 4" BASE COURSE AND 4" DENSE GRADED CRUSHED STONE.

PROPOSED PAVEMENT MILLING & HMA OVERLAY

EXCAVATION: 1-3/4" PAVEMENT MILLING

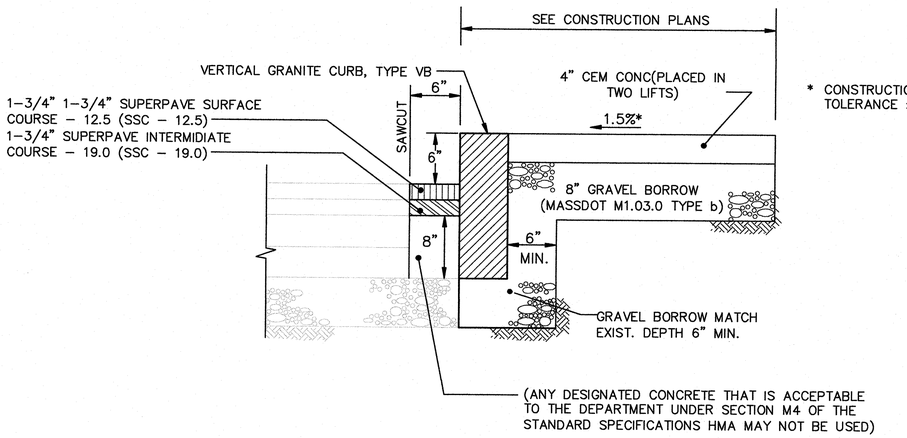
SURFACE: 1-3/4" SUPERPAVE SURFACE COURSE - 12.5 (SSC - 12.5)

ASPHALT EMULSION FOR TACK COAT (RS-1) AT:
0.08 GAL/SY OVER EXISTING SMOOTH OR NEW PAVEMENT
0.09 GAL/SY OVER MILLED PAVEMENT

PROPOSED CEMENT CONCRETE SIDEWALK, & PEDESTRIAN CURB RAMPS

SURFACE: 4" CEMENT CONCRETE
(AIR-ENTRAINED 4000 PSI-3/4"-610 LB)

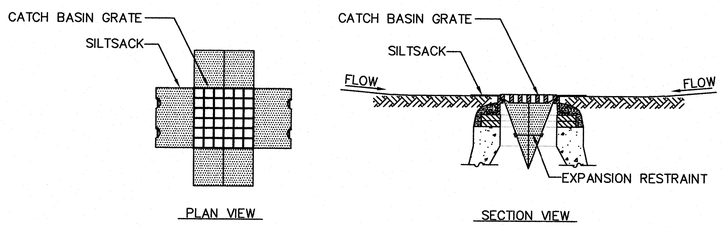
SUBBASE: 8" GRAVEL BORROW
(MASSDOT M1.03.0 TYPE c)



* CONSTRUCTION TOLERANCE ±0.5%.

CURB SETTING & SIDEWALK DETAIL

NOT TO SCALE



NOTES:

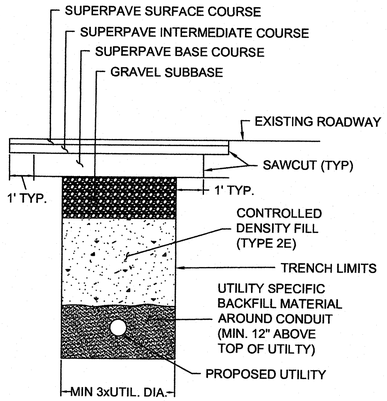
1. INSTALL SILTSACK IN ALL CATCH BASINS WITHIN THE LIMITS OF WORK AND AS DIRECTED BY THE ENGINEER PRIOR TO COMMENCEMENT OF WORK.
2. GRATE TO BE PLACED OVER SILTSACK.
3. SILTSACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED. MAINTAIN UNTIL UPSTREAM AREAS HAVE BEEN PERMANENTLY STABILIZED

SILT SACK

NOT TO SCALE

TRENCH SECTION

N.T.S.
(FOR TEMPORARY PAVING SEE NOTE 1)



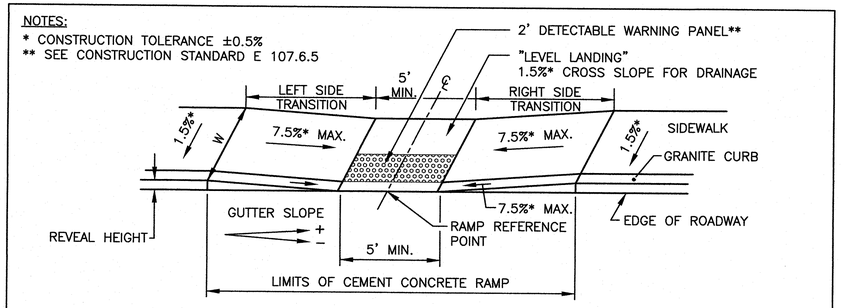
*TRENCHES ON FREEWAYS SHALL REQUIRE A PAVEMENT DESIGN TO BE SUBMITTED FOR APPROVAL

ALL HOT MIX ASPHALT SHALL BE PRODUCED WITH A WARM MIX ADDITIVE

NOTES:

1. IF A TEMPORARY PATCH IS TO BE USED, THE CDF SHALL BE PLACED TO THE ELEVATION OF THE ADJOINING SUBGRADE, THEN GRAVEL SHALL BE PLACED AND COMPACTED TO WITHIN 3 1/2 INCHES OF THE FINISHED GRADE. THE LAST 3 1/2 INCHES SHALL BE HOT MIX ASPHALT PLACED IN TWO LAYERS: 1 1/2 SURFACE COURSE OVER 2" INTERMEDIATE COURSE.
2. MATERIAL WHICH MEETS THE SPECIFICATION FOR GRAVEL BORROW TYPE C (M1.03.0 TYPE C), PLACED AND COMPACTED IN LAYERS NO GREATER THAN 6", MAY BE USED IN PLACE OF THE CDF WITH APPROVAL FROM THE DISTRICT HIGHWAY DIRECTOR.
3. THE EXPOSED EDGES OF ALL LONGITUDINAL AND TRANSVERSE SAW CUT JOINTS SHALL BE TREATED WITH HOT POURED RUBBERIZED ASPHALT JOINT SEALANT MEETING MASSDOT SPECIFICATIONS.
4. YELLOW METAL FOIL MARKING TAPE SHALL BE PLACED 18" OVER THE CONDUIT (METAL MARKING TAPE/WIRE SHOULD BE USED FOR NON-METALLIC CONDUIT.)
5. FOR ROADS WITH AN EXISTING CEMENT CONCRETE BASE, A REINFORCED, HIGH EARLY STRENGTH AIR ENTRAINED, CLASS "F" CEMENT CONCRETE SLAB SHALL BE CAST IN PLACE TO MEET THE EXISTING PAVEMENT. SPECIFIC JOINT DETAILS WITH THE EXISTING PAVEMENT SHALL BE APPROVED DEPENDENT ON THE EXISTING SITE CONDITIONS.
6. AL TRENCH DIMENSIONS SHALL BE IN ACCORDANCE WITH SUB-SECTION 140.80 OF THE MASSDOT STANDARDS AND SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
7. SIC 19.0 MAY BE SUBSTITUED FOR SBC-37.5

NOTES:
* CONSTRUCTION TOLERANCE ±0.5%
** SEE CONSTRUCTION STANDARD E 107.6.5



WCR #	RAMP REFERENCE POINT		WIDTH OF SIDEWALK W (L/R)	WIDTH OF RAMP MIN. 5.00'	TRANSITION LENGTH		REVEAL HEIGHT		GUTTER SLOPE %
	STATION	OFFSET			LEFT SIDE	RIGHT SIDE	LEFT SIDE	RIGHT SIDE	
1	102+71.32	33.69' LT	5.50'/5.50'	5.00'	11.00'	6.50'	6"	6"	+2.1%
2	102+72.19	27.45' RT	5.50'/6.00'	5.00'	4.50'	9.00'	3"	6"	−0.5%***
3	102+90.22	36.59' RT	−/5.50'	5.00'	−	5.30'	6"	3"	−1.1%
4	103+97.72	35.14' RT	6.10'/6.25'	5.00'	9.50'	9.00'	6"	6"	−1.7%

PEDESTRIAN CURB RAMP ON NARROW SIDEWALK

NOT TO SCALE

*** GUTTER SLOPE SHALL BE GRADED TO DRAIN TO THE EXISTING CATCH BASIN AT STA 102+60 RT

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STEPHEN M. BOUDREAU
CIVIL
No. 36136
REGISTERED PROFESSIONAL ENGINEER
11/13/23

REVISIONS

NO.	DESCRIPTION	DATE

DRAWING TITLE

Construction Details

SHEET 21 OF 21	DRAWING NUMBER 21
JOB NO. 9353	
CAD 9353DS	

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TRIP-GENERATION CALCULATIONS

Existing
209000 Office LUC 710

Proposed
185175 Warehouse LUC 150

	"EXISTING"	PROPOSED (vehicles)	PROPOSED (trucks)	PROPOSED (Cars)	NET CHANGE IN TRIPS
Weekday Daily					
Enter	1,102	165	54	111	-937
Exit	1,102	166	54	112	-936
Total	2,204	331	108	223	-1,873
Weekday AM					
Enter	278	35	2	33	-243
Exit	38	11	2	9	-27
Total	316	46	4	42	-270
Weekday PM					
Enter	52	14	3	11	-38
Exit	254	35	3	32	-219
Total	306	49	6	43	-257

Institute of Transportation Engineers (ITE)

Land Use Code (LUC) 150 - Warehousing

General Urban/Suburban

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 185.175

AVERAGE WEEKDAY DAILY

T = 1.58 * (X) + 38.29
T = 1.58 * 185.175 + 38.29
T = 330.87
T = 331 vehicle trips
with 50% (165 vpd) entering and 50% (166 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.12* (X) + 23.62
T = 0.12 * 185.175 + 23.62
T = 45.84
T = 46 vehicle trips
with 77% (35 vph) entering and 23% (11 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.12* (X) + 26.48
T = 0.12 * 185.175 + 26.48
T = 48.70
T = 49 vehicle trips
with 28% (14 vph) entering and 72% (35 vph) exiting.

Institute of Transportation Engineers (ITE)

Land Use Code (LUC) 150 - Warehousing

General Urban/Suburban

Average Truck Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 185.175

AVERAGE WEEKDAY DAILY

T = 0.54 * (X) + 7.47
T = 0.54 * 185.175 + 7.47
T = 107.46
T = 108 vehicle trips
with 50% (54 vpd) entering and 50% (54 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.02* (X)
T = 0.02 * 185.175
T = 3.70
T = 4 vehicle trips
with 52% (2 vph) entering and 48% (2 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

T = 0.03* (X)
T = 0.03 * 185.175
T = 5.56
T = 6 vehicle trips
with 52% (3 vph) entering and 48% (3 vph) exiting.

Institute of Transportation Engineers (ITE)

Land Use Code (LUC) 710 - General Office Building

General Urban/Suburban

Average Vehicle Trips Ends vs: 1000 Sq. Feet Gross Floor Area
Independent Variable (X): 209.000

AVERAGE WEEKDAY DAILY

Ln(T) = 0.87 Ln (X) + 3.05
Ln(T) = 0.87 Ln (209.000) + 3.05
Ln(T) = 7.70
T = 2203.56
T = 2,204 vehicle trips
with 50% (1,102 vpd) entering and 50% (1,102 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

Ln(T) = 0.86 Ln (X) + 1.16
Ln(T) = 0.86 Ln (209.000) + 1.16
Ln(T) = 5.75
T = 315.58
T = 316 vehicle trips
with 88% (278 vph) entering and 12% (38 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

Ln(T) = 0.83 Ln (X) + 1.29
Ln(T) = 0.83 Ln (209.000) + 1.29
Ln(T) = 5.72
T = 306.17
T = 306 vehicle trips
with 17% (52 vph) entering and 83% (254 vph) exiting.

TRIP DISTRIBUTION DATA

Residence		Place of Work		Commuting Flow	To/From South	To/From East	To/From West	To/From South	To/From East	To/From West
State Name	Minor Civil Division Name	State Name	Minor Civil Division Name	Workers in Commuting Flow	Constitution Blvd	King Street	King Street	Constitution Blvd	King Street	King Street
Massachusetts	Franklin Town city	Massachusetts	Franklin Town city	4,085	0%	80%	20%	0	3268	817
Rhode Island	Woonsocket city	Massachusetts	Franklin Town city	960	10%	0%	90%	96	0	864
Massachusetts	Bellingham town	Massachusetts	Franklin Town city	887	0%	70%	30%	0	620.9	266.1
Massachusetts	Milford town	Massachusetts	Franklin Town city	622	0%	100%	0%	0	622	0
Massachusetts	Uxbridge town	Massachusetts	Franklin Town city	526	0%	75%	25%	0	394.5	131.5
Rhode Island	Providence city	Massachusetts	Franklin Town city	523	30%	40%	30%	156.9	209.2	156.9
Massachusetts	North Attleborough town	Massachusetts	Franklin Town city	426	30%	35%	35%	127.8	149.1	149.1
Rhode Island	Cumberland town	Massachusetts	Franklin Town city	405	50%		50%	202.5	0	202.5
Massachusetts	Blackstone town	Massachusetts	Franklin Town city	402	0%	0%	100%	0	0	402
Massachusetts	Medway town	Massachusetts	Franklin Town city	364	0%	100%	0%	0	364	0
Massachusetts	Boston city	Massachusetts	Franklin Town city	331	0%	100%	0%	0	331	0
Massachusetts	Worcester city	Massachusetts	Franklin Town city	301	0%	50%	50%	0	150.5	150.5
Rhode Island	Pawtucket city	Massachusetts	Franklin Town city	284	10%	65%	25%	28.4	184.6	71
Massachusetts	Wrentham town	Massachusetts	Franklin Town city	281	30%	70%	0%	84.3	196.7	0
Massachusetts	Mendon town	Massachusetts	Franklin Town city	253	0%	100%	0%	0	253	0
Massachusetts	Norfolk town	Massachusetts	Franklin Town city	247	0%	100%	0%	0	247	0
Rhode Island	Burrillville town	Massachusetts	Franklin Town city	244	20%	80%	0%	48.8	195.2	0
Massachusetts	Mansfield town	Massachusetts	Franklin Town city	219	0%	100%	0%	0	219	0
Massachusetts	Attleboro city	Massachusetts	Franklin Town city	217	0%	100%	0%	0	217	0
Massachusetts	Foxborough town	Massachusetts	Franklin Town city	214	0%	100%	0%	0	214	0
Massachusetts	Northbridge town	Massachusetts	Franklin Town city	205	0%	100%	0%	0	205	0
Massachusetts	Plainville town	Massachusetts	Franklin Town city	194	0%	100%	0%	0	194	0
Massachusetts	Brockton city	Massachusetts	Franklin Town city	192	0%	100%	0%	0	192	0
Massachusetts	Taunton city	Massachusetts	Franklin Town city	179	0%	100%	0%	0	179	0
Massachusetts	Quincy city	Massachusetts	Franklin Town city	174	0%	100%	0%	0	174	0
Rhode Island	North Providence town	Massachusetts	Franklin Town city	150	20%	30%	50%	30	45	75
Rhode Island	Lincoln town	Massachusetts	Franklin Town city	145	30%	0%	70%	43.5	0	101.5
Rhode Island	Coventry town	Massachusetts	Franklin Town city	136	30%	30%	40%	40.8	40.8	54.4
Massachusetts	Hopkinton town	Massachusetts	Franklin Town city	132	0%	100%	0%	0	132	0
Massachusetts	Hopedale town	Massachusetts	Franklin Town city	130	0%	100%	0%	0	130	0
Rhode Island	North Smithfield town	Massachusetts	Franklin Town city	119	30%	0%	70%	35.7	0	83.3
Massachusetts	Upton town	Massachusetts	Franklin Town city	116	0%	100%	0%	0	116	0
Massachusetts	Norwood town	Massachusetts	Franklin Town city	115	0%	100%	0%	0	115	0
Massachusetts	Millville town	Massachusetts	Franklin Town city	108	0%	0%	100%	0	0	108
								894.7	9358.5	3632.8
								6.4%	67.4%	26.2%
							USE	5%	70%	25%

CAPACITY ANALYSIS METHODOLOGY

CAPACITY ANALYSIS METHODOLOGY

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM).[9] The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year. A description of the operating condition under each level of service is provided below:

- *LOS A* describes conditions with little to no delay to motorists.
- *LOS B* represents a desirable level with relatively low delay to motorists.
- *LOS C* describes conditions with average delays to motorists.
- *LOS D* describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- *LOS E* represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- *LOS F* is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on average *control* delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Table A-1 summarizes the relationship between level of service and average control delay.

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[9] *Highway Capacity Manual 2000*, Transportation Research Board; Washington, D.C.; 2000.

TABLE A-1
Level-of-Service Criteria for Intersections

Level of Service	Unsignalized Intersection Criteria Average Control Delay (Seconds per Vehicle)	Signalized Intersection Criteria Average Control Delay (Seconds per Vehicle)
A	≤10	≤10
B	>10 and ≤15	>10 and ≤20
C	>15 and ≤25	>20 and ≤35
D	>25 and ≤35	>35 and ≤55
E	>35 and ≤50	>55 and ≤80
F	>50	>80

Source *Highway Capacity Manual 2000*, Transportation Research Board; Washington, D.C.; 2000. Pages 10-16, 20-6, and 17-2.

For signalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups or to individual intersection approaches.

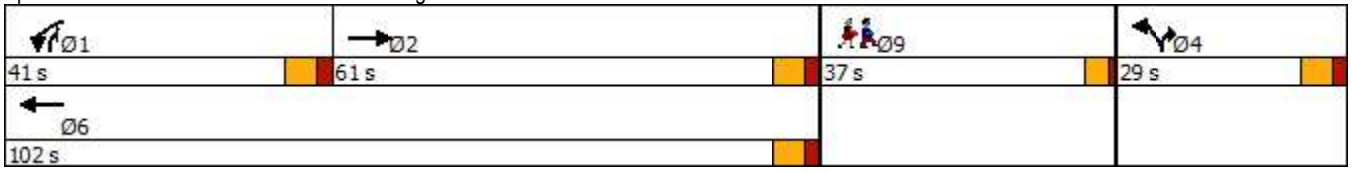
CAPACITY AND QUEUE ANALYSIS WORKSHEETS

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø9
Lane Configurations							
Traffic Volume (vph)	772	74	336	435	38	227	
Future Volume (vph)	772	74	336	435	38	227	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		350	350		155	0	
Storage Lanes		0	2		1	2	
Taper Length (ft)			50		100		
Right Turn on Red		Yes				No	
Link Speed (mph)	40			35	20		
Link Distance (ft)	1008			1170	339		
Travel Time (s)	17.2			22.8	11.6		
Peak Hour Factor	0.94	0.94	0.78	0.78	0.82	0.82	
Heavy Vehicles (%)	4%	3%	5%	6%	16%	9%	
Shared Lane Traffic (%)							
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	24			24	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)		9	15		15	9	
Turn Type	NA		Prot	NA	Prot	pt+ov	
Protected Phases	2		1	6	4	1 4	9
Permitted Phases							
Detector Phase	2		1	6	4	1 4	
Switch Phase							
Minimum Initial (s)	7.0		7.0	5.0	7.0		5.0
Minimum Split (s)	13.0		13.0	11.0	13.0		37.0
Total Split (s)	61.0		41.0	102.0	29.0		37.0
Total Split (%)	36.3%		24.4%	60.7%	17.3%		22%
Yellow Time (s)	4.0		4.0	4.0	4.0		3.0
All-Red Time (s)	2.0		2.0	2.0	2.0		1.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0		
Total Lost Time (s)	4.0		4.0	4.0	4.0		
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	Min		None	Min	None		None

Intersection Summary

Area Type: Other
Cycle Length: 168
Actuated Cycle Length: 90.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Constitution Blvd & King Street



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	900	431	558	46	277
v/c Ratio	0.67	0.51	0.45	0.19	0.23
Control Delay	28.4	35.2	10.2	44.2	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	35.2	10.2	44.2	18.8
Queue Length 50th (ft)	171	87	79	19	40
Queue Length 95th (ft)	545	238	375	80	143
Internal Link Dist (ft)	928		1090	259	
Turn Bay Length (ft)		350		155	
Base Capacity (vph)	2483	1566	1644	494	1762
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	0.36	0.28	0.34	0.09	0.16

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	772	74	336	435	38	227
Future Volume (vph)	772	74	336	435	38	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	1.00	1.00	0.88
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3428		3335	1792	1556	2608
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3428		3335	1792	1556	2608
Peak-hour factor, PHF	0.94	0.94	0.78	0.78	0.82	0.82
Adj. Flow (vph)	821	79	431	558	46	277
RTOR Reduction (vph)	4	0	0	0	0	0
Lane Group Flow (vph)	896	0	431	558	46	277
Heavy Vehicles (%)	4%	3%	5%	6%	16%	9%
Turn Type	NA		Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	4	1 4
Permitted Phases						
Actuated Green, G (s)	33.7		20.6	60.3	12.1	38.7
Effective Green, g (s)	35.7		22.6	62.3	14.1	40.7
Actuated g/C Ratio	0.39		0.25	0.68	0.15	0.44
Clearance Time (s)	6.0		6.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1330		819	1213	238	1153
v/s Ratio Prot	c0.26		c0.13	0.31	0.03	c0.11
v/s Ratio Perm						
v/c Ratio	0.67		0.53	0.46	0.19	0.24
Uniform Delay, d1	23.3		30.1	7.0	34.0	16.0
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4		0.6	0.3	0.4	0.1
Delay (s)	24.7		30.7	7.2	34.4	16.1
Level of Service	C		C	A	C	B
Approach Delay (s)	24.7			17.5	18.7	
Approach LOS	C			B	B	

Intersection Summary

HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	92.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	182	82	3	1	104	305
Future Volume (vph)	0	182	82	3	1	104	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0		150	
Storage Lanes	0	1		0		1	
Taper Length (ft)	25					50	
Link Speed (mph)	20		20				20
Link Distance (ft)	920		420				339
Travel Time (s)	31.4		14.3				11.6
Confl. Peds. (#/hr)				1		1	
Peak Hour Factor	0.87	0.87	0.72	0.72	0.78	0.78	0.78
Heavy Vehicles (%)	0%	5%	21%	0%	0%	6%	4%
Shared Lane Traffic (%)							
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(ft)	0		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	1.00
Turning Speed (mph)	15	9		9	9	15	
Sign Control	Stop		Free				Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	182	82	3	1	104	305
Future Volume (Veh/h)	0	182	82	3	1	104	305
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.87	0.87	0.72	0.72	0.78	0.78	0.78
Hourly flow rate (vph)	0	209	114	4	0	133	391
Pedestrians	1						
Lane Width (ft)	12.0						
Walking Speed (ft/s)	3.5						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (ft)							339
pX, platoon unblocked					0.00		
vC, conflicting volume	578	60			0	119	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	578	60			0	119	
tC, single (s)	6.8	7.0			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	79			0	91	
cM capacity (veh/h)	409	982			0	1437	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	209	76	42	133	196	196
Volume Left	0	0	0	133	0	0
Volume Right	209	0	4	0	0	0
cSH	982	1700	1700	1437	1700	1700
Volume to Capacity	0.21	0.04	0.02	0.09	0.12	0.12
Queue Length 95th (ft)	20	0	0	8	0	0
Control Delay (s)	9.7	0.0	0.0	7.8	0.0	0.0
Lane LOS	A			A		
Approach Delay (s)	9.7	0.0		2.0		
Approach LOS	A					

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	30.4%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	1	0	0	3	1	53	1	39	221	2
Future Volume (vph)	1	0	1	0	0	3	1	53	1	39	221	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		20			20			20			20	
Link Distance (ft)		590			802			610			420	
Travel Time (s)		20.1			27.3			20.8			14.3	
Confl. Peds. (#/hr)									3	3		
Peak Hour Factor	0.50	0.50	0.50	0.38	0.38	0.38	0.86	0.86	0.86	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	33%	0%	30%	100%	0%	5%	0%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

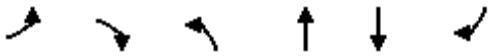
Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	1	0	0	3	1	53	1	39	221	2
Future Volume (Veh/h)	1	0	1	0	0	3	1	53	1	39	221	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.38	0.38	0.38	0.86	0.86	0.86	0.79	0.79	0.79
Hourly flow rate (vph)	2	0	2	0	0	8	1	62	1	49	280	3
Pedestrians					3							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											759	
pX, platoon unblocked												
vC, conflicting volume	452	448	282	448	448	66	283			66		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	452	448	282	448	448	66	283			66		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.5	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.6	2.2			2.2		
p0 queue free %	100	100	100	100	100	99	100			97		
cM capacity (veh/h)	503	491	762	508	491	915	1291			1544		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	4	8	64	49	283
Volume Left	2	0	1	49	0
Volume Right	2	8	1	0	3
cSH	606	915	1291	1544	1700
Volume to Capacity	0.01	0.01	0.00	0.03	0.17
Queue Length 95th (ft)	0	1	0	2	0
Control Delay (s)	11.0	9.0	0.1	7.4	0.0
Lane LOS	B	A	A	A	
Approach Delay (s)	11.0	9.0	0.1	1.1	
Approach LOS	B	A			

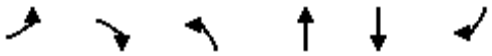
Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	21.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	55	222	0
Future Volume (vph)	0	0	0	55	222	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	20			20	20	
Link Distance (ft)	820			1737	610	
Travel Time (s)	28.0			59.2	20.8	
Peak Hour Factor	0.25	0.25	0.86	0.86	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	29%	5%	0%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
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
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	55	222	0
Future Volume (Veh/h)	0	0	0	55	222	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.86	0.86	0.79	0.79
Hourly flow rate (vph)	0	0	0	64	281	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	345	281	281			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	345	281	281			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	656	763	1293			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	64	281
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.04	0.17
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

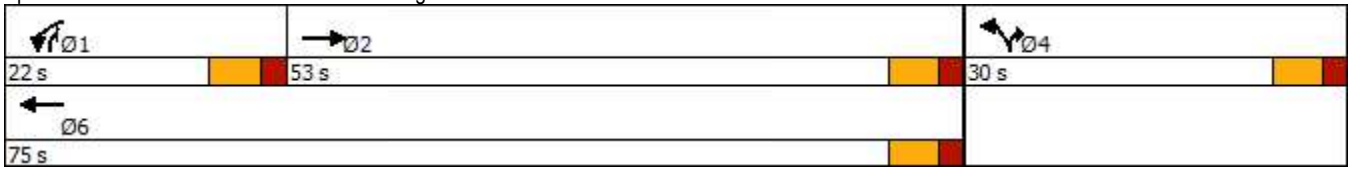
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	15.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	394	42	182	854	77	302
Future Volume (vph)	394	42	182	854	77	302
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		350	350		155	0
Storage Lanes		0	2		1	2
Taper Length (ft)			50		100	
Right Turn on Red		Yes				No
Link Speed (mph)	40			35	20	
Link Distance (ft)	1008			1170	339	
Travel Time (s)	17.2			22.8	11.6	
Peak Hour Factor	0.87	0.87	0.96	0.96	0.65	0.65
Heavy Vehicles (%)	2%	14%	7%	3%	4%	6%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	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)		9	15		15	9
Turn Type	NA		Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	4	1 4
Permitted Phases						
Detector Phase	2		1	6	4	1 4
Switch Phase						
Minimum Initial (s)	7.0		7.0	5.0	7.0	
Minimum Split (s)	13.0		13.0	11.0	13.0	
Total Split (s)	53.0		22.0	75.0	30.0	
Total Split (%)	50.5%		21.0%	71.4%	28.6%	
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)	-2.0		-2.0	-2.0	-2.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	Min		None	Min	None	

Intersection Summary

Area Type: Other
Cycle Length: 105
Actuated Cycle Length: 64.6
Natural Cycle: 50
Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Constitution Blvd & King Street



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	501	190	890	118	465
v/c Ratio	0.40	0.30	0.78	0.28	0.34
Control Delay	15.7	28.4	14.5	26.2	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.7	28.4	14.5	26.2	12.6
Queue Length 50th (ft)	63	28	184	33	49
Queue Length 95th (ft)	134	92	483	80	105
Internal Link Dist (ft)	928		1090	259	
Turn Bay Length (ft)		350		155	
Base Capacity (vph)	2772	1012	1719	776	1638
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	0.18	0.19	0.52	0.15	0.28

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	394	42	182	854	77	302
Future Volume (vph)	394	42	182	854	77	302
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	0.95		0.97	1.00	1.00	0.88
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3449		3273	1845	1736	2682
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3449		3273	1845	1736	2682
Peak-hour factor, PHF	0.87	0.87	0.96	0.96	0.65	0.65
Adj. Flow (vph)	453	48	190	890	118	465
RTOR Reduction (vph)	9	0	0	0	0	0
Lane Group Flow (vph)	492	0	190	890	118	465
Heavy Vehicles (%)	2%	14%	7%	3%	4%	6%
Turn Type	NA		Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	4	1 4
Permitted Phases						
Actuated Green, G (s)	21.6		10.4	38.0	13.3	29.7
Effective Green, g (s)	23.6		12.4	40.0	15.3	31.7
Actuated g/C Ratio	0.37		0.20	0.63	0.24	0.50
Clearance Time (s)	6.0		6.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1285		641	1165	419	1343
v/s Ratio Prot	0.14		0.06	c0.48	0.07	c0.17
v/s Ratio Perm						
v/c Ratio	0.38		0.30	0.76	0.28	0.35
Uniform Delay, d1	14.5		21.7	8.3	19.5	9.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		0.3	3.0	0.4	0.2
Delay (s)	14.7		22.0	11.3	19.9	9.7
Level of Service	B		C	B	B	A
Approach Delay (s)	14.7			13.2	11.8	
Approach LOS	B			B	B	

Intersection Summary

HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	135	244	7	146	78
Future Volume (vph)	0	135	244	7	146	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	150	
Storage Lanes	0	1		0	1	
Taper Length (ft)	25				50	
Link Speed (mph)	20		20			20
Link Distance (ft)	920		420			339
Travel Time (s)	31.4		14.3			11.6
Peak Hour Factor	0.73	0.73	0.62	0.62	0.90	0.90
Heavy Vehicles (%)	0%	4%	7%	0%	2%	21%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		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		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	135	244	7	146	78
Future Volume (Veh/h)	0	135	244	7	146	78
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.73	0.73	0.62	0.62	0.90	0.90
Hourly flow rate (vph)	0	185	394	11	162	87
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						339
pX, platoon unblocked						
vC, conflicting volume	767	202			405	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	767	202			405	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	77			86	
cM capacity (veh/h)	294	798			1150	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	185	263	142	162	44	44
Volume Left	0	0	0	162	0	0
Volume Right	185	0	11	0	0	0
cSH	798	1700	1700	1150	1700	1700
Volume to Capacity	0.23	0.15	0.08	0.14	0.03	0.03
Queue Length 95th (ft)	22	0	0	12	0	0
Control Delay (s)	10.9	0.0	0.0	8.6	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	10.9	0.0		5.6		
Approach LOS	B					

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	33.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	0	0	0	0	29	0	189	1	4	1	38
Future Volume (vph)	1	0	0	0	0	29	0	189	1	4	1	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0		70	
Storage Lanes	0		0	0		0	0		0		0	
Taper Length (ft)	25			25			25				25	
Link Speed (mph)		20			20			20				20
Link Distance (ft)		590			802			610				420
Travel Time (s)		20.1			27.3			20.8				14.3
Peak Hour Factor	0.25	0.25	0.25	0.81	0.81	0.81	0.56	0.56	0.56	0.69	0.69	0.69
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	100%	37%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Left
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	9	15	
Sign Control		Stop			Stop			Free				Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	1
Future Volume (vph)	1
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.69
Heavy Vehicles (%)	0%
Shared Lane Traffic (%)	
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Sign Control	

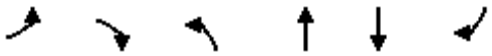
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	1	0	0	0	0	29	0	189	1	4	1	38
Future Volume (Veh/h)	1	0	0	0	0	29	0	189	1	4	1	38
Sign Control		Stop			Stop			Free				Free
Grade		0%			0%			0%				0%
Peak Hour Factor	0.25	0.25	0.25	0.81	0.81	0.81	0.56	0.56	0.56	0.69	0.69	0.69
Hourly flow rate (vph)	4	0	0	0	0	36	0	338	2	0	1	55
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None				None
Median storage veh)												
Upstream signal (ft)												759
pX, platoon unblocked										0.00		
vC, conflicting volume	432	398	56	396	397	339	56			0	340	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	432	398	56	396	397	339	56			0	340	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			0.0	5.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			0.0	3.1	
p0 queue free %	99	100	100	100	100	95	100			0	100	
cM capacity (veh/h)	509	543	1017	567	543	708	1562			0	828	

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	4	36	340	1	56
Volume Left	4	0	0	1	0
Volume Right	0	36	2	0	1
cSH	509	708	1562	828	1700
Volume to Capacity	0.01	0.05	0.00	0.00	0.03
Queue Length 95th (ft)	1	4	0	0	0
Control Delay (s)	12.1	10.4	0.0	9.4	0.0
Lane LOS	B	B		A	
Approach Delay (s)	12.1	10.4	0.0	0.2	
Approach LOS	B	B			

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	20.0%	ICU Level of Service	A	
Analysis Period (min)	15			

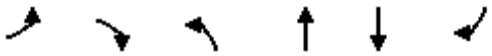
Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	1
Future Volume (Veh/h)	1
Sign Control	
Grade	
Peak Hour Factor	0.69
Hourly flow rate (vph)	1
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	
Direction, Lane #	



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	190	38	0
Future Volume (vph)	0	0	0	190	38	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	20			20	20	
Link Distance (ft)	820			1737	610	
Travel Time (s)	28.0			59.2	20.8	
Peak Hour Factor	0.25	0.25	0.56	0.56	0.73	0.73
Heavy Vehicles (%)	0%	0%	8%	8%	37%	37%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
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
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	190	38	0
Future Volume (Veh/h)	0	0	0	190	38	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.56	0.56	0.73	0.73
Hourly flow rate (vph)	0	0	0	339	52	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	391	52	52			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	391	52	52			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	100	100	100			
cM capacity (veh/h)	617	1021	1516			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	339	52
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.20	0.03
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

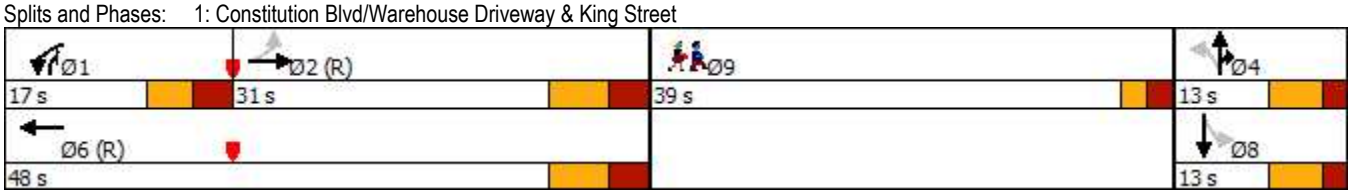
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	828	79	361	466	38	41	0	243	11	0	3
Future Volume (vph)	9	828	79	361	466	38	41	0	243	11	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	10	11	11
Storage Length (ft)	0		350	350		0	0		0	110		0
Storage Lanes	0		0	2		0	0		2	1		0
Taper Length (ft)	25			50			100			50		
Right Turn on Red			Yes			Yes			No			Yes
Link Speed (mph)		40			35			20			30	
Link Distance (ft)		1008			1170			339			587	
Travel Time (s)		17.2			22.8			11.6			13.3	
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
Heavy Vehicles (%)	2%	4%	3%	5%	6%	2%	16%	2%	9%	2%	2%	2%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.09	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	
Protected Phases		2		1	6			4	4 1		8	
Permitted Phases	2						4			8		
Detector Phase	2	2		1	6		4	4	4 1	8	8	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	5.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		13.5	12.5		13.0	13.0		13.0	13.0	
Total Split (s)	31.0	31.0		17.0	48.0		13.0	13.0		13.0	13.0	
Total Split (%)	31.0%	31.0%		17.0%	48.0%		13.0%	13.0%		13.0%	13.0%	
Yellow Time (s)	4.5	4.5		3.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-3.5		-2.5	-3.5			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 39 (39%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 1: Constitution Blvd/Warehouse Driveway & King Street



Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	39.0
Total Split (s)	39.0
Total Split (%)	39%
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None

Intersection Summary

Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	996	392	548	45	264	12	3
v/c Ratio	0.65	0.64	0.45	0.29	0.28	0.07	0.00
Control Delay	24.6	43.9	10.8	45.5	24.8	40.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	43.9	10.8	45.5	24.8	40.7	0.0
Queue Length 50th (ft)	219	116	91	26	63	7	0
Queue Length 95th (ft)	#527	#219	408	64	119	25	0
Internal Link Dist (ft)	928		1090	259			507
Turn Bay Length (ft)		350				110	
Base Capacity (vph)	1533	609	1230	156	927	160	781
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.64	0.45	0.29	0.28	0.07	0.00

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)	9	828	79	361	466	38	41	0	243	11	0	3
Future Volume (vph)	9	828	79	361	466	38	41	0	243	11	0	3
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	10	11	11
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95		0.97	1.00			1.00	0.88	1.00	1.00	
Frt		0.99		1.00	0.99			1.00	0.85	1.00	0.85	
Flt Protected		1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)		3314		3224	1718			1556	2608	1652	1531	
Flt Permitted		0.95		0.95	1.00			0.76	1.00	0.73	1.00	
Satd. Flow (perm)		3144		3224	1718			1238	2608	1265	1531	
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)	10	900	86	392	507	41	45	0	264	12	0	3
RTOR Reduction (vph)	0	5	0	0	2	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	991	0	392	546	0	0	45	264	12	0	0
Heavy Vehicles (%)	2%	4%	3%	5%	6%	2%	16%	2%	9%	2%	2%	2%
Turn Type	Perm	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	
Protected Phases		2		1	6			4	4 1		8	
Permitted Phases	2						4			8		
Actuated Green, G (s)		41.9		16.4	64.8			10.7	33.1	10.7	10.7	
Effective Green, g (s)		45.4		18.9	68.3			12.7	35.1	12.7	12.7	
Actuated g/C Ratio		0.45		0.19	0.68			0.13	0.35	0.13	0.13	
Clearance Time (s)		7.5		6.5	7.5			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)		1427		609	1173			157	915	160	194	
v/s Ratio Prot				c0.12	0.32				c0.10		0.00	
v/s Ratio Perm		c0.32						0.04		0.01		
v/c Ratio		0.69		0.64	0.47			0.29	0.29	0.07	0.00	
Uniform Delay, d1		21.8		37.4	7.4			39.5	23.4	38.5	38.1	
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.8		2.3	1.3			1.0	0.2	0.2	0.0	
Delay (s)		24.6		39.8	8.7			40.6	23.6	38.7	38.1	
Level of Service		C		D	A			D	C	D	D	
Approach Delay (s)		24.6			21.7			26.1			38.6	
Approach LOS		C			C			C			D	

Intersection Summary

HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	195	88	3	1	112	327
Future Volume (vph)	0	195	88	3	1	112	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0		150	
Storage Lanes	0	1		0		1	
Taper Length (ft)	25					50	
Link Speed (mph)	20		20				20
Link Distance (ft)	920		420				339
Travel Time (s)	31.4		14.3				11.6
Confl. Peds. (#/hr)				1		1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	5%	21%	0%	0%	6%	4%
Shared Lane Traffic (%)							
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(ft)	0		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	1.00
Turning Speed (mph)	15	9		9	9	15	
Sign Control	Stop		Free				Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	195	88	3	1	112	327
Future Volume (Veh/h)	0	195	88	3	1	112	327
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	212	96	3	0	122	355
Pedestrians	1						
Lane Width (ft)	12.0						
Walking Speed (ft/s)	3.5						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (ft)							339
pX, platoon unblocked					0.00		
vC, conflicting volume	520	50			0	100	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	520	50			0	100	
tC, single (s)	6.8	7.0			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	79			0	92	
cM capacity (veh/h)	449	996			0	1460	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	212	64	35	122	178	178
Volume Left	0	0	0	122	0	0
Volume Right	212	0	3	0	0	0
cSH	996	1700	1700	1460	1700	1700
Volume to Capacity	0.21	0.04	0.02	0.08	0.10	0.10
Queue Length 95th (ft)	20	0	0	7	0	0
Control Delay (s)	9.6	0.0	0.0	7.7	0.0	0.0
Lane LOS	A			A		
Approach Delay (s)	9.6	0.0		2.0		
Approach LOS	A					

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	31.7%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	1	0	0	3	1	57	1	39	237	2
Future Volume (vph)	1	0	1	0	0	3	1	57	1	39	237	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		20			20			20			20	
Link Distance (ft)		590			802			610			420	
Travel Time (s)		20.1			27.3			20.8			14.3	
Confl. Peds. (#/hr)									3	3		
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
Heavy Vehicles (%)	2%	2%	2%	0%	0%	33%	2%	30%	100%	0%	5%	2%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	0	1	0	0	3	1	57	1	39	237	2
Future Volume (Veh/h)	1	0	1	0	0	3	1	57	1	39	237	2
Sign Control		Stop			Stop			Free			Free	
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)	1	0	1	0	0	3	1	62	1	42	258	2
Pedestrians					3							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											759	
pX, platoon unblocked												
vC, conflicting volume	410	411	259	410	412	66	260			66		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	410	411	259	410	412	66	260			66		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.5	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.6	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			97		
cM capacity (veh/h)	537	514	780	540	517	915	1304			1544		

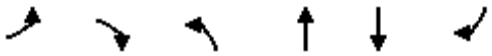
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	2	3	64	42	260
Volume Left	1	0	1	42	0
Volume Right	1	3	1	0	2
cSH	636	915	1304	1544	1700
Volume to Capacity	0.00	0.00	0.00	0.03	0.15
Queue Length 95th (ft)	0	0	0	2	0
Control Delay (s)	10.7	8.9	0.1	7.4	0.0
Lane LOS	B	A	A	A	
Approach Delay (s)	10.7	8.9	0.1	1.0	
Approach LOS	B	A			

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	22.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	59	238	0
Future Volume (vph)	0	0	0	59	238	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	20			20	20	
Link Distance (ft)	820			1737	610	
Travel Time (s)	28.0			59.2	20.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	31%	5%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
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
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	59	238	0
Future Volume (Veh/h)	0	0	0	59	238	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	64	259	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	323	259	259			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	323	259	259			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	671	780	1306			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	64	259
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.04	0.15
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

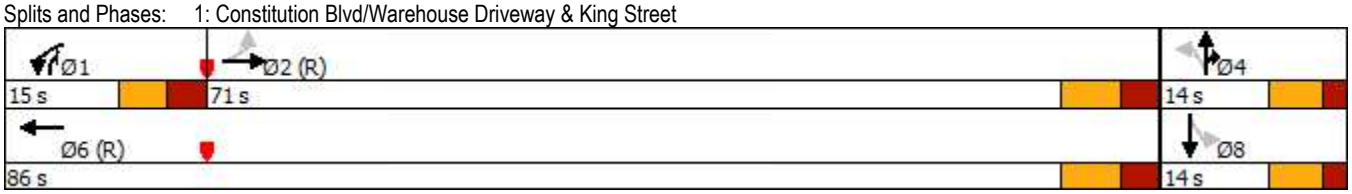
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	422	42	195	916	14	83	0	324	37	0	9
Future Volume (vph)	3	422	42	195	916	14	83	0	324	37	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	10	11	11
Storage Length (ft)	0		350	350		0	0		0	110		0
Storage Lanes	0		0	2		0	0		2	1		0
Taper Length (ft)	25			50			100			50		
Right Turn on Red			Yes			Yes			No			Yes
Link Speed (mph)		40			35			20			30	
Link Distance (ft)		1008			1170			339			587	
Travel Time (s)		17.2			22.8			11.6			13.3	
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
Heavy Vehicles (%)	2%	2%	14%	7%	3%	2%	4%	2%	6%	2%	2%	2%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.09	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	
Protected Phases		2		1	6			4	4 1		8	
Permitted Phases	2						4			8		
Detector Phase	2	2		1	6		4	4	4 1	8	8	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	5.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		13.5	12.5		13.0	13.0		13.0	13.0	
Total Split (s)	71.0	71.0		15.0	86.0		14.0	14.0		14.0	14.0	
Total Split (%)	71.0%	71.0%		15.0%	86.0%		14.0%	14.0%		14.0%	14.0%	
Yellow Time (s)	4.5	4.5		3.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-3.5		-2.5	-3.5			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 47 (47%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: Constitution Blvd/Warehouse Driveway & King Street



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	508	212	1011	90	352	40	10
v/c Ratio	0.27	0.54	0.75	0.41	0.41	0.21	0.02
Control Delay	9.8	47.0	11.2	44.9	28.4	40.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	47.0	11.2	44.9	28.4	40.3	0.1
Queue Length 50th (ft)	81	64	338	50	90	22	0
Queue Length 95th (ft)	78	105	302	#130	160	58	0
Internal Link Dist (ft)	928		1090	259			507
Turn Bay Length (ft)		350				110	
Base Capacity (vph)	2134	389	1460	221	869	190	433
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.54	0.69	0.41	0.41	0.21	0.02

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)	3	422	42	195	916	14	83	0	324	37	0	9
Future Volume (vph)	3	422	42	195	916	14	83	0	324	37	0	9
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	10	11	11
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95		0.97	1.00			1.00	0.88	1.00	1.00	
Frt		0.99		1.00	1.00			1.00	0.85	1.00	0.85	
Flt Protected		1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)		3338		3164	1779			1736	2682	1652	1531	
Flt Permitted		0.95		0.95	1.00			0.75	1.00	0.68	1.00	
Satd. Flow (perm)		3175		3164	1779			1372	2682	1183	1531	
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)	3	459	46	212	996	15	90	0	352	40	0	10
RTOR Reduction (vph)	0	9	0	0	1	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	499	0	212	1010	0	0	90	352	40	2	0
Heavy Vehicles (%)	2%	2%	14%	7%	3%	2%	4%	2%	6%	2%	2%	2%
Turn Type	Perm	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	
Protected Phases		2		1	6			4	4 1		8	
Permitted Phases	2						4			8		
Actuated Green, G (s)		56.1		9.8	72.4			14.1	29.9	14.1	14.1	
Effective Green, g (s)		59.6		12.3	75.9			16.1	31.9	16.1	16.1	
Actuated g/C Ratio		0.60		0.12	0.76			0.16	0.32	0.16	0.16	
Clearance Time (s)		7.5		6.5	7.5			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)		1892		389	1350			220	855	190	246	
v/s Ratio Prot				0.07	c0.57				c0.13		0.00	
v/s Ratio Perm		0.16						0.07		0.03		
v/c Ratio		0.26		0.54	0.75			0.41	0.41	0.21	0.01	
Uniform Delay, d1		9.7		41.2	6.7			37.7	26.7	36.4	35.2	
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3		1.6	3.8			1.2	0.3	0.6	0.0	
Delay (s)		10.0		42.8	10.6			38.9	27.0	37.0	35.2	
Level of Service		B		D	B			D	C	D	D	
Approach Delay (s)		10.0			16.1			29.4			36.6	
Approach LOS		B			B			C			D	

Intersection Summary

HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	145	262	8	154	83
Future Volume (vph)	0	145	262	8	154	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	150	
Storage Lanes	0	1		0	1	
Taper Length (ft)	25				50	
Link Speed (mph)	20		20			20
Link Distance (ft)	920		420			339
Travel Time (s)	31.4		14.3			11.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	7%	0%	2%	21%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		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		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	145	262	8	154	83
Future Volume (Veh/h)	0	145	262	8	154	83
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	158	285	9	167	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						339
pX, platoon unblocked						
vC, conflicting volume	668	147			294	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	668	147			294	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	82			87	
cM capacity (veh/h)	343	867			1264	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	158	190	104	167	45	45
Volume Left	0	0	0	167	0	0
Volume Right	158	0	9	0	0	0
cSH	867	1700	1700	1264	1700	1700
Volume to Capacity	0.18	0.11	0.06	0.13	0.03	0.03
Queue Length 95th (ft)	17	0	0	11	0	0
Control Delay (s)	10.1	0.0	0.0	8.3	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	10.1	0.0		5.4		
Approach LOS	B					

Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	35.0%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	1	0	0	0	0	29	0	203	1	4	1	41
Future Volume (vph)	1	0	0	0	0	29	0	203	1	4	1	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0		70	
Storage Lanes	0		0	0		0	0		0		1	
Taper Length (ft)	25			25			25				25	
Link Speed (mph)		20			20			20				20
Link Distance (ft)		590			802			610				420
Travel Time (s)		20.1			27.3			20.8				14.3
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
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	9%	0%	0%	100%	37%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Left
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	9	15	
Sign Control		Stop			Stop			Free				Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	1
Future Volume (vph)	1
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.92
Heavy Vehicles (%)	2%
Shared Lane Traffic (%)	
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Sign Control	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	1	0	0	0	0	29	0	203	1	4	1	41
Future Volume (Veh/h)	1	0	0	0	0	29	0	203	1	4	1	41
Sign Control		Stop			Stop			Free				Free
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)	1	0	0	0	0	32	0	221	1	0	1	45
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None				None
Median storage veh)												
Upstream signal (ft)												759
pX, platoon unblocked										0.00		
vC, conflicting volume	301	270	46	268	270	222	46			0	222	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	301	270	46	268	270	222	46			0	222	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			0.0	5.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			0.0	3.1	
p0 queue free %	100	100	100	100	100	96	100			0	100	
cM capacity (veh/h)	625	636	1024	688	640	823	1562			0	932	

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	1	32	222	1	46
Volume Left	1	0	0	1	0
Volume Right	0	32	1	0	1
cSH	625	823	1562	932	1700
Volume to Capacity	0.00	0.04	0.00	0.00	0.03
Queue Length 95th (ft)	0	3	0	0	0
Control Delay (s)	10.8	9.6	0.0	8.9	0.0
Lane LOS	B	A		A	
Approach Delay (s)	10.8	9.6	0.0	0.2	
Approach LOS	B	A			

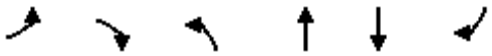
Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	20.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	1
Future Volume (Veh/h)	1
Sign Control	
Grade	
Peak Hour Factor	0.92
Hourly flow rate (vph)	1
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	
Direction, Lane #	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	204	41	0
Future Volume (vph)	0	0	0	204	41	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	20			20	20	
Link Distance (ft)	820			1737	610	
Travel Time (s)	28.0			59.2	20.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	9%	37%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
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
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	204	41	0
Future Volume (Veh/h)	0	0	0	204	41	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	222	45	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	267	45	45			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	267	45	45			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	722	1025	1563			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	222	45
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.13	0.03
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

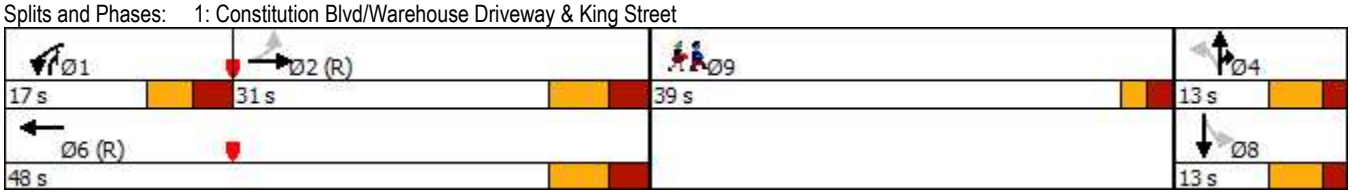
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	14.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	828	148	556	466	38	50	0	270	11	0	3
Future Volume (vph)	9	828	148	556	466	38	50	0	270	11	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	10	11	11
Storage Length (ft)	0		350	350		0	0		0	110		0
Storage Lanes	0		0	2		0	0		2	1		0
Taper Length (ft)	25			50			100			50		
Right Turn on Red			Yes			Yes			No			Yes
Link Speed (mph)		40			35			20			30	
Link Distance (ft)		1008			1170			339			587	
Travel Time (s)		17.2			22.8			11.6			13.3	
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
Heavy Vehicles (%)	2%	4%	3%	5%	6%	2%	16%	2%	9%	2%	2%	2%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.09	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	
Protected Phases		2		1	6			4	4 1		8	
Permitted Phases	2						4			8		
Detector Phase	2	2		1	6		4	4	4 1	8	8	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	5.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		13.5	12.5		13.0	13.0		13.0	13.0	
Total Split (s)	31.0	31.0		17.0	48.0		13.0	13.0		13.0	13.0	
Total Split (%)	31.0%	31.0%		17.0%	48.0%		13.0%	13.0%		13.0%	13.0%	
Yellow Time (s)	4.5	4.5		3.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-3.5		-2.5	-3.5			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 39 (39%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated

Splits and Phases: 1: Constitution Blvd/Warehouse Driveway & King Street



Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	39.0
Total Split (s)	39.0
Total Split (%)	39%
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None

Intersection Summary

Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1071	604	548	54	293	12	3
v/c Ratio	0.95	0.58	0.44	0.37	0.23	0.08	0.00
Control Delay	48.0	34.4	10.6	48.8	19.0	41.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	34.4	10.6	48.8	19.0	41.2	0.0
Queue Length 50th (ft)	301	163	84	32	57	7	0
Queue Length 95th (ft)	#581	#379	408	#76	132	25	0
Internal Link Dist (ft)	928		1090	259			507
Turn Bay Length (ft)		350				110	
Base Capacity (vph)	1132	1047	1245	145	1258	147	774
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.58	0.44	0.37	0.23	0.08	0.00

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)	9	828	148	556	466	38	50	0	270	11	0	3
Future Volume (vph)	9	828	148	556	466	38	50	0	270	11	0	3
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	10	11	11
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95		0.97	1.00			1.00	0.88	1.00	1.00	
Frt		0.98		1.00	0.99			1.00	0.85	1.00	0.85	
Flt Protected		1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)		3284		3224	1718			1556	2608	1652	1531	
Flt Permitted		0.95		0.95	1.00			0.76	1.00	0.72	1.00	
Satd. Flow (perm)		3115		3224	1718			1238	2608	1255	1531	
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)	10	900	161	604	507	41	54	0	293	12	0	3
RTOR Reduction (vph)	0	13	0	0	2	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	1058	0	604	546	0	0	54	293	12	0	0
Heavy Vehicles (%)	2%	4%	3%	5%	6%	2%	16%	2%	9%	2%	2%	2%
Turn Type	Perm	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	
Protected Phases		2		1	6			4	4 1		8	
Permitted Phases	2						4			8		
Actuated Green, G (s)		29.2		30.0	65.7			9.8	45.8	9.8	9.8	
Effective Green, g (s)		32.7		32.5	69.2			11.8	47.8	11.8	11.8	
Actuated g/C Ratio		0.33		0.32	0.69			0.12	0.48	0.12	0.12	
Clearance Time (s)		7.5		6.5	7.5			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)		1018		1047	1188			146	1246	148	180	
v/s Ratio Prot				c0.19	0.32				0.11		0.00	
v/s Ratio Perm		c0.34						c0.04		0.01		
v/c Ratio		1.04		0.58	0.46			0.37	0.24	0.08	0.00	
Uniform Delay, d1		33.6		28.0	7.0			40.7	15.3	39.3	38.9	
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		38.8		0.8	1.3			1.6	0.1	0.2	0.0	
Delay (s)		72.4		28.8	8.2			42.3	15.4	39.5	38.9	
Level of Service		E		C	A			D	B	D	D	
Approach Delay (s)		72.4			19.0			19.6			39.4	
Approach LOS		E			B			B			D	

Intersection Summary

HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	195	124	3	1	112	591
Future Volume (vph)	0	195	124	3	1	112	591
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0		150	
Storage Lanes	0	1		0		1	
Taper Length (ft)	25					50	
Link Speed (mph)	20		20				20
Link Distance (ft)	920		420				339
Travel Time (s)	31.4		14.3				11.6
Confl. Peds. (#/hr)				1		1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	5%	21%	0%	0%	6%	4%
Shared Lane Traffic (%)							
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(ft)	0		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	1.00
Turning Speed (mph)	15	9		9	9	15	
Sign Control	Stop		Free				Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	195	124	3	1	112	591
Future Volume (Veh/h)	0	195	124	3	1	112	591
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	212	135	3	0	122	642
Pedestrians	1						
Lane Width (ft)	12.0						
Walking Speed (ft/s)	3.5						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (ft)							339
pX, platoon unblocked					0.00		
vC, conflicting volume	702	70			0	139	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	702	70			0	139	
tC, single (s)	6.8	7.0			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	78			0	91	
cM capacity (veh/h)	344	968			0	1412	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	212	90	48	122	321	321
Volume Left	0	0	0	122	0	0
Volume Right	212	0	3	0	0	0
cSH	968	1700	1700	1412	1700	1700
Volume to Capacity	0.22	0.05	0.03	0.09	0.19	0.19
Queue Length 95th (ft)	21	0	0	7	0	0
Control Delay (s)	9.8	0.0	0.0	7.8	0.0	0.0
Lane LOS	A			A		
Approach Delay (s)	9.8	0.0		1.2		
Approach LOS	A					

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	32.2%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	0	2	0	0	3	15	57	1	39	303	200
Future Volume (vph)	37	0	2	0	0	3	15	57	1	39	303	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		20			20			20			20	
Link Distance (ft)		590			802			610			420	
Travel Time (s)		20.1			27.3			20.8			14.3	
Confl. Peds. (#/hr)									3	3		
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
Heavy Vehicles (%)	2%	2%	2%	0%	0%	33%	2%	30%	100%	0%	5%	2%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

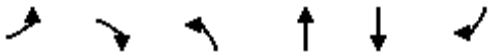
Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	0	2	0	0	3	15	57	1	39	303	200
Future Volume (Veh/h)	37	0	2	0	0	3	15	57	1	39	303	200
Sign Control		Stop			Stop			Free			Free	
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)	40	0	2	0	0	3	16	62	1	42	329	217
Pedestrians					3							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											759	
pX, platoon unblocked												
vC, conflicting volume	619	620	438	512	728	66	546			66		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	619	620	438	512	728	66	546			66		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.5	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.6	2.2			2.2		
p0 queue free %	90	100	100	100	100	100	98			97		
cM capacity (veh/h)	386	386	619	456	337	915	1023			1544		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	42	3	79	42	546
Volume Left	40	0	16	42	0
Volume Right	2	3	1	0	217
cSH	393	915	1023	1544	1700
Volume to Capacity	0.11	0.00	0.02	0.03	0.32
Queue Length 95th (ft)	9	0	1	2	0
Control Delay (s)	15.3	8.9	1.8	7.4	0.0
Lane LOS	C	A	A	A	
Approach Delay (s)	15.3	8.9	1.8	0.5	
Approach LOS	C	A			

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	43.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	0	73	239	66
Future Volume (vph)	0	1	0	73	239	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	20			20	20	
Link Distance (ft)	820			1737	610	
Travel Time (s)	28.0			59.2	20.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	31%	5%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
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
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1	0	73	239	66
Future Volume (Veh/h)	0	1	0	73	239	66
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	0	79	260	72
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	375	296	332			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	375	296	332			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	626	743	1227			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	1	79	332
Volume Left	0	0	0
Volume Right	1	0	72
cSH	743	1700	1700
Volume to Capacity	0.00	0.05	0.20
Queue Length 95th (ft)	0	0	0
Control Delay (s)	9.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.8	0.0	0.0
Approach LOS	A		

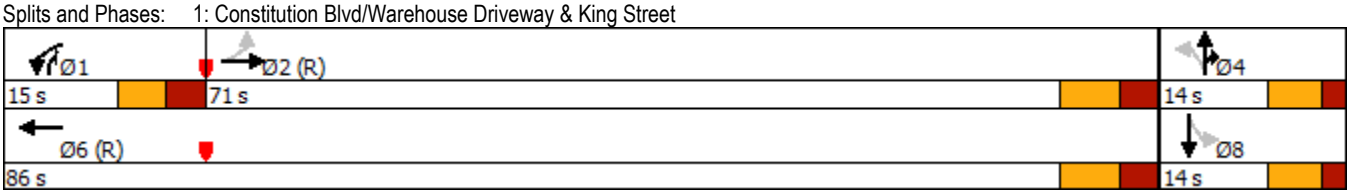
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	422	55	231	916	14	146	0	502	37	0	9
Future Volume (vph)	3	422	55	231	916	14	146	0	502	37	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	10	11	11
Storage Length (ft)	0		350	350		0	0		0	110		0
Storage Lanes	0		0	2		0	0		2	1		0
Taper Length (ft)	25			50			100			50		
Right Turn on Red			Yes			Yes			No			Yes
Link Speed (mph)		40			35			20			30	
Link Distance (ft)		1008			1170			339			587	
Travel Time (s)		17.2			22.8			11.6			13.3	
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
Heavy Vehicles (%)	2%	2%	14%	7%	3%	2%	4%	2%	6%	2%	2%	2%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.09	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	
Protected Phases		2		1	6			4	4 1		8	
Permitted Phases	2						4			8		
Detector Phase	2	2		1	6		4	4	4 1	8	8	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	5.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		13.5	12.5		13.0	13.0		13.0	13.0	
Total Split (s)	71.0	71.0		15.0	86.0		14.0	14.0		14.0	14.0	
Total Split (%)	71.0%	71.0%		15.0%	86.0%		14.0%	14.0%		14.0%	14.0%	
Yellow Time (s)	4.5	4.5		3.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-3.5		-2.5	-3.5			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 47 (47%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated

Splits and Phases: 1: Constitution Blvd/Warehouse Driveway & King Street



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	522	251	1011	159	546	40	10
v/c Ratio	0.29	0.67	0.78	0.61	0.58	0.23	0.02
Control Delay	10.2	52.2	12.9	52.5	32.0	43.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	52.2	12.9	52.5	32.0	43.1	0.1
Queue Length 50th (ft)	88	80	426	87	148	20	0
Queue Length 95th (ft)	80	#131	302	#249	#275	#60	0
Internal Link Dist (ft)	928		1090	259			507
Turn Bay Length (ft)		350				110	
Base Capacity (vph)	2124	375	1460	262	937	174	472
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.67	0.69	0.61	0.58	0.23	0.02

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)	3	422	55	231	916	14	146	0	502	37	0	9
Future Volume (vph)	3	422	55	231	916	14	146	0	502	37	0	9
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	10	11	11
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95		0.97	1.00			1.00	0.88	1.00	1.00	
Frt		0.98		1.00	1.00			1.00	0.85	1.00	0.85	
Flt Protected		1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)		3316		3164	1779			1736	2682	1652	1531	
Flt Permitted		0.95		0.95	1.00			0.75	1.00	0.52	1.00	
Satd. Flow (perm)		3154		3164	1779			1372	2682	912	1531	
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)	3	459	60	251	996	15	159	0	546	40	0	10
RTOR Reduction (vph)	0	13	0	0	1	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	509	0	251	1010	0	0	159	546	40	2	0
Heavy Vehicles (%)	2%	2%	14%	7%	3%	2%	4%	2%	6%	2%	2%	2%
Turn Type	Perm	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	
Protected Phases		2		1	6			4	4 1		8	
Permitted Phases	2						4			8		
Actuated Green, G (s)		53.5		9.4	69.4			17.1	32.5	17.1	17.1	
Effective Green, g (s)		57.0		11.9	72.9			19.1	34.5	19.1	19.1	
Actuated g/C Ratio		0.57		0.12	0.73			0.19	0.34	0.19	0.19	
Clearance Time (s)		7.5		6.5	7.5			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)		1797		376	1296			262	925	174	292	
v/s Ratio Prot				0.08	c0.57				c0.20		0.00	
v/s Ratio Perm		0.16						0.12		0.04		
v/c Ratio		0.28		0.67	0.78			0.61	0.59	0.23	0.01	
Uniform Delay, d1		11.0		42.2	8.5			37.0	26.9	34.2	32.8	
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.4		4.4	4.7			3.9	1.0	0.7	0.0	
Delay (s)		11.4		46.6	13.2			41.0	28.0	34.9	32.8	
Level of Service		B		D	B			D	C	C	C	
Approach Delay (s)		11.4			19.8			30.9			34.5	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	145	503	8	154	132
Future Volume (vph)	0	145	503	8	154	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	150	
Storage Lanes	0	1		0	1	
Taper Length (ft)	25				50	
Link Speed (mph)	20		20			20
Link Distance (ft)	920		420			339
Travel Time (s)	31.4		14.3			11.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	7%	0%	2%	21%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		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		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	145	503	8	154	132
Future Volume (Veh/h)	0	145	503	8	154	132
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	158	547	9	167	143
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						339
pX, platoon unblocked						
vC, conflicting volume	957	278			556	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	957	278			556	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	78			83	
cM capacity (veh/h)	216	713			1011	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	158	365	191	167	72	72
Volume Left	0	0	0	167	0	0
Volume Right	158	0	9	0	0	0
cSH	713	1700	1700	1011	1700	1700
Volume to Capacity	0.22	0.21	0.11	0.17	0.04	0.04
Queue Length 95th (ft)	21	0	0	15	0	0
Control Delay (s)	11.5	0.0	0.0	9.3	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	11.5	0.0		5.0		
Approach LOS	B					

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	41.7%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	242	0	3	0	0	29	3	203	1	4	1	53
Future Volume (vph)	242	0	3	0	0	29	3	203	1	4	1	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0		70	
Storage Lanes	0		0	0		0	0		0		1	
Taper Length (ft)	25			25			25				25	
Link Speed (mph)		20			20			20				20
Link Distance (ft)		590			802			610				420
Travel Time (s)		20.1			27.3			20.8				14.3
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
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	9%	0%	0%	100%	37%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Left
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	9	15	
Sign Control		Stop			Stop			Free				Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	38
Future Volume (vph)	38
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.92
Heavy Vehicles (%)	2%
Shared Lane Traffic (%)	
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Sign Control	

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	242	0	3	0	0	29	3	203	1	4	1	53
Future Volume (Veh/h)	242	0	3	0	0	29	3	203	1	4	1	53
Sign Control		Stop			Stop			Free				Free
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)	263	0	3	0	0	32	3	221	1	0	1	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None				None
Median storage veh)												
Upstream signal (ft)												759
pX, platoon unblocked										0.00		
vC, conflicting volume	340	308	78	290	328	222	99			0	222	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	340	308	78	290	328	222	99			0	222	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			0.0	5.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			0.0	3.1	
p0 queue free %	55	100	100	100	100	96	100			0	100	
cM capacity (veh/h)	589	604	982	662	592	823	1494			0	932	

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	266	32	225	1	99
Volume Left	263	0	3	1	0
Volume Right	3	32	1	0	41
cSH	591	823	1494	932	1700
Volume to Capacity	0.45	0.04	0.00	0.00	0.06
Queue Length 95th (ft)	58	3	0	0	0
Control Delay (s)	16.0	9.6	0.1	8.9	0.0
Lane LOS	C	A	A	A	
Approach Delay (s)	16.0	9.6	0.1	0.1	
Approach LOS	C	A			

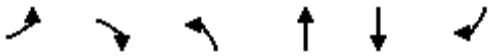
Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	40.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	38
Future Volume (Veh/h)	38
Sign Control	
Grade	
Peak Hour Factor	0.92
Hourly flow rate (vph)	41
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	
Direction, Lane #	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	10	0	207	44	12
Future Volume (vph)	0	10	0	207	44	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	20			20	20	
Link Distance (ft)	820			1737	610	
Travel Time (s)	28.0			59.2	20.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	9%	37%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
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
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	10	0	207	44	12
Future Volume (Veh/h)	0	10	0	207	44	12
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	11	0	225	48	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	280	54	61			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	280	54	61			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	710	1012	1542			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	11	225	61
Volume Left	0	0	0
Volume Right	11	0	13
cSH	1012	1700	1700
Volume to Capacity	0.01	0.13	0.04
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.6	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.6	0.0	0.0
Approach LOS	A		

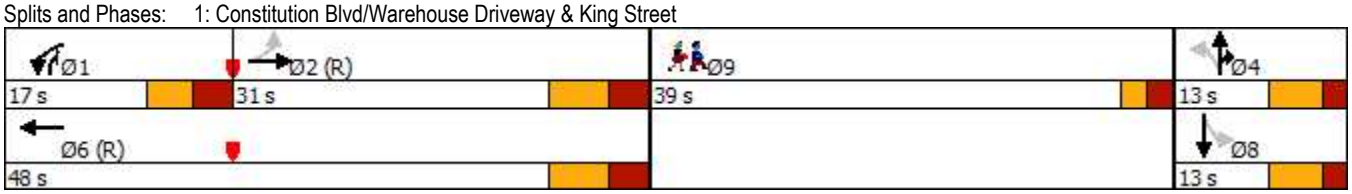
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	14.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	828	87	386	466	38	43	0	251	11	0	3
Future Volume (vph)	9	828	87	386	466	38	43	0	251	11	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	10	11	11
Storage Length (ft)	0		350	350		0	0		0	110		0
Storage Lanes	0		0	2		0	0		2	1		0
Taper Length (ft)	25			50			100			50		
Right Turn on Red			Yes			Yes			No			Yes
Link Speed (mph)		40			35			20			30	
Link Distance (ft)		1008			1170			339			587	
Travel Time (s)		17.2			22.8			11.6			13.3	
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
Heavy Vehicles (%)	2%	4%	3%	5%	6%	2%	16%	2%	9%	2%	2%	2%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.09	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	
Protected Phases		2		1	6			4	4 1		8	
Permitted Phases	2						4			8		
Detector Phase	2	2		1	6		4	4	4 1	8	8	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	5.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		13.5	12.5		13.0	13.0		13.0	13.0	
Total Split (s)	31.0	31.0		17.0	48.0		13.0	13.0		13.0	13.0	
Total Split (%)	31.0%	31.0%		17.0%	48.0%		13.0%	13.0%		13.0%	13.0%	
Yellow Time (s)	4.5	4.5		3.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-3.5		-2.5	-3.5			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 39 (39%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated

Splits and Phases: 1: Constitution Blvd/Warehouse Driveway & King Street



Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Right Turn on Red	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	39.0
Total Split (s)	39.0
Total Split (%)	39%
Yellow Time (s)	2.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None

Intersection Summary

Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	1005	420	548	47	273	12	3
v/c Ratio	0.68	0.63	0.45	0.30	0.28	0.07	0.00
Control Delay	26.3	42.2	10.9	45.4	23.7	40.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	42.2	10.9	45.4	23.7	40.5	0.0
Queue Length 50th (ft)	234	121	91	27	62	7	0
Queue Length 95th (ft)	#534	#241	408	67	123	25	0
Internal Link Dist (ft)	928		1090	259			507
Turn Bay Length (ft)		350				110	
Base Capacity (vph)	1470	668	1227	158	979	161	783
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.63	0.45	0.30	0.28	0.07	0.00

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)	9	828	87	386	466	38	43	0	251	11	0	3
Future Volume (vph)	9	828	87	386	466	38	43	0	251	11	0	3
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	10	11	11
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95		0.97	1.00			1.00	0.88	1.00	1.00	
Frt		0.99		1.00	0.99			1.00	0.85	1.00	0.85	
Flt Protected		1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)		3310		3224	1718			1556	2608	1652	1531	
Flt Permitted		0.95		0.95	1.00			0.76	1.00	0.73	1.00	
Satd. Flow (perm)		3140		3224	1718			1238	2608	1263	1531	
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)	10	900	95	420	507	41	47	0	273	12	0	3
RTOR Reduction (vph)	0	6	0	0	2	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	999	0	420	546	0	0	47	273	12	0	0
Heavy Vehicles (%)	2%	4%	3%	5%	6%	2%	16%	2%	9%	2%	2%	2%
Turn Type	Perm	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	
Protected Phases		2		1	6			4	4 1		8	
Permitted Phases	2						4			8		
Actuated Green, G (s)		40.0		18.2	64.7			10.8	35.0	10.8	10.8	
Effective Green, g (s)		43.5		20.7	68.2			12.8	37.0	12.8	12.8	
Actuated g/C Ratio		0.44		0.21	0.68			0.13	0.37	0.13	0.13	
Clearance Time (s)		7.5		6.5	7.5			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)		1365		667	1171			158	964	161	195	
v/s Ratio Prot				c0.13	0.32				c0.10		0.00	
v/s Ratio Perm		c0.32						0.04		0.01		
v/c Ratio		0.73		0.63	0.47			0.30	0.28	0.07	0.00	
Uniform Delay, d1		23.4		36.2	7.4			39.5	22.2	38.4	38.0	
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		3.5		1.9	1.3			1.1	0.2	0.2	0.0	
Delay (s)		26.9		38.0	8.8			40.6	22.3	38.6	38.0	
Level of Service		C		D	A			D	C	D	D	
Approach Delay (s)		26.9			21.5			25.0			38.5	
Approach LOS		C			C			C			D	

Intersection Summary

HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	0	195	98	3	1	112	360
Future Volume (vph)	0	195	98	3	1	112	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0		150	
Storage Lanes	0	1		0		1	
Taper Length (ft)	25					50	
Link Speed (mph)	20		20				20
Link Distance (ft)	920		420				339
Travel Time (s)	31.4		14.3				11.6
Confl. Peds. (#/hr)				1		1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	5%	21%	0%	0%	6%	4%
Shared Lane Traffic (%)							
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	R NA	Left	Left
Median Width(ft)	0		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	1.00
Turning Speed (mph)	15	9		9	9	15	
Sign Control	Stop		Free				Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	0	195	98	3	1	112	360
Future Volume (Veh/h)	0	195	98	3	1	112	360
Sign Control	Stop		Free				Free
Grade	0%		0%				0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	212	107	3	0	122	391
Pedestrians	1						
Lane Width (ft)	12.0						
Walking Speed (ft/s)	3.5						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None				None
Median storage veh)							
Upstream signal (ft)							339
pX, platoon unblocked					0.00		
vC, conflicting volume	549	56			0	111	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	549	56			0	111	
tC, single (s)	6.8	7.0			0.0	4.2	
tC, 2 stage (s)							
tF (s)	3.5	3.3			0.0	2.3	
p0 queue free %	100	79			0	92	
cM capacity (veh/h)	430	988			0	1446	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	212	71	39	122	196	196
Volume Left	0	0	0	122	0	0
Volume Right	212	0	3	0	0	0
cSH	988	1700	1700	1446	1700	1700
Volume to Capacity	0.21	0.04	0.02	0.08	0.12	0.12
Queue Length 95th (ft)	20	0	0	7	0	0
Control Delay (s)	9.6	0.0	0.0	7.7	0.0	0.0
Lane LOS	A			A		
Approach Delay (s)	9.6	0.0		1.8		
Approach LOS	A					

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	1	0	0	3	3	57	1	39	245	27
Future Volume (vph)	11	0	1	0	0	3	3	57	1	39	245	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		20			20			20			20	
Link Distance (ft)		590			802			610			420	
Travel Time (s)		20.1			27.3			20.8			14.3	
Confl. Peds. (#/hr)									3	3		
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
Heavy Vehicles (%)	2%	2%	2%	0%	0%	33%	2%	30%	100%	0%	5%	2%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	0	1	0	0	3	3	57	1	39	245	27
Future Volume (Veh/h)	11	0	1	0	0	3	3	57	1	39	245	27
Sign Control		Stop			Stop			Free			Free	
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)	12	0	1	0	0	3	3	62	1	42	266	29
Pedestrians					3							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											759	
pX, platoon unblocked												
vC, conflicting volume	436	436	280	422	450	66	295			66		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	436	436	280	422	450	66	295			66		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.5	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.6	2.2			2.2		
p0 queue free %	98	100	100	100	100	100	100			97		
cM capacity (veh/h)	516	497	758	529	491	915	1266			1544		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	13	3	66	42	295
Volume Left	12	0	3	42	0
Volume Right	1	3	1	0	29
cSH	529	915	1266	1544	1700
Volume to Capacity	0.02	0.00	0.00	0.03	0.17
Queue Length 95th (ft)	2	0	0	2	0
Control Delay (s)	12.0	8.9	0.4	7.4	0.0
Lane LOS	B	A	A	A	
Approach Delay (s)	12.0	8.9	0.4	0.9	
Approach LOS	B	A			

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	28.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	0	61	238	8
Future Volume (vph)	0	1	0	61	238	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	20			20	20	
Link Distance (ft)	820			1737	610	
Travel Time (s)	28.0			59.2	20.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	31%	5%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
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
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1	0	61	238	8
Future Volume (Veh/h)	0	1	0	61	238	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	0	66	259	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	330	264	268			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	330	264	268			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	665	775	1296			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	1	66	268
Volume Left	0	0	0
Volume Right	1	0	9
cSH	775	1700	1700
Volume to Capacity	0.00	0.04	0.16
Queue Length 95th (ft)	0	0	0
Control Delay (s)	9.7	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.7	0.0	0.0
Approach LOS	A		

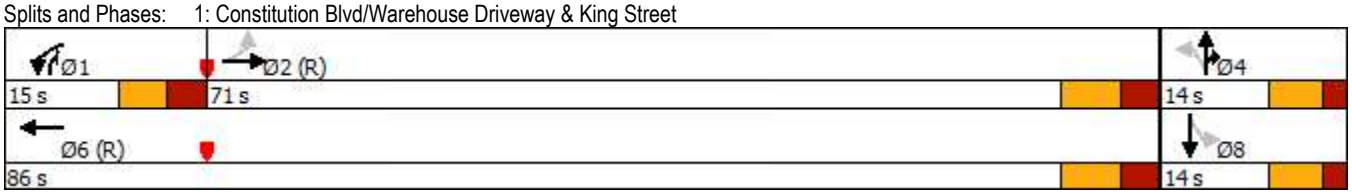
Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	23.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	422	45	206	916	14	91	0	349	37	0	9
Future Volume (vph)	3	422	45	206	916	14	91	0	349	37	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	10	11	11
Storage Length (ft)	0		350	350		0	0		0	110		0
Storage Lanes	0		0	2		0	0		2	1		0
Taper Length (ft)	25			50			100			50		
Right Turn on Red			Yes			Yes			No			Yes
Link Speed (mph)		40			35			20			30	
Link Distance (ft)		1008			1170			339			587	
Travel Time (s)		17.2			22.8			11.6			13.3	
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
Heavy Vehicles (%)	2%	2%	14%	8%	3%	2%	4%	2%	6%	2%	2%	2%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		22			22			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.04	1.04	1.00	1.00	1.00	1.09	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	
Protected Phases		2		1	6			4	4 1		8	
Permitted Phases	2						4			8		
Detector Phase	2	2		1	6		4	4	4 1	8	8	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	5.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		13.5	12.5		13.0	13.0		13.0	13.0	
Total Split (s)	71.0	71.0		15.0	86.0		14.0	14.0		14.0	14.0	
Total Split (%)	71.0%	71.0%		15.0%	86.0%		14.0%	14.0%		14.0%	14.0%	
Yellow Time (s)	4.5	4.5		3.5	4.5		4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-3.5		-2.5	-3.5			-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0		4.0	4.0			4.0		4.0	4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	C-Min	C-Min		None	C-Min		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 47 (47%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: Constitution Blvd/Warehouse Driveway & King Street



Lane Group	EBT	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	511	224	1011	99	379	40	10
v/c Ratio	0.27	0.59	0.75	0.44	0.43	0.21	0.02
Control Delay	9.8	48.5	11.4	45.7	28.7	40.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	48.5	11.4	45.7	28.7	40.3	0.1
Queue Length 50th (ft)	84	68	352	55	97	21	0
Queue Length 95th (ft)	78	111	302	#145	173	58	0
Internal Link Dist (ft)	928		1090	259			507
Turn Bay Length (ft)		350				110	
Base Capacity (vph)	2133	382	1460	226	877	188	438
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.59	0.69	0.44	0.43	0.21	0.02

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)	3	422	45	206	916	14	91	0	349	37	0	9
Future Volume (vph)	3	422	45	206	916	14	91	0	349	37	0	9
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	10	11	11
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor		0.95		0.97	1.00			1.00	0.88	1.00	1.00	
Frt		0.99		1.00	1.00			1.00	0.85	1.00	0.85	
Flt Protected		1.00		0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)		3333		3134	1779			1736	2682	1652	1531	
Flt Permitted		0.95		0.95	1.00			0.75	1.00	0.66	1.00	
Satd. Flow (perm)		3170		3134	1779			1372	2682	1142	1531	
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)	3	459	49	224	996	15	99	0	379	40	0	10
RTOR Reduction (vph)	0	10	0	0	1	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	501	0	224	1010	0	0	99	379	40	2	0
Heavy Vehicles (%)	2%	2%	14%	8%	3%	2%	4%	2%	6%	2%	2%	2%
Turn Type	Perm	NA		Prot	NA		Perm	NA	pt+ov	Perm	NA	
Protected Phases		2		1	6			4	4 1		8	
Permitted Phases	2						4			8		
Actuated Green, G (s)		55.8		9.7	72.0			14.5	30.2	14.5	14.5	
Effective Green, g (s)		59.3		12.2	75.5			16.5	32.2	16.5	16.5	
Actuated g/C Ratio		0.59		0.12	0.76			0.16	0.32	0.16	0.16	
Clearance Time (s)		7.5		6.5	7.5			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)		1879		382	1343			226	863	188	252	
v/s Ratio Prot				0.07	c0.57				c0.14		0.00	
v/s Ratio Perm		0.16						0.07		0.04		
v/c Ratio		0.27		0.59	0.75			0.44	0.44	0.21	0.01	
Uniform Delay, d1		9.8		41.5	6.9			37.6	26.8	36.1	34.9	
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3		2.3	3.9			1.4	0.4	0.6	0.0	
Delay (s)		10.2		43.8	10.9			38.9	27.1	36.7	34.9	
Level of Service		B		D	B			D	C	D	C	
Approach Delay (s)		10.2			16.9			29.6			36.3	
Approach LOS		B			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	145	295	8	154	97
Future Volume (vph)	0	145	295	8	154	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	150	
Storage Lanes	0	1		0	1	
Taper Length (ft)	25				50	
Link Speed (mph)	20		20			20
Link Distance (ft)	920		420			339
Travel Time (s)	31.4		14.3			11.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	4%	7%	0%	2%	21%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		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		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	145	295	8	154	97
Future Volume (Veh/h)	0	145	295	8	154	97
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	158	321	9	167	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						339
pX, platoon unblocked						
vC, conflicting volume	712	165			330	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	712	165			330	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	81			86	
cM capacity (veh/h)	321	844			1226	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	158	214	116	167	52	52
Volume Left	0	0	0	167	0	0
Volume Right	158	0	9	0	0	0
cSH	844	1700	1700	1226	1700	1700
Volume to Capacity	0.19	0.13	0.07	0.14	0.03	0.03
Queue Length 95th (ft)	17	0	0	12	0	0
Control Delay (s)	10.2	0.0	0.0	8.4	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	10.2	0.0		5.2		
Approach LOS	B					

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	34	0	1	0	0	29	0	203	1	4	1	45
Future Volume (vph)	34	0	1	0	0	29	0	203	1	4	1	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0		70	
Storage Lanes	0		0	0		0	0		0		0	
Taper Length (ft)	25			25			25				25	
Link Speed (mph)		20			20			20				20
Link Distance (ft)		590			802			610				420
Travel Time (s)		20.1			27.3			20.8				14.3
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
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	9%	0%	0%	100%	37%
Shared Lane Traffic (%)												
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	R NA	Left	Left
Median Width(ft)		0			0			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	9	15	
Sign Control		Stop			Stop			Free				Free

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	11
Future Volume (vph)	11
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	0.92
Heavy Vehicles (%)	2%
Shared Lane Traffic (%)	
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Sign Control	

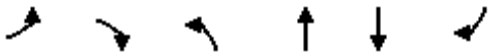
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	34	0	1	0	0	29	0	203	1	4	1	45
Future Volume (Veh/h)	34	0	1	0	0	29	0	203	1	4	1	45
Sign Control		Stop			Stop			Free				Free
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)	37	0	1	0	0	32	0	221	1	0	1	49
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None				None
Median storage veh)												
Upstream signal (ft)												759
pX, platoon unblocked										0.00		
vC, conflicting volume	310	279	55	274	284	222	61			0	222	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	310	279	55	274	284	222	61			0	222	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			0.0	5.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			0.0	3.1	
p0 queue free %	94	100	100	100	100	96	100			0	100	
cM capacity (veh/h)	617	628	1012	682	627	823	1542			0	932	

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	38	32	222	1	61
Volume Left	37	0	0	1	0
Volume Right	1	32	1	0	12
cSH	623	823	1542	932	1700
Volume to Capacity	0.06	0.04	0.00	0.00	0.04
Queue Length 95th (ft)	5	3	0	0	0
Control Delay (s)	11.2	9.6	0.0	8.9	0.0
Lane LOS	B	A		A	
Approach Delay (s)	11.2	9.6	0.0	0.1	
Approach LOS	B	A			

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	26.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	11
Future Volume (Veh/h)	11
Sign Control	
Grade	
Peak Hour Factor	0.92
Hourly flow rate (vph)	12
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh)	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	
tC, single (s)	
tC, 2 stage (s)	
tF (s)	
p0 queue free %	
cM capacity (veh/h)	
Direction, Lane #	



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	1	0	204	42	4
Future Volume (vph)	0	1	0	204	42	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	20			20	20	
Link Distance (ft)	820			1737	610	
Travel Time (s)	28.0			59.2	20.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	9%	37%	2%
Shared Lane Traffic (%)						
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			0	0	
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
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1	0	204	42	4
Future Volume (Veh/h)	0	1	0	204	42	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	0	222	46	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	270	48	50			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	270	48	50			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	719	1021	1557			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	1	222	50
Volume Left	0	0	0
Volume Right	1	0	4
cSH	1021	1700	1700
Volume to Capacity	0.00	0.13	0.03
Queue Length 95th (ft)	0	0	0
Control Delay (s)	8.5	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.5	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	14.1%	ICU Level of Service	A
Analysis Period (min)	15		