

Traffic Impact Study

Proposed Warehouse Expansion

35 Carlsbad Street
Cranston, RI

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INTRODUCTION

McMahon, a Bowman company has completed a traffic impact study for the proposed 97,860 square foot (SF) warehouse building expansion to be located at 35 Carlsbad Street, in Cranston, Rhode Island. This traffic impact study is based on the Preliminary Site Plan prepared by Woodard & Curran, dated January 25, 2023. The purpose of this traffic impact study is to evaluate existing and projected traffic operations and safety conditions associated with the proposed development within the study area.

The traffic impact study is based on a review of existing traffic volumes, recent crash data, and the anticipated traffic generating characteristics of the proposed project. The study examines existing and projected traffic operations (both with and without the proposed expansion) at key intersections in the vicinity of the project site. The study area was selected based on a review of the surrounding roadway network and anticipated trip generating characteristics of the proposed project. This study provides a detailed analysis of traffic operations during the weekday morning and weekday afternoon, when the combination of adjacent roadway volumes and project trips is expected to be the greatest.

Based on the analysis presented in this study, the proposed expansion is not expected to have a significant impact on the safety and operations of the area roadways and intersections. The following report documents these findings.

Project Description

The project site is located at the northeast quadrant of the unsignalized intersection of Carolina Street at Carlsbad Street and is directly east of an existing warehouse and office building. The site contains a grass and gravel area and an adjacent parking lot that would be replaced by the proposed 97,860 SF warehouse, as shown in Figure 1 below. Access to the site would be provided via two unsignalized full-access driveways on Carlsbad Street, one unsignalized one way entrance driveway on Burnham Avenue, and one unsignalized one way exit driveway on Carolina Street. All exiting approaches would be under stop control for exiting vehicles. A total of 156 parking spaces would be provided, six of which would be accessible, and a total of six loading docks would be provided.

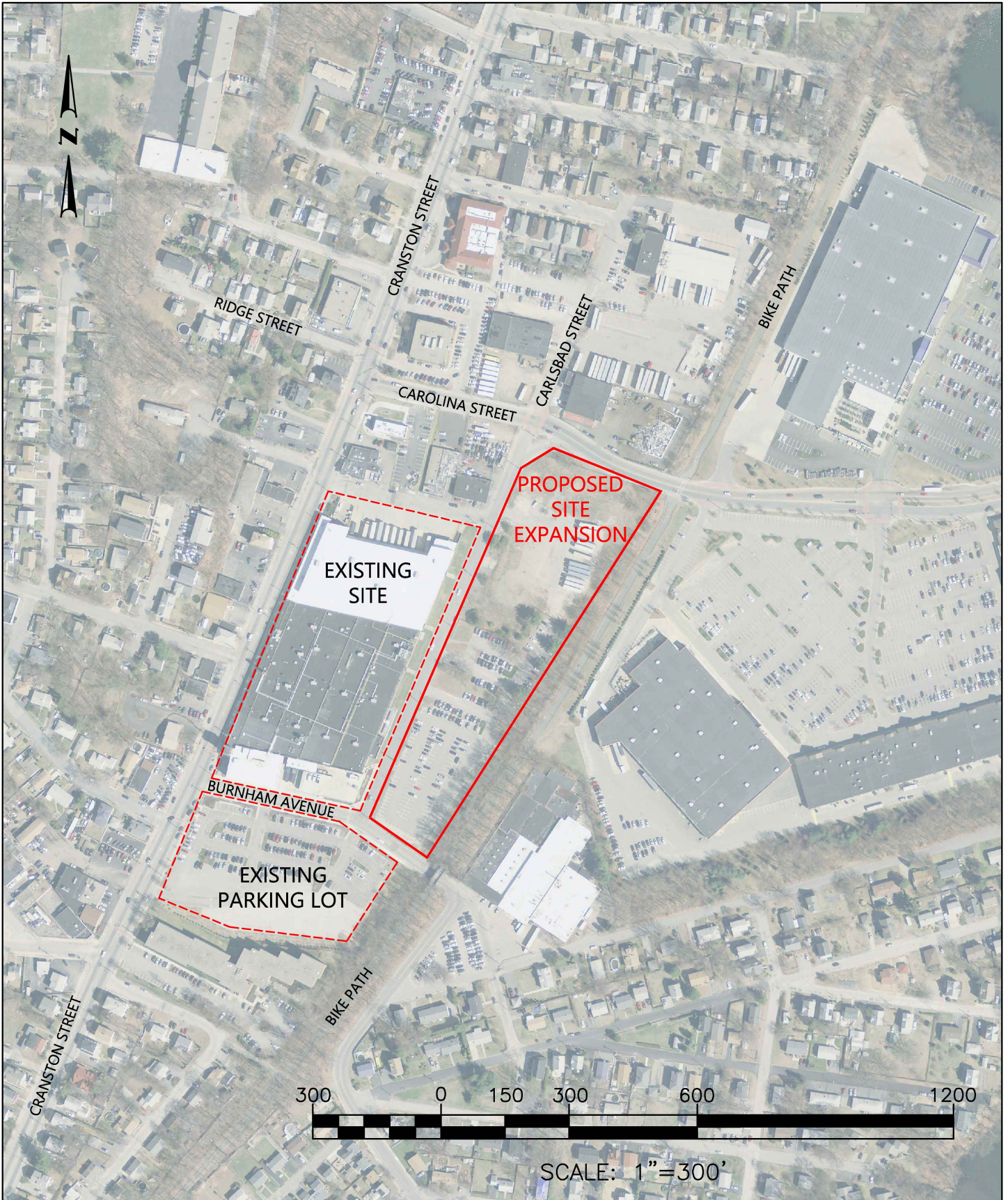


Figure 1
Site Location Map
Proposed Warehouse Expansion
Cranston, Rhode Island

Study Methodology

This traffic impact study evaluates existing and projected traffic operations within the study area for the weekday morning and weekday afternoon peak hour traffic conditions, when the combination of the adjacent roadway volumes and estimated project trips would be expected to be the greatest.

The study was conducted in three steps. The first step consisted of an inventory of existing traffic conditions within the project study area. As part of this inventory, manual turning movement counts were collected in the vicinity of the project site during the weekday morning and weekday afternoon peak periods. A field visit was also completed to document intersection and roadway geometries and available sight distances at the site driveways. Crash data in the vicinity of the site driveways was obtained from the City of Cranston to determine if the project area roadways have any existing traffic safety deficiencies.

The second step of the study builds upon the data collected in the first step to establish the basis for evaluating potential transportation impacts associated with the projected future conditions. During this second step, the projected traffic demands associated with any planned future developments that could influence traffic volumes at the study area intersections were assessed. Consistent with RIDOT traffic study guidelines, 2023 Existing traffic volumes were forecasted to the future year 2028 to establish 2028 No Build (without project) conditions and 2028 Build (with project) conditions.

The third step of this study determined if measures were necessary to improve existing or future traffic operations and safety, minimize potential traffic impacts, and provide safe and efficient access to the proposed project site.

Study Area Intersections

Based on a review of the anticipated traffic generating characteristics of the proposed project and a review of the adjacent roadways serving the project site, the following study area intersections were selected for analysis:

- Cranston Street at Carolina Street/Ridge Street (signalized)
- Carlsbad Street at Carolina Street
- Carlsbad Street at Field Street/site driveway
- Carlsbad Street at Burnham Avenue/parking lot
- Cranston Street at Burnham Avenue
- Carolina Street at proposed northern site driveway
- Carlsbad Street at proposed southern site driveway
- Burnham Avenue at proposed site driveway

The traffic impact study documents existing and future traffic conditions for the study area intersections noted above.

EXISTING CONDITIONS

The existing conditions assessment included in this study consists of an inventory of intersection and roadway geometries, an inventory of traffic control devices, the collection of peak period traffic volumes, and a review of recent crash data. The existing conditions in the vicinity of the project site are summarized below.

Roadway Network

Carolina Street

Carolina Street generally extends in an east-west direction through the City of Cranston and is classified as a local road under City jurisdiction. West of Carlsbad Street, Carolina Street provides one 21-foot-wide travel lane and one 12.5-foot-wide travel lane in the eastbound and westbound direction, respectively. A one-foot-wide shoulder is provided on the south side of the roadway, and a two-foot-wide shoulder is provided on the north side. Six-foot-wide concrete sidewalks are provided on both sides of the roadway. East of Carlsbad Street, Carolina Street generally provides one 13-foot-wide travel lane in each direction, widening to two lanes in each direction approximately 375 feet east of the project site. Approximately 4.5 to five-foot-wide shoulders are provided on both sides of the roadway. A 4.5-foot-wide sidewalk is provided on the south side of the road, while a five-foot-wide sidewalk is provided on the north side. Colored stamped asphalt crosswalks are provided at the intersection with Carlsbad Street. The Washington Secondary Bike Trail is located approximately 100 feet east of the proposed driveway on Carolina Street and provides a marked crossing across Carolina Street for bike path users. Carolina Street has a posted speed limit of 25 miles per hour (mph) east of the study area.

Cranston Street

Cranston Street generally extends in a north-south direction through the City of Cranston and is classified as a local road under City jurisdiction. Cranston Street generally provides two 11-foot-wide travel lanes with a 12.5-foot-wide two way left center turning lane. Ten-foot-wide painted shoulders are provided on each side of the roadway, with on-street parking allowed. Eight-foot-wide concrete sidewalks are provided on both sides of the roadway, and a colored stamped asphalt crosswalk is provided across Cranston Street approximately 70 feet north of the intersection of Burnham Avenue. Bicycle accommodations are not provided. Cranston Street has a posted speed limit of 25 mph south of the study area.

Carlsbad Street

Carlsbad Street generally extends in a north-south direction between Oneida Street and Burnham Avenue and is classified as a local road under City jurisdiction. The roadway cross section consists of one approximately 15-foot-wide travel lane in each direction, although there are no marked centerlines or edge lines. An eight-foot-wide sidewalk is provided on the east side of the roadway, while a five-foot wide sidewalk is provided on the west side of the roadway. Bicycle accommodations are not provided. No speed limits are posted; however, given the characteristics of the adjacent land use, the speed limit is considered to be 25 mph.

Field Street

Field Street generally extends in an east-west direction between Carlsbad Street and Cranston Street and is classified as a local road under City jurisdiction, and primarily provides access to commercial properties to the north and the existing warehouse truck bays located at 1160 Cranston Street to the south. The roadway cross section consists of one travel lane in each direction, measuring approximately 17.5-feet wide, although there are no marked centerlines or edge lines. A 5.5-foot-wide asphalt and concrete sidewalk is provided on the north side of the roadway, while a wide 14-foot-wide sidewalk is

provided on the south side. Bicycle accommodations are not provided. No speed limits are posted; however, given the characteristics of the adjacent land use, the speed limit is considered to be 25 mph.

Burnham Avenue

Burnham Avenue generally extends in an east-west direction between Cranston Street and Gordon Street is classified as a local road under City jurisdiction, and generally provides access to an existing warehouse parking lot to the south and a residential neighborhood to the east. The roadway cross section consists of one approximately 16.5-foot-wide travel lane in each direction, although there are no marked centerlines or edge lines. An eight-foot-wide concrete sidewalk is provided on the south side of the roadway between Cranston Street and Wayne Avenue, and a 7.5-foot-wide sidewalk is provided on the north side of the roadway between Cranston Street and Carlsbad Street. Bicycle accommodations are not provided. No speed limits are posted; however, given the characteristics of the adjacent land use, the speed limit is considered to be 25 mph.

Signalized Intersections

Cranston Street at Ridge Street/Carolina Street

The signalized intersection of Cranston Street at Ridge Street/Carolina Street consists of four approaches and is under City jurisdiction. Colored stamped asphalt crosswalks with curb ramps and pedestrian pushbuttons are provided across all approaches to the intersection. An exclusive pedestrian phase is provided at the signal.

The Ridge Street eastbound approach to the intersection consists of a single shared left-turn/right-turn lane. Although unmarked, the eastbound travel lane is considered to be approximately 12 feet wide. The Carolina Street westbound approach consists of a single shared left-turn/right-turn lane measuring approximately 12 feet wide.

The Cranston Street northbound approach to the intersection consists of one shared left-turn/through/right-turn lane, while the southbound approach to the intersection consists of one exclusive 11-foot-wide left-turn lane and one 11.5-foot-wide shared through/right-turn lane.

Unsignalized Intersections

Cranston Street at Burnham Avenue

The unsignalized intersection of Cranston Street at Burnham Avenue consists of three approaches, with the Burnham Avenue westbound approach under stop control. Burnham Avenue consists of one shared left-turn/right-turn lane measuring approximately 17 feet wide. Two unsignalized midblock colored stamped crosswalks with curb ramps are provided across Cranston Street; one approximately 100 feet south of the intersection with Burnham Avenue and one approximately 70 feet north of the intersection. No pedestrian crossing signs are provided at or in advance of the crosswalks. A painted crosswalk with curb ramps is provided across Burnham Avenue at the intersection with Cranston Street. On-street parking is provided on both sides of Cranston Street in the vicinity of the intersection, with parking restrictions on the east side of the street within 25 feet south of the intersection and 10 feet north of the intersection.

A Rhode Island Public Transit Authority (RIPTA) bus stop is present on the west side of the intersection, and is serviced by the Arlington/Oaklawn Route 30, running from the Community College of Rhode Island (CCRI) campus in Warwick to Kennedy Plaza in Providence.

Carolina Street at Carlsbad Street

The unsignalized intersection of Carolina Street at Carlsbad Street consists of four approaches, with the Carlsbad Street southbound approach under stop control for all movements. The northbound approach consists of one left-turn/through lane measuring approximately 16 feet wide and a 25-foot-wide channelized right-turn lane separated by a raised concrete median island. The left-turn/through lane is under stop control, with the right-turns under yield control. Colored stamped crosswalks with curb ramps are provided across all approaches to the intersection.

Carlsbad Street at Field Street

The unsignalized intersection of Carlsbad Street at Field Street consists of four approaches, with the westbound approach consisting of an existing gated driveway to a trailer storage parking lot at the proposed project site. Signing and striping are not present on the eastbound and westbound approaches to the intersection, although they are considered to be under stop control.

Carlsbad Street at Burnham Avenue

The unsignalized intersection of Carlsbad Street at Burnham Avenue consists of four approaches, with the northbound approach serving as a full access driveway to an employee parking lot. Both the northbound and southbound approaches are under stop control. A painted crosswalk with curb ramps and pedestrian crossing signage is provided across the west side of Burnham Avenue, connecting the parking lot to existing concrete sidewalk along Burnham Avenue and Carlsbad Street. Although unmarked, the northbound and southbound travel lanes are considered to be approximately 15 feet wide, while the eastbound and westbound travel lanes are considered to be approximately 16 feet wide.

Existing Traffic Volumes

To assess peak hour traffic conditions, turning movement counts (TMCs) were conducted at the intersections of Cranston Street at Ridge Street/Carolina Street, Carlsbad Street at Field Street, and Burnham Avenue at Carlsbad Street during the weekday morning (7:00 AM to 9:00 AM) and weekday afternoon (4:00 PM to 6:00 PM) peak periods. Twelve-hour TMCs (7:00 AM to 7:00 PM) were conducted at the intersections of Cranston Street at Burnham Avenue and Carolina Street at Carlsbad Street. A 48-hour automatic traffic recorder (ATR) count was also collected on Carolina Street and Carlsbad Street in the vicinity of the project site driveways.

TMCs were conducted on Thursday, March 2, 2023. The results of the turning movement counts are tabulated by 15-minute periods and are provided in Appendix A of this report. The four highest consecutive 15-minute intervals during each of these count periods constitute the peak hours that are the basis of the traffic analysis provided in this report. Based on a review of the peak period traffic data, the weekday morning peak hour occurs between 7:30 AM and 8:30 AM and the weekday afternoon peak hour occurs between 4:00 PM and 5:00 PM.

The 48-hour ATR counts were conducted on Carolina Street and Carlsbad Street in the vicinity of the project site driveways from Wednesday, March 1, 2023 to Friday, March 3, 2023. The results of the ATR are provided in Appendix A of this report and are summarized in Table 1.

Table 1: Existing Traffic Volume Summary

Roadway	Direction	ADT¹	85th % Speed²
Carlsbad Street	Northbound	2,050	32
South of Field Street	<u>Southbound</u>	<u>2,180</u>	31
	Combined	4,230	
Carolina Street	Eastbound	7,470	27
East of Carlsbad Street	<u>Westbound</u>	<u>8,330</u>	29
	Combined	15,800	

1 Average daily traffic volume in vehicles per day

2 85th percentile vehicle speed in mph

As shown in Table 1, Carlsbad Street carries an average daily traffic (ADT) of approximately 4,230 vehicles per day (vpd), with approximately 2,050 vpd northbound and approximately 2,180 vpd southbound. Based on the results of the ATR, the 85th percentile speed on Carlsbad Street in the vicinity of the project site was measured to be 32 mph and 31 mph in the northbound and southbound directions, respectively.

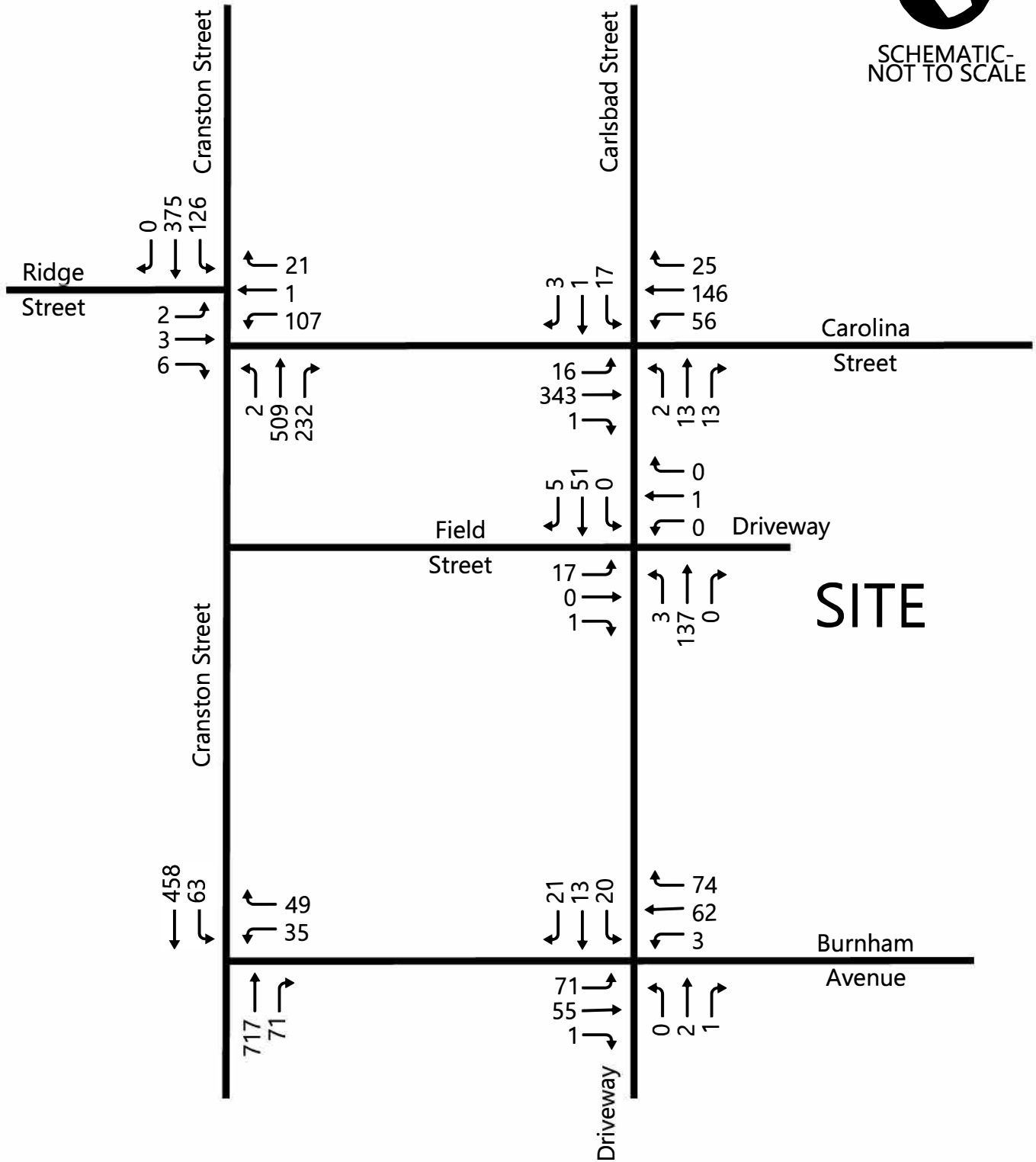
Carolina Street carries an ADT of approximately 15,800 vpd, with approximately 7,470 vpd eastbound and approximately 8,330 vpd westbound. Based on the results of the ATR, the 85th percentile speed on Carolina Street in the vicinity of the project site was measured to be 27 in the eastbound direction and 29 in the westbound direction.

Seasonal Variation

Based on RIDOT's 2017 Seasonal Factors, no adjustments for March are provided for local roadways. Therefore, the counted traffic volumes were not adjusted. The 2023 Existing weekday morning and weekday afternoon peak hour traffic volumes are presented in the traffic projection model provided in Appendix B and are displayed in Figure 2 and Figure 3, respectively.



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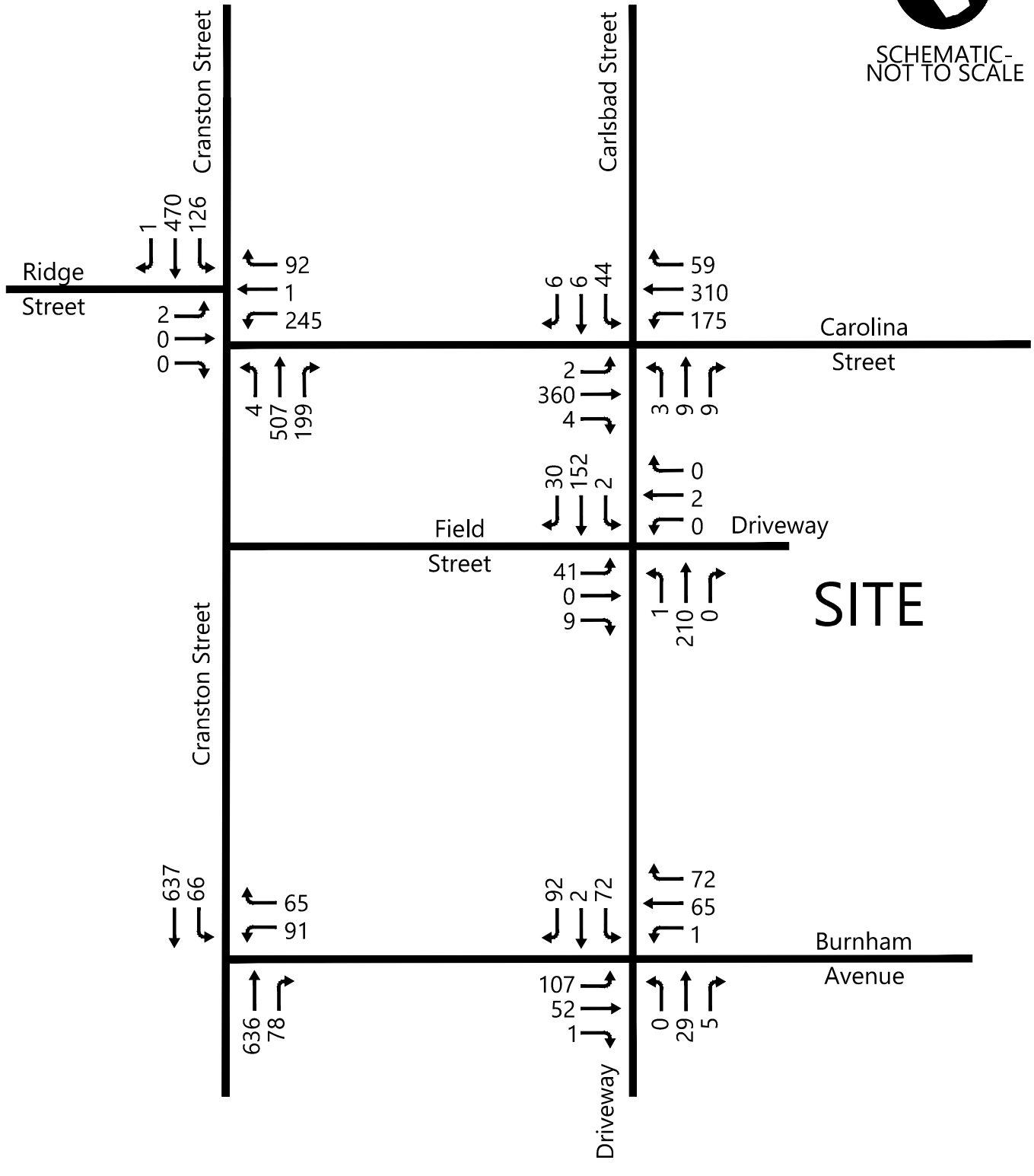


SITE

Figure 2
2023 Existing Weekday Morning
Peak Hour Traffic Volumes
Proposed Warehouse Expansion
Cranston, Rhode Island



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SITE

Figure 3
2023 Existing Weekday Afternoon
Peak Hour Traffic Volumes
Proposed Warehouse Expansion
Cranston, Rhode Island

Crash Summary

Crash data in the vicinity of the project site was obtained from the City of Cranston for the most recent three-year period (2020-2022) available. Table 2 summarizes crashes occurring within this time period at the study area intersections. Based on standard engineering practice, crashes reported to occur within a 200-foot radius of the study area intersections were included in the crash summary. Crashes reported to occur outside of that radius are not considered to be related to the intersection operations.

Table 2: Crash Summary

	Cranston Street at Burnham Avenue	Cranston Street at Ridge Street/Carolina Street	Carolina Street at Carlsbad Street	Carlsbad Street at Field Street	Carlsbad Street at Burnham Avenue
Year					
2020	1	3	3	2	0
2021	1	13	4	0	3
2022	<u>2</u>	<u>6</u>	<u>10</u>	<u>1</u>	<u>1</u>
Total	4	22	17	3	4
Type					
Angle	3	5	3	3	3
Rear-end	1	10	14	0	0
Sideswipe	0	4	0	0	0
Head-on	0	1	0	0	0
Pedestrian	0	0	0	0	0
Bicycle	0	1	0	0	0
Single Vehicle	0	1	0	0	1
Unknown	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	4	22	17	3	4
Severity					
Property Damage	4	17	13	3	4
Personal Injury	0	5	4	0	0
Fatality	0	0	0	0	0
Unknown	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	4	22	17	3	4
Weather					
Clear	4	20	15	3	4
Cloudy	0	0	1	0	0
Rain	0	2	1	0	0
Snow	0	0	0	0	0
Sleet	0	0	0	0	0
Fog	0	0	0	0	0
Unknown	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	4	22	17	3	4
Time					
7:00 AM to 9:00 AM	0	1	1	0	0
9:00 AM to 4:00 PM	2	10	10	2	2
4:00 PM to 6:00 PM	1	5	2	1	0
6:00 PM to 7:00 AM	<u>1</u>	<u>6</u>	<u>4</u>	<u>0</u>	<u>2</u>
Total	4	22	17	3	4

As shown in Table 2 above, the unsignalized intersection of Cranston Street at Burnham Avenue is reported to have experienced four crashes during the three-year period analyzed. Of these four crashes, three were angle collisions and one was a rear-end collision. All four crashes resulted in property damage only.

The signalized intersection of Cranston Street at Ridge Street/Carolina Street is reported to have experienced 22 crashes during the three-year period analyzed. Of these 22 crashes, 10 were rear-end collisions, five were angle collisions, four were sideswipe crashes, one was a head-on collision, one was a single vehicle crash and one involved a bicyclist. Five crashes resulted in personal injury and 17 crashes resulted in property damage only.

The unsignalized intersection of Carolina Street at Carlsbad Street is reported to have experienced 17 crashes during the three-year period analyzed. Of these 17 crashes, 14 were rear-end collision and three were angle collisions. Four crashes resulted in personal injury and 13 crashes resulted in property damage only.

The unsignalized intersection of Carlsbad Street at Field Street is reported to have experienced three crashes during the three-year period analyzed. All three crashes were angle collisions resulting in property damage only.

The unsignalized intersection of Carlsbad Street at Burnham Avenue is reported to have experienced four crashes during the three-year period analyzed. Of these four crashes, three were angle collisions and one was a single vehicle crash. All four crashes resulted in property damage only.

Based on a review of the crash narratives, the collisions that occurred at the study area intersection were not reported to be related to the intersection geometry. Additionally, the relatively low crash frequency at the study area intersections and the low severity of the observed crashes (property damage only), do not reflect existing safety deficiencies at the intersection.

FUTURE CONDITIONS

To determine future traffic demands on the study area roadways and intersections, the 2023 Existing traffic volumes were projected to the future-year 2028, in accordance with RIDOT guidelines. Traffic volumes on the study area roadways in 2028 are considered to include existing traffic, as well as new traffic resulting from general growth in the study area and from other planned development projects, independent of the proposed project. The potential background traffic growth, unrelated to the proposed project, was considered in the development of the 2028 No Build (without project) peak hour traffic volumes. The estimated traffic increases associated with the proposed project were then added to the 2028 No Build volumes to reflect the 2028 Build (with project) traffic conditions. A more detailed description of the development of the 2028 No Build and 2028 Build traffic volume networks is presented below.

Future Roadway Improvements

Planned roadway improvement projects can affect area travel patterns and future traffic operations. To develop a clearer understanding of future area roadway operations, the City of Cranston was consulted. Based on a discussion with the City of Cranston, no planned roadway improvement projects in the vicinity of the study area were identified which are anticipated to impact future-year 2028 traffic volumes.

The Rhode Island State Transportation Improvement Program (STIP) online map was also reviewed to develop an understanding of future area roadway improvement projects. The STIP map is accessible to the public and shows the locations of upcoming roadway improvement projects throughout the state. According to the STIP map, there are no planned roadway improvement projects within the vicinity of the project site that would be expected to impact study area traffic operations under future conditions.

Background Traffic Growth

Traffic growth is generally a function of changes in motor vehicle use and expected land development within the area. To establish the rate at which traffic on the study area roadways can be expected to grow during the five-year forecast period (2023 to 2028), both planned area developments and historic traffic growth were reviewed.

Site-Specific Growth

Based on discussions with the City of Cranston Planning Department, there are no known developments proposed in the vicinity of the study area that would generate noticeable additional traffic within the study area. The Cranston Printworks Redevelopment project is located approximately 0.70 miles southwest of the proposed project site, but the study area intersections identified for the Cranston Printworks Redevelopment do not overlap with the study area intersections reviewed in this study.

Historic Traffic Growth

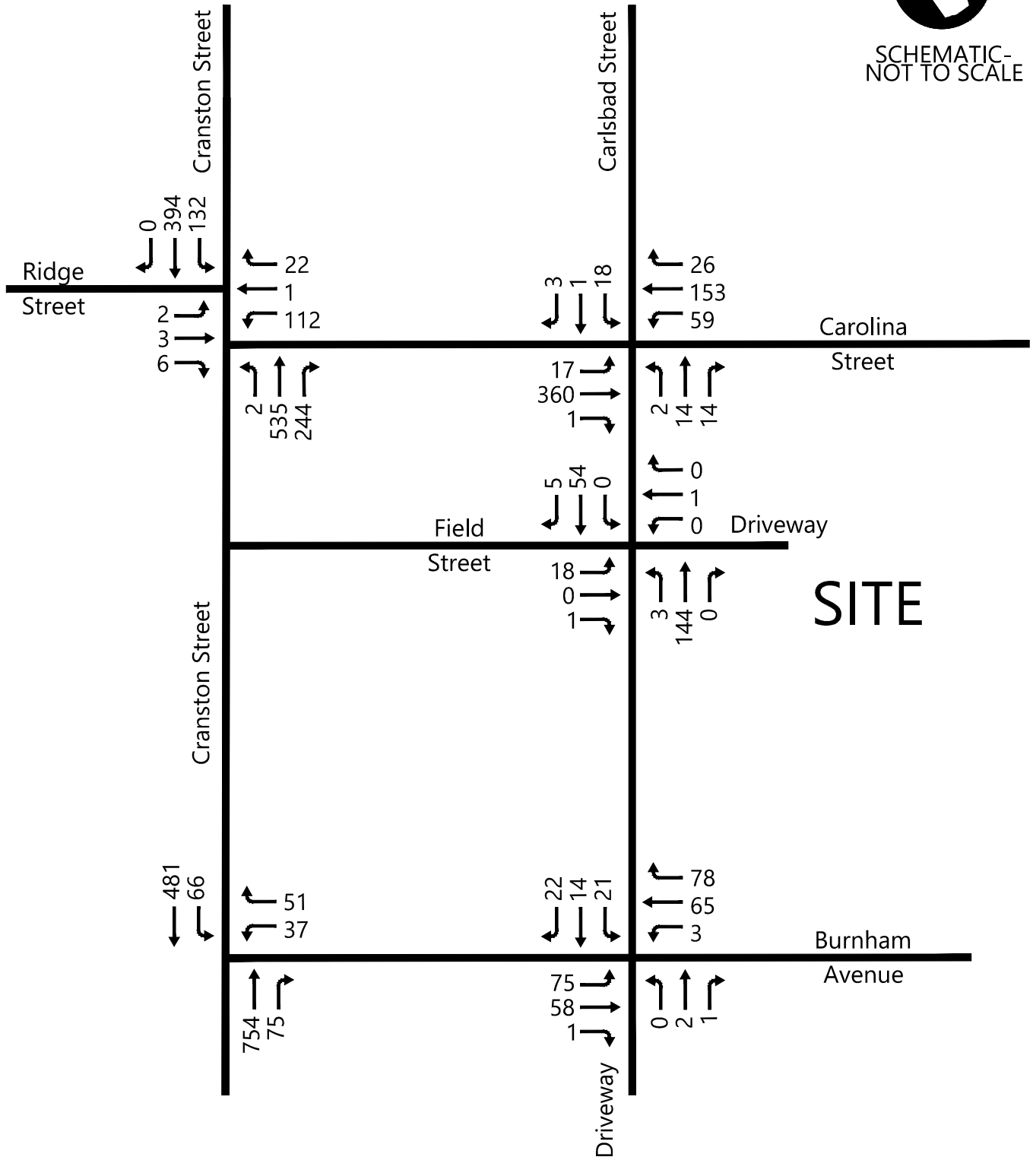
Based on information provided as part of the Rhode Island Statewide Planning Program, a background traffic growth rate of one percent per year, compounded annually, was utilized in this analysis. The one percent per year is considered to account for general traffic growth in the area and future development projects that are not yet known.

2028 No Build Traffic Volumes

The 2023 Existing peak hour traffic volumes were grown by one percent per year, compounded annually, over the five-year study horizon to establish the 2028 No Build weekday morning and weekday afternoon peak hour traffic volumes, which are illustrated in Figure 4 and Figure 5, respectively. The 2028 No Build traffic volumes are documented in the traffic projection model presented in Appendix B of this report.



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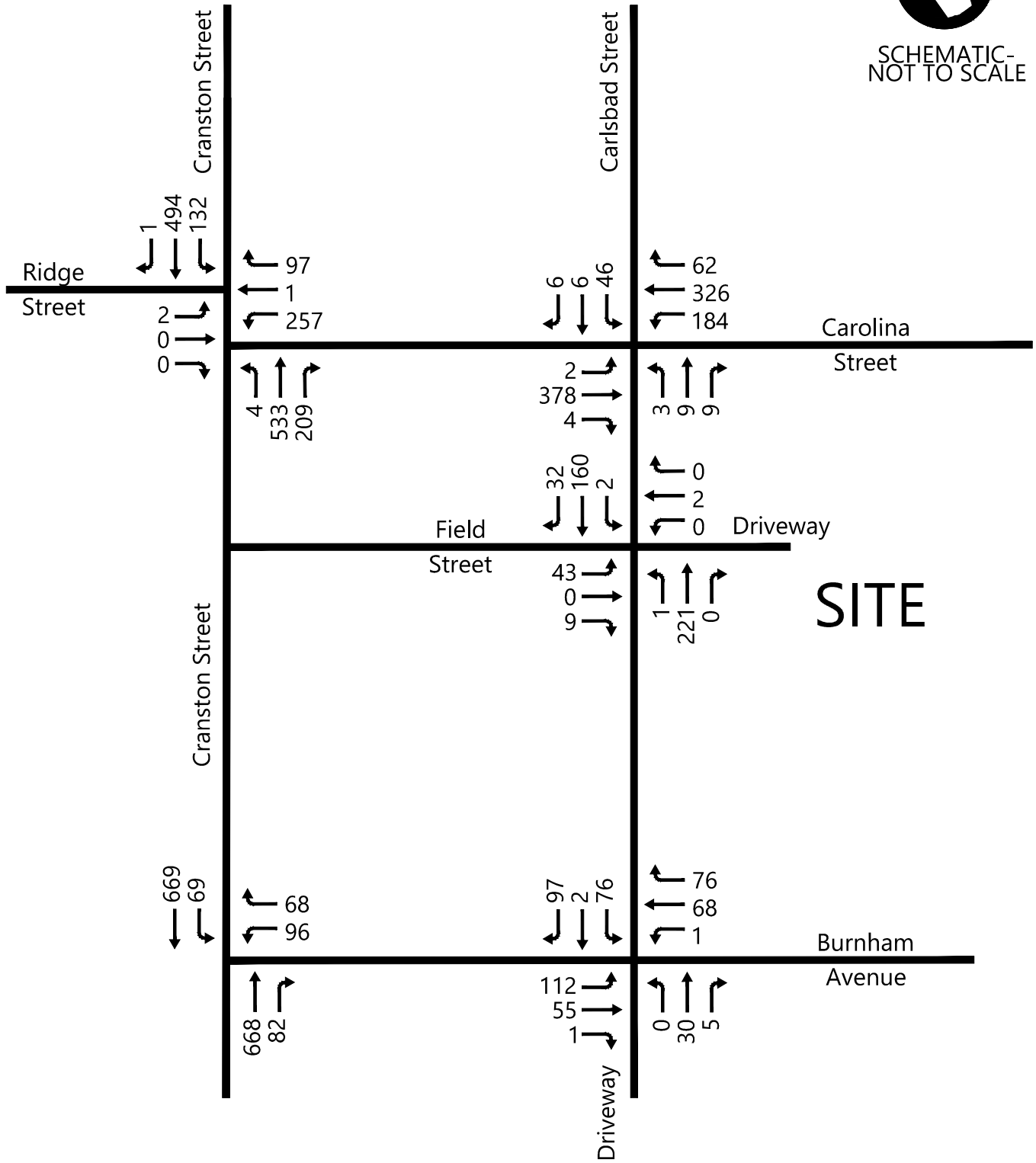


SITE

Figure 4
2028 No Build Weekday Morning
Peak Hour Traffic Volumes
Proposed Warehouse Expansion
Cranston, Rhode Island



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SITE

Figure 5
2028 No Build Weekday Afternoon
Peak Hour Traffic Volumes
Proposed Warehouse Expansion
Cranston, Rhode Island

Site-Generated Traffic

To estimate the number of vehicle trips associated with the project, the Institute of Transportation Engineers' (ITE) publication, *Trip Generation Manual, 11th Edition*, was referenced. This publication provides traffic generation information for various Land Use Codes (LUCs) compiled from studies conducted by members nationwide. The trip generation estimates for the proposed 97,860 sf warehouse building were developed based on data presented in the *Trip Generation Manual* for LUC 150 (Warehousing). This reference establishes vehicle trip rates (in this case expressed in trips per employee) based on actual traffic counts conducted at similar types of existing land uses. Based on new employee information provided by Taco, Inc., it is estimated that 16 new employees would work at the new facility upon completion of construction, with the potential for up to 25 additional employees (approximately five per year over 5 years beyond completion). To provide a conservative analysis, a total of 41 employees was used to estimate the number of new passenger vehicle project trips as provided by LUC 150. The new truck project trips were based on information provided from Taco, Inc. A summary of the peak hour trip generation estimates for the Project are summarized in Table 3 below.

Table 3: Estimated Project Trips

Description	Weekday AM Peak Hour			Weekday PM Peak Hour		
	In	Out	Total	In	Out	Total
Proposed Warehouse ⁽¹⁾	19	7	26	10	17	27
Proposed Warehouse ⁽²⁾ - Truck Trips	<u>2</u>	<u>1</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>3</u>
Total Trips	21	8	29	11	19	30

(1) ITE Land Use Code 150 (Warehousing), based on 41 employees.

(2) ITE Land Use Code 150 (Warehousing) - Truck Trips, based on information from TACO.

As shown in Table 3, the proposed project is estimated to result in approximately 29 new vehicle trips (21 entering vehicles and 8 exiting vehicles) during the weekday morning peak hour and approximately 30 new vehicle trips (11 entering vehicles and 19 exiting vehicles) during the weekday afternoon peak hour. In addition, approximately five trucks that currently park at an existing warehouse building across the street are now expected to park at the new warehouse facility. These rerouted trips are shown in the attached traffic projection model included in Appendix B.

Project Trip Distribution and Assignment

The traffic estimated to be generated by the proposed expansion was distributed onto the study area roadways and intersections based on the existing and logical travel patterns of the adjacent roadways. The resulting arrival and departure patterns are presented in Figure 6 and are documented in the traffic projection model located in Appendix B.

The project-related traffic was then assigned to the surrounding roadway network based on the project trip distribution patterns presented in Figure 6. The resulting distributed new project trips are shown in Figure 7 and Figure 8 for the weekday morning and weekday afternoon peak hours, respectively.

It should be noted that Taco, Inc. employees work in two main shifts that occur outside of the observed peak hours; 7:00 AM to 3:30 PM and 4:00 PM to 12:30 AM. Based on these time frames, employees arriving and departing the site are not expected to fully coincide with the weekday morning and afternoon peak hours defined in this study. In order to provide a conservative analysis, all of the projected additional employee trips have been included in the future 2028 weekday morning and weekday afternoon peak hour Build conditions.

2028 Build Traffic Volumes

To establish the 2028 Build peak hour traffic volumes, the distributed new project trips shown in Figure 7 and Figure 8 were then added to the 2028 No Build peak hour traffic volumes to reflect the 2028 Build peak hour traffic volumes. The resulting 2028 Build weekday morning and weekday afternoon peak hour traffic volumes are presented in Figure 9 and Figure 10, respectively. The 2028 Build traffic volumes are documented in the traffic projection model presented in Appendix B of this report.

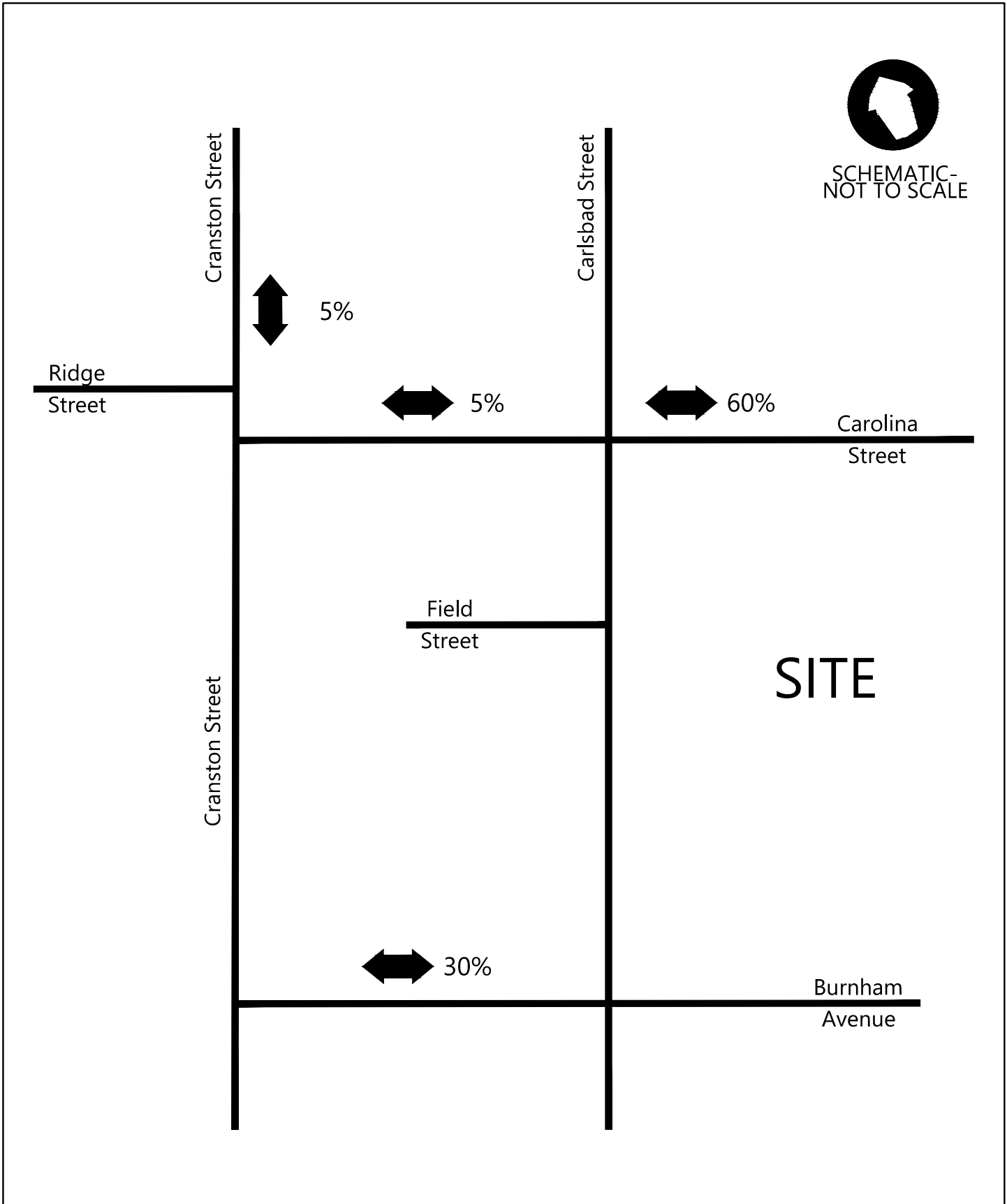
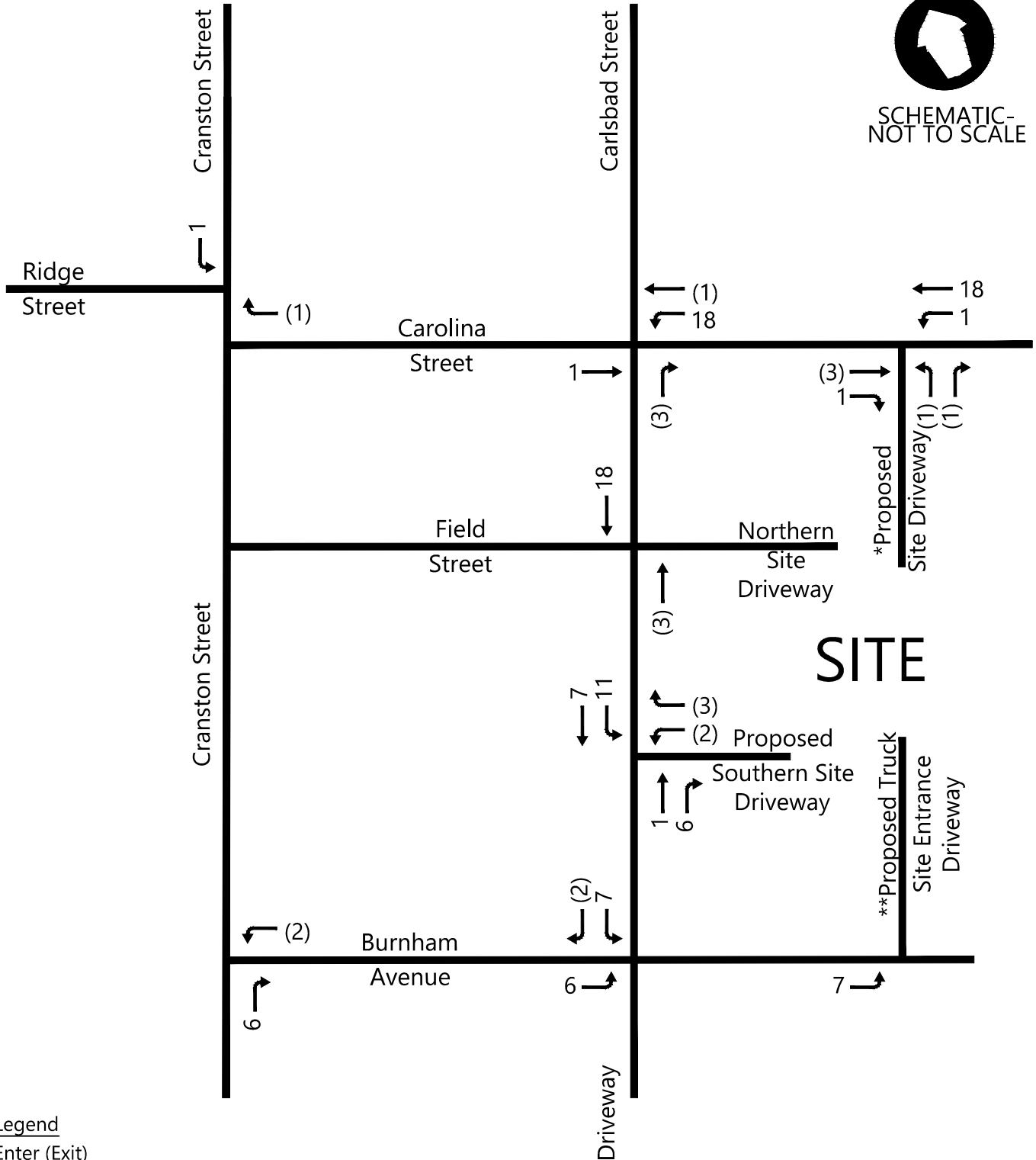


Figure 6
Direction of Arrivals and Departures
Proposed Warehouse Expansion
Cranston, Rhode Island



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Legend

Enter (Exit)

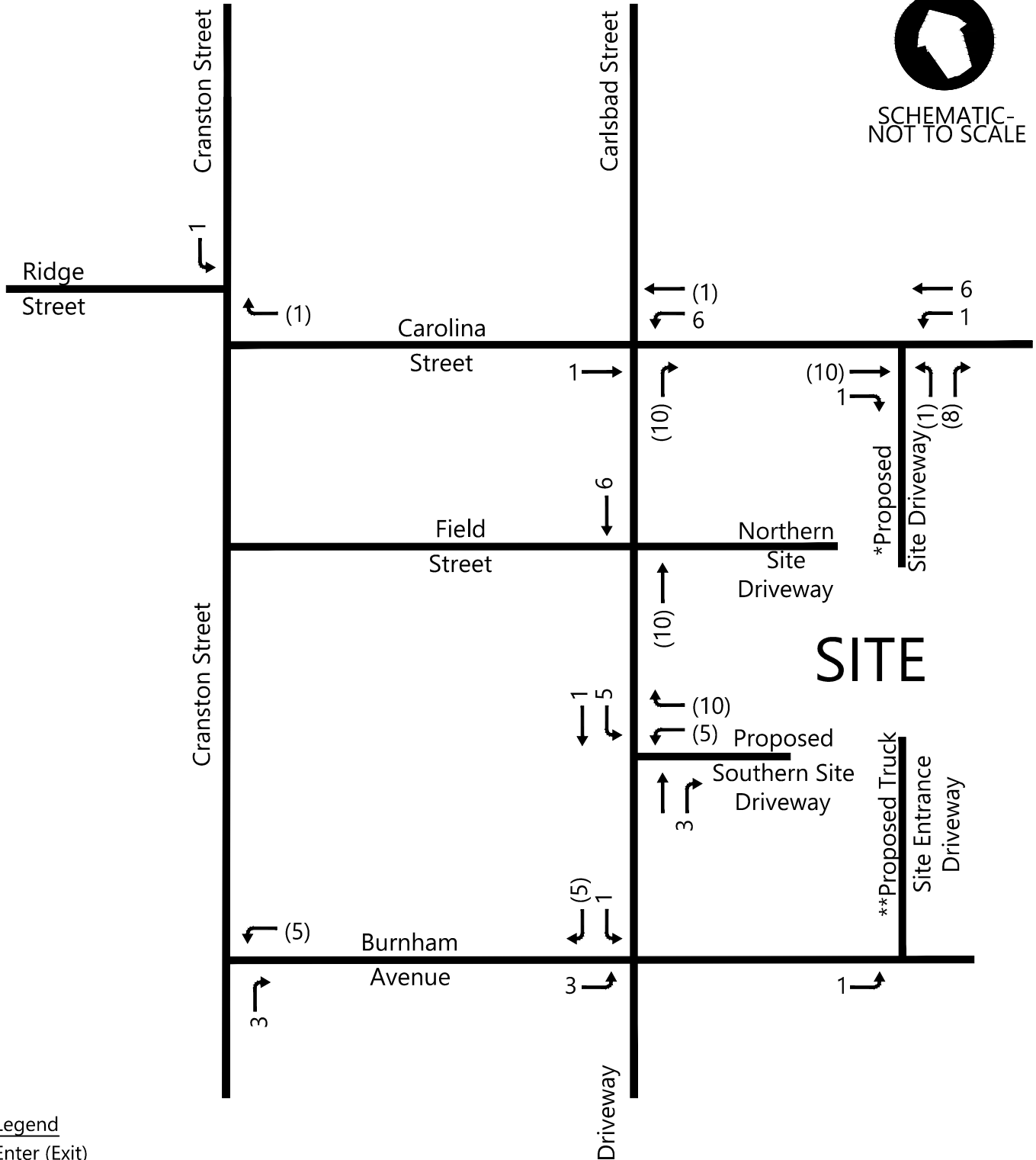
*Proposed Site Driveway Entry (passenger vehicles only) and Exit (passenger vehicles and trucks)

**Proposed Truck Only Entry Site Driveway

Figure 7
Weekday Morning Peak Hour
New Project Trips
Proposed Warehouse Expansion
Cranston, Rhode Island



SCHEMATIC-
NOT TO SCALE



Legend

Enter (Exit)

*Proposed Site Driveway Entry (passenger vehicles only) and Exit (passenger vehicles and trucks)

**Proposed Truck Only Entry Site Driveway



SCHEMATIC- NOT TO SCALE

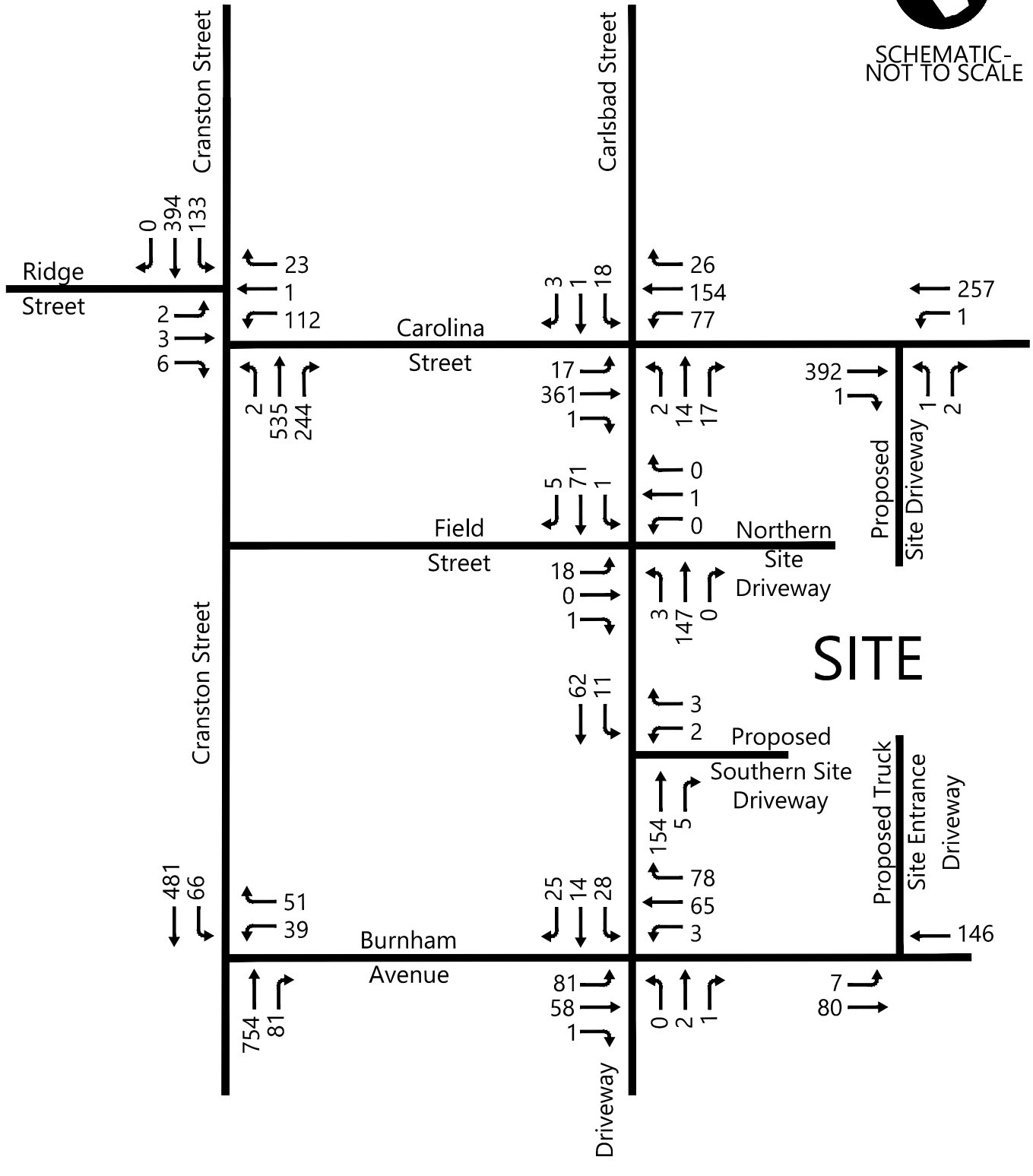


Figure 9
 2028 Build Weekday Morning
 Peak Hour Traffic Volumes
 Proposed Warehouse Expansion
 Cranston, Rhode Island



SCHEMATIC-
NOT TO SCALE

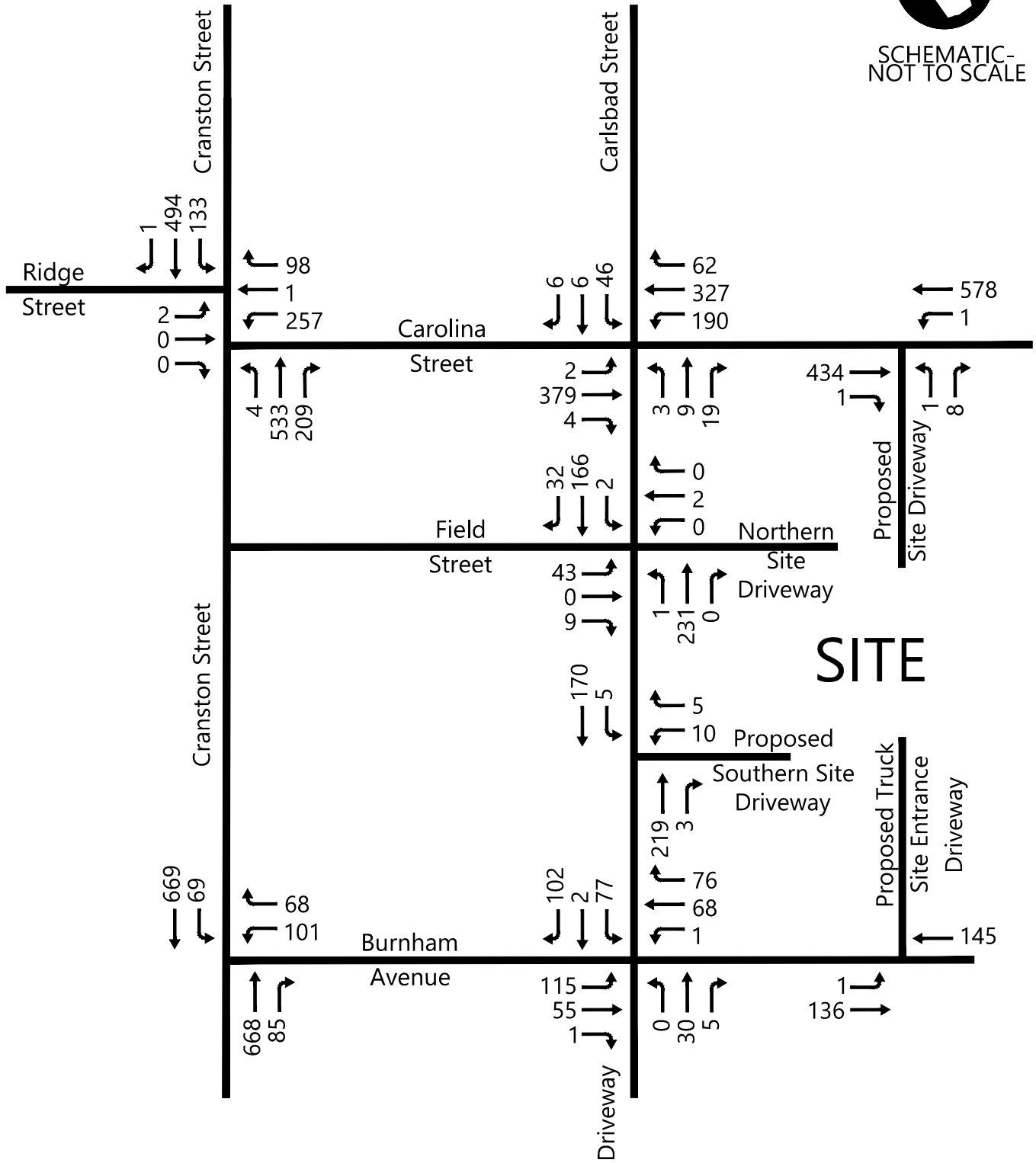


Figure 10
2028 Build Weekday Afternoon
Peak Hour Traffic Volumes
Proposed Warehouse Expansion
Cranston, Rhode Island

TRAFFIC SIGNAL WARRANT ANALYSIS

A traffic signal warrant analysis was performed for the intersections of Carolina Street at Carlsbad Street and Cranston Street at Burnham Avenue using the volumes collected in the February 2023 TMC. Right-turning volumes at intersections can potentially overstate the need for a traffic signal, as these movements typically operate with lower delays than left-turning movements and would reduce the need for a traffic signal. The Manual on Uniform Traffic Control Devices (MUTCD) signal warrant methodology considers the total approach volumes and does not account for the relative percentage of individual turning movements. As such, the MUTCD permits the reduction of right-turn volumes to identify if left-turn volumes exceed the warrant for the installation of a traffic signal. For the purpose of this analysis, 100% of Carlsbad Street northbound right-turn volumes and 100% of Burnham Avenue westbound right-turn volumes were removed from the traffic volumes to perform the signal warrant analysis.

The warrant analysis was based on procedures outlined in the latest edition of the MUTCD. The MUTCD establishes nine criteria, referred to as warrants, for the installation of traffic signals. The warrants are based upon traffic volumes, existing roadway conditions, crash history, pedestrian volumes, and proximity to schools. The manual states that satisfaction of these warrants does not in itself require the installation of a traffic signal. However, a traffic signal should not be installed unless one or more of the warrants is met.

The analyses performed for this traffic assessment are based on the criteria for the Eight-Hour (Warrant 1), Four-Hour (Warrant 2), and Peak Hour (Warrant 3) volume warrants. The following warrants were not applicable to this project: Pedestrian Volumes (Warrant 4), School Crossing (Warrant 5), Coordinated Signal System (Warrant 6), Roadway Network (Warrant 8), and Intersection Near a Grade Crossing (Warrant 9). In addition, Crash Experience (Warrant 7), was not used for this traffic assessment. Based on guidance from the Federal Highway Administration (FHWA), "five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash." Based on the crash summary, there were fewer than three angle collisions that may be considered correctable by a traffic control signal that occurred within a 12-month time period at the intersections of Cranston Street at Burnham Avenue and Carolina Street at Carlsbad Street. As such, Warrant 7 is not applicable.

The Eight-Hour (Warrant 1) and Four-Hour (Warrant 2) vehicular volume signal warrants are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing traffic signal control at an intersection. Warrant 1 is separated into Conditions A and B. According to the MUTCD, "the Minimum Vehicular Volume, Condition A, is intended for application at locations where a large volume of intersection traffic is the principal reason to consider installing a traffic control signal." The MUTCD also sets forth guidelines for Condition B, stating "the Interruption of Continuous Traffic, Condition B is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. In order for this warrant to be met, minimum vehicular volumes for the major street and minor street, found in Table 4C-1 of the MUTCD, must be exceeded. If any one condition is satisfied, Warrant 1 is met."

To satisfy Warrant 2, the plotted points representing the hourly volumes on the major street and minor street intersection approaches during any four hours of an average weekday must fall above the applicable curve in Figure 4C-2 of the MUTCD.

The Peak Hour (Warrant 3) vehicular volume signal warrant is intended for use at a location where traffic conditions are such that for a minimum of one hour of an average day, the minor-street traffic experiences undue delay when entering or crossing the major street. Warrant 3 is satisfied when the plotted point representing the total hourly traffic volume of both approaches on the major street and the corresponding hourly volume of the higher-volume minor street approach for one hour of an average day falls above the applicable curve in Figure 4C-4 of the MUTCD.

The results of the signal warrant analyses are attached in Appendix C, and a summary is provided in Table 4.

Table 4: Traffic Signal Warrant Analysis Summary

MUTCD Warrant	Cranston Street at Burnham Avenue Met?	Carolina Street at Carlsbad Street Met?
Warrant 1- Eight-Hour Warrant	No	No
Warrant 2- Four-Hour Warrant	No	No
Warrant 3- Peak-Hour Warrant	No	No

As shown in Table 4 above, the traffic volumes in the intersections of Cranston Street at Burnham Avenue and Carolina Street at Carlsbad Street do not meet Warrants 1, 2 or 3.

It should be noted that a signal warrant analysis for the intersections of Cranston Street at Burnham Avenue and Carolina Street at Carlsbad Street was previously completed in 2006 by Earth Tech, Inc. as part of a prior Traffic Impact Study (TIS) for a previous warehouse expansion across the street from the proposed project site. Based on the traffic volumes collected in 2005 and 2006, the intersection of Cranston Street at Burnham Avenue was shown to meet signal warrants 1B, 2 and 3. The raw TMC volumes included in Appendix A of the Earth Tech, Inc. TIS were not available to review, however The prior signal warrant analysis may not have accounted for removal of right turn volumes as permitted by the MUTCD which results in warrants 1B, 2 and 3 being met for the Cranston Street at Burnham Avenue intersection.

Based on a review of the MUTCD signal warrant analysis, the installation of a traffic signal would not be warranted. Under 2028 Build conditions with a minimal volume of new trips expected, signal warrants would continue to not be met with the project in place.

TRAFFIC OPERATIONS ANALYSIS

In previous sections of this report, the quantity of traffic at the study area intersections has been discussed. This section describes the overall quality of the traffic flow at the study area intersections during the weekday morning and weekday afternoon peak hours. As a basis for this assessment, intersection capacity analysis was conducted using the Synchro capacity analysis software at the study area intersections under the 2023 Existing, 2028 No Build, and 2028 Build peak hour traffic conditions. The analysis is based on Synchro capacity analysis methodologies and procedures contained in the *Highway Capacity Manual, 6th Edition* (HCM), which are summarized in Appendix D. A discussion of the evaluation criteria and a summary of the results of the capacity analysis are presented below.

Level-of-Service Criteria

Average total vehicle delay is reported as level-of-service (LOS) on a scale of A to F. LOS A represents delays of 10 seconds or less and LOS F represents delays in excess of 50 seconds for unsignalized intersections and greater than 80 seconds for signalized intersections. A more detailed description of the LOS criteria is provided in Appendix D.

Capacity Analysis Results

Intersection capacity analysis was conducted using Synchro capacity analysis software for the study area intersections to evaluate the 2023 Existing, 2028 No Build, and 2028 Build traffic conditions during the weekday morning and weekday afternoon peak hours. The peak hour traffic volumes utilized as part of this analysis are provided in the traffic projection model, attached in Appendix B of this report.

The Synchro capacity analysis results for the 2023 Existing, 2028 No Build and 2028 Build traffic conditions are presented in Appendix E, Appendix F, and Appendix G, respectively. The capacity analysis results for the study area intersections are presented in Table 5 and Table 6 below for the weekday morning and weekday afternoon peak hours, respectively. The results of the specific capacity analysis at the study area intersections are discussed below, with a more detailed summary of the capacity analysis for the study area intersection provided in Appendix H.

Table 5: Weekday Morning Intersection Capacity Analysis

Intersection	Movement	2023 Existing			2028 No Build			2028 Build		
		LOS ¹	Delay ²	V/C ³	LOS	Delay	V/C	LOS	Delay	V/C
Cranston Street at Ridge Street/Carolina Street	EB LTR	C	29.5	0.18	C	29.5	0.18	C	29.5	0.18
	WB LTR	D	41.2	0.62	D	41.6	0.63	D	41.4	0.63
	NB LTR	F	>80.0	>1.00	F	>80.0	>1.00	F	>80.0	>1.00
	SB L	B	13.5	0.33	B	13.8	0.34	B	13.8	0.35
	TR	B	12.9	0.38	B	13.3	0.40	B	13.3	0.40
	<i>Overall</i>	<i>F</i>	<i>>80.0</i>	<i>0.86</i>	<i>F</i>	<i>>80.0</i>	<i>0.90</i>	<i>F</i>	<i>>80.0</i>	<i>0.90</i>
Cranston Street at Burnham Avenue	WB LR	C	23.7	0.36	D	26.1	0.40	D	26.7	0.41
	NB TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB LT	A	1.2	0.10	A	1.3	0.11	A	1.3	0.11
Carlsbad Street at Carolina Street	EB LTR	A	0.3	0.02	A	0.3	0.02	A	0.3	0.02
	WB LTR	A	2.1	0.06	A	2.1	0.06	A	2.6	0.08
	NB LT	B	12.1	0.06	B	12.6	0.06	B	12.5	0.07
	SB LTR	C	18.1	0.08	C	19.4	0.09	C	20.9	0.10
Carlsbad Street at Field Street/ Northern Site Driveway	EB LTR	B	10.2	0.03	B	10.3	0.04	B	10.6	0.04
	WB LTR	B	10.4	0.01	B	10.5	0.01	B	10.7	0.01
	NB LTR	A	0.2	0.00	A	0.2	0.00	A	0.1	0.00
	SB LTR	A	0.0	0.00	A	0.0	0.00	A	0.1	0.00
Carlsbad Street at Burnham Avenue/Parking Lot	EB LTR	A	4.3	0.06	A	4.4	0.06	A	4.5	0.07
	WB LTR	A	0.2	0.00	A	0.2	0.00	A	0.2	0.00
	NB LTR	B	11.3	0.02	B	11.4	0.02	B	11.6	0.02
	SB LTR	B	11.6	0.13	B	11.8	0.14	B	12.2	0.17
Carolina Street at Proposed Northern Site Driveway	EB TR	-	-	-	-	-	-	A	0.0	0.00
	WB LT	-	-	-	-	-	-	A	0.0	0.00
	NB LR	-	-	-	-	-	-	B	11.9	0.01
Carlsbad Street at Proposed Southern Site Driveway	WB LR	-	-	-	-	-	-	A	9.5	0.01
	NB TR	-	-	-	-	-	-	A	0.0	0.00
	SB LT	-	-	-	-	-	-	A	1.1	0.01

1 Level-of-Service

2 Average vehicle delay in seconds

3 Volume to capacity ratio

- Not Applicable

Table 6: Weekday Afternoon Intersection Capacity Analysis

Intersection	Movement	2023 Existing			2028 No Build			2028 Build		
		LOS ¹	Delay ²	V/C ³	LOS	Delay	V/C	LOS	Delay	V/C
Cranston Street at Ridge Street/Carolina Street	EB LTR	D	39.0	0.03	D	39.5	0.03	D	39.5	0.03
	WB LTR	E	55.3	0.90	E	65.7	0.96	E	66.2	0.96
	NB LTR	F	>80.0	>1.00	F	>80.0	>1.00	F	>80.0	>1.00
	SB L	B	12.9	0.26	B	12.9	0.27	B	12.9	0.27
	TR	B	15.4	0.50	B	15.8	0.52	B	15.8	0.52
	<i>Overall</i>	<i>F</i>	<i>>80.0</i>	<i>0.93</i>	<i>F</i>	<i>>80.0</i>	<i>0.97</i>	<i>F</i>	<i>>80.0</i>	<i>0.97</i>
Cranston Street at Burnham Avenue	WB LR	E	43.5	0.70	F	55.4	0.79	F	60.0	0.82
	NB TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB T	A	1.0	0.09	A	1.0	0.10	A	1.0	0.10
Carlsbad Street at Carolina Street	EB LTR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	WB LTR	A	2.9	0.17	A	2.9	0.18	A	3.0	0.19
	NB LT	C	22.3	0.11	C	24.7	0.12	C	18.8	0.13
	SB LTR	F	60.5	0.56	F	79.1	0.65	F	86.0	0.68
Carlsbad Street at Field Street/ Proposed Northern Site Driveway	EB LTR	B	12.3	0.10	B	12.7	0.11	B	12.9	0.11
	WB LTR	B	14.7	0.01	C	15.1	0.01	C	15.4	0.01
	NB LTR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB LTR	A	0.1	0.00	A	0.1	0.00	A	0.1	0.00
Carlsbad Street at Burnham Avenue/Parking Lot	EB LTR	A	5.2	0.09	A	5.3	0.10	A	5.3	0.10
	WB LTR	A	0.1	0.00	A	0.1	0.00	A	0.1	0.00
	NB LTR	B	13.4	0.11	B	13.8	0.12	B	13.9	0.12
	SB LTR	B	13.2	0.30	B	13.8	0.32	B	14.0	0.34
Carolina Street at Proposed Northern Site Driveway	EB TR	-	-	-	-	-	-	A	0.0	0.00
	WB LT	-	-	-	-	-	-	A	0.0	0.00
	NB LR	-	-	-	-	-	-	B	12.3	0.02
Carlsbad Street at Proposed Southern Site Driveway	WB LR	-	-	-	-	-	-	B	10.2	0.02
	NB TR	-	-	-	-	-	-	A	0.0	0.00
	SB LT	-	-	-	-	-	-	A	0.2	0.00

1 Level-of-Service

2 Average vehicle delay in seconds

3 Volume to capacity ratio

- Not Applicable

Cranston Street at Ridge Street/Carolina Street

As shown above, the existing signalized intersection of Cranston Street at Ridge Street/Carolina Street is shown to currently operate at overall LOS F during both the weekday morning and weekday afternoon peak hours. Under 2028 No Build conditions (without the proposed project), the intersection is shown to continue operating at overall LOS F during both peak hours analyzed and under capacity (volume-to-capacity ratio under 1.0) which indicates that exiting vehicles can be processed and the delay experienced is a function of the volumes on Carolina Street and Cranston Street. With the proposed project in place, the intersection is shown to experience minor increases in overall average vehicle delay when compared to 2028 No Build. Under all scenarios, the northbound movement operates at LOS F and over capacity.

Certain intersection movements could be mitigated through the implementation of optimized traffic signal timings; however, a rebalancing of timings would increase vehicle delays and the volume to capacity ratio on other approaches. No changes to the existing signal timings are proposed as mitigation as part of this study.

Cranston Street at Burnham Avenue

The stop-controlled westbound left-turn/right-turn movement at the existing unsignalized intersection of Cranston Street at Burnham Avenue is shown to currently operate at LOS C during the weekday morning peak hour and LOS E during the weekday afternoon peak hour. Under 2028 No Build conditions (without the proposed project), the critical westbound movement is shown to degrade to LOS D and LOS F for the weekday morning and weekday afternoon peak hour, respectively. With the proposed project in place under 2028 Build conditions, the westbound exiting left-turn/right-turn movement onto Cranston Street is shown to continue operating at LOS D and LOS F for the weekday morning and weekday afternoon peak hour, respectively, and under capacity.

Carlsbad Street at Carolina Street

The stop-controlled approaches to the unsignalized intersection of Carlsbad Street at Carolina Street are shown to operate at LOS C or better during the weekday morning peak hour. During the weekday afternoon peak hour, the northbound and southbound movements are shown to operate at LOS C and LOS F, respectively. Under 2028 No Build conditions (without the proposed project), the northbound and southbound movements are shown to continue operating at LOS C or better during the weekday morning peak hour. During the weekday afternoon peak hour, the northbound and southbound movements are shown to operate at LOS C and LOS F (and under capacity), respectively. With the proposed project in place under 2028 Build conditions, the northbound and southbound movements are shown to continue operating at LOS C or better during the weekday morning peak hour. During the afternoon peak hour, the northbound and southbound movements are shown to continue operating at LOS C and LOS F (and under capacity), respectively.

Carlsbad Street at Burnham Avenue/Parking Lot

The stop-controlled approaches to the unsignalized intersection of Carlsbad Street at Burnham Avenue/parking lot are currently shown to operate at LOS B during both the weekday morning and weekday afternoon peak hours. Under 2028 No Build conditions (without the proposed project) and under 2028 Build conditions (with the proposed project in place), all approaches are shown to operate under capacity at LOS B or better during both peak hours studied.

Carlsbad Street at Field Street/Northern Site Driveway

With the proposed project in place under 2028 Build conditions, the westbound left-turn/through/right-turn movement from the site onto Carlsbad Street is projected to operate at LOS B during the weekday morning peak hour and LOS C during the weekday afternoon peak hour.

Carolina Street at Proposed Northern Site Driveway

With the proposed project in place under 2028 Build conditions, the northbound left-turn/right-turn movements from the site onto Carolina Street are shown to operate at LOS B during both the weekday morning and weekday afternoon peak hours.

Carlsbad Street at Proposed Southern Site Driveway

With the proposed project in place under 2028 Build conditions, the westbound left-turn/right-turn movements from the site onto Carlsbad Street are shown to operate at LOS A during the weekday morning peak hour and LOS B during the weekday afternoon peak hour.

The exiting delay and vehicle queues at the project site driveways resulting from the proposed project would be incurred by vehicles internal to the site and would not be anticipated to impact operations along adjacent roadways. All driveway approaches are projected to operate under capacity.

Site Access and Circulation

Access to the project site would be provided via two unsignalized full-access driveways on Carlsbad Street, a one-way truck entrance on Burnham Avenue, and a one-way truck exit on Carolina Street. Passenger vehicles would be permitted to enter the northern parking lot from Carolina Street and exit from Carolina Street, although the majority are anticipated to utilize the southern parking lot driveway on Carlsbad Street. Site access would be accommodated by a two-way circulatory parking lot for passenger vehicles, with signage and pavement markings proposed to inform drivers of the site circulation. A truck turning plan was provided by Woodard and Curran, dated January 25, 2023, showing truck movements entering at the Burnham Avenue one-way truck driveway and exiting at the Carolina Street one-way truck exit. The plan also shows turning movements from trucks exiting the proposed bays. The existing geometry of the study area roadways accommodates the anticipated truck turning movements.

As previously noted, Taco, Inc. employees work primarily in two shifts that occur outside of the peak hours; 7:00 AM to 3:30 PM and 4:00 PM to 12:30 AM. As such, employees arriving and departing the site are not expected to fully coincide with the weekday morning and afternoon peak hours defined in this study. Parking lot driveway observations were conducted during the weekday afternoon peak hour (4:00 PM to 5:00 PM) to review operations at the existing employee parking lots. Based on these observations, six vehicles were observed entering the Burnham Street parking lot and 45 vehicles were observed exiting. A combined total of 14 vehicles were observed exiting the parking lots along Carlsbad Street, with no vehicles entering during the weekday afternoon peak hour.

Woodard and Curran also prepared a parking memorandum dated February 3, 2023 to describe the existing and proposed parking changes as a result of the project. Based on Woodard and Curran's review of parking, a total of 393 parking spaces are available for employees and visitors between two lots. With the proposed development and addition of new employees as a result of the proposed project, a total of 268 parking spaces would be required during the highest shift. The total number of parking spaces provided between the two parking lots exceeds the projected peak parking demand. The Woodard and Curran parking memorandum is included in Appendix I.

Based on a review of the site plan and truck turning plan, the existing driveways and proposed parking lot are expected to allow for safe and efficient site access and circulation.

Sight Distance

A field review of the available sight distance was conducted at the project site driveways on Carolina Street, Carlsbad Street, and Burnham Avenue. The American Association of State Highway and Transportation Officials (AASHTO) publication, *A Policy on Geometric Design, 2018 Edition*, defines minimum and recommended sight distances at intersections.

The minimum sight distance is based on the required stopping sight distance (SSD) for vehicles traveling along the main roadway. The recommended sight distance allows vehicles to enter the main street traffic flow without requiring the mainline traffic to slow to less than 70% of their speed and is referred to as intersection sight distance (ISD). According to AASHTO, “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 time to anticipate and avoid collisions.” The 85th percentile speed along Carolina Street and Carlsbad Street were used to establish the stopping sight distance and intersection sight distance criteria, while the assumed 25 mph speed limit on Burnham Avenue was used to establish the stopping sight distance and intersection sight distance criteria at the southern project site driveway, as shown in Table 7 and Table 8, respectively. For the purpose of this TIS, a “combination truck” was utilized as the design vehicle for the Carolina Street project site driveway due to the driveway being the designated truck exit for the facility.

Table 7: Stopping Sight Distance Summary

Site Driveway Location	Travelling	Posted Speed Limit (mph)	85th % Speed (mph)	SSD ¹ Required (feet)	SSD Measured (feet)	Meets Required SSD?
Proposed Northern Site Driveway at Carolina Street	Eastbound	25	27	170	405	Yes
	Westbound	25	29	190	>500	Yes
Proposed Northern Site Driveway at Carlsbad Street	Northbound	-	32	220	>500	Yes
	Southbound	-	31	210	>500	Yes
Proposed Southern Site Driveway at Carlsbad Street	Northbound	-	32	220	160 ²	No
	Southbound	-	31	210	>500	Yes
Proposed Southern Site Driveway at Burnham Avenue	Eastbound	25	-	155	>500 ³	Yes
	Westbound	25	-	155	311	Yes

1 Stopping sight distance (see AASHTO equations 3-2 and 3-3) utilized based on the 85th percentile speeds for Carolina Street and Carlsbad Street, and the assumed speed limit for Burnham Avenue.

2 Sightline extends from the T-intersection with Burnham Avenue.

3 Sightline extends from the T-intersection with Cranston Street.

As shown in Table 7, the available SSD at the project site driveways exceed the AASHTO SSD requirements for the 85th percentile speed on Carolina Street and the 25-mph speed consideration on Burnham Avenue. The available SSD for vehicles along Carlsbad Street exceeds the AASHTO requirements for the 85th percentile speed, with the exception of the northbound approach to the proposed southern site driveway, as the measured 160 feet extends to the T-intersection with Burnham Street. Due to the proximity to the intersection with Burnham Avenue, it is anticipated that vehicle speeds may be slightly less than the observed 85th percentile speed due to vehicles slowing to complete

turning movements. The sight distance measurements were based on the 85th percentile speed obtained on Carlsbad Street north of the proposed parking lot driveway to obtain free-flow speeds.

Table 8: Intersection Sight Distance Summary

Site Driveway Location	Looking	Posted Speed Limit (mph)	85th % Speed (mph)	ISD ¹ Recommended	ISD Measured	Meets Recommended ISD?
Proposed Northern Site Driveway at Carolina Street	Left (West)	25	27	420	325 ²	No
	Right (East)	25	29	495	> 500	Yes
Proposed Northern Site Driveway at Carlsbad Street	Left (South)	-	32	310	> 500	Yes
	Right (North)	-	31	345	> 500	Yes
Proposed Southern Site Driveway at Carlsbad Street	Left (South)	-	32	310	160 ³	No
	Right (North)	-	31	345	> 500	Yes

1 Intersection sight distance (see AASHTO equations 9-1 and 9-2) based on the 85th percentile speeds.

2 Sightline would meet AASHTO recommended distances if the storage yard moved equipment further away from Carolina Street.

3 Sightline extends to the T-intersection with Burnham Avenue.

As shown above in Table 8, the existing available ISD for trucks exiting the site via the northern project site driveway onto Carolina Street is less than the AASHTO ISD recommendations for the 85th percentile speed. There is a storage yard on the northwest corner of the intersection of Carolina Street and Carlsbad Street that impedes sight distance when looking left. Sight distance would meet the AASHTO recommended distances if the equipment was moved further into the yard away from Carolina Street.

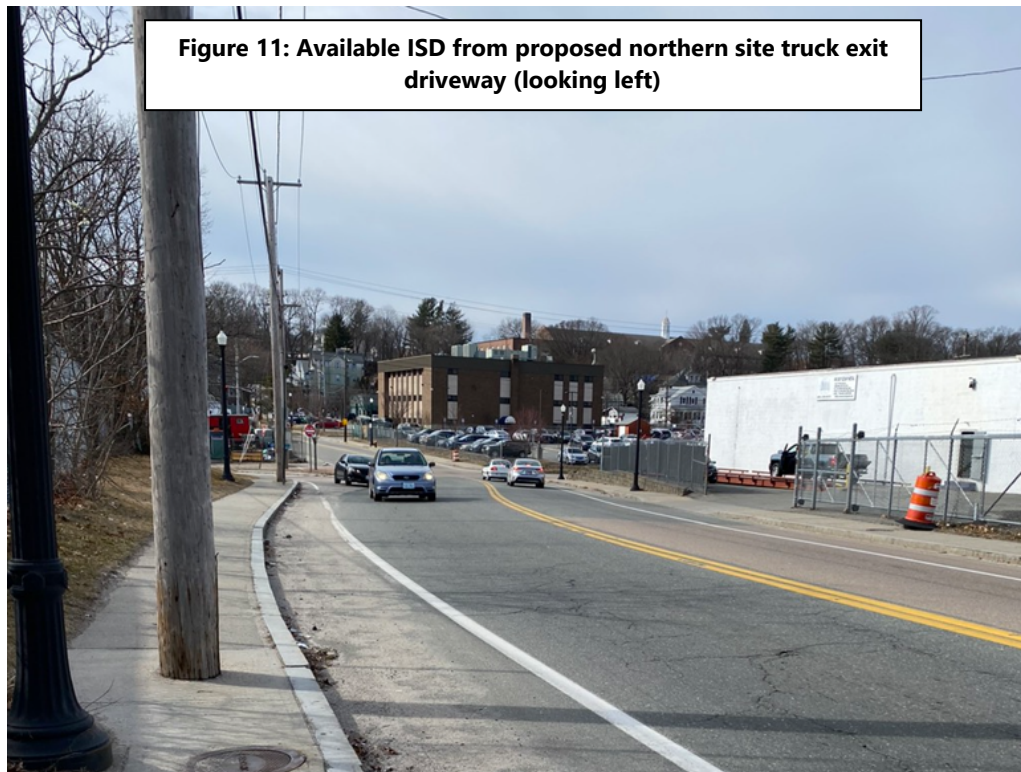


Figure 11: Available ISD from proposed northern site truck exit driveway (looking left)

ISD for vehicles exiting the site via the proposed northern project site driveway onto Carlsbad Street exceeds the AASHTO ISD recommendations for the 85th percentile speed. At the southern project site driveway, ISD exceeds the AASHTO ISD recommendations for the 85th percentile speed when looking to the right (north); however, the ISD looking left (south) is shown to be less than required, due to the t-intersection with Burnham Avenue.

CONCLUSION

The proposed project involves the construction of an approximately 97,860 square foot (SF) warehouse building expansion to be located at 35 Carlsbad Street, in Cranston, Rhode Island. Access to the site would be provided via two unsignalized full-access driveways on Carlsbad Street, one unsignalized one way entrance driveway on Burnham Avenue, and one unsignalized one way exit driveway on Carolina Street. All exiting approaches would be under stop control for exiting vehicles.

The proposed project is estimated to generate approximately 29 new vehicle trips (21 entering vehicles and 8 exiting vehicles) during the weekday morning peak hour and approximately 30 new vehicle trips (11 entering vehicles and 19 exiting vehicles) during the weekday afternoon peak hour.

With the proposed project in place under 2028 Build conditions, operations at the project site driveways during the weekday morning and weekday afternoon peak hours are projected to operate at LOS B or better and under capacity. The project is not anticipated to have a noticeable impact on operations along Carolina Street or Carlsbad Street, or at the signalized intersection of Cranston Street at Carolina Street/Ridge Street.

The available sight distances at the project site driveways along Burnham Avenue and Carlsbad Street would not be impacted as part of the proposed development. ISD for vehicles exiting the site via the proposed northern project site driveway onto Carlsbad Street exceeds the AASHTO ISD recommendations for the 85th percentile speed. At the southern project site driveway, ISD exceeds the AASHTO ISD recommendations for the 85th percentile speed when looking to the right (north); however, the ISD looking left (south) is shown to be less than required, due to the t-intersection with Burnham Avenue. The available ISD for vehicles exiting the site via the proposed northern project site driveway onto Carolina Street is less than the AASHTO ISD recommendations for the 85th percentile speed. There is a storage yard with equipment on the northwest corner of the intersection of Carolina Street and Carlsbad Street that impedes sight distance when looking left. Sight distance would meet the AASHTO recommended distances if the stored equipment was moved further into the yard away from Carolina Street. It is recommended the City coordinate with the property owner of the storage yard about the location of the equipment storage on site in consideration of the proposed development. The available stopping sight distances measured at the study area intersections are considered acceptable and meet the AASHTO required stopping sight distances.

Based on a review of the analysis contained within this traffic impact study, the proposed project is not shown to have a significant impact on the overall traffic operations of the study area intersections and roadways.

Appendix for Traffic Impact Study

Proposed Warehouse Expansion

35 Carlsbad Street
Cranston, RI

Prepared by
McMahon, a Bowman Company
14 Breakneck Hill Road, Suite 201
Lincoln, RI 02865
401.648.7200

Prepared for
Taco, Inc.

March 2023

APPENDIX A
Traffic Count Data

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Cranston Street at Burnham Street
 Cranston, Rhode Island

File Name : 24136
 Site Code : 24136
 Start Date : 3/2/2023
 Page No : 1

Groups Printed- Lights - Trucks - Buses

Start Time	Cranston Street From North					Burnham Street From East					Cranston Street From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	1	64	8	1	74	9	0	5	3	17	20	109	0	3	132	0	0	0	0	0	223
07:15 AM	1	98	22	1	122	20	0	7	7	34	14	133	0	0	147	0	0	1	0	1	304
07:30 AM	0	110	19	0	129	18	0	10	4	32	15	148	0	0	163	0	0	0	0	0	324
07:45 AM	1	134	16	0	151	12	3	11	2	28	23	184	0	0	207	0	0	0	0	0	386
Total	3	406	65	2	476	59	3	33	16	111	72	574	0	3	649	0	0	1	0	1	1237
08:00 AM	0	105	12	0	117	12	0	7	0	19	18	207	0	0	225	0	0	0	0	0	361
08:15 AM	0	109	16	0	125	7	0	7	0	14	15	178	1	0	194	0	0	0	0	0	333
08:30 AM	0	81	10	0	91	13	0	2	0	15	8	115	0	0	123	0	0	0	0	0	229
08:45 AM	0	101	6	0	107	16	0	8	0	24	13	152	0	0	165	0	0	0	0	0	296
Total	0	396	44	0	440	48	0	24	0	72	54	652	1	0	707	0	0	0	0	0	1219
09:00 AM	0	89	13	0	102	15	0	11	2	28	16	137	0	0	153	0	0	0	0	0	283
09:15 AM	0	103	6	0	109	10	0	10	0	20	16	120	2	0	138	0	0	0	0	0	267
09:30 AM	0	94	12	0	106	9	0	5	0	14	8	98	0	0	106	0	0	0	0	0	226
09:45 AM	0	127	10	0	137	14	0	15	0	29	13	131	0	0	144	0	0	0	0	0	310
Total	0	413	41	0	454	48	0	41	2	91	53	486	2	0	541	0	0	0	0	0	1086
10:00 AM	0	83	4	0	87	2	0	5	1	8	9	95	0	0	104	0	0	0	0	0	199
10:15 AM	0	92	11	0	103	11	0	6	0	17	10	122	0	0	132	0	1	0	0	1	253
10:30 AM	0	119	15	0	134	11	0	23	2	36	9	130	0	0	139	0	1	0	0	1	310
10:45 AM	0	90	2	0	92	7	0	5	1	13	15	84	0	0	99	0	0	0	0	0	204
Total	0	384	32	0	416	31	0	39	4	74	43	431	0	0	474	0	2	0	0	2	966
11:00 AM	0	142	7	0	149	18	0	15	0	33	16	167	0	0	183	0	0	0	0	0	365
11:15 AM	0	67	9	0	76	7	0	7	0	14	6	107	0	0	113	0	0	0	0	0	203
11:30 AM	0	133	7	1	141	12	0	9	0	21	17	111	0	0	128	0	0	0	0	0	290
11:45 AM	0	130	9	0	139	17	0	9	0	26	11	110	0	0	121	0	0	0	0	0	286
Total	0	472	32	1	505	54	0	40	0	94	50	495	0	0	545	0	0	0	0	0	1144
12:00 PM	0	115	4	0	119	11	0	16	0	27	17	163	0	0	180	0	0	0	0	0	326
12:15 PM	0	110	10	4	124	17	0	11	0	28	13	108	0	0	121	0	0	0	0	0	273
12:30 PM	0	164	6	0	170	11	0	13	2	26	14	182	0	0	196	0	0	0	0	0	392
12:45 PM	0	100	12	0	112	12	0	12	0	24	9	123	0	0	132	0	0	0	0	0	268
Total	0	489	32	4	525	51	0	52	2	105	53	576	0	0	629	0	0	0	0	0	1259
01:00 PM	0	113	6	0	119	8	0	16	2	26	9	143	2	0	154	0	0	0	0	0	299
01:15 PM	0	125	12	1	138	15	0	15	1	31	15	177	0	0	192	0	0	0	0	0	361
01:30 PM	0	122	8	0	130	8	0	10	0	18	11	100	0	0	111	0	0	1	0	1	260
01:45 PM	0	143	11	0	154	16	0	18	0	34	15	170	0	0	185	0	0	0	0	0	373
Total	0	503	37	1	541	47	0	59	3	109	50	590	2	0	642	0	0	1	0	1	1293
02:00 PM	0	165	11	0	176	27	0	17	0	44	19	137	0	0	156	0	0	1	0	1	377
02:15 PM	0	140	11	0	151	16	0	12	0	28	10	126	1	0	137	0	0	0	0	0	316
02:30 PM	0	153	15	0	168	19	0	17	0	36	20	193	0	0	213	0	0	0	0	0	417
02:45 PM	0	134	22	0	156	10	0	18	1	29	24	130	0	0	154	0	0	0	0	0	339
Total	0	592	59	0	651	72	0	64	1	137	73	586	1	0	660	0	0	1	0	1	1449
03:00 PM	1	147	17	0	165	16	0	10	0	26	24	136	1	0	161	0	0	1	0	1	353
03:15 PM	0	135	16	0	151	27	0	20	0	47	25	142	0	0	167	0	1	0	0	1	366
03:30 PM	0	140	16	0	156	24	0	20	0	44	21	140	0	0	161	0	0	0	0	0	361
03:45 PM	0	166	24	0	190	17	0	19	1	37	18	152	0	0	170	0	0	0	0	0	397
Total	1	588	73	0	662	84	0	69	1	154	88	570	1	0	659	0	1	1	0	2	1477

Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

File Name : 24136
 Site Code : 24136
 Start Date : 3/2/2023
 Page No : 2

Groups Printed- Lights - Trucks - Buses

Start Time	Cranston Street From North					Burnham Street From East					Cranston Street From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	139	9	0	148	23	0	26	0	49	28	167	0	0	195	0	0	0	0	0	392
04:15 PM	0	172	18	0	190	19	0	21	0	40	26	162	0	0	188	1	0	0	0	1	419
04:30 PM	0	169	18	0	187	9	0	22	0	31	16	163	0	0	179	0	0	0	0	0	397
04:45 PM	0	157	21	0	178	14	0	22	1	37	8	144	0	0	152	0	0	0	0	0	367
Total	0	637	66	0	703	65	0	91	1	157	78	636	0	0	714	1	0	0	0	1	1575
05:00 PM	0	151	13	0	164	15	0	28	0	43	24	169	2	0	195	1	0	0	0	1	403
05:15 PM	0	154	11	0	165	8	0	24	0	32	14	174	2	0	190	1	0	0	0	1	388
05:30 PM	0	154	13	0	167	9	1	21	0	31	12	167	0	0	179	0	0	0	0	0	377
05:45 PM	0	145	10	0	155	14	0	27	0	41	13	151	1	0	165	0	0	0	0	0	361
Total	0	604	47	0	651	46	1	100	0	147	63	661	5	0	729	2	0	0	0	2	1529
06:00 PM	0	133	18	0	151	12	0	27	0	39	8	164	0	0	172	0	0	0	0	0	362
06:15 PM	0	165	4	0	169	6	0	14	0	20	18	144	0	0	162	0	0	0	0	0	351
06:30 PM	0	110	11	0	121	11	0	19	0	30	15	131	0	0	146	0	0	0	0	0	297
06:45 PM	0	88	6	0	94	6	0	9	0	15	8	106	0	1	115	0	0	0	0	0	224
Total	0	496	39	0	535	35	0	69	0	104	49	545	0	1	595	0	0	0	0	0	1234
Grand Total	4	5980	567	8	6559	640	4	681	30	1355	726	6802	12	4	7544	3	3	4	0	10	15468
Apprch %	0.1	91.2	8.6	0.1		47.2	0.3	50.3	2.2		9.6	90.2	0.2	0.1		30	30	40	0		
Total %	0	38.7	3.7	0.1	42.4	4.1	0	4.4	0.2	8.8	4.7	44	0.1	0	48.8	0	0	0	0	0.1	
Lights	1	5897										6697									15224
% Lights	25	98.6	97.5	87.5	98.5	97.5	100	99.3	100	98.5	97.8	98.5	100	100	98.4	100	100	75	0	90	98.4
Trucks	3	40	6	1	50	5	0	1	0	6	4	53	0	0	57	0	0	0	0	0	113
% Trucks	75	0.7	1.1	12.5	0.8	0.8	0	0.1	0	0.4	0.6	0.8	0	0	0.8	0	0	0	0	0	0.7
Buses	0	43	8	0	51	11	0	4	0	15	12	52	0	0	64	0	0	1	0	1	131
% Buses	0	0.7	1.4	0	0.8	1.7	0	0.6	0	1.1	1.7	0.8	0	0	0.8	0	0	25	0	10	0.8

Connecticut Counts LLC

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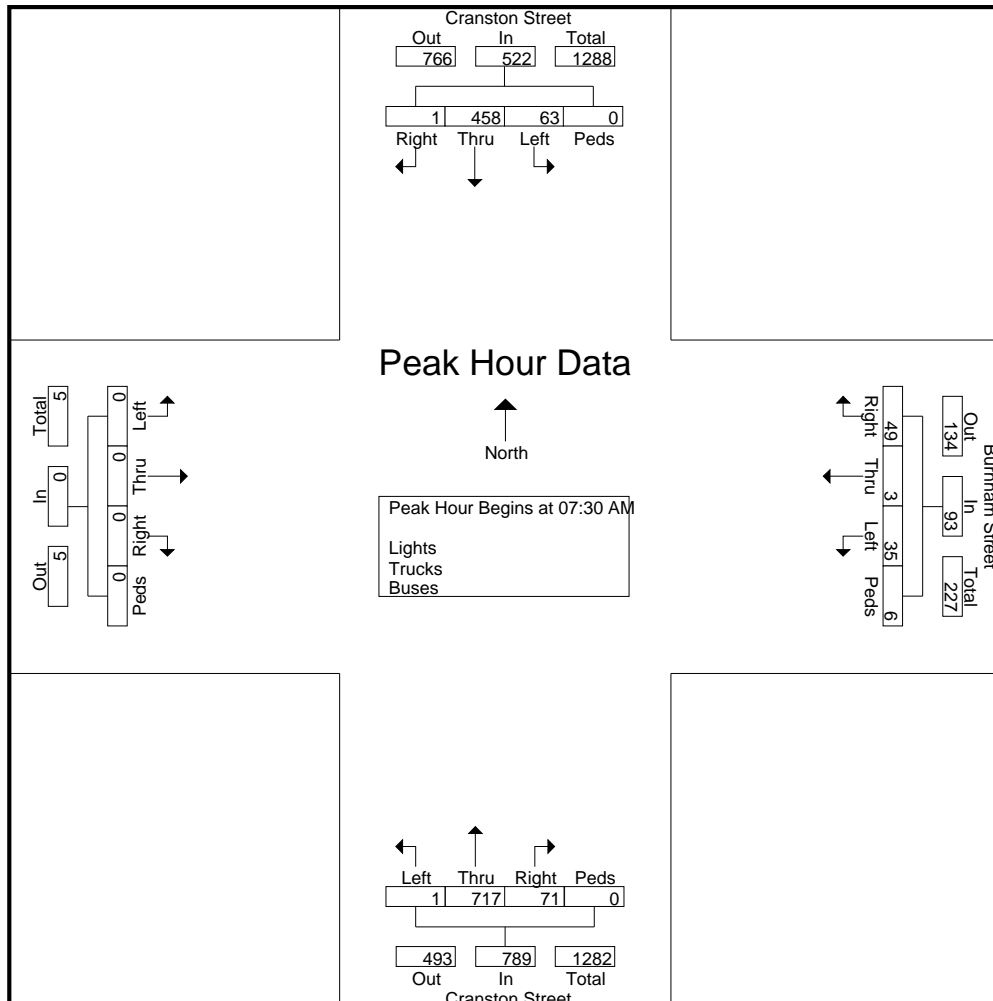
File Name : 24136
Site Code : 24136
Start Date : 3/2/2023
Page No : 3

Start Time	Cranston Street From North					Burnham Street From East					Cranston Street From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

07:30 AM	0	110	19	0	129	18	0	10	4	32	15	148	0	0	163	0	0	0	0	0	324
07:45 AM	1	134	16	0	151	12	3	11	2	28	23	184	0	0	207	0	0	0	0	0	386
08:00 AM	0	105	12	0	117	12	0	7	0	19	18	207	0	0	225	0	0	0	0	0	361
08:15 AM	0	109	16	0	125	7	0	7	0	14	15	178	1	0	194	0	0	0	0	0	333
Total Volume	1	458	63	0	522	49	3	35	6	93	71	717	1	0	789	0	0	0	0	0	1404
% App. Total	0.2	87.7	12.1	0		52.7	3.2	37.6	6.5		9	90.9	0.1	0		0	0	0	0		
PHF	.250	.854	.829	.000	.864	.681	.250	.795	.375	.727	.772	.866	.250	.000	.877	.000	.000	.000	.000	.000	.909



Connecticut Counts LLC

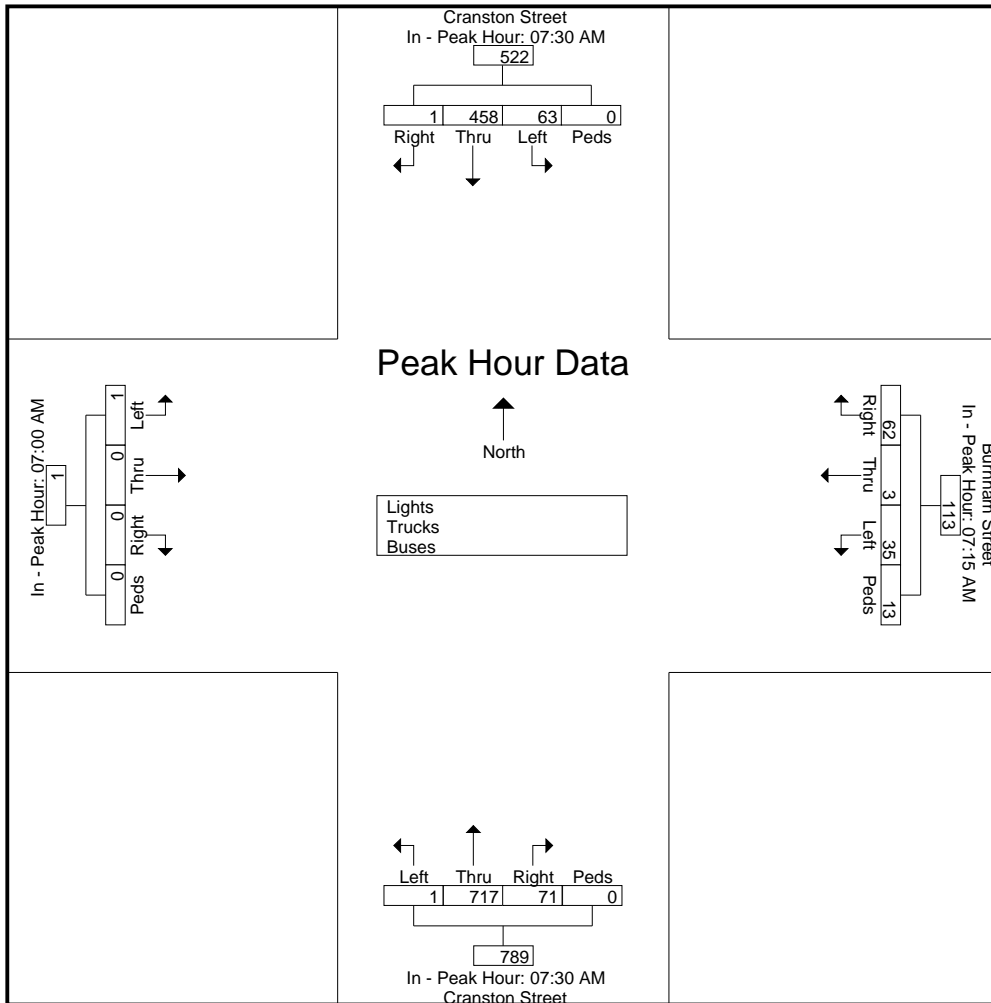
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24136
Site Code : 24136
Start Date : 3/2/2023
Page No : 4

Start Time	Cranston Street From North					Burnham Street From East					Cranston Street From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM					07:15 AM					07:30 AM					07:00 AM				
+0 mins.	0	110	19	0	129	20	0	7	7	34	15	148	0	0	163	0	0	0	0	0
+15 mins.	1	134	16	0	151	18	0	10	4	32	23	184	0	0	207	0	0	1	0	1
+30 mins.	0	105	12	0	117	12	3	11	2	28	18	207	0	0	225	0	0	0	0	0
+45 mins.	0	109	16	0	125	12	0	7	0	19	15	178	1	0	194	0	0	0	0	0
Total Volume	1	458	63	0	522	62	3	35	13	113	71	717	1	0	789	0	0	1	0	1
% App. Total	0.2	87.7	12.1	0		54.9	2.7	31	11.5		9	90.9	0.1	0		0	0	100	0	
PHF	.250	.854	.829	.000	.864	.775	.250	.795	.464	.831	.772	.866	.250	.000	.877	.000	.000	.250	.000	.250

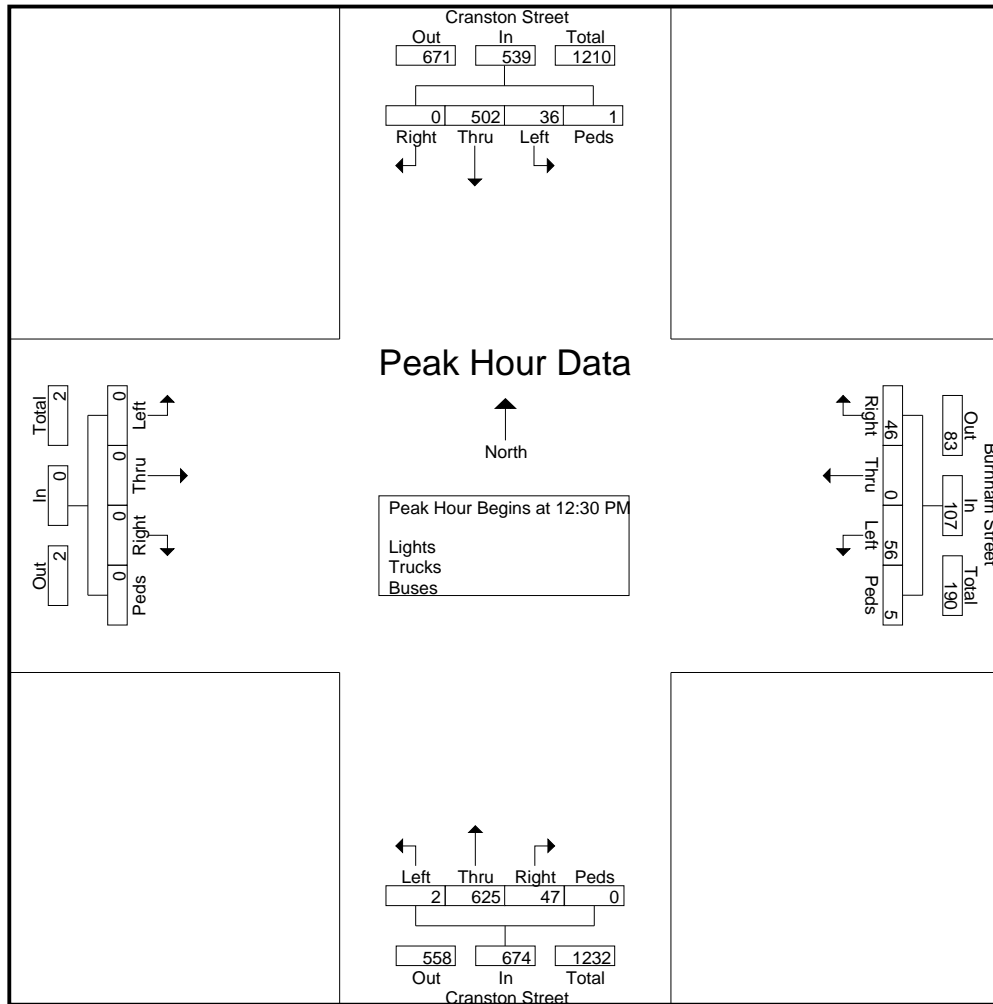


Connecticut Counts LLC

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File Name : 24136
Site Code : 24136
Start Date : 3/2/2023
Page No : 5

Start Time	Cranston Street From North					Burnham Street From East					Cranston Street From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:30 PM																					
12:30 PM	0	164	6	0	170	11	0	13	2	26	14	182	0	0	196	0	0	0	0	0	392
12:45 PM	0	100	12	0	112	12	0	12	0	24	9	123	0	0	132	0	0	0	0	0	268
01:00 PM	0	113	6	0	119	8	0	16	2	26	9	143	2	0	154	0	0	0	0	0	299
01:15 PM	0	125	12	1	138	15	0	15	1	31	15	177	0	0	192	0	0	0	0	0	361
Total Volume	0	502	36	1	539	46	0	56	5	107	47	625	2	0	674	0	0	0	0	0	1320
% App. Total	0	93.1	6.7	0.2		43	0	52.3	4.7		7	92.7	0.3	0		0	0	0	0		
PHF	.000	.765	.750	.250	.793	.767	.000	.875	.625	.863	.783	.859	.250	.000	.860	.000	.000	.000	.000	.000	.842



Connecticut Counts LLC

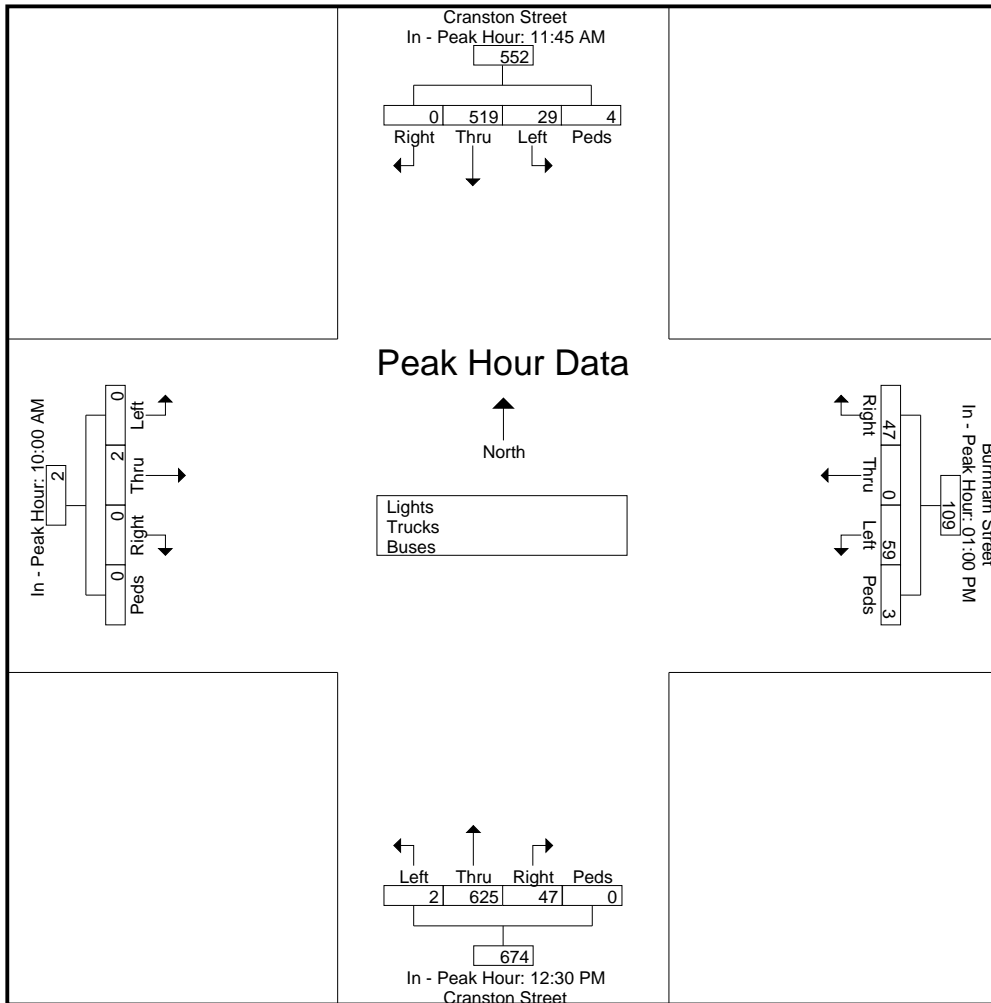
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24136
Site Code : 24136
Start Date : 3/2/2023
Page No : 6

Start Time	Cranston Street From North					Burnham Street From East					Cranston Street From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	11:45 AM					01:00 PM					12:30 PM					10:00 AM				
+0 mins.	0	130	9	0	139	8	0	16	2	26	14	182	0	0	196	0	0	0	0	0
+15 mins.	0	115	4	0	119	15	0	15	1	31	9	123	0	0	132	0	1	0	0	1
+30 mins.	0	110	10	4	124	8	0	10	0	18	9	143	2	0	154	0	1	0	0	1
+45 mins.	0	164	6	0	170	16	0	18	0	34	15	177	0	0	192	0	0	0	0	0
Total Volume	0	519	29	4	552	47	0	59	3	109	47	625	2	0	674	0	2	0	0	2
% App. Total	0	94	5.3	0.7		43.1	0	54.1	2.8		7	92.7	0.3	0		0	100	0	0	
PHF	.000	.791	.725	.250	.812	.734	.000	.819	.375	.801	.783	.859	.250	.000	.860	.000	.500	.000	.000	.500

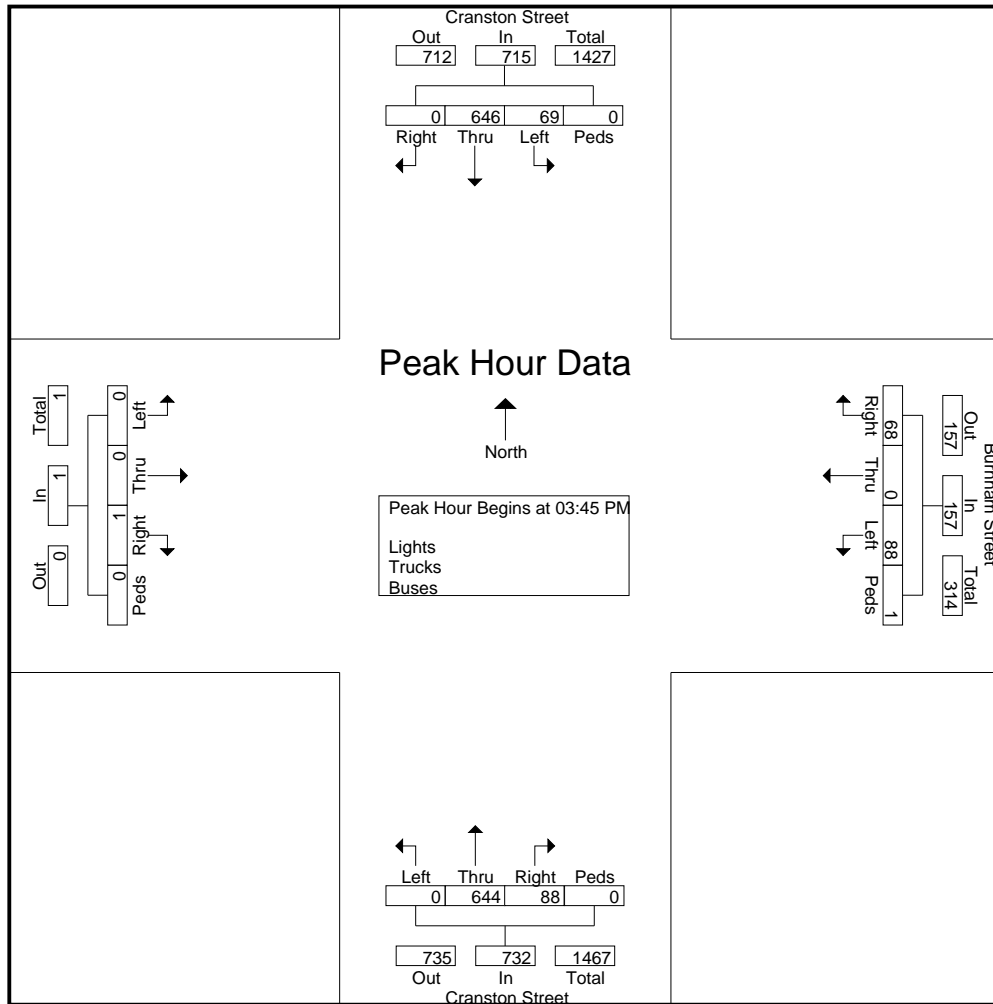


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Kensington, Connecticut 06037
(860) 828-1693

File Name : 24136
Site Code : 24136
Start Date : 3/2/2023
Page No : 7

Start Time	Cranston Street From North					Burnham Street From East					Cranston Street From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	0	166	24	0	190	17	0	19	1	37	18	152	0	0	170	0	0	0	0	0	397
04:00 PM	0	139	9	0	148	23	0	26	0	49	28	167	0	0	195	0	0	0	0	0	392
04:15 PM	0	172	18	0	190	19	0	21	0	40	26	162	0	0	188	1	0	0	0	1	419
04:30 PM	0	169	18	0	187	9	0	22	0	31	16	163	0	0	179	0	0	0	0	0	397
Total Volume	0	646	69	0	715	68	0	88	1	157	88	644	0	0	732	1	0	0	0	1	1605
% App. Total	0	90.3	9.7	0		43.3	0	56.1	0.6		12	88	0	0		100	0	0	0		
PHF	.000	.939	.719	.000	.941	.739	.000	.846	.250	.801	.786	.964	.000	.000	.938	.250	.000	.000	.000	.250	.958



Connecticut Counts LLC

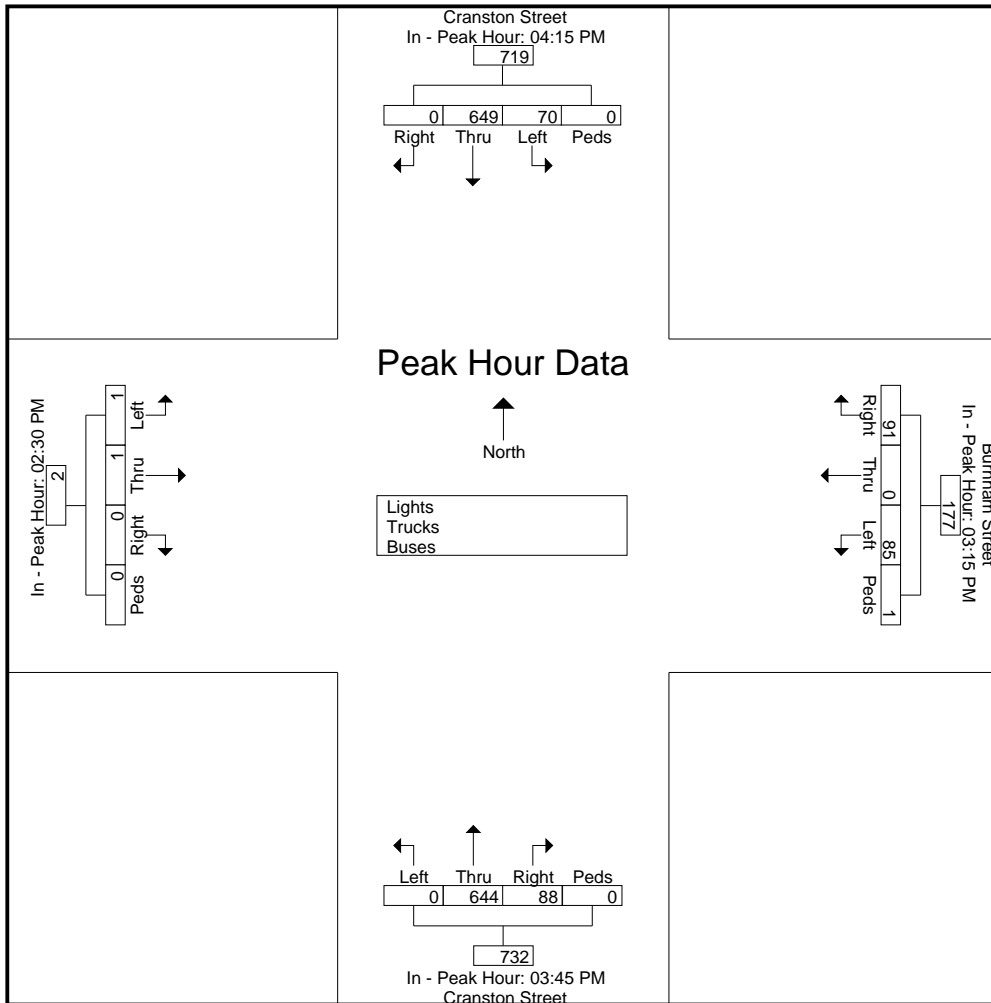
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24136
Site Code : 24136
Start Date : 3/2/2023
Page No : 8

Start Time	Cranston Street From North					Burnham Street From East					Cranston Street From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM					03:15 PM					03:45 PM					02:30 PM				
+0 mins.	0	172	18	0	190	27	0	20	0	47	18	152	0	0	170	0	0	0	0	0
+15 mins.	0	169	18	0	187	24	0	20	0	44	28	167	0	0	195	0	0	0	0	0
+30 mins.	0	157	21	0	178	17	0	19	1	37	26	162	0	0	188	0	0	1	0	1
+45 mins.	0	151	13	0	164	23	0	26	0	49	16	163	0	0	179	0	1	0	0	1
Total Volume	0	649	70	0	719	91	0	85	1	177	88	644	0	0	732	0	1	1	0	2
% App. Total	0	90.3	9.7	0		51.4	0	48	0.6		12	88	0	0		0	50	50	0	
PHF	.000	.943	.833	.000	.946	.843	.000	.817	.250	.903	.786	.964	.000	.000	.938	.000	.250	.250	.000	.500



Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Cranston St at Ridge Street/Carolina St
 Cranston, Rhode Island

File Name : 24137
 Site Code : 24137
 Start Date : 3/2/2023
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Cranston Street From North					Carolina Street From East					Cranston Street From South					Ridge Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	60	18	0	78	5	0	17	0	22	48	88	1	0	137	1	0	0	0	1	238
07:15 AM	0	76	29	1	106	8	0	28	0	36	49	115	0	0	164	1	1	1	4	7	313
07:30 AM	0	87	26	0	113	4	1	31	2	38	61	106	1	0	168	0	1	1	0	2	321
07:45 AM	0	110	27	0	137	9	0	25	0	34	60	129	0	0	189	0	0	1	1	2	362
Total	0	333	100	1	434	26	1	101	2	130	218	438	2	0	658	2	2	3	5	12	1234
08:00 AM	0	92	28	1	121	6	0	29	0	35	48	146	0	0	194	1	0	0	1	2	352
08:15 AM	0	86	45	0	131	2	0	22	4	28	63	128	1	0	192	5	2	0	0	7	358
08:30 AM	0	100	33	0	133	9	0	29	2	40	61	145	1	0	207	0	0	0	0	0	380
08:45 AM	0	75	22	0	97	15	0	25	0	40	48	96	0	1	145	0	0	0	0	0	282
Total	0	353	128	1	482	32	0	105	6	143	220	515	2	1	738	6	2	0	1	9	1372
Grand Total	0	686	228	2	916	58	1	206	8	273	438	953	4	1	1396	8	4	3	6	21	2606
Apprch %	0	74.9	24.9	0.2		21.2	0.4	75.5	2.9		31.4	68.3	0.3	0.1		38.1	19	14.3	28.6		
Total %	0	26.3	8.7	0.1	35.1	2.2	0	7.9	0.3	10.5	16.8	36.6	0.2	0	53.6	0.3	0.2	0.1	0.2	0.8	
Lights	0	670	221	2	893	57	0	202	8	267	432	942	4	1	1379	8	4	3	6	21	2560
% Lights	0	97.7	96.9	100	97.5	98.3	0	98.1	100	97.8	98.6	98.8	100	100	98.8	100	100	100	100	100	98.2
Buses	0	11	7	0	18	0	1	1	0	2	1	9	0	0	10	0	0	0	0	0	30
% Buses	0	1.6	3.1	0	2	0	100	0.5	0	0.7	0.2	0.9	0	0	0.7	0	0	0	0	0	1.2
Trucks	0	5	0	0	5	1	0	3	0	4	5	2	0	0	7	0	0	0	0	0	16
% Trucks	0	0.7	0	0	0.5	1.7	0	1.5	0	1.5	1.1	0.2	0	0	0.5	0	0	0	0	0	0.6

Connecticut Counts LLC

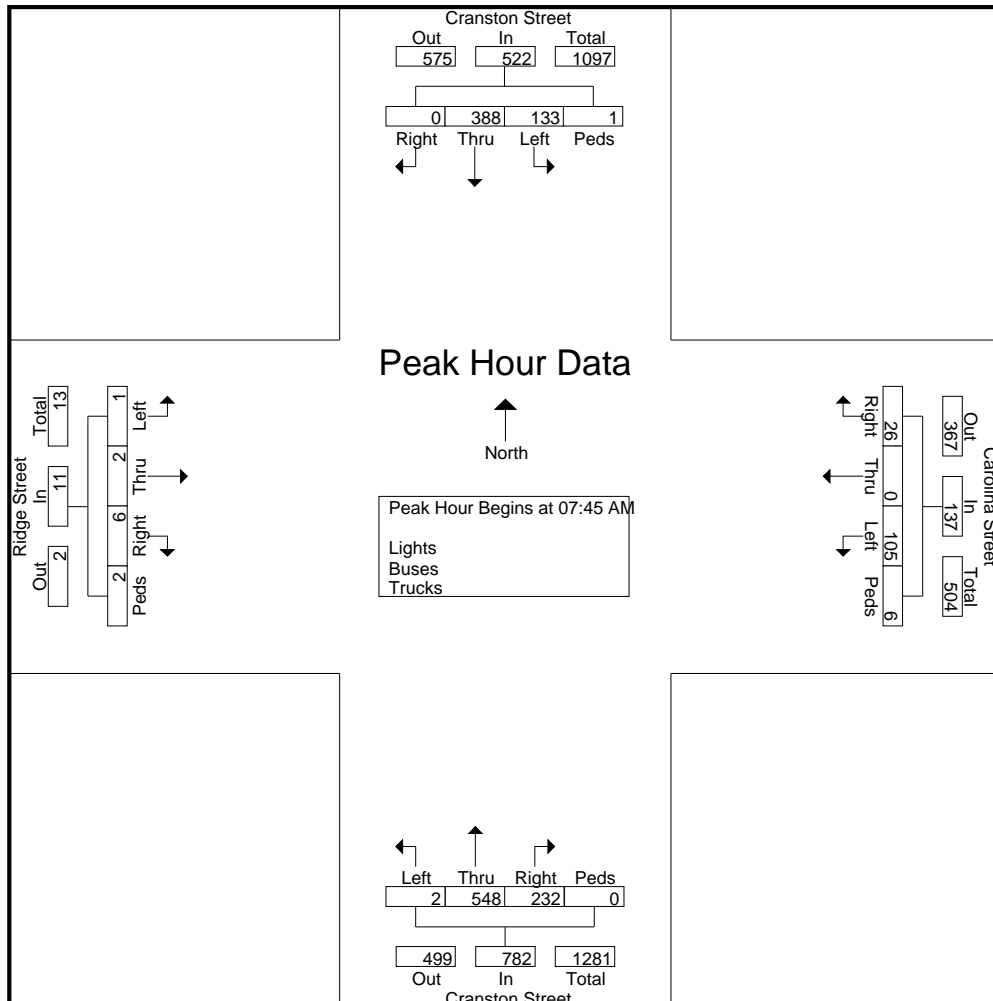
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24137
Site Code : 24137
Start Date : 3/2/2023
Page No : 2

Start Time	Cranston Street From North					Carolina Street From East					Cranston Street From South					Ridge Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	0	110	27	0	137	9	0	25	0	34	60	129	0	0	189	0	0	1	1	2	362
08:00 AM	0	92	28	1	121	6	0	29	0	35	48	146	0	0	194	1	0	0	1	2	352
08:15 AM	0	86	45	0	131	2	0	22	4	28	63	128	1	0	192	5	2	0	0	7	358
08:30 AM	0	100	33	0	133	9	0	29	2	40	61	145	1	0	207	0	0	0	0	0	380
Total Volume	0	388	133	1	522	26	0	105	6	137	232	548	2	0	782	6	2	1	2	11	1452
% App. Total	0	74.3	25.5	0.2		19	0	76.6	4.4		29.7	70.1	0.3	0		54.5	18.2	9.1	18.2		
PHF	.000	.882	.739	.250	.953	.722	.000	.905	.375	.856	.921	.938	.500	.000	.944	.300	.250	.250	.500	.393	.955



Connecticut Counts LLC

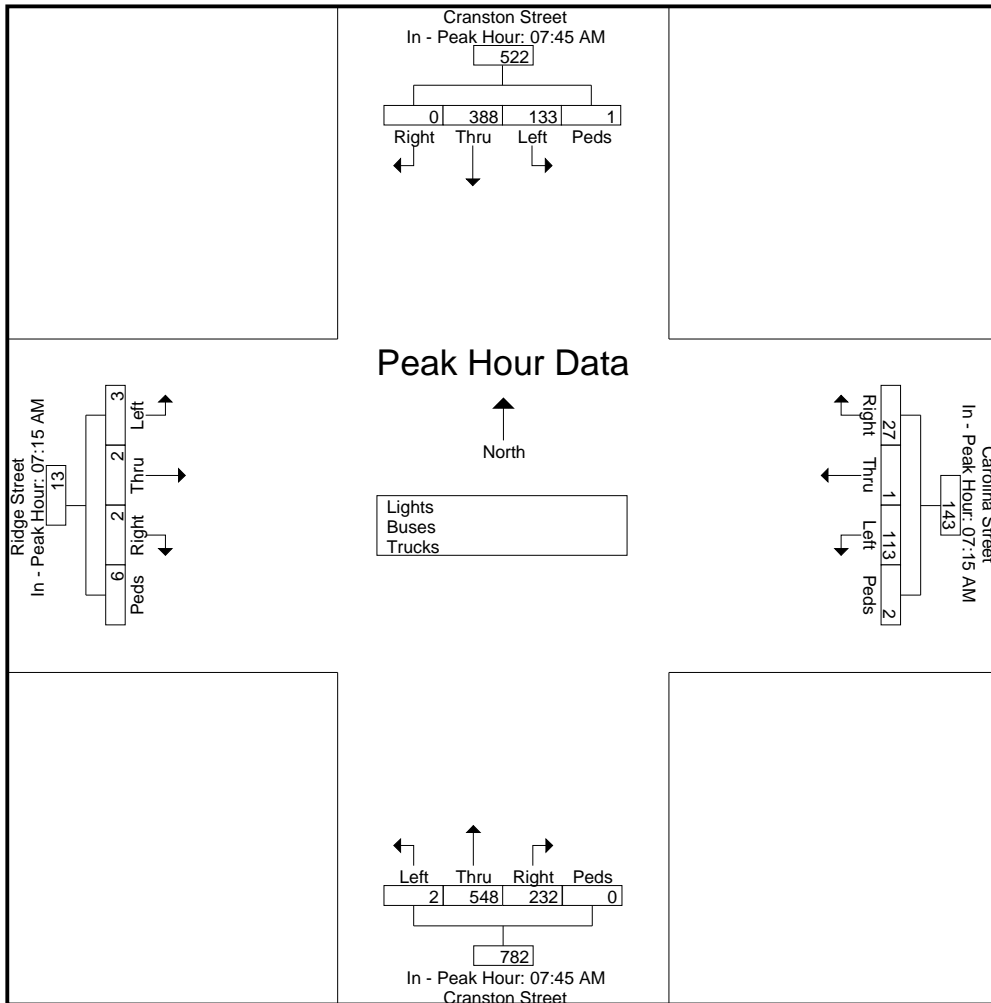
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24137
Site Code : 24137
Start Date : 3/2/2023
Page No : 3

Start Time	Cranston Street From North					Carolina Street From East					Cranston Street From South					Ridge Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM					07:15 AM					07:45 AM					07:15 AM				
+0 mins.	0	110	27	0	137	8	0	28	0	36	60	129	0	0	189	1	1	1	4	7
+15 mins.	0	92	28	1	121	4	1	31	2	38	48	146	0	0	194	0	1	1	0	2
+30 mins.	0	86	45	0	131	9	0	25	0	34	63	128	1	0	192	0	0	1	1	2
+45 mins.	0	100	33	0	133	6	0	29	0	35	61	145	1	0	207	1	0	0	1	2
Total Volume	0	388	133	1	522	27	1	113	2	143	232	548	2	0	782	2	2	3	6	13
% App. Total	0	74.3	25.5	0.2		18.9	0.7	79	1.4		29.7	70.1	0.3	0		15.4	15.4	23.1	46.2	
PHF	.000	.882	.739	.250	.953	.750	.250	.911	.250	.941	.921	.938	.500	.000	.944	.500	.500	.750	.375	.464



Connecticut Counts LLC
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Cranston St at Ridge Street/Carolina St
 Cranston, Rhode Island

File Name : 24138
 Site Code : 24138
 Start Date : 3/2/2023
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Cranston Street From North					Carolina Street From East					Cranston Street From South					Ridge Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	0	109	56	0	165	23	1	56	1	81	61	136	1	0	198	0	0	0	3	3	447
04:15 PM	0	116	38	0	154	23	0	66	0	89	46	124	0	1	171	0	0	1	1	2	416
04:30 PM	1	121	31	0	153	20	0	64	0	84	47	121	1	0	169	0	0	1	2	3	409
04:45 PM	0	124	48	1	173	26	0	59	0	85	45	126	2	0	173	0	0	0	2	2	433
Total	1	470	173	1	645	92	1	245	1	339	199	507	4	1	711	0	0	2	8	10	1705
05:00 PM	1	102	60	1	164	15	0	59	1	75	50	146	1	0	197	0	0	0	1	1	437
05:15 PM	1	103	35	0	139	23	0	64	0	87	41	109	1	0	151	0	0	0	2	2	379
05:30 PM	0	107	46	0	153	22	1	62	1	86	45	134	0	2	181	0	1	0	1	2	422
05:45 PM	0	106	44	3	153	22	4	51	6	83	37	123	1	2	163	1	0	0	1	2	401
Total	2	418	185	4	609	82	5	236	8	331	173	512	3	4	692	1	1	0	5	7	1639
Grand Total	3	888	358	5	1254	174	6	481	9	670	372	1019	7	5	1403	1	1	2	13	17	3344
Apprch %	0.2	70.8	28.5	0.4		26	0.9	71.8	1.3		26.5	72.6	0.5	0.4		5.9	5.9	11.8	76.5		
Total %	0.1	26.6	10.7	0.1	37.5	5.2	0.2	14.4	0.3	20	11.1	30.5	0.2	0.1	42	0	0	0.1	0.4	0.5	
Lights	3	882	356	5	1246	174	6	479	9	668	370	1006									
% Lights	100	99.3	99.4	100	99.4	100	100	99.6	100	99.7	99.5	98.7	100	100	98.9	100	100	100	100	100	99.3
Buses	0	4	1	0	5	0	0	0	0	0	2	8	0	0	10	0	0	0	0	0	15
% Buses	0	0.5	0.3	0	0.4	0	0	0	0	0	0.5	0.8	0	0	0.7	0	0	0	0	0	0.4
Trucks	0	2	1	0	3	0	0	2	0	2	0	5	0	0	5	0	0	0	0	0	10
% Trucks	0	0.2	0.3	0	0.2	0	0	0.4	0	0.3	0	0.5	0	0	0.4	0	0	0	0	0	0.3

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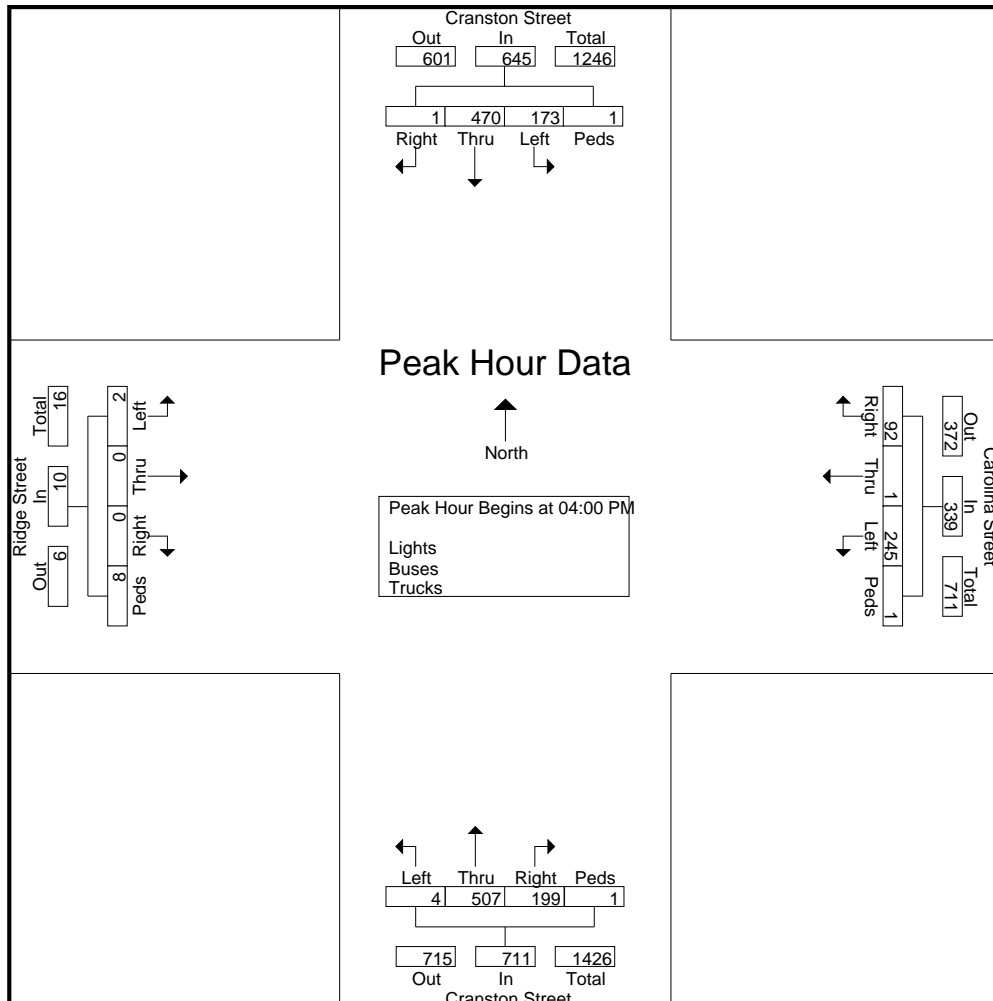
Kensington, Connecticut 06037
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File Name : 24138
Site Code : 24138
Start Date : 3/2/2023
Page No : 2

Start Time	Cranston Street From North					Carolina Street From East					Cranston Street From South					Ridge Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:00 PM

04:00 PM	0	109	56	0	165	23	1	56	1	81	61	136	1	0	198	0	0	0	3	3	447
04:15 PM	0	116	38	0	154	23	0	66	0	89	46	124	0	1	171	0	0	1	1	2	416
04:30 PM	1	121	31	0	153	20	0	64	0	84	47	121	1	0	169	0	0	1	2	3	409
04:45 PM	0	124	48	1	173	26	0	59	0	85	45	126	2	0	173	0	0	0	2	2	433
Total Volume	1	470	173	1	645	92	1	245	1	339	199	507	4	1	711	0	0	2	8	10	1705
% App. Total	0.2	72.9	26.8	0.2		27.1	0.3	72.3	0.3		28	71.3	0.6	0.1		0	0	20	80		
PHF	.250	.948	.772	.250	.932	.885	.250	.928	.250	.952	.816	.932	.500	.250	.898	.000	.000	.500	.667	.833	.954



Connecticut Counts LLC

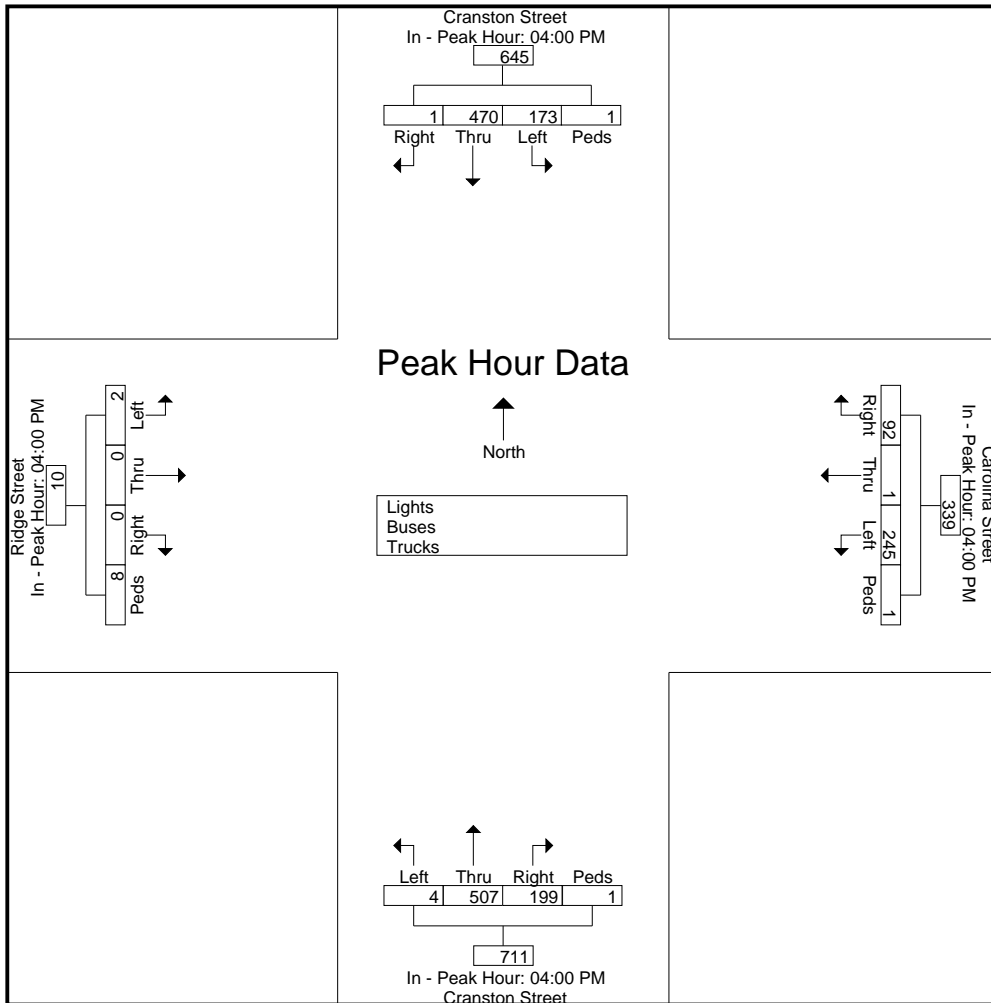
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24138
Site Code : 24138
Start Date : 3/2/2023
Page No : 3

Start Time	Cranston Street From North					Carolina Street From East					Cranston Street From South					Ridge Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM					04:00 PM					04:00 PM					04:00 PM				
+0 mins.	0	109	56	0	165	23	1	56	1	81	61	136	1	0	198	0	0	0	3	3
+15 mins.	0	116	38	0	154	23	0	66	0	89	46	124	0	1	171	0	0	1	1	2
+30 mins.	1	121	31	0	153	20	0	64	0	84	47	121	1	0	169	0	0	1	2	3
+45 mins.	0	124	48	1	173	26	0	59	0	85	45	126	2	0	173	0	0	0	2	2
Total Volume	1	470	173	1	645	92	1	245	1	339	199	507	4	1	711	0	0	2	8	10
% App. Total	0.2	72.9	26.8	0.2		27.1	0.3	72.3	0.3		28	71.3	0.6	0.1		0	0	20	80	
PHF	.250	.948	.772	.250	.932	.885	.250	.928	.250	.952	.816	.932	.500	.250	.898	.000	.000	.500	.667	.833



Connecticut Counts LLC

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Carlsbad Street at Burnham Avenue
Cranston, Rhode Island

File Name : 24139
Site Code : 24139
Start Date : 3/2/2023
Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Carlsbad Street From North					Burnham Avenue From East					Private Drive From South					Burnham Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	6	6	5	0	17	13	9	0	0	22	1	0	0	1	2	0	9	6	6	21	62
07:15 AM	10	3	6	1	20	20	21	0	0	41	0	0	0	0	0	0	18	13	0	31	92
07:30 AM	6	7	8	0	21	23	24	1	0	48	1	2	0	1	4	0	19	18	1	38	111
07:45 AM	8	3	3	0	14	16	17	0	0	33	0	0	0	3	3	1	13	18	2	34	84
Total	30	19	22	1	72	72	71	1	0	144	2	2	0	5	9	1	59	55	9	124	349
08:00 AM	3	0	7	0	10	18	13	0	0	31	0	0	0	2	2	0	11	18	2	31	74
08:15 AM	4	3	2	0	9	17	8	2	0	27	0	0	0	1	1	0	12	17	1	30	67
08:30 AM	4	2	9	0	15	14	16	0	0	30	0	0	0	1	1	0	12	9	0	21	67
08:45 AM	6	2	9	0	17	18	17	0	0	35	1	0	0	3	4	0	5	14	2	21	77
Total	17	7	27	0	51	67	54	2	0	123	1	0	0	7	8	0	40	58	5	103	285
Grand Total	47	26	49	1	123	139	125	3	0	267	3	2	0	12	17	1	99	113	14	227	634
Apprch %	38.2	21.1	39.8	0.8		52.1	46.8	1.1	0		17.6	11.8	0	70.6		0.4	43.6	49.8	6.2		
Total %	7.4	4.1	7.7	0.2	19.4	21.9	19.7	0.5	0	42.1	0.5	0.3	0	1.9	2.7	0.2	15.6	17.8	2.2	35.8	
Lights	45	26	49	1	121	139	122	3	0	264	3	2	0	12	17	1	97	111	14	223	625
% Lights	95.7	100	100	100	98.4	100	97.6	100	0	98.9	100	100	0	100	100	100	98	98.2	100	98.2	98.6
Buses	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	2	0	4	6
% Buses	0	0	0	0	0	0	1.6	0	0	0.7	0	0	0	0	0	0	2	1.8	0	1.8	0.9
Trucks	2	0	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
% Trucks	4.3	0	0	0	1.6	0	0.8	0	0	0.4	0	0	0	0	0	0	0	0	0	0	0.5

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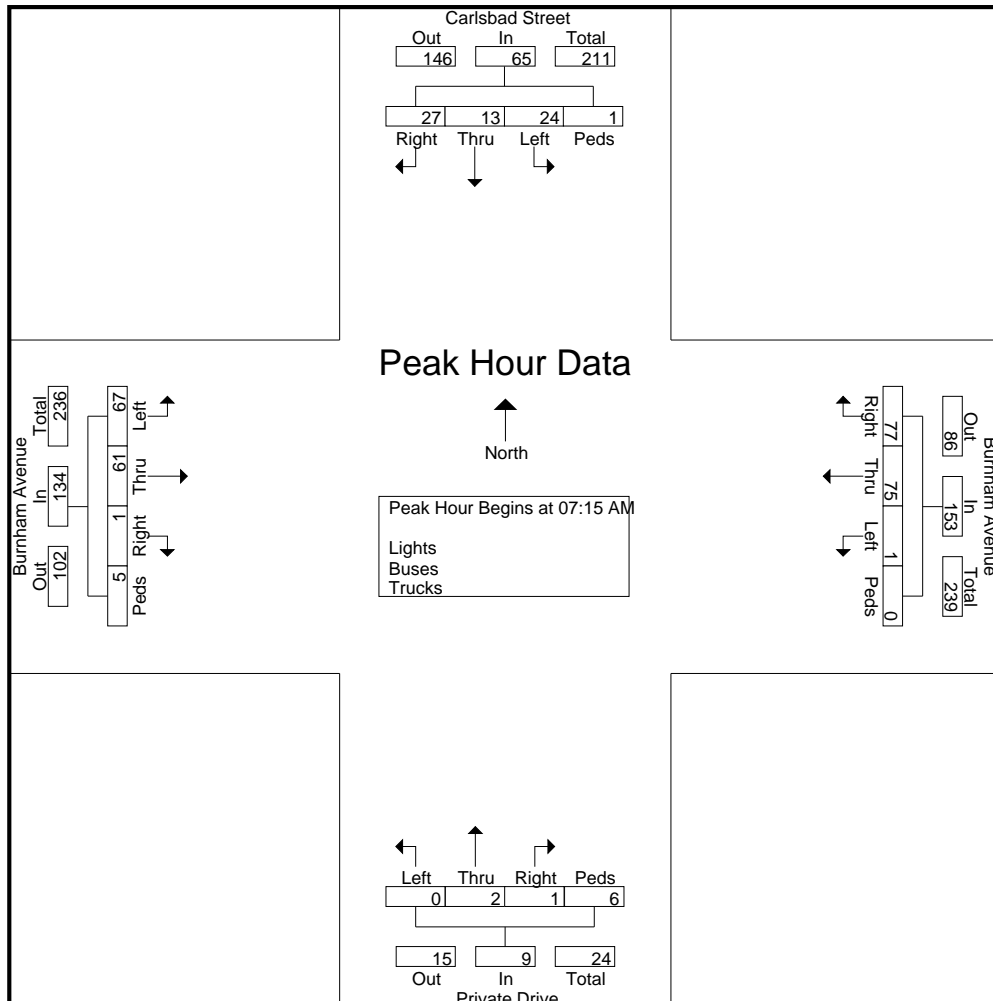
Kensington, Connecticut 06037
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File Name : 24139
Site Code : 24139
Start Date : 3/2/2023
Page No : 2

Start Time	Carlsbad Street From North					Burnham Avenue From East					Private Drive From South					Burnham Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:15 AM

07:15 AM	10	3	6	1	20	20	21	0	0	41	0	0	0	0	0	0	18	13	0	31	92
07:30 AM	6	7	8	0	21	23	24	1	0	48	1	2	0	1	4	0	19	18	1	38	111
07:45 AM	8	3	3	0	14	16	17	0	0	33	0	0	0	3	3	1	13	18	2	34	84
08:00 AM	3	0	7	0	10	18	13	0	0	31	0	0	0	2	2	0	11	18	2	31	74
Total Volume	27	13	24	1	65	77	75	1	0	153	1	2	0	6	9	1	61	67	5	134	361
% App. Total	41.5	20	36.9	1.5		50.3	49	0.7	0		11.1	22.2	0	66.7		0.7	45.5	50	3.7		
PHF	.675	.464	.750	.250	.774	.837	.781	.250	.000	.797	.250	.250	.000	.500	.563	.250	.803	.931	.625	.882	.813



Connecticut Counts LLC

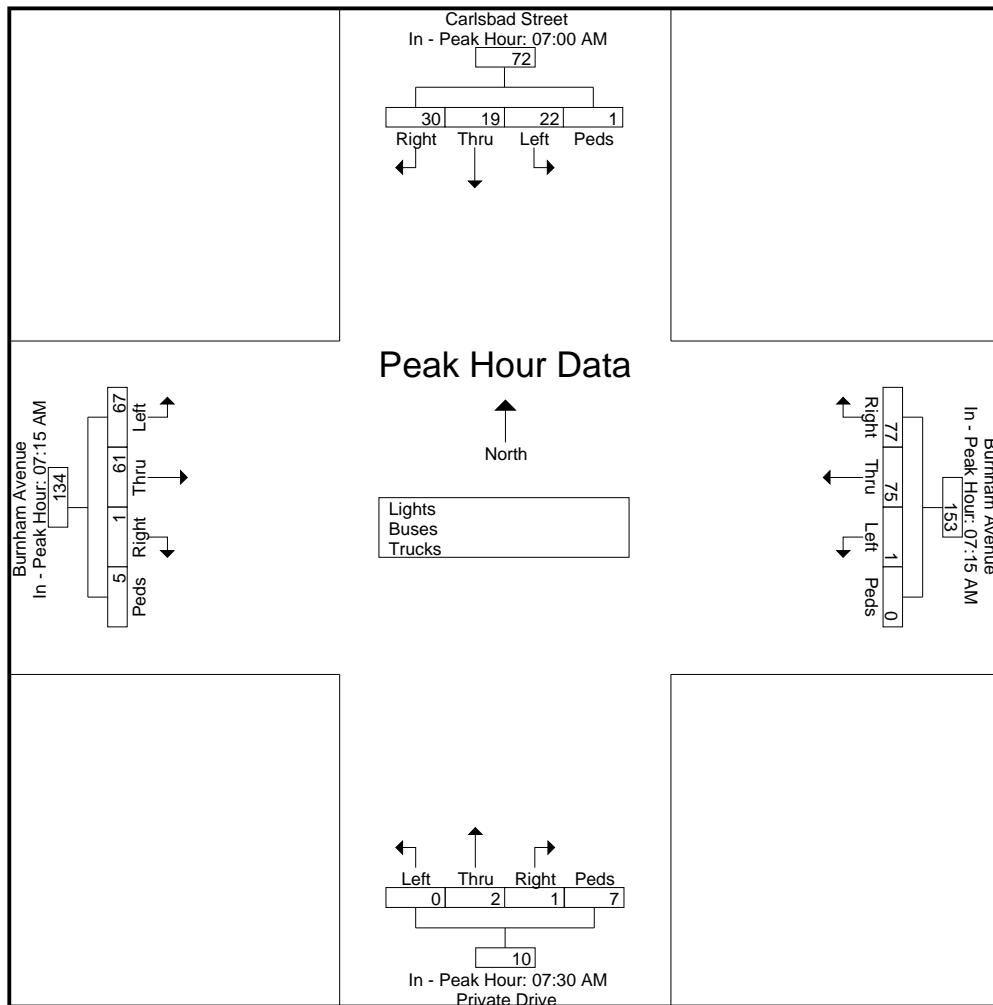
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File Name : 24139
Site Code : 24139
Start Date : 3/2/2023
Page No : 3

Start Time	Carlsbad Street From North					Burnham Avenue From East					Private Drive From South					Burnham Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM					07:15 AM					07:30 AM					07:45 AM				
+0 mins.	6	6	5	0	17	20	21	0	0	41	1	2	0	1	4	0	18	13	0	31
+15 mins.	10	3	6	1	20	23	24	1	0	48	0	0	0	3	3	0	19	18	1	38
+30 mins.	6	7	8	0	21	16	17	0	0	33	0	0	0	2	2	1	13	18	2	34
+45 mins.	8	3	3	0	14	18	13	0	0	31	0	0	0	1	1	0	11	18	2	31
Total Volume	30	19	22	1	72	77	75	1	0	153	1	2	0	7	10	1	61	67	5	134
% App. Total	41.7	26.4	30.6	1.4		50.3	49	0.7	0		10	20	0	70		0.7	45.5	50	3.7	
PHF	.750	.679	.688	.250	.857	.837	.781	.250	.000	.797	.250	.250	.000	.583	.625	.250	.803	.931	.625	.882



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Carlsbad Street at Burnham Avenue
 Cranston, Rhode Island

File Name : 24140
 Site Code : 24140
 Start Date : 3/2/2023
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Carlsbad Street From North					Burnham Avenue From East					Private Drive From South					Burnham Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	26	1	19	0	46	16	25	0	0	41	1	12	0	0	13	0	11	36	0	47	147
04:15 PM	22	0	20	0	42	17	13	0	0	30	1	4	0	1	6	0	14	29	1	44	122
04:30 PM	19	1	13	0	33	20	13	0	0	33	1	7	0	2	10	1	13	18	1	33	109
04:45 PM	25	0	20	1	46	19	14	1	1	35	2	6	0	2	10	0	14	24	1	39	130
Total	92	2	72	1	167	72	65	1	1	139	5	29	0	5	39	1	52	107	3	163	508
05:00 PM	37	0	24	0	61	15	15	1	0	31	0	5	1	2	8	0	15	23	1	39	139
05:15 PM	14	0	8	0	22	15	14	0	0	29	0	1	0	1	2	0	10	22	1	33	86
05:30 PM	17	0	16	0	33	21	17	0	0	38	0	1	0	1	2	0	12	20	1	33	106
05:45 PM	21	0	13	0	34	8	16	0	0	24	1	2	0	0	3	0	7	16	1	24	85
Total	89	0	61	0	150	59	62	1	0	122	1	9	1	4	15	0	44	81	4	129	416
Grand Total	181	2	133	1	317	131	127	2	1	261	6	38	1	9	54	1	96	188	7	292	924
Apprch %	57.1	0.6	42	0.3		50.2	48.7	0.8	0.4		11.1	70.4	1.9	16.7		0.3	32.9	64.4	2.4		
Total %	19.6	0.2	14.4	0.1	34.3	14.2	13.7	0.2	0.1	28.2	0.6	4.1	0.1	1	5.8	0.1	10.4	20.3	0.8	31.6	
Lights	181	2	133	1	317	130	127	2	1	260	6	38	1	9	54	1	95	182	7	285	916
% Lights	100	100	100	100	100	99.2	100	100	100	99.6	100	100	100	100	100	100	99	96.8	100	97.6	99.1
Buses	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	3	0	4	5
% Buses	0	0	0	0	0	0.8	0	0	0	0.4	0	0	0	0	0	0	1	1.6	0	1.4	0.5
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	3
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.6	0	1	0.3

Connecticut Counts LLC

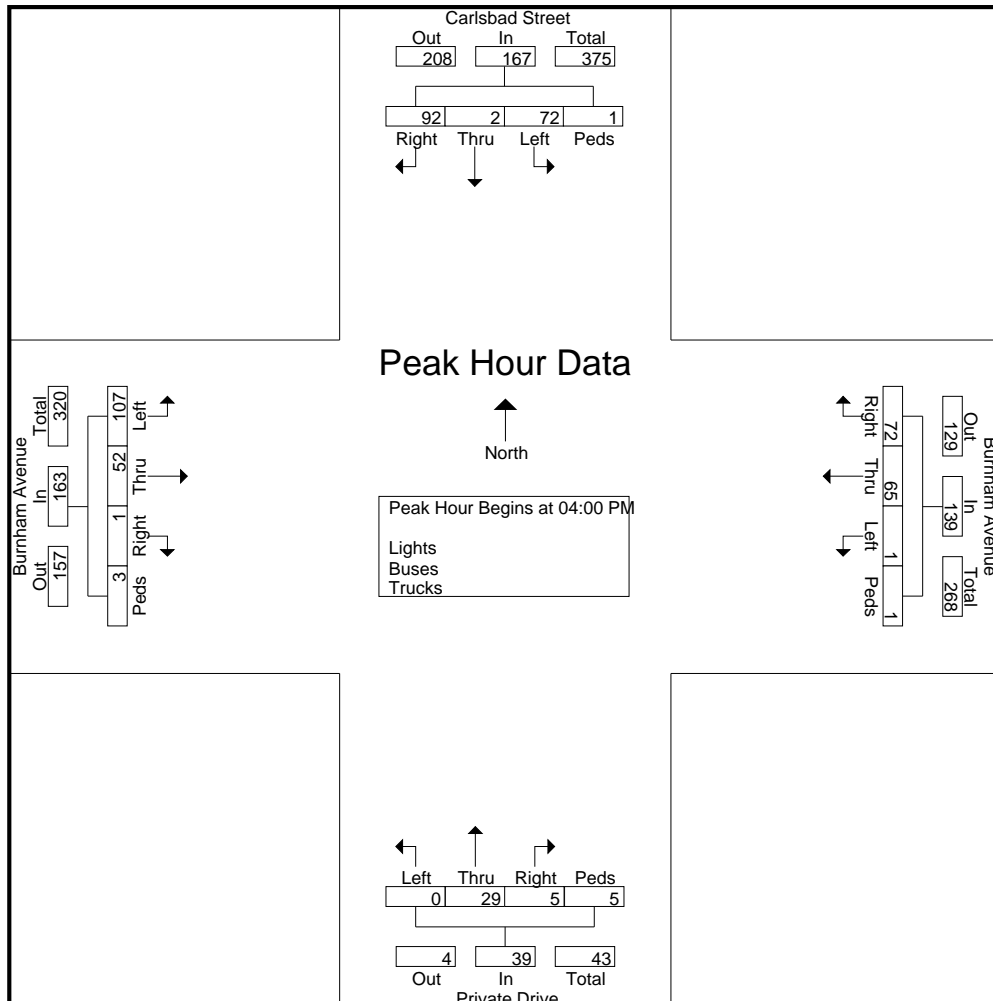
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File Name : 24140
Site Code : 24140
Start Date : 3/2/2023
Page No : 2

Start Time	Carlsbad Street From North					Burnham Avenue From East					Private Drive From South					Burnham Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:00 PM

04:00 PM	26	1	19	0	46	16	25	0	0	41	1	12	0	0	13	0	11	36	0	47	147
04:15 PM	22	0	20	0	42	17	13	0	0	30	1	4	0	1	6	0	14	29	1	44	122
04:30 PM	19	1	13	0	33	20	13	0	0	33	1	7	0	2	10	1	13	18	1	33	109
04:45 PM	25	0	20	1	46	19	14	1	1	35	2	6	0	2	10	0	14	24	1	39	130
Total Volume	92	2	72	1	167	72	65	1	1	139	5	29	0	5	39	1	52	107	3	163	508
% App. Total	55.1	1.2	43.1	0.6		51.8	46.8	0.7	0.7		12.8	74.4	0	12.8		0.6	31.9	65.6	1.8		
PHF	.885	.500	.900	.250	.908	.900	.650	.250	.250	.848	.625	.604	.000	.625	.750	.250	.929	.743	.750	.867	.864



Connecticut Counts LLC

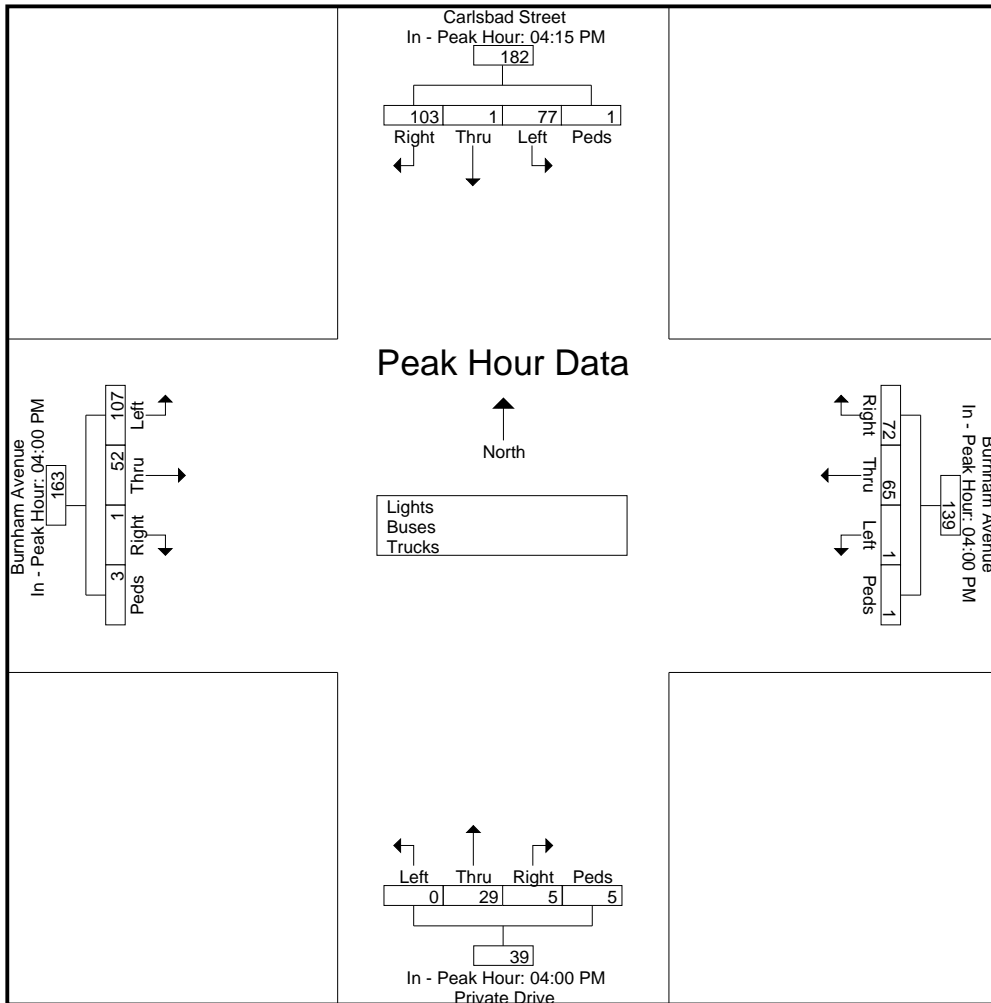
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24140
Site Code : 24140
Start Date : 3/2/2023
Page No : 3

Start Time	Carlsbad Street From North					Burnham Avenue From East					Private Drive From South					Burnham Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM					04:00 PM					04:00 PM					04:00 PM				
+0 mins.	22	0	20	0	42	16	25	0	0	41	1	12	0	0	13	0	11	36	0	47
+15 mins.	19	1	13	0	33	17	13	0	0	30	1	4	0	1	6	0	14	29	1	44
+30 mins.	25	0	20	1	46	20	13	0	0	33	1	7	0	2	10	1	13	18	1	33
+45 mins.	37	0	24	0	61	19	14	1	1	35	2	6	0	2	10	0	14	24	1	39
Total Volume	103	1	77	1	182	72	65	1	1	139	5	29	0	5	39	1	52	107	3	163
% App. Total	56.6	0.5	42.3	0.5		51.8	46.8	0.7	0.7		12.8	74.4	0	12.8		0.6	31.9	65.6	1.8	
PHF	.696	.250	.802	.250	.746	.900	.650	.250	.250	.848	.625	.604	.000	.625	.750	.250	.929	.743	.750	.867



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Carlsbad Street at Field Street
 Cranston, Rhode Island

File Name : 24141
 Site Code : 24141
 Start Date : 3/2/2023
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Carlsbad Street From North					Private Drive From East					Carlsbad Street From South					Field Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	1	19	0	0	20	0	0	0	0	0	0	23	0	0	23	1	0	4	0	5	48
07:15 AM	3	22	0	0	25	0	0	0	0	0	0	27	0	0	27	0	0	2	0	2	54
07:30 AM	1	20	0	0	21	0	1	0	1	2	0	34	0	1	35	0	0	3	0	3	61
07:45 AM	1	14	0	0	15	0	0	0	0	0	0	34	1	0	35	0	0	3	0	3	53
Total	6	75	0	0	81	0	1	0	1	2	0	118	1	1	120	1	0	12	0	13	216
08:00 AM	1	9	0	0	10	0	0	0	0	0	0	35	0	0	35	1	0	5	0	6	51
08:15 AM	2	8	0	0	10	0	0	0	1	1	0	34	2	1	37	0	0	6	0	6	54
08:30 AM	4	18	0	0	22	0	0	0	0	0	0	26	1	0	27	0	0	3	0	3	52
08:45 AM	0	16	0	0	16	0	0	0	0	0	0	26	0	0	26	0	0	5	0	5	47
Total	7	51	0	0	58	0	0	0	1	1	0	121	3	1	125	1	0	19	0	20	204
Grand Total	13	126	0	0	139	0	1	0	2	3	0	239	4	2	245	2	0	31	0	33	420
Apprch %	9.4	90.6	0	0		0	33.3	0	66.7		0	97.6	1.6	0.8		6.1	0	93.9	0		
Total %	3.1	30	0	0	33.1	0	0.2	0	0.5	0.7	0	56.9	1	0.5	58.3	0.5	0	7.4	0	7.9	
Lights	10	124	0	0	134	0	1	0	2	3	0	235	4	2	241	2	0	29	0	31	409
% Lights	76.9	98.4	0	0	96.4	0	100	0	100	100	0	98.3	100	100	98.4	100	0	93.5	0	93.9	97.4
Buses	2	0	0	0	2	0	0	0	0	0	0	4	0	0	4	0	0	2	0	2	8
% Buses	15.4	0	0	0	1.4	0	0	0	0	0	0	1.7	0	0	1.6	0	0	6.5	0	6.1	1.9
Trucks	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
% Trucks	7.7	1.6	0	0	2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7

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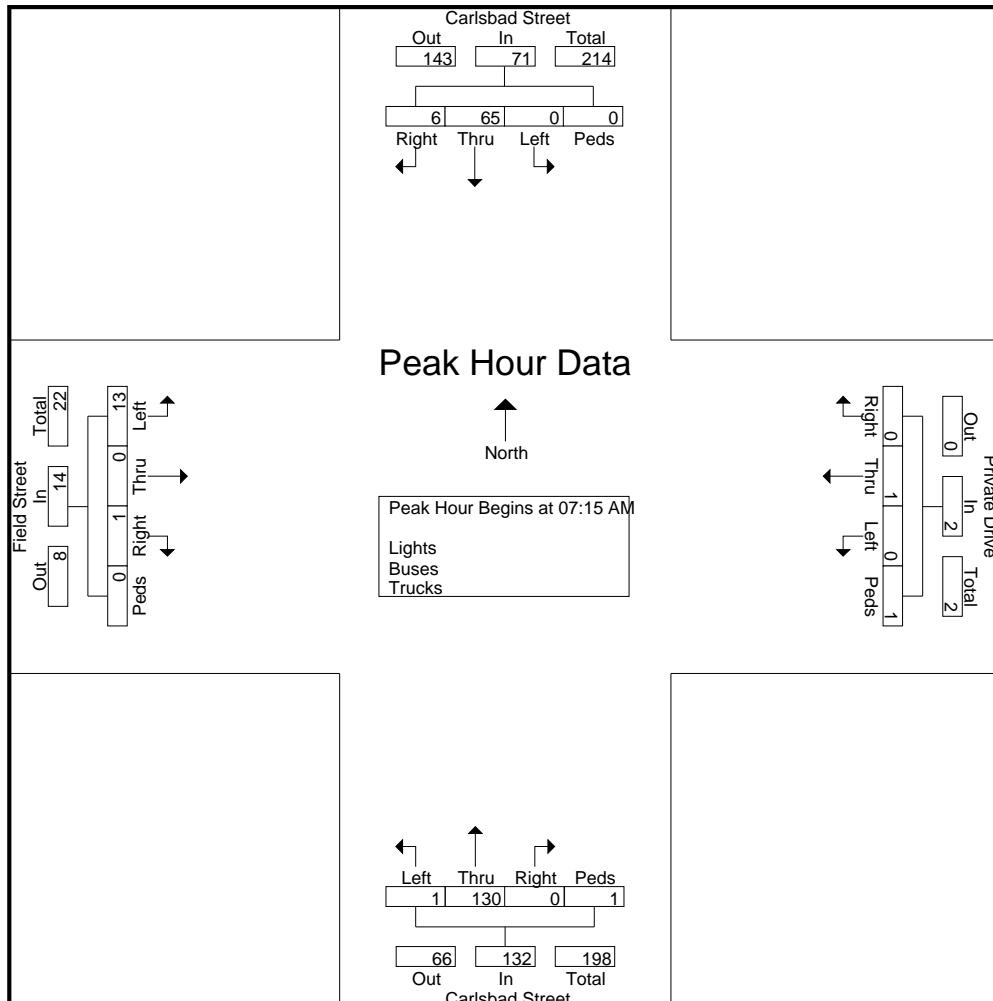
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24141
Site Code : 24141
Start Date : 3/2/2023
Page No : 2

Start Time	Carlsbad Street From North					Private Drive From East					Carlsbad Street From South					Field Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:15 AM

07:15 AM	3	22	0	0	25	0	0	0	0	0	0	27	0	0	27	0	0	2	0	2	54
07:30 AM	1	20	0	0	21	0	1	0	1	2	0	34	0	1	35	0	0	3	0	3	61
07:45 AM	1	14	0	0	15	0	0	0	0	0	0	34	1	0	35	0	0	3	0	3	53
08:00 AM	1	9	0	0	10	0	0	0	0	0	0	35	0	0	35	1	0	5	0	6	51
Total Volume	6	65	0	0	71	0	1	0	1	2	0	130	1	1	132	1	0	13	0	14	219
% App. Total	8.5	91.5	0	0		0	50	0	50		0	98.5	0.8	0.8		7.1	0	92.9	0		
PHF	.500	.739	.000	.000	.710	.000	.250	.000	.250	.250	.000	.929	.250	.250	.943	.250	.000	.650	.000	.583	.898



Connecticut Counts LLC

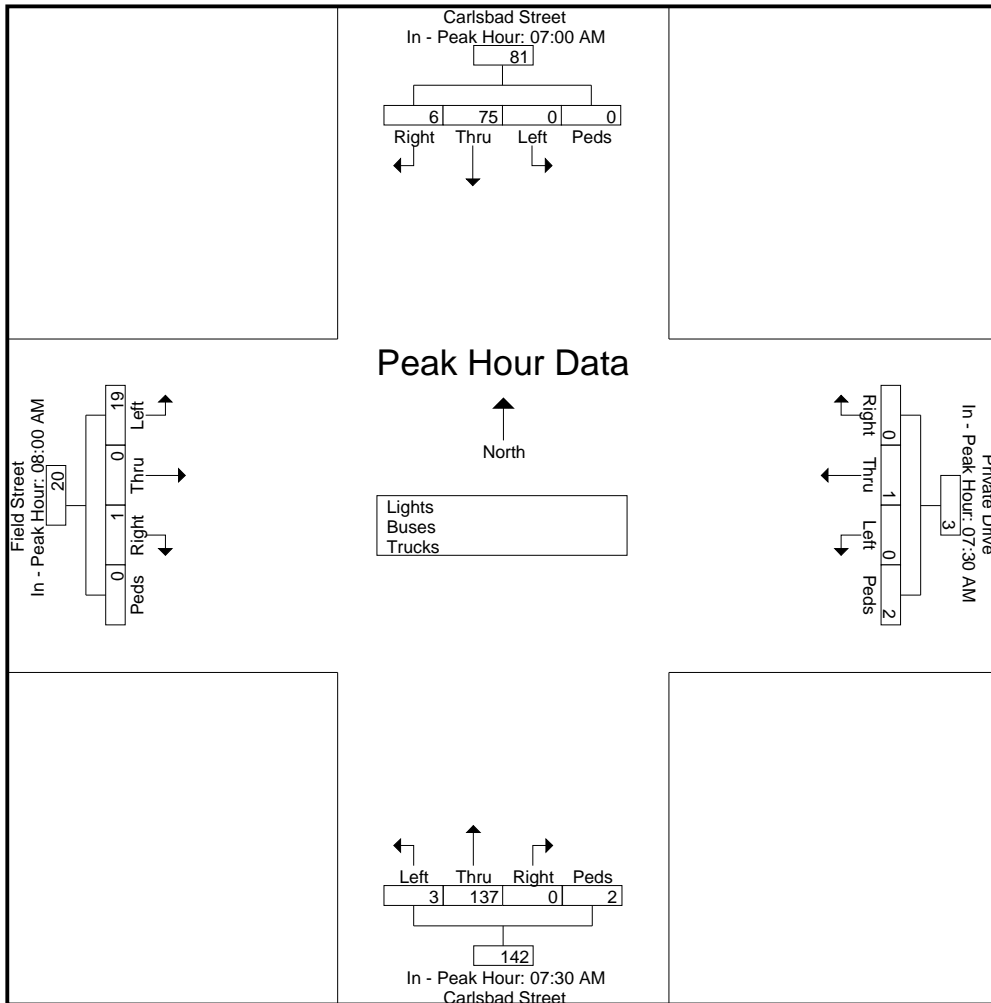
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24141
Site Code : 24141
Start Date : 3/2/2023
Page No : 3

Start Time	Carlsbad Street From North					Private Drive From East					Carlsbad Street From South					Field Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM					07:30 AM					07:30 AM					08:00 AM				
+0 mins.	1	19	0	0	20	0	1	0	1	2	0	34	0	1	35	1	0	5	0	6
+15 mins.	3	22	0	0	25	0	0	0	0	0	0	34	1	0	35	0	0	6	0	6
+30 mins.	1	20	0	0	21	0	0	0	0	0	0	35	0	0	35	0	0	3	0	3
+45 mins.	1	14	0	0	15	0	0	0	1	1	0	34	2	1	37	0	0	5	0	5
Total Volume	6	75	0	0	81	0	1	0	2	3	0	137	3	2	142	1	0	19	0	20
% App. Total	7.4	92.6	0	0		0	33.3	0	66.7		0	96.5	2.1	1.4		5	0	95	0	
PHF	.500	.852	.000	.000	.810	.000	.250	.000	.500	.375	.000	.979	.375	.500	.959	.250	.000	.792	.000	.833



Connecticut Counts LLC
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Carlsbad Street at Field Street
 Cranston, Rhode Island

File Name : 24142
 Site Code : 24142
 Start Date : 3/2/2023
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Carlsbad Street From North					Private Drive From East					Carlsbad Street From South					Field Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	4	39	0	0	43	0	0	0	0	0	0	65	0	0	65	3	0	11	0	14	122
04:15 PM	8	39	1	0	48	0	1	0	0	1	0	48	1	0	49	1	0	11	0	12	110
04:30 PM	9	33	0	0	42	0	0	0	0	0	0	52	0	0	52	3	0	8	0	11	105
04:45 PM	9	41	1	0	51	0	1	0	0	1	0	45	0	0	45	2	0	11	0	13	110
Total	30	152	2	0	184	0	2	0	0	2	0	210	1	0	211	9	0	41	0	50	447
05:00 PM	6	42	1	2	51	0	0	0	0	0	0	43	0	0	43	3	0	5	2	10	104
05:15 PM	7	41	1	2	51	0	0	0	0	0	0	34	0	0	34	1	0	6	2	9	94
05:30 PM	5	27	0	1	33	0	0	0	1	1	0	45	0	0	45	2	0	11	1	14	93
05:45 PM	5	37	0	0	42	0	1	0	0	1	0	24	1	0	25	0	1	5	1	7	75
Total	23	147	2	5	177	0	1	0	1	2	0	146	1	0	147	6	1	27	6	40	366
Grand Total	53	299	4	5	361	0	3	0	1	4	0	356	2	0	358	15	1	68	6	90	813
Apprch %	14.7	82.8	1.1	1.4		0	75	0	25		0	99.4	0.6	0		16.7	1.1	75.6	6.7		
Total %	6.5	36.8	0.5	0.6	44.4	0	0.4	0	0.1	0.5	0	43.8	0.2	0	44	1.8	0.1	8.4	0.7	11.1	
Lights	51	299	2	5	357	0	0	0	1	1	0	353	1	0	354	15	0	66	6	87	799
% Lights	96.2	100	50	100	98.9	0	0	0	100	25	0	99.2	50	0	98.9	100	0	97.1	100	96.7	98.3
Buses	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	5
% Buses	0	0	0	0	0	0	0	0	0	0	0	0.8	0	0	0.8	0	0	2.9	0	2.2	0.6
Trucks	2	0	2	0	4	0	3	0	0	3	0	0	1	0	1	0	1	0	0	1	9
% Trucks	3.8	0	50	0	1.1	0	100	0	0	75	0	0	50	0	0.3	0	100	0	0	1.1	1.1

Connecticut Counts LLC

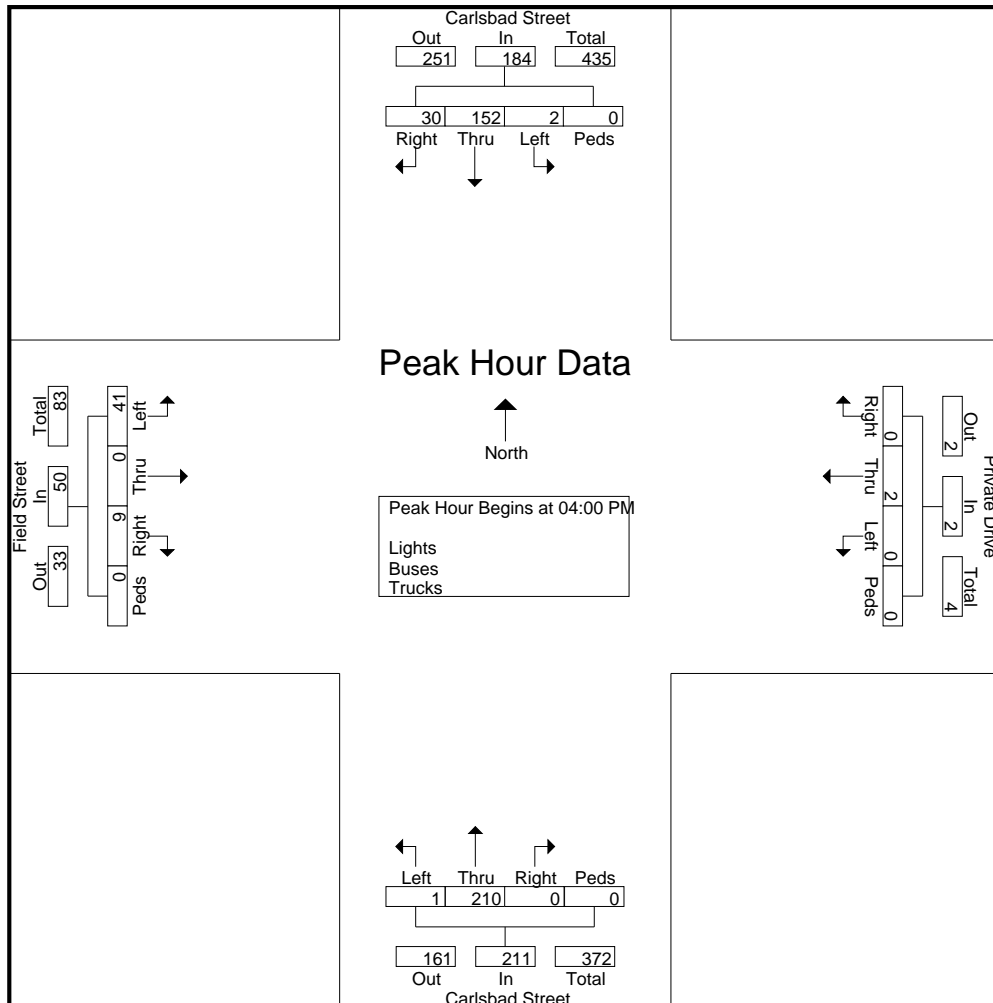
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24142
Site Code : 24142
Start Date : 3/2/2023
Page No : 2

Start Time	Carlsbad Street From North					Private Drive From East					Carlsbad Street From South					Field Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:00 PM

04:00 PM	4	39	0	0	43	0	0	0	0	0	0	65	0	0	65	3	0	11	0	14	122
04:15 PM	8	39	1	0	48	0	1	0	0	1	0	48	1	0	49	1	0	11	0	12	110
04:30 PM	9	33	0	0	42	0	0	0	0	0	0	52	0	0	52	3	0	8	0	11	105
04:45 PM	9	41	1	0	51	0	1	0	0	1	0	45	0	0	45	2	0	11	0	13	110
Total Volume	30	152	2	0	184	0	2	0	0	2	0	210	1	0	211	9	0	41	0	50	447
% App. Total	16.3	82.6	1.1	0		0	100	0	0		0	99.5	0.5	0		18	0	82	0		
PHF	.833	.927	.500	.000	.902	.000	.500	.000	.000	.500	.000	.808	.250	.000	.812	.750	.000	.932	.000	.893	.916



Connecticut Counts LLC

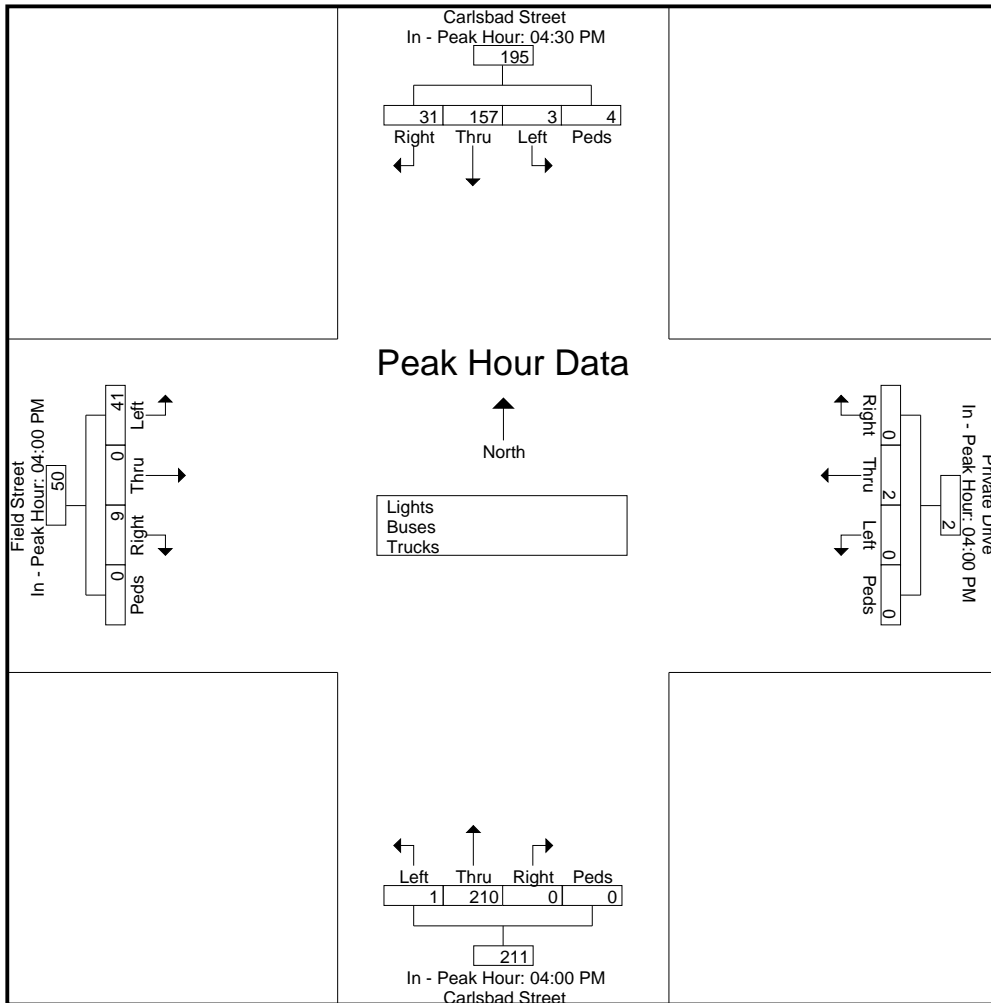
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24142
Site Code : 24142
Start Date : 3/2/2023
Page No : 3

Start Time	Carlsbad Street From North					Private Drive From East					Carlsbad Street From South					Field Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM					04:00 PM					04:00 PM					04:00 PM				
+0 mins.	9	33	0	0	42	0	0	0	0	0	0	65	0	0	65	3	0	11	0	14
+15 mins.	9	41	1	0	51	0	1	0	0	1	0	48	1	0	49	1	0	11	0	12
+30 mins.	6	42	1	2	51	0	0	0	0	0	0	52	0	0	52	3	0	8	0	11
+45 mins.	7	41	1	2	51	0	1	0	0	1	0	45	0	0	45	2	0	11	0	13
Total Volume	31	157	3	4	195	0	2	0	0	2	0	210	1	0	211	9	0	41	0	50
% App. Total	15.9	80.5	1.5	2.1		0	100	0	0		0	99.5	0.5	0		18	0	82	0	
PHF	.861	.935	.750	.500	.956	.000	.500	.000	.000	.500	.000	.808	.250	.000	.812	.750	.000	.932	.000	.893



Connecticut Counts LLC
Kensington, Connecticut 06037
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Carolina Street at Carlsbad Street
 Cranston, Rhode Island

File Name : 24143
 Site Code : 24143
 Start Date : 3/2/2023
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Carlsbad Street From North					Carolina Street From East					Carlsbad Street From South					Carolina Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	2	0	2	5	25	21	0	51	22	3	0	0	25	0	64	0	0	64	142
07:15 AM	1	2	4	0	7	5	33	19	0	57	35	0	0	1	36	1	77	0	1	79	179
07:30 AM	0	1	4	0	5	5	41	19	0	65	40	4	0	0	44	0	99	1	0	100	214
07:45 AM	1	0	4	0	5	3	30	16	0	49	39	3	0	0	42	0	76	2	0	78	174
Total	2	3	14	0	19	18	129	75	0	222	136	10	0	1	147	1	316	3	1	321	709
08:00 AM	1	0	5	3	9	7	37	10	0	54	30	4	1	0	35	0	63	4	0	67	165
08:15 AM	1	0	4	0	5	10	38	11	0	59	40	2	1	0	43	1	105	9	0	115	222
08:30 AM	1	1	9	2	13	2	31	17	0	50	28	1	0	1	30	1	71	6	0	78	171
08:45 AM	0	0	4	4	8	8	50	14	0	72	27	2	0	9	38	1	80	1	0	82	200
Total	3	1	22	9	35	27	156	52	0	235	125	9	2	10	146	3	319	20	0	342	758
09:00 AM	3	1	2	0	6	10	30	18	0	58	34	1	0	0	35	1	87	0	0	88	187
09:15 AM	3	0	2	0	5	8	45	19	0	72	27	3	0	0	30	0	62	1	0	63	170
09:30 AM	0	1	8	0	9	11	53	17	0	81	24	2	1	2	29	1	84	2	1	88	207
09:45 AM	2	0	6	0	8	3	38	17	1	59	30	2	3	1	36	0	50	1	1	52	155
Total	8	2	18	0	28	32	166	71	1	270	115	8	4	3	130	2	283	4	2	291	719
10:00 AM	2	0	5	3	10	4	49	15	0	68	27	2	0	4	33	0	59	0	0	59	170
10:15 AM	3	0	5	0	8	7	48	18	0	73	19	2	1	5	27	1	67	2	0	70	178
10:30 AM	2	0	6	2	10	16	39	25	0	80	38	2	0	2	42	1	87	1	0	89	221
10:45 AM	1	0	6	1	8	5	43	8	0	56	33	1	2	1	37	0	49	1	0	50	151
Total	8	0	22	6	36	32	179	66	0	277	117	7	3	12	139	2	262	4	0	268	720
11:00 AM	3	0	3	0	6	12	63	24	0	99	29	1	1	2	33	1	81	0	0	82	220
11:15 AM	0	1	9	1	11	7	48	16	1	72	22	3	0	2	27	3	79	0	1	83	193
11:30 AM	2	0	3	0	5	18	59	18	0	95	31	2	0	1	34	2	80	2	0	84	218
11:45 AM	1	0	12	0	13	15	54	28	0	97	48	2	0	0	50	0	87	1	0	88	248
Total	6	1	27	1	35	52	224	86	1	363	130	8	1	5	144	6	327	3	1	337	879
12:00 PM	2	3	5	1	11	13	62	30	0	105	37	5	0	1	43	1	108	0	0	109	268
12:15 PM	6	3	6	0	15	8	65	16	0	89	26	1	2	0	29	0	73	1	0	74	207
12:30 PM	4	2	7	1	14	14	58	25	0	97	27	2	2	4	35	1	87	2	0	90	236
12:45 PM	3	3	8	5	19	9	63	27	0	99	44	2	2	3	51	1	73	1	0	75	244
Total	15	11	26	7	59	44	248	98	0	390	134	10	6	8	158	3	341	4	0	348	955
01:00 PM	2	0	9	1	12	11	68	21	0	100	26	1	1	0	28	1	82	0	0	83	223
01:15 PM	4	1	5	13	23	7	50	21	2	80	31	0	1	0	32	0	109	0	0	109	244
01:30 PM	1	2	5	0	8	11	62	15	0	88	31	2	1	1	35	1	75	2	0	78	209
01:45 PM	1	0	4	2	7	14	68	29	1	112	33	3	2	1	39	2	93	2	0	97	255
Total	8	3	23	16	50	43	248	86	3	380	121	6	5	2	134	4	359	4	0	367	931
02:00 PM	7	4	10	1	22	16	61	31	0	108	38	4	1	0	43	1	84	3	0	88	261
02:15 PM	8	2	8	0	18	14	58	22	1	95	32	0	0	0	32	3	65	3	0	71	216
02:30 PM	6	3	13	1	23	14	64	32	0	110	30	0	1	19	50	1	90	4	0	95	278
02:45 PM	1	2	7	1	11	10	67	47	0	124	45	3	0	3	51	2	93	0	0	95	281
Total	22	11	38	3	74	54	250	132	1	437	145	7	2	22	176	7	332	10	0	349	1036
03:00 PM	0	2	11	1	14	22	70	34	0	126	38	1	1	14	54	1	122	1	1	125	319
03:15 PM	0	1	6	2	9	14	71	50	0	135	46	5	3	0	54	1	94	2	3	100	298
03:30 PM	3	2	7	0	12	16	86	25	0	127	96	14	4	2	116	0	92	1	0	93	348
03:45 PM	0	1	11	3	15	21	69	39	0	129	48	6	0	0	54	0	72	1	1	74	272
Total	3	6	35	6	50	73	296	148	0	517	228	26	8	16	278	2	380	5	5	392	1237

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24143
 Site Code : 24143
 Start Date : 3/2/2023
 Page No : 2

Groups Printed- Lights - Buses - Trucks

Start Time	Carlsbad Street From North					Carolina Street From East					Carlsbad Street From South					Carolina Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	1	1	17	3	22	6	90	43	0	139	75	0	1	1	77	2	115	0	0	117	355
04:15 PM	0	5	12	0	17	22	74	49	0	145	52	3	1	1	57	0	77	0	0	77	296
04:30 PM	5	0	5	0	10	15	70	36	0	121	60	5	1	3	69	0	80	2	0	82	282
04:45 PM	0	0	10	0	10	16	76	47	0	139	49	1	0	0	50	2	88	0	0	90	289
Total	6	6	44	3	59	59	310	175	0	544	236	9	3	5	253	4	360	2	0	366	1222
05:00 PM	4	4	21	0	29	23	73	60	0	156	47	2	0	1	50	1	96	2	0	99	334
05:15 PM	2	0	7	1	10	13	83	28	0	124	47	1	2	0	50	1	77	1	0	79	263
05:30 PM	1	1	7	0	9	22	86	36	2	146	43	2	1	1	47	0	88	2	0	90	292
05:45 PM	1	1	9	0	11	16	67	32	0	115	30	1	0	1	32	1	76	3	0	80	238
Total	8	6	44	1	59	74	309	156	2	541	167	6	3	3	179	3	337	8	0	348	1127
06:00 PM	0	1	3	1	5	15	74	41	0	130	31	1	0	1	33	2	92	0	0	94	262
06:15 PM	1	1	4	1	7	13	83	32	0	128	39	2	0	0	41	0	93	1	1	95	271
06:30 PM	0	0	3	0	3	11	68	31	0	110	39	1	1	1	42	0	61	0	0	61	216
06:45 PM	0	0	4	1	5	11	61	17	0	89	21	2	0	1	24	1	68	0	0	69	187
Total	1	2	14	3	20	50	286	121	0	457	130	6	1	3	140	3	314	1	1	319	936
Grand Total	90	52	327	55	524	558	2801	1266	8	4633	1784	112	38	90	2024	40	3930	68	10	4048	11229
Apprch %	17.2	9.9	62.4	10.5		12	60.5	27.3	0.2		88.1	5.5	1.9	4.4		1	97.1	1.7	0.2		
Total %	0.8	0.5	2.9	0.5	4.7	5	24.9	11.3	0.1	41.3	15.9	1	0.3	0.8	18	0.4	35	0.6	0.1	36	
Lights	88	49	317	55	509	534	2782	1246		98.6	1757					3893					11080
% Lights	97.8	94.2	96.9	100	97.1	95.7	99.3	98.4	100	98.6	98.5	98.2	97.4	97.8	98.4	100	99.1	97.1	100	99	98.7
Buses	0	0	0	0	0	0	3	2	0	5	14	0	0	0	14	0	12	1	0	13	32
% Buses	0	0	0	0	0	0	0.1	0.2	0	0.1	0.8	0	0	0	0.7	0	0.3	1.5	0	0.3	0.3
Trucks	2	3	10	0	15	24	16	18	0	58	13	2	1	2	18	0	25	1	0	26	117
% Trucks	2.2	5.8	3.1	0	2.9	4.3	0.6	1.4	0	1.3	0.7	1.8	2.6	2.2	0.9	0	0.6	1.5	0	0.6	1

Connecticut Counts LLC

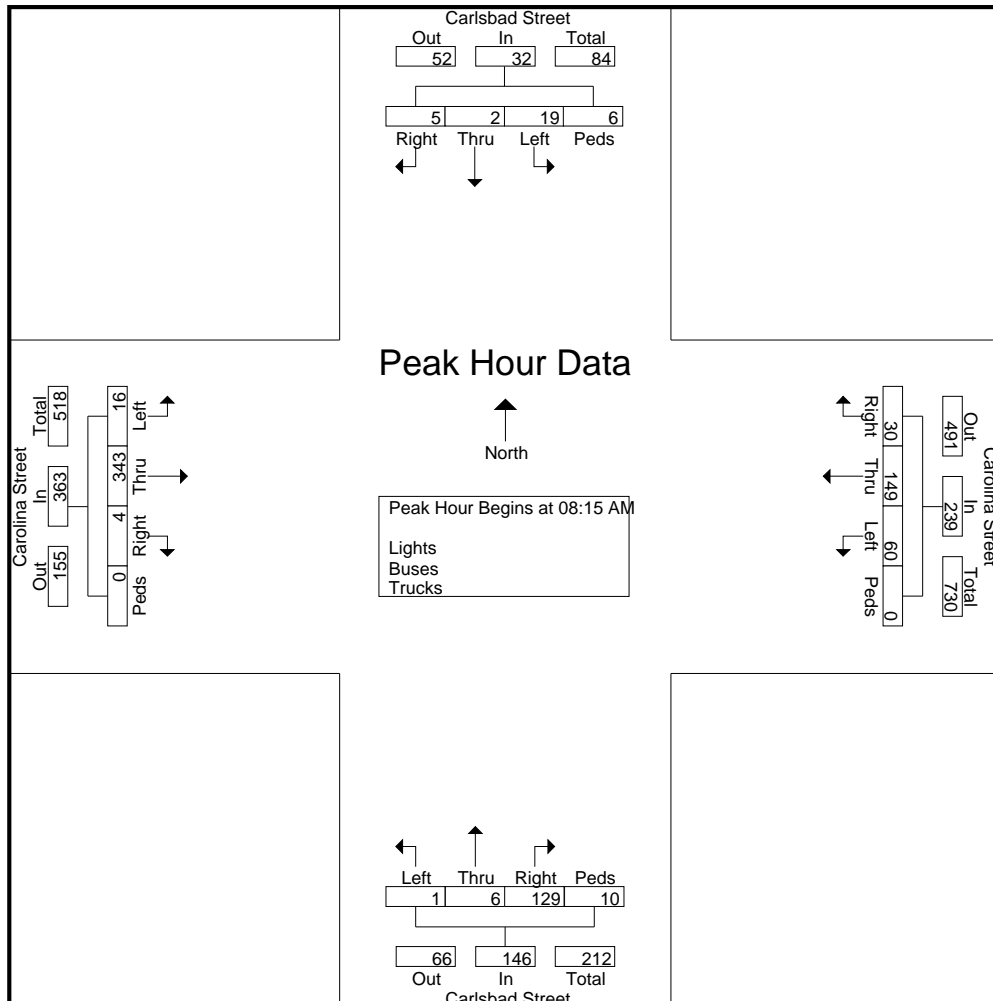
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24143
Site Code : 24143
Start Date : 3/2/2023
Page No : 3

Start Time	Carlsbad Street From North					Carolina Street From East					Carlsbad Street From South					Carolina Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 08:15 AM

08:15 AM	1	0	4	0	5	10	38	11	0	59	40	2	1	0	43	1	105	9	0	115	222
08:30 AM	1	1	9	2	13	2	31	17	0	50	28	1	0	1	30	1	71	6	0	78	171
08:45 AM	0	0	4	4	8	8	50	14	0	72	27	2	0	9	38	1	80	1	0	82	200
09:00 AM	3	1	2	0	6	10	30	18	0	58	34	1	0	0	35	1	87	0	0	88	187
Total Volume	5	2	19	6	32	30	149	60	0	239	129	6	1	10	146	4	343	16	0	363	780
% App. Total	15.6	6.2	59.4	18.8		12.6	62.3	25.1	0		88.4	4.1	0.7	6.8		1.1	94.5	4.4	0		
PHF	.417	.500	.528	.375	.615	.750	.745	.833	.000	.830	.806	.750	.250	.278	.849	1.000	.817	.444	.000	.789	.878



Connecticut Counts LLC

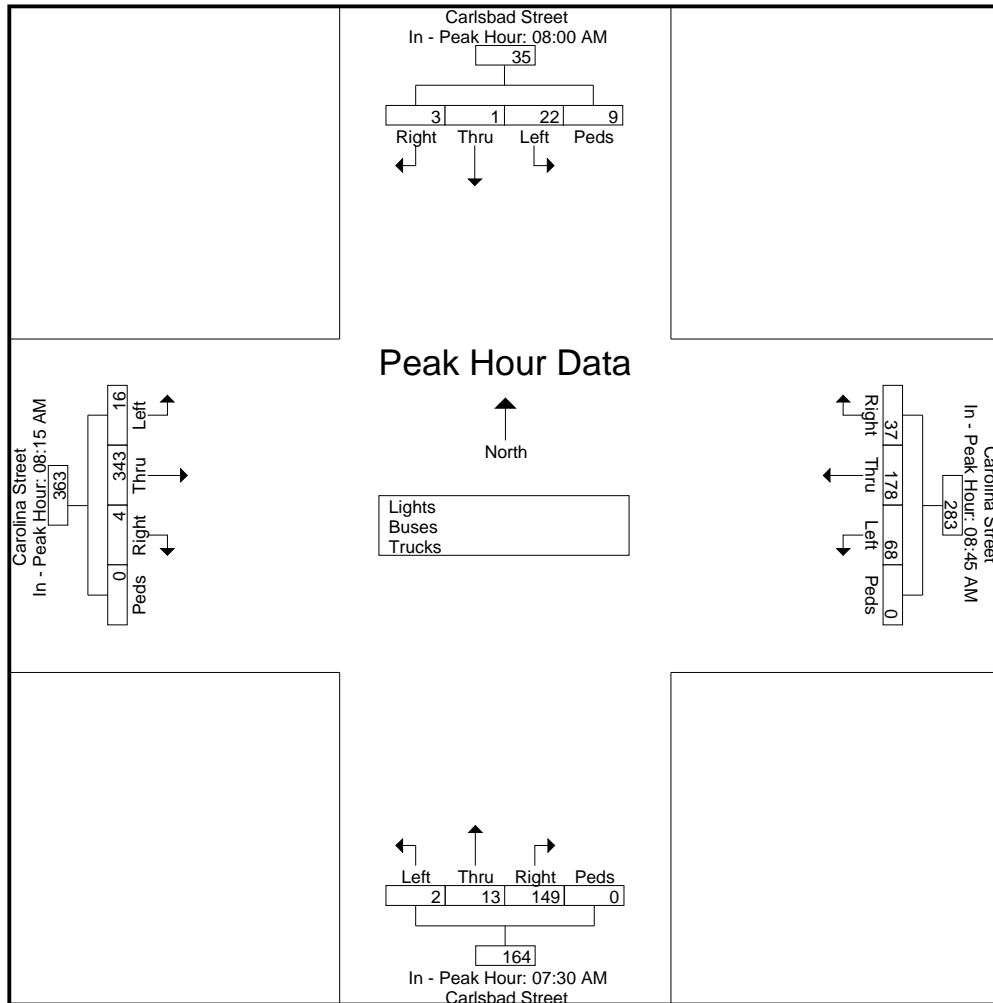
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24143
Site Code : 24143
Start Date : 3/2/2023
Page No : 4

Start Time	Carlsbad Street From North					Carolina Street From East					Carlsbad Street From South					Carolina Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM					08:45 AM					07:30 AM					08:15 AM				
+0 mins.	1	0	5	3	9	8	50	14	0	72	40	4	0	0	44	1	105	9	0	115
+15 mins.	1	0	4	0	5	10	30	18	0	58	39	3	0	0	42	1	71	6	0	78
+30 mins.	1	1	9	2	13	8	45	19	0	72	30	4	1	0	35	1	80	1	0	82
+45 mins.	0	0	4	4	8	11	53	17	0	81	40	2	1	0	43	1	87	0	0	88
Total Volume	3	1	22	9	35	37	178	68	0	283	149	13	2	0	164	4	343	16	0	363
% App. Total	8.6	2.9	62.9	25.7		13.1	62.9	24	0		90.9	7.9	1.2	0		1.1	94.5	4.4	0	
PHF	.750	.250	.611	.563	.673	.841	.840	.895	.000	.873	.931	.813	.500	.000	.932	1.000	.817	.444	.000	.789



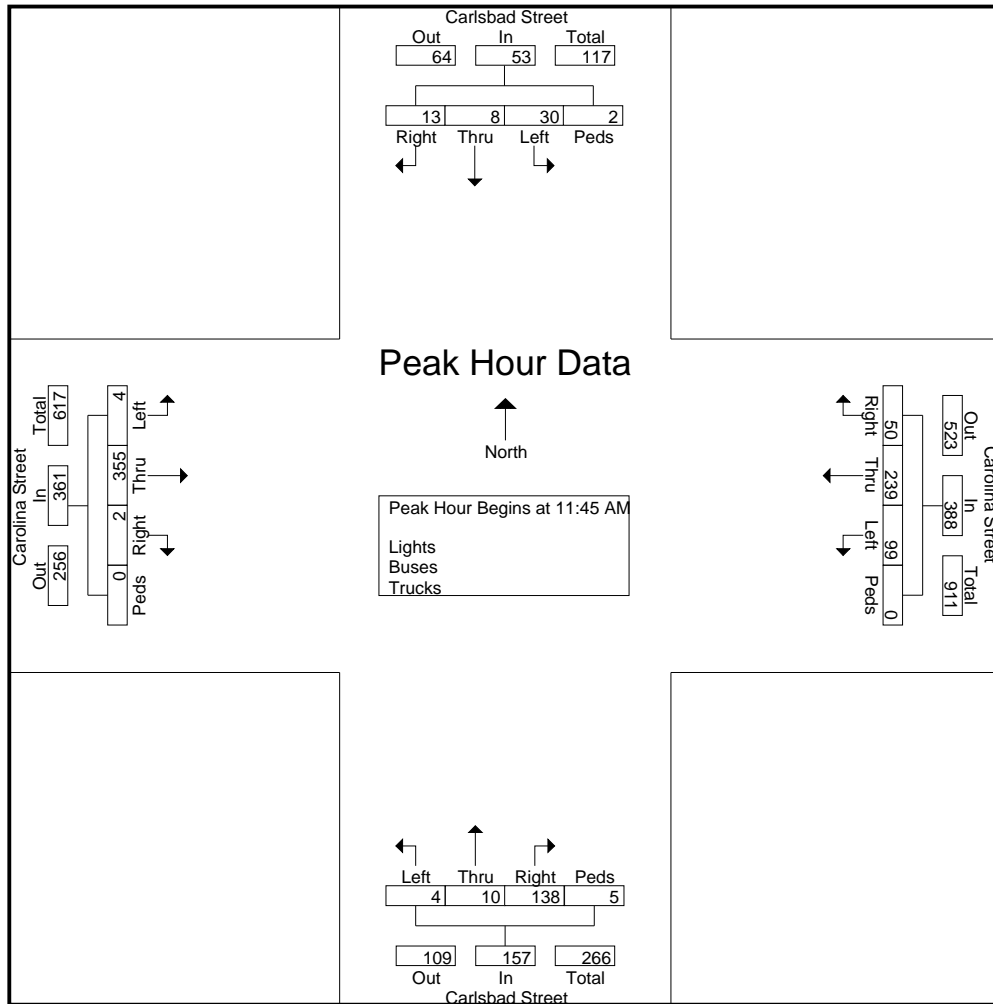
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 24143
Site Code : 24143
Start Date : 3/2/2023
Page No : 5

Start Time	Carlsbad Street From North					Carolina Street From East					Carlsbad Street From South					Carolina Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
11:45 AM	1	0	12	0	13	15	54	28	0	97	48	2	0	0	50	0	87	1	0	88	248
12:00 PM	2	3	5	1	11	13	62	30	0	105	37	5	0	1	43	1	108	0	0	109	268
12:15 PM	6	3	6	0	15	8	65	16	0	89	26	1	2	0	29	0	73	1	0	74	207
12:30 PM	4	2	7	1	14	14	58	25	0	97	27	2	2	4	35	1	87	2	0	90	236
Total Volume	13	8	30	2	53	50	239	99	0	388	138	10	4	5	157	2	355	4	0	361	959
% App. Total	24.5	15.1	56.6	3.8		12.9	61.6	25.5	0		87.9	6.4	2.5	3.2		0.6	98.3	1.1	0		
PHF	.542	.667	.625	.500	.883	.833	.919	.825	.000	.924	.719	.500	.500	.313	.785	.500	.822	.500	.000	.828	.895

Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 11:45 AM



Connecticut Counts LLC

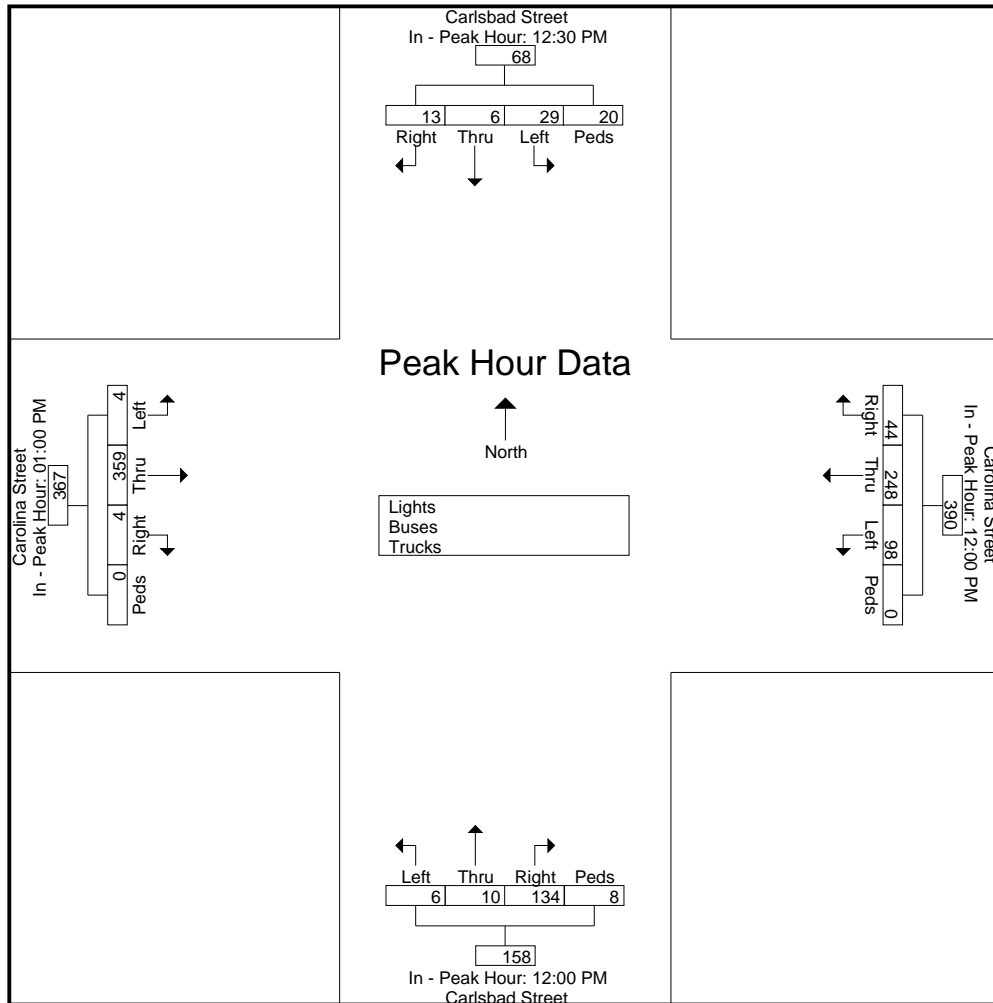
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24143
Site Code : 24143
Start Date : 3/2/2023
Page No : 6

Start Time	Carlsbad Street From North					Carolina Street From East					Carlsbad Street From South					Carolina Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	12:30 PM					12:00 PM					12:00 PM					01:00 PM				
+0 mins.	4	2	7	1	14	13	62	30	0	105	37	5	0	1	43	1	82	0	0	83
+15 mins.	3	3	8	5	19	8	65	16	0	89	26	1	2	0	29	0	109	0	0	109
+30 mins.	2	0	9	1	12	14	58	25	0	97	27	2	2	4	35	1	75	2	0	78
+45 mins.	4	1	5	13	23	9	63	27	0	99	44	2	2	3	51	2	93	2	0	97
Total Volume	13	6	29	20	68	44	248	98	0	390	134	10	6	8	158	4	359	4	0	367
% App. Total	19.1	8.8	42.6	29.4		11.3	63.6	25.1	0		84.8	6.3	3.8	5.1		1.1	97.8	1.1	0	
PHF	.813	.500	.806	.385	.739	.786	.954	.817	.000	.929	.761	.500	.750	.500	.775	.500	.823	.500	.000	.842

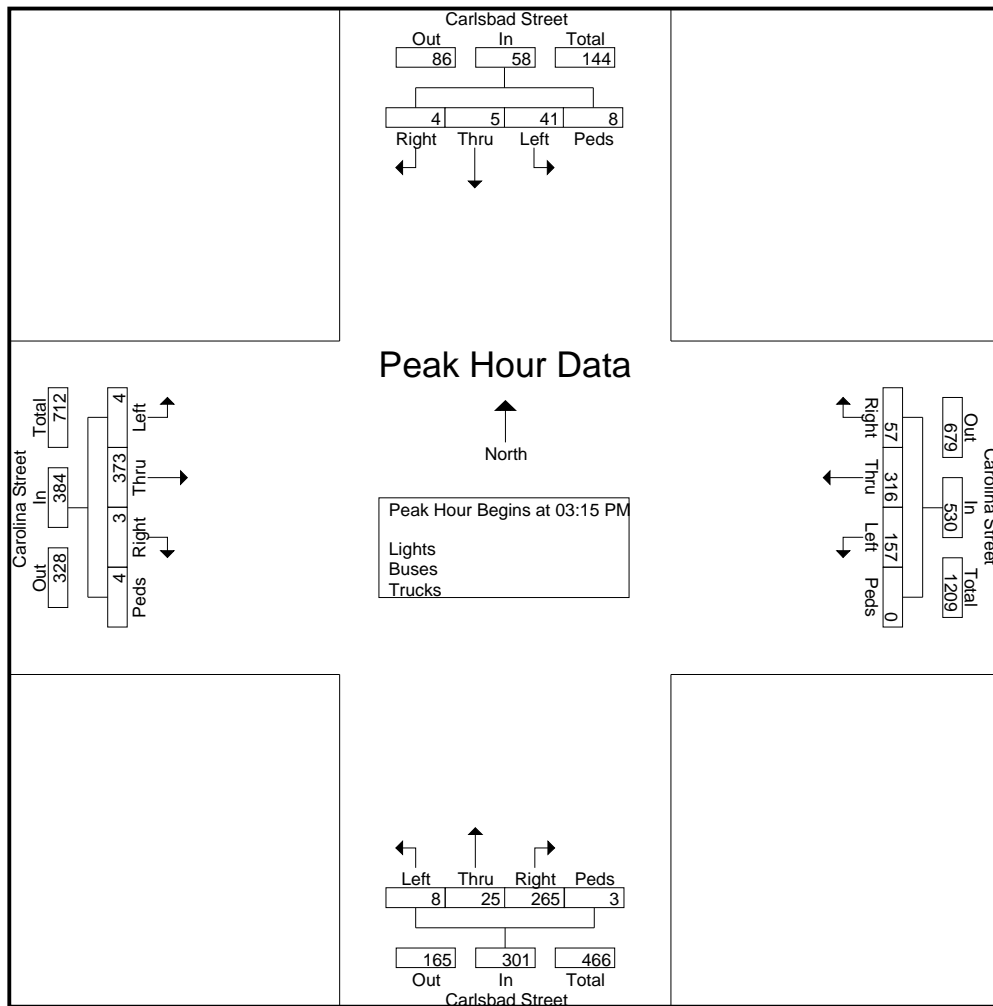


Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 24143
Site Code : 24143
Start Date : 3/2/2023
Page No : 7

Start Time	Carlsbad Street From North					Carolina Street From East					Carlsbad Street From South					Carolina Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:15 PM																					
03:15 PM	0	1	6	2	9	14	71	50	0	135	46	5	3	0	54	1	94	2	3	100	298
03:30 PM	3	2	7	0	12	16	86	25	0	127	96	14	4	2	116	0	92	1	0	93	348
03:45 PM	0	1	11	3	15	21	69	39	0	129	48	6	0	0	54	0	72	1	1	74	272
04:00 PM	1	1	17	3	22	6	90	43	0	139	75	0	1	1	77	2	115	0	0	117	355
Total Volume	4	5	41	8	58	57	316	157	0	530	265	25	8	3	301	3	373	4	4	384	1273
% App. Total	6.9	8.6	70.7	13.8		10.8	59.6	29.6	0		88	8.3	2.7	1		0.8	97.1	1	1		
PHF	.333	.625	.603	.667	.659	.679	.878	.785	.000	.953	.690	.446	.500	.375	.649	.375	.811	.500	.333	.821	.896



Connecticut Counts LLC

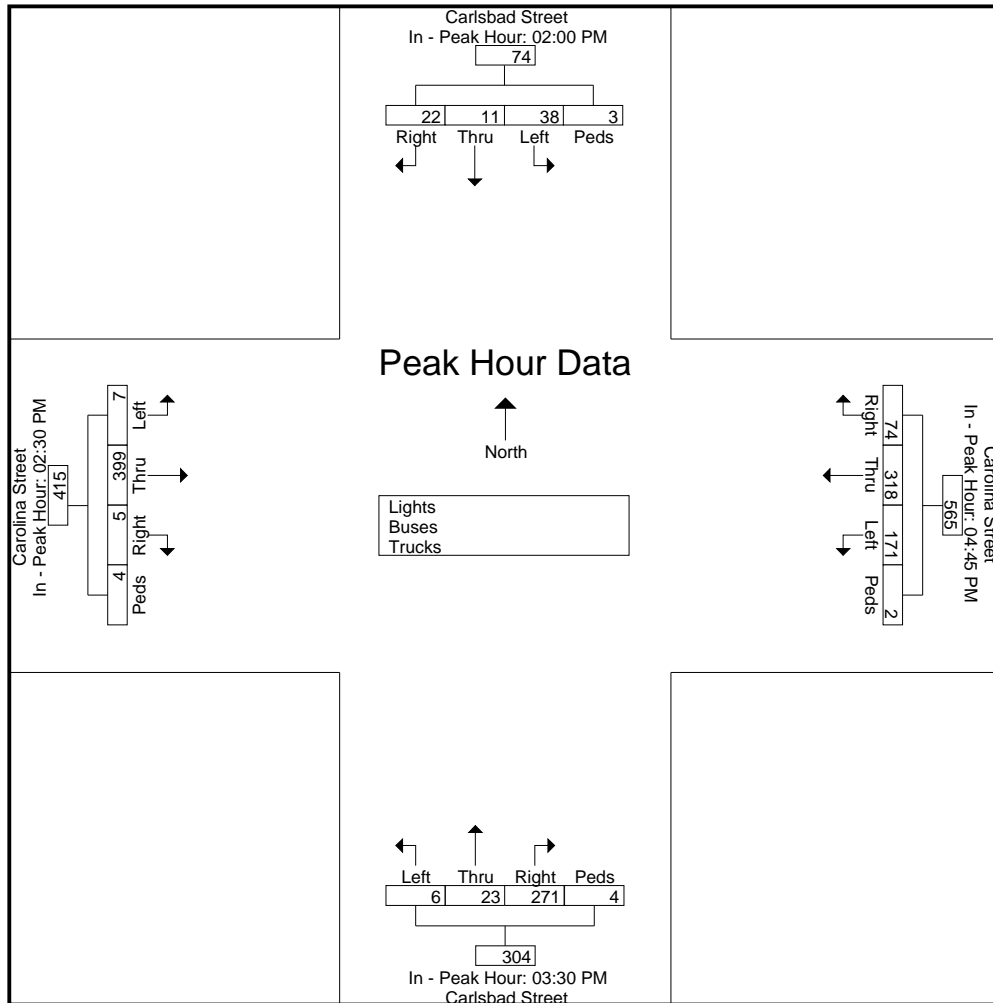
Kensington, Connecticut 06037
(860) 828-1693

File Name : 24143
Site Code : 24143
Start Date : 3/2/2023
Page No : 8

Start Time	Carlsbad Street From North					Carolina Street From East					Carlsbad Street From South					Carolina Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:00 PM					04:45 PM					03:30 PM					02:30 PM				
+0 mins.	7	4	10	1	22	16	76	47	0	139	96	14	4	2	116	1	90	4	0	95
+15 mins.	8	2	8	0	18	23	73	60	0	156	48	6	0	0	54	2	93	0	0	95
+30 mins.	6	3	13	1	23	13	83	28	0	124	75	0	1	1	77	1	122	1	1	125
+45 mins.	1	2	7	1	11	22	86	36	2	146	52	3	1	1	57	1	94	2	3	100
Total Volume	22	11	38	3	74	74	318	171	2	565	271	23	6	4	304	5	399	7	4	415
% App. Total	29.7	14.9	51.4	4.1		13.1	56.3	30.3	0.4		89.1	7.6	2	1.3		1.2	96.1	1.7	1	
PHF	.688	.688	.731	.750	.804	.804	.924	.713	.250	.905	.706	.411	.375	.500	.655	.625	.818	.438	.333	.830



Carolina Street East of Carlsbad Street
Cranston, Rhode Island

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5820

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total	Pace Speed	Number in Pace
03/02/23	0	2	18	46	16	7	0	0	0	0	0	0	0	0	89	21-30	64
01:00	0	1	3	18	9	1	0	0	0	0	0	0	0	0	32	26-35	27
02:00	0	0	21	14	7	1	0	0	0	0	0	0	0	0	43	21-30	35
03:00	0	0	2	11	3	0	0	0	0	0	0	0	0	0	16	26-35	14
04:00	0	1	13	35	16	4	1	0	0	0	0	0	0	0	70	26-35	51
05:00	1	0	37	40	17	1	0	0	0	0	0	0	0	0	96	21-30	77
06:00	0	10	65	105	32	4	0	0	0	0	0	0	0	0	216	21-30	170
07:00	2	5	91	162	47	8	0	0	0	0	0	0	0	0	315	21-30	253
08:00	1	19	133	130	24	2	1	0	0	0	0	0	0	0	310	21-30	263
09:00	0	38	173	143	36	3	0	0	0	0	0	0	0	0	393	21-30	316
10:00	0	33	186	137	29	1	0	0	0	0	0	0	0	0	386	21-30	323
11:00	1	44	241	174	19	4	0	0	0	0	0	0	0	0	483	21-30	415
12 PM	6	54	268	178	28	2	1	0	0	0	0	0	0	0	537	21-30	446
13:00	1	37	253	196	33	0	0	0	0	0	0	0	0	0	520	21-30	449
14:00	1	50	237	184	39	1	0	0	0	0	0	0	0	0	512	21-30	421
15:00	7	99	310	185	31	0	0	0	0	0	0	0	0	0	632	21-30	495
16:00	4	61	363	227	30	0	0	0	0	0	0	0	0	0	685	21-30	590
17:00	17	108	378	180	24	1	0	0	0	0	0	0	0	0	708	21-30	558
18:00	4	98	327	165	18	3	0	0	0	0	0	0	0	0	615	21-30	492
19:00	3	46	282	192	19	1	0	0	0	0	0	0	0	0	543	21-30	474
20:00	0	30	165	173	46	4	0	0	0	0	0	0	0	0	418	21-30	338
21:00	0	8	93	168	45	6	1	1	0	0	0	0	0	0	322	21-30	261
22:00	0	12	62	104	40	8	1	0	0	0	0	0	0	0	227	21-30	166
23:00	0	5	35	87	27	6	4	0	0	0	0	0	0	0	164	21-30	122
Total	48	761	3756	3054	635	68	9	1	0	0	0	0	0	0	8332		
Percent	0.6%	9.1%	45.1%	36.7%	7.6%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	11:00	11:00	11:00	07:00	07:00	04:00								11:00		
Vol.	2	44	241	174	47	8	1								483		
PM Peak	17:00	17:00	17:00	16:00	20:00	22:00	23:00	21:00							17:00		
Vol.	17	108	378	227	46	8	4	1							708		

Carolina Street East of Carlsbad Street
Cranston, Rhode Island

Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Site Code:
Station ID: 5820

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total	Pace Speed	Number in Pace
03/03/23	0	2	13	50	13	6	0	0	0	0	0	0	0	0	84	26-35	63
01:00	0	1	6	30	10	4	0	0	0	0	0	0	0	0	51	26-35	40
02:00	0	0	14	17	6	2	0	0	0	0	0	0	0	0	39	21-30	31
03:00	0	0	4	20	7	1	0	0	0	0	0	0	0	0	32	26-35	27
04:00	0	0	6	23	13	4	0	0	0	0	0	0	0	0	46	26-35	36
05:00	6	1	26	60	17	6	0	0	0	0	0	0	0	0	116	21-30	86
06:00	0	4	55	102	43	3	0	1	0	1	0	2	0	0	211	21-30	157
07:00	0	8	71	170	56	7	2	0	0	0	0	0	0	0	314	21-30	241
08:00	5	28	134	192	40	5	0	0	0	0	0	0	0	0	404	21-30	326
09:00	1	20	115	207	37	2	1	0	0	0	0	0	0	0	383	21-30	322
10:00	2	31	239	150	41	2	0	0	0	0	0	0	0	0	465	21-30	389
11:00	4	54	266	133	26	3	0	0	0	0	0	0	0	0	486	21-30	399
12 PM	5	91	255	229	29	3	0	0	0	0	0	0	0	0	612	21-30	484
13:00	9	65	243	173	25	1	0	0	0	0	0	0	0	0	516	21-30	416
14:00	15	54	266	202	32	3	1	0	0	0	0	0	0	0	573	21-30	468
15:00	3	77	356	190	31	1	0	0	0	0	0	0	0	0	658	21-30	546
16:00	10	57	322	197	27	0	0	0	0	0	0	0	0	0	613	21-30	519
17:00	17	93	326	175	17	2	0	0	0	0	0	0	0	0	630	21-30	501
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	77	586	2717	2320	470	55	4	1	0	1	0	2	0	0	6233		
Percent	1.2%	9.4%	43.6%	37.2%	7.5%	0.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	05:00	11:00	11:00	09:00	07:00	07:00	07:00	06:00		06:00		06:00	06:00		11:00		
Vol.	6	54	266	207	56	7	2	1		1		2			486		
PM Peak	17:00	17:00	15:00	12:00	14:00	12:00	14:00								15:00		
Vol.	17	93	356	229	32	3	1								658		
Total	130	1545	7519	6332	1367	160	15	2	0	1	0	2	0	0	17073		
Percent	0.8%	9.0%	44.0%	37.1%	8.0%	0.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 20 MPH
 50th Percentile : 24 MPH
 85th Percentile : 29 MPH
 95th Percentile : 32 MPH

Stats
 10 MPH Pace Speed : 21-30 MPH
 Number in Pace : 13851
 Percent in Pace : 81.1%
 Number of Vehicles > 25 MPH : 7879
 Percent of Vehicles > 25 MPH : 46.1%
 Mean Speed(Average) : 25 MPH

Carolina Street East of Carlsbad Street
Cranston, Rhode Island

Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Site Code:
Station ID: 5820

Latitude: 0' 0.0000 Undefined

Eastbound																Pace	Number
Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total	Speed	in Pace
	15	20	25	30	35	40	45	50	55	60	65	70	75	999			
03/03/23	0	2	19	14	1	0	0	0	0	0	0	0	0	0	36	21-30	33
01:00	2	1	21	17	1	0	0	0	0	0	0	0	0	0	42	21-30	38
02:00	3	3	10	16	2	0	0	0	0	0	0	0	0	0	34	21-30	26
03:00	0	5	10	8	2	0	0	0	0	0	0	0	0	0	25	21-30	18
04:00	2	7	36	32	6	0	1	0	0	0	0	0	0	0	84	21-30	68
05:00	0	8	43	65	10	2	0	0	0	0	0	0	0	0	128	21-30	108
06:00	4	29	101	119	17	3	0	0	0	0	0	0	0	0	273	21-30	220
07:00	0	29	208	193	43	0	0	0	0	0	0	0	0	0	473	21-30	401
08:00	6	37	231	170	30	2	0	0	0	0	0	0	0	0	476	21-30	401
09:00	5	67	250	151	16	3	0	0	0	0	0	0	0	0	492	21-30	401
10:00	15	72	290	95	6	0	0	0	0	0	0	0	0	0	478	21-30	385
11:00	6	100	330	90	14	0	0	0	0	0	0	0	0	0	540	16-25	430
12 PM	4	92	342	126	15	0	0	0	0	0	0	0	0	0	579	21-30	468
13:00	9	72	307	127	11	1	0	0	0	0	0	0	0	0	527	21-30	434
14:00	4	78	300	141	21	0	0	0	0	0	0	0	0	0	544	21-30	441
15:00	37	110	351	118	14	1	0	0	0	0	0	0	0	0	631	21-30	469
16:00	12	90	397	139	4	0	1	0	0	0	0	0	0	0	643	21-30	536
17:00	9	136	351	88	2	0	0	0	0	0	0	0	0	0	586	16-25	487
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	118	938	3597	1709	215	12	2	0	0	0	0	0	0	0	6591		
Percent	1.8%	14.2%	54.6%	25.9%	3.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	11:00	07:00	07:00	06:00	04:00									11:00	
Vol.	15	100	330	193	43	3	1									540	
PM Peak	15:00	17:00	16:00	14:00	14:00	13:00	16:00									16:00	
Vol.	37	136	397	141	21	1	1									643	
Total	287	2467	8490	3794	440	31	6	0	0	0	0	0	0	0	15515		
Percent	1.8%	15.9%	54.7%	24.5%	2.8%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 19 MPH
 50th Percentile : 22 MPH
 85th Percentile : 27 MPH
 95th Percentile : 29 MPH

Stats
 10 MPH Pace Speed : 21-30 MPH
 Number in Pace : 12284
 Percent in Pace : 79.2%
 Number of Vehicles > 25 MPH : 4271
 Percent of Vehicles > 25 MPH : 27.5%
 Mean Speed(Average) : 23 MPH

Carolina Street East of Carlsbad Street
Cranston, Rhode Island

Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Site Code:
Station ID: 5820

Latitude: 0' 0.0000 Undefined

Start Time	27-Feb-23		Tue		Wed		Thu		Fri		Weekday Average		Sat		Sun	
	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound
	d	d	nd	d	nd	d	nd	d	nd	d	nd	d	nd	d	nd	d
12:00 AM	*	*	*	*	*	*	89	33	84	36	86	34	*	*	*	*
01:00	*	*	*	*	*	*	32	39	51	42	42	40	*	*	*	*
02:00	*	*	*	*	*	*	43	29	39	34	41	32	*	*	*	*
03:00	*	*	*	*	*	*	16	18	32	25	24	22	*	*	*	*
04:00	*	*	*	*	*	*	70	87	46	84	58	86	*	*	*	*
05:00	*	*	*	*	*	*	96	143	116	128	106	136	*	*	*	*
06:00	*	*	*	*	*	*	216	292	211	273	214	282	*	*	*	*
07:00	*	*	*	*	*	*	315	451	314	473	314	462	*	*	*	*
08:00	*	*	*	*	*	*	310	460	404	476	357	468	*	*	*	*
09:00	*	*	*	*	*	*	393	428	383	492	388	460	*	*	*	*
10:00	*	*	*	*	*	*	386	413	465	478	426	446	*	*	*	*
11:00	*	*	*	*	*	*	483	452	486	540	484	496	*	*	*	*
12:00 PM	*	*	*	*	*	*	537	510	612	579	574	544	*	*	*	*
01:00	*	*	*	*	*	*	520	499	516	527	518	513	*	*	*	*
02:00	*	*	*	*	*	*	512	533	573	544	542	538	*	*	*	*
03:00	*	*	*	*	*	*	632	631	658	631	645	631	*	*	*	*
04:00	*	*	*	*	*	*	685	614	613	643	649	628	*	*	*	*
05:00	*	*	*	*	234	235	708	528	630	586	524	450	*	*	*	*
06:00	*	*	*	*	581	443	615	453	*	*	598	448	*	*	*	*
07:00	*	*	*	*	545	267	543	316	*	*	544	292	*	*	*	*
08:00	*	*	*	*	442	216	418	242	*	*	430	229	*	*	*	*
09:00	*	*	*	*	330	156	322	150	*	*	326	153	*	*	*	*
10:00	*	*	*	*	216	103	227	106	*	*	222	104	*	*	*	*
11:00	*	*	*	*	160	34	164	43	*	*	162	38	*	*	*	*
Total	0	0	0	0	2508	1454	8332	7470	6233	6591	8274	7532	0	0	0	0
Day	0	0	0	0	3962	15802	12824	15806	0	0	0	0	0	0	0	0
AM Peak	-	-	-	-	-	-	11:00	08:00	11:00	11:00	11:00	11:00	-	-	-	-
Vol.	-	-	-	-	-	-	483	460	486	540	484	496	-	-	-	-
PM Peak	-	-	-	-	18:00	18:00	17:00	15:00	15:00	16:00	16:00	15:00	-	-	-	-
Vol.	-	-	-	-	581	443	708	631	658	643	649	631	-	-	-	-

Comb. Total	0	0	3962	15802	12824	15806	0	0
ADT	ADT 15,749	AADT 15,749						

Carlsbad Street South of Field Street
Cranston, Rhode Island

Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Site Code:
Station ID: 5821

Latitude: 0' 0.0000 Undefined

Northbound

Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total	Pace Speed	Number in Pace
03/03/23	0	3	4	3	4	0	0	0	0	0	0	0	0	0	14	16-25	7
01:00	1	3	17	6	2	1	0	0	0	0	0	0	0	0	30	21-30	23
02:00	0	2	3	7	1	1	0	0	0	0	0	0	0	0	14	21-30	10
03:00	0	0	0	2	1	0	0	0	0	0	0	0	0	0	3	24-33	3
04:00	0	4	4	4	3	1	0	0	0	0	0	0	0	0	16	16-25	8
05:00	0	1	1	14	5	4	1	0	0	0	0	0	0	0	26	26-35	19
06:00	0	0	3	15	22	9	2	0	1	0	0	0	0	0	52	26-35	37
07:00	1	1	20	45	34	15	3	0	0	0	0	0	0	0	119	26-35	79
08:00	0	8	15	67	48	14	0	0	0	0	0	0	0	0	152	26-35	115
09:00	0	4	18	50	45	11	1	0	0	0	0	0	0	0	129	26-35	95
10:00	1	5	21	64	24	11	1	0	0	0	0	0	0	0	127	26-35	88
11:00	1	12	43	57	22	8	1	0	0	0	0	0	0	0	144	21-30	100
12 PM	2	5	50	114	39	12	1	0	0	0	0	0	0	0	223	21-30	164
13:00	1	13	48	77	24	10	1	1	0	0	0	0	0	0	175	21-30	125
14:00	2	13	44	89	63	12	0	1	0	0	0	0	0	0	224	26-35	152
15:00	16	30	74	80	42	11	1	0	0	1	0	0	0	0	255	21-30	154
16:00	2	20	76	98	39	4	2	0	1	0	0	0	0	0	242	21-30	174
17:00	1	10	53	87	36	9	2	0	0	0	0	0	0	0	198	21-30	140
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	28	134	494	879	454	133	16	2	2	0	1	0	0	0	2143		
Percent	1.3%	6.3%	23.1%	41.0%	21.2%	6.2%	0.7%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	01:00	11:00	11:00	08:00	08:00	07:00	07:00		06:00								08:00
Vol.	1	12	43	67	48	15	3		1								152
PM Peak	15:00	15:00	16:00	12:00	14:00	12:00	16:00	13:00	16:00		15:00						15:00
Vol.	16	30	76	114	63	12	2	1	1		1						255
Total	57	287	1165	1827	968	247	36	7	4	0	1	0	0	0	4599		
Percent	1.2%	6.2%	25.3%	39.7%	21.0%	5.4%	0.8%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 21 MPH
 50th Percentile : 27 MPH
 85th Percentile : 32 MPH
 95th Percentile : 36 MPH

Stats
 10 MPH Pace Speed : 21-30 MPH
 Number in Pace : 2992
 Percent in Pace : 65.1%
 Number of Vehicles > 25 MPH : 3090
 Percent of Vehicles > 25 MPH : 67.2%
 Mean Speed(Average) : 28 MPH

Carlsbad Street South of Field Street
Cranston, Rhode Island

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5821

Latitude: 0' 0.0000 Undefined

Southbound

Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total	Pace Speed	Number in Pace
03/01/23	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	2	10	47	88	27	1	1	0	0	0	0	0	0	0	176	21-30	135
18:00	1	5	19	53	28	2	1	0	0	0	0	0	0	0	109	26-35	81
19:00	0	4	29	83	16	3	0	0	0	0	0	0	0	0	135	21-30	112
20:00	0	3	17	49	14	5	1	0	0	0	0	0	0	0	89	21-30	66
21:00	0	4	10	34	10	2	0	0	0	0	0	0	0	0	60	21-30	44
22:00	0	1	6	30	9	3	3	0	0	0	0	0	0	0	52	26-35	39
23:00	0	1	7	24	6	3	0	0	0	0	0	0	0	0	41	21-30	31
Total	3	28	135	361	110	19	6	0	0	0	0	0	0	0	662		
Percent	0.5%	4.2%	20.4%	54.5%	16.6%	2.9%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.	17:00	17:00	17:00	17:00	18:00	20:00	22:00								17:00		
	2	10	47	88	28	5	3								176		

Carlsbad Street South of Field Street
Cranston, Rhode Island

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5821

Latitude: 0' 0.0000 Undefined

Southbound

Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	Total	Pace Speed	Number in Pace
03/02/23	1	0	9	14	3	2	0	0	0	0	0	0	0	0	29	21-30	23
01:00	0	1	1	1	3	1	1	0	0	0	0	0	0	0	8	31-40	4
02:00	0	0	7	7	2	0	0	0	0	0	0	0	0	0	16	21-30	14
03:00	0	1	4	0	0	0	0	0	0	0	0	0	0	0	5	16-25	5
04:00	0	9	8	16	1	0	1	0	0	0	0	0	0	0	35	21-30	24
05:00	2	13	47	14	3	1	0	0	0	0	0	0	0	0	80	19-28	61
06:00	1	5	21	31	16	4	0	0	0	0	0	0	0	0	78	21-30	52
07:00	0	5	27	53	15	5	3	0	0	0	0	0	0	0	108	21-30	80
08:00	0	2	12	34	9	1	0	0	0	0	0	0	0	0	58	21-30	46
09:00	1	5	10	53	11	3	0	0	0	0	0	0	0	0	83	26-35	64
10:00	0	3	18	43	8	2	1	0	0	0	0	0	0	0	75	21-30	61
11:00	2	3	27	46	11	1	0	0	0	0	0	0	0	0	90	21-30	73
12 PM	2	13	46	55	12	2	0	0	0	0	0	0	0	0	130	21-30	101
13:00	0	8	24	60	16	5	0	0	0	0	0	0	0	0	113	21-30	84
14:00	0	4	31	75	24	6	0	0	0	0	0	0	0	0	140	21-30	106
15:00	4	15	62	75	30	4	1	0	0	0	0	0	0	0	191	21-30	137
16:00	1	5	33	120	30	4	0	0	0	0	0	0	0	0	193	21-30	153
17:00	0	12	65	94	37	6	0	0	0	0	0	0	0	0	214	21-30	159
18:00	1	5	38	66	18	5	0	1	0	0	0	0	0	0	134	21-30	104
19:00	1	7	40	60	14	1	0	0	0	0	0	0	0	0	123	21-30	100
20:00	0	5	32	64	16	0	0	0	0	0	0	0	0	0	117	21-30	96
21:00	0	1	21	39	9	2	2	0	0	0	0	0	0	0	74	21-30	60
22:00	1	0	14	16	18	3	1	0	0	0	0	0	0	0	53	26-35	34
23:00	0	1	8	18	5	1	0	0	0	0	0	0	0	0	33	21-30	26
Total	17	123	605	1054	311	59	10	1	0	0	0	0	0	0	2180		
Percent	0.8%	5.6%	27.8%	48.3%	14.3%	2.7%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	05:00	05:00	05:00	07:00	06:00	07:00	07:00									07:00	
Vol.	2	13	47	53	16	5	3								108		
PM Peak	15:00	15:00	17:00	16:00	17:00	14:00	21:00	18:00							17:00		
Vol.	4	15	65	120	37	6	2	1							214		

Carlsbad Street South of Field Street
Cranston, Rhode Island

Connecticut Counts LLC Kensington, Connecticut 06037 (860) 828-1693

Site Code:
Station ID: 5821

Latitude: 0' 0.0000 Undefined

Southbound

Start Time	1	16	21	26	31	36	41	46	51	56	61	66	71	76	999	Total	Pace Speed	Number in Pace
03/03/23	0	1	2	14	5	0	1	0	0	0	0	0	0	0	0	23	26-35	19
01:00	0	1	3	3	5	0	0	0	0	0	0	0	0	0	0	12	25-34	8
02:00	0	0	7	11	3	3	0	0	0	0	0	0	0	0	0	24	21-30	18
03:00	0	1	2	1	2	1	0	0	0	0	0	0	0	0	0	7	31-40	3
04:00	2	5	26	5	1	1	0	0	0	0	0	0	0	0	0	40	16-25	31
05:00	1	6	36	22	7	0	0	0	0	0	0	0	0	0	0	72	21-30	58
06:00	0	0	12	35	18	0	0	0	1	0	0	0	0	0	0	66	26-35	53
07:00	0	2	17	58	17	5	0	0	0	0	0	0	0	0	0	99	21-30	75
08:00	1	4	14	46	15	2	3	0	0	0	0	0	0	0	0	85	24-33	61
09:00	1	3	14	40	12	1	2	0	0	0	0	0	0	0	0	73	21-30	54
10:00	0	3	20	34	15	2	0	0	0	0	0	0	0	0	0	74	21-30	54
11:00	0	4	37	35	10	2	2	0	0	0	0	0	0	0	0	90	21-30	72
12 PM	2	21	46	55	22	9	0	0	0	0	0	0	0	0	0	155	21-30	101
13:00	5	9	36	50	26	1	0	0	0	0	0	0	0	0	0	127	21-30	86
14:00	1	10	32	49	28	8	1	0	0	0	0	0	0	0	0	129	21-30	81
15:00	3	21	65	98	26	9	0	1	0	0	0	0	0	0	0	223	21-30	163
16:00	0	15	49	109	25	6	0	0	0	0	0	0	0	0	0	204	21-30	158
17:00	0	3	52	103	23	3	1	0	0	0	0	0	0	0	0	185	21-30	155
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	16	109	470	768	260	53	10	1	1	0	0	0	0	0	0	1688		
Percent	0.9%	6.5%	27.8%	45.5%	15.4%	3.1%	0.6%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	04:00	05:00	11:00	07:00	06:00	07:00	08:00		06:00									07:00
Vol.	2	6	37	58	18	5	3		1									99
PM Peak	13:00	12:00	15:00	16:00	14:00	12:00	14:00	15:00										15:00
Vol.	5	21	65	109	28	9	1	1										223
Total	36	260	1210	2183	681	131	26	2	1	0	0	0	0	0	0	4530		
Percent	0.8%	5.7%	26.7%	48.2%	15.0%	2.9%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 21 MPH
50th Percentile : 26 MPH
85th Percentile : 31 MPH
95th Percentile : 34 MPH

Stats
10 MPH Pace Speed : 21-30 MPH
Number in Pace : 3393
Percent in Pace : 74.9%
Number of Vehicles > 25 MPH : 3024
Percent of Vehicles > 25 MPH : 66.8%
Mean Speed(Average) : 27 MPH

Carlsbad Street South of Field Street
Cranston, Rhode Island

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5821

Latitude: 0' 0.0000 Undefined

Start Time	27-Feb-23		Tue		Wed		Thu		Fri		Weekday Average		Sat		Sun	
	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound
12:00 AM	*	*	*	*	*	*	11	29	14	23	12	26	*	*	*	*
01:00	*	*	*	*	*	*	26	8	30	12	28	10	*	*	*	*
02:00	*	*	*	*	*	*	14	16	14	24	14	20	*	*	*	*
03:00	*	*	*	*	*	*	6	5	3	7	4	6	*	*	*	*
04:00	*	*	*	*	*	*	17	35	16	40	16	38	*	*	*	*
05:00	*	*	*	*	*	*	34	80	26	72	30	76	*	*	*	*
06:00	*	*	*	*	*	*	51	78	52	66	52	72	*	*	*	*
07:00	*	*	*	*	*	*	119	108	119	99	119	104	*	*	*	*
08:00	*	*	*	*	*	*	125	58	152	85	138	72	*	*	*	*
09:00	*	*	*	*	*	*	118	83	129	73	124	78	*	*	*	*
10:00	*	*	*	*	*	*	101	75	127	74	114	74	*	*	*	*
11:00	*	*	*	*	*	*	124	90	144	90	134	90	*	*	*	*
12:00 PM	*	*	*	*	*	*	132	130	223	155	178	142	*	*	*	*
01:00	*	*	*	*	*	*	112	113	175	127	144	120	*	*	*	*
02:00	*	*	*	*	*	*	158	140	224	129	191	134	*	*	*	*
03:00	*	*	*	*	*	*	233	191	255	223	244	207	*	*	*	*
04:00	*	*	*	*	*	*	218	193	242	204	230	198	*	*	*	*
05:00	*	*	*	*	167	176	163	214	198	185	176	192	*	*	*	*
06:00	*	*	*	*	97	109	111	134	*	*	104	122	*	*	*	*
07:00	*	*	*	*	55	135	62	123	*	*	58	129	*	*	*	*
08:00	*	*	*	*	38	89	49	117	*	*	44	103	*	*	*	*
09:00	*	*	*	*	26	60	31	74	*	*	28	67	*	*	*	*
10:00	*	*	*	*	22	52	18	53	*	*	20	52	*	*	*	*
11:00	*	*	*	*	6	41	12	33	*	*	9	37	*	*	*	*
Total Day	0	0	0	0	411	662	2045	2180	2143	1688	2211	2169	0	0	0	0
AM Peak Vol.	-	-	-	-	-	-	08:00	07:00	08:00	07:00	08:00	07:00	-	-	-	-
PM Peak Vol.	-	-	-	-	17:00	17:00	15:00	17:00	15:00	15:00	15:00	15:00	-	-	-	-

Comb. Total	0	0	1073	4225	3831	4380	0	0
ADT	ADT 4,363	AADT 4,363						

APPENDIX B
Traffic Projection Model

Carlsbad Street at Burnham Avenue	EB L	71	71	4	75	30%	6							6	81
	T	55	55	3	58									0	58
	R	1	1	0	1									0	1
	WB L	3	3	0	3									0	3
	T	62	62	3	65									0	65
	R	74	74	4	78									0	78
	NB L	0	0	0	0									0	0
	T	2	2	0	2									0	2
	R	1	1	0	1									0	1
	SB L	20	20	1	21		100%	7						7	28
T	13	13	1	14									0	14	
R	21	21	1	22					60%	3			3	25	
Carolina Street at Proposed Site Driveway (Passenger - Truck Exit)	EB T	373	373	19	392									0	392
	R	-	-	-	0	5%	1							1	1
	WB L	-	-	-	0	5%	1							1	1
	T	227	227	12	239	60%	11	100%	7					18	257
	NB L	-	-	-	0					5%	1			1	1
R	-	-	-	0					5%	1	100%	1	2	2	
Carlsbad Street at Proposed Southern Site Driveway	WB L	-	-	-	0					30%	2			2	2
	R	-	-	-	0					60%	3			3	3
	NB T	147	147	7	154									0	154
	R	-	-	-	0	30%	5							5	5
	SB L	-	-	-	0	55%	11							11	11
T	52	52	3	55			100%	7					7	62	
Burnham Avenue at Proposed Site Driveway (Truck Only Entrance)	EB L	-	-	-	0			100%	7					7	7
	T	76	76	4	80									0	80
	WB T	139	139	7	146									0	146
	R	-	-	-	0									0	0

Peak Hour: 7:30 AM-8:30 AM

Carlsbad Street at Burnham Avenue	EB	L	107	107	5	112	30%	3							3	115
		T	52	52	3	55									0	55
		R	1	1	0	1									0	1
	WB	L	1	1	0	1									0	1
		T	65	65	3	68									0	68
		R	72	72	4	76									0	76
	NB	L	0	0	0	0									0	0
		T	29	29	1	30									0	30
		R	5	5	0	5									0	5
	SB	L	72	72	4	76		100%	1						1	77
	T	2	2	0	2									0	2	
	R	92	92	5	97					30%	5			5	102	
Carolina Street at Proposed Site Driveway (Passenger - Truck Exit)	EB	T	413	413	21	434									0	434
		R	-	-	-	0	5%	1							1	1
	WB	L	-	-	-	0	5%	1							1	1
		T	544	544	28	572	60%	5	100%	1					6	578
	NB	L	-	-	-	0					5%	1			1	1
	R	-	-	-	0					5%	1	100%	7	8	8	
Carlsbad Street at Proposed Southern Site Driveway	WB	L	-	-	-	0					30%	5			5	5
		R	-	-	-	0					60%	10			10	10
	NB	T	208	208	11	219									0	219
		R	-	-	-	0	30%	3							3	3
	SB	L	-	-	-	0	55%	5							5	5
	T	161	161	8	169			100%	1					1	170	
Burnham Avenue at Proposed Site Driveway (Truck Only Entrance)	EB	L	-	-	-	0			100%	1					1	1
		T	129	129	7	136									0	136
	WB	T	138	138	7	145									0	145
		R	-	-	-	0									0	0

Peak Hour: 4:00 PM-5:00 PM

APPENDIX C
Signal Warrant Analysis

HCS7 Warrants Report

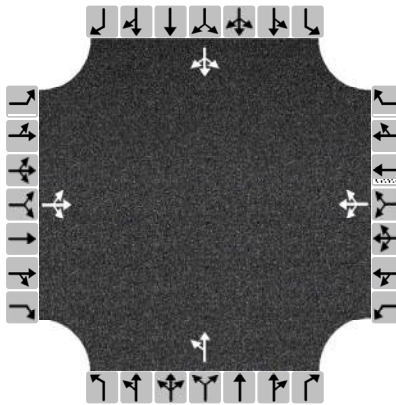
Project Information

Analyst	McMahon	Date	3/15/2023
Agency		Analysis Year	2023 Existing
Jurisdiction	Cranston, RI	Time Period Analyzed	Weekday
Project Description	Proposed Industrial Expansion		

General

Major Street Direction	East-West	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	4
Major Street Speed (mi/h)	25	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	400		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Number of Lanes, N	0	1	0	0	1	0	0	1	0	0	1	0
Lane Usage		LTR			LTR			LT			LTR	
Vehicle Volumes Averages (veh/h)	5	327	3	105	233	46	3	9	0	27	4	7
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	0

HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)	4A (100%)	4B (100%)
07 - 08	542	19	571	0	0	No	No	No	No	No	No	No	No	No
08 - 09	577	26	614	0	0	No	No	No	No	No	No	No	No	No
09 - 10	558	28	598	0	0	No	No	No	No	No	No	No	No	No
10 - 11	545	30	585	0	0	No	No	No	No	No	No	No	No	No
11 - 12	698	34	741	0	0	No	No	No	No	No	No	No	No	No
12 - 13	738	52	806	0	0	No	No	No	No	No	No	No	No	No
13 - 14	744	34	789	0	0	No	No	No	No	No	No	No	No	No
14 - 15	785	71	865	0	0	No	No	No	Yes	No	No	No	No	No
15 - 16	904	44	982	0	0	No	No	No	No	No	No	No	No	No
16 - 17	910	56	978	0	0	No	No	No	No	No	No	No	No	No
17 - 18	887	58	954	0	0	No	No	No	No	No	No	No	No	No
18 - 19	775	17	799	0	0	No	No	No	No	No	No	No	No	No
Total	8663	469	9282	0	0	0	0	0	1	0	0	0	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	
Warrant 3: Peak Hour	
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	✓
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 80% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

HCS7 Warrants Report

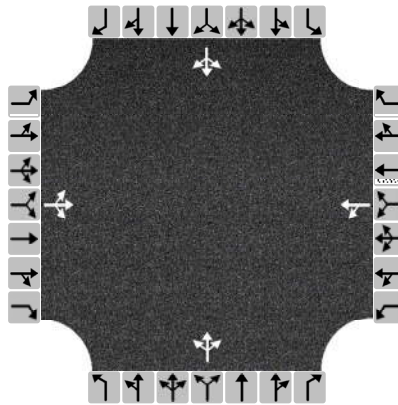
Project Information

Analyst	McMahon	Date	3/15/2023
Agency		Analysis Year	2023 Existing
Jurisdiction	Cranston, RI	Time Period Analyzed	Weekday
Project Description	Proposed Industrial Expansion		

General

Major Street Direction	North-South	Population < 10,000	No
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	25	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	0		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Number of Lanes, N	0	1	0	0	1	0	0	1	0	0	1	0
Lane Usage		LTR			LT			LTR			LTR	
Vehicle Volumes Averages (veh/h)	0	0	0	56	0	2	1	566	60	47	498	0
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	0
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	0

HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)	4A (100%)	4B (100%)
07 - 08	1120	36	1157	0	0	No	No	No	No	No	No	No	No	No
08 - 09	1147	24	1171	0	0	No	No	No	No	No	No	No	No	No
09 - 10	995	41	1036	0	0	No	No	No	No	No	No	No	No	No
10 - 11	890	39	931	0	0	No	No	No	No	No	No	No	No	No
11 - 12	1049	40	1089	0	0	No	No	No	No	No	No	No	No	No
12 - 13	1150	52	1202	0	0	No	No	No	No	No	No	No	No	No
13 - 14	1182	59	1242	0	0	No	No	No	No	No	No	No	No	No
14 - 15	1311	64	1376	0	0	No	No	No	Yes	No	No	No	No	No
15 - 16	1321	69	1392	0	0	No	No	No	Yes	No	No	No	No	No
16 - 17	1417	91	1509	0	0	No	No	Yes	Yes	Yes	No	No	No	No
17 - 18	1380	101	1483	0	0	No	No	Yes	Yes	Yes	No	No	No	No
18 - 19	1129	104	1233	0	0	No	No	Yes	Yes	Yes	No	No	No	No
Total	14091	720	14821	0	0	0	0	3	5	3	0	0	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume

- A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--
- B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--
- 80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)

Warrant 2: Four-Hour Vehicular Volume

- Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)

Warrant 3: Peak Hour

- A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--
- B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)

Warrant 4: Pedestrian Volume

- A. Four Hour Volumes --or--
- B. One-Hour Volumes

Warrant 5: School Crossing

- Gaps Same Period --and--
- Student Volumes
- Nearest Traffic Control Signal (optional)

Warrant 6: Coordinated Signal System

- Degree of Platooning (Predominant direction or both directions)

Warrant 7: Crash Experience

- A. Adequate trials of alternatives, observance and enforcement failed --and--
- B. Reported crashes susceptible to correction by signal (12-month period) --and--
- C. 80% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied

Warrant 8: Roadway Network

- A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--
- B. Weekend Volume (Five hours total)

Warrant 9: Grade Crossing

- A. Grade Crossing within 140 ft --and--
- B. Peak-Hour Vehicular Volumes

APPENDIX D

Highway Capacity Manual Methodologies

CAPACITY/LEVEL-OF-SERVICE ANALYSES METHODOLOGY

The detailed capacity/level-of-service analysis contained in this traffic impact study was performed in accordance with the standard techniques contained in the *Highway Capacity Manual*.⁽¹⁾ By definition, capacity represents “the maximum rate of flow that can reasonably be expected to pass a point on a uniform section of a lane or roadway under prevailing roadway, traffic, and control conditions.” The level of functioning of an intersection or a uniform section of a lane or roadway can be expressed in terms of levels of service. 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”. Such measures include “speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.”

At unsignalized intersections, a methodology for evaluating the relative functioning of intersections controlled by stop or yield signs has been developed, and is based on several assumptions, including:

- Major street flows are not affected by the minor (stop-sign controlled) street movements.
- Left turns from the major street to the minor street are influenced only by opposing major street through flow.
- Minor street left turns are impeded by all major street traffic plus opposing minor street traffic.
- Minor street through traffic is impeded by all major street traffic.
- Minor street right turns are impeded only by the major street traffic coming from the left.

The concept of stop-controlled or yield-controlled intersection analysis is based on the estimate of average total delay on minor streets. The methodology of analysis relies on three elements: the size and distribution of gaps in the major traffic stream, the usefulness of these gaps to the minor stream drivers, and the relative priority of the various traffic streams at the intersection. The results of the analysis provide an estimate of average total delay for the various critical movements at the unsignalized intersections. Correlation between average total delay and the respective levels of service are provided for unsignalized intersections as follows:

(1) *Transportation Research Board, Highway Capacity Manual 2010, published by the Transportation Research Board, Washington, DC, 2010.*

Unsignalized Intersections

Level of Service	Control Delay Per Vehicle (seconds)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	> 50

At signalized intersections, an additional element must be considered: time allocation. Level of service is based on the average control delay per vehicle for various movements within the intersection. Volume/capacity relationships also affect the operations of signalized intersections. Thus, both volume/capacity and delay must be considered to evaluate the overall operation of a signalized intersection. Correlation between average delay per vehicle and the respective levels of service are provided for signalized intersections as follows:

Signalized Intersections

Level of Service	Control Delay Per Vehicle (seconds)
A	≤ 10
B	>10 – 20
C	>20 – 35
D	>35 – 55
E	>55 – 80
F	> 80

APPENDIX E

2023 Existing Capacity/Level-of-Service Analysis

Lanes, Volumes, Timings
6: Cranston Street & Ridge Street/Carolina Street

2023 Existing Weekday AM
03/16/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Volume (vph)	2	3	6	107	1	21	2	509	232	126	375	0
Future Volume (vph)	2	3	6	107	1	21	2	509	232	126	375	0
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	190		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1747	0	0	1702	0	0	1796	0	1703	1827	0
Flt Permitted					0.742			0.999		0.170		
Satd. Flow (perm)	0	1763	0	0	1315	0	0	1794	0	305	1827	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			8			20				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		316			416			259				425
Travel Time (s)		7.2			9.5			5.9				9.7
Peak Hour Factor	0.39	0.39	0.39	0.90	0.90	0.90	0.96	0.96	0.96	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	4%	100%	5%	2%	2%	0%	6%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	0	0	143	0	0	774	0	138	412	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			3			2		1	1 2	
Permitted Phases	4			3			2			1 2		
Detector Phase	4	4		3	3		2	2		1	1 2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		8.0	8.0		4.0		
Minimum Split (s)	8.5	8.5		22.5	22.5		23.0	23.0		8.5		
Total Split (s)	10.0	10.0		23.0	23.0		27.0	27.0		20.0		
Total Split (%)	9.5%	9.5%		21.9%	21.9%		25.7%	25.7%		19.0%		
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		
All-Red Time (s)	1.0	1.0		1.0	1.0		1.5	1.5		1.0		
Lost Time Adjust (s)		0.0			0.0			0.0		0.0		
Total Lost Time (s)		4.5			4.5			5.0		4.5		
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Recall Mode	None	None		None	None		Min	Min		None		
Act Effct Green (s)		5.5			12.1			23.5		37.1	41.9	
Actuated g/C Ratio		0.08			0.17			0.34		0.53	0.60	
v/c Ratio		0.18			0.62			1.26		0.33	0.38	
Control Delay		29.5			41.2			154.6		13.5	12.9	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		29.5			41.2			154.6		13.5	12.9	
LOS		C			D			F		B	B	
Approach Delay		29.5			41.2			154.6			13.1	
Approach LOS		C			D			F			B	
Queue Length 50th (ft)		5			48			~378		16	56	
Queue Length 95th (ft)		11			152			#1045		102	307	
Internal Link Dist (ft)		236			336			179			345	
Turn Bay Length (ft)										190		
Base Capacity (vph)		161			377			615		502	1091	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	24%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lanes, Volumes, Timings
 6: Cranston Street & Ridge Street/Carolina Street

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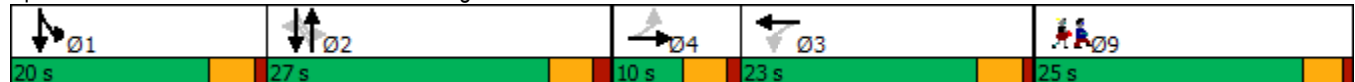


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.17			0.38			1.26		0.27	0.38	

Intersection Summary

Area Type:	Other
Cycle Length:	105
Actuated Cycle Length:	70.1
Natural Cycle:	120
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.26
Intersection Signal Delay:	89.4
Intersection LOS:	F
Intersection Capacity Utilization	86.4%
ICU Level of Service	E
Analysis Period (min)	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 6: Cranston Street & Ridge Street/Carolina Street



Lane Group	Ø9
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	71	55	1	3	62	74	0	2	1	20	13	21
Future Vol, veh/h	71	55	1	3	62	74	0	2	1	20	13	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	72	72	72	25	25	25	64	64	64
Heavy Vehicles, %	3	4	0	0	2	2	2	2	2	2	2	2
Mvmt Flow	83	64	1	4	86	103	0	8	4	31	20	33

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	189	0	0	65	0	0	403	428	65	383	377	138
Stage 1	-	-	-	-	-	-	231	231	-	146	146	-
Stage 2	-	-	-	-	-	-	172	197	-	237	231	-
Critical Hdwy	4.13	-	-	4.1	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.227	-	-	2.2	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1379	-	-	1550	-	-	558	519	999	575	555	910
Stage 1	-	-	-	-	-	-	772	713	-	857	776	-
Stage 2	-	-	-	-	-	-	830	738	-	766	713	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1379	-	-	1550	-	-	496	485	999	538	519	910
Mov Cap-2 Maneuver	-	-	-	-	-	-	496	485	-	538	519	-
Stage 1	-	-	-	-	-	-	724	669	-	804	774	-
Stage 2	-	-	-	-	-	-	777	736	-	707	669	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.3	0.2	11.3	11.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	585	1379	-	-	1550	-	-	633
HCM Lane V/C Ratio	0.021	0.06	-	-	0.003	-	-	0.133
HCM Control Delay (s)	11.3	7.8	0	-	7.3	0	-	11.6
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	0.5

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	343	1	56	146	25	2	13	13	17	1	3
Future Vol, veh/h	16	343	1	56	146	25	2	13	13	17	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	87	87	87	93	93	93	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	440	1	64	168	29	2	14	14	19	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	197	0	0	441	0	0	796	808	441	801	794	183
Stage 1	-	-	-	-	-	-	483	483	-	311	311	-
Stage 2	-	-	-	-	-	-	313	325	-	490	483	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1376	-	-	1119	-	-	305	315	616	303	321	859
Stage 1	-	-	-	-	-	-	565	553	-	699	658	-
Stage 2	-	-	-	-	-	-	698	649	-	560	553	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1376	-	-	1119	-	-	284	289	616	267	294	859
Mov Cap-2 Maneuver	-	-	-	-	-	-	284	289	-	267	294	-
Stage 1	-	-	-	-	-	-	554	542	-	685	616	-
Stage 2	-	-	-	-	-	-	650	607	-	523	542	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			2.1			12.1			18.1		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	538	1376	-	-	1119	-	-	298
HCM Lane V/C Ratio	0.056	0.015	-	-	0.058	-	-	0.08
HCM Control Delay (s)	12.1	7.7	0	-	8.4	0	-	18.1
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0.2	-	-	0.3

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	0	1	0	1	0	3	137	0	0	51	5
Future Vol, veh/h	17	0	1	0	1	0	3	137	0	0	51	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	25	25	25	97	97	97	67	67	67
Heavy Vehicles, %	12	0	0	0	0	0	0	3	0	0	4	60
Mvmt Flow	23	0	1	0	4	0	3	141	0	0	76	7

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	229	227	80	227	230	141	83	0	0	141	0	0
Stage 1	80	80	-	147	147	-	-	-	-	-	-	-
Stage 2	149	147	-	80	83	-	-	-	-	-	-	-
Critical Hdwy	7.22	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.22	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.22	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3,608	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	705	676	986	733	673	912	1527	-	-	1455	-	-
Stage 1	904	832	-	860	779	-	-	-	-	-	-	-
Stage 2	830	779	-	934	830	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	701	675	986	731	672	912	1527	-	-	1455	-	-
Mov Cap-2 Maneuver	701	675	-	731	672	-	-	-	-	-	-	-
Stage 1	902	832	-	858	777	-	-	-	-	-	-	-
Stage 2	824	777	-	933	830	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.2		10.4		0.2		0	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1527	-	-	712	672	1455	-	-
HCM Lane V/C Ratio	0.002	-	-	0.034	0.006	-	-	-
HCM Control Delay (s)	7.4	0	-	10.2	10.4	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	49	717	71	63	458
Future Vol, veh/h	35	49	717	71	63	458
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	88	88	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	63	815	81	73	533

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1535	856	0	0	896
Stage 1	856	-	-	-	-
Stage 2	679	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	128	357	-	-	757
Stage 1	416	-	-	-	-
Stage 2	504	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	110	357	-	-	757
Mov Cap-2 Maneuver	244	-	-	-	-
Stage 1	416	-	-	-	-
Stage 2	435	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.7	0	1.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	299	757
HCM Lane V/C Ratio	-	-	0.36	0.097
HCM Control Delay (s)	-	-	23.7	10.3
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	1.6	0.3

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Volume (vph)	2	0	0	245	1	92	4	507	199	126	470	1
Future Volume (vph)	2	0	0	245	1	92	4	507	199	126	470	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	190		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1805	0	0	1753	0	0	1785	0	1787	1881	0
Flt Permitted					0.784			0.997		0.240		
Satd. Flow (perm)	0	1900	0	0	1424	0	0	1779	0	451	1881	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					16			16				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		316			416			259				425
Travel Time (s)		7.2			9.5			5.9				9.7
Peak Hour Factor	0.50	0.50	0.50	0.95	0.95	0.95	0.90	0.90	0.90	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	3%	1%	1%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	356	0	0	788	0	134	501	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			3			2		1	1 2	
Permitted Phases	4			3			2			1 2		
Detector Phase	4	4		3	3		2	2		1	1 2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		8.0	8.0		4.0		
Minimum Split (s)	8.5	8.5		22.5	22.5		13.0	13.0		8.5		
Total Split (s)	10.0	10.0		23.0	23.0		21.0	21.0		26.0		
Total Split (%)	9.5%	9.5%		21.9%	21.9%		20.0%	20.0%		24.8%		
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		
All-Red Time (s)	1.0	1.0		1.0	1.0		1.5	1.5		1.0		
Lost Time Adjust (s)		0.0			0.0			0.0		0.0		
Total Lost Time (s)		4.5			4.5			5.0		4.5		
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Recall Mode	None	None		None	None		Min	Min		None		
Act Effct Green (s)		5.3			19.3			16.7		33.5	38.2	
Actuated g/C Ratio		0.07			0.27			0.23		0.47	0.53	
v/c Ratio		0.03			0.90			1.85		0.26	0.50	
Control Delay		39.0			55.3			413.1		12.9	15.4	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		39.0			55.3			413.1		12.9	15.4	
LOS		D			E			F		B	B	
Approach Delay		39.0			55.3			413.1			14.9	
Approach LOS		D			E			F			B	
Queue Length 50th (ft)		2			124			~474		22	102	
Queue Length 95th (ft)		8			#490			#1145		99	385	
Internal Link Dist (ft)		236			336			179			345	
Turn Bay Length (ft)										190		
Base Capacity (vph)		152			395			426		652	992	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	24%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

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2023 Existing Weekday PM
 03/16/2023

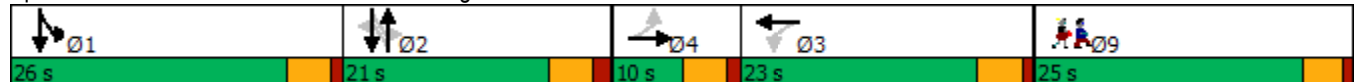


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.03			0.90			1.85		0.21	0.51	

Intersection Summary

Area Type:	Other
Cycle Length:	105
Actuated Cycle Length:	71.7
Natural Cycle:	150
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.85
Intersection Signal Delay:	199.0
Intersection LOS:	F
Intersection Capacity Utilization:	92.9%
ICU Level of Service:	F
Analysis Period (min):	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 6: Cranston Street & Ridge Street/Carolina Street



Lane Group	Ø9
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection												
Int Delay, s/veh	7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	107	52	1	1	65	72	0	29	5	72	2	92
Future Vol, veh/h	107	52	1	1	65	72	0	29	5	72	2	92
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	84	84	84	65	65	65	90	90	90
Heavy Vehicles, %	6	2	0	0	0	1	0	0	0	0	0	0
Mvmt Flow	126	61	1	1	77	86	0	45	8	80	2	102

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	163	0	0	62	0	0	488	479	62	462	436	120
Stage 1	-	-	-	-	-	-	314	314	-	122	122	-
Stage 2	-	-	-	-	-	-	174	165	-	340	314	-
Critical Hdwy	4.16	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.254	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1392	-	-	1554	-	-	493	489	1009	513	517	937
Stage 1	-	-	-	-	-	-	701	660	-	887	799	-
Stage 2	-	-	-	-	-	-	833	766	-	679	660	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1392	-	-	1554	-	-	406	443	1009	436	468	937
Mov Cap-2 Maneuver	-	-	-	-	-	-	406	443	-	436	468	-
Stage 1	-	-	-	-	-	-	635	598	-	804	798	-
Stage 2	-	-	-	-	-	-	739	765	-	565	598	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.2	0.1	13.4	13.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	483	1392	-	-	1554	-	-	620
HCM Lane V/C Ratio	0.108	0.09	-	-	0.001	-	-	0.297
HCM Control Delay (s)	13.4	7.8	0	-	7.3	0	-	13.2
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0.3	-	-	0	-	-	1.2

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	360	4	175	310	59	3	9	9	44	6	6
Future Vol, veh/h	2	360	4	175	310	59	3	9	9	44	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	94	94	94	82	82	82	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	462	5	186	330	63	4	11	11	59	8	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	393	0	0	467	0	0	1213	1236	465	1210	1207	362
Stage 1	-	-	-	-	-	-	471	471	-	734	734	-
Stage 2	-	-	-	-	-	-	742	765	-	476	473	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1166	-	-	1094	-	-	159	176	597	159	183	683
Stage 1	-	-	-	-	-	-	573	560	-	412	426	-
Stage 2	-	-	-	-	-	-	408	412	-	570	558	-
Platoon blocked, %		-	-	-	-	-						
Mov Cap-1 Maneuver	1166	-	-	1094	-	-	125	137	597	122	143	683
Mov Cap-2 Maneuver	-	-	-	-	-	-	125	137	-	122	143	-
Stage 1	-	-	-	-	-	-	571	558	-	411	333	-
Stage 2	-	-	-	-	-	-	307	322	-	547	556	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			2.9			22.3			60.5		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	234	1166	-	-	1094	-	-	136
HCM Lane V/C Ratio	0.109	0.002	-	-	0.17	-	-	0.556
HCM Control Delay (s)	22.3	8.1	0	-	9	0	-	60.5
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.4	0	-	-	0.6	-	-	2.8

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	41	0	9	0	2	0	1	210	0	2	152	30
Future Vol, veh/h	41	0	9	0	2	0	1	210	0	2	152	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	50	50	50	81	81	81	90	90	90
Heavy Vehicles, %	5	0	0	0	100	0	100	1	0	100	0	7
Mvmt Flow	46	0	10	0	4	0	1	259	0	2	169	33

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	453	451	186	456	467	259	202	0	0	259	0	0
Stage 1	190	190	-	261	261	-	-	-	-	-	-	-
Stage 2	263	261	-	195	206	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.5	6.2	7.1	7.5	6.2	5.1	-	-	5.1	-	-
Critical Hdwy Stg 1	6.15	5.5	-	6.1	6.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.5	-	6.1	6.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.3	3.5	4.9	3.3	3.1	-	-	3.1	-	-
Pot Cap-1 Maneuver	512	507	861	518	375	785	950	-	-	898	-	-
Stage 1	805	747	-	748	545	-	-	-	-	-	-	-
Stage 2	736	696	-	811	581	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	506	505	861	510	374	785	950	-	-	898	-	-
Mov Cap-2 Maneuver	506	505	-	510	374	-	-	-	-	-	-	-
Stage 1	804	745	-	747	544	-	-	-	-	-	-	-
Stage 2	730	695	-	799	579	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	14.7	0	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	950	-	-	547	374	898	-	-
HCM Lane V/C Ratio	0.001	-	-	0.103	0.011	0.002	-	-
HCM Control Delay (s)	8.8	0	-	12.3	14.7	9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	0	-	-

Intersection						
Int Delay, s/veh	5.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			↑
Traffic Vol, veh/h	91	65	636	78	66	637
Future Vol, veh/h	91	65	636	78	66	637
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	92	92	93	93
Heavy Vehicles, %	5	25	17	21	21	13
Mvmt Flow	114	81	691	85	71	685

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1561	734	0	0	776	0
Stage 1	734	-	-	-	-	-
Stage 2	827	-	-	-	-	-
Critical Hdwy	6.45	6.45	-	-	4.31	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.525	-	-	2.389	-
Pot Cap-1 Maneuver	121	384	-	-	761	-
Stage 1	470	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 103	384	-	-	761	-
Mov Cap-2 Maneuver	232	-	-	-	-	-
Stage 1	470	-	-	-	-	-
Stage 2	360	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	43.5	0	1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	278	761
HCM Lane V/C Ratio	-	-	0.701	0.093
HCM Control Delay (s)	-	-	43.5	10.2
HCM Lane LOS	-	-	E	B
HCM 95th %tile Q(veh)	-	-	4.8	0.3

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

APPENDIX F

2023 No Build Capacity/Level-of-Service Analysis

Lanes, Volumes, Timings
6: Cranston Street & Ridge Street/Carolina Street

2028 No Build Weekday AM
03/16/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Volume (vph)	2	3	6	112	1	22	2	535	244	132	394	0
Future Volume (vph)	2	3	6	112	1	22	2	535	244	132	394	0
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	190		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1747	0	0	1702	0	0	1796	0	1703	1827	0
Flt Permitted					0.742			0.999		0.170		
Satd. Flow (perm)	0	1763	0	0	1316	0	0	1794	0	305	1827	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			8			20				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		316			416			259				425
Travel Time (s)		7.2			9.5			5.9				9.7
Peak Hour Factor	0.39	0.39	0.39	0.90	0.90	0.90	0.96	0.96	0.96	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	4%	100%	5%	2%	2%	0%	6%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	0	0	149	0	0	813	0	145	433	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			3			2		1	1 2	
Permitted Phases	4			3			2			1 2		
Detector Phase	4	4		3	3		2	2		1	1 2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		8.0	8.0		4.0		
Minimum Split (s)	8.5	8.5		22.5	22.5		23.0	23.0		8.5		
Total Split (s)	10.0	10.0		23.0	23.0		27.0	27.0		20.0		
Total Split (%)	9.5%	9.5%		21.9%	21.9%		25.7%	25.7%		19.0%		
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		
All-Red Time (s)	1.0	1.0		1.0	1.0		1.5	1.5		1.0		
Lost Time Adjust (s)		0.0			0.0			0.0		0.0		
Total Lost Time (s)		4.5			4.5			5.0		4.5		
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Recall Mode	None	None		None	None		Min	Min		None		
Act Effct Green (s)		5.5			12.4			23.5		37.2	42.0	
Actuated g/C Ratio		0.08			0.18			0.33		0.53	0.60	
v/c Ratio		0.18			0.63			1.33		0.34	0.40	
Control Delay		29.5			41.6			185.5		13.8	13.3	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		29.5			41.6			185.5		13.8	13.3	
LOS		C			D			F		B	B	
Approach Delay		29.5			41.6			185.5			13.4	
Approach LOS		C			D			F			B	
Queue Length 50th (ft)		5			50			~417		17	62	
Queue Length 95th (ft)		11			#160			#1104		107	325	
Internal Link Dist (ft)		236			336			179			345	
Turn Bay Length (ft)										190		
Base Capacity (vph)		160			374			610		499	1087	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	24%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lanes, Volumes, Timings
6: Cranston Street & Ridge Street/Carolina Street

2028 No Build Weekday AM
03/16/2023

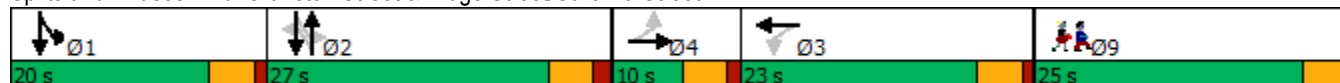


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.17			0.40			1.33		0.29	0.40	

Intersection Summary

Area Type:	Other
Cycle Length:	105
Actuated Cycle Length:	70.5
Natural Cycle:	120
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.33
Intersection Signal Delay:	105.6
Intersection LOS:	F
Intersection Capacity Utilization	89.8%
ICU Level of Service	E
Analysis Period (min)	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 6: Cranston Street & Ridge Street/Carolina Street



Lane Group	Ø9
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	75	58	1	3	65	78	0	2	1	21	14	22
Future Vol, veh/h	75	58	1	3	65	78	0	2	1	21	14	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	72	72	72	25	25	25	64	64	64
Heavy Vehicles, %	3	4	0	0	2	2	2	2	2	2	2	2
Mvmt Flow	87	67	1	4	90	108	0	8	4	33	22	34

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	198	0	0	68	0	0	422	448	68	400	394	144
Stage 1	-	-	-	-	-	-	242	242	-	152	152	-
Stage 2	-	-	-	-	-	-	180	206	-	248	242	-
Critical Hdwy	4.13	-	-	4.1	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.227	-	-	2.2	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1369	-	-	1546	-	-	542	506	995	560	542	903
Stage 1	-	-	-	-	-	-	762	705	-	850	772	-
Stage 2	-	-	-	-	-	-	822	731	-	756	705	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1369	-	-	1546	-	-	478	471	995	522	505	903
Mov Cap-2 Maneuver	-	-	-	-	-	-	478	471	-	522	505	-
Stage 1	-	-	-	-	-	-	712	658	-	794	770	-
Stage 2	-	-	-	-	-	-	766	729	-	695	658	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	4.4			0.2			11.4			11.8		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	571	1369	-	-	1546	-	-	617
HCM Lane V/C Ratio	0.021	0.064	-	-	0.003	-	-	0.144
HCM Control Delay (s)	11.4	7.8	0	-	7.3	0	-	11.8
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	0.5

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	360	1	59	153	26	2	14	14	18	1	3
Future Vol, veh/h	17	360	1	59	153	26	2	14	14	18	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	87	87	87	93	93	93	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	462	1	68	176	30	2	15	15	20	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	206	0	0	463	0	0	836	849	463	841	834	191
Stage 1	-	-	-	-	-	-	507	507	-	327	327	-
Stage 2	-	-	-	-	-	-	329	342	-	514	507	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1365	-	-	1098	-	-	287	298	599	284	304	851
Stage 1	-	-	-	-	-	-	548	539	-	686	648	-
Stage 2	-	-	-	-	-	-	684	638	-	543	539	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1365	-	-	1098	-	-	265	271	599	247	277	851
Mov Cap-2 Maneuver	-	-	-	-	-	-	265	271	-	247	277	-
Stage 1	-	-	-	-	-	-	536	527	-	671	603	-
Stage 2	-	-	-	-	-	-	632	593	-	503	527	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			2.1			12.6			19.4		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	507	1365	-	-	1098	-	-	275
HCM Lane V/C Ratio	0.064	0.016	-	-	0.062	-	-	0.091
HCM Control Delay (s)	12.6	7.7	0	-	8.5	0	-	19.4
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0.2	-	-	0.3

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	0	1	0	1	0	3	144	0	0	54	5
Future Vol, veh/h	18	0	1	0	1	0	3	144	0	0	54	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	25	25	25	97	97	97	67	67	67
Heavy Vehicles, %	12	0	0	0	0	0	0	3	0	0	4	60
Mvmt Flow	24	0	1	0	4	0	3	148	0	0	81	7

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	241	239	85	239	242	148	88	0	0	148	0	0
Stage 1	85	85	-	154	154	-	-	-	-	-	-	-
Stage 2	156	154	-	85	88	-	-	-	-	-	-	-
Critical Hdwy	7.22	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.22	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.22	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.608	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	693	666	980	719	663	904	1520	-	-	1446	-	-
Stage 1	899	828	-	853	774	-	-	-	-	-	-	-
Stage 2	823	774	-	928	826	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	689	665	980	717	662	904	1520	-	-	1446	-	-
Mov Cap-2 Maneuver	689	665	-	717	662	-	-	-	-	-	-	-
Stage 1	897	828	-	851	772	-	-	-	-	-	-	-
Stage 2	817	772	-	927	826	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.3		10.5		0.2		0	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1520	-	-	700	662	1446	-	-
HCM Lane V/C Ratio	0.002	-	-	0.036	0.006	-	-	-
HCM Control Delay (s)	7.4	0	-	10.3	10.5	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection						
Int Delay, s/veh	2.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	37	51	754	75	66	481
Future Vol, veh/h	37	51	754	75	66	481
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	88	88	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	65	857	85	77	559

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1613	900	0	0	942
Stage 1	900	-	-	-	-
Stage 2	713	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	115	337	-	-	728
Stage 1	397	-	-	-	-
Stage 2	486	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	97	337	-	-	728
Mov Cap-2 Maneuver	229	-	-	-	-
Stage 1	397	-	-	-	-
Stage 2	412	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.1	0	1.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	281	728
HCM Lane V/C Ratio	-	-	0.401	0.105
HCM Control Delay (s)	-	-	26.1	10.5
HCM Lane LOS	-	-	D	B
HCM 95th %tile Q(veh)	-	-	1.9	0.4

Lanes, Volumes, Timings
6: Cranston Street & Ridge Street/Carolina Street

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Volume (vph)	2	0	0	257	1	97	4	533	209	132	494	1
Future Volume (vph)	2	0	0	257	1	97	4	533	209	132	494	1
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	190		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1805	0	0	1753	0	0	1785	0	1787	1881	0
Flt Permitted					0.784			0.997		0.240		
Satd. Flow (perm)	0	1900	0	0	1424	0	0	1779	0	451	1881	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					16			16				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		316			416			259				425
Travel Time (s)		7.2			9.5			5.9				9.7
Peak Hour Factor	0.50	0.50	0.50	0.95	0.95	0.95	0.90	0.90	0.90	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	3%	1%	1%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	374	0	0	828	0	140	527	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			3			2		1	1 2	
Permitted Phases	4			3			2			1 2		
Detector Phase	4	4		3	3		2	2		1	1 2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		8.0	8.0		4.0		
Minimum Split (s)	8.5	8.5		22.5	22.5		13.0	13.0		8.5		
Total Split (s)	10.0	10.0		23.0	23.0		21.0	21.0		26.0		
Total Split (%)	9.5%	9.5%		21.9%	21.9%		20.0%	20.0%		24.8%		
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		
All-Red Time (s)	1.0	1.0		1.0	1.0		1.5	1.5		1.0		
Lost Time Adjust (s)		0.0			0.0			0.0		0.0		
Total Lost Time (s)		4.5			4.5			5.0		4.5		
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Recall Mode	None	None		None	None		Min	Min		None		
Act Effct Green (s)		5.3			19.3			16.7		34.1	38.7	
Actuated g/C Ratio		0.07			0.27			0.23		0.47	0.54	
v/c Ratio		0.03			0.96			1.96		0.27	0.52	
Control Delay		39.5			65.7			462.1		12.9	15.8	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		39.5			65.7			462.1		12.9	15.8	
LOS		D			E			F		B	B	
Approach Delay		39.5			65.7			462.1			15.2	
Approach LOS		D			E			F			B	
Queue Length 50th (ft)		2			136			~517		23	110	
Queue Length 95th (ft)		8			#519			#1206		103	412	
Internal Link Dist (ft)		236			336			179			345	
Turn Bay Length (ft)										190		
Base Capacity (vph)		150			391			422		648	994	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	24%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lanes, Volumes, Timings
 6: Cranston Street & Ridge Street/Carolina Street

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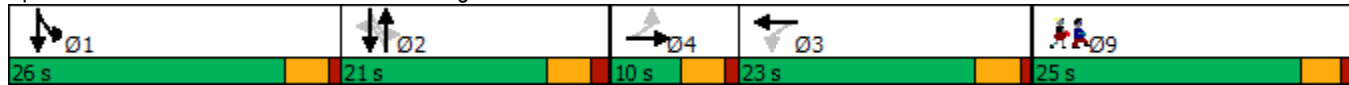


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.03			0.96			1.96		0.22	0.53	

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 72.2
 Natural Cycle: 150
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.96
 Intersection Signal Delay: 222.9 Intersection LOS: F
 Intersection Capacity Utilization 97.1% ICU Level of Service F
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Cranston Street & Ridge Street/Carolina Street



Lane Group	Ø9
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection												
Int Delay, s/veh	7.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	112	55	1	1	68	76	0	30	5	76	2	97
Future Vol, veh/h	112	55	1	1	68	76	0	30	5	76	2	97
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	84	84	84	65	65	65	90	90	90
Heavy Vehicles, %	6	2	0	0	0	1	0	0	0	0	0	0
Mvmt Flow	132	65	1	1	81	90	0	46	8	84	2	108

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	171	0	0	66	0	0	513	503	66	485	458	126
Stage 1	-	-	-	-	-	-	330	330	-	128	128	-
Stage 2	-	-	-	-	-	-	183	173	-	357	330	-
Critical Hdwy	4.16	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.254	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1382	-	-	1549	-	-	475	474	1003	496	502	930
Stage 1	-	-	-	-	-	-	687	649	-	881	794	-
Stage 2	-	-	-	-	-	-	823	760	-	665	649	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1382	-	-	1549	-	-	386	427	1003	418	452	930
Mov Cap-2 Maneuver	-	-	-	-	-	-	386	427	-	418	452	-
Stage 1	-	-	-	-	-	-	619	585	-	794	793	-
Stage 2	-	-	-	-	-	-	725	759	-	548	585	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.3	0.1	13.8	13.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	465	1382	-	-	1549	-	-	602
HCM Lane V/C Ratio	0.116	0.095	-	-	0.001	-	-	0.323
HCM Control Delay (s)	13.8	7.9	0	-	7.3	0	-	13.8
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0.3	-	-	0	-	-	1.4

Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	378	4	184	326	62	3	9	9	46	6	6
Future Vol, veh/h	2	378	4	184	326	62	3	9	9	46	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	94	94	94	82	82	82	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	485	5	196	347	66	4	11	11	62	8	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	413	0	0	490	0	0	1274	1299	488	1271	1268	380
Stage 1	-	-	-	-	-	-	494	494	-	772	772	-
Stage 2	-	-	-	-	-	-	780	805	-	499	496	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1146	-	-	1073	-	-	144	161	580	145	168	667
Stage 1	-	-	-	-	-	-	557	546	-	392	409	-
Stage 2	-	-	-	-	-	-	388	395	-	554	545	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1146	-	-	1073	-	-	110	122	580	108	127	667
Mov Cap-2 Maneuver	-	-	-	-	-	-	110	122	-	108	127	-
Stage 1	-	-	-	-	-	-	555	544	-	390	311	-
Stage 2	-	-	-	-	-	-	284	301	-	530	543	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			2.9			24.7			79.1		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	208	1146	-	-	1073	-	-	120
HCM Lane V/C Ratio	0.123	0.002	-	-	0.182	-	-	0.653
HCM Control Delay (s)	24.7	8.1	0	-	9.1	0	-	79.1
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.4	0	-	-	0.7	-	-	3.4

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	43	0	9	0	2	0	1	221	0	2	160	32
Future Vol, veh/h	43	0	9	0	2	0	1	221	0	2	160	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	50	50	50	81	81	81	90	90	90
Heavy Vehicles, %	5	0	0	0	100	0	100	1	0	100	0	7
Mvmt Flow	48	0	10	0	4	0	1	273	0	2	178	36

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	477	475	196	480	493	273	214	0	0	273	0	0
Stage 1	200	200	-	275	275	-	-	-	-	-	-	-
Stage 2	277	275	-	205	218	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.5	6.2	7.1	7.5	6.2	5.1	-	-	5.1	-	-
Critical Hdwy Stg 1	6.15	5.5	-	6.1	6.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.5	-	6.1	6.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.3	3.5	4.9	3.3	3.1	-	-	3.1	-	-
Pot Cap-1 Maneuver	493	491	850	499	361	771	939	-	-	885	-	-
Stage 1	795	739	-	736	536	-	-	-	-	-	-	-
Stage 2	723	686	-	802	573	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	488	489	850	492	360	771	939	-	-	885	-	-
Mov Cap-2 Maneuver	488	489	-	492	360	-	-	-	-	-	-	-
Stage 1	794	737	-	735	535	-	-	-	-	-	-	-
Stage 2	717	685	-	790	571	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.7		15.1		0		0.1	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	939	-	-	527	360	885	-	-
HCM Lane V/C Ratio	0.001	-	-	0.111	0.011	0.003	-	-
HCM Control Delay (s)	8.8	0	-	12.7	15.1	9.1	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	-	-

Intersection						
Int Delay, s/veh	6.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			U
Traffic Vol, veh/h	96	68	668	82	69	669
Future Vol, veh/h	96	68	668	82	69	669
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	92	92	93	93
Heavy Vehicles, %	5	25	17	21	21	13
Mvmt Flow	120	85	726	89	74	719

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1638	771	0	0	815
Stage 1	771	-	-	-	-
Stage 2	867	-	-	-	-
Critical Hdwy	6.45	6.45	-	-	4.31
Critical Hdwy Stg 1	5.45	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-
Follow-up Hdwy	3.545	3.525	-	-	2.389
Pot Cap-1 Maneuver	~ 109	366	-	-	735
Stage 1	451	-	-	-	-
Stage 2	406	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	~ 91	366	-	-	735
Mov Cap-2 Maneuver	217	-	-	-	-
Stage 1	451	-	-	-	-
Stage 2	338	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	55.4	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	261	735
HCM Lane V/C Ratio	-	-	0.785	0.101
HCM Control Delay (s)	-	-	55.4	10.4
HCM Lane LOS	-	-	F	B
HCM 95th %tile Q(veh)	-	-	5.9	0.3

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

APPENDIX G

2028 Build Capacity/Level-of-Service Analysis

Lanes, Volumes, Timings
6: Cranston Street & Ridge Street/Carolina Street

2028 Build Weekday AM
03/22/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Volume (vph)	2	3	6	112	1	23	2	535	244	133	394	0
Future Volume (vph)	2	3	6	112	1	23	2	535	244	133	394	0
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	190		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1747	0	0	1702	0	0	1796	0	1703	1827	0
Flt Permitted					0.745			0.999		0.170		
Satd. Flow (perm)	0	1763	0	0	1320	0	0	1794	0	305	1827	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			9			20				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		316			416			259				425
Travel Time (s)		7.2			9.5			5.9				9.7
Peak Hour Factor	0.39	0.39	0.39	0.90	0.90	0.90	0.96	0.96	0.96	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	4%	100%	5%	2%	2%	0%	6%	4%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	28	0	0	151	0	0	813	0	146	433	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			3			2		1	1 2	
Permitted Phases	4			3			2			1 2		
Detector Phase	4	4		3	3		2	2		1	1 2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		8.0	8.0		4.0		
Minimum Split (s)	8.5	8.5		22.5	22.5		23.0	23.0		8.5		
Total Split (s)	10.0	10.0		23.0	23.0		27.0	27.0		20.0		
Total Split (%)	9.5%	9.5%		21.9%	21.9%		25.7%	25.7%		19.0%		
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		
All-Red Time (s)	1.0	1.0		1.0	1.0		1.5	1.5		1.0		
Lost Time Adjust (s)		0.0			0.0			0.0		0.0		
Total Lost Time (s)		4.5			4.5			5.0		4.5		
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Recall Mode	None	None		None	None		Min	Min		None		
Act Effct Green (s)		5.5			12.5			23.5		37.2	42.0	
Actuated g/C Ratio		0.08			0.18			0.33		0.53	0.59	
v/c Ratio		0.18			0.63			1.33		0.35	0.40	
Control Delay		29.5			41.4			186.0		13.8	13.3	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		29.5			41.4			186.0		13.8	13.3	
LOS		C			D			F		B	B	
Approach Delay		29.5			41.4			186.0			13.5	
Approach LOS		C			D			F			B	
Queue Length 50th (ft)		5			50			~417		18	62	
Queue Length 95th (ft)		11			#161			#1104		108	325	
Internal Link Dist (ft)		236			336			179			345	
Turn Bay Length (ft)										190		
Base Capacity (vph)		160			375			610		498	1086	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	24%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lanes, Volumes, Timings
 6: Cranston Street & Ridge Street/Carolina Street

2028 Build Weekday AM
 03/22/2023

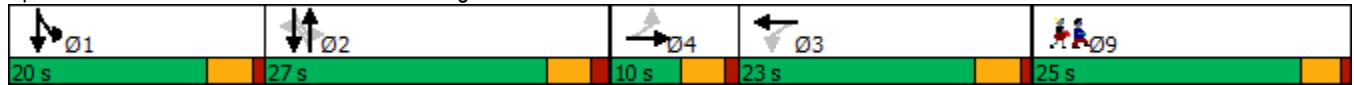


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.17			0.40			1.33		0.29	0.40	

Intersection Summary

Area Type: Other
 Cycle Length: 105
 Actuated Cycle Length: 70.6
 Natural Cycle: 120
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.33
 Intersection Signal Delay: 105.7 Intersection LOS: F
 Intersection Capacity Utilization 89.9% ICU Level of Service E
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Cranston Street & Ridge Street/Carolina Street



Lane Group	Ø9
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	81	58	1	3	65	78	0	2	1	28	14	25
Future Vol, veh/h	81	58	1	3	65	78	0	2	1	28	14	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	72	72	72	25	25	25	64	64	64
Heavy Vehicles, %	3	4	0	0	2	2	2	2	2	2	2	2
Mvmt Flow	94	67	1	4	90	108	0	8	4	44	22	39

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	198	0	0	68	0	0	439	462	68	414	408	144
Stage 1	-	-	-	-	-	-	256	256	-	152	152	-
Stage 2	-	-	-	-	-	-	183	206	-	262	256	-
Critical Hdwy	4.13	-	-	4.1	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.227	-	-	2.2	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1369	-	-	1546	-	-	528	497	995	549	533	903
Stage 1	-	-	-	-	-	-	749	696	-	850	772	-
Stage 2	-	-	-	-	-	-	819	731	-	743	696	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1369	-	-	1546	-	-	461	460	995	509	494	903
Mov Cap-2 Maneuver	-	-	-	-	-	-	461	460	-	509	494	-
Stage 1	-	-	-	-	-	-	696	647	-	790	770	-
Stage 2	-	-	-	-	-	-	759	729	-	679	647	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.5	0.2	11.6	12.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	560	1369	-	-	1546	-	-	603
HCM Lane V/C Ratio	0.021	0.069	-	-	0.003	-	-	0.174
HCM Control Delay (s)	11.6	7.8	0	-	7.3	0	-	12.2
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	0.6

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	361	1	77	154	26	2	14	17	18	1	3
Future Vol, veh/h	17	361	1	77	154	26	2	14	17	18	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	87	87	87	93	93	93	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	463	1	89	177	30	2	15	18	20	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	207	0	0	464	0	0	880	893	464	885	878	192
Stage 1	-	-	-	-	-	-	508	508	-	370	370	-
Stage 2	-	-	-	-	-	-	372	385	-	515	508	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1364	-	-	1097	-	-	268	281	598	266	287	850
Stage 1	-	-	-	-	-	-	547	539	-	650	620	-
Stage 2	-	-	-	-	-	-	648	611	-	543	539	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1364	-	-	1097	-	-	243	250	598	225	255	850
Mov Cap-2 Maneuver	-	-	-	-	-	-	243	250	-	225	255	-
Stage 1	-	-	-	-	-	-	535	527	-	636	563	-
Stage 2	-	-	-	-	-	-	585	555	-	500	527	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			2.6			12.5			20.9		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	514	1364	-	-	1097	-	-	252
HCM Lane V/C Ratio	0.069	0.016	-	-	0.081	-	-	0.099
HCM Control Delay (s)	12.5	7.7	0	-	8.6	0	-	20.9
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0.3	-	-	0.3

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	0	1	0	1	0	3	147	0	1	71	5
Future Vol, veh/h	18	0	1	0	1	0	3	147	0	1	71	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	25	25	25	97	97	97	67	67	67
Heavy Vehicles, %	12	0	0	0	0	0	0	3	0	0	4	60
Mvmt Flow	24	0	1	0	4	0	3	152	0	1	106	7

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	272	270	110	270	273	152	113	0	0	152	0	0
Stage 1	112	112	-	158	158	-	-	-	-	-	-	-
Stage 2	160	158	-	112	115	-	-	-	-	-	-	-
Critical Hdwy	7.22	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.22	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.22	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.608	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	661	640	949	687	637	900	1489	-	-	1441	-	-
Stage 1	869	807	-	849	771	-	-	-	-	-	-	-
Stage 2	819	771	-	898	804	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	656	638	949	684	635	900	1489	-	-	1441	-	-
Mov Cap-2 Maneuver	656	638	-	684	635	-	-	-	-	-	-	-
Stage 1	867	806	-	847	769	-	-	-	-	-	-	-
Stage 2	813	769	-	896	803	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	10.6		10.7		0.1		0.1			
HCM LOS	B		B							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1489	-	-	667	635	1441	-	-
HCM Lane V/C Ratio	0.002	-	-	0.038	0.006	0.001	-	-
HCM Control Delay (s)	7.4	0	-	10.6	10.7	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	39	51	754	81	66	481
Future Vol, veh/h	39	51	754	81	66	481
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	88	88	86	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	65	857	92	77	559

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1616	903	0	0	949
Stage 1	903	-	-	-	-
Stage 2	713	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	114	336	-	-	724
Stage 1	396	-	-	-	-
Stage 2	486	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	96	336	-	-	724
Mov Cap-2 Maneuver	228	-	-	-	-
Stage 1	396	-	-	-	-
Stage 2	411	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.7	0	1.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	279	724
HCM Lane V/C Ratio	-	-	0.414	0.106
HCM Control Delay (s)	-	-	26.7	10.6
HCM Lane LOS	-	-	D	B
HCM 95th %tile Q(veh)	-	-	1.9	0.4

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	3	154	5	11	62
Future Vol, veh/h	2	3	154	5	11	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	3	167	5	12	67

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	261	170	0	0	172	0
Stage 1	170	-	-	-	-	-
Stage 2	91	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	728	874	-	-	1405	-
Stage 1	860	-	-	-	-	-
Stage 2	933	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	721	874	-	-	1405	-
Mov Cap-2 Maneuver	721	-	-	-	-	-
Stage 1	860	-	-	-	-	-
Stage 2	925	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	1.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	806	1405
HCM Lane V/C Ratio	-	-	0.007	0.009
HCM Control Delay (s)	-	-	9.5	7.6
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	392	1	1	257	1	2
Future Vol, veh/h	392	1	1	257	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	426	1	1	279	1	2

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	427	0	708
Stage 1	-	-	-	-	427
Stage 2	-	-	-	-	281
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1132	-	401
Stage 1	-	-	-	-	658
Stage 2	-	-	-	-	767
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1132	-	401
Mov Cap-2 Maneuver	-	-	-	-	401
Stage 1	-	-	-	-	658
Stage 2	-	-	-	-	766

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	528	-	-	1132	-
HCM Lane V/C Ratio	0.006	-	-	0.001	-
HCM Control Delay (s)	11.9	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Lanes, Volumes, Timings
6: Cranston Street & Ridge Street/Carolina Street

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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Volume (vph)	2	0	0	257	1	98	4	533	209	133	494	1
Future Volume (vph)	2	0	0	257	1	98	4	533	209	133	494	1
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	190		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1805	0	0	1753	0	0	1785	0	1787	1881	0
Flt Permitted					0.784			0.997		0.240		
Satd. Flow (perm)	0	1900	0	0	1424	0	0	1779	0	451	1881	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					16			16				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		316			416			259				425
Travel Time (s)		7.2			9.5			5.9				9.7
Peak Hour Factor	0.50	0.50	0.50	0.95	0.95	0.95	0.90	0.90	0.90	0.94	0.94	0.94
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	3%	1%	1%	1%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	375	0	0	828	0	141	527	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			3			2		1	1 2	
Permitted Phases	4			3			2			1 2		
Detector Phase	4	4		3	3		2	2		1	1 2	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		8.0	8.0		4.0		
Minimum Split (s)	8.5	8.5		22.5	22.5		13.0	13.0		8.5		
Total Split (s)	10.0	10.0		23.0	23.0		21.0	21.0		26.0		
Total Split (%)	9.5%	9.5%		21.9%	21.9%		20.0%	20.0%		24.8%		
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5		
All-Red Time (s)	1.0	1.0		1.0	1.0		1.5	1.5		1.0		
Lost Time Adjust (s)		0.0			0.0			0.0		0.0		
Total Lost Time (s)		4.5			4.5			5.0		4.5		
Lead/Lag	Lead	Lead		Lag	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Recall Mode	None	None		None	None		Min	Min		None		
Act Effct Green (s)		5.3			19.3			16.7		34.1	38.7	
Actuated g/C Ratio		0.07			0.27			0.23		0.47	0.54	
v/c Ratio		0.03			0.96			1.96		0.27	0.52	
Control Delay		39.5			66.2			462.1		12.9	15.8	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		39.5			66.2			462.1		12.9	15.8	
LOS		D			E			F		B	B	
Approach Delay		39.5			66.2			462.1			15.2	
Approach LOS		D			E			F			B	
Queue Length 50th (ft)		2			137			~517		23	110	
Queue Length 95th (ft)		8			#522			#1206		104	412	
Internal Link Dist (ft)		236			336			179			345	
Turn Bay Length (ft)										190		
Base Capacity (vph)		150			391			422		648	994	

Lane Group	Ø9
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Heavy Vehicles (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	25.0
Total Split (s)	25.0
Total Split (%)	24%
Yellow Time (s)	3.0
All-Red Time (s)	1.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	

Lanes, Volumes, Timings
 6: Cranston Street & Ridge Street/Carolina Street

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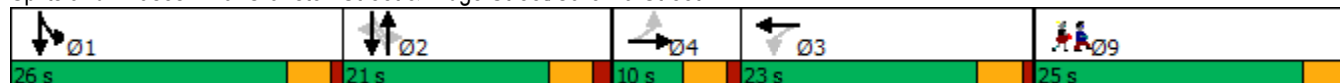


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.03			0.96			1.96		0.22	0.53	

Intersection Summary

Area Type:	Other
Cycle Length:	105
Actuated Cycle Length:	72.2
Natural Cycle:	150
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.96
Intersection Signal Delay:	222.8
Intersection LOS:	F
Intersection Capacity Utilization:	97.1%
ICU Level of Service:	F
Analysis Period (min):	15
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 6: Cranston Street & Ridge Street/Carolina Street



Lane Group	Ø9
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Intersection												
Int Delay, s/veh	7.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	115	55	1	1	68	76	0	30	5	77	2	102
Future Vol, veh/h	115	55	1	1	68	76	0	30	5	77	2	102
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	84	84	84	65	65	65	90	90	90
Heavy Vehicles, %	6	2	0	0	0	1	0	0	0	0	0	0
Mvmt Flow	135	65	1	1	81	90	0	46	8	86	2	113

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	171	0	0	66	0	0	522	509	66	491	464	126
Stage 1	-	-	-	-	-	-	336	336	-	128	128	-
Stage 2	-	-	-	-	-	-	186	173	-	363	336	-
Critical Hdwy	4.16	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.254	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1382	-	-	1549	-	-	468	470	1003	491	498	930
Stage 1	-	-	-	-	-	-	682	645	-	881	794	-
Stage 2	-	-	-	-	-	-	820	760	-	660	645	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1382	-	-	1549	-	-	378	422	1003	412	447	930
Mov Cap-2 Maneuver	-	-	-	-	-	-	378	422	-	412	447	-
Stage 1	-	-	-	-	-	-	613	580	-	792	793	-
Stage 2	-	-	-	-	-	-	717	759	-	542	580	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.3	0.1	13.9	14
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	460	1382	-	-	1549	-	-	601
HCM Lane V/C Ratio	0.117	0.098	-	-	0.001	-	-	0.335
HCM Control Delay (s)	13.9	7.9	0	-	7.3	0	-	14
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0.3	-	-	0	-	-	1.5

Intersection												
Int Delay, s/veh	7.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	379	4	190	327	62	3	9	19	46	6	6
Future Vol, veh/h	2	379	4	190	327	62	3	9	19	46	6	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	94	94	94	82	82	82	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	486	5	202	348	66	4	11	23	62	8	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	414	0	0	491	0	0	1288	1313	489	1285	1282	381
Stage 1	-	-	-	-	-	-	495	495	-	785	785	-
Stage 2	-	-	-	-	-	-	793	818	-	500	497	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1145	-	-	1072	-	-	141	158	579	142	165	666
Stage 1	-	-	-	-	-	-	556	546	-	386	404	-
Stage 2	-	-	-	-	-	-	382	390	-	553	545	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1145	-	-	1072	-	-	107	119	579	103	124	666
Mov Cap-2 Maneuver	-	-	-	-	-	-	107	119	-	103	124	-
Stage 1	-	-	-	-	-	-	554	544	-	384	304	-
Stage 2	-	-	-	-	-	-	277	294	-	518	543	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			3			18.8			86		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	299	1145	-	-	1072	-	-	115
HCM Lane V/C Ratio	0.126	0.002	-	-	0.189	-	-	0.682
HCM Control Delay (s)	18.8	8.2	0	-	9.1	0	-	86
HCM Lane LOS	C	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.4	0	-	-	0.7	-	-	3.6

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	43	0	9	0	2	0	1	231	0	2	166	32
Future Vol, veh/h	43	0	9	0	2	0	1	231	0	2	166	32
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	50	50	50	81	81	81	90	90	90
Heavy Vehicles, %	5	0	0	0	100	0	100	1	0	100	0	7
Mvmt Flow	48	0	10	0	4	0	1	285	0	2	184	36

Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	495	493	202	498	511	285	220	0	0	285	0	0
Stage 1	206	206	-	287	287	-	-	-	-	-	-	-
Stage 2	289	287	-	211	224	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.5	6.2	7.1	7.5	6.2	5.1	-	-	5.1	-	-
Critical Hdwy Stg 1	6.15	5.5	-	6.1	6.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.5	-	6.1	6.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.3	3.5	4.9	3.3	3.1	-	-	3.1	-	-
Pot Cap-1 Maneuver	480	480	844	486	352	759	933	-	-	875	-	-
Stage 1	789	735	-	725	529	-	-	-	-	-	-	-
Stage 2	712	678	-	796	569	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	474	478	844	479	351	759	933	-	-	875	-	-
Mov Cap-2 Maneuver	474	478	-	479	351	-	-	-	-	-	-	-
Stage 1	788	733	-	724	528	-	-	-	-	-	-	-
Stage 2	706	677	-	784	567	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	15.4	0	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	933	-	-	513	351	875	-	-
HCM Lane V/C Ratio	0.001	-	-	0.114	0.011	0.003	-	-
HCM Control Delay (s)	8.9	0	-	12.9	15.4	9.1	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	-	-

Intersection						
Int Delay, s/veh	7.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	101	68	668	85	69	669
Future Vol, veh/h	101	68	668	85	69	669
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	80	80	92	92	93	93
Heavy Vehicles, %	5	25	17	21	21	13
Mvmt Flow	126	85	726	92	74	719

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1639	772	0	0	818
Stage 1	772	-	-	-	-
Stage 2	867	-	-	-	-
Critical Hdwy	6.45	6.45	-	-	4.31
Critical Hdwy Stg 1	5.45	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-
Follow-up Hdwy	3.545	3.525	-	-	2.389
Pot Cap-1 Maneuver	~ 109	365	-	-	733
Stage 1	451	-	-	-	-
Stage 2	406	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	~ 91	365	-	-	733
Mov Cap-2 Maneuver	217	-	-	-	-
Stage 1	451	-	-	-	-
Stage 2	338	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	60	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	259	733
HCM Lane V/C Ratio	-	-	0.816	0.101
HCM Control Delay (s)	-	-	60	10.5
HCM Lane LOS	-	-	F	B
HCM 95th %tile Q(veh)	-	-	6.4	0.3

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

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	10	219	3	5	170
Future Vol, veh/h	5	10	219	3	5	170
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	11	238	3	5	185

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	435	240	0	0	241
Stage 1	240	-	-	-	-
Stage 2	195	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	578	799	-	-	1326
Stage 1	800	-	-	-	-
Stage 2	838	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	576	799	-	-	1326
Mov Cap-2 Maneuver	576	-	-	-	-
Stage 1	800	-	-	-	-
Stage 2	835	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	708	1326
HCM Lane V/C Ratio	-	-	0.023	0.004
HCM Control Delay (s)	-	-	10.2	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	434	1	1	578	1	8
Future Vol, veh/h	434	1	1	578	1	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	472	1	1	628	1	9

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	473	0	1103
Stage 1	-	-	-	-	473
Stage 2	-	-	-	-	630
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1089	-	234
Stage 1	-	-	-	-	627
Stage 2	-	-	-	-	531
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1089	-	234
Mov Cap-2 Maneuver	-	-	-	-	234
Stage 1	-	-	-	-	627
Stage 2	-	-	-	-	530

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	505	-	-	1089	-
HCM Lane V/C Ratio	0.019	-	-	0.001	-
HCM Control Delay (s)	12.3	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

APPENDIX H
Capacity/Level-of-Service Analysis

CAPACITY ANALYSIS SUMMARY

Weekday Morning Peak Hour
Proposed Warehouse Expansion
Cranston, RI

Intersection	Movement	2023 Existing			2028 No Build			2028 Build		
		LOS ¹	Delay ²	V/C ³	LOS	Delay	V/C	LOS	Delay	V/C
Cranston Street at	EB LTR	C	29.5	0.18	C	29.5	0.18	C	29.5	0.18
Ridge Street/Carolina Street	WB LTR	D	41.2	0.62	D	41.6	0.63	D	41.4	0.63
	NB LTR	F	154.6	1.26	F	185.5	1.33	F	186.0	1.33
	SB L	B	13.5	0.33	B	13.8	0.34	B	13.8	0.35
	TR	B	12.9	0.38	B	13.3	0.40	B	13.3	0.40
	<i>Overall</i>	<i>F</i>	<i>89.4</i>	<i>0.86</i>	<i>F</i>	<i>105.6</i>	<i>0.90</i>	<i>F</i>	<i>105.7</i>	<i>0.90</i>
Cranston Street at Burnham Avenue	WB LR	C	23.7	0.36	D	26.1	0.40	D	26.7	0.41
	NB TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB LT	A	1.2	0.10	A	1.3	0.11	A	1.3	0.11
Carlsbad Street at Carolina Street	EB LTR	A	0.3	0.02	A	0.3	0.02	A	0.3	0.02
	WB LTR	A	2.1	0.06	A	2.1	0.06	A	2.6	0.08
	NB LT	B	12.1	0.06	B	12.6	0.06	B	12.5	0.07
	SB LTR	C	18.1	0.08	C	19.4	0.09	C	20.9	0.10
Carlsbad Street at Field Street/ Northern Site Driveway	EB LTR	B	10.2	0.03	B	10.3	0.04	B	10.6	0.04
	WB LTR	B	10.4	0.01	B	10.5	0.01	B	10.7	0.01
	NB LTR	A	0.2	0.00	A	0.2	0.00	A	0.1	0.00
	SB LTR	A	0.0	0.00	A	0.0	0.00	A	0.1	0.00
Carlsbad Street at Burnham Avenue/Parking Lot	EB LTR	A	4.3	0.06	A	4.4	0.06	A	4.5	0.07
	WB LTR	A	0.2	0.00	A	0.2	0.00	A	0.2	0.00
	NB LTR	B	11.3	0.02	B	11.4	0.02	B	11.6	0.02
	SB LTR	B	11.6	0.13	B	11.8	0.14	B	12.2	0.17
Carolina Street at Proposed Northern Site Driveway	EB TR	-	-	-	-	-	-	A	0.0	0.00
	WB LT	-	-	-	-	-	-	A	0.0	0.00
	NB LR	-	-	-	-	-	-	B	11.9	0.01
Carlsbad Street at Proposed Southern Site Driveway	WB LR	-	-	-	-	-	-	A	9.5	0.01
	NB TR	-	-	-	-	-	-	A	0.0	0.00
	SB LT	-	-	-	-	-	-	A	1.1	0.01

1 Level-of-Service

2 Average vehicle delay in seconds

3 Volume to capacity ratio

- Not Applicable

QUEUE SUMMARY

**Weekday Morning Peak Hour
Proposed Warehouse Expansion
Cranston, RI**

Intersection	Movement	2023 Existing		2028 No Build		2028 Build	
		50th Queue ¹	95th Queue ²	50th Queue	95th Queue	50th Queue	95th Queue
Cranston Street at	EB LTR	5	11	5	11	5	11
Ridge Street/Carolina Street	WB LTR	48	152	50	160	50	161
	NB LTR	378	1045	417	1104	417	1104
	SB L	16	102	17	107	18	108
	TR	56	307	62	325	62	325
Cranston Street at	WB LR	-	40	-	48	-	48
Burnham Avenue	NB TR	-	0	-	0	-	0
	SB LT	-	8	-	10	-	10
Carlsbad Street at	EB LTR	-	0	-	0	-	0
Carolina Street	WB LTR	-	5	-	5	-	8
	NB LT	-	5	-	5	-	5
	SB LTR	-	8	-	8	-	8
Carlsbad Street at	EB LTR	-	3	-	3	-	3
Field Street/ Northern Site Driveway	WB LTR	-	0	-	0	-	0
	NB LTR	-	0	-	0	-	0
	SB LTR	-	0	-	0	-	0
Carlsbad Street at	EB LTR	-	3	-	5	-	5
Burnham Avenue/Parking Lot	WB LTR	-	0	-	0	-	0
	NB LTR	-	0	-	3	-	3
	SB LTR	-	0	-	13	-	15
Carolina Street at	EB TR	-	-	-	-	-	0
Proposed Northern Site Driveway	WB LT	-	-	-	-	-	0
	NB LR	-	-	-	-	-	0
Carlsbad Street at	WB LR	-	-	-	-	-	0
Proposed Southern Site Driveway	NB TR	-	-	-	-	-	0
	SB LT	-	-	-	-	-	0

¹ 50th Percentile Queue Length (ft)

² 95th Percentile Queue Length (ft)

- Not Applicable

CAPACITY ANALYSIS SUMMARY

Weekday Afternoon Peak Hour
Proposed Warehouse Expansion
Cranston, RI

Intersection	Movement	2023 Existing			2028 No Build			2028 Build		
		LOS ¹	Delay ²	V/C ³	LOS	Delay	V/C	LOS	Delay	V/C
Cranston Street at	EB LTR	D	39.0	0.03	D	39.5	0.03	D	39.5	0.03
Ridge Street/Carolina Street	WB LTR	E	55.3	0.90	E	65.7	0.96	E	66.2	0.96
	NB LTR	F	413.1	1.85	F	462.1	1.96	F	462.1	1.96
	SB L	B	12.9	0.26	B	12.9	0.27	B	12.9	0.27
	TR	B	15.4	0.50	B	15.8	0.52	B	15.8	0.52
	<i>Overall</i>	<i>F</i>	<i>199.0</i>	<i>0.93</i>	<i>F</i>	<i>222.9</i>	<i>0.97</i>	<i>F</i>	<i>222.8</i>	<i>0.97</i>
Cranston Street at Burnham Avenue	WB LR	E	43.5	0.70	F	55.4	0.79	F	60.0	0.82
	NB TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB LT	A	1.0	0.09	A	1.0	0.10	A	1.0	0.10
Carlsbad Street at Carolina Street	EB LTR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	WB LTR	A	2.9	0.17	A	2.9	0.18	A	3.0	0.19
	NB LT	C	22.3	0.11	C	24.7	0.12	C	18.8	0.13
	SB LTR	F	60.5	0.56	F	79.1	0.65	F	86.0	0.68
Carlsbad Street at Field Street/ Northern Site Driveway	EB LTR	B	12.3	0.10	B	12.7	0.11	B	12.9	0.11
	WB LTR	B	14.7	0.01	C	15.1	0.01	C	15.4	0.01
	NB LTR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB LTR	A	0.1	0.00	A	0.1	0.00	A	0.1	0.00
Carlsbad Street at Burnham Avenue/Parking Lot	EB LTR	A	5.2	0.09	A	5.3	0.10	A	5.3	0.10
	WB LTR	A	0.1	0.00	A	0.1	0.00	A	0.1	0.00
	NB LTR	B	13.4	0.11	B	13.8	0.12	B	13.9	0.12
	SB LTR	B	13.2	0.30	B	13.8	0.32	B	14.0	0.34
Carolina Street at Proposed Northern Site Driveway	EB TR	-	-	-	-	-	-	A	0.0	0.00
	WB LT	-	-	-	-	-	-	A	0.0	0.00
	NB LR	-	-	-	-	-	-	B	12.3	0.02
Carlsbad Street at Proposed Southern Site Driveway	WB LR	-	-	-	-	-	-	B	10.2	0.02
	NB TR	-	-	-	-	-	-	A	0.0	0.00
	SB LT	-	-	-	-	-	-	A	0.2	0.00

1 Level-of-Service

2 Average vehicle delay in seconds

3 Volume to capacity ratio

- Not Applicable

QUEUE SUMMARY

**Weekday Afternoon Peak Hour
Proposed Warehouse Expansion
Cranston, RI**

Intersection	Movement	2023 Existing		2028 No Build		2028 Build	
		50th Queue ¹	95th Queue ²	50th Queue	95th Queue	50th Queue	95th Queue
Cranston Street at	EB LTR	2	8	2	8	2	8
Ridge Street/Carolina Street	WB LTR	124	490	136	519	137	522
	NB LTR	474	1145	517	1206	517	1206
	SB L	22	99	23	103	23	104
	TR	102	385	110	412	110	412
Cranston Street at Burnham Avenue	WB LR	-	120	-	148	-	160
	NB TR	-	0	-	0	-	0
	SB LT	-	8	-	8	-	8
Carlsbad Street at Carolina Street	EB LTR	-	0	-	0	-	0
	WB LTR	-	15	-	18	-	18
	NB LT	-	10	-	10	-	10
	SB LTR	-	70	-	85	-	90
Carlsbad Street at Field Street/ Northern Site Driveway	EB LTR	-	8	-	10	-	10
	WB LTR	-	0	-	0	-	0
	NB LTR	-	0	-	0	-	0
	SB LTR	-	0	-	0	-	0
Carlsbad Street at Burnham Avenue/Parking Lot	EB LTR	-	8	-	8	-	8
	WB LTR	-	0	-	0	-	0
	NB LTR	-	10	-	10	-	10
	SB LTR	-	30	-	35	-	38
Carolina Street at Proposed Northern Site Driveway	EB TR	-	-	-	-	-	0
	WB LT	-	-	-	-	-	0
	NB LR	-	-	-	-	-	3
Carlsbad Street at Proposed Southern Site Driveway	WB LR	-	-	-	-	-	3
	NB TR	-	-	-	-	-	0
	SB LT	-	-	-	-	-	0

¹ 50th Percentile Queue Length (ft)

² 95th Percentile Queue Length (ft)

- Not Applicable

APPENDIX I

Woodard & Curran Parking and Traffic Summary

MEMORANDUM



TO: Jon Giampietro, Taco, Inc.
CC: Bob Kelliher
FROM: Jan Greenwood
DATE: February 3, 2023
RE: Parking and Traffic Summary
Taco, Inc. Proposed Manufacturing and Warehouse Facility
35 Carlsbad Street, Cranston, RI

This memorandum describes the parking and traffic changes that are expected to result from the construction and operation of Taco's proposed manufacturing and warehouse facility. The existing and proposed parking and truck traffic conditions are described below, with these conclusions:

- The project will provide sufficient parking to support the existing employees and visitors, the projected additional 16 employees, and the potential addition of another 5 employees per year over the succeeding 5 years.
- The project will result in a negligible change in traffic. Employee traffic will increase by the number of employees noted above. Truck traffic is expected to add only one additional tractor trailer round trip per day from Route 10, plus six box truck round trips between the existing and proposed facility.

PARKING

Existing Conditions

A total of 393 parking spaces are available for employees and visitors in two locations. The Burnham lot, located on the southeast corner of the Cranston Street/Burnham Avenue intersection has 149 parking spaces. The Carlsbad lot, which is on the southern end of the proposed facility site, has 244 parking spaces. Storage for trailers is provided in a separate gated area on the northern end of the proposed facility site.

Taco currently employs 207 manufacturing and warehouse employees in three shifts at the 1160 Cranston Street facility. The first shift is the largest with 123 employees. The shifts do not overlap. Taco's management staff work on site and remotely on a flexible schedule. Visitors include attendees at occasional training events hosted at Taco's Training Center. Understanding the variability in the number of employees and visitors on site, Taco evaluated their parking needs across several data points with the result that on average, 227 parking spaces are in use, leaving 166 parking spaces available each day.

Proposed Conditions

An additional 16 employees are anticipated to work in the proposed facility. Assuming all are on the first shift, a total of 243 parking spaces would be required. If an additional 5 employees



per year are added, 268 parking spaces would be required, conservatively assuming all would be on the first shift.

The existing parking at the Carlsbad lot will be demolished and 156 new parking spaces (including 6 handicap spaces) will be constructed such that there will be a total of 305 spaces available for employees and visitors. This will initially provide an additional 62 spaces above the average, which is more than enough to accommodate the fluctuation in need, including the occasional 20-person training event. If, after 5 more years, 25 first shift employees have been added, there would still be 37 spaces available on an average day. Storage for trailers will be provided along the rear lot line parallel to the truck route.

TRUCK TRAFFIC

Existing Conditions

An average of 22 trucks per day arrive and leave Taco's facility at 1160 Cranston Street on Monday through Friday. Occasionally, operations and trucking extend into Saturday. While the manufacturing facility operates 24 hours per day, the warehouse hours are more limited. Receiving hours are from 6AM to 2PM. Peak hours for incoming trucks are between 7AM to noon. Shipping hours are 6AM – 6PM with peak hours for outbound trucks between 2PM and 5PM.

Of the 22± trucks per day, all but one will usually dock on the north side of the building, and one will dock on the south side. About 90% of the trucks are tractor trailers that arrive from Route 10 and approach from the east on Carolina Street, take a left onto Carlsbad Street and a right onto Field Street. They reverse this route when they exit. The other 10% of trucks are box trucks, such as FedEx, that have local-based hubs and take local routes.

Proposed Conditions

Overall, there will be very little change in truck traffic. Approximately 5 of the 22 daily trucks will be routed directly to the proposed facility instead of the existing facility. Arriving from Route 10, they will travel south on Carlsbad Street to Burnham Avenue, take a left onto Burnham Avenue and another left into the new truck entrance. They will exit the new facility onto Carolina Street and take a right to the highway. One additional tractor trailer truck per day is planned to enter the new facility, and approximately 6 box truck trips would transfer cargo from the existing facility to the new facility.

Truck traffic will occur mainly between 6AM and 6 PM with peak receiving hours from 7AM to noon. Peak shipping hours will be between 2PM and 5PM.