



City of Groton, CT
Department of Planning & Economic Development

Application Review Sheet

Site Plan #469
Special Permit #461
CSP #314
COMMENT #7

Date: April 24, 2019
Address: 75 Eastern Point Road, Electric Boat
Project: South Yard Assembly Building
From: Dennis Goderre

Comments

The attached correspondence from BL Companies constitutes further review comments regarding the traffic report responses provided by your office. This is NOT a review of the recently received 2029 traffic impact statement. Said review is underway and any comments will follow separately.

April 19, 2019

Mr. Dennis G. Goderre ASLA, AICP CUD
City Planner
City of Groton
295 Meridian Street
Groton, CT 06340

Re: Project: Electric Boat South Yard Assembly Building (SYAB) Technical Review
Draft Comments
Site: 75 Eastern Point Road
BL Project No.: 1900041

Dear Mr. Goderre:

In accordance with your request, we have conducted a Peer Review of the Revised Electric Boat South Yard Assembly Building Planning & Zoning Special Permit submission package.

We have received a copy of the following documents from Fuss & O'Neill pertaining to our peer review for the revised submission for April 2019:

- General Dynamics Electric Boat South Yard Assembly Building Permit Plans, prepared by Fuss & O'Neill
- CTDEEP & USACE Joint Permit Application – Alternatives Analyses, prepared by Fuss & O'Neill
- Technical Report – Preliminary Cultural Resources Review – Electric Boat Proposed South Yard Facility Expansion, prepared by Fuss & O'Neill
- Natural Resources Evaluation and Effects Electric Boat South Yard Project, prepared by Stantech
- Stormwater Management Report – Supplemental Info, prepared by Fuss & O'Neill
- Responses to Comments from the City of Groton and Groton Utilities

As part of the effort, BL Companies evaluated the adequacy and comprehensiveness of the following facets of the Traffic Impact Statement (TIS) prepared by the developers consultant:

- Existing conditions of study area
- 2024 background conditions of study area
- 2024 background conditions with improvements of the study area
- 2029 background conditions of study area
- Proposed conditions of study area
- Intersection crash, capacity, and queueing analysis

Project Understanding

This project proposes the construction of a 198,000sf assembly building with a 16,500sf utility building (the "Site") on the Groton campus of Electric Boat Corporation at 75 Eastern Point Road in Groton, Connecticut.

The adjacent roadway network was analyzed as part of this TIS, consisting of Eastern Point Road, CT Route 349, Chester Street, and Thames Road. Seven intersections, five signalized and two unsignalized, around the Site were also analyzed. A growth rate of 0.5% per year, to the design year of 2029, was applied to the 2018

existing traffic volumes at intersections within the study area. As noted in the report, no pending or approved developments have been identified in the study area. There is one resurfacing project proposed for 2019, the resurfacing of Route 349, as part of the Pavement Preservation program.

Electric Boat currently has 3,818 parking spaces at this facility, as noted on the Parking Inventory Map, “P-MAP”, dated April 2019. This number of parking spaces meets the zoning requirements for the 10,882 projected employees in the peak year of 2029. Per the zoning regulations in the City of Groton, the requirement is one parking space for every three employees. Employees using the parking facilities will arrive, by shuttle and/or walking to the site.

Peer Review Comments dated April, 22, 2019

We offer the following comments based on the revised traffic study dated April 2019 provided by the Consultant. We are anticipating the submittal of a 2029 Traffic Analysis Appendix for the development:

1. Please reference the provided PDF markup attached to this letter. We recommend the Consultant revise their narrative accordingly.
2. In Section 4.3 – Trip Generation, the Consultant reference ITE Land Use Code 140 – Manufacturing for their trip generation and use the number of employees as their variable to determine trips. It is unclear how the trips are determined based on the narrative. The square footages of the facilities are stated, but not the number of employees. The Consultant should revise their narrative and analysis to reflect the correct trip generation information.
3. In Section 4.4 – Trip Distribution, it is unclear where the origin and destination of all trips. It appears based on Figure No. 4 in the Appendix that the trips are being distributed to a parking lot. The Consultant should revise their narrative to make it clear if they are entering the Site or a nearby parking lot.
4. It appears in the Trip Distribution that trips will be distributed to Allen Street at Smith Street and Allen Street at Mitchell Street. If site generated trips are distributed to those intersections a analysis of the intersection capacity should be provided. The Consultant should provide analysis for all intersections impacted by site generated traffic.
5. The narrative for Section 4.4 – Trip Distribution states that 45% of the entering traffic would be generated from I-95 Westbound. It appears that there is only 35%. The Consultant should revise their trip distribution to reflect the narrative.
6. Crash data is not included for all intersections where there are impacts from trips. The Consultant should provide crash data for all intersections impacted by site generated traffic.
7. In Section 5.2 – Intersection Sight Distance Analysis, the Consultant states that sight distance is measure 10 feet back from the edge of traveled way. Intersection sight distance should be measured from 15 feet back based on the CTDOT Highway Design Manual revised February 2013. The Consultant should measure any site drive intersection sight distances from 15 feet back of the edge of travel way.
8. In Table 2 – Intersection Crash Data Summary in the Appendix, the Average/Year column is actually showing the Total. The Consultant should correct this column to show either average crashes per year.
9. In Table 5 – Queue Length Summary Weekday Morning Peak Hour, the southbound approach at CT Route 349 and Mumford Avenue #1 has a queue length that exceeds capacity. The Consultant should recommend mitigation if queue length exceeds capacity.
10. In Figure 2: 2019 Existing Traffic Conditions, several volumes do not reflect the raw data sheets (refer to the attached PDF markup). The Consultant should revise their existing traffic conditions to match the raw data. The Consultant should also reflect these revisions in any analysis effected by this change (Background and Combined).

11. The intersection of Poquonnock Road, Chicago Avenue, Benham Road, and Mitchell Street appears to be set to MAX recall on all approaches in the intersection. It appears that on the record signal plans that only the southbound Mitchell Street approach is set to MAX Recall in all scenarios analyzed. The Consultant should revise this in their analysis.
12. In relation to Comment #11, changing the recall settings may improve the overall Levels of Service in the intersection. The Consultant should explore changing detector recall mode at the intersection of Poquonnock Road, Chicago Avenue, Benham Road, and Mitchell Street.

Summary

Based on our review of the Revised Traffic Impact Statement, we recommend the following issues be addressed:

1. Submit 2029 Traffic Analysis.
2. Revise the Traffic Impact Statement narrative based on the attached PDF markup.
3. Revise Trip Generation.
4. Revise Trip Distribution to match narrative provided in Section 4.4.
5. Provide a trip distribution and trip generation for additional transit shuttles and additional employees by 2024.
6. Provide additional analysis for the intersections of Allen Street at Smith Street and Allen Street at Mitchell Street.
7. Provide crash data for the intersections of Allen Street at Smith Street and Allen Street at Mitchell Street.
8. Revise Table 2 Crash Data.
9. Provide mitigation for the queue on the Mumford Avenue Southbound Approach at CT Route 349.
10. Revise the detection mode for the intersection of Poquonnock Road, Chicago Avenue, Benham Road, and Mitchell Street in the Background and Combined scenarios.
11. Explore changing the detection modes for the intersection of Poquonnock Road, Chicago Avenue, Benham Road, and Mitchell Street in the Combined Improved scenario.

Please do not hesitate to call if you have any questions or concerns related to our review of the traffic impact study associated with this project. We are prepared to discuss our report and associated findings.

Sincerely,



Michael Dion, P.E., PTOE
Senior Project Manager
BL Companies, Inc.

Electric Boat Corporation Traffic Impact Study

Assembly Building
Groton, Connecticut

April 2019

City of Groton Planning and Zoning Commission

Office of the State Traffic Administration (OSTA)
Administrative Decision Review



146 Hartford Road
Manchester, CT 06040

Prepared for:
Mr. Paul Harren
Electric Boat Corporation
75 Eastern Point Road
Groton, CT 06340

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End of Report

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2. Intersection Crash Data Summary
3. Signalized Intersection Level of Service Summary
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1. Site Location Map
2. 2019 Existing Conditions
3. 2024 Background Conditions
4. Site Generated Traffic Arrival/Departure Distribution
5. Site Generated Traffic Volumes
6. 2024 Combined Conditions

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Intersection Capacity Analysis Worksheets – Weekday Morning Peak Hour

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Intersection Capacity Analysis Worksheets – Weekday Afternoon Peak Hour

Appendix E

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Parking Inventory Map
Table 7 – Electric Boat Employee Projections
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Traffic Signal Plans



Summary Sheet

As an aid to reviewers, this Summary Sheet has been included to outline the various study parameters utilized in this report. Although a full explanation of the study methodologies is included in the text of the report, this summary can serve as a useful reference for reviewers.

Applicant:
Electric Boat Corporation

Site Acreage:
74.89 acres

Development Size/Type:
198,000 S.F. assembly building with a 16,500 S.F. utility building

Parking:
3,818 existing parking spaces

Applications:
City of Groton Planning and Zoning Commission: Land Use Application
Office of the State Traffic Administration (OSTA): Administrative Decision Review

Build Year:
2024

Background Traffic Growth Factor:
0.5% per year

Traffic Counts:
Fuss & O'Neill – October 18, 2018 (Turning Movement Counts)
Fuss & O'Neill – March 27, 2019 (Turning Movement Counts)

Peak Hours Analyzed:
Weekday Morning Peak Hour – varies from 6:00 a.m. to 8:15 a.m.
Weekday Afternoon Peak Hour – varies from 3:00 p.m. to 5:15 p.m.

Expected Trip Generation:
Weekday Morning Peak Hour – 327 Trips (265 entering, 62 exiting)
Weekday Afternoon Peak Hour – 342 Trips (150 entering, 192 exiting)

Capacity Analysis:
Technique – Highway Capacity Manual 2000 Edition
Execution – Synchro and SimTraffic Professional Software, Version 10.0

1 Introduction

Electric Boat Corporation proposes to construct a 198,000 square foot assembly building with a 16,500 square foot utility building at their Groton campus located at 75 Eastern Point Road in Groton, Connecticut. This facility is expected to be completed and operational in the year 2024. The proposed development will reside on the Thames River at the southwest corner of the 74.89 acre parcel parallel to Eastern Point Road and CT Route 349 as shown on the site location map, Figure No.1 attached. Access to the proposed development will be through the existing site driveways located on Eastern Point Road with additional parking located along Eastern Point Road.

Fuss & O'Neill has been retained by Electric Boat Corporation to study the traffic impact of the proposed 198,000 square foot assembly building with a 16,500 square foot utility building at their Groton campus located at 75 Eastern Point Road in Groton, Connecticut. This study has been prepared to document the findings of the study and is being submitted to the City of Groton in support of the development's land use applications and to the Office of the State Traffic Administration (OSTA) in support of an Administrative Decision Review.

2 Existing Condition

2.1 Site of Development

The existing parcel is a 74.89 acre site which currently holds existing Electric Boat facilities. The Electric Boat Groton campus contains facilities totaling 2,348,471 square feet and a total of 3,818 existing parking spaces for 8,010 existing employees, which is in conformance with the City of Groton zoning regulations of one parking space for every 3 employees during its largest shift. The existing parking is shown on the attached parking inventory map provided in Appendix G. The site is located along the Thames River on the west side of Eastern Point Road and CT Route 349. The site is bounded by Thames Street to the north, Eastern Point Road and CT Route 349 to the east, property owned by Buckeye Terminals LLC to the south and Thames River to the west.

2.2 Adjacent Roadway Network

The adjacent roadway network consists of the following roadways:

- Eastern Point Road
- Eastern Point Road (CT Route 349)
- Chester Street / Rainville Avenue (CT Route 349)
- Thames Street
- North Street
- Bridge Street
- Clarence B Sharp Highway (CT Route 349)
- Poquonnock Road (CT Route 649)

Eastern Point Road runs primarily north/south from its intersection with Thames Street, Smith Street and Poquonnock Road to the north and continues south for approximately one quarter mile where it also becomes designated as CT Route 349 at its intersection with Chester Street (CT Route 349). Eastern Point Road mainly carries two lanes of travel, one in each direction, throughout its entirety and is classified by the CTDOT as an urban minor arterial road. The posted speed limit is 25 miles per hour in the vicinity of the site. The land use surrounding Eastern Point Road includes industrial, residential and restaurant.

Eastern Point Road (CT Route 349) begins at the intersection of Eastern Point Road and Chester Street (CT Route 349) to the north and runs south for approximately one and three-quarter miles before terminating at its intersection with Beach Pond Road and Shennecossett Road. Eastern Point Road (CT Route 349) provides two lanes of travel, one in each direction, throughout its entirety and is classified by the CTDOT as an urban minor arterial road. The posted speed limit is 25 miles per hour in the vicinity of the site. The land use surrounding Eastern Point Road (CT Route 349) is a mix of residential, industrial and commercial establishments.

Chester Street (CT Route 349) begins at the intersection of Eastern Point Road and Eastern Point Road (CT Route 349) and runs east for approximately 400 feet where it turns into Rainville Avenue at its intersection with Mumford Avenue. Rainville Avenue then continues east, intersecting with Benham Road, the Clarence B Sharp Highway/Brandege Avenue, and ultimately Poquonnock Road. The majority of this roadway provides four lanes of travel, two in each direction. It is classified by CTDOT as an urban minor arterial road. The posted speed limit is 30 miles per hour. The land use surrounding this stretch of roadway is primarily residential establishments.

Thames Street runs primarily north/south from its intersection with Eastern Point Road, Smith Street and Poquonnock Road to the south and continues north for approximately one mile where it terminates at its intersection with Bridge Street. Thames Street carries two lanes of travel, one in each direction, throughout its entirety and is classified by the CTDOT as an urban collector road. The posted speed limit is 25 miles per hour. The land use surrounding Thames Street is a mix of residential and commercial.

North Street runs primarily north/south from its intersection with Bridge Street and the I-95 Ramps to the north and continues south for approximately one-third of a mile where it terminates at its intersection with Meridian Street and Mitchell Street. North Street carries three lanes of travel, one in the southbound direction, and two in the northbound direction, throughout its entirety and is classified by the CTDOT as minor arterial road. The posted speed limit is 25 miles per hour. The land use surrounding North Street is a primarily general commercial with some residential areas.

Bridge Street begins at the intersection of Thames Street and the Bailey Agencies Driveway and runs east for approximately one mile where it terminates at its intersection with Mumford Avenue. Rainville Avenue then continues east, intersecting with the Route 1 and Route 349 on and off ramps. This roadway provides two lanes of travel, one in each direction. It is classified by CTDOT as an urban minor arterial road. The posted speed limit is 35 miles per hour. The land use surrounding this roadway is a mix of residential, industrial and commercial establishments.

Clarence B Sharp Highway (CT Route 349) begins at the I-95 on and off ramps and runs south for approximately 1.5 miles where it turns into Brandegee Avenue at its intersection with Rainville Avenue. The majority of this roadway provides four lanes of travel, two in each direction. It is classified by CTDOT as an urban expressway, and following its intersection with Meridian Street and Meridian Street Extension it is qualified as an urban minor arterial road. The posted speed limit is 50 miles per hour from the I-95 ramps to its intersection with Meridian Street and Meridian Street Extension and the speed limit for the remainder of the road is 45 miles per hour. The land use surrounding this stretch of roadway is primarily residential and some commercial establishments.

Poquonnock Road (CT Route 649) runs primarily east/west from its intersection with Eastern Point Road, Smith Street and Thames Street to the east and continues west for approximately 2.5 miles where it terminates at the Poquonnock River. In the area of the study intersections, Poquonnock Road (CT Route 649) carries two lanes of travel, one in each direction, and is classified by the CTDOT as an urban collector road west of its intersection with Old Farm Road and Rainville Avenue, and an urban minor arterial road east of the intersection. The posted speed limit is 30 miles per hour in the area of the study intersections. The land use surrounding Poquonnock Road (CT Route 649) is a mix of residential and Five Corners. ?

2.3 Study Area Intersections

The following study area intersections were reviewed:

- CT Route 349 at Eastern Point Road
- CT Route 349 at Mumford Avenue
- CT Route 349 at Benham Road
- CT Route 349 at Route 649 and Brandegee Avenue
- Eastern Point Road at Thames Street, Smith Street and Poquonnock Road
- Poquonnock Road at Chicago Avenue, Benham Road, and Mitchell Street
- Poquonnock Road at EB Parking Lot (M-Lot)
- North Street at Meridian Street and Mitchell Street
- North Street at Broad Street
- Bridge Street at North Street and I-95 Ramps
- CT Route 349 and Meridian Street and Meridian Street Extension
- CT Route 649 at Rainville Avenue and Old Farm Road

The 3-way signalized intersection of CT Route 349 at Eastern Point Road provides an approach from the north on Eastern Point Road, and an approach from the east on Chester Street (CT Route 349) and an approach from the south on Eastern Point Road (CT Route 349). The Eastern Point Road approach from the north provides a dedicated left turn lane onto Chester Avenue (CT Route 349) and an exclusive through lane onto Eastern Point Road (CT Route 349). The Chester Street (CT Route 349) approach from the east provides a dedicated left turn lane onto Eastern Point Road (CT Route 349) and a combined left/right turn lane onto Eastern Point Road (CT Route 349) and Eastern Point Road. The Eastern Point Road (CT Route 349) approach from the south provides an exclusive through lane onto Eastern Point Road and a dedicated right turn lane onto Chester Street (CT Route 349).

The 4-way unsignalized intersection of CT Route 349 at Mumford Avenue provides an approach from the south on Mumford Avenue, an approach from the east on Rainville Avenue (CT Route 349), an approach from the north on Mumford Avenue, and an approach from the west on Chester Street (CT Route 349). The Mumford Avenue (south) and Mumford Avenue (north) approaches both provide one combined left/through/right turn lane. The Rainville Avenue (CT Route 349) and Chester Street (CT Route 349) approaches both provide two travel lanes for all movements.

The 4-way signalized intersection of CT Route 349 and Benham Road provides approaches from the north and south on Benham Road, and approaches from the west and east on Rainville Avenue (CT Route 349). The Benham Road approach from the north provides a dedicated left turn lane onto CT Route 349 and a shared through/right turn lane. The Benham Road approach from the south provides a dedicated right turn lane onto CT Route 349 and a shared through/left turn lane. The Rainville Avenue (CT Route 349) approaches from the east and west provide a shared left turn/through lane and a shared right turn/through lane.

The 4-way signalized intersection of CT Route 349 at CT Route 649 and Brandegee Avenue provides an approach from the north on Clarence Sharp Highway (CT Route 349), an approach from the east on Rainville Avenue (CT Route 649), an approach from the south on Brandegee Avenue, and an approach from the west on Rainville Avenue (CT Route 349). The Clarence Sharp Highway (CT Route 349) approach from the north provides exclusive left and right turn lanes along with a through lane. The Rainville Avenue (CT Route 649) approach from the east provides a shared through/left turn lane and an exclusive right turn lane. The Brandegee Avenue approach from the south provides a shared through/left turn lane and a shared through/right turn lane. The Rainville Avenue (CT Route 349) approach from the west provides an exclusive left turn lane onto Clarence Sharp Highway (CT Route 349) and a combined left/through/right turn lane.

The 4-way signalized intersection of Eastern Point Rd. at Thames St., Smith St. and Poquonnock Rd. provides an approach from the north on Smith Street, from the south on Eastern Point Road, from the east on Poquonnock Road and from the west on Thames Street. The Smith Street approach from the north, the Poquonnock Road approach from the east and the East Point Road from the south all provide a shared left/through/right turn lane. The Thames Street approach from the west provides an exclusive right turn lane onto Eastern Point Road and a combined through/left turn lane.

The 5-way signalized intersection of Poquonnock Rd. at Chicago Ave, Benham Rd, and Mitchell St. provides an approach from the north on Mitchell Street, approaches from the east and west on Poquonnock Road, an approach from the south on Chicago Avenue and an approach from the southeast on Benham Road. The Mitchell Street approach from the north provides a shared through/left turn lane and a shared through/right turn lane. The Poquonnock Road approaches from the east and west, the Chicago Avenue approach from the south and the Benham Road approach from the southeast all provide a single shared left/through/right turn lane.

The 3-way unsignalized intersection of Poquonnock Road at the EB Parking Lot (M-Lot) provides approaches from the east and west on Poquonnock Road, and an approach from the south at the parking lot driveway. The Poquonnock Road approach from the west provides a free-flowing combined through/right turn lane and the approach from the east provides a free-flowing combined through/left

turn lane. The parking lot driveway approach from the south provides a stop-controlled combined left/right turn lane onto Poquonnock Road.

The 4-way signalized intersection of North Street at Meridian Street and Mitchell Street provides approaches from the east and west on Meridian Street, and approaches from the north and south on Mitchell Street and North Street, respectively. Travelling eastbound on Meridian Street provides an all way one lane approach, while travelling westbound provides one dedicated left turn lane onto Mitchell Street and one through/right turn lane continuing on Meridian Street or turning onto North Street. Travelling northbound on Mitchell Street provides a dedicated left turn lane onto Meridian Street, two through lanes onto North Street, and a dedicated right turn lane onto Meridian Street. Meanwhile, the southbound approach on North Street provides one dedicated left turn lane onto Meridian Street and one through/right turn lane onto Mitchell Street or Meridian Street, respectively.

The 4-way signalized intersection of North Street at Broad Street provides approaches from the east and west on Broad Street, and approaches from the north and south on North Street. Travelling eastbound on Broad Street provides an all way one lane approach, while travelling westbound provides one dedicated left turn lane onto North Street and one through/right turn lane continuing on Broad Street or turning onto North Street. Travelling northbound and southbound on North Street provides two or one all way approaches, respectively.

The 4-way signalized intersection of Bridge Street at North Street and I-95 Ramps provides approaches from the east and west on Bridge Street, and approaches from the north and south on North Street and I-95 on and off ramps, respectively. Travelling eastbound provides two dedicated left turn lanes onto the I-95 on ramp and one through/right turn lane continuing on Bridge Street or turning onto North Street. Travelling westbound on Bridge Street provides one dedicated right turn lane onto the I-95 on ramp, and one through/left turn lane continuing on Bridge Street or turning onto North Street. Travelling northbound on North Street provides a dedicated left turn lane onto Bridge Street, one through lane onto the I-95 on ramp, and a dedicated right turn lane onto Bridge Street. Meanwhile, the southbound approach on the I-95 off ramp provides one dedicated left turn lane onto Bridge Street, one through lane onto North Street and one channelized right turn lane onto Bridge Street.

shared through/right turn lane continuing onto I-95 on ramp or turning onto Bridge Street.

The 4-way intersection of CT Route 349 and Meridian Street and Meridian Street Extension provides approaches east and west on Meridian Street and Meridian Street Extension, respectively, and approaches from the north and south on Clarence B Sharp Highway (CT Route 349). Travelling eastbound on Meridian Street provides two dedicated left turn lane onto Clarence B Sharp Highway (CT Route 349), and one through/right turn lane continuing onto Meridian Street Extension or turning onto Clarence B Sharp Highway (CT Route 349). Travelling westbound provides one dedicated left turn lane onto Clarence B Sharp Highway (CT Route 349), one through lane continuing onto Meridian Street, and one dedicated right turn lane onto Clarence B Sharp Highway (CT Route 349). Travelling northbound on Clarence B Sharp Highway (CT Route 349) provides a dedicated left turn lane onto Bridge Street, ~~one through lane onto the I-95 on ramp, and a dedicated right turn lane onto Meridian Street,~~ two through lanes continuing on Clarence B Sharp Highway (CT Route 349), and one dedicated right turn lane onto Meridian Street Extension. The southbound approach on Clarence B Sharp Highway (CT Route 349) provides one dedicated left turn lane onto Meridian Street Extension, two through lanes

Meridian Street

shared through/right turn lane continuing onto Clarence B Sharp Highway (CT Route 349) or turning onto Meridian Street Extension.



continuing on Clarence B Sharp Highway (CT Route 349), and one dedicated right turn lane onto Meridian Street.

The 4-way signalized intersection of CT Route 649 at Rainville Avenue and Old Farm Road provides approaches from the east and west on Poquonnock Road (CT Route 649), and approaches from the north and south on Rainville Avenue and Old Farm Road, respectively. Travelling eastbound on Poquonnock Road (CT Route 649) provides one dedicated left turn lane onto Old Farm Road, and one through/right turn lane continuing on Poquonnock Road (CT Route 649) or turning onto Rainville Avenue. Travelling westbound provides one dedicated left turn lane onto Rainville Avenue and one through/right turn lane continuing on Poquonnock Road (CT Route 649) or turning onto Old Farm Road. Travelling northbound on Rainville Avenue provides one through/left turn lane continuing onto Old Farm Road or turning onto Poquonnock Road (CT Route 649), and one dedicated right turn lane onto Poquonnock Road (CT Route 649). Travelling southbound on Old Farm Road provides one all way approach.

2.4 Traffic Volumes, Speeds and Counts

The greatest potential for traffic impact on the roadway network by the proposed development will occur during the weekday morning and weekday afternoon peak hours, the periods when commuter and/or Electric Boat and transit related trips are at their highest levels. In order to determine the traffic impact of the proposed development on adjacent street traffic, representatives of Fuss & O'Neill, Inc. conducted weekday morning and weekday afternoon peak hour manual turning movement counts on October 18, 2018 at seven (7) intersections and an additional eight (8) intersections on March 27, 2019 in the study area. The traffic count data collected indicates that the weekday morning peak hour of traffic varies from 6:00 a.m. to 8:15 a.m. and the weekday afternoon peak hour varies from 3:00 p.m. to 5:15 p.m. throughout each of the study area intersections. These peak hours were subsequently analyzed for impacts. As a conservative analysis, network wide peak hours were not utilized and each individual intersection was analyzed for its own peak hour of traffic. The existing traffic volumes for these peak hours are shown in Figure No. 2, of the traffic volume figures, attached. The raw turning movement count data can be found, attached.

3 Background Traffic Conditions

3.1 Growth Rate

Upon review of historical ADT traffic volume data from the Connecticut Department of Transportation (CTDOT) within the study area, a gradual decline in traffic volumes was observed over the past 10 years. For the purposes of this study however, the 2018 and 2019 existing traffic volumes were projected to the 2024 peak design year using a 0.5 percent per year peak hour growth factor to account for potential future traffic growth in the study area. This growth rate should be considered conservative based on the observed gradual decline in traffic volumes over the past several years and based on the fact that there are no significant planned major traffic generators in the study area that would substantially increase traffic volumes in the foreseeable future.

3.2 Other Developments

Fuss & O'Neill contacted the Connecticut Department of Transportation's (CTDOT) Office of the State Traffic Administration (OSTA) and the City of Groton to identify any other pending or approved developments having site related traffic in the study area. No such developments were identified.

3.3 Planned Roadway Improvement Projects

Fuss & O'Neill contacted the CTDOT and the City of Groton Planning office to determine if any roadway improvements are planned in the area of the proposed development. The CTDOT District 2 office indicated that Route 349 is scheduled for resurfacing in the year 2019 as part of the 2019 Pavement Preservation program. The resurfacing of Route 349 will improve the safety of traffic operations in the vicinity of the site.

4 Proposed Conditions

4.1 Development

Electric Boat Corporation proposes to construct a 198,000 square foot assembly building with a 16,500 square foot utility building at their Groton campus located at 75 Eastern Point Road in Groton, Connecticut. This facility is expected to be completed and operational in the year 2024. It is anticipated that the development will result in no significant increase in the number of employees until the year 2024, therefore no significant increase in trip generation or increase in the number of parking spaces is proposed until the year 2024.

Beginning in the year 2024, Electric Boat anticipates 8,854 total employees (7,036 first shift, 1,455 second shift, and 364 third shift), an increase of 458 employees during the highest shift (1st shift). The increase in the number of employees starting in the year 2024 will be accommodated via an additional parking facility located along Eastern Point Road, designated as "Potential Off-Site Parking B".

Although an increase in the number of employees is expected starting in the year 2024, it is anticipated that Electric Boat will not exceed City of Groton zoning regulations of 1 parking space for every 3 employees during its largest shift over the next 11 years. The expected number of employees and the parking rate projections from the year 2019 to 2030 are shown in Table 7 & 8 of Appendix G, attached.

4.2 Site Access and Circulation

Primary site access is proposed to be provided via existing site driveways and walkways along Eastern Point Road and surrounding roadways within the study area. Internal site driveways will provide access to commercial vehicles for deliveries and for preferred parking members. Walkways connecting across Eastern Point Road will provide access to the development for patrons parking in surface parking lots to

the east of Eastern Point Road. Additional parking facility access will be provided via Eastern Point Road.

4.3 Trip Generation

The expected site generated traffic data was obtained from the Institute of Transportation Engineers (ITE) publication, Trip Generation, 10th Edition, 2017. This publication is an industry-accepted resource for determining trip generation. Trip generation for the weekday morning and afternoon peak hour was calculated using the ITE land use code 140 "Manufacturing". The ITE manual indicates that the 198,000 square foot assembly building with a 16,500 square foot utility building is expected to generate a total of 363 vehicle trips (294 entering, 69 exiting) during the morning peak hour, and a total of 380 vehicle trips (167 entering, 213 exiting) during the afternoon peak hour. Due to the availability of vans offered by Electric Boat to their employees for vanpooling, a 10% credit was applied to the trip generation. After applying the 10% credit the facility is expected to generate a total of 327 vehicle trips (265 entering, 62 exiting) during the morning peak hour, and a total of 342 vehicle trips (150 entering, 192 exiting) during the afternoon peak hour. A summary of the peak hour trip generation information for the proposed facility is provided in Table 1 of Appendix A.

Trip generation does not appear to be from ITE Trip Generation. This narrative should reflect the source used in the Appendix.

Trip generation was calculated by number of new employees, not square footage.

4.4 Trip Distribution

The distribution of traffic entering and exiting the proposed site was applied to the road network based on the existing regional traffic distributions and the layout of the adjacent roadway network. During the peak hours, the following arrival distributions of traffic are anticipated:

- 45% from the west on Interstate 95
- 35% from the east on Interstate 95
- 10% from the north on Route 12
- 10% from the north on Route 184

It appears that all trips are assumed to be entering/exiting from Parking Lot B according to Figure No. 4. Is this the case?

A regional arrival/departure distribution for the new site generated traffic traveling to and from the project site is shown in Figure No. 4 of Appendix B.

4.5 Combined Volumes

The site generated traffic was distributed to the roadway system based on the arrival/departure distributions with the results shown in Figure No. 5 of Appendix B. These volumes were then added to the background volumes to yield the year 2024 peak hour Combined traffic volumes shown in Figure No. 6 of Appendix B.

5 Analyses

5.1 Crash Analysis

Crash data was gathered from the University of Connecticut Crash Data Repository for the following intersections:

Crash Data should also include:
-Allen Street @ Smith Street
-Allen Street at Mitchell Street

Route 349 at Eastern Point Road
Route 349 at Mumford Avenue
Route 349 at Benham Road
Route 349 at Route 649 and Brandegee Avenue
Eastern Point Road at Thames Street, Smith Street and Poquonnock Road
Poquonnock Road at Chicago Avenue, Benham Road, and Mitchell Street

- Poquonnock Road at EB Parking Lot (M-Lot)
- North Street at Meridian Street and Mitchell Street
- North Street at Broad Street
- Bridge Street at North Street and I-95 Ramps
- CT Route 349 and Meridian Street and Meridian Street Extension
- CT Route 649 at Rainville Avenue and Old Farm Road

The records were gathered for the most recent three years of available data, December 31, 2015 through December 31, 2018. A summary of the crash data per intersection and roadway segment is provided in Table 2 of Appendix A.

The intersection of CT Route 349 at Eastern Point Road experienced an average of less than one crash per year. During the three year span, the intersection experienced one angle crash.

The intersection of CT Route 349 at Mumford Avenue experienced an average of less than one crash per year. During the three year span, the intersection experienced one front to rear end crash and one unknown crash.

The intersection of CT Route 349 at Benham Road experienced an average of approximately five crashes per year. During the three year span the intersection experienced a total of 14 crashes, with a majority being front to rear end crashes.

The intersection of CT Route 349 at CT Route 649 and Brandegee Avenue experienced an average of six crashes per year. During the three year span the intersection experienced a total of 18 crashes, with a majority being angled. Although eight angled crashes are reported at this intersection, abnormal crash patterns or frequencies were not identified, based on the size and volume of traffic at the intersection.

The intersection of Eastern Point Rd. at Thames St., Smith St. and Poquonnock Rd. experienced an average of less than one crash per year. During the three year span, the intersection experienced one front to rear end crash.

The intersection of Poquonnock Rd. at Chicago Ave, Benham Rd, and Mitchell St. experienced an average of two crashes per year. During the three year span the intersection experienced a total of six crashes, with a majority being front to rear end crashes.

The intersection of Poquonnock Road at the EB Parking Lot (M-Lot) experienced an average of less than one crash per year. During the three year span, the intersection experienced two crashes, one crash with the guardrail and one front to front end crash.

The intersection of North Street at Meridian Street and Mitchell Street experienced an average of less than two crashes per year. During the three year span, the intersection experienced five crashes, the majority being front to rear end crash.

The intersection of North Street at Broad Street experienced an average of less than two crashes per year. During the three year span, the intersection experienced five crashes, the majority being front to rear end and same direct sideswipe crashes.

The intersection of Bridge Street at North Street and the I-95 Ramps experienced an average of four crashes per year. During the three year span the intersection experienced a total of 12 crashes, with a majority being front to rear end crashes.

The intersection of CT Route 349 at Meridian Street and Meridian Street Extension experienced an average of 10 crashes per year. During the three year span the intersection experienced a total of 30 crashes, with a majority being front to rear end crashes. Although a relatively high number of crashes are observed at this intersection, the crash frequencies and patterns are consistent with what is typically experienced at a high volume signalized intersection at the end of an expressway. It is noted that advance traffic signal ahead warning signage is present on both Route 349 approaches to the intersection.

The intersection of CT Route 649 at Rainville Avenue and Old Farm Road experienced an average of less than four crashes per year. During the three year span the intersection experienced a total of 10 crashes, with a majority being unknown crashes.

The majority of the crashes reported at the intersections were rear-end type crashes, consistent with what is typically experienced in the vicinity of signalized intersections. No abnormal crash patterns or frequencies were identified. A crash data summary and more detailed crash data reports are attached at the conclusion of this report.

5.2 Intersection Sight Distance Analysis

Intersection sight distance was measured at the "Potential Off-Site Parking B" existing site driveway located along Route 349 (Eastern Point Road) in accordance with criteria set forth in the 2003 CTDOT Highway Design Manual. Sight distance is measured from a point 10 feet back from the edge of traveled way at a height of 3.5 feet, the standard height of a driver's eye.

15 feet

For the design speed of 30 miles per hour (posted 25 mph), 335 feet of intersection sight distance is required for a passenger car turning right or left onto a two-lane roadway. Adequate sight distance in excess of 335 feet is available looking left (north) and right (south) at the "Potential Off-Site Parking B" site driveway.

5.3 Intersection Capacity Analysis

Capacity analyses for both signalized and unsignalized intersections were conducted using Synchro Professional Software, version 10.0.

In discussing intersection capacity analyses results, two terms are used to describe the operating condition of the road or intersection. These two terms are volume to capacity ratio (v/c) and level of service (LOS).

The v/c ratio is a ratio of the volume of traffic using an intersection to the total capacity of the intersection (the maximum number of vehicles that can utilize the intersection during an hour). The v/c ratio can be used to describe the percentage of capacity utilized by a single intersection movement, a combination of movements, an entire intersection approach, or the intersection as a whole.

LOS is a measure of the delay experienced by stopped vehicles at an intersection. LOS is rated on a scale from A to F, with A describing a condition of very low delay (less than 10 seconds per vehicle), and F describing a condition where delays will exceed 50 seconds per vehicle for unsignalized intersections and 80 seconds per vehicle for signalized intersections. Delay is described as a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Therefore, intersections with longer delay times are less acceptable to most drivers.

LOS is generally used to describe the operation (based on delay time) of both signalized and unsignalized intersections, while v/c ratio is applied to signalized intersections only. These definitions for v/c ratio and LOS, as well as the methodology for conducting signalized and unsignalized intersection capacity analyses, are taken from the "Highway Capacity Manual, 6th Edition" published by the Transportation Research Board.

Using the above referenced methodologies, the weekday morning and weekday afternoon peak hour 2024 background and combined conditions analyses were conducted at the following intersections:

- CT Route 349 at Eastern Point Road
- CT Route 349 at Mumford Avenue
- CT Route 349 at Benham Road
- CT Route 349 at Route 649 and Brandegee Avenue
- Eastern Point Road at Thames Street, Smith Street and Poquonnock Road
- Poquonnock Road at Chicago Avenue, Benham Road, and Mitchell Street
- Poquonnock Road at EB Parking Lot (M-Lot)
- North Street at Meridian Street and Mitchell Street
- North Street at Broad Street
- Bridge Street at North Street and I-95 Ramps
- CT Route 349 and Meridian Street and Meridian Street Extension
- CT Route 649 at Rainville Avenue and Old Farm Road

Tables No. 3 & 4 of Appendix A presents a summary of the levels of service at the signalized and unsignalized intersections, for both background and combined conditions traffic volume. Copies of the analysis worksheets can be found attached for the weekday morning, and weekday afternoon peak hours respectively.

The signalized intersection of CT Route 349 at Eastern Point Road operates at LOS B under background and combined conditions during the weekday morning peak hour and operates at LOS A under background conditions and LOS B under combined conditions during the weekday afternoon peak hour. All approaches on Route 349 and Eastern Point Rd. operate at acceptable levels of service under 2024 background and combined conditions during the weekday morning and afternoon peak hour.

At the unsignalized intersection of CT Route 349 at Mumford Avenue, the eastbound and westbound approaches operate at LOS A under background and combined conditions during the weekday morning and afternoon peak hours. The northbound and southbound approaches operates at LOS F under background and combined conditions during the weekday morning peak hour. The northbound approach operates at LOS C under background conditions and operates at LOS D under combined conditions during the weekday afternoon peak hour while the southbound approach operate at LOS E under background conditions and LOS F under combined conditions during the weekday afternoon peak hour. The eastbound and westbound approaches on Route 349 operate at acceptable levels of service under 2024 background and combined conditions during the weekday morning and afternoon peak hour. The northbound and southbound Mumford Avenue approaches do not operate efficiently when modeled in Synchro due to the high number of pedestrian crossings and opposing free flow movements on Route 349, however field observations indicate that the approaches operate much more efficiently than the analysis indicates during each peak hour.

The signalized intersection of CT Route 349 at Benham Road operates at LOS B under background and combined conditions during the weekday morning and afternoon peak hours and operates at LOS C under background and combined conditions during the weekday morning and afternoon peak hours. All approaches on Route 349 and Benham Road operate at acceptable levels of service under 2024 background and combined conditions during the weekday morning and afternoon peak hours.

The signalized intersection of CT Route 349 at Route 649 and Brandegee Avenue operates at LOS C under background and combined conditions during the weekday morning peak hour and operates at LOS D under background conditions and LOS E under combined conditions during the weekday afternoon peak hour. It is recommended to optimize the traffic signal timings to increase the intersection and approach LOS on the westbound approach during the weekday morning peak hour and on the eastbound approach during the weekday afternoon peak hour. Upon implementation of the proposed signal timing improvements, the overall background conditions intersection LOS is maintained in the combined conditions during both peak hours. Recommended improvements are outlined in Section 6: Conclusions and Recommendations with LOS results for the 2024 combined improved condition shown in Table 3, of Appendix A.

The signalized intersection of Eastern Point Rd. at Thames St., Smith St. and Poquonnock Rd. operates at LOS B under background and combined conditions during the weekday morning and afternoon peak

hours. All approaches on Eastern Point Rd., Thames St., Smith St., and Poquonnock Rd. operate at acceptable levels of service under 2024 background and combined conditions during the weekday morning and afternoon peak hour.

The signalized intersection of Poquonnock Rd. at Chicago Ave., Benham Rd., and Mitchell St. operates at LOS D under background conditions and LOS E under combined conditions during the weekday morning peak hour. The intersection operates at LOS E under background conditions and LOS F under combined conditions during the weekday afternoon peak hour. Due to the degradation in intersection LOS during the weekday morning and afternoon peak hours it is recommended to optimize the traffic signal timings to facilitate an increase in intersection and approach LOS. Upon implementation of the proposed signal timing improvements, the overall background conditions intersection LOS is maintained in the combined conditions during both peak hours. Recommended improvements are outlined in Section 6: Conclusions and Recommendations with LOS results for the 2024 combined improved condition shown in Table 3, of Appendix A.

At the unsignalized intersection of Poquonnock Rd. at the EB Parking Lot (M-Lot), the Poquonnock Road eastbound and westbound approaches operate at LOS A under background and combined conditions during the weekday morning and weekday afternoon peak hours. The northbound parking lot approach operates at LOS B under background and combined conditions during the weekday morning peak hour and operates at LOS C under background and combined conditions during the weekday afternoon peak hour. All approaches on Poquonnock Rd. and the EB Parking Lot (M-Lot) driveway operate at acceptable levels of service under 2024 background and combined conditions during the weekday morning and afternoon peak hour.

The signalized intersection of North St. at Meridian St. and Mitchell St. operates at LOS B under background and combined conditions during the weekday morning and afternoon peak hours. All approaches on North St., Meridian St. and Mitchell St. operate at acceptable levels of service under 2024 background and combined conditions during the weekday morning and afternoon peak hour.

The signalized intersection of North St. at Broad St. operates at LOS A under background conditions and LOS B under combined conditions during the weekday morning peak hour and operates at LOS A under background and combined conditions during the weekday afternoon peak hour. All approaches on North St and Broad St. operate at acceptable levels of service under 2024 background and combined conditions during the weekday morning and afternoon peak hour.

The signalized intersection of Bridge Street at North Street and I-95 ramps operates at LOS D under background conditions and LOS F under combined conditions during the weekday morning peak hour. The intersection operates at LOS D under background and combined conditions during the afternoon peak hour. Due to the degradation in intersection LOS during the weekday morning peak hour it is recommended to optimize the traffic signal timings to facilitate an increase in intersection and approach LOS. Upon implementation of the proposed signal timing improvements, the overall intersection LOS is improved to LOS C in the combined conditions during the morning peak hour. Recommended improvements are outlined in Section 6: Conclusions and Recommendations with LOS results for the 2024 combined improved condition shown in Table 3, of Appendix A.

The signalized intersection of CT Route 349 and Meridian St. and Meridian St. Ext. operates at LOS C under background conditions and LOS D under combined conditions during the weekday morning peak hour and operates at LOS C under background and combined conditions during the weekday afternoon peak hour. All approaches on CT Route 349, Meridian St. and Meridian St. Ext. operate at acceptable levels of service under 2024 background and combined conditions during the weekday morning and afternoon peak hour.

The signalized intersection of CT Route 649 at Rainville Ave. and Old Farm Rd. operates at LOS B under background and combined conditions during the weekday morning and afternoon peak hours. All approaches on CT Route 649, Rainville Ave. and Old Farm Rd. operate at acceptable levels of service under 2024 background and combined conditions during the weekday morning and afternoon peak hour.

5.4 Queue Analysis

Existing Condition 95th percentile (design) queue lengths were reviewed at each intersection in the study area. The 95th percentile (design) vehicle queue lengths represent the maximum queue lengths that can be expected at each of the critical approach lanes of the study area intersections and is a function of the traffic signal timing, vehicular arrival patterns during the analysis period, and the saturation flow rate. The queue lengths are provided in the Synchro capacity analysis worksheets, attached, and Table #5 attached provides a summary of the queue lengths for the critical lanes at each intersection.

Overall, minor increase in queuing is experienced at all study intersection approaches under 2024 background and combined conditions during the weekday morning and afternoon peak hours. A review of existing storage capacity reveals that adequate storage exists to accommodate existing queue lengths at most study intersection approaches with implemented recommendations as outlined in Section 6: Conclusions and Recommendations.

6 Conclusions & Recommendations

The purpose of preparing a Traffic Impact Study is to identify the impact of the proposed development's site generated traffic. The study efforts have indicated that the 198,000 square foot assembly building with a 16,500 square foot utility building is expected to generate a total of 363 vehicle trips (294 entering, 69 exiting) during the morning peak hour, and a total of 380 vehicle trips (167 entering, 213 exiting) during the afternoon peak hour. Due to the availability of vans offered by Electric Boat to their employees for vanpooling, a 10% reduction of vehicular trips generated by the site has been factored into the above trip generation. After applying the 10% credit the facility is expected to generate a total of 327 vehicle trips (265 entering, 62 exiting) during the morning peak hour, and a total of 342 vehicle trips (150 entering, 192 exiting) during the afternoon peak hour.

The 198,000 square foot assembly building with a 16,500 square foot utility is expected to be completed and operational in the year 2024. The proposed development will reside on the Thames River at the southwest corner of the 74.89 acre parcel parallel to Eastern Point Road and CT Route 349. Access to

the proposed development will be through the existing site driveways located on Eastern Point Road with additional parking located along Eastern Point Road.

Capacity analysis revealed that most study intersections operate efficiently under 2024 background and combined conditions during the weekday morning and afternoon peak hours with the addition of the trips generated by the proposed facility and the expected growth rate for the area for weekday morning and weekday afternoon peak hours.

Capacity analysis also revealed that the intersections of CT Route 349 at Route 649 and Brandegee Avenue, Poquonnock Rd. at Chicago Ave., Benham Rd., and Mitchell St. will experience a more significant LOS degradation with peak hour delays under combined conditions during the weekday morning and afternoon peak hours. However, the signal timing revisions outlined below will reduce delay, manage queuing, and allow the intersections to operate at a more acceptable level of service, similar to how they operate under background conditions.

A review of crash data provided by the University of Connecticut Crash Data Repository indicated that there were no abnormal crash frequencies and crash patterns in the study area given the volume of traffic and presence of traffic signals in the study area.

Based on the results of the capacity and queue analysis, traffic signal timing optimizations are recommended at the following study area intersections to increase intersection and approach level of service and improve delay during the weekday morning and afternoon peak hours:

- CT Route 349 at Route 649 and Brandegee Avenue
- Poquonnock Road at Chicago Avenue, Benham Road, and Mitchell Street
- Bridge Street at North Street and I-95 Ramps
- CT Route 349 and Meridian Street and Meridian Street Extension

Based on the results of the foregoing analysis, it is the professional opinion of Fuss & O'Neill, Inc. that the proposed Electric Boat development expansion, upon implementation of the signal timing revisions identified above, will not have a significant impact to traffic operations and that employees can be safely and efficiently accommodated within the study area.

Appendix A

Tables



Table 1

Peak Hour Site Generated Traffic Volumes
 Electric Boat – Assembly Building Development
 Groton, Connecticut

458 Employees	Total Trips	Trips Entering	Trips Exiting
Weekday Morning Peak Hour	327	265	62
Weekday Afternoon Peak Hour	342	150	192

Note: Trip generation based on Rate per Land use Code 140 (Manufacturing), as published in Trip Generation, 10th Edition, 2017. Trip generation rates include a 10% vanpool credit.

Table 2

Intersection Crash Data Summary
 Electric Boat – Assembly Building Development
 Groton, Connecticut

Intersections/Road Segments	Crashes Per Year			
	2016	2017	2018	Average/Year
CT Rte. 349 at Eastern Point Rd.	0*	1	0	1
CT Rte. 349 at Mumford Ave.	0	1	1	1
CT Rte. 349 at Benham Rd.	4	3	7	5
CT Rte. 349 at Rte. 649 and Brandegee Ave.	4	6	8	18
Eastern Point Rd. at Thames St., Smith St. & Poquonnock Rd.	0	0	1	1
Poquonnock Rd. at Chicago Ave., Benham Rd., & Mitchell St.	3	1	2	1
Poquonnock Rd. at EB Parking Lot (M-Lot)	0	1	1	1
North St. at Meridian St. and Mitchell St.	1	2	2	2
North St. at Broad St.	0	3	2	2
Bridge St. at North St. and I-95 Ramps	1	6	5	4
CT Rte. 349 and Meridian St. and Meridian St. Ext.	7	9	14	10
CT Rte. 649 at Rainville Ave. and Old Farm Rd.	3	6	1	4

Total not average

Should be 2

*Values indicated are number of crashes within 200 feet of each intersection during time period shown.
 Data provided by the University of Connecticut Crash Data Repository

Allen Street intersections should be included in this summary



Table 3

Signalized Intersection Level of Service Summary
 Electric Boat – Assembly Building Development
 Groton, Connecticut

Signalized Intersections	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
	2024 Background	2024 Combined	2024 Combined Improved	2024 Background	2024 Combined	2024 Combined Improved
CT Route 349 at Eastern Point Road	0.28/LOS B*	0.45/LOS B	N/A	0.19/LOS A	0.35/LOS B	N/A
WB Approach	LOS B	LOS C	N/A	LOS C	LOS B	N/A
NB Approach	LOS B	LOS B	N/A	LOS A	LOS B	N/A
SB Approach	LOS A	LOS B	N/A	LOS A	LOS B	N/A
CT Route 349 at Benham Road	0.67/LOS B	0.74/LOS B	N/A	0.61/LOS C	0.69/LOS C	N/A
EB Approach	LOS B	LOS B	N/A	LOS C	LOS C	N/A
WB Approach	LOS B	LOS B	N/A	LOS B	LOS B	N/A
NB Approach	LOS B	LOS C	N/A	LOS C	LOS C	N/A
SB Approach	LOS C	LOS C	N/A	LOS C	LOS D	N/A
CT Route 349 at Route 649 and Brandegee Avenue	0.66/LOS C	0.68/LOS C	0.68/LOS C	0.76/LOS D	0.82/LOS E	0.83/LOS D
EB Approach	LOS E	LOS E	LOS E	LOS D	LOS F	LOS D
WB Approach	LOS F	LOS F	LOS E	LOS E	LOS E	LOS E

Signalized Intersections	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
	2024 Background	2024 Combined	2024 Combined Improved	2024 Background	2024 Combined	2024 Combined Improved
NB Approach	LOS C	LOS C	LOS D	LOS D	LOS D	LOS E
SB Approach	LOS A	LOS A	LOS B	LOS C	LOS B	LOS C
Eastern Point Rd. at Thames St., Smith St. and Poquonnock Rd.	0.37/LOS B	0.41/LOS B	N/A	0.38/LOS B	0.42/LOS B	N/A
EB Approach	LOS B	LOS B	N/A	LOS B	LOS B	N/A
WB Approach	LOS C	LOS C	N/A	LOS C	LOS C	N/A
NB Approach	LOS B	LOS B	N/A	LOS B	LOS B	N/A
SB Approach	LOS C	LOS C	N/A	LOS C	LOS C	N/A
Poquonnock Rd. at Chicago Ave., Benham Rd., and Mitchell St.	0.59/LOS D	0.63/LOS E	0.64/LOS D	0.80/LOS E	0.98/LOS F	0.88/LOS E
EB Approach	LOS D	LOS D	LOS D	LOS F	LOS F	LOS D
WB Approach	LOS D	LOS D	LOS D	LOS D	LOS D	LOS D
NB Approach	LOS C	LOS D	LOS D	LOS D	LOS D	LOS E
SB Approach	LOS E	LOS E	LOS D	LOS D	LOS D	LOS E
NE Approach	LOS D	LOS D	LOS E	LOS D	LOS F	LOS F
North Street at Meridian Street and Mitchell Street	0.54/LOS B	0.61/LOS B	N/A	0.50/LOS B	0.54/LOS B	N/A
EB Approach	LOS C	LOS C	N/A	LOS C	LOS C	N/A
WB Approach	LOS C	LOS C	N/A	LOS C	LOS C	N/A

Signalized Intersections	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
	2024 Background	2024 Combined	2024 Combined Improved	2024 Background	2024 Combined	2024 Combined Improved
NB Approach	LOS B	LOS B	N/A	LOS B	LOS B	N/A
SB Approach	LOS A	LOS A	N/A	LOS A	LOS A	N/A
North Street at Broad Street	0.58/LOS A	0.65/LOS B	N/A	0.54/LOS A	0.57/LOS A	N/A
EB Approach	LOS B	LOS B	N/A	LOS B	LOS B	N/A
WB Approach	LOS C	LOS C	N/A	LOS C	LOS C	N/A
NB Approach	LOS A	LOS A	N/A	LOS A	LOS A	N/A
SB Approach	LOS A	LOS A	N/A	LOS A	LOS A	N/A
Bridge Street at North Street and I-95 Ramps	0.66/LOS D	0.76/LOS F	0.73/LOS C	0.69/LOS D	0.76/LOS D	0.75/LOS D
EB Approach	LOS D	LOS D	LOS D	LOS D	LOS D	LOS D
WB Approach	LOS C	LOS C	LOS C	LOS C	LOS C	LOS C
NB Approach	LOS C	LOS C	LOS C	LOS C	LOS C	LOS C
SB Approach	LOS E	LOS F	LOS C	LOS D	LOS E	LOS C
Route 349 at Meridian Street and Meridian Street Extension	0.79/LOS C	0.87/LOS D	0.79/LOS C	0.65/LOS C	0.70/LOS C	N/A
EB Approach	LOS C	LOS C	LOS D	LOS C	LOS C	N/A
WB Approach	LOS C	LOS C	LOS D	LOS C	LOS C	N/A
NB Approach	LOS B	LOS B	LOS B	LOS C	LOS C	N/A
SB Approach	LOS C	LOS E	LOS B	LOS B	LOS B	N/A

Signalized Intersections	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
	2024 Background	2024 Combined	2024 Combined Improved	2024 Background	2024 Combined	2024 Combined Improved
CT Route 649 at Rainville Avenue and Old Farms Road	0.33/LOS B	0.33/LOS B	N/A	0.52/LOS B	0.52/LOS B	N/A
EB Approach	LOS A	LOS A	N/A	LOS A	LOS A	N/A
WB Approach	LOS A	LOS A	N/A	LOS B	LOS B	N/A
NB Approach	LOS C	LOS C	N/A	LOS C	LOS C	N/A
SB Approach	LOS C	LOS C	N/A	LOS C	LOS C	N/A

* Values indicated are intersection v/c Ratio/Level of Service

Table 4

Unsignalized Intersection Level of Service Summary
 Electric Boat – Assembly Building Development
 Groton, Connecticut

Unsignalized Intersections	Weekday Morning Peak Hour		Weekday Afternoon Peak Hour	
	2024 Background	2024 Combined	2024 Background	2024 Combined
CT Route 349 at Mumford Avenue #1				
EB Approach	LOS A*	LOS A	LOS A	LOS A
WB Approach	LOS A	LOS A	LOS A	LOS A
NB Approach	LOS F	LOS F	LOS C	LOS D
SB Approach	LOS F	LOS F	LOS E	LOS F
Poquonnock Rd. at EB Parking Lot (M-Lot)				
EB Approach	LOS A	LOS A	LOS A	LOS A
WB Approach	LOS A	LOS A	LOS A	LOS A
NB Approach	LOS B	LOS B	LOS C	LOS C

*All values indicated are approach LOS

Table 5

Queue Length Summary Weekday Morning Peak Hour
 Electric Boat – Assembly Building Development
 Groton, Connecticut

Intersection	Approach Lane	2024 Background	2024 Combined	2024 Combined Improved	Available Storage
CT Route 349 at Eastern Point Road	WB Left Turn	90 Feet	165 Feet	N/A	320 Feet
	NB Through	50 Feet	70 Feet	N/A	320 Feet
	NB Right Turn	20 Feet	20 Feet	N/A	175 Feet
	SB Left Turn	20 Feet	30 Feet	N/A	125 Feet
	SB Through	70 Feet	130 Feet	N/A	345 Feet
CT Route 349 at Mumford Avenue #1	EB Approach	0 Feet	0 Feet	N/A	325 Feet
	WB Approach	0 Feet	0 Feet	N/A	1,000 Feet
	NB Approach	135 Feet	190 Feet	N/A	300 Feet
	SB Approach	320 Feet	275 Feet	N/A	245 Feet
CT Route 349 at Benham Road	EB Approach	35 Feet	50 Feet	N/A	1,000 Feet
	WB Approach	225 Feet	325 Feet	N/A	900 Feet
	NB Left/Through	80 Feet	80 Feet	N/A	215 Feet
	NB Right Turn	35 Feet	35 Feet	N/A	215 Feet
	SB Left Turn	65 Feet	65 Feet	N/A	
	SB Through	125 Feet	125 Feet	N/A	
CT Route 349 at Route 649 and Brandegee Avenue	EB Left Turn	205 Feet	230 Feet	250 Feet	>700 Feet
	EB Through	175 Feet	205 Feet	205 Feet	>700 Feet
	WB Through	370 Feet	370 Feet	260 Feet	>700 Feet
	WB Right Turn	40 Feet	40 Feet	40 Feet	>700 Feet
	NB Approach	160 Feet	160 Feet	220 Feet	>300 Feet
	SB Left Turn	115 Feet	115 Feet	130 Feet	100 Feet
	SB Through	510 Feet	510 Feet	570 Feet	>1,000 Feet
	SB Right Turn	20 Feet	20 Feet	20 Feet	>1,000 Feet

It appears that the queue length exceeds capacity. Why is no mitigation proposed for this site?

Intersection	Approach Lane	2024 Background	2024 Combined	2024 Combined Improved	Available Storage
Eastern Point Rd. at Thames St., Smith St. and Poquonnock Rd.	EB Through	55 Feet	55 Feet	N/A	100 Feet
	EB Right Turn	0 Feet	0 Feet	N/A	100 Feet
	WB Approach	65 Feet	70 Feet	N/A	700 Feet
	NB Approach	35 Feet	45 Feet	N/A	>1,000 Feet
	SB Approach	55 Feet	80 Feet	N/A	575 Feet
Poquonnock Rd. at Chicago Ave., Benham Rd., and Mitchell St.	EB Approach	110 Feet	115 Feet	120 Feet	450 Feet
	WB Approach	130 Feet	130 Feet	130 Feet	>1,000 Feet
	NB Approach	160 Feet	160 Feet	180 Feet	720 Feet
	SB Through/Left	400 Feet	400 Feet	300 Feet	315 Feet
	SB Through/Right	200 Feet	310 Feet	235 Feet	315 Feet
	NE Left	75 Feet	85 Feet	85 Feet	640 Feet
Poquonnock Rd. at EB Parking Lot (M-Lot)	EB Approach	0 Feet	0 Feet	N/A	435 Feet
	WB Approach	5 Feet	5 Feet	N/A	485 Feet
	NB Approach	10 Feet	10 Feet	N/A	>100 Feet
North Street at Meridian Street and Mitchell Street	EB Approach	40 Feet	40 Feet	N/A	920 Feet
	WB Through/Right	45 Feet	45 Feet	N/A	2,095 Feet
	WB Left	115 Feet	115 Feet	N/A	275 Feet
	NB Left	0 Feet	0 Feet	N/A	70 Feet
	NB Through	90 Feet	95 Feet	N/A	>2,000 Feet
	NB Right	20 Feet	20 Feet	N/A	330 Feet
	SB Through/Right	215 Feet	280 Feet	N/A	1,000 Feet
	SB Left	30 Feet	30 Feet	N/A	70 Feet
North Street at Broad Street	EB Approach	25 Feet	25 Feet	N/A	700 Feet
	WB Through/Right	10 Feet	10 Feet	N/A	220 Feet
	WB Left	75 Feet	75 Feet	N/A	220 Feet
	NB Approach	40 Feet	45 Feet	N/A	>1,000 Feet
	SB Approach	175 Feet	205 Feet	N/A	310 Feet

Intersection	Approach Lane	2024 Background	2024 Combined	2024 Combined Improved	Available Storage
Bridge Street at North Street and I-95 Ramps	EB Left	55 Feet	55 Feet	50 Feet	660 Feet
	EB Through/Right	70 Feet	70 Feet	60 Feet	655 Feet
	WB Right	5 Feet	5 Feet	5 Feet	340 Feet
	WB Through/Left	55 Feet	55 Feet	45 Feet	350 Feet
	NB Left	70 Feet	70 Feet	50 Feet	45 Feet
	NB Through/Right	150 Feet	165 Feet	120 Feet	280 Feet
	SB Left	65 Feet	65 Feet	40 Feet	140 Feet
	SB Through	670 Feet	840 Feet	480 Feet	1,270 Feet
	SB Right	0 Feet	0 Feet	0 Feet	>1,000 Feet
Route 349 at Meridian Street and Meridian Street Extension	EB Through/Right	55 Feet	55 Feet	N/A	>1,000 feet
	EB Left	50 Feet	50 Feet	N/A	835 Feet
	WB Right	20 Feet	20 Feet	N/A	155 Feet
	WB Through	75 Feet	75 Feet	N/A	>2,000 feet
	WB Left	85 Feet	85 Feet	N/A	140 Feet
	NB Left	55 Feet	55 Feet	N/A	180 Feet
	NB Through	115 Feet	125 Feet	N/A	>2,000 Feet
	SB Right	45 Feet	45 Feet	N/A	250 Feet
	SB Through	585 Feet	725 Feet	N/A	>4,000 Feet
SB Left	45 Feet	45 Feet	N/A	260 Feet	
CT Route 649 at Rainville Avenue and Old Farms Road	EB Left	10 Feet	10 Feet	N/A	200 Feet
	EB Through/Right	65 Feet	65 Feet	N/A	>2,000 Feet
	WB Left	55 Feet	55 Feet	N/A	210 Feet
	WB Through/Right	30 Feet	30 Feet	N/A	>2,000 Feet
	NB Through/Left	15 Feet	15 Feet	N/A	990 Feet
	NB Right	35 Feet	35 Feet	N/A	110 Feet
	SB Approach	50 Feet	50 Feet	N/A	545 Feet

Table 6

Queue Length Summary Weekday Afternoon Peak Hour
Electric Boat – Assembly Building Development
Groton, Connecticut

Intersection	Approach Lane	2024 Background	2024 Combined	2024 Combined Improved	Available Storage
CT Route 349 at Eastern Point Road	WB Left Turn	10 Feet	70 Feet	N/A	320 Feet
	NB Through	80 Feet	120 Feet	N/A	320 Feet
	NB Right Turn	25 Feet	10 Feet	N/A	175 Feet
	SB Left Turn	20 Feet	20 Feet	N/A	125 Feet
	SB Through	40 Feet	60 Feet	N/A	345 Feet
CT Route 349 at Mumford Avenue #1	EB Approach	0 Feet	5 Feet	N/A	325 Feet
	WB Approach	5 Feet	5 Feet	N/A	1,000 Feet
	NB Approach	60 Feet	95 Feet	N/A	300 Feet
	SB Approach	75 Feet	185 Feet	N/A	245 Feet
CT Route 349 at Benham Road	EB Approach	255 Feet	350 Feet	N/A	1,000 Feet
	WB Approach	45 Feet	85 Feet	N/A	900 Feet
	NB Left/Through	115 Feet	15 Feet	N/A	215 Feet
	NB Right Turn	45 Feet	45 Feet	N/A	215 Feet
	SB Left Turn	145 Feet	155 Feet	N/A	210 Feet
	SB Through	130 Feet	130 Feet	N/A	210 Feet
CT Route 349 at Route 649 and Brandegee Avenue	EB Left Turn	630 Feet	790 Feet	705 Feet	1,000 Feet
	EB Through	620 Feet	775 Feet	690 Feet	1,000 Feet
	WB Through	160 Feet	160 Feet	195 Feet	>700 Feet
	WB Right Turn	20 Feet	20 Feet	20 Feet	>700 Feet
	NB Approach	395 Feet	395 Feet	465 Feet	>300 Feet
	SB Left Turn	100 Feet	100 Feet	105 Feet	100 Feet
	SB Through	265 Feet	265 Feet	275 Feet	>1,000 Feet
	SB Right Turn	10 Feet	10 Feet	10 Feet	>1,000 Feet

Intersection	Approach Lane	2024 Background	2024 Combined	2024 Combined Improved	Available Storage
Eastern Point Rd. at Thames St., Smith St. and Poquonnock Rd.	EB Through	50 Feet	55 Feet	N/A	100 Feet
	EB Right Turn	20 Feet	25 Feet	N/A	100 Feet
	WB Approach	95 Feet	95 Feet	N/A	700 Feet
	NB Approach	160 Feet	190 Feet	N/A	>1,000 Feet
	SB Approach	40 Feet	60 Feet	N/A	575 Feet
Poquonnock Rd. at Chicago Ave., Benham Rd., and Mitchell St.	EB Approach	315 Feet	350 Feet	325 Feet	450 Feet
	WB Approach	165 Feet	165 Feet	180 Feet	>1,000 Feet
	NB Approach	350 Feet	350 Feet	470 Feet	720 Feet
	SB Through/Left	220 Feet	220 Feet	330 Feet	315 Feet
	SB Through/Right	40 Feet	60 Feet	100 Feet	315 Feet
	NE Left	75 Feet	335 Feet	350 Feet	640 Feet
Poquonnock Rd. at EB Parking Lot (M-Lot)	EB Approach	0 Feet	0 Feet	N/A	435 Feet
	WB Approach	0 Feet	0 Feet	N/A	485 Feet
	NB Approach	70 Feet	70 Feet	N/A	>100 Feet
North Street at Meridian Street and Mitchell Street	EB Approach	115 Feet	115 Feet	N/A	920 Feet
	WB Through/Right	55 Feet	55 Feet	N/A	2,095 Feet
	WB Left	55 Feet	55 Feet	N/A	275 Feet
	NB Left	20 Feet	20 Feet	N/A	70 Feet
	NB Through	255 Feet	280 Feet	N/A	>2,000 Feet
	NB Right	45 Feet	55 Feet	N/A	330 Feet
	SB Through/Right	140 Feet	165 Feet	N/A	1,000 Feet
	SB Left	40 Feet	40 Feet	N/A	70 Feet
North Street at Broad Street	EB Approach	20 Feet	20 Feet	N/A	700 Feet
	WB Through/Right	20 Feet	20 Feet	N/A	220 Feet
	WB Left	35 Feet	80 Feet	N/A	220 Feet
	NB Approach	135 Feet	150 Feet	N/A	>1000 Feet
	SB Approach	90 Feet	110 Feet	N/A	310 Feet

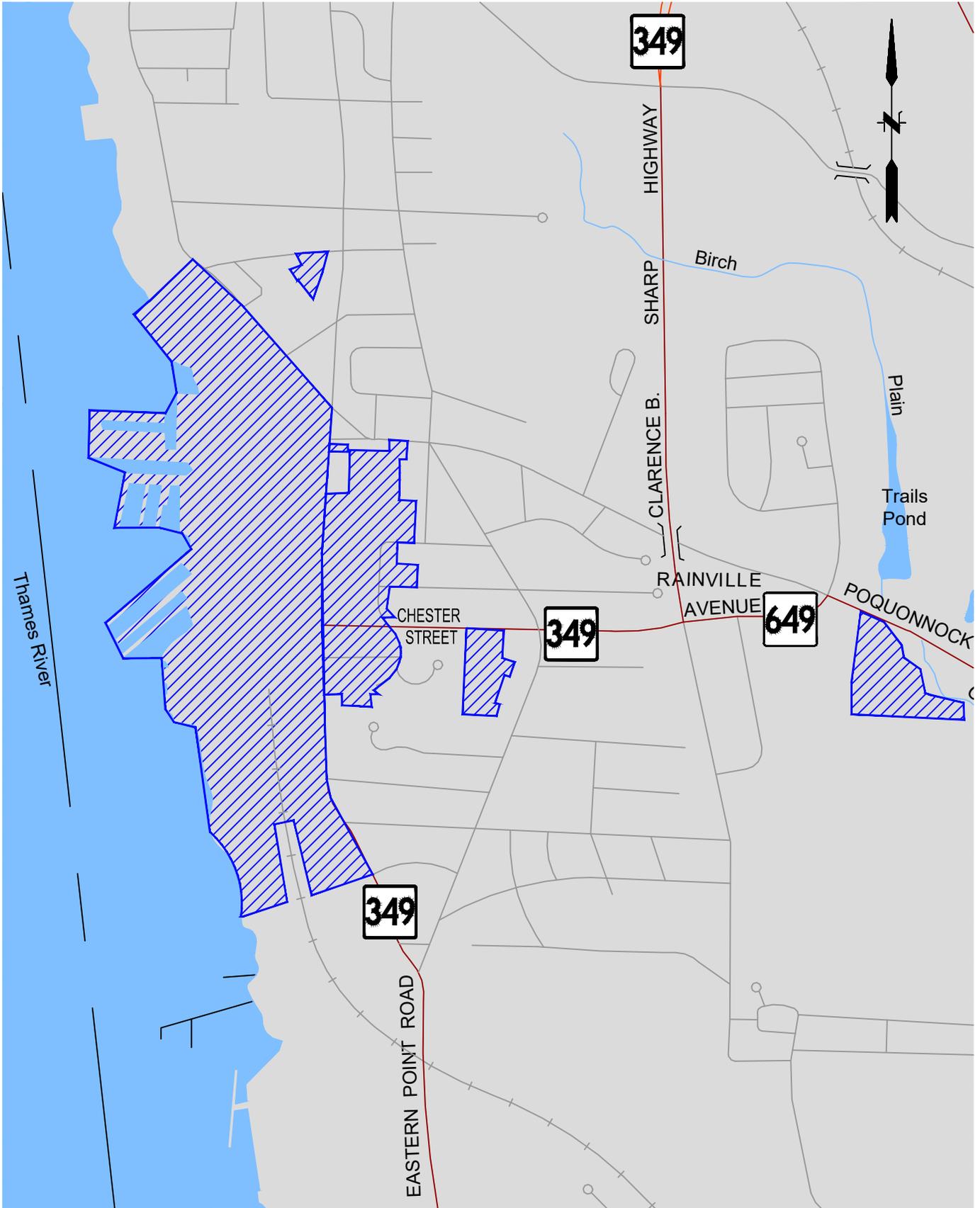
Intersection	Approach Lane	2024 Background	2024 Combined	2024 Combined Improved	Available Storage
Bridge Street at North Street and I-95 Ramps	EB Left	150 Feet	150 Feet	155 Feet	660 Feet
	EB Through/Right	165 Feet	165 Feet	165 Feet	655 Feet
	WB Right	10 Feet	10 Feet	10 Feet	340 Feet
	WB Through/Left	80 Feet	80 Feet	85 Feet	350 Feet
	NB Left	60 Feet	60 Feet	65 Feet	45 Feet
	NB Through/Right	300 Feet	335 Feet	355 Feet	280 Feet
	SB Left	90 Feet	90 Feet	80 Feet	140 Feet
	SB Through	385 Feet	485 Feet	350 Feet	1270 Feet
	SB Right	0 Feet	0 Feet	0 Feet	>1,000 Feet
Route 349 at Meridian Street and Meridian Street Extension	EB Through/Right	105 Feet	105 Feet	N/A	>1,000 feet
	EB Left	100 Feet	100 Feet	N/A	835 Feet
	WB Right	30 Feet	30 Feet	N/A	155 Feet
	WB Through	110 Feet	110 Feet	N/A	>2,000 feet
	WB Left	75 Feet	75 Feet	N/A	140 Feet
	NB Left	50 Feet	50 Feet	N/A	180 Feet
	NB Through	350 Feet	435 Feet	N/A	>2,000 feet
	SB Right	0 Feet	10 Feet	N/A	250 Feet
	SB Through	135 Feet	170 Feet	N/A	>4,000 Feet
SB Left	65 Feet	65 Feet	N/A	260 Feet	
CT Route 649 at Rainville Avenue and Old Farms Road	EB Left	15 Feet	15 Feet	N/A	200 Feet
	EB Through/Right	85 Feet	85 Feet	N/A	>2,000 Feet
	WB Left	90 Feet	90 Feet	N/A	210 Feet
	WB Through/Right	65 Feet	65 Feet	N/A	>2,000 Feet
	NB Through/Left	40 Feet	40 Feet	N/A	990 Feet
	NB Right	20 Feet	20 Feet	N/A	110 Feet
	SB Approach	35 Feet	35 Feet	N/A	545 Feet

Appendix B

Figures

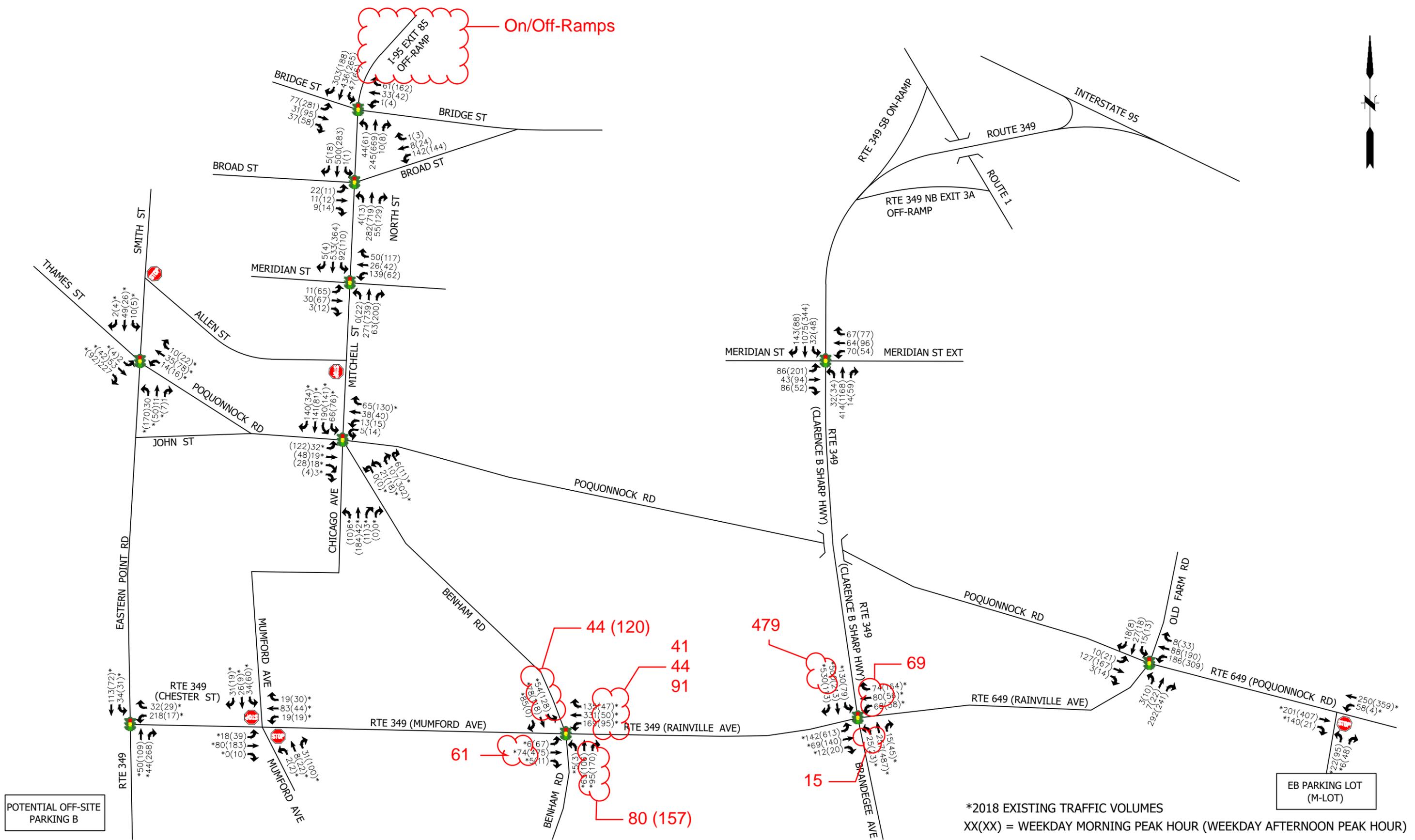


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On/Off-Ramps



POTENTIAL OFF-SITE PARKING B

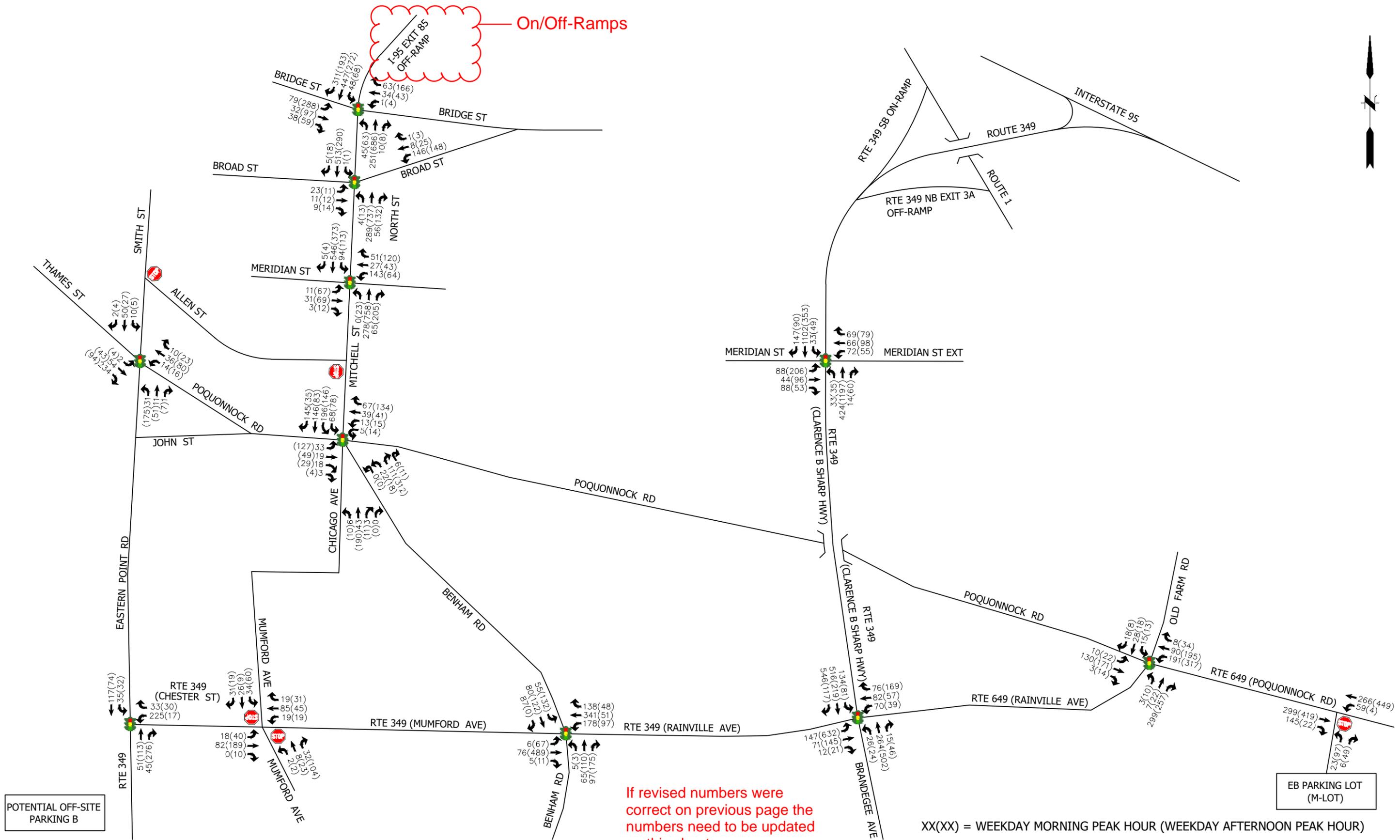
EB PARKING LOT (M-LOT)

*2018 EXISTING TRAFFIC VOLUMES
 XX(YY) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)

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On/Off-Ramps



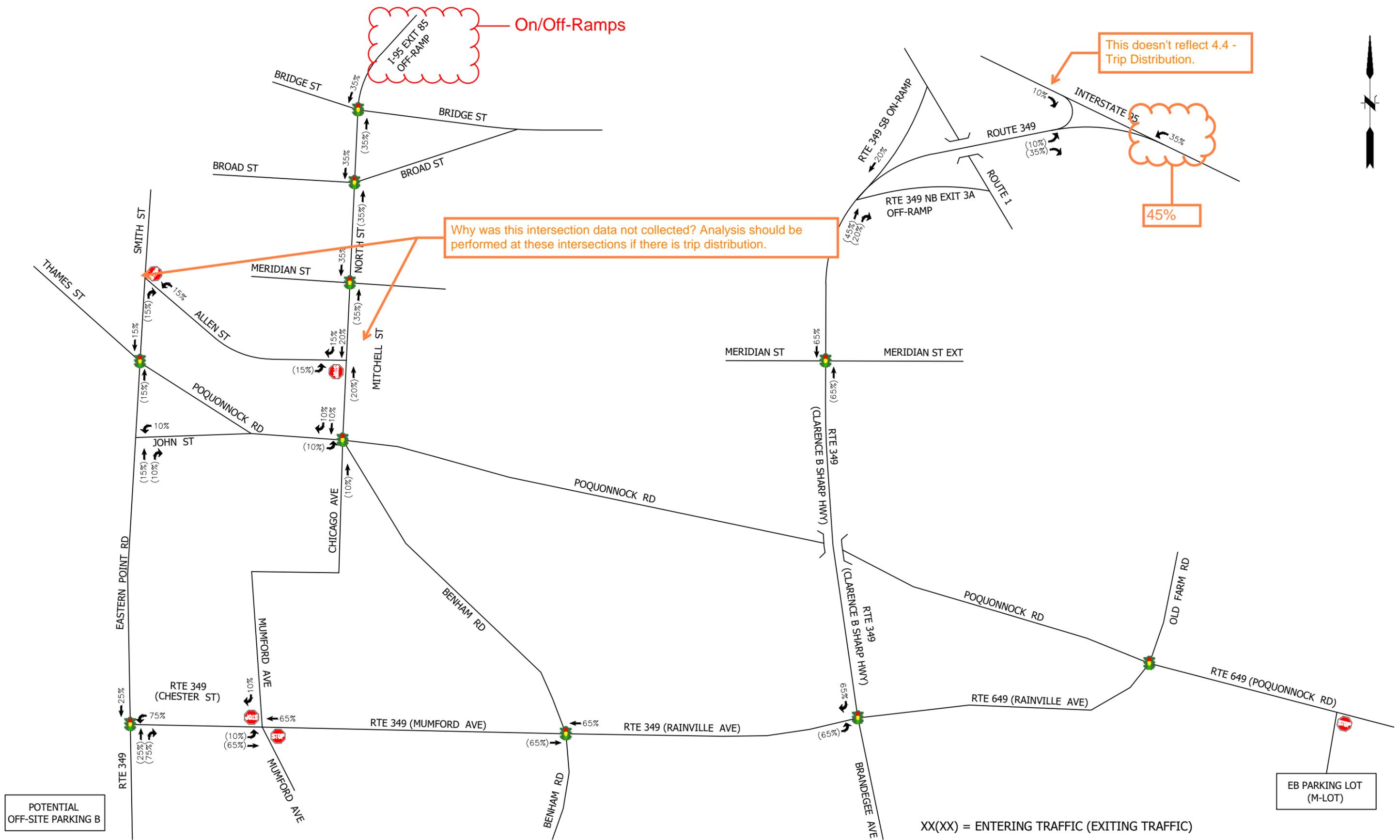
POTENTIAL OFF-SITE PARKING B

EB PARKING LOT (M-LOT)

If revised numbers were correct on previous page the numbers need to be updated on this sheet.

XX(XX) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)

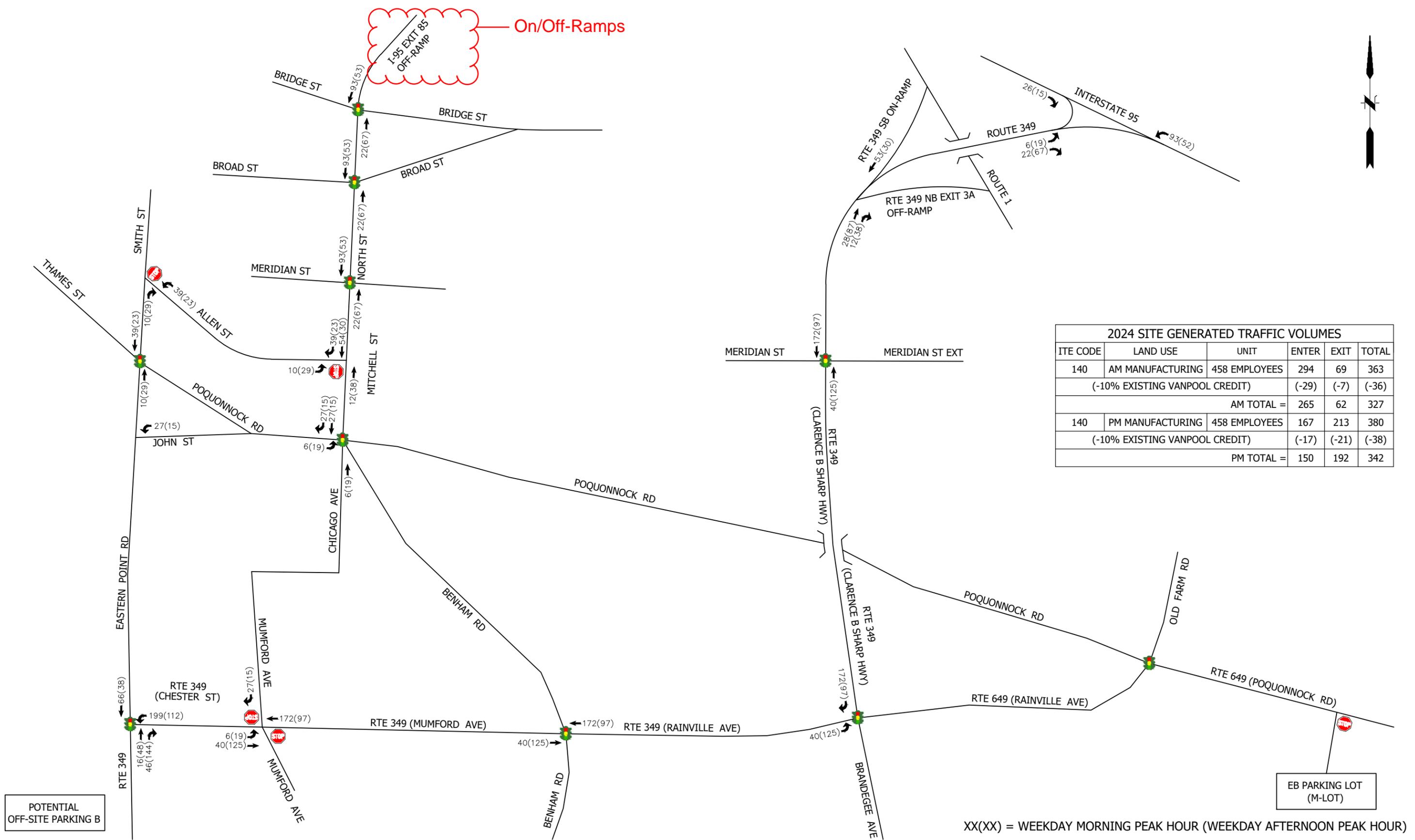
File Path: J:\DWG\1997570A11\CivilTraffic\Figures\1997570A11_TV\F01.dwg Layout: FIG. 4 - DISTRIBUTION (%) Plotted: Fri, April 05, 2019 - 5:08 PM User: MARC MANCINI



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On/Off-Ramps

I-95 EXIT 85 OFF-RAMP

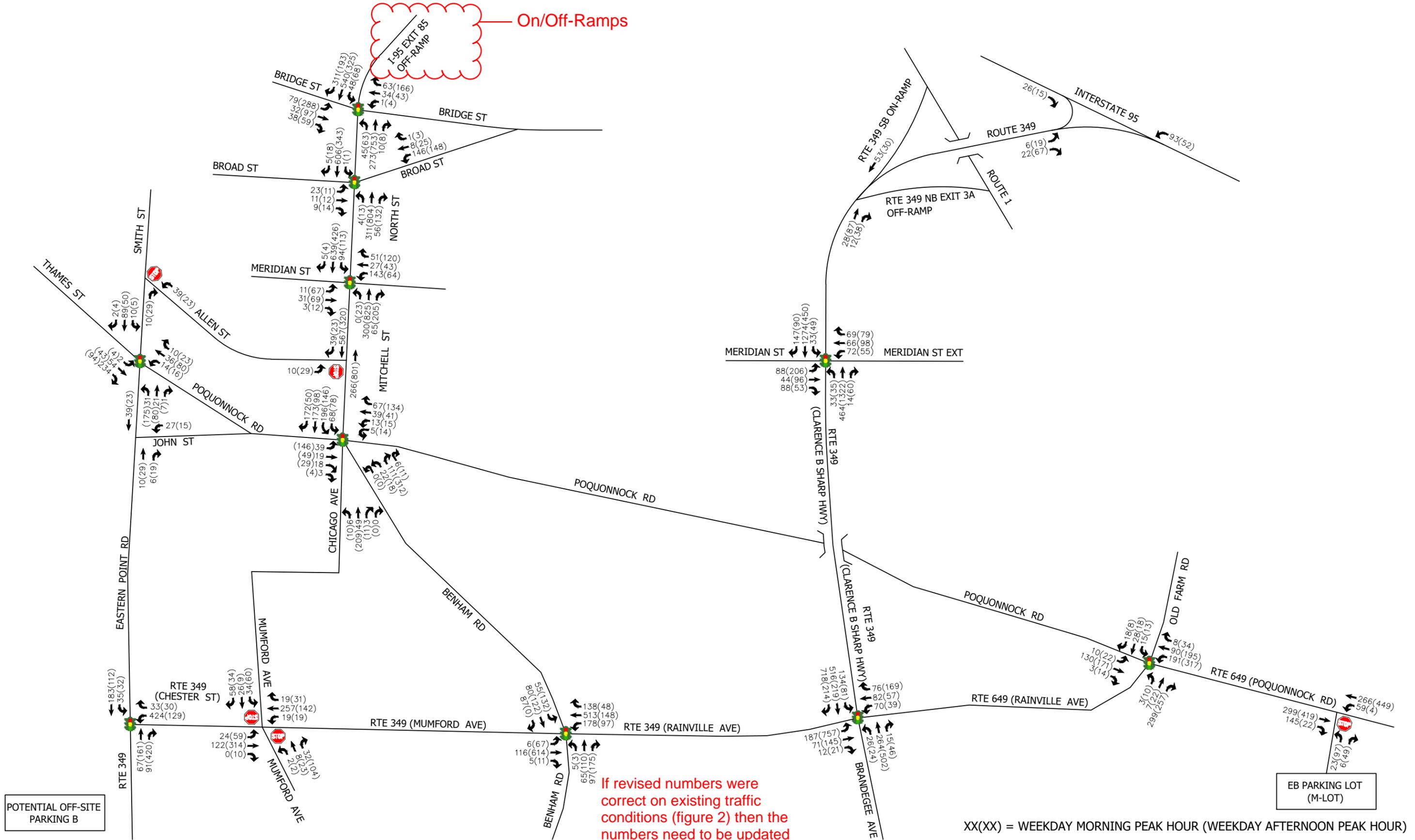


2024 SITE GENERATED TRAFFIC VOLUMES					
ITE CODE	LAND USE	UNIT	ENTER	EXIT	TOTAL
140	AM MANUFACTURING	458 EMPLOYEES	294	69	363
			(-10% EXISTING VANPOOL CREDIT)	(-29)	(-7)
			AM TOTAL =	265	62
140	PM MANUFACTURING	458 EMPLOYEES	167	213	380
			(-10% EXISTING VANPOOL CREDIT)	(-17)	(-21)
			PM TOTAL =	150	192

XX(XX) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)

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On/Off-Ramps



If revised numbers were correct on existing traffic conditions (figure 2) then the numbers need to be updated on this sheet.

POTENTIAL OFF-SITE PARKING B

EB PARKING LOT (M-LOT)

XX(XX) = WEEKDAY MORNING PEAK HOUR (WEEKDAY AFTERNOON PEAK HOUR)

Appendix C

Intersection Capacity Analysis Worksheets 2024 Background Traffic Volumes Weekday Morning Peak Hour



Lanes, Volumes, Timings
 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Electric Boat - Groton, CT
 2024 AM Background

								Ø3
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations	 							
Traffic Volume (vph)	225	33	51	45	35	117		
Future Volume (vph)	225	33	51	45	35	117		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	12	11	11	12	15		
Storage Length (ft)	0	0		175	125			
Storage Lanes	2	0		1	1			
Taper Length (ft)	25				60			
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00		
Ped Bike Factor	0.98				1.00			
Frt	0.977			0.850				
Flt Protected	0.959				0.950			
Satd. Flow (prot)	3386	0	1801	1531	1770	2049		
Flt Permitted	0.959				0.699			
Satd. Flow (perm)	3315	0	1801	1531	1296	2049		
Right Turn on Red		Yes		Yes				
Satd. Flow (RTOR)	17			65				
Link Speed (mph)	30		25			25		
Link Distance (ft)	406		522			429		
Travel Time (s)	9.2		14.2			11.7		
Confl. Peds. (#/hr)	17				6			
Peak Hour Factor	0.69	0.57	0.57	0.69	0.34	0.66		
Adj. Flow (vph)	326	58	89	65	103	177		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	384	0	89	65	103	177		
Turn Type	Prot		NA	Perm	D.P+P	NA		
Protected Phases	4		2		1	1 2	3	
Permitted Phases				2	2			
Detector Phase	4		2	2	1	1 2		
Switch Phase								
Minimum Initial (s)	9.0		15.0	15.0	4.0		5.0	
Minimum Split (s)	14.2		20.6	20.6	7.1		24.0	
Total Split (s)	50.2		40.6	40.6	13.1		26.5	
Total Split (%)	38.5%		31.1%	31.1%	10.0%		20%	
Maximum Green (s)	45.0		35.0	35.0	10.0		24.5	
Yellow Time (s)	3.8		3.8	3.8	3.0		2.0	
All-Red Time (s)	1.4		1.8	1.8	0.1		0.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0			
Total Lost Time (s)	5.2		5.6	5.6	3.1			
Lead/Lag	Lag		Lag	Lag	Lead		Lead	
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	
Vehicle Extension (s)	2.0		2.5	2.5	1.0		3.0	
Recall Mode	None		Min	Min	None		None	
Walk Time (s)							7.0	
Flash Dont Walk (s)							15.0	
Pedestrian Calls (#/hr)							5	
Act Effct Green (s)	10.8		15.9	15.9	24.7		28.0	
Actuated g/C Ratio	0.21		0.31	0.31	0.49		0.55	
v/c Ratio	0.52		0.16	0.12	0.15		0.16	

Lanes, Volumes, Timings
 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Electric Boat - Groton, CT
 2024 AM Background



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Control Delay	21.3		18.1	7.5	9.3	8.9	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	21.3		18.1	7.5	9.3	8.9	
LOS	C		B	A	A	A	
Approach Delay	21.3		13.6			9.0	
Approach LOS	C		B			A	
Queue Length 50th (ft)	42		15	0	9	16	
Queue Length 95th (ft)	92		47	17	22	70	
Internal Link Dist (ft)	326		442			349	
Turn Bay Length (ft)				175	125		
Base Capacity (vph)	3087		1314	1134	804	1903	
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	0.12		0.07	0.06	0.13	0.09	

Intersection Summary

Area Type:	Other
Cycle Length:	130.4
Actuated Cycle Length:	50.7
Natural Cycle:	70
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.52
Intersection Signal Delay:	15.7
Intersection Capacity Utilization	29.0%
Analysis Period (min)	15
Intersection LOS:	B
ICU Level of Service	A

Splits and Phases: 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Ø1	Ø2	Ø3	Ø4
13.1 s	40.6 s	26.5 s	50.2 s

HCM Signalized Intersection Capacity Analysis
 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Electric Boat - Groton, CT
 2024 AM Background

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	 					
Traffic Volume (vph)	225	33	51	45	35	117
Future Volume (vph)	225	33	51	45	35	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	15
Total Lost time (s)	5.2		5.6	5.6	3.1	3.1
Lane Util. Factor	0.97		1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.98		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3388		1801	1531	1765	2049
Flt Permitted	0.96		1.00	1.00	0.70	1.00
Satd. Flow (perm)	3388		1801	1531	1299	2049
Peak-hour factor, PHF	0.69	0.57	0.57	0.69	0.34	0.66
Adj. Flow (vph)	326	58	89	65	103	177
RTOR Reduction (vph)	13	0	0	45	0	0
Lane Group Flow (vph)	371	0	89	20	103	177
Confl. Peds. (#/hr)	17				6	
Turn Type	Prot		NA	Perm	D.P+P	NA
Protected Phases	4		2		1	1 2
Permitted Phases				2	2	
Actuated Green, G (s)	10.8		15.9	15.9	22.1	25.2
Effective Green, g (s)	10.8		15.9	15.9	22.1	25.2
Actuated g/C Ratio	0.21		0.31	0.31	0.43	0.49
Clearance Time (s)	5.2		5.6	5.6	3.1	
Vehicle Extension (s)	2.0		2.5	2.5	1.0	
Lane Grp Cap (vph)	709		554	471	612	1000
v/s Ratio Prot	c0.11		0.05		0.02	c0.09
v/s Ratio Perm				0.01	0.05	
v/c Ratio	0.52		0.16	0.04	0.17	0.18
Uniform Delay, d1	18.1		13.0	12.5	9.0	7.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		0.1	0.0	0.0	0.0
Delay (s)	18.4		13.1	12.5	9.0	7.4
Level of Service	B		B	B	A	A
Approach Delay (s)	18.4		12.9			8.0
Approach LOS	B		B			A
Intersection Summary						
HCM 2000 Control Delay			13.8		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.28			
Actuated Cycle Length (s)			51.6		Sum of lost time (s)	15.9
Intersection Capacity Utilization			29.0%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	82	0	19	85	19	2	8	32	34	26	31
Future Volume (vph)	18	82	0	19	85	19	2	8	32	34	26	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	12	12	12	15	15	15	15	15	15
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.971			0.909			0.964	
Flt Protected		0.989			0.994			0.995			0.984	
Satd. Flow (prot)	0	3267	0	0	3416	0	0	1853	0	0	1944	0
Flt Permitted		0.989			0.994			0.995			0.984	
Satd. Flow (perm)	0	3267	0	0	3416	0	0	1853	0	0	1944	0
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		406			1171			266			576	
Travel Time (s)		9.2			26.6			7.3			15.7	
Confl. Peds. (#/hr)	14			439			13			380		
Peak Hour Factor	0.75	0.95	0.92	0.92	0.67	0.53	0.25	0.40	0.55	0.71	0.43	0.78
Adj. Flow (vph)	24	86	0	21	127	36	8	20	58	48	60	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	110	0	0	184	0	0	86	0	0	148	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	26.2%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 2: Mumford Ave. & Route 349 (Chester St.)/Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 AM Background

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	82	0	19	85	19	2	8	32	34	26	31
Future Volume (Veh/h)	18	82	0	19	85	19	2	8	32	34	26	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.95	0.92	0.92	0.67	0.53	0.25	0.40	0.55	0.71	0.43	0.78
Hourly flow rate (vph)	24	86	0	21	127	36	8	20	58	48	60	40
Pedestrians		13			380			439			14	
Lane Width (ft)		10.0			12.0			15.0			15.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		1			36			52			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		406			1171							
pX, platoon unblocked												
vC, conflicting volume	177			525			762	792	862	740	774	108
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	177			525			762	792	862	740	774	108
iC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
iC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			85	86	36	0	59	96
cM capacity (veh/h)	1373			495			52	141	91	35	145	900
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	67	43	84	100	86	148						
Volume Left	24	0	21	0	8	48						
Volume Right	0	0	0	36	58	40						
cSH	1373	1700	495	1700	92	81						
Volume to Capacity	0.02	0.03	0.04	0.06	0.93	1.83						
Queue Length 95th (ft)	1	0	3	0	133	319						
Control Delay (s)	2.8	0.0	3.5	0.0	157.7	506.1						
Lane LOS	A		A		F	F						
Approach Delay (s)	1.7		1.6		157.7	506.1						
Approach LOS					F	F						
Intersection Summary												
Average Delay			168.5									
Intersection Capacity Utilization			26.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
3: Benham Rd. & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
2024 AM Background

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 	 	 		
Traffic Volume (vph)	6	76	5	178	341	138	5	65	97	55	80	87
Future Volume (vph)	6	76	5	178	341	138	5	65	97	55	80	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	14	10	10	10
Storage Length (ft)	0		0	0		0	0		250	0		0
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								1.00				
Frt		0.985			0.970				0.850		0.924	
Flt Protected		0.996			0.986			0.994		0.950		
Satd. Flow (prot)	0	3241	0	0	3159	0	0	1728	1689	1652	1606	0
Flt Permitted		0.894			0.692			0.943		0.693		
Satd. Flow (perm)	0	2909	0	0	2217	0	0	1639	1689	1205	1606	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			42				121		49	
Link Speed (mph)		30			30			30		30		30
Link Distance (ft)		1171			1087			448		267		267
Travel Time (s)		26.6			24.7			10.2		6.1		6.1
Confl. Peds. (#/hr)							1					
Peak Hour Factor	0.62	0.69	0.38	0.80	0.80	0.86	0.42	0.75	0.80	0.69	0.61	0.64
Adj. Flow (vph)	10	110	13	223	426	160	12	87	121	80	131	136
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	133	0	0	809	0	0	99	121	80	267	0
Turn Type	Perm	NA		D.Pm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			1 2			4			4	
Permitted Phases	2			2			4		4	4		
Detector Phase	2	2		2	1 2		4	4	4	4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0			9.0	9.0	9.0	9.0	9.0	
Minimum Split (s)	17.2	17.2		17.2			14.5	14.5	14.5	14.5	14.5	
Total Split (s)	39.3	39.3		39.3			25.5	25.5	25.5	25.5	25.5	
Total Split (%)	40.6%	40.6%		40.6%			26.3%	26.3%	26.3%	26.3%	26.3%	
Maximum Green (s)	34.1	34.1		34.1			20.0	20.0	20.0	20.0	20.0	
Yellow Time (s)	4.2	4.2		4.2			3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0			2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.2						5.5	5.5	5.5	5.5	
Lead/Lag	Lag	Lag		Lag			Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0			2.5	2.5	2.5	2.5	2.5	
Recall Mode	Min	Min		Min			None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		21.5			33.7			15.2	15.2	15.2	15.2	
Actuated g/C Ratio		0.35			0.55			0.25	0.25	0.25	0.25	
v/c Ratio		0.13			0.65			0.24	0.24	0.27	0.62	

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	6.0	5.0
Minimum Split (s)	9.1	23.0
Total Split (s)	9.1	23.0
Total Split (%)	9%	24%
Maximum Green (s)	6.0	21.0
Yellow Time (s)	3.0	2.0
All-Red Time (s)	0.1	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	0.2	3.0
Recall Mode	Max	None
Walk Time (s)		7.0
Flash Dont Walk (s)		14.0
Pedestrian Calls (#/hr)		1
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		

Lanes, Volumes, Timings
 3: Benham Rd. & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		14.5			14.3			24.5	7.3	25.9	26.7	
Queue Delay		0.0			0.0			0.0	0.0	0.0	0.0	
Total Delay		14.5			14.3			24.5	7.3	25.9	26.7	
LOS		B			B			C	A	C	C	
Approach Delay		14.5			14.3			15.1			26.5	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)		13			77			26	0	21	61	
Queue Length 95th (ft)		34			227			81	33	64	124	
Internal Link Dist (ft)		1091			1007			368			187	
Turn Bay Length (ft)									250			
Base Capacity (vph)		1777			1754			585	681	430	605	
Starvation Cap Reductn		0			0			0	0	0	0	
Spillback Cap Reductn		0			0			0	0	0	0	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		0.07			0.46			0.17	0.18	0.19	0.44	

Intersection Summary

Area Type:	Other
Cycle Length:	96.9
Actuated Cycle Length:	61.2
Natural Cycle:	90
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.65
Intersection Signal Delay:	17.3
Intersection Capacity Utilization	40.5%
Analysis Period (min)	15
Intersection LOS:	B
ICU Level of Service	A

Splits and Phases: 3: Benham Rd. & Route 349 (Rainville Ave.)

01	02	03	04
9.1 s	39.3 s	23 s	25.5 s

Lane Group	Ø1	Ø3
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)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
 3: Benham Rd. & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 AM Background

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	6	76	5	178	341	138	5	65	97	55	80	87	
Future Volume (vph)	6	76	5	178	341	138	5	65	97	55	80	87	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	10	10	10	10	10	10	10	10	14	10	10	10	
Total Lost time (s)		5.2			3.1			5.5	5.5	5.5	5.5		
Lane Util. Factor		0.95			0.95			1.00	1.00	1.00	1.00		
Frb, ped/bikes		1.00			1.00			1.00	1.00	1.00	1.00		
Flpb, ped/bikes		1.00			1.00			1.00	1.00	1.00	1.00		
Frt		0.99			0.97			1.00	0.85	1.00	0.92		
Flt Protected		1.00			0.99			0.99	1.00	0.95	1.00		
Satd. Flow (prot)		3243			3162			1728	1689	1652	1606		
Flt Permitted		0.89			0.69			0.94	1.00	0.69	1.00		
Satd. Flow (perm)		2909			2218			1639	1689	1205	1606		
Peak-hour factor, PHF	0.62	0.69	0.38	0.80	0.80	0.86	0.42	0.75	0.80	0.69	0.61	0.64	
Adj. Flow (vph)	10	110	13	222	426	160	12	87	121	80	131	136	
RTOR Reduction (vph)	0	8	0	0	21	0	0	0	91	0	37	0	
Lane Group Flow (vph)	0	125	0	0	788	0	0	99	30	80	230	0	
Confl. Peds. (#/hr)							1						
Turn Type	Perm	NA		D.Pm	NA		Perm	NA	Perm	Perm	NA		
Protected Phases		2			1 2			4			4		
Permitted Phases	2			2			4		4	4			
Actuated Green, G (s)		21.5			31.2			15.2	15.2	15.2	15.2		
Effective Green, g (s)		21.5			31.2			15.2	15.2	15.2	15.2		
Actuated g/C Ratio		0.35			0.50			0.25	0.25	0.25	0.25		
Clearance Time (s)		5.2						5.5	5.5	5.5	5.5		
Vehicle Extension (s)		3.0						2.5	2.5	2.5	2.5		
Lane Grp Cap (vph)		1012			1119			403	415	296	395		
v/s Ratio Prot												c0.14	
v/s Ratio Perm		0.04			c0.36			0.06	0.02	0.07			
v/c Ratio		0.12			0.70			0.25	0.07	0.27	0.58		
Uniform Delay, d1		13.7			11.8			18.7	17.9	18.8	20.5		
Progression Factor		1.00			1.00			1.00	1.00	1.00	1.00		
Incremental Delay, d2		0.1			2.0			0.2	0.1	0.4	1.8		
Delay (s)		13.8			13.8			18.9	17.9	19.2	22.3		
Level of Service		B			B			B	B	B	C		
Approach Delay (s)		13.8			13.8			18.4			21.6		
Approach LOS		B			B			B			C		
Intersection Summary													
HCM 2000 Control Delay			16.3									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.67										
Actuated Cycle Length (s)			61.8									Sum of lost time (s)	15.8
Intersection Capacity Utilization			40.5%									ICU Level of Service	A
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings

Electric Boat - Groton, CT

4: Brandegee Ave./Route 349 (CBSHwy.) & Route 349 (Rainville Ave.)

2024 AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	71	12	70	82	76	26	264	15	134	516	546
Future Volume (vph)	147	71	12	70	82	76	26	264	15	134	516	546
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	11	10	10	10	10	10	10	10	10	10
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			80		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor								1.00				
Fr _t		0.983				0.850		0.992				0.850
Fl _t Protected	0.950	0.989			0.975			0.994		0.950		
Satd. Flow (prot)	1569	1663	0	0	1695	1478	0	3257	0	1652	1739	1478
Fl _t Permitted	0.950	0.989			0.975			0.816		0.498		
Satd. Flow (perm)	1569	1663	0	0	1695	1478	0	2673	0	866	1739	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				95		5				593
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1087			427			507			1053	
Travel Time (s)		24.7			9.7			11.5			23.9	
Confl. Peds. (#/hr)							10					
Peak Hour Factor	0.87	0.78	0.75	0.65	0.82	0.80	0.54	0.86	0.75	0.85	0.86	0.92
Adj. Flow (vph)	169	91	16	108	100	95	48	307	20	158	600	593
Shared Lane Traffic (%)	19%											
Lane Group Flow (vph)	137	139	0	0	208	95	0	375	0	158	600	593
Turn Type	Split	NA		Split	NA	Prot	Perm	NA		pm+pt	NA	custom
Protected Phases	4	4		5	5	5		2		1	1 2	1 2 4
Permitted Phases							2			1 2		5
Detector Phase	4	4		5	5	5	2	2		1	1 2	1 2 4
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	6.0	6.0	15.0	15.0		6.0		
Minimum Split (s)	12.5	12.5		10.5	10.5	10.5	19.5	19.5		10.5		
Total Split (s)	26.3	26.3		18.8	18.8	18.8	66.3	66.3		15.1		
Total Split (%)	17.5%	17.5%		12.5%	12.5%	12.5%	44.2%	44.2%		10.1%		
Maximum Green (s)	21.8	21.8		14.3	14.3	14.3	61.8	61.8		10.6		
Yellow Time (s)	3.5	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	1.0	1.0	1.0		1.0		
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0		
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5		
Lead/Lag	Lag	Lag					Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0		
Recall Mode	None	None		None	None	None	Max	Max		None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	17.6	17.6		14.4	14.4	14.4	62.2	62.2		72.9	77.4	122.2
Actuated g/C Ratio	0.14	0.14		0.11	0.11	0.11	0.49	0.49		0.58	0.61	0.97
v/c Ratio	0.63	0.59		1.08	0.38	0.38	0.28	0.28		0.28	0.56	0.41

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	23.5
Total Split (s)	23.5
Total Split (%)	16%
Maximum Green (s)	21.5
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	3
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	66.0	61.6			140.8	15.6		21.1		14.1	19.2	1.0
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	66.0	61.6			140.8	15.6		21.1		14.1	19.2	1.0
LOS	E	E			F	B		C		B	B	A
Approach Delay		63.8			101.5			21.1			10.6	
Approach LOS		E			F			C			B	
Queue Length 50th (ft)	108	106			-182	0		87		49	258	0
Queue Length 95th (ft)	203	175			#369	40		159		115	510	18
Internal Link Dist (ft)		1007			347			427			973	
Turn Bay Length (ft)										100		
Base Capacity (vph)	272	291			192	252		1316		564	1063	1445
Starvation Cap Reductn	0	0			0	0		0		0	0	0
Spillback Cap Reductn	0	0			0	0		0		0	0	0
Storage Cap Reductn	0	0			0	0		0		0	0	0
Reduced v/c Ratio	0.50	0.48			1.08	0.38		0.28		0.28	0.56	0.41

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 126.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.08

Intersection Signal Delay: 30.6

Intersection Capacity Utilization 65.8%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service C

~ 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: 4: Brandegee Ave./Route 349 (CBSHwy.) & Route 349 (Rainville Ave.)

Ø1	Ø2	Ø5	Ø3	Ø4
15.1 s	66.3 s	18.8 s	23.5 s	26.3 s

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 4: Brandegee Ave./Route 349 (CBSHwy.) & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 AM Background

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	71	12	70	82	76	26	264	15	134	516	546
Future Volume (vph)	147	71	12	70	82	76	26	264	15	134	516	546
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	10	10	10	10	10	10	10	10
Total Lost time (s)	4.5	4.5			4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.95	0.95			1.00	1.00		0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.98			1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	0.99			0.97	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1569	1662			1695	1478		3255		1652	1739	1478
Flt Permitted	0.95	0.99			0.97	1.00		0.82		0.50	1.00	1.00
Satd. Flow (perm)	1569	1662			1695	1478		2673		866	1739	1478
Peak-hour factor, PHF	0.87	0.78	0.75	0.65	0.82	0.80	0.54	0.86	0.75	0.85	0.86	0.92
Adj. Flow (vph)	169	91	16	108	100	95	48	307	20	158	600	593
RTOR Reduction (vph)	0	3	0	0	0	84	0	3	0	0	0	66
Lane Group Flow (vph)	137	136	0	0	208	11	0	372	0	158	600	527
Confl. Peds. (#/hr)							10					
Turn Type	Split	NA		Split	NA	Prot	Perm	NA		pm+pt	NA	custom
Protected Phases	4	4		5	5	5		2		1	1 2	1 2 4
Permitted Phases							2			1 2		5
Actuated Green, G (s)	17.6	17.6			14.4	14.4		62.2		72.9	77.4	113.9
Effective Green, g (s)	17.6	17.6			14.4	14.4		62.2		72.9	77.4	113.9
Actuated g/C Ratio	0.14	0.14			0.11	0.11		0.49		0.57	0.60	0.89
Clearance Time (s)	4.5	4.5			4.5	4.5		4.5		4.5		
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0		3.0		
Lane Grp Cap (vph)	215	228			190	166		1296		558	1049	1365
v/s Ratio Prot	c0.09	0.08			c0.12	0.01				0.02	c0.35	0.30
v/s Ratio Perm								0.14		0.14		0.06
v/c Ratio	0.64	0.59			1.09	0.06		0.29		0.28	0.57	0.39
Uniform Delay, d1	52.3	51.9			56.9	50.9		19.7		13.3	15.4	1.2
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	6.1	4.1			92.9	0.2		0.6		0.3	0.8	0.2
Delay (s)	58.3	56.1			149.8	51.0		20.3		13.5	16.1	1.4
Level of Service	E	E			F	D		C		B	B	A
Approach Delay (s)		57.2			118.8			20.3			9.4	
Approach LOS		E			F			C			A	
Intersection Summary												
HCM 2000 Control Delay			31.3									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			128.2									Sum of lost time (s) 20.0
Intersection Capacity Utilization			65.8%									ICU Level of Service C
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	54	234	14	36	10	31	11	1	10	50	2
Future Volume (vph)	2	54	234	14	36	10	31	11	1	10	50	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.97			0.98			1.00	
Frt			0.850		0.967			0.993			0.996	
Flt Protected		0.996			0.988			0.967			0.993	
Satd. Flow (prot)	0	1855	1583	0	1780	0	0	1789	0	0	1842	0
Flt Permitted		0.996			0.988			0.967			0.993	
Satd. Flow (perm)	0	1812	1583	0	1730	0	0	1760	0	0	1840	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			411		17			3			2	
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		678			836			704			713	
Travel Time (s)		15.4			22.8			19.2			19.4	
Confl. Peds. (#/hr)	121			46			13			4		
Peak Hour Factor	0.25	0.55	0.57	0.70	0.88	0.50	0.62	0.55	0.25	0.62	0.49	0.50
Adj. Flow (vph)	8	98	411	20	41	20	50	20	4	16	102	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	106	411	0	81	0	0	74	0	0	122	0
Turn Type	Split	NA	pt+ov	Split	NA		Split	NA		Split	NA	
Protected Phases	1	1	1 2	5	5		2	2		4	4	
Permitted Phases												
Detector Phase	1	1	1 2	5	5		2	2		4	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0		6.0	6.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		26.0	26.0		11.0	11.0	
Total Split (s)	20.0	20.0		20.0	20.0		26.0	26.0		20.0	20.0	
Total Split (%)	23.3%	23.3%		23.3%	23.3%		30.2%	30.2%		23.3%	23.3%	
Maximum Green (s)	15.0	15.0		15.0	15.0		20.0	20.0		15.0	15.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			6.0			5.0	
Lead/Lag	Lead	Lead					Lag	Lag				
Lead-Lag Optimize?	Yes	Yes					Yes	Yes				
Vehicle Extension (s)	2.0	2.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	None		Max	Max		None	None	
Act Effct Green (s)		9.9	39.3		9.3			21.3			9.9	
Actuated g/C Ratio		0.15	0.61		0.14			0.33			0.15	
v/c Ratio		0.37	0.37		0.30			0.13			0.43	
Control Delay		32.7	2.4		27.4			20.7			32.8	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		32.7	2.4		27.4			20.7			32.8	
LOS		C	A		C			C			C	
Approach Delay		8.6			27.4			20.7			32.8	
Approach LOS		A			C			C			C	
Queue Length 50th (ft)		41	0		24			21			46	

Lanes, Volumes, Timings
 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		54	0		67			36			53	
Internal Link Dist (ft)		598			756			624			633	
Turn Bay Length (ft)												
Base Capacity (vph)		456	1108		451			589			455	
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		0.23	0.37		0.18			0.13			0.27	

Intersection Summary

Area Type: Other
 Cycle Length: 86
 Actuated Cycle Length: 64.8
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.43
 Intersection Signal Delay: 15.3
 Intersection LOS: B
 Intersection Capacity Utilization 38.7%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.



HCM Signalized Intersection Capacity Analysis
 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Background

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	54	234	14	36	10	31	11	1	10	50	2
Future Volume (vph)	2	54	234	14	36	10	31	11	1	10	50	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0			6.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.97			0.99			1.00	
Flt Protected		1.00	1.00		0.99			0.97			0.99	
Satd. Flow (prot)		1856	1583		1779			1789			1842	
Flt Permitted		1.00	1.00		0.99			0.97			0.99	
Satd. Flow (perm)		1856	1583		1779			1789			1842	
Peak-hour factor, PHF	0.25	0.55	0.57	0.70	0.88	0.50	0.62	0.55	0.25	0.62	0.49	0.50
Adj. Flow (vph)	8	98	411	20	41	20	50	20	4	16	102	4
RTOR Reduction (vph)	0	0	188	0	15	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	106	223	0	66	0	0	72	0	0	120	0
Confl. Peds. (#/hr)	121			46			13			4		
Turn Type	Split	NA	pt+ov	Split	NA		Split	NA		Split	NA	
Protected Phases	1	1	1 2	5	5		2	2		4	4	
Permitted Phases												
Actuated Green, G (s)		9.9	36.2		6.7			21.3			7.9	
Effective Green, g (s)		9.9	36.2		6.7			21.3			7.9	
Actuated g/C Ratio		0.15	0.54		0.10			0.32			0.12	
Clearance Time (s)		5.0			5.0			6.0			5.0	
Vehicle Extension (s)		2.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		275	857		178			570			217	
v/s Ratio Prot		c0.06	c0.14		c0.04			0.04			c0.07	
v/s Ratio Perm												
v/c Ratio		0.39	0.26		0.37			0.13			0.55	
Uniform Delay, d1		25.7	8.2		28.1			16.1			27.8	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		0.3	0.1		1.3			0.5			3.0	
Delay (s)		26.0	8.2		29.4			16.6			30.8	
Level of Service		C	A		C			B			C	
Approach Delay (s)		11.9			29.4			16.6			30.8	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			17.0									B
HCM 2000 Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			66.8							21.0		
Intersection Capacity Utilization			38.7%								A	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Background

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↕					↕			↕		
Traffic Volume (vph)	33	19	18	3	5	13	39	67	22	111	6	68
Future Volume (vph)	33	19	18	3	5	13	39	67	22	111	6	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor										1.00		
Frt		0.967					0.927			0.992		
Flt Protected		0.975					0.993			0.993		
Satd. Flow (prot)	0	1756	0	0	0	0	1715	0	0	1835	0	0
Flt Permitted		0.593					0.948			0.993		
Satd. Flow (perm)	0	1068	0	0	0	0	1637	0	0	1832	0	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)		1					41			2		
Link Speed (mph)		25					25			25		
Link Distance (ft)		836					602			696		
Travel Time (s)		22.8					16.4			19.0		
Confl. Peds. (#/hr)									6			
Peak Hour Factor	0.57	0.68	0.75	0.75	0.81	0.68	0.74	0.74	0.75	0.69	0.50	0.82
Adj. Flow (vph)	58	28	24	4	6	19	53	91	29	161	12	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	114	0	0	0	0	169	0	0	202	0	0
Turn Type	Perm	NA			Perm	Perm	NA		Split	NA		Split
Protected Phases		4					4		2	2		1
Permitted Phases	4				4	4						
Detector Phase	4	4			4	4	4		2	2		1
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0	8.0	8.0		10.0	10.0		20.0
Minimum Split (s)	13.0	13.0			13.0	13.0	13.0		15.0	15.0		25.0
Total Split (s)	25.0	25.0			25.0	25.0	25.0		30.0	30.0		25.0
Total Split (%)	20.5%	20.5%			20.5%	20.5%	20.5%		24.6%	24.6%		20.5%
Maximum Green (s)	20.0	20.0			20.0	20.0	20.0		25.0	25.0		20.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)		0.0					0.0			0.0		
Total Lost Time (s)		5.0					5.0			5.0		
Lead/Lag	Lag	Lag			Lag	Lag	Lag		Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		3.0
Recall Mode	None	None			None	None	None		Max	Max		Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		15.8					15.8			25.4		
Actuated g/C Ratio		0.16					0.16			0.26		
v/c Ratio		0.66					0.57			0.42		
Control Delay		58.8					37.6			35.8		
Queue Delay		0.0					0.0			0.0		
Total Delay		58.8					37.6			35.8		
LOS		E					D			D		

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Background

	↓	↙	↘	↖	↗	↘	Ø3
Lane Group	SBT	SBR	SBR2	NEL2	NEL	NER	Ø3
Lane Configurations	↕	↕			↕		
Traffic Volume (vph)	196	146	145	6	43	3	
Future Volume (vph)	196	146	145	6	43	3	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt		0.850			0.989		
Flt Protected	0.987				0.956		
Satd. Flow (prot)	1839	1583	0	0	1761	0	
Flt Permitted	0.987				0.956		
Satd. Flow (perm)	1839	1583	0	0	1761	0	
Right Turn on Red			Yes				
Satd. Flow (RTOR)		143					
Link Speed (mph)	25				25		
Link Distance (ft)	1056				667		
Travel Time (s)	28.8				18.2		
Confl. Peds. (#/hr)							
Peak Hour Factor	0.82	0.73	0.95	0.50	0.53	0.38	
Adj. Flow (vph)	239	200	153	12	81	8	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	322	353	0	0	101	0	
Turn Type	NA	Prot		Prot	Prot		
Protected Phases	1	1		5	5	3	
Permitted Phases							
Detector Phase	1	1		5	5		
Switch Phase							
Minimum Initial (s)	20.0	20.0		6.0	6.0	5.0	
Minimum Split (s)	25.0	25.0		11.0	11.0	25.0	
Total Split (s)	25.0	25.0		17.0	17.0	25.0	
Total Split (%)	20.5%	20.5%		13.9%	13.9%	20%	
Maximum Green (s)	20.0	20.0		12.0	12.0	21.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	0.0	
Lost Time Adjust (s)	0.0	0.0			0.0		
Total Lost Time (s)	5.0	5.0			5.0		
Lead/Lag	Lead	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	
Vehicle Extension (s)	3.0	3.0		2.0	2.0	3.0	
Recall Mode	Max	Max		Max	Max	None	
Walk Time (s)						6.0	
Flash Dont Walk (s)						15.0	
Pedestrian Calls (#/hr)						3	
Act Effct Green (s)	20.3	20.3			12.2		
Actuated g/C Ratio	0.21	0.21			0.12		
v/c Ratio	0.85	0.80			0.46		
Control Delay	60.0	38.0			50.7		
Queue Delay	0.0	0.0			0.0		
Total Delay	60.0	38.0			50.7		
LOS	E	D			D		

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Background

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Approach Delay		58.8					37.6			35.8		
Approach LOS		E					D			D		
Queue Length 50th (ft)		62					69			97		
Queue Length 95th (ft)		108					128			162		
Internal Link Dist (ft)		756					522			616		
Turn Bay Length (ft)												
Base Capacity (vph)		222					371			476		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.51					0.46			0.42		

Intersection Summary

Area Type: Other
 Cycle Length: 122
 Actuated Cycle Length: 97.9
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 46.1
 Intersection LOS: D
 Intersection Capacity Utilization 52.5%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Ø1 25 s	Ø2 30 s	Ø5 17 s	Ø3 25 s	Ø4 25 s
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Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Background

	↓	↙	↘	↖	↗	↘	
Lane Group	SBT	SBR	SBR2	NEL2	NEL	NER	Ø3
Approach Delay	48.5				50.7		
Approach LOS	D				D		
Queue Length 50th (ft)	183	119			56		
Queue Length 95th (ft)	#401	#201			77		
Internal Link Dist (ft)	976				587		
Turn Bay Length (ft)							
Base Capacity (vph)	381	441			219		
Starvation Cap Reductn	0	0			0		
Spillback Cap Reductn	0	0			0		
Storage Cap Reductn	0	0			0		
Reduced v/c Ratio	0.85	0.80			0.46		
Intersection Summary							

HCM Signalized Intersection Capacity Analysis
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Background

													
Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	
Lane Configurations		↕					↕			↕			
Traffic Volume (vph)	33	19	18	3	5	13	39	67	22	111	6	68	
Future Volume (vph)	33	19	18	3	5	13	39	67	22	111	6	68	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		5.0					5.0			5.0			
Lane Util. Factor		1.00					1.00			1.00			
Frbp, ped/bikes		1.00					1.00			1.00			
Flpb, ped/bikes		1.00					1.00			1.00			
Frt		0.97					0.93			0.99			
Flt Protected		0.98					0.99			0.99			
Satd. Flow (prot)		1756					1715			1835			
Flt Permitted		0.59					0.95			0.99			
Satd. Flow (perm)		1068					1637			1835			
Peak-hour factor, PHF	0.57	0.68	0.75	0.75	0.81	0.68	0.74	0.74	0.75	0.69	0.50	0.82	
Adj. Flow (vph)	58	28	24	4	6	19	53	91	29	161	12	83	
RTOR Reduction (vph)	0	1	0	0	0	0	35	0	0	1	0	0	
Lane Group Flow (vph)	0	113	0	0	0	0	134	0	0	201	0	0	
Confl. Peds. (#/hr)									6				
Turn Type	Perm	NA			Perm	Perm	NA		Split	NA		Split	
Protected Phases		4					4		2	2		1	
Permitted Phases	4				4	4							
Actuated Green, G (s)		15.8					15.8			25.4			
Effective Green, g (s)		15.8					15.8			25.4			
Actuated g/C Ratio		0.16					0.16			0.25			
Clearance Time (s)		5.0					5.0			5.0			
Vehicle Extension (s)		4.0					4.0			4.0			
Lane Grp Cap (vph)		166					255			461			
v/s Ratio Prot										c0.11			
v/s Ratio Perm		c0.11					0.08						
v/c Ratio		0.68					0.53			0.43			
Uniform Delay, d1		40.3					39.2			31.8			
Progression Factor		1.00					1.00			1.00			
Incremental Delay, d2		11.8					2.5			3.0			
Delay (s)		52.1					41.8			34.8			
Level of Service		D					D			C			
Approach Delay (s)		52.1					41.8			34.8			
Approach LOS		D					D			C			
Intersection Summary													
HCM 2000 Control Delay			50.8				HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.59										
Actuated Cycle Length (s)			101.1				Sum of lost time (s)			24.0			
Intersection Capacity Utilization			52.5%				ICU Level of Service			A			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Background

	↓	↙	↘	↖	↗	↘
Movement	SBT	SBR	SBR2	NEL2	NEL	NER
Lane Configurations	↖	↘			↘	
Traffic Volume (vph)	196	146	145	6	43	3
Future Volume (vph)	196	146	145	6	43	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00			1.00	
Frbp, ped/bikes	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00	
Frt	1.00	0.85			0.99	
Flt Protected	0.99	1.00			0.96	
Satd. Flow (prot)	1839	1583			1762	
Flt Permitted	0.99	1.00			0.96	
Satd. Flow (perm)	1839	1583			1762	
Peak-hour factor, PHF	0.82	0.73	0.95	0.50	0.53	0.38
Adj. Flow (vph)	239	200	153	12	81	8
RTOR Reduction (vph)	0	114	0	0	0	0
Lane Group Flow (vph)	322	239	0	0	101	0
Confl. Peds. (#/hr)						
Turn Type	NA	Prot		Prot	Prot	
Protected Phases	1	1		5	5	
Permitted Phases						
Actuated Green, G (s)	20.3	20.3			12.2	
Effective Green, g (s)	20.3	20.3			12.2	
Actuated g/C Ratio	0.20	0.20			0.12	
Clearance Time (s)	5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			2.0	
Lane Grp Cap (vph)	369	317			212	
v/s Ratio Prot	c0.18	0.15			c0.06	
v/s Ratio Perm						
v/c Ratio	0.87	0.75			0.48	
Uniform Delay, d1	39.1	38.0			41.5	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	23.7	15.2			7.5	
Delay (s)	62.8	53.3			49.0	
Level of Service	E	D			D	
Approach Delay (s)	57.8				49.0	
Approach LOS	E				D	
Intersection Summary						

Lanes, Volumes, Timings
 7: M-Lot Driveway & Route 649 (Poquonnock Rd.)

Electric Boat - Groton, CT
 2024 AM Background

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘↙	
Traffic Volume (vph)	299	145	59	266	23	6
Future Volume (vph)	299	145	59	266	23	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	15	15	15
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.946				0.947	
Flt Protected				0.991	0.970	
Satd. Flow (prot)	3683	0	0	3858	1882	0
Flt Permitted				0.991	0.970	
Satd. Flow (perm)	3683	0	0	3858	1882	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	504			552	258	
Travel Time (s)	13.7			15.1	7.0	
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.90	0.78	0.85	0.91	0.92	0.38
Adj. Flow (vph)	332	186	69	292	25	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	518	0	0	361	41	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.4%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 7: M-Lot Driveway & Route 649 (Poquonnock Rd.)

Electric Boat - Groton, CT
 2024 AM Background

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (veh/h)	299	145	59	266	23	6
Future Volume (Veh/h)	299	145	59	266	23	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.78	0.85	0.91	0.92	0.38
Hourly flow rate (vph)	332	186	69	292	25	16
Pedestrians						1
Lane Width (ft)						15.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	504					
pX, platoon unblocked						
vC, conflicting volume			519		710	260
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			519		710	260
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		93	98
cM capacity (veh/h)			1042		343	738
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	221	297	166	195	41	
Volume Left	0	0	69	0	25	
Volume Right	0	186	0	0	16	
cSH	1700	1700	1042	1700	434	
Volume to Capacity	0.13	0.17	0.07	0.11	0.09	
Queue Length 95th (ft)	0	0	5	0	8	
Control Delay (s)	0.0	0.0	4.0	0.0	14.2	
Lane LOS	A			B		
Approach Delay (s)	0.0		1.8	14.2		
Approach LOS						B
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			35.4%	ICU Level of Service	A	
Analysis Period (min)	15					

Lanes, Volumes, Timings
8: Mitchell St./North St. & Meridian St.

Electric Boat - Groton, CT
2024 AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	31	3	143	27	51	0	278	65	94	546	5
Future Volume (vph)	11	31	3	143	27	51	0	278	65	94	546	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	95		0	60		115	60		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			180			30			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99								
Frt		0.985			0.901				0.850		0.997	
Flt Protected		0.987		0.950						0.950		
Satd. Flow (prot)	0	1992	0	1770	1678	0	1863	3539	1583	1770	1857	0
Flt Permitted		0.919		0.761						0.558		
Satd. Flow (perm)	0	1854	0	1408	1678	0	1863	3539	1583	1039	1857	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			57				87		2	
Link Speed (mph)		30			25			30		30		
Link Distance (ft)		834			697			953		634		
Travel Time (s)		19.0			19.0			21.7		14.4		
Confl. Peds. (#/hr)	1			3								
Peak Hour Factor	0.55	0.68	0.38	0.87	0.93	0.89	0.92	0.87	0.75	0.60	0.91	0.42
Adj. Flow (vph)	20	46	8	164	29	57	0	320	87	157	600	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	74	0	164	86	0	0	320	87	157	612	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	D.P+P	NA	
Protected Phases		4			4			2		1	1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	1	2
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		25.0	25.0	25.0	5.0		
Minimum Split (s)	12.0	12.0		12.0	12.0		30.0	30.0	30.0	8.1		
Total Split (s)	19.0	19.0		19.0	19.0		30.0	30.0	30.0	8.1		
Total Split (%)	24.3%	24.3%		24.3%	24.3%		38.4%	38.4%	38.4%	10.4%		
Maximum Green (s)	15.0	15.0		15.0	15.0		25.0	25.0	25.0	5.0		
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	0.1		
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)		4.0		4.0	4.0		5.0	5.0	5.0	3.1		
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		14.5		14.5	14.5			34.3	34.3	53.4	56.5	
Actuated g/C Ratio		0.19		0.19	0.19			0.44	0.44	0.68	0.72	
v/c Ratio		0.21		0.63	0.24			0.21	0.12	0.18	0.46	

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	27%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings
 8: Mitchell St./North St. & Meridian St.

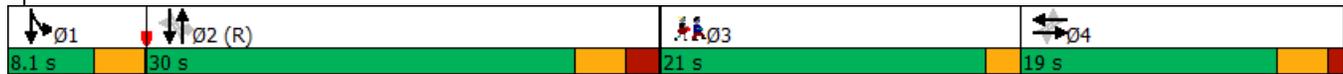
Electric Boat - Groton, CT
 2024 AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		24.3		39.2	12.7			16.3	5.2	4.7	6.6	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		24.3		39.2	12.7			16.3	5.2	4.7	6.6	
LOS		C		D	B			B	A	A	A	
Approach Delay		24.3			30.1			13.9			6.2	
Approach LOS		C			C			B			A	
Queue Length 50th (ft)		28		75	12			49	0	18	97	
Queue Length 95th (ft)		41		116	43			88	19	31	217	
Internal Link Dist (ft)		754			617			873			554	
Turn Bay Length (ft)				95					115	60		
Base Capacity (vph)		399		299	401			1555	744	871	1343	
Starvation Cap Reductn		0		0	0			0	0	0	0	
Spillback Cap Reductn		0		0	0			0	0	0	0	
Storage Cap Reductn		0		0	0			0	0	0	0	
Reduced v/c Ratio		0.19		0.55	0.21			0.21	0.12	0.18	0.46	

Intersection Summary

Area Type: Other
 Cycle Length: 78.1
 Actuated Cycle Length: 78.1
 Offset: 8.1 (10%), Referenced to phase 2:NBSB and 6:, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 13.2
 Intersection Capacity Utilization 75.3%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 8: Mitchell St./North St. & Meridian St.



Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 8: Mitchell St./North St. & Meridian St.

Electric Boat - Groton, CT
 2024 AM Background

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	31	3	143	27	51	0	278	65	94	546	5
Future Volume (vph)	11	31	3	143	27	51	0	278	65	94	546	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0		4.0	4.0			5.0	5.0	3.1	3.1	
Lane Util. Factor		1.00		1.00	1.00			0.95	1.00	1.00	1.00	
Frbp, ped/bikes		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00		0.99	1.00			1.00	1.00	1.00	1.00	
Frt		0.99		1.00	0.90			1.00	0.85	1.00	1.00	
Flt Protected		0.99		0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1991		1757	1678			3539	1583	1770	1857	
Flt Permitted		0.92		0.76	1.00			1.00	1.00	0.56	1.00	
Satd. Flow (perm)		1854		1407	1678			3539	1583	1039	1857	
Peak-hour factor, PHF	0.55	0.68	0.38	0.87	0.93	0.89	0.92	0.87	0.75	0.60	0.91	0.42
Adj. Flow (vph)	20	46	8	164	29	57	0	320	87	157	600	12
RTOR Reduction (vph)	0	6	0	0	46	0	0	0	49	0	1	0
Lane Group Flow (vph)	0	68	0	164	40	0	0	320	38	157	611	0
Confl. Peds. (#/hr)	1			3								
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	D.P+P	NA	
Protected Phases		4			4			2		1	1 2	
Permitted Phases	4			4			2		2	2		
Actuated Green, G (s)		14.5		14.5	14.5			34.3	34.3	51.5	54.6	
Effective Green, g (s)		14.5		14.5	14.5			34.3	34.3	51.5	54.6	
Actuated g/C Ratio		0.19		0.19	0.19			0.44	0.44	0.66	0.70	
Clearance Time (s)		4.0		4.0	4.0			5.0	5.0	3.1		
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0	3.0		
Lane Grp Cap (vph)		344		261	311			1554	695	846	1298	
v/s Ratio Prot					0.02			0.09		0.04	c0.33	
v/s Ratio Perm		0.04		c0.12					0.02	0.08		
v/c Ratio		0.20		0.63	0.13			0.21	0.05	0.19	0.47	
Uniform Delay, d1		26.9		29.3	26.5			13.5	12.6	5.0	5.3	
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3		4.7	0.2			0.3	0.2	0.1	0.3	
Delay (s)		27.2		34.0	26.7			13.8	12.7	5.1	5.5	
Level of Service		C		C	C			B	B	A	A	
Approach Delay (s)		27.2			31.5			13.6			5.4	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			13.1									B
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			78.1								14.1	
Intersection Capacity Utilization			75.3%									D
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
9: North St. & Broad St.

Electric Boat - Groton, CT
2024 AM Background

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	11	9	146	8	1	4	289	56	1	513	5
Future Volume (vph)	23	11	9	146	8	1	4	289	56	1	513	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	11	11	11	11	11	11	12	14	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		1.00						1.00			1.00	
Fr _t		0.971			0.962			0.971			0.998	
Fl _t Protected		0.974		0.950				0.999				
Satd. Flow (prot)	0	1997	0	1711	1732	0	0	3319	0	0	1983	0
Fl _t Permitted		0.870		0.726				0.945			0.998	
Satd. Flow (perm)	0	1778	0	1307	1732	0	0	3139	0	0	1979	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			4			81			2	
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		699			143			486			286	
Travel Time (s)		19.1			3.9			11.0			6.5	
Confl. Peds. (#/hr)	6						1			1		
Peak Hour Factor	0.92	0.92	0.92	0.74	0.67	0.25	0.50	0.87	0.69	0.25	0.82	0.62
Adj. Flow (vph)	25	12	10	197	12	4	8	332	81	4	626	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	0	197	16	0	0	421	0	0	638	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		25.0	25.0		25.0	25.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		30.0	30.0		30.0	30.0	
Total Split (s)	19.0	19.0		19.0	19.0		30.0	30.0		30.0	30.0	
Total Split (%)	38.8%	38.8%		38.8%	38.8%		61.2%	61.2%		61.2%	61.2%	
Maximum Green (s)	15.0	15.0		15.0	15.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		11.7		11.7	11.7			29.2			29.2	
Actuated g/C Ratio		0.25		0.25	0.25			0.63			0.63	
v/c Ratio		0.10		0.60	0.04			0.21			0.51	
Control Delay		11.1		23.1	11.0			4.9			9.1	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		11.1		23.1	11.0			4.9			9.1	
LOS		B		C	B			A			A	
Approach Delay		11.1			22.2			4.9			9.1	
Approach LOS		B			C			A			A	

Lanes, Volumes, Timings
9: North St. & Broad St.

Electric Boat - Groton, CT
2024 AM Background

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		7		45	2			21			97	
Queue Length 95th (ft)		25		73	9			42			173	
Internal Link Dist (ft)		619			63			406			206	
Turn Bay Length (ft)												
Base Capacity (vph)		582		423	563			2003			1245	
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		0.08		0.47	0.03			0.21			0.51	

Intersection Summary

Area Type:	Other
Cycle Length:	49
Actuated Cycle Length:	46.4
Natural Cycle:	45
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.60
Intersection Signal Delay:	10.0
Intersection Capacity Utilization	49.0%
Analysis Period (min)	15
Intersection LOS:	A
ICU Level of Service	A

Splits and Phases: 9: North St. & Broad St.



HCM Signalized Intersection Capacity Analysis
 9: North St. & Broad St.

Electric Boat - Groton, CT
 2024 AM Background

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	11	9	146	8	1	4	289	56	1	513	5
Future Volume (vph)	23	11	9	146	8	1	4	289	56	1	513	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	11	11	11	11	11	12	14	12
Total Lost time (s)		4.0		4.0	4.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			1.00	
Frpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.97		1.00	0.96			0.97			1.00	
Flt Protected		0.97		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1989		1711	1733			3319			1983	
Flt Permitted		0.87		0.73	1.00			0.94			1.00	
Satd. Flow (perm)		1776		1308	1733			3139			1979	
Peak-hour factor, PHF	0.92	0.92	0.92	0.74	0.67	0.25	0.50	0.87	0.69	0.25	0.82	0.62
Adj. Flow (vph)	25	12	10	197	12	4	8	332	81	4	626	8
RTOR Reduction (vph)	0	8	0	0	3	0	0	33	0	0	1	0
Lane Group Flow (vph)	0	39	0	197	13	0	0	388	0	0	637	0
Confl. Peds. (#/hr)	6						1			1		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2				2
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		10.1		10.1	10.1			28.1			28.1	
Effective Green, g (s)		10.1		10.1	10.1			28.1			28.1	
Actuated g/C Ratio		0.21		0.21	0.21			0.60			0.60	
Clearance Time (s)		4.0		4.0	4.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		380		279	370			1868			1178	
v/s Ratio Prot					0.01							
v/s Ratio Perm		0.02		c0.15				0.12			c0.32	
v/c Ratio		0.10		0.71	0.03			0.21			0.54	
Uniform Delay, d1		14.9		17.2	14.7			4.4			5.7	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.1		7.9	0.0			0.3			1.8	
Delay (s)		15.0		25.1	14.7			4.7			7.5	
Level of Service		B		C	B			A			A	
Approach Delay (s)		15.0			24.3			4.7			7.5	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.6					HCM 2000 Level of Service		A		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			47.2					Sum of lost time (s)		9.0		
Intersection Capacity Utilization			49.0%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
2024 AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	32	38	1	34	63	45	251	10	48	447	311
Future Volume (vph)	79	32	38	1	34	63	45	251	10	48	447	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	105		0	0		0	38		0	75		0
Storage Lanes	2		0	0		1	1		0	1		1
Taper Length (ft)	300			25			25			75		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt		0.922				0.850		0.990				0.850
Flt Protected	0.950				0.997		0.950			0.950		
Satd. Flow (prot)	3319	1717	0	0	1857	1583	1770	3504	0	1770	1863	1583
Flt Permitted	0.950				0.997		0.950			0.950		
Satd. Flow (perm)	3319	1717	0	0	1857	1583	1765	3504	0	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38				110		5				202
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		550			441			176			423	
Travel Time (s)		15.0			12.0			4.0			11.5	
Confl. Peds. (#/hr)							2					
Peak Hour Factor	0.84	0.78	0.84	0.25	0.52	0.80	0.85	0.91	0.50	0.65	0.79	0.92
Adj. Flow (vph)	94	41	45	4	65	79	53	276	20	74	566	338
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	86	0	0	69	79	53	296	0	74	566	338
Turn Type	Split	NA		Split	NA	pt+ov	Split	NA		Split	NA	Free
Protected Phases	4	4		5	5	15	2	2		1	1	
Permitted Phases												Free
Detector Phase	4	4		5	5	15	2	2		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0		15.0	15.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		25.0	25.0		20.0	20.0	
Total Split (s)	20.0	20.0		17.0	17.0		25.0	25.0		29.0	29.0	
Total Split (%)	16.8%	16.8%		14.3%	14.3%		21.0%	21.0%		24.4%	24.4%	
Maximum Green (s)	15.0	15.0		12.0	12.0		20.0	20.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag					Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		3.0	3.0		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	9.1	9.1			9.2	35.3	20.7	20.7		24.8	24.8	85.2
Actuated g/C Ratio	0.11	0.11			0.11	0.41	0.24	0.24		0.29	0.29	1.00
v/c Ratio	0.27	0.40			0.34	0.11	0.12	0.35		0.14	1.04	0.21

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	24%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	41.0	31.1			44.7	1.6	31.9	30.9		28.7	83.9	0.3
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	41.0	31.1			44.7	1.6	31.9	30.9		28.7	83.9	0.3
LOS	D	C			D	A	C	C		C	F	A
Approach Delay		36.3			21.7			31.0			50.9	
Approach LOS		D			C			C			D	
Queue Length 50th (ft)	23	23			33	0	21	63		27	~291	0
Queue Length 95th (ft)	56	68			54	6	68	151		63	#669	0
Internal Link Dist (ft)		470			361			96			343	
Turn Bay Length (ft)	105						38			75		
Base Capacity (vph)	603	343			270	752	429	853		515	542	1583
Starvation Cap Reductn	0	0			0	0	0	0		0	0	0
Spillback Cap Reductn	0	0			0	0	0	0		0	0	0
Storage Cap Reductn	0	0			0	0	0	0		0	0	0
Reduced v/c Ratio	0.16	0.25			0.26	0.11	0.12	0.35		0.14	1.04	0.21

Intersection Summary

Area Type: Other
 Cycle Length: 119
 Actuated Cycle Length: 85.2
 Natural Cycle: 110
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 42.5
 Intersection LOS: D
 Intersection Capacity Utilization 57.1%
 ICU Level of Service B
 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: 10: North St./I-95 On/Off Ramps & Bridge St.

Ø1 29 s	Ø2 25 s	Ø5 17 s	Ø3 28 s	Ø4 20 s
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Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 AM Background

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	79	32	38	1	34	63	45	251	10	48	447	311	
Future Volume (vph)	79	32	38	1	34	63	45	251	10	48	447	311	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	11	12	12	12	12	12	12	12	12	12	12	12	
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	4.0	
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.92			1.00	0.85	1.00	0.99		1.00	1.00	0.85	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3319	1717			1857	1583	1770	3503		1770	1863	1583	
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3319	1717			1857	1583	1770	3503		1770	1863	1583	
Peak-hour factor, PHF	0.84	0.78	0.84	0.25	0.52	0.80	0.85	0.91	0.50	0.65	0.79	0.92	
Adj. Flow (vph)	94	41	45	4	65	79	53	276	20	74	566	338	
RTOR Reduction (vph)	0	34	0	0	0	51	0	4	0	0	0	0	
Lane Group Flow (vph)	94	52	0	0	69	28	53	292	0	74	566	338	
Confl. Peds. (#/hr)							2						
Turn Type	Split	NA		Split	NA	pt+ov	Split	NA		Split	NA	Free	
Protected Phases	4	4		5	5	15	2	2		1	1		
Permitted Phases												Free	
Actuated Green, G (s)	9.1	9.1			7.2	32.0	20.7	20.7		24.8	24.8	90.2	
Effective Green, g (s)	9.1	9.1			7.2	32.0	20.7	20.7		24.8	24.8	90.2	
Actuated g/C Ratio	0.10	0.10			0.08	0.35	0.23	0.23		0.27	0.27	1.00	
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0		
Vehicle Extension (s)	2.5	2.5			3.0		3.0	3.0		2.5	2.5		
Lane Grp Cap (vph)	334	173			148	561	406	803		486	512	1583	
v/s Ratio Prot	0.03	0.03			c0.04	0.02	0.03	c0.08		0.04	c0.30		
v/s Ratio Perm												c0.21	
v/c Ratio	0.28	0.30			0.47	0.05	0.13	0.36		0.15	1.11	0.21	
Uniform Delay, d1	37.5	37.6			39.7	19.1	27.6	29.2		24.7	32.7	0.0	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.7			2.3	0.0	0.7	1.3		0.1	71.8	0.3	
Delay (s)	37.9	38.3			42.0	19.1	28.3	30.5		24.9	104.5	0.3	
Level of Service	D	D			D	B	C	C		C	F	A	
Approach Delay (s)		38.1			29.8			30.2			62.5		
Approach LOS		D			C			C			E		
Intersection Summary													
HCM 2000 Control Delay			50.1		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.66										
Actuated Cycle Length (s)			90.2		Sum of lost time (s)						25.0		
Intersection Capacity Utilization			57.1%		ICU Level of Service						B		
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings
 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Electric Boat - Groton, CT
 2024 AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	44	88	72	66	69	33	424	14	33	1102	147
Future Volume (vph)	88	44	88	72	66	69	33	424	14	33	1102	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	230		0	90		90	120		150	130		120
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	300			120			150			300		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.95	1.00
Ped Bike Factor												
Fr t		0.906				0.850		0.995				0.850
Fl t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1688	0	1770	1863	1583	1770	5060	0	1770	3539	1583
Fl t Permitted	0.950			0.635			0.950			0.950		
Satd. Flow (perm)	3433	1688	0	1183	1863	1583	1770	5060	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		62				91		3				103
Link Speed (mph)		25			25			45				45
Link Distance (ft)		588			486			576				595
Travel Time (s)		16.0			13.3			8.7				9.0
Confl. Peds. (#/hr)						1						
Peak Hour Factor	0.83	0.60	0.72	0.70	0.73	0.84	0.88	0.83	0.73	0.61	0.84	0.70
Adj. Flow (vph)	106	73	122	103	90	82	38	511	19	54	1312	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	106	195	0	103	90	82	38	530	0	54	1312	210
Turn Type	Prot	NA		Perm	NA	pt+ov	Prot	NA		Prot	NA	custom
Protected Phases	4	4 8			8	5 8	1	6		5	2	2 4
Permitted Phases				8								6
Detector Phase	4	4 8		8	8	5 8	1	6		5	2	2 4
Switch Phase												
Minimum Initial (s)	5.0			9.0	9.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	10.9			14.7	14.7		11.8	20.0		11.8	20.0	
Total Split (s)	24.9			26.7	26.7		17.8	35.0		17.8	35.0	
Total Split (%)	17.4%			18.6%	18.6%		12.4%	24.4%		12.4%	24.4%	
Maximum Green (s)	19.0			21.0	21.0		11.0	30.0		11.0	30.0	
Yellow Time (s)	3.3			3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.6			2.4	2.4		3.8	2.0		3.8	2.0	
Lost Time Adjust (s)	0.0			0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.9			5.7	5.7		6.8	5.0		6.8	5.0	
Lead/Lag	Lag						Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes						Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.5		2.0	2.5	
Recall Mode	None			None	None		None	Max		None	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	9.8	28.4		12.7	12.7	25.8	6.5	30.8		7.2	34.1	49.9
Actuated g/C Ratio	0.12	0.35		0.16	0.16	0.32	0.08	0.38		0.09	0.42	0.61
v/c Ratio	0.26	0.31		0.56	0.31	0.15	0.27	0.28		0.35	0.89	0.21
Control Delay	36.2	14.7		46.3	35.6	4.9	44.3	20.4		44.8	34.4	5.7

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	39.0
Total Split (s)	39.0
Total Split (%)	27%
Maximum Green (s)	35.0
Yellow Time (s)	4.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	28.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lanes, Volumes, Timings
 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Electric Boat - Groton, CT
 2024 AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	36.2	14.7		46.3	35.6	4.9	44.3	20.4		44.8	34.4	5.7
LOS	D	B		D	D	A	D	C		D	C	A
Approach Delay		22.3			30.4			22.0			30.9	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	25	49		50	42	0	19	67		26	339	23
Queue Length 95th (ft)	50	54		83	73	22	54	115		46	#587	45
Internal Link Dist (ft)		508			406			496			515	
Turn Bay Length (ft)	230			90		90	120			130		120
Base Capacity (vph)	822	796		313	493	618	245	1916		245	1481	1187
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.13	0.24		0.33	0.18	0.13	0.16	0.28		0.22	0.89	0.18

Intersection Summary

Area Type: Other
 Cycle Length: 143.4
 Actuated Cycle Length: 81.4
 Natural Cycle: 130
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 28.1 Intersection LOS: C
 Intersection Capacity Utilization 59.5% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Ø1	Ø2	Ø3	Ø4	Ø8
17.8 s	35 s	39 s	24.9 s	26.7 s
Ø5	Ø6			
17.8 s	35 s			

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Electric Boat - Groton, CT
 2024 AM Background

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	44	88	72	66	69	33	424	14	33	1102	147
Future Volume (vph)	88	44	88	72	66	69	33	424	14	33	1102	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9		5.7	5.7	6.8	6.8	5.0		6.8	5.0	5.0
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.95	1.00
Frb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1688		1770	1863	1583	1770	5058		1770	3539	1583
Flt Permitted	0.95	1.00		0.64	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1688		1183	1863	1583	1770	5058		1770	3539	1583
Peak-hour factor, PHF	0.83	0.60	0.72	0.70	0.73	0.84	0.88	0.83	0.73	0.61	0.84	0.70
Adj. Flow (vph)	106	73	122	103	90	82	38	511	19	54	1312	210
RTOR Reduction (vph)	0	41	0	0	0	64	0	2	0	0	0	43
Lane Group Flow (vph)	106	154	0	103	90	18	38	528	0	54	1312	167
Confl. Peds. (#/hr)						1						
Turn Type	Prot	NA		Perm	NA	pt+ov	Prot	NA		Prot	NA	custom
Protected Phases	4	4 8			8	5 8	1	6		5	2	2 4
Permitted Phases				8								6
Actuated Green, G (s)	9.8	28.4		12.7	12.7	24.3	4.0	32.2		5.9	34.1	48.9
Effective Green, g (s)	9.8	28.4		12.7	12.7	18.6	4.0	32.2		5.9	34.1	48.9
Actuated g/C Ratio	0.12	0.34		0.15	0.15	0.22	0.05	0.38		0.07	0.41	0.58
Clearance Time (s)	5.9			5.7	5.7		6.8	5.0		6.8	5.0	
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	400	570		178	281	350	84	1938		124	1436	921
v/s Ratio Prot	0.03	c0.09			0.05	0.01	0.02	0.10		c0.03	c0.37	0.11
v/s Ratio Perm				c0.09								
v/c Ratio	0.27	0.27		0.58	0.32	0.05	0.45	0.27		0.44	0.91	0.18
Uniform Delay, d1	33.8	20.3		33.2	31.8	25.8	38.9	17.8		37.5	23.6	8.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1		2.8	0.2	0.0	1.4	0.3		0.9	10.5	0.0
Delay (s)	33.9	20.3		36.0	32.0	25.8	40.3	18.2		38.3	34.0	8.2
Level of Service	C	C		D	C	C	D	B		D	C	A
Approach Delay (s)		25.1			31.6			19.7			30.7	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			27.9									C
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			84.0							27.4		
Intersection Capacity Utilization			59.5%									B
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

Electric Boat - Groton, CT

12: Route 649 (Rainville Ave.)/Old Farms Rd. & Route 649 (Poquonnock Rd.) 2024 AM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	130	3	191	90	8	3	7	299	15	28	18
Future Volume (vph)	10	130	3	191	90	8	3	7	299	15	28	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	11	11	11	15	15	15
Storage Length (ft)	155		0	0		0	0		85	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	135			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												1.00
Frt		0.993			0.985				0.850		0.959	
Flt Protected	0.950			0.950				0.986			0.987	
Satd. Flow (prot)	1711	1788	0	1652	1774	0	0	1775	1531	0	1939	0
Flt Permitted	0.678			0.646				0.900			0.903	
Satd. Flow (perm)	1221	1788	0	1123	1774	0	0	1621	1531	0	1772	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			9				365		24	
Link Speed (mph)		30			30			75			30	
Link Distance (ft)		529			504			284			348	
Travel Time (s)		12.0			11.5			2.6			7.9	
Confl. Peds. (#/hr)										4		
Peak Hour Factor	0.83	0.77	0.38	0.86	0.81	0.67	0.38	0.35	0.82	0.62	0.68	0.64
Adj. Flow (vph)	12	169	8	222	111	12	8	20	365	24	41	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	177	0	222	123	0	0	28	365	0	93	0
Turn Type	custom	NA		custom	NA		Perm	NA	custom	Perm	NA	
Protected Phases	1	1 2		3	2 3			5	5		5	
Permitted Phases	2			2			5		3	5		
Detector Phase	1	1 2		3	2 3		5	5	5	5	5	
Switch Phase												
Minimum Initial (s)	3.0			3.0			5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	7.0			7.2			11.2	11.2	11.2	11.2	11.2	
Total Split (s)	9.0			14.2			22.2	22.2	22.2	22.2	22.2	
Total Split (%)	11.1%			17.5%			27.3%	27.3%	27.3%	27.3%	27.3%	
Maximum Green (s)	5.0			10.0			16.0	16.0	16.0	16.0	16.0	
Yellow Time (s)	3.0			3.0			4.2	4.2	4.2	4.2	4.2	
All-Red Time (s)	1.0			1.2			2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0			0.0				0.0	0.0		0.0	
Total Lost Time (s)	4.0			4.2				6.2	6.2		6.2	
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	1.0			2.0			2.0	2.0	2.0	2.0	2.0	
Recall Mode	None			None			None	None	None	None	None	
Act Effct Green (s)	36.8	40.8		39.1	35.9			8.0	19.6		8.0	
Actuated g/C Ratio	0.52	0.58		0.55	0.51			0.11	0.28		0.11	
v/c Ratio	0.02	0.17		0.33	0.14			0.15	0.53		0.42	
Control Delay	8.4	8.4		6.1	5.2			30.1	5.4		28.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	8.4	8.4		6.1	5.2			30.1	5.4		28.8	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	20.8
Total Split (s)	35.8
Total Split (%)	44%
Maximum Green (s)	30.0
Yellow Time (s)	3.8
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	5.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A		A	A			C	A		C	
Approach Delay		8.4			5.8			7.2			28.8	
Approach LOS		A			A			A			C	
Queue Length 50th (ft)	2	30		21	11			11	0		28	
Queue Length 95th (ft)	10	64		53	29			13	36		49	
Internal Link Dist (ft)		449			424			204			268	
Turn Bay Length (ft)	155								85			
Base Capacity (vph)	673	1016		738	972			368	682		421	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.02	0.17		0.30	0.13			0.08	0.54		0.22	

Intersection Summary

Area Type: Other
 Cycle Length: 81.2
 Actuated Cycle Length: 70.7
 Natural Cycle: 55
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 8.9 Intersection LOS: A
 Intersection Capacity Utilization 43.4% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 12: Route 649 (Rainville Ave.)/Old Farms Rd. & Route 649 (Poquonnock Rd.)

01	02	05	03
9 s	35.8 s	22.2 s	14.2 s

Lane Group	Ø2
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Electric Boat - Groton, CT

12: Route 649 (Rainville Ave.)/Old Farms Rd. & Route 649 (Poquonnock Rd.) 2024 AM Background

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	130	3	191	90	8	3	7	299	15	28	18
Future Volume (vph)	10	130	3	191	90	8	3	7	299	15	28	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	11	11	11	11	11	15	15	15
Total Lost time (s)	4.0	4.0		4.2	5.8			6.2	6.2		6.2	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Fr _t	1.00	0.99		1.00	0.99			1.00	0.85		0.96	
Fl _t Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	
Satd. Flow (prot)	1711	1788		1652	1774			1775	1531		1936	
Fl _t Permitted	0.68	1.00		0.65	1.00			0.90	1.00		0.90	
Satd. Flow (perm)	1221	1788		1122	1774			1621	1531		1770	
Peak-hour factor, PHF	0.83	0.77	0.38	0.86	0.81	0.67	0.38	0.35	0.82	0.62	0.68	0.64
Adj. Flow (vph)	12	169	8	222	111	12	8	20	365	24	41	28
RTOR Reduction (vph)	0	2	0	0	4	0	0	0	285	0	21	0
Lane Group Flow (vph)	12	175	0	222	119	0	0	28	80	0	72	0
Confl. Peds. (#/hr)										4		
Turn Type	custom	NA		custom	NA		Perm	NA	custom	Perm	NA	
Protected Phases	1	1 2		3	2 3			5	5		5	
Permitted Phases	2			2			5		3	5		
Actuated Green, G (s)	35.0	39.0		37.5	37.5			8.0	15.4		8.0	
Effective Green, g (s)	35.0	39.0		37.5	37.5			8.0	15.4		8.0	
Actuated g/C Ratio	0.50	0.55		0.53	0.53			0.11	0.22		0.11	
Clearance Time (s)	4.0			4.2				6.2	6.2		6.2	
Vehicle Extension (s)	1.0			2.0				2.0	2.0		2.0	
Lane Grp Cap (vph)	639	987		651	942			183	468		200	
v/s Ratio Prot	0.00	c0.10		c0.04	0.07				0.02			
v/s Ratio Perm	0.01			c0.15				0.02	0.03		c0.04	
v/c Ratio	0.02	0.18		0.34	0.13			0.15	0.17		0.36	
Uniform Delay, d1	9.0	7.8		9.0	8.3			28.2	22.4		28.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.0		0.1	0.0			0.1	0.1		0.4	
Delay (s)	9.0	7.9		9.1	8.3			28.4	22.5		29.3	
Level of Service	A	A		A	A			C	C		C	
Approach Delay (s)		7.9			8.8			22.9			29.3	
Approach LOS		A			A			C			C	

Intersection Summary		
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.33	B
Actuated Cycle Length (s)	70.6	Sum of lost time (s)
Intersection Capacity Utilization	43.4%	20.2
Analysis Period (min)	15	ICU Level of Service
		A

c Critical Lane Group

Appendix C

Intersection Capacity Analysis Worksheets 2024 Combined Traffic Volumes Weekday Morning Peak Hour



Lanes, Volumes, Timings
 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Electric Boat - Groton, CT
 2024 AM Combined

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Lane Configurations	 						
Traffic Volume (vph)	424	33	67	91	35	183	
Future Volume (vph)	424	33	67	91	35	183	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	11	11	12	15	
Storage Length (ft)	0	0		175	125		
Storage Lanes	2	0		1	1		
Taper Length (ft)	25				60		
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	
Ped Bike Factor	0.97				1.00		
Frt	0.987			0.850			
Flt Protected	0.956				0.950		
Satd. Flow (prot)	3397	0	1801	1531	1770	2049	
Flt Permitted	0.956				0.681		
Satd. Flow (perm)	3320	0	1801	1531	1263	2049	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)	8			132			
Link Speed (mph)	30		25			25	
Link Distance (ft)	406		522			429	
Travel Time (s)	9.2		14.2			11.7	
Confl. Peds. (#/hr)	17	17			6		
Peak Hour Factor	0.69	0.57	0.57	0.69	0.34	0.66	
Adj. Flow (vph)	614	58	118	132	103	277	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	672	0	118	132	103	277	
Turn Type	Prot		NA	Perm	D.P+P	NA	
Protected Phases	4		2		1	1 2	3
Permitted Phases				2	2		
Detector Phase	4		2	2	1	1 2	
Switch Phase							
Minimum Initial (s)	9.0		15.0	15.0	4.0		5.0
Minimum Split (s)	14.2		20.6	20.6	7.1		24.0
Total Split (s)	50.2		40.6	40.6	13.1		26.5
Total Split (%)	38.5%		31.1%	31.1%	10.0%		20%
Maximum Green (s)	45.0		35.0	35.0	10.0		24.5
Yellow Time (s)	3.8		3.8	3.8	3.0		2.0
All-Red Time (s)	1.4		1.8	1.8	0.1		0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0		
Total Lost Time (s)	5.2		5.6	5.6	3.1		
Lead/Lag	Lag		Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes
Vehicle Extension (s)	2.0		2.5	2.5	1.0		3.0
Recall Mode	None		Min	Min	None		None
Walk Time (s)							7.0
Flash Dont Walk (s)							15.0
Pedestrian Calls (#/hr)							5
Act Effct Green (s)	16.2		16.2	16.2	27.5		30.8
Actuated g/C Ratio	0.28		0.28	0.28	0.47		0.52
v/c Ratio	0.71		0.24	0.26	0.16		0.26

Lanes, Volumes, Timings
 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Electric Boat - Groton, CT
 2024 AM Combined



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Control Delay	24.8		23.1	7.2	12.0	12.0	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	24.8		23.1	7.2	12.0	12.0	
LOS	C		C	A	B	B	
Approach Delay	24.8		14.7			12.0	
Approach LOS	C		B			B	
Queue Length 50th (ft)	93		27	0	13	37	
Queue Length 95th (ft)	165		68	20	27	129	
Internal Link Dist (ft)	326		442			349	
Turn Bay Length (ft)				175	125		
Base Capacity (vph)	2756		1136	1014	717	1779	
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	0.24		0.10	0.13	0.14	0.16	

Intersection Summary

Area Type:	Other
Cycle Length:	130.4
Actuated Cycle Length:	58.9
Natural Cycle:	70
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.71
Intersection Signal Delay:	19.1
Intersection Capacity Utilization	34.8%
Analysis Period (min)	15
Intersection LOS:	B
ICU Level of Service	A

Splits and Phases: 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Ø1	Ø2	Ø3	Ø4
13.1 s	40.6 s	26.5 s	50.2 s

HCM Signalized Intersection Capacity Analysis
 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Electric Boat - Groton, CT
 2024 AM Combined

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	 					
Traffic Volume (vph)	424	33	67	91	35	183
Future Volume (vph)	424	33	67	91	35	183
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	15
Total Lost time (s)	5.2		5.6	5.6	3.1	3.1
Lane Util. Factor	0.97		1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3396		1801	1531	1765	2049
Flt Permitted	0.96		1.00	1.00	0.68	1.00
Satd. Flow (perm)	3396		1801	1531	1266	2049
Peak-hour factor, PHF	0.69	0.57	0.57	0.69	0.34	0.66
Adj. Flow (vph)	614	58	118	132	103	277
RTOR Reduction (vph)	6	0	0	96	0	0
Lane Group Flow (vph)	666	0	118	36	103	277
Confl. Peds. (#/hr)	17	17			6	
Turn Type	Prot		NA	Perm	D.P+P	NA
Protected Phases	4		2		1	1 2
Permitted Phases				2	2	
Actuated Green, G (s)	16.2		16.2	16.2	24.9	28.0
Effective Green, g (s)	16.2		16.2	16.2	24.9	28.0
Actuated g/C Ratio	0.27		0.27	0.27	0.42	0.47
Clearance Time (s)	5.2		5.6	5.6	3.1	
Vehicle Extension (s)	2.0		2.5	2.5	1.0	
Lane Grp Cap (vph)	919		487	414	599	959
v/s Ratio Prot	c0.20		0.07		0.02	c0.14
v/s Ratio Perm				0.02	0.05	
v/c Ratio	0.72		0.24	0.09	0.17	0.29
Uniform Delay, d1	19.8		17.0	16.3	10.8	9.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4		0.2	0.1	0.0	0.1
Delay (s)	22.2		17.2	16.3	10.9	9.8
Level of Service	C		B	B	B	A
Approach Delay (s)	22.2		16.7			10.1
Approach LOS	C		B			B
Intersection Summary						
HCM 2000 Control Delay			17.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.45			
Actuated Cycle Length (s)			59.8		Sum of lost time (s)	15.9
Intersection Capacity Utilization			34.8%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	122	0	19	257	19	2	8	32	34	26	58
Future Volume (vph)	24	122	0	19	257	19	2	8	32	34	26	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	12	12	12	15	15	15	15	15	15
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Fr _t					0.988			0.909			0.945	
Fl _t Protected		0.990			0.998			0.995			0.987	
Satd. Flow (prot)	0	3270	0	0	3490	0	0	1853	0	0	1911	0
Fl _t Permitted		0.990			0.998			0.995			0.987	
Satd. Flow (perm)	0	3270	0	0	3490	0	0	1853	0	0	1911	0
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		406			1171			266			576	
Travel Time (s)		9.2			26.6			7.3			15.7	
Confl. Peds. (#/hr)	14			439			13					380
Peak Hour Factor	0.75	0.95	0.92	0.92	0.67	0.53	0.25	0.40	0.55	0.71	0.43	0.78
Adj. Flow (vph)	32	128	0	21	384	36	8	20	58	48	60	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	160	0	0	441	0	0	86	0	0	182	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 2: Mumford Ave. & Route 349 (Chester St.)/Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 AM Combined

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	122	0	19	257	19	2	8	32	34	26	58
Future Volume (Veh/h)	24	122	0	19	257	19	2	8	32	34	26	58
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.95	0.92	0.92	0.67	0.53	0.25	0.40	0.55	0.71	0.43	0.78
Hourly flow rate (vph)	32	128	0	21	384	36	8	20	58	48	60	74
Pedestrians		380						439			14	
Lane Width (ft)		10.0						15.0			15.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		30						52			2	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		406			1171							
pX, platoon unblocked												
vC, conflicting volume	434			567			1349	1107	503	654	1089	604
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	434			567			1349	1107	503	654	1089	604
iC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
iC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			0	78	76	61	36	76
cM capacity (veh/h)	1103			478			8	91	245	124	93	303
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	96	64	213	228	86	182						
Volume Left	32	0	21	0	8	48						
Volume Right	0	0	0	36	58	74						
cSH	1103	1700	478	1700	59	143						
Volume to Capacity	0.03	0.04	0.04	0.13	1.46	1.27						
Queue Length 95th (ft)	2	0	3	0	191	277						
Control Delay (s)	3.0	0.0	1.8	0.0	397.4	227.2						
Lane LOS	A		A		F	F						
Approach Delay (s)	1.8		0.9		397.4	227.2						
Approach LOS					F	F						
Intersection Summary												
Average Delay			87.7									
Intersection Capacity Utilization			40.3%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
3: Benham Rd. & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
2024 AM Combined

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 	 	 	 	
Traffic Volume (vph)	6	116	5	178	513	138	5	65	97	55	80	87
Future Volume (vph)	6	116	5	178	513	138	5	65	97	55	80	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	14	10	10	10
Storage Length (ft)	0		0	0		0	0		250	0		0
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								1.00				
Frt		0.990			0.977				0.850		0.924	
Flt Protected		0.997			0.989			0.994		0.950		
Satd. Flow (prot)	0	3260	0	0	3192	0	0	1728	1689	1652	1606	0
Flt Permitted		0.902			0.721			0.941		0.693		
Satd. Flow (perm)	0	2950	0	0	2327	0	0	1636	1689	1205	1606	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			29				121		49	
Link Speed (mph)		30			30			30		30		30
Link Distance (ft)		1171			1087			448		267		
Travel Time (s)		26.6			24.7			10.2		6.1		
Confl. Peds. (#/hr)							1					
Peak Hour Factor	0.62	0.69	0.38	0.80	0.80	0.86	0.42	0.75	0.80	0.69	0.61	0.64
Adj. Flow (vph)	10	168	13	223	641	160	12	87	121	80	131	136
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	191	0	0	1024	0	0	99	121	80	267	0
Turn Type	Perm	NA		D.Pm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			1 2			4			4	
Permitted Phases	2			2			4		4	4		
Detector Phase	2	2		2	1 2		4	4	4	4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0			9.0	9.0	9.0	9.0	9.0	
Minimum Split (s)	17.2	17.2		17.2			14.5	14.5	14.5	14.5	14.5	
Total Split (s)	39.3	39.3		39.3			25.5	25.5	25.5	25.5	25.5	
Total Split (%)	40.6%	40.6%		40.6%			26.3%	26.3%	26.3%	26.3%	26.3%	
Maximum Green (s)	34.1	34.1		34.1			20.0	20.0	20.0	20.0	20.0	
Yellow Time (s)	4.2	4.2		4.2			3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0			2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.2						5.5	5.5	5.5	5.5	
Lead/Lag	Lag	Lag		Lag			Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0			2.5	2.5	2.5	2.5	2.5	
Recall Mode	Min	Min		Min			None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		29.9			41.7			15.1	15.1	15.1	15.1	
Actuated g/C Ratio		0.43			0.60			0.22	0.22	0.22	0.22	
v/c Ratio		0.15			0.72			0.28	0.26	0.31	0.69	

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	6.0	5.0
Minimum Split (s)	9.1	23.0
Total Split (s)	9.1	23.0
Total Split (%)	9%	24%
Maximum Green (s)	6.0	21.0
Yellow Time (s)	3.0	2.0
All-Red Time (s)	0.1	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	0.2	3.0
Recall Mode	Max	None
Walk Time (s)		7.0
Flash Dont Walk (s)		14.0
Pedestrian Calls (#/hr)		1
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		

Lanes, Volumes, Timings
 3: Benham Rd. & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 AM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		13.9			16.2			28.2	7.7	29.7	32.8	
Queue Delay		0.0			0.0			0.0	0.0	0.0	0.0	
Total Delay		13.9			16.2			28.2	7.7	29.7	32.8	
LOS		B			B			C	A	C	C	
Approach Delay		13.9			16.2			16.9			32.1	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)		21			116			35	0	29	85	
Queue Length 95th (ft)		49			323			81	33	64	124	
Internal Link Dist (ft)		1091			1007			368			187	
Turn Bay Length (ft)									250			
Base Capacity (vph)		1543			1621			500	600	368	525	
Starvation Cap Reductn		0			0			0	0	0	0	
Spillback Cap Reductn		0			0			0	0	0	0	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		0.12			0.63			0.20	0.20	0.22	0.51	

Intersection Summary	
Area Type:	Other
Cycle Length:	96.9
Actuated Cycle Length:	69.2
Natural Cycle:	110
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	19.1
Intersection Capacity Utilization	55.7%
Analysis Period (min)	15
Intersection LOS:	B
ICU Level of Service	B

Splits and Phases: 3: Benham Rd. & Route 349 (Rainville Ave.)

Ø1	Ø2	Ø3	Ø4
9.1 s	39.3 s	23 s	25.5 s

Lane Group	Ø1	Ø3
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)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
 3: Benham Rd. & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 AM Combined

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 				 	 	 	
Traffic Volume (vph)	6	116	5	178	513	138	5	65	97	55	80	87
Future Volume (vph)	6	116	5	178	513	138	5	65	97	55	80	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	14	10	10	10
Total Lost time (s)		5.2			3.1			5.5	5.5	5.5	5.5	
Lane Util. Factor		0.95			0.95			1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00			1.00			1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00	1.00	1.00	1.00	
Frt		0.99			0.98			1.00	0.85	1.00	0.92	
Flt Protected		1.00			0.99			0.99	1.00	0.95	1.00	
Satd. Flow (prot)		3261			3191			1728	1689	1652	1606	
Flt Permitted		0.90			0.72			0.94	1.00	0.69	1.00	
Satd. Flow (perm)		2948			2327			1635	1689	1205	1606	
Peak-hour factor, PHF	0.62	0.69	0.38	0.80	0.80	0.86	0.42	0.75	0.80	0.69	0.61	0.64
Adj. Flow (vph)	10	168	13	222	641	160	12	87	121	80	131	136
RTOR Reduction (vph)	0	5	0	0	13	0	0	0	95	0	38	0
Lane Group Flow (vph)	0	186	0	0	1011	0	0	99	26	80	229	0
Confl. Peds. (#/hr)							1					
Turn Type	Perm	NA		D.Pm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			1 2			4			4	
Permitted Phases	2			2			4		4	4		
Actuated Green, G (s)		29.9			39.4			15.1	15.1	15.1	15.1	
Effective Green, g (s)		29.9			39.4			15.1	15.1	15.1	15.1	
Actuated g/C Ratio		0.43			0.56			0.22	0.22	0.22	0.22	
Clearance Time (s)		5.2						5.5	5.5	5.5	5.5	
Vehicle Extension (s)		3.0						2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)		1255			1306			351	363	259	345	
v/s Ratio Prot												c0.14
v/s Ratio Perm		0.06			c0.43			0.06	0.02	0.07		
v/c Ratio		0.15			0.77			0.28	0.07	0.31	0.66	
Uniform Delay, d1		12.3			12.0			23.0	22.0	23.2	25.2	
Progression Factor		1.00			1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.1			2.9			0.3	0.1	0.5	4.3	
Delay (s)		12.4			14.9			23.3	22.0	23.7	29.5	
Level of Service		B			B			C	C	C	C	
Approach Delay (s)		12.4			14.9			22.6			28.1	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			18.2			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			70.2			Sum of lost time (s)			15.8			
Intersection Capacity Utilization			55.7%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings

Electric Boat - Groton, CT

4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

2024 AM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	71	12	70	82	76	26	264	15	134	516	718
Future Volume (vph)	187	71	12	70	82	76	26	264	15	134	516	718
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	11	10	10	10	10	10	10	10	10	10
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			80		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor								1.00				
Frt		0.985				0.850		0.992				0.850
Flt Protected	0.950	0.983			0.975			0.994		0.950		
Satd. Flow (prot)	1569	1656	0	0	1695	1478	0	3257	0	1652	1739	1478
Flt Permitted	0.950	0.983			0.975			0.815		0.496		
Satd. Flow (perm)	1569	1656	0	0	1695	1478	0	2670	0	862	1739	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				95		5				780
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1087			427			507			1053	
Travel Time (s)		24.7			9.7			11.5			23.9	
Confl. Peds. (#/hr)							10					
Peak Hour Factor	0.87	0.78	0.75	0.65	0.82	0.80	0.54	0.86	0.75	0.85	0.86	0.92
Adj. Flow (vph)	215	91	16	108	100	95	48	307	20	158	600	780
Shared Lane Traffic (%)	26%											
Lane Group Flow (vph)	159	163	0	0	208	95	0	375	0	158	600	780
Turn Type	Split	NA		Split	NA	Prot	Perm	NA		pm+pt	NA	custom
Protected Phases	4	4		5	5	5		2		1	1 2	1 2 4
Permitted Phases							2			1 2		5
Detector Phase	4	4		5	5	5	2	2		1	1 2	1 2 4
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	6.0	6.0	15.0	15.0		6.0		
Minimum Split (s)	12.5	12.5		10.5	10.5	10.5	19.5	19.5		10.5		
Total Split (s)	26.3	26.3		18.8	18.8	18.8	66.3	66.3		15.1		
Total Split (%)	17.5%	17.5%		12.5%	12.5%	12.5%	44.2%	44.2%		10.1%		
Maximum Green (s)	21.8	21.8		14.3	14.3	14.3	61.8	61.8		10.6		
Yellow Time (s)	3.5	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	1.0	1.0	1.0		1.0		
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0		
Total Lost Time (s)	4.5	4.5			4.5	4.5		4.5		4.5		
Lead/Lag	Lag	Lag					Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0		
Recall Mode	None	None		None	None	None	Max	Max		None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	19.6	19.6			14.4	14.4		62.1		72.8	77.3	124.1
Actuated g/C Ratio	0.15	0.15			0.11	0.11		0.48		0.57	0.60	0.97
v/c Ratio	0.67	0.64			1.10	0.38		0.29		0.29	0.57	0.54

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	23.5
Total Split (s)	23.5
Total Split (%)	16%
Maximum Green (s)	21.5
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	3
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	66.7	63.6			146.7	15.7		21.8		14.6	20.0	1.6
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	66.7	63.6			146.7	15.7		21.8		14.6	20.0	1.6
LOS	E	E			F	B		C		B	C	A
Approach Delay		65.1			105.6			21.8			10.1	
Approach LOS		E			F			C			B	
Queue Length 50th (ft)	127	128			-191	0		92		53	278	0
Queue Length 95th (ft)	232	205			#369	40		159		115	510	19
Internal Link Dist (ft)		1007			347			427			973	
Turn Bay Length (ft)										100		
Base Capacity (vph)	267	284			189	249		1293		553	1046	1452
Starvation Cap Reductn	0	0			0	0		0		0	0	0
Spillback Cap Reductn	0	0			0	0		0		0	0	0
Storage Cap Reductn	0	0			0	0		0		0	0	0
Reduced v/c Ratio	0.60	0.57			1.10	0.38		0.29		0.29	0.57	0.54

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 128.5

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.10

Intersection Signal Delay: 30.2

Intersection Capacity Utilization 76.4%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service D

~ 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: 4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

Ø1	Ø2	Ø5	Ø3	Ø4
15.1 s	66.3 s	18.8 s	23.5 s	26.3 s

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Electric Boat - Groton, CT

4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

2024 AM Combined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	71	12	70	82	76	26	264	15	134	516	718
Future Volume (vph)	187	71	12	70	82	76	26	264	15	134	516	718
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	10	10	10	10	10	10	10	10
Total Lost time (s)	4.5	4.5			4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.95	0.95			1.00	1.00		0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99			1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	0.98			0.97	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1569	1657			1695	1478		3255		1652	1739	1478
Flt Permitted	0.95	0.98			0.97	1.00		0.82		0.50	1.00	1.00
Satd. Flow (perm)	1569	1657			1695	1478		2670		862	1739	1478
Peak-hour factor, PHF	0.87	0.78	0.75	0.65	0.82	0.80	0.54	0.86	0.75	0.85	0.86	0.92
Adj. Flow (vph)	215	91	16	108	100	95	48	307	20	158	600	780
RTOR Reduction (vph)	0	3	0	0	0	84	0	3	0	0	0	86
Lane Group Flow (vph)	159	160	0	0	208	11	0	372	0	158	600	694
Confl. Peds. (#/hr)							10					
Turn Type	Split	NA		Split	NA	Prot	Perm	NA		pm+pt	NA	custom
Protected Phases	4	4		5	5	5		2		1	1 2	1 2 4
Permitted Phases							2			1 2		5
Actuated Green, G (s)	19.6	19.6			14.4	14.4		62.1		72.8	77.3	115.8
Effective Green, g (s)	19.6	19.6			14.4	14.4		62.1		72.8	77.3	115.8
Actuated g/C Ratio	0.15	0.15			0.11	0.11		0.48		0.56	0.59	0.89
Clearance Time (s)	4.5	4.5			4.5	4.5		4.5		4.5		
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0		3.0		
Lane Grp Cap (vph)	236	249			187	163		1274		547	1033	1366
v/s Ratio Prot	c0.10	0.10			c0.12	0.01				0.02	c0.35	c0.40
v/s Ratio Perm								0.14		0.14		0.07
v/c Ratio	0.67	0.64			1.11	0.06		0.29		0.29	0.58	0.51
Uniform Delay, d1	52.2	52.0			57.8	51.8		20.7		14.0	16.4	1.4
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	7.4	5.6			99.1	0.2		0.6		0.3	0.8	0.3
Delay (s)	59.6	57.6			157.0	52.0		21.2		14.3	17.2	1.7
Level of Service	E	E			F	D		C		B	B	A
Approach Delay (s)		58.6			124.1			21.2			9.1	
Approach LOS		E			F			C			A	
Intersection Summary												
HCM 2000 Control Delay			30.9									C
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			130.1							20.0		
Intersection Capacity Utilization			76.4%									D
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	54	234	14	36	10	31	21	1	10	89	2
Future Volume (vph)	2	54	234	14	36	10	31	21	1	10	89	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.97			0.99			1.00	
Frt			0.850		0.967			0.994			0.997	
Flt Protected		0.996			0.988			0.974			0.996	
Satd. Flow (prot)	0	1855	1583	0	1780	0	0	1803	0	0	1850	0
Flt Permitted		0.996			0.988			0.974			0.996	
Satd. Flow (perm)	0	1812	1583	0	1730	0	0	1783	0	0	1848	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			411		17			2			1	
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		678			836			704			713	
Travel Time (s)		15.4			22.8			19.2			19.4	
Confl. Peds. (#/hr)	121			46			13			4		
Peak Hour Factor	0.25	0.55	0.57	0.70	0.88	0.50	0.62	0.55	0.25	0.62	0.49	0.50
Adj. Flow (vph)	8	98	411	20	41	20	50	38	4	16	182	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	106	411	0	81	0	0	92	0	0	202	0
Turn Type	Split	NA	pt+ov	Split	NA		Split	NA		Split	NA	
Protected Phases	1	1	1 2	5	5		2	2		4	4	
Permitted Phases												
Detector Phase	1	1	1 2	5	5		2	2		4	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0		6.0	6.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		26.0	26.0		11.0	11.0	
Total Split (s)	20.0	20.0		20.0	20.0		26.0	26.0		20.0	20.0	
Total Split (%)	23.3%	23.3%		23.3%	23.3%		30.2%	30.2%		23.3%	23.3%	
Maximum Green (s)	15.0	15.0		15.0	15.0		20.0	20.0		15.0	15.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			6.0			5.0	
Lead/Lag	Lead	Lead					Lag	Lag				
Lead-Lag Optimize?	Yes	Yes					Yes	Yes				
Vehicle Extension (s)	2.0	2.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		None	None		Max	Max		None	None	
Act Effct Green (s)		9.8	36.5		9.1			20.5			12.1	
Actuated g/C Ratio		0.14	0.53		0.13			0.29			0.17	
v/c Ratio		0.41	0.40		0.33			0.17			0.63	
Control Delay		34.6	2.6		29.0			22.6			37.4	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		34.6	2.6		29.0			22.6			37.4	
LOS		C	A		C			C			D	
Approach Delay		9.2			29.0			22.6			37.4	
Approach LOS		A			C			C			D	
Queue Length 50th (ft)		44	0		26			29			81	

Lanes, Volumes, Timings
 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		55	0		68			43			80	
Internal Link Dist (ft)		598			756			624			633	
Turn Bay Length (ft)												
Base Capacity (vph)		410	1012		407			533			410	
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		0.26	0.41		0.20			0.17			0.49	

Intersection Summary

Area Type: Other

Cycle Length: 86

Actuated Cycle Length: 69.5

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

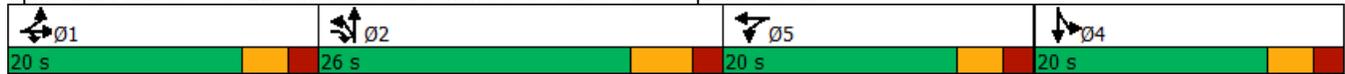
Maximum v/c Ratio: 0.63

Intersection Signal Delay: 18.8 Intersection LOS: B

Intersection Capacity Utilization 39.0% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.



HCM Signalized Intersection Capacity Analysis
 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	54	234	14	36	10	31	21	1	10	89	2
Future Volume (vph)	2	54	234	14	36	10	31	21	1	10	89	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0			6.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Flpb, ped/bikes		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.97			0.99			1.00	
Flt Protected		1.00	1.00		0.99			0.97			1.00	
Satd. Flow (prot)		1856	1583		1779			1803			1850	
Flt Permitted		1.00	1.00		0.99			0.97			1.00	
Satd. Flow (perm)		1856	1583		1779			1803			1850	
Peak-hour factor, PHF	0.25	0.55	0.57	0.70	0.88	0.50	0.62	0.55	0.25	0.62	0.49	0.50
Adj. Flow (vph)	8	98	411	20	41	20	50	38	4	16	182	4
RTOR Reduction (vph)	0	0	205	0	15	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	106	206	0	66	0	0	91	0	0	201	0
Confl. Peds. (#/hr)	121			46			13			4		
Turn Type	Split	NA	pt+ov	Split	NA		Split	NA		Split	NA	
Protected Phases	1	1	1 2	5	5		2	2		4	4	
Permitted Phases												
Actuated Green, G (s)		9.8	35.3		6.9			20.5			12.1	
Effective Green, g (s)		9.8	35.3		6.9			20.5			12.1	
Actuated g/C Ratio		0.14	0.50		0.10			0.29			0.17	
Clearance Time (s)		5.0			5.0			6.0			5.0	
Vehicle Extension (s)		2.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		258	794		174			525			318	
v/s Ratio Prot		c0.06	c0.13		c0.04			0.05			c0.11	
v/s Ratio Perm												
v/c Ratio		0.41	0.26		0.38			0.17			0.63	
Uniform Delay, d1		27.6	10.0		29.7			18.6			27.0	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		0.4	0.1		1.4			0.7			4.1	
Delay (s)		28.0	10.1		31.1			19.3			31.1	
Level of Service		C	B		C			B			C	
Approach Delay (s)		13.8			31.1			19.3			31.1	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			19.8									
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			70.3									
Intersection Capacity Utilization			39.0%									
Analysis Period (min)			15									
c Critical Lane Group												

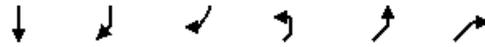
Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↕					↕			↕		
Traffic Volume (vph)	39	19	18	3	5	13	39	67	22	111	6	68
Future Volume (vph)	39	19	18	3	5	13	39	67	22	111	6	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor										1.00		
Frt		0.970					0.927			0.992		
Flt Protected		0.973					0.993			0.993		
Satd. Flow (prot)	0	1758	0	0	0	0	1715	0	0	1835	0	0
Flt Permitted		0.591					0.947			0.993		
Satd. Flow (perm)	0	1068	0	0	0	0	1635	0	0	1832	0	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)		1					41			2		
Link Speed (mph)		25					25			25		
Link Distance (ft)		836					602			696		
Travel Time (s)		22.8					16.4			19.0		
Confl. Peds. (#/hr)									6			
Peak Hour Factor	0.57	0.68	0.75	0.75	0.81	0.68	0.74	0.74	0.75	0.69	0.50	0.82
Adj. Flow (vph)	68	28	24	4	6	19	53	91	29	161	12	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	124	0	0	0	0	169	0	0	202	0	0
Turn Type	Perm	NA			Perm	Perm	NA		Split	NA		Split
Protected Phases		4					4		2	2		1
Permitted Phases	4				4	4						
Detector Phase	4	4			4	4	4		2	2		1
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0	8.0	8.0		10.0	10.0		20.0
Minimum Split (s)	13.0	13.0			13.0	13.0	13.0		15.0	15.0		25.0
Total Split (s)	25.0	25.0			25.0	25.0	25.0		30.0	30.0		25.0
Total Split (%)	20.5%	20.5%			20.5%	20.5%	20.5%		24.6%	24.6%		20.5%
Maximum Green (s)	20.0	20.0			20.0	20.0	20.0		25.0	25.0		20.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)		0.0					0.0			0.0		
Total Lost Time (s)		5.0					5.0			5.0		
Lead/Lag	Lag	Lag			Lag	Lag	Lag		Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		3.0
Recall Mode	None	None			None	None	None		Max	Max		Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		17.1					17.1			25.3		
Actuated g/C Ratio		0.17					0.17			0.26		
v/c Ratio		0.67					0.53			0.43		
Control Delay		58.3					36.0			36.5		
Queue Delay		0.0					0.0			0.0		
Total Delay		58.3					36.0			36.5		
LOS		E					D			D		

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined



Lane Group	SBT	SBR	SBR2	NEL2	NEL	NER	Ø3
Lane Configurations	↕	↕			↕		
Traffic Volume (vph)	196	173	172	6	49	3	
Future Volume (vph)	196	173	172	6	49	3	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt		0.850			0.990		
Flt Protected	0.987				0.956		
Satd. Flow (prot)	1839	1583	0	0	1763	0	
Flt Permitted	0.987				0.956		
Satd. Flow (perm)	1839	1583	0	0	1763	0	
Right Turn on Red			Yes				
Satd. Flow (RTOR)		143					
Link Speed (mph)	25				25		
Link Distance (ft)	1056				667		
Travel Time (s)	28.8				18.2		
Confl. Peds. (#/hr)							
Peak Hour Factor	0.82	0.73	0.95	0.50	0.53	0.38	
Adj. Flow (vph)	239	237	181	12	92	8	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	322	418	0	0	112	0	
Turn Type	NA	Prot		Prot	Prot		
Protected Phases	1	1		5	5	3	
Permitted Phases							
Detector Phase	1	1		5	5		
Switch Phase							
Minimum Initial (s)	20.0	20.0		6.0	6.0	5.0	
Minimum Split (s)	25.0	25.0		11.0	11.0	25.0	
Total Split (s)	25.0	25.0		17.0	17.0	25.0	
Total Split (%)	20.5%	20.5%		13.9%	13.9%	20%	
Maximum Green (s)	20.0	20.0		12.0	12.0	21.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	0.0	
Lost Time Adjust (s)	0.0	0.0			0.0		
Total Lost Time (s)	5.0	5.0			5.0		
Lead/Lag	Lead	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	
Vehicle Extension (s)	3.0	3.0		2.0	2.0	3.0	
Recall Mode	Max	Max		Max	Max	None	
Walk Time (s)						6.0	
Flash Dont Walk (s)						15.0	
Pedestrian Calls (#/hr)						3	
Act Effct Green (s)	20.3	20.3			12.2		
Actuated g/C Ratio	0.20	0.20			0.12		
v/c Ratio	0.86	0.96			0.52		
Control Delay	62.2	61.3			53.1		
Queue Delay	0.0	0.0			0.0		
Total Delay	62.2	61.3			53.1		
LOS	E	E			D		

Phase 2 should only be set to recall

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Approach Delay		58.3					36.0			36.5		
Approach LOS		E					D			D		
Queue Length 50th (ft)		69					69			101		
Queue Length 95th (ft)		117					128			162		
Internal Link Dist (ft)		756					522			616		
Turn Bay Length (ft)												
Base Capacity (vph)		218					366			469		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.57					0.46			0.43		

Intersection Summary

Area Type: Other

Cycle Length: 122

Actuated Cycle Length: 99.2

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 53.7

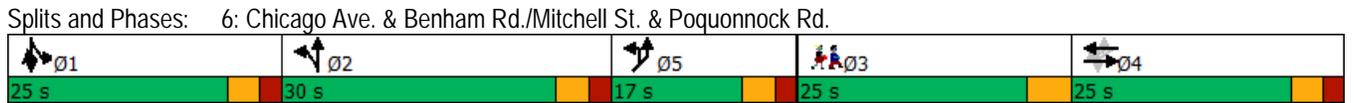
Intersection LOS: D

Intersection Capacity Utilization 53.7%

ICU Level of Service A

Analysis Period (min) 15

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



Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined

	↓	↙	↘	↖	↗	↘	
Lane Group	SBT	SBR	SBR2	NEL2	NEL	NER	Ø3
Approach Delay	61.7				53.1		
Approach LOS	E				D		
Queue Length 50th (ft)	189	173			65		
Queue Length 95th (ft)	#401	#309			85		
Internal Link Dist (ft)	976				587		
Turn Bay Length (ft)							
Base Capacity (vph)	375	437			216		
Starvation Cap Reductn	0	0			0		
Spillback Cap Reductn	0	0			0		
Storage Cap Reductn	0	0			0		
Reduced v/c Ratio	0.86	0.96			0.52		
Intersection Summary							

HCM Signalized Intersection Capacity Analysis
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↕					↕			↕		
Traffic Volume (vph)	39	19	18	3	5	13	39	67	22	111	6	68
Future Volume (vph)	39	19	18	3	5	13	39	67	22	111	6	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0					5.0			5.0		
Lane Util. Factor		1.00					1.00			1.00		
Frbp, ped/bikes		1.00					1.00			1.00		
Flpb, ped/bikes		1.00					1.00			1.00		
Frt		0.97					0.93			0.99		
Flt Protected		0.97					0.99			0.99		
Satd. Flow (prot)		1758					1715			1835		
Flt Permitted		0.59					0.95			0.99		
Satd. Flow (perm)		1067					1637			1835		
Peak-hour factor, PHF	0.57	0.68	0.75	0.75	0.81	0.68	0.74	0.74	0.75	0.69	0.50	0.82
Adj. Flow (vph)	68	28	24	4	6	19	53	91	29	161	12	83
RTOR Reduction (vph)	0	1	0	0	0	0	34	0	0	2	0	0
Lane Group Flow (vph)	0	123	0	0	0	0	135	0	0	200	0	0
Confl. Peds. (#/hr)									6			
Turn Type	Perm	NA			Perm	Perm	NA		Split	NA		Split
Protected Phases		4					4		2	2		1
Permitted Phases	4				4	4						
Actuated Green, G (s)		17.1					17.1			25.3		
Effective Green, g (s)		17.1					17.1			25.3		
Actuated g/C Ratio		0.17					0.17			0.25		
Clearance Time (s)		5.0					5.0			5.0		
Vehicle Extension (s)		4.0					4.0			4.0		
Lane Grp Cap (vph)		178					273			453		
v/s Ratio Prot										c0.11		
v/s Ratio Perm		c0.12					0.08					
v/c Ratio		0.69					0.49			0.44		
Uniform Delay, d1		40.1					38.7			32.5		
Progression Factor		1.00					1.00			1.00		
Incremental Delay, d2		11.8					1.9			3.1		
Delay (s)		52.0					40.6			35.7		
Level of Service		D					D			D		
Approach Delay (s)		52.0					40.6			35.7		
Approach LOS		D					D			D		
Intersection Summary												
HCM 2000 Control Delay			61.1				HCM 2000 Level of Service			E		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			102.3				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			53.7%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined

	↓	↙	↘	↖	↗	↘
Movement	SBT	SBR	SBR2	NEL2	NEL	NER
Lane Configurations	↕	↕			↕	
Traffic Volume (vph)	196	173	172	6	49	3
Future Volume (vph)	196	173	172	6	49	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00			1.00	
Frbp, ped/bikes	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00	
Frt	1.00	0.85			0.99	
Flt Protected	0.99	1.00			0.96	
Satd. Flow (prot)	1839	1583			1763	
Flt Permitted	0.99	1.00			0.96	
Satd. Flow (perm)	1839	1583			1763	
Peak-hour factor, PHF	0.82	0.73	0.95	0.50	0.53	0.38
Adj. Flow (vph)	239	237	181	12	92	8
RTOR Reduction (vph)	0	115	0	0	0	0
Lane Group Flow (vph)	322	303	0	0	112	0
Confl. Peds. (#/hr)						
Turn Type	NA	Prot		Prot	Prot	
Protected Phases	1	1		5	5	
Permitted Phases						
Actuated Green, G (s)	20.3	20.3			12.2	
Effective Green, g (s)	20.3	20.3			12.2	
Actuated g/C Ratio	0.20	0.20			0.12	
Clearance Time (s)	5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			2.0	
Lane Grp Cap (vph)	364	314			210	
v/s Ratio Prot	0.18	c0.19			c0.06	
v/s Ratio Perm						
v/c Ratio	0.88	0.97			0.53	
Uniform Delay, d1	39.9	40.7			42.4	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	25.4	42.9			9.4	
Delay (s)	65.3	83.5			51.7	
Level of Service	E	F			D	
Approach Delay (s)	75.6				51.7	
Approach LOS	E				D	
Intersection Summary						

Lanes, Volumes, Timings
 7: M-Lot Driveway & Route 649 (Poquonnock Rd.)

Electric Boat - Groton, CT
 2024 AM Combined

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	
Traffic Volume (vph)	299	145	59	266	23	6
Future Volume (vph)	299	145	59	266	23	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	15	15	15
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.946				0.947	
Flt Protected				0.991	0.970	
Satd. Flow (prot)	3683	0	0	3858	1882	0
Flt Permitted				0.991	0.970	
Satd. Flow (perm)	3683	0	0	3858	1882	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	504			552	258	
Travel Time (s)	13.7			15.1	7.0	
Confl. Peds. (#/hr)		1				
Peak Hour Factor	0.90	0.78	0.85	0.91	0.92	0.38
Adj. Flow (vph)	332	186	69	292	25	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	518	0	0	361	41	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.4%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 7: M-Lot Driveway & Route 649 (Poquonnock Rd.)

Electric Boat - Groton, CT
 2024 AM Combined

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘↘	
Traffic Volume (veh/h)	299	145	59	266	23	6
Future Volume (Veh/h)	299	145	59	266	23	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.78	0.85	0.91	0.92	0.38
Hourly flow rate (vph)	332	186	69	292	25	16
Pedestrians						1
Lane Width (ft)						15.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	504					
pX, platoon unblocked						
vC, conflicting volume			519		710	260
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			519		710	260
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		93	98
cM capacity (veh/h)			1042		343	738
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	221	297	166	195	41	
Volume Left	0	0	69	0	25	
Volume Right	0	186	0	0	16	
cSH	1700	1700	1042	1700	434	
Volume to Capacity	0.13	0.17	0.07	0.11	0.09	
Queue Length 95th (ft)	0	0	5	0	8	
Control Delay (s)	0.0	0.0	4.0	0.0	14.2	
Lane LOS	A			B		
Approach Delay (s)	0.0		1.8	14.2		
Approach LOS				B		
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			35.4%	ICU Level of Service	A	
Analysis Period (min)	15					

Lanes, Volumes, Timings
8: Mitchell St./North St. & Meridian St.

Electric Boat - Groton, CT
2024 AM Combined

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	31	3	143	27	51	0	300	65	94	639	5
Future Volume (vph)	11	31	3	143	27	51	0	300	65	94	639	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	95		0	60		115	60		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			180			30			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		0.99								
Frt		0.985			0.901				0.850		0.997	
Flt Protected		0.987		0.950						0.950		
Satd. Flow (prot)	0	1992	0	1770	1678	0	1863	3539	1583	1770	1857	0
Flt Permitted		0.919		0.761						0.540		
Satd. Flow (perm)	0	1854	0	1408	1678	0	1863	3539	1583	1006	1857	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			57				87		1	
Link Speed (mph)		30			25			30		30		30
Link Distance (ft)		834			697			953		634		
Travel Time (s)		19.0			19.0			21.7		14.4		
Confl. Peds. (#/hr)	1			3								
Peak Hour Factor	0.55	0.68	0.38	0.87	0.93	0.89	0.92	0.87	0.75	0.60	0.91	0.42
Adj. Flow (vph)	20	46	8	164	29	57	0	345	87	157	702	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	74	0	164	86	0	0	345	87	157	714	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	D.P+P	NA	
Protected Phases		4			4			2		1	1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	1	2
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		25.0	25.0	25.0	5.0		
Minimum Split (s)	12.0	12.0		12.0	12.0		30.0	30.0	30.0	8.1		
Total Split (s)	19.0	19.0		19.0	19.0		30.0	30.0	30.0	8.1		
Total Split (%)	24.3%	24.3%		24.3%	24.3%		38.4%	38.4%	38.4%	10.4%		
Maximum Green (s)	15.0	15.0		15.0	15.0		25.0	25.0	25.0	5.0		
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	0.1		
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)		4.0		4.0	4.0		5.0	5.0	5.0	3.1		
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		14.5		14.5	14.5			31.4	31.4	53.4	56.5	
Actuated g/C Ratio		0.19		0.19	0.19			0.40	0.40	0.68	0.72	
v/c Ratio		0.21		0.63	0.24			0.24	0.13	0.18	0.53	

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	27%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings
 8: Mitchell St./North St. & Meridian St.

Electric Boat - Groton, CT
 2024 AM Combined

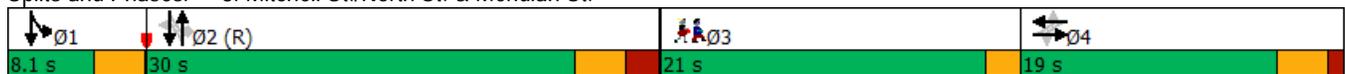
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		24.3		39.2	12.7			17.9	5.3	4.7	7.6	
Queue Delay		0.0		0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay		24.3		39.2	12.7			17.9	5.3	4.7	7.6	
LOS		C		D	B			B	A	A	A	
Approach Delay		24.3			30.1			15.4			7.1	
Approach LOS		C			C			B			A	
Queue Length 50th (ft)		28		75	12			62	0	18	124	
Queue Length 95th (ft)		41		116	43			95	19	31	278	
Internal Link Dist (ft)		754			617			873			554	
Turn Bay Length (ft)				95					115	60		
Base Capacity (vph)		399		299	401			1424	689	884	1343	
Starvation Cap Reductn		0		0	0			0	0	0	0	
Spillback Cap Reductn		0		0	0			0	0	0	0	
Storage Cap Reductn		0		0	0			0	0	0	0	
Reduced v/c Ratio		0.19		0.55	0.21			0.24	0.13	0.18	0.53	

Intersection Summary

Area Type: Other
 Cycle Length: 78.1
 Actuated Cycle Length: 78.1
 Offset: 8.1 (10%), Referenced to phase 2:NBSB and 6:, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 13.6
 Intersection Capacity Utilization 80.2%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 8: Mitchell St./North St. & Meridian St.



Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 8: Mitchell St./North St. & Meridian St.

Electric Boat - Groton, CT
 2024 AM Combined

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	11	31	3	143	27	51	0	300	65	94	639	5	
Future Volume (vph)	11	31	3	143	27	51	0	300	65	94	639	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	15	12	12	12	12	12	12	12	12	12	12	
Total Lost time (s)		4.0		4.0	4.0			5.0	5.0	3.1	3.1		
Lane Util. Factor		1.00		1.00	1.00			0.95	1.00	1.00	1.00		
Frbp, ped/bikes		1.00		1.00	1.00			1.00	1.00	1.00	1.00		
Flpb, ped/bikes		1.00		0.99	1.00			1.00	1.00	1.00	1.00		
Frt		0.99		1.00	0.90			1.00	0.85	1.00	1.00		
Flt Protected		0.99		0.95	1.00			1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1991		1757	1678			3539	1583	1770	1858		
Flt Permitted		0.92		0.76	1.00			1.00	1.00	0.54	1.00		
Satd. Flow (perm)		1854		1407	1678			3539	1583	1007	1858		
Peak-hour factor, PHF	0.55	0.68	0.38	0.87	0.93	0.89	0.92	0.87	0.75	0.60	0.91	0.42	
Adj. Flow (vph)	20	46	8	164	29	57	0	345	87	157	702	12	
RTOR Reduction (vph)	0	6	0	0	46	0	0	0	52	0	0	0	
Lane Group Flow (vph)	0	68	0	164	40	0	0	345	35	157	714	0	
Confl. Peds. (#/hr)	1			3									
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	D.P+P	NA		
Protected Phases		4			4			2		1	1	2	
Permitted Phases	4			4			2		2	2			
Actuated Green, G (s)		14.5		14.5	14.5			31.4	31.4	51.5	54.6		
Effective Green, g (s)		14.5		14.5	14.5			31.4	31.4	51.5	54.6		
Actuated g/C Ratio		0.19		0.19	0.19			0.40	0.40	0.66	0.70		
Clearance Time (s)		4.0		4.0	4.0			5.0	5.0	3.1			
Vehicle Extension (s)		3.0		3.0	3.0			3.0	3.0	3.0			
Lane Grp Cap (vph)		344		261	311			1422	636	860	1298		
v/s Ratio Prot					0.02			0.10		0.05	c0.38		
v/s Ratio Perm		0.04		c0.12					0.02	0.07			
v/c Ratio		0.20		0.63	0.13			0.24	0.05	0.18	0.55		
Uniform Delay, d1		26.9		29.3	26.5			15.5	14.3	5.0	5.7		
Progression Factor		1.00		1.00	1.00			1.00	1.00	1.00	1.00		
Incremental Delay, d2		0.3		4.7	0.2			0.4	0.2	0.1	0.5		
Delay (s)		27.2		34.0	26.7			15.9	14.4	5.1	6.2		
Level of Service		C		C	C			B	B	A	A		
Approach Delay (s)		27.2			31.5			15.6			6.0		
Approach LOS		C			C			B			A		
Intersection Summary													
HCM 2000 Control Delay			13.4		HCM 2000 Level of Service					B			
HCM 2000 Volume to Capacity ratio			0.61										
Actuated Cycle Length (s)			78.1		Sum of lost time (s)					14.1			
Intersection Capacity Utilization			80.2%		ICU Level of Service					D			
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings
9: North St. & Broad St.

Electric Boat - Groton, CT
2024 AM Combined

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	11	9	146	8	1	4	311	56	1	606	5
Future Volume (vph)	23	11	9	146	8	1	4	311	56	1	606	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	11	11	11	11	11	11	12	14	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		1.00						1.00			1.00	
Fr _t		0.971			0.962			0.973			0.999	
Fl _t Protected		0.974		0.950				0.999				
Satd. Flow (prot)	0	1997	0	1711	1732	0	0	3326	0	0	1985	0
Fl _t Permitted		0.870		0.726				0.944			0.998	
Satd. Flow (perm)	0	1778	0	1307	1732	0	0	3142	0	0	1981	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			4			79			2	
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		699			143			486			286	
Travel Time (s)		19.1			3.9			11.0			6.5	
Confl. Peds. (#/hr)	6						1			1		
Peak Hour Factor	0.92	0.92	0.92	0.74	0.67	0.25	0.50	0.87	0.69	0.25	0.82	0.62
Adj. Flow (vph)	25	12	10	197	12	4	8	357	81	4	739	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	0	197	16	0	0	446	0	0	751	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		25.0	25.0		25.0	25.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		30.0	30.0		30.0	30.0	
Total Split (s)	19.0	19.0		19.0	19.0		30.0	30.0		30.0	30.0	
Total Split (%)	38.8%	38.8%		38.8%	38.8%		61.2%	61.2%		61.2%	61.2%	
Maximum Green (s)	15.0	15.0		15.0	15.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		11.7		11.7	11.7			29.2			29.2	
Actuated g/C Ratio		0.25		0.25	0.25			0.63			0.63	
v/c Ratio		0.10		0.60	0.04			0.22			0.60	
Control Delay		11.1		23.1	11.0			5.0			10.9	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		11.1		23.1	11.0			5.0			10.9	
LOS		B		C	B			A			B	
Approach Delay		11.1			22.2			5.0			10.9	
Approach LOS		B			C			A			B	

Lanes, Volumes, Timings
9: North St. & Broad St.

Electric Boat - Groton, CT
2024 AM Combined

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		7		45	2			22			125	
Queue Length 95th (ft)		25		73	9			45			220	
Internal Link Dist (ft)		619			63			406			206	
Turn Bay Length (ft)												
Base Capacity (vph)		582		423	563			2004			1246	
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		0.08		0.47	0.03			0.22			0.60	

Intersection Summary

Area Type:	Other
Cycle Length:	49
Actuated Cycle Length:	46.4
Natural Cycle:	45
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.60
Intersection Signal Delay:	10.8
Intersection LOS:	B
Intersection Capacity Utilization:	53.9%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 9: North St. & Broad St.



HCM Signalized Intersection Capacity Analysis
 9: North St. & Broad St.

Electric Boat - Groton, CT
 2024 AM Combined

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	11	9	146	8	1	4	311	56	1	606	5
Future Volume (vph)	23	11	9	146	8	1	4	311	56	1	606	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	11	11	11	11	11	12	14	12
Total Lost time (s)		4.0		4.0	4.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			1.00	
Frbp, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.97		1.00	0.96			0.97			1.00	
Flt Protected		0.97		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1989		1711	1733			3325			1984	
Flt Permitted		0.87		0.73	1.00			0.94			1.00	
Satd. Flow (perm)		1776		1308	1733			3140			1980	
Peak-hour factor, PHF	0.92	0.92	0.92	0.74	0.67	0.25	0.50	0.87	0.69	0.25	0.82	0.62
Adj. Flow (vph)	25	12	10	197	12	4	8	357	81	4	739	8
RTOR Reduction (vph)	0	8	0	0	3	0	0	32	0	0	1	0
Lane Group Flow (vph)	0	39	0	197	13	0	0	414	0	0	750	0
Confl. Peds. (#/hr)	6							1			1	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2				2
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		10.1		10.1	10.1			28.1			28.1	
Effective Green, g (s)		10.1		10.1	10.1			28.1			28.1	
Actuated g/C Ratio		0.21		0.21	0.21			0.60			0.60	
Clearance Time (s)		4.0		4.0	4.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		380		279	370			1869			1178	
v/s Ratio Prot					0.01							
v/s Ratio Perm		0.02		c0.15				0.13			c0.38	
v/c Ratio		0.10		0.71	0.03			0.22			0.64	
Uniform Delay, d1		14.9		17.2	14.7			4.5			6.2	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.1		7.9	0.0			0.3			2.6	
Delay (s)		15.0		25.1	14.7			4.7			8.9	
Level of Service		B		C	B			A			A	
Approach Delay (s)		15.0			24.3			4.7			8.9	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.1					HCM 2000 Level of Service		B		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			47.2					Sum of lost time (s)		9.0		
Intersection Capacity Utilization			53.9%					ICU Level of Service		A		
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
2024 AM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	32	38	1	34	63	45	273	10	48	540	311
Future Volume (vph)	79	32	38	1	34	63	45	273	10	48	540	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	105		0	0		0	38		0	75		0
Storage Lanes	2		0	0		1	1		0	1		1
Taper Length (ft)	300			25			25			75		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt		0.922				0.850		0.991				0.850
Flt Protected	0.950				0.997		0.950			0.950		
Satd. Flow (prot)	3319	1717	0	0	1857	1583	1770	3507	0	1770	1863	1583
Flt Permitted	0.950				0.997		0.950			0.950		
Satd. Flow (perm)	3319	1717	0	0	1857	1583	1766	3507	0	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		38				110		5				202
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		550			441			176			423	
Travel Time (s)		15.0			12.0			4.0			11.5	
Confl. Peds. (#/hr)							2					
Peak Hour Factor	0.84	0.78	0.84	0.25	0.52	0.80	0.85	0.91	0.50	0.65	0.79	0.92
Adj. Flow (vph)	94	41	45	4	65	79	53	300	20	74	684	338
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	86	0	0	69	79	53	320	0	74	684	338
Turn Type	Split	NA		Split	NA	pt+ov	Split	NA		Split	NA	Free
Protected Phases	4	4		5	5	15	2	2		1	1	
Permitted Phases												Free
Detector Phase	4	4		5	5	15	2	2		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0		15.0	15.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		25.0	25.0		20.0	20.0	
Total Split (s)	20.0	20.0		17.0	17.0		25.0	25.0		29.0	29.0	
Total Split (%)	16.8%	16.8%		14.3%	14.3%		21.0%	21.0%		24.4%	24.4%	
Maximum Green (s)	15.0	15.0		12.0	12.0		20.0	20.0		24.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag					Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		3.0	3.0		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	9.1	9.1			9.2	35.3	20.7	20.7		24.8	24.8	85.2
Actuated g/C Ratio	0.11	0.11			0.11	0.41	0.24	0.24		0.29	0.29	1.00
v/c Ratio	0.27	0.40			0.34	0.11	0.12	0.37		0.14	1.26	0.21

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	24%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 AM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	41.0	31.1			44.7	1.6	31.9	31.2		28.7	162.1	0.3
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	41.0	31.1			44.7	1.6	31.9	31.2		28.7	162.1	0.3
LOS	D	C			D	A	C	C		C	F	A
Approach Delay		36.3			21.7			31.3			103.2	
Approach LOS		D			C			C			F	
Queue Length 50th (ft)	23	23			33	0	21	68		27	~430	0
Queue Length 95th (ft)	56	68			54	6	68	163		63	#841	0
Internal Link Dist (ft)		470			361			96			343	
Turn Bay Length (ft)	105						38			75		
Base Capacity (vph)	603	343			270	752	429	854		515	542	1583
Starvation Cap Reductn	0	0			0	0	0	0		0	0	0
Spillback Cap Reductn	0	0			0	0	0	0		0	0	0
Storage Cap Reductn	0	0			0	0	0	0		0	0	0
Reduced v/c Ratio	0.16	0.25			0.26	0.11	0.12	0.37		0.14	1.26	0.21

Intersection Summary

Area Type: Other
 Cycle Length: 119
 Actuated Cycle Length: 85.2
 Natural Cycle: 130
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.26
 Intersection Signal Delay: 74.9
 Intersection Capacity Utilization 57.1%
 Analysis Period (min) 15
 Intersection LOS: E
 ICU Level of Service B

~ 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: 10: North St./I-95 On/Off Ramps & Bridge St.

Ø1 29 s	Ø2 25 s	Ø5 17 s	Ø3 28 s	Ø4 20 s
------------	------------	------------	------------	------------

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 AM Combined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	79	32	38	1	34	63	45	273	10	48	540	311	
Future Volume (vph)	79	32	38	1	34	63	45	273	10	48	540	311	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	11	12	12	12	12	12	12	12	12	12	12	12	
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	4.0	
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.92			1.00	0.85	1.00	0.99		1.00	1.00	0.85	
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3319	1717			1857	1583	1770	3506		1770	1863	1583	
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3319	1717			1857	1583	1770	3506		1770	1863	1583	
Peak-hour factor, PHF	0.84	0.78	0.84	0.25	0.52	0.80	0.85	0.91	0.50	0.65	0.79	0.92	
Adj. Flow (vph)	94	41	45	4	65	79	53	300	20	74	684	338	
RTOR Reduction (vph)	0	34	0	0	0	51	0	4	0	0	0	0	
Lane Group Flow (vph)	94	52	0	0	69	28	53	316	0	74	684	338	
Confl. Peds. (#/hr)							2						
Turn Type	Split	NA		Split	NA	pt+ov	Split	NA		Split	NA	Free	
Protected Phases	4	4		5	5	15	2	2		1	1		
Permitted Phases												Free	
Actuated Green, G (s)	9.1	9.1			7.2	32.0	20.7	20.7		24.8	24.8	90.2	
Effective Green, g (s)	9.1	9.1			7.2	32.0	20.7	20.7		24.8	24.8	90.2	
Actuated g/C Ratio	0.10	0.10			0.08	0.35	0.23	0.23		0.27	0.27	1.00	
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0		
Vehicle Extension (s)	2.5	2.5			3.0		3.0	3.0		2.5	2.5		
Lane Grp Cap (vph)	334	173			148	561	406	804		486	512	1583	
v/s Ratio Prot	0.03	0.03			c0.04	0.02	0.03	c0.09		0.04	c0.37		
v/s Ratio Perm												c0.21	
v/c Ratio	0.28	0.30			0.47	0.05	0.13	0.39		0.15	1.34	0.21	
Uniform Delay, d1	37.5	37.6			39.7	19.1	27.6	29.4		24.7	32.7	0.0	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.7			2.3	0.0	0.7	1.4		0.1	164.1	0.3	
Delay (s)	37.9	38.3			42.0	19.1	28.3	30.9		24.9	196.8	0.3	
Level of Service	D	D			D	B	C	C		C	F	A	
Approach Delay (s)		38.1			29.8			30.5			124.6		
Approach LOS		D			C			C			F		
Intersection Summary													
HCM 2000 Control Delay			88.6		HCM 2000 Level of Service					F			
HCM 2000 Volume to Capacity ratio			0.76										
Actuated Cycle Length (s)			90.2		Sum of lost time (s)					25.0			
Intersection Capacity Utilization			57.1%		ICU Level of Service					B			
Analysis Period (min)			15										

c Critical Lane Group

Lanes, Volumes, Timings
 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Electric Boat - Groton, CT
 2024 AM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	44	88	72	66	69	33	464	14	33	1274	147
Future Volume (vph)	88	44	88	72	66	69	33	464	14	33	1274	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	230		0	90		90	120		150	130		120
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	300			120			150			300		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.95	1.00
Ped Bike Factor												
Fr _t		0.906				0.850		0.995				0.850
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1688	0	1770	1863	1583	1770	5060	0	1770	3539	1583
Fl _t Permitted	0.950			0.635			0.950			0.950		
Satd. Flow (perm)	3433	1688	0	1183	1863	1583	1770	5060	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		62				91		3				103
Link Speed (mph)		25			25			45				45
Link Distance (ft)		588			486			576				595
Travel Time (s)		16.0			13.3			8.7				9.0
Confl. Peds. (#/hr)						1						
Peak Hour Factor	0.83	0.60	0.72	0.70	0.73	0.84	0.88	0.83	0.73	0.61	0.84	0.70
Adj. Flow (vph)	106	73	122	103	90	82	38	559	19	54	1517	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	106	195	0	103	90	82	38	578	0	54	1517	210
Turn Type	Prot	NA		Perm	NA	pt+ov	Prot	NA		Prot	NA	custom
Protected Phases	4	4 8			8	5 8	1	6		5	2	2 4
Permitted Phases				8								6
Detector Phase	4	4 8		8	8	5 8	1	6		5	2	2 4
Switch Phase												
Minimum Initial (s)	5.0			9.0	9.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	10.9			14.7	14.7		11.8	20.0		11.8	20.0	
Total Split (s)	24.9			26.7	26.7		17.8	35.0		17.8	35.0	
Total Split (%)	17.4%			18.6%	18.6%		12.4%	24.4%		12.4%	24.4%	
Maximum Green (s)	19.0			21.0	21.0		11.0	30.0		11.0	30.0	
Yellow Time (s)	3.3			3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.6			2.4	2.4		3.8	2.0		3.8	2.0	
Lost Time Adjust (s)	0.0			0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.9			5.7	5.7		6.8	5.0		6.8	5.0	
Lead/Lag	Lag						Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes						Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.5		2.0	2.5	
Recall Mode	None			None	None		None	Max		None	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	9.8	28.4		12.7	12.7	25.8	6.5	30.8		7.2	34.1	49.9
Actuated g/C Ratio	0.12	0.35		0.16	0.16	0.32	0.08	0.38		0.09	0.42	0.61
v/c Ratio	0.26	0.31		0.56	0.31	0.15	0.27	0.30		0.35	1.02	0.21
Control Delay	36.2	14.7		46.3	35.6	4.9	44.3	20.6		44.8	57.7	5.7

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	39.0
Total Split (s)	39.0
Total Split (%)	27%
Maximum Green (s)	35.0
Yellow Time (s)	4.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	28.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lanes, Volumes, Timings
 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Electric Boat - Groton, CT
 2024 AM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	36.2	14.7		46.3	35.6	4.9	44.3	20.6		44.8	57.7	5.7
LOS	D	B		D	D	A	D	C		D	E	A
Approach Delay		22.3			30.4			22.1			51.2	
Approach LOS		C			C			C			D	
Queue Length 50th (ft)	25	49		50	42	0	19	74		26	~478	23
Queue Length 95th (ft)	50	54		83	73	22	54	125		46	#723	45
Internal Link Dist (ft)		508			406			496			515	
Turn Bay Length (ft)	230			90		90	120			130		120
Base Capacity (vph)	822	796		313	493	618	245	1916		245	1481	1187
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.13	0.24		0.33	0.18	0.13	0.16	0.30		0.22	1.02	0.18

Intersection Summary

Area Type: Other
 Cycle Length: 143.4
 Actuated Cycle Length: 81.4
 Natural Cycle: 150
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 40.3 Intersection LOS: D
 Intersection Capacity Utilization 64.3% ICU Level of Service C
 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: 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Ø1	Ø2	Ø3	Ø4	Ø8
17.8 s	35 s	39 s	24.9 s	26.7 s
Ø5	Ø6			
17.8 s	35 s			

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Electric Boat - Groton, CT
 2024 AM Combined

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	44	88	72	66	69	33	464	14	33	1274	147
Future Volume (vph)	88	44	88	72	66	69	33	464	14	33	1274	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9		5.7	5.7	6.8	6.8	5.0		6.8	5.0	5.0
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.95	1.00
Frb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1688		1770	1863	1583	1770	5060		1770	3539	1583
Flt Permitted	0.95	1.00		0.64	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1688		1183	1863	1583	1770	5060		1770	3539	1583
Peak-hour factor, PHF	0.83	0.60	0.72	0.70	0.73	0.84	0.88	0.83	0.73	0.61	0.84	0.70
Adj. Flow (vph)	106	73	122	103	90	82	38	559	19	54	1517	210
RTOR Reduction (vph)	0	41	0	0	0	64	0	2	0	0	0	43
Lane Group Flow (vph)	106	154	0	103	90	18	38	576	0	54	1517	167
Confl. Peds. (#/hr)						1						
Turn Type	Prot	NA		Perm	NA	pt+ov	Prot	NA		Prot	NA	custom
Protected Phases	4	4 8			8	5 8	1	6		5	2	2 4
Permitted Phases				8								6
Actuated Green, G (s)	9.8	28.4		12.7	12.7	24.3	4.0	32.2		5.9	34.1	48.9
Effective Green, g (s)	9.8	28.4		12.7	12.7	18.6	4.0	32.2		5.9	34.1	48.9
Actuated g/C Ratio	0.12	0.34		0.15	0.15	0.22	0.05	0.38		0.07	0.41	0.58
Clearance Time (s)	5.9			5.7	5.7		6.8	5.0		6.8	5.0	
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	400	570		178	281	350	84	1939		124	1436	921
v/s Ratio Prot	0.03	c0.09			0.05	0.01	0.02	0.11		c0.03	c0.43	0.11
v/s Ratio Perm				c0.09								
v/c Ratio	0.27	0.27		0.58	0.32	0.05	0.45	0.30		0.44	1.06	0.18
Uniform Delay, d1	33.8	20.3		33.2	31.8	25.8	38.9	18.0		37.5	24.9	8.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1		2.8	0.2	0.0	1.4	0.4		0.9	40.2	0.0
Delay (s)	33.9	20.3		36.0	32.0	25.8	40.3	18.4		38.3	65.2	8.2
Level of Service	C	C		D	C	C	D	B		D	E	A
Approach Delay (s)		25.1			31.6			19.8			57.6	
Approach LOS		C			C			B			E	
Intersection Summary												
HCM 2000 Control Delay			44.1									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			84.0									Sum of lost time (s) 27.4
Intersection Capacity Utilization			64.3%									ICU Level of Service C
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

Electric Boat - Groton, CT

12: Route 649 (Rainville Ave.)/Old Farms Rd. & Route 649 (Poquonnock Rd.) 2024 AM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	130	3	191	90	8	3	7	299	15	28	18
Future Volume (vph)	10	130	3	191	90	8	3	7	299	15	28	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	11	11	11	15	15	15
Storage Length (ft)	155		0	0		0	0		85	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	135			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												1.00
Fr _t		0.993			0.985				0.850		0.959	
Fl _t Protected	0.950			0.950				0.986			0.987	
Satd. Flow (prot)	1711	1788	0	1652	1774	0	0	1775	1531	0	1939	0
Fl _t Permitted	0.678			0.646				0.900			0.903	
Satd. Flow (perm)	1221	1788	0	1123	1774	0	0	1621	1531	0	1772	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			9				365		24	
Link Speed (mph)		30			30			75			30	
Link Distance (ft)		529			504			284			348	
Travel Time (s)		12.0			11.5			2.6			7.9	
Confl. Peds. (#/hr)										4		
Peak Hour Factor	0.83	0.77	0.38	0.86	0.81	0.67	0.38	0.35	0.82	0.62	0.68	0.64
Adj. Flow (vph)	12	169	8	222	111	12	8	20	365	24	41	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	12	177	0	222	123	0	0	28	365	0	93	0
Turn Type	custom	NA		custom	NA		Perm	NA	custom	Perm	NA	
Protected Phases	1	1 2		3	2 3			5	5		5	
Permitted Phases	2			2			5		3	5		
Detector Phase	1	1 2		3	2 3		5	5	5	5	5	
Switch Phase												
Minimum Initial (s)	3.0			3.0			5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	7.0			7.2			11.2	11.2	11.2	11.2	11.2	
Total Split (s)	9.0			14.2			22.2	22.2	22.2	22.2	22.2	
Total Split (%)	11.1%			17.5%			27.3%	27.3%	27.3%	27.3%	27.3%	
Maximum Green (s)	5.0			10.0			16.0	16.0	16.0	16.0	16.0	
Yellow Time (s)	3.0			3.0			4.2	4.2	4.2	4.2	4.2	
All-Red Time (s)	1.0			1.2			2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0			0.0				0.0	0.0		0.0	
Total Lost Time (s)	4.0			4.2				6.2	6.2		6.2	
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	1.0			2.0			2.0	2.0	2.0	2.0	2.0	
Recall Mode	None			None			None	None	None	None	None	
Act Effct Green (s)	36.8	40.8		39.1	35.9			8.0	19.6		8.0	
Actuated g/C Ratio	0.52	0.58		0.55	0.51			0.11	0.28		0.11	
v/c Ratio	0.02	0.17		0.33	0.14			0.15	0.53		0.42	
Control Delay	8.4	8.4		6.1	5.2			30.1	5.4		28.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	8.4	8.4		6.1	5.2			30.1	5.4		28.8	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	20.8
Total Split (s)	35.8
Total Split (%)	44%
Maximum Green (s)	30.0
Yellow Time (s)	3.8
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	5.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A		A	A			C	A		C	
Approach Delay		8.4			5.8			7.2			28.8	
Approach LOS		A			A			A			C	
Queue Length 50th (ft)	2	30		21	11			11	0		28	
Queue Length 95th (ft)	10	64		53	29			13	36		49	
Internal Link Dist (ft)		449			424			204			268	
Turn Bay Length (ft)	155								85			
Base Capacity (vph)	673	1016		738	972			368	682		421	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.02	0.17		0.30	0.13			0.08	0.54		0.22	

Intersection Summary

Area Type: Other
 Cycle Length: 81.2
 Actuated Cycle Length: 70.7
 Natural Cycle: 55
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 8.9 Intersection LOS: A
 Intersection Capacity Utilization 43.4% ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 12: Route 649 (Rainville Ave.)/Old Farms Rd. & Route 649 (Poquonnock Rd.)

01	02	05	03
9 s	35.8 s	22.2 s	14.2 s

Lane Group	Ø2
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Electric Boat - Groton, CT

12: Route 649 (Rainville Ave.)/Old Farms Rd. & Route 649 (Poquonnock Rd.) 2024 AM Combined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	130	3	191	90	8	3	7	299	15	28	18
Future Volume (vph)	10	130	3	191	90	8	3	7	299	15	28	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	11	11	11	11	11	15	15	15
Total Lost time (s)	4.0	4.0		4.2	5.8			6.2	6.2		6.2	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Fr t	1.00	0.99		1.00	0.99			1.00	0.85		0.96	
Fl t Protected	0.95	1.00		0.95	1.00			0.99	1.00		0.99	
Satd. Flow (prot)	1711	1788		1652	1774			1775	1531		1936	
Fl t Permitted	0.68	1.00		0.65	1.00			0.90	1.00		0.90	
Satd. Flow (perm)	1221	1788		1122	1774			1621	1531		1770	
Peak-hour factor, PHF	0.83	0.77	0.38	0.86	0.81	0.67	0.38	0.35	0.82	0.62	0.68	0.64
Adj. Flow (vph)	12	169	8	222	111	12	8	20	365	24	41	28
RTOR Reduction (vph)	0	2	0	0	4	0	0	0	285	0	21	0
Lane Group Flow (vph)	12	175	0	222	119	0	0	28	80	0	72	0
Confl. Peds. (#/hr)										4		
Turn Type	custom	NA		custom	NA		Perm	NA	custom	Perm	NA	
Protected Phases	1	1 2		3	2 3			5	5		5	
Permitted Phases	2			2			5		3	5		
Actuated Green, G (s)	35.0	39.0		37.5	37.5			8.0	15.4		8.0	
Effective Green, g (s)	35.0	39.0		37.5	37.5			8.0	15.4		8.0	
Actuated g/C Ratio	0.50	0.55		0.53	0.53			0.11	0.22		0.11	
Clearance Time (s)	4.0			4.2				6.2	6.2		6.2	
Vehicle Extension (s)	1.0			2.0				2.0	2.0		2.0	
Lane Grp Cap (vph)	639	987		651	942			183	468		200	
v/s Ratio Prot	0.00	c0.10		c0.04	0.07				0.02			
v/s Ratio Perm	0.01			c0.15				0.02	0.03		c0.04	
v/c Ratio	0.02	0.18		0.34	0.13			0.15	0.17		0.36	
Uniform Delay, d1	9.0	7.8		9.0	8.3			28.2	22.4		28.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.0		0.1	0.0			0.1	0.1		0.4	
Delay (s)	9.0	7.9		9.1	8.3			28.4	22.5		29.3	
Level of Service	A	A		A	A			C	C		C	
Approach Delay (s)		7.9			8.8			22.9			29.3	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	70.6	Sum of lost time (s)	20.2
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Appendix C

Intersection Capacity Analysis Worksheets 2024 Combined Improved Traffic Volumes Weekday Morning Peak Hour



Lanes, Volumes, Timings

Electric Boat - Groton, CT

4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

2024 AM Combined Imp.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	71	12	70	82	76	26	264	15	134	516	718
Future Volume (vph)	187	71	12	70	82	76	26	264	15	134	516	718
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	11	10	10	10	10	10	10	10	10	10
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			80		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor								1.00				
Frt		0.985				0.850		0.992				0.850
Flt Protected	0.950	0.983			0.975			0.994		0.950		
Satd. Flow (prot)	1569	1656	0	0	1695	1478	0	3257	0	1652	1739	1478
Flt Permitted	0.950	0.983			0.975			0.807		0.409		
Satd. Flow (perm)	1569	1656	0	0	1695	1478	0	2642	0	711	1739	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				95		3				780
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1087			427			507			1053	
Travel Time (s)		24.7			9.7			11.5			23.9	
Confl. Peds. (#/hr)							10					
Peak Hour Factor	0.87	0.78	0.75	0.65	0.82	0.80	0.54	0.86	0.75	0.85	0.86	0.92
Adj. Flow (vph)	215	91	16	108	100	95	48	307	20	158	600	780
Shared Lane Traffic (%)	26%											
Lane Group Flow (vph)	159	163	0	0	208	95	0	375	0	158	600	780
Turn Type	Split	NA		Split	NA	Prot	Perm	NA		pm+pt	NA	custom
Protected Phases	4	4		5	5	5		2		1	1 2	1 2 4
Permitted Phases							2			1 2		5
Detector Phase	4	4		5	5	5	2	2		1	1 2	1 2 4
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	6.0	6.0	15.0	15.0		6.0		
Minimum Split (s)	12.5	12.5		10.5	10.5	10.5	19.5	19.5		10.5		
Total Split (s)	25.0	25.0		28.0	28.0	28.0	35.5	35.5		38.0		
Total Split (%)	16.7%	16.7%		18.7%	18.7%	18.7%	23.7%	23.7%		25.3%		
Maximum Green (s)	20.5	20.5		23.5	23.5	23.5	31.0	31.0		33.5		
Yellow Time (s)	3.5	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	1.0	1.0	1.0		1.0		
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0		
Total Lost Time (s)	4.5	4.5			4.5	4.5		4.5		4.5		
Lead/Lag	Lag	Lag					Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0		
Recall Mode	None	None		None	None	None	Max	Max		None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	18.9	18.9			19.8	19.8		31.4		63.7	68.3	119.9
Actuated g/C Ratio	0.15	0.15			0.16	0.16		0.25		0.51	0.55	0.97
v/c Ratio	0.67	0.64			0.77	0.30		0.56		0.26	0.63	0.54

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	23.5
Total Split (s)	23.5
Total Split (%)	16%
Maximum Green (s)	21.5
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	3
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	66.3	63.2			70.6	12.3		46.3		17.6	25.3	1.6
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	66.3	63.2			70.6	12.3		46.3		17.6	25.3	1.6
LOS	E	E			E	B		D		B	C	A
Approach Delay		64.8			52.3			46.3			12.5	
Approach LOS		E			D			D			B	
Queue Length 50th (ft)	126	126			160	0		137		60	313	0
Queue Length 95th (ft)	#247	207			260	37		222		129	572	19
Internal Link Dist (ft)		1007			347			427			973	
Turn Bay Length (ft)										100		
Base Capacity (vph)	262	279			324	359		670		628	955	1450
Starvation Cap Reductn	0	0			0	0		0		0	0	0
Spillback Cap Reductn	0	0			0	0		0		0	0	0
Storage Cap Reductn	0	0			0	0		0		0	0	0
Reduced v/c Ratio	0.61	0.58			0.64	0.26		0.56		0.25	0.63	0.54

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 124.2
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.77
 Intersection Signal Delay: 28.9
 Intersection LOS: C
 Intersection Capacity Utilization 76.4%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

38 s	35.5 s	28 s	23.5 s	25 s

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Electric Boat - Groton, CT

4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

2024 AM Combined Imp.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	71	12	70	82	76	26	264	15	134	516	718
Future Volume (vph)	187	71	12	70	82	76	26	264	15	134	516	718
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	10	10	10	10	10	10	10	10
Total Lost time (s)	4.5	4.5			4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.95	0.95			1.00	1.00		0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99			1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	0.98			0.97	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1569	1657			1695	1478		3254		1652	1739	1478
Flt Permitted	0.95	0.98			0.97	1.00		0.81		0.41	1.00	1.00
Satd. Flow (perm)	1569	1657			1695	1478		2644		712	1739	1478
Peak-hour factor, PHF	0.87	0.78	0.75	0.65	0.82	0.80	0.54	0.86	0.75	0.85	0.86	0.92
Adj. Flow (vph)	215	91	16	108	100	95	48	307	20	158	600	780
RTOR Reduction (vph)	0	3	0	0	0	80	0	2	0	0	0	88
Lane Group Flow (vph)	159	160	0	0	208	15	0	373	0	158	600	692
Confl. Peds. (#/hr)							10					
Turn Type	Split	NA		Split	NA	Prot	Perm	NA		pm+pt	NA	custom
Protected Phases	4	4		5	5	5		2		1	1 2	1 2 4
Permitted Phases							2			1 2		5
Actuated Green, G (s)	18.9	18.9			19.8	19.8		31.4		63.7	68.2	111.4
Effective Green, g (s)	18.9	18.9			19.8	19.8		31.4		63.7	68.2	111.4
Actuated g/C Ratio	0.15	0.15			0.16	0.16		0.25		0.51	0.54	0.89
Clearance Time (s)	4.5	4.5			4.5	4.5		4.5		4.5		
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0		3.0		
Lane Grp Cap (vph)	236	249			267	232		661		602	944	1363
v/s Ratio Prot	c0.10	0.10			c0.12	0.01				0.07	c0.35	0.37
v/s Ratio Perm								0.14		0.07		0.10
v/c Ratio	0.67	0.64			0.78	0.06		0.56		0.26	0.64	0.51
Uniform Delay, d1	50.4	50.2			50.8	45.0		41.1		17.1	20.0	1.5
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	7.4	5.6			13.4	0.1		3.5		0.2	1.4	0.3
Delay (s)	57.8	55.8			64.2	45.1		44.6		17.3	21.4	1.8
Level of Service	E	E			E	D		D		B	C	A
Approach Delay (s)		56.8			58.2			44.6			11.0	
Approach LOS		E			E			D			B	
Intersection Summary												
HCM 2000 Control Delay			27.4									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			125.6									Sum of lost time (s) 20.0
Intersection Capacity Utilization			76.4%									ICU Level of Service D
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined Imp.

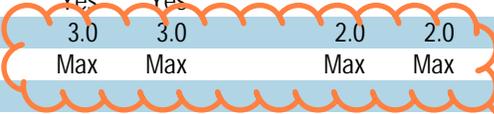
Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↕					↕			↕		
Traffic Volume (vph)	39	19	18	3	5	13	39	67	22	111	6	68
Future Volume (vph)	39	19	18	3	5	13	39	67	22	111	6	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor										1.00		
Frt		0.970					0.927			0.992		
Flt Protected		0.973					0.993			0.993		
Satd. Flow (prot)	0	1758	0	0	0	0	1715	0	0	1835	0	0
Flt Permitted		0.590					0.948			0.993		
Satd. Flow (perm)	0	1066	0	0	0	0	1637	0	0	1831	0	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)		1					41			2		
Link Speed (mph)		25					25			25		
Link Distance (ft)		836					602			696		
Travel Time (s)		22.8					16.4			19.0		
Confl. Peds. (#/hr)									6			
Peak Hour Factor	0.57	0.68	0.75	0.75	0.81	0.68	0.74	0.74	0.75	0.69	0.50	0.82
Adj. Flow (vph)	68	28	24	4	6	19	53	91	29	161	12	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	124	0	0	0	0	169	0	0	202	0	0
Turn Type	Perm	NA			Perm	Perm	NA		Split	NA		Split
Protected Phases		4					4		2	2		1
Permitted Phases	4				4	4						
Detector Phase	4	4			4	4	4		2	2		1
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0	8.0	8.0		10.0	10.0		20.0
Minimum Split (s)	13.0	13.0			13.0	13.0	13.0		15.0	15.0		25.0
Total Split (s)	24.0	24.0			24.0	24.0	24.0		21.0	21.0		36.0
Total Split (%)	19.7%	19.7%			19.7%	19.7%	19.7%		17.2%	17.2%		29.5%
Maximum Green (s)	19.0	19.0			19.0	19.0	19.0		16.0	16.0		31.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)		0.0					0.0			0.0		
Total Lost Time (s)		5.0					5.0			5.0		
Lead/Lag	Lag	Lag			Lag	Lag	Lag		Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		3.0
Recall Mode	None	None			None	None	None		Max	Max		Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		17.4					17.4			16.2		
Actuated g/C Ratio		0.17					0.17			0.16		
v/c Ratio		0.67					0.53			0.68		
Control Delay		58.8					36.4			53.9		
Queue Delay		0.0					0.0			0.0		
Total Delay		58.8					36.4			53.9		
LOS		E					D			D		

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined Imp.



Lane Group	SBT	SBR	SBR2	NEL2	NEL	NER	Ø3
Lane Configurations	↕	↕			↕		
Traffic Volume (vph)	196	173	172	6	49	3	
Future Volume (vph)	196	173	172	6	49	3	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor							
Frt		0.850			0.990		
Flt Protected	0.987				0.956		
Satd. Flow (prot)	1839	1583	0	0	1763	0	
Flt Permitted	0.987				0.956		
Satd. Flow (perm)	1839	1583	0	0	1763	0	
Right Turn on Red			Yes				
Satd. Flow (RTOR)		143					
Link Speed (mph)	25				25		
Link Distance (ft)	1056				667		
Travel Time (s)	28.8				18.2		
Confl. Peds. (#/hr)							
Peak Hour Factor	0.82	0.73	0.95	0.50	0.53	0.38	
Adj. Flow (vph)	239	237	181	12	92	8	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	322	418	0	0	112	0	
Turn Type	NA	Prot		Prot	Prot		
Protected Phases	1	1		5	5	3	
Permitted Phases							
Detector Phase	1	1		5	5		
Switch Phase							
Minimum Initial (s)	20.0	20.0		6.0	6.0	5.0	
Minimum Split (s)	25.0	25.0		11.0	11.0	25.0	
Total Split (s)	36.0	36.0		16.0	16.0	25.0	
Total Split (%)	29.5%	29.5%		13.1%	13.1%	20%	
Maximum Green (s)	31.0	31.0		11.0	11.0	21.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	0.0	
Lost Time Adjust (s)	0.0	0.0			0.0		
Total Lost Time (s)	5.0	5.0			5.0		
Lead/Lag	Lead	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	
Vehicle Extension (s)	3.0	3.0		2.0	2.0	3.0	
Recall Mode	Max	Max		Max	Max	No	
Walk Time (s)						6	
Flash Dont Walk (s)						15	
Pedestrian Calls (#/hr)							
Act Effct Green (s)	31.3	31.3			11.1		
Actuated g/C Ratio	0.31	0.31			0.11		
v/c Ratio	0.56	0.71			0.57		
Control Delay	35.4	28.7			57.5		
Queue Delay	0.0	0.0			0.0		
Total Delay	35.4	28.7			57.5		
LOS	D	C			E		



Would placing the intersection in min recall improve capacity? All approaches should also not be considered for max recall. Arterial phases should be the only approaches where detection is set to recall.

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined Imp.

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Approach Delay		58.8					36.4			53.9		
Approach LOS		E					D			D		
Queue Length 50th (ft)		70					70			117		
Queue Length 95th (ft)		119					129			178		
Internal Link Dist (ft)		756					522			616		
Turn Bay Length (ft)												
Base Capacity (vph)		204					346			297		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.61					0.49			0.68		

Intersection Summary	
Area Type:	Other
Cycle Length:	122
Actuated Cycle Length:	100.3
Natural Cycle:	90
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.71
Intersection Signal Delay:	40.2
Intersection Capacity Utilization	53.7%
Analysis Period (min)	15
Intersection LOS:	D
ICU Level of Service	A

Splits and Phases: 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Ø1	Ø2	Ø5	Ø3	Ø4
36 s	21 s	16 s	25 s	24 s

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined Imp.

	↓	↙	↘	↖	↗	↘	
Lane Group	SBT	SBR	SBR2	NEL2	NEL	NER	Ø3
Approach Delay	31.6				57.5		
Approach LOS	C				E		
Queue Length 50th (ft)	163	148			66		
Queue Length 95th (ft)	297	234			86		
Internal Link Dist (ft)	976				587		
Turn Bay Length (ft)							
Base Capacity (vph)	574	592			195		
Starvation Cap Reductn	0	0			0		
Spillback Cap Reductn	0	0			0		
Storage Cap Reductn	0	0			0		
Reduced v/c Ratio	0.56	0.71			0.57		
Intersection Summary							

HCM Signalized Intersection Capacity Analysis
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined Imp.

													
Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	
Lane Configurations		↕					↕			↕			
Traffic Volume (vph)	39	19	18	3	5	13	39	67	22	111	6	68	
Future Volume (vph)	39	19	18	3	5	13	39	67	22	111	6	68	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		5.0					5.0			5.0			
Lane Util. Factor		1.00					1.00			1.00			
Frbp, ped/bikes		1.00					1.00			1.00			
Flpb, ped/bikes		1.00					1.00			1.00			
Frt		0.97					0.93			0.99			
Flt Protected		0.97					0.99			0.99			
Satd. Flow (prot)		1758					1715			1835			
Flt Permitted		0.59					0.95			0.99			
Satd. Flow (perm)		1066					1637			1835			
Peak-hour factor, PHF	0.57	0.68	0.75	0.75	0.81	0.68	0.74	0.74	0.75	0.69	0.50	0.82	
Adj. Flow (vph)	68	28	24	4	6	19	53	91	29	161	12	83	
RTOR Reduction (vph)	0	1	0	0	0	0	34	0	0	2	0	0	
Lane Group Flow (vph)	0	123	0	0	0	0	135	0	0	200	0	0	
Confl. Peds. (#/hr)									6				
Turn Type	Perm	NA			Perm	Perm	NA		Split	NA		Split	
Protected Phases		4					4		2	2		1	
Permitted Phases	4				4	4							
Actuated Green, G (s)		17.4					17.4			16.2			
Effective Green, g (s)		17.4					17.4			16.2			
Actuated g/C Ratio		0.17					0.17			0.16			
Clearance Time (s)		5.0					5.0			5.0			
Vehicle Extension (s)		4.0					4.0			4.0			
Lane Grp Cap (vph)		179					275			287			
v/s Ratio Prot										c0.11			
v/s Ratio Perm		c0.12					0.08						
v/c Ratio		0.69					0.49			0.70			
Uniform Delay, d1		40.5					39.0			41.3			
Progression Factor		1.00					1.00			1.00			
Incremental Delay, d2		11.3					1.9			13.2			
Delay (s)		51.8					40.9			54.5			
Level of Service		D					D			D			
Approach Delay (s)		51.8					40.9			54.5			
Approach LOS		D					D			D			
Intersection Summary													
HCM 2000 Control Delay			43.2				HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.64										
Actuated Cycle Length (s)			103.5				Sum of lost time (s)			24.0			
Intersection Capacity Utilization			53.7%				ICU Level of Service			A			
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 AM Combined Imp.

	↓	↙	↘	↖	↗	↘
Movement	SBT	SBR	SBR2	NEL2	NEL	NER
Lane Configurations	↖	↘			↘	
Traffic Volume (vph)	196	173	172	6	49	3
Future Volume (vph)	196	173	172	6	49	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00			1.00	
Frbp, ped/bikes	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00			1.00	
Frt	1.00	0.85			0.99	
Flt Protected	0.99	1.00			0.96	
Satd. Flow (prot)	1839	1583			1763	
Flt Permitted	0.99	1.00			0.96	
Satd. Flow (perm)	1839	1583			1763	
Peak-hour factor, PHF	0.82	0.73	0.95	0.50	0.53	0.38
Adj. Flow (vph)	239	237	181	12	92	8
RTOR Reduction (vph)	0	100	0	0	0	0
Lane Group Flow (vph)	322	318	0	0	112	0
Confl. Peds. (#/hr)						
Turn Type	NA	Prot		Prot	Prot	
Protected Phases	1	1		5	5	
Permitted Phases						
Actuated Green, G (s)	31.3	31.3			11.1	
Effective Green, g (s)	31.3	31.3			11.1	
Actuated g/C Ratio	0.30	0.30			0.11	
Clearance Time (s)	5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			2.0	
Lane Grp Cap (vph)	556	478			189	
v/s Ratio Prot	0.18	c0.20			c0.06	
v/s Ratio Perm						
v/c Ratio	0.58	0.67			0.59	
Uniform Delay, d1	30.5	31.5			44.0	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	4.4	7.2			12.9	
Delay (s)	34.9	38.7			57.0	
Level of Service	C	D			E	
Approach Delay (s)	37.0				57.0	
Approach LOS	D				E	
Intersection Summary						

Lanes, Volumes, Timings
10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
2024 AM Combined Imp.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	32	38	1	34	63	45	273	10	48	540	311
Future Volume (vph)	79	32	38	1	34	63	45	273	10	48	540	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	105		0	0		0	38		0	75		0
Storage Lanes	2		0	0		1	1		0	1		1
Taper Length (ft)	300			25			25			75		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt		0.922				0.850		0.991				0.850
Flt Protected	0.950				0.997		0.950			0.950		
Satd. Flow (prot)	3319	1717	0	0	1857	1583	1770	3507	0	1770	1863	1583
Flt Permitted	0.950				0.997		0.950			0.950		
Satd. Flow (perm)	3319	1717	0	0	1857	1583	1766	3507	0	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36				110		5				202
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		550			441			176			423	
Travel Time (s)		15.0			12.0			4.0			11.5	
Confl. Peds. (#/hr)							2					
Peak Hour Factor	0.84	0.78	0.84	0.25	0.52	0.80	0.85	0.91	0.50	0.65	0.79	0.92
Adj. Flow (vph)	94	41	45	4	65	79	53	300	20	74	684	338
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	86	0	0	69	79	53	320	0	74	684	338
Turn Type	Split	NA		Split	NA	pt+ov	Split	NA		Split	NA	Free
Protected Phases	4	4		5	5	15	2	2		1	1	
Permitted Phases												Free
Detector Phase	4	4		5	5	15	2	2		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0		15.0	15.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		25.0	25.0		20.0	20.0	
Total Split (s)	13.0	13.0		13.0	13.0		25.0	25.0		40.0	40.0	
Total Split (%)	10.9%	10.9%		10.9%	10.9%		21.0%	21.0%		33.6%	33.6%	
Maximum Green (s)	8.0	8.0		8.0	8.0		20.0	20.0		35.0	35.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag					Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	8.0	8.0		8.0	44.3	20.1	20.1			35.1	35.1	88.4
Actuated g/C Ratio	0.09	0.09		0.09	0.50	0.23	0.23			0.40	0.40	1.00
v/c Ratio	0.31	0.46		0.41	0.09	0.13	0.40			0.11	0.92	0.21

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	24%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 AM Combined Imp.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	41.9	33.8			47.2	0.9	29.7	31.1		18.6	47.0	0.3
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	41.9	33.8			47.2	0.9	29.7	31.1		18.6	47.0	0.3
LOS	D	C			D	A	C	C		B	D	A
Approach Delay		38.0			22.5			30.9			30.7	
Approach LOS		D			C			C			C	
Queue Length 50th (ft)	26	28			38	0	25	82		27	376	0
Queue Length 95th (ft)	47	60			45	5	52	122		39	#478	0
Internal Link Dist (ft)		470			361			96			343	
Turn Bay Length (ft)	105						38			75		
Base Capacity (vph)	301	188			168	848	402	800		703	740	1583
Starvation Cap Reductn	0	0			0	0	0	0		0	0	0
Spillback Cap Reductn	0	0			0	0	0	0		0	0	0
Storage Cap Reductn	0	0			0	0	0	0		0	0	0
Reduced v/c Ratio	0.31	0.46			0.41	0.09	0.13	0.40		0.11	0.92	0.21

Intersection Summary

Area Type: Other
 Cycle Length: 119
 Actuated Cycle Length: 88.4
 Natural Cycle: 130
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 30.8
 Intersection LOS: C
 Intersection Capacity Utilization 57.1%
 ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: North St./I-95 On/Off Ramps & Bridge St.



Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 AM Combined Imp.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	79	32	38	1	34	63	45	273	10	48	540	311	
Future Volume (vph)	79	32	38	1	34	63	45	273	10	48	540	311	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	11	12	12	12	12	12	12	12	12	12	12	12	
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	4.0	
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Fr _t	1.00	0.92			1.00	0.85	1.00	0.99		1.00	1.00	0.85	
Fl _t Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3319	1717			1857	1583	1770	3506		1770	1863	1583	
Fl _t Permitted	0.95	1.00			1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3319	1717			1857	1583	1770	3506		1770	1863	1583	
Peak-hour factor, PHF	0.84	0.78	0.84	0.25	0.52	0.80	0.85	0.91	0.50	0.65	0.79	0.92	
Adj. Flow (vph)	94	41	45	4	65	79	53	300	20	74	684	338	
RTOR Reduction (vph)	0	33	0	0	0	43	0	4	0	0	0	0	
Lane Group Flow (vph)	94	53	0	0	69	36	53	316	0	74	684	338	
Confl. Peds. (#/hr)							2						
Turn Type	Split	NA		Split	NA	pt+ov	Split	NA		Split	NA	Free	
Protected Phases	4	4		5	5	15	2	2		1	1		
Permitted Phases												Free	
Actuated Green, G (s)	8.0	8.0			6.2	41.3	20.1	20.1		35.1	35.1	89.4	
Effective Green, g (s)	8.0	8.0			6.2	41.3	20.1	20.1		35.1	35.1	89.4	
Actuated g/C Ratio	0.09	0.09			0.07	0.46	0.22	0.22		0.39	0.39	1.00	
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0		
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	297	153			128	731	397	788		694	731	1583	
v/s Ratio Prot	0.03	0.03			c0.04	0.02	0.03	c0.09		0.04	c0.37		
v/s Ratio Perm												c0.21	
v/c Ratio	0.32	0.35			0.54	0.05	0.13	0.40		0.11	0.94	0.21	
Uniform Delay, d1	38.1	38.2			40.2	13.2	27.7	29.5		17.2	26.1	0.0	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.6	1.4			4.3	0.0	0.7	1.5		0.1	19.1	0.3	
Delay (s)	38.8	39.6			44.5	13.3	28.4	31.0		17.3	45.2	0.3	
Level of Service	D	D			D	B	C	C		B	D	A	
Approach Delay (s)		39.2			27.8			30.7			29.5		
Approach LOS		D			C			C			C		
Intersection Summary													
HCM 2000 Control Delay			30.6		HCM 2000 Level of Service						C		
HCM 2000 Volume to Capacity ratio			0.73										
Actuated Cycle Length (s)			89.4		Sum of lost time (s)					25.0			
Intersection Capacity Utilization			57.1%		ICU Level of Service					B			
Analysis Period (min)			15										

c Critical Lane Group

Appendix D

Intersection Capacity Analysis Worksheets 2024 Background Traffic Volumes Weekday Afternoon Peak Hour



Lanes, Volumes, Timings
 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Electric Boat - Groton, CT
 2024 PM Background

							
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Lane Configurations	 						
Traffic Volume (vph)	17	30	113	276	32	74	
Future Volume (vph)	17	30	113	276	32	74	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	11	11	12	15	
Storage Length (ft)	0	0		175	125		
Storage Lanes	2	0		1	1		
Taper Length (ft)	25				60		
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	
Ped Bike Factor	0.93			0.99	0.99		
Frt	0.908			0.850			
Flt Protected	0.981				0.950		
Satd. Flow (prot)	3219	0	1801	1531	1770	2049	
Flt Permitted	0.981				0.633		
Satd. Flow (perm)	2996	0	1801	1510	1170	2049	
Right Turn on Red		Yes		Yes			
Satd. Flow (RTOR)	45			373			
Link Speed (mph)	30		25			25	
Link Distance (ft)	421		522			429	
Travel Time (s)	9.6		14.2			11.7	
Confl. Peds. (#/hr)	49			2	18		
Peak Hour Factor	0.61	0.66	0.57	0.74	0.60	0.60	
Adj. Flow (vph)	28	45	198	373	53	123	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	73	0	198	373	53	123	
Turn Type	Prot		NA	Perm	D.P+P	NA	
Protected Phases	4		2		1	1 2	3
Permitted Phases				2	2		
Detector Phase	4		2	2	1	1 2	
Switch Phase							
Minimum Initial (s)	9.0		15.0	15.0	4.0		5.0
Minimum Split (s)	14.2		20.6	20.6	7.1		24.0
Total Split (s)	20.2		50.6	50.6	13.1		26.5
Total Split (%)	18.3%		45.8%	45.8%	11.9%		24%
Maximum Green (s)	15.0		45.0	45.0	10.0		24.5
Yellow Time (s)	3.8		3.8	3.8	3.0		2.0
All-Red Time (s)	1.4		1.8	1.8	0.1		0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0		
Total Lost Time (s)	5.2		5.6	5.6	3.1		
Lead/Lag	Lag		Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes
Vehicle Extension (s)	2.0		2.5	2.5	1.0		3.0
Recall Mode	None		Min	Min	None		None
Walk Time (s)							7.0
Flash Dont Walk (s)							15.0
Pedestrian Calls (#/hr)							8
Act Effct Green (s)	10.1		22.8	22.8	28.5		32.9
Actuated g/C Ratio	0.22		0.51	0.51	0.63		0.73
v/c Ratio	0.10		0.22	0.39	0.07		0.08

Lanes, Volumes, Timings
 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Electric Boat - Groton, CT
 2024 PM Background



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Control Delay	12.5		14.3	3.9	7.2	6.7	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	12.5		14.3	3.9	7.2	6.7	
LOS	B		B	A	A	A	
Approach Delay	12.5		7.5			6.9	
Approach LOS	B		A			A	
Queue Length 50th (ft)	2		33	0	4	10	
Queue Length 95th (ft)	12		78	23	21	39	
Internal Link Dist (ft)	341		442			349	
Turn Bay Length (ft)				175	125		
Base Capacity (vph)	1224		1652	1416	952	1947	
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	0.06		0.12	0.26	0.06	0.06	

Intersection Summary

Area Type:	Other
Cycle Length:	110.4
Actuated Cycle Length:	45.1
Natural Cycle:	70
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.39
Intersection Signal Delay:	7.8
Intersection Capacity Utilization	29.0%
Analysis Period (min)	15
Intersection LOS:	A
ICU Level of Service	A

Splits and Phases: 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Ø1	Ø2	Ø3	Ø4
13.1 s	50.6 s	26.5 s	20.2 s

HCM Signalized Intersection Capacity Analysis
 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Electric Boat - Groton, CT
 2024 PM Background

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	 					
Traffic Volume (vph)	17	30	113	276	32	74
Future Volume (vph)	17	30	113	276	32	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	15
Total Lost time (s)	5.2		5.6	5.6	3.1	3.1
Lane Util. Factor	0.97		1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00		1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.91		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3218		1801	1510	1761	2049
Flt Permitted	0.98		1.00	1.00	0.63	1.00
Satd. Flow (perm)	3218		1801	1510	1174	2049
Peak-hour factor, PHF	0.61	0.66	0.57	0.74	0.60	0.60
Adj. Flow (vph)	28	45	198	373	53	123
RTOR Reduction (vph)	41	0	0	211	0	0
Lane Group Flow (vph)	33	0	198	162	53	123
Confl. Peds. (#/hr)	49			2	18	
Turn Type	Prot		NA	Perm	D.P+P	NA
Protected Phases	4		2		1	1 2
Permitted Phases				2	2	
Actuated Green, G (s)	4.9		21.3	21.3	25.6	28.7
Effective Green, g (s)	4.9		21.3	21.3	25.6	28.7
Actuated g/C Ratio	0.10		0.43	0.43	0.52	0.59
Clearance Time (s)	5.2		5.6	5.6	3.1	
Vehicle Extension (s)	2.0		2.5	2.5	1.0	
Lane Grp Cap (vph)	321		782	656	664	1200
v/s Ratio Prot	c0.01		c0.11		0.01	c0.06
v/s Ratio Perm				0.11	0.03	
v/c Ratio	0.10		0.25	0.25	0.08	0.10
Uniform Delay, d1	20.0		8.8	8.8	5.8	4.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		0.1	0.1	0.0	0.0
Delay (s)	20.1		8.9	8.9	5.8	4.5
Level of Service	C		A	A	A	A
Approach Delay (s)	20.1		8.9			4.9
Approach LOS	C		A			A
Intersection Summary						
HCM 2000 Control Delay			9.0		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.19			
Actuated Cycle Length (s)			49.0		Sum of lost time (s)	15.9
Intersection Capacity Utilization			29.0%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔			↕↔			↕↔			↕↔	
Traffic Volume (vph)	40	189	10	19	45	31	2	23	104	60	9	19
Future Volume (vph)	40	189	10	19	45	31	2	23	104	60	9	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	12	12	12	15	15	15	15	15	15
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Fr _t		0.991			0.938			0.886			0.974	
Fl _t Protected		0.993			0.990			0.999			0.967	
Satd. Flow (prot)	0	3251	0	0	3287	0	0	1814	0	0	1930	0
Fl _t Permitted		0.993			0.990			0.999			0.967	
Satd. Flow (perm)	0	3251	0	0	3287	0	0	1814	0	0	1930	0
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		421			1171			266			576	
Travel Time (s)		9.6			26.6			7.3			15.7	
Confl. Peds. (#/hr)	38			176			54			36		
Peak Hour Factor	0.81	0.71	0.50	0.47	0.58	0.38	0.50	0.92	0.66	0.83	0.75	0.95
Adj. Flow (vph)	49	266	20	40	78	82	4	25	158	72	12	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	335	0	0	200	0	0	187	0	0	104	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 2: Mumford Ave. & Route 349 (Chester St.)/Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 PM Background

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	189	10	19	45	31	2	23	104	60	9	19
Future Volume (Veh/h)	40	189	10	19	45	31	2	23	104	60	9	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.71	0.50	0.47	0.58	0.38	0.50	0.92	0.66	0.83	0.75	0.95
Hourly flow rate (vph)	49	266	20	40	78	82	4	25	158	72	12	20
Pedestrians		54			36			176			38	
Lane Width (ft)		10.0			12.0			15.0			15.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		4			3			21			5	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		421			1171							
pX, platoon unblocked												
vC, conflicting volume	198			462			749	828	355	674	797	172
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	198			462			749	828	355	674	797	172
iC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
iC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			95			98	88	68	51	95	97
cM capacity (veh/h)	1310			866			162	211	490	148	220	769
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	182	153	79	121	187	104						
Volume Left	49	0	40	0	4	72						
Volume Right	0	20	0	82	158	20						
cSH	1310	1700	866	1700	402	183						
Volume to Capacity	0.04	0.09	0.05	0.07	0.47	0.57						
Queue Length 95th (ft)	3	0	4	0	60	75						
Control Delay (s)	2.3	0.0	5.0	0.0	21.5	47.6						
Lane LOS	A		A		C	E						
Approach Delay (s)	1.3		2.0		21.5	47.6						
Approach LOS					C	E						
Intersection Summary												
Average Delay			11.9									
Intersection Capacity Utilization			36.1%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
3: Benham Rd. & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
2024 PM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	489	11	97	51	48	3	110	175	132	122	0
Future Volume (vph)	67	489	11	97	51	48	3	110	175	132	122	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	14	10	10	10
Storage Length (ft)	0		0	0		0	0		250	0		0
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00			1.00				
Frt		0.995			0.964				0.850			
Flt Protected		0.993			0.977			0.999		0.950		
Satd. Flow (prot)	0	3264	0	0	3111	0	0	1737	1689	1652	1739	0
Flt Permitted		0.850			0.558			0.994		0.641		
Satd. Flow (perm)	0	2794	0	0	1776	0	0	1728	1689	1114	1739	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			60				213			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1171			1087			448			267	
Travel Time (s)		26.6			24.7			10.2			6.1	
Confl. Peds. (#/hr)				2			3					
Peak Hour Factor	0.67	0.84	0.46	0.81	0.73	0.79	0.75	0.66	0.82	0.61	0.84	0.92
Adj. Flow (vph)	100	582	24	120	70	61	4	167	213	216	145	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	706	0	0	251	0	0	171	213	216	145	0
Turn Type	Perm	NA		D.Pm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			1 2			4			4	
Permitted Phases	2			2			4		4	4		
Detector Phase	2	2		2	1 2		4	4	4	4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0			9.0	9.0	9.0	9.0	9.0	
Minimum Split (s)	17.2	17.2		17.2			14.5	14.5	14.5	14.5	14.5	
Total Split (s)	39.3	39.3		39.3			25.5	25.5	25.5	25.5	25.5	
Total Split (%)	38.9%	38.9%		38.9%			25.3%	25.3%	25.3%	25.3%	25.3%	
Maximum Green (s)	34.1	34.1		34.1			20.0	20.0	20.0	20.0	20.0	
Yellow Time (s)	4.2	4.2		4.2			3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0			2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.2						5.5	5.5	5.5	5.5	
Lead/Lag	Lag	Lag		Lag			Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0			2.5	2.5	2.5	2.5	2.5	
Recall Mode	Min	Min		Min			None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		25.6			41.2			20.6	20.6	20.6	20.6	
Actuated g/C Ratio		0.35			0.56			0.28	0.28	0.28	0.28	
v/c Ratio		0.73			0.25			0.36	0.34	0.70	0.30	

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	6.0	5.0
Minimum Split (s)	9.1	23.0
Total Split (s)	13.1	23.0
Total Split (%)	13%	23%
Maximum Green (s)	10.0	21.0
Yellow Time (s)	3.0	2.0
All-Red Time (s)	0.1	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	0.2	3.0
Recall Mode	Max	None
Walk Time (s)		7.0
Flash Dont Walk (s)		14.0
Pedestrian Calls (#/hr)		2
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		

Lanes, Volumes, Timings
 3: Benham Rd. & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 PM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		27.0			8.0			27.8	6.4	42.0	27.1	
Queue Delay		0.0			0.0			0.0	0.0	0.0	0.0	
Total Delay		27.0			8.0			27.8	6.4	42.0	27.1	
LOS		C			A			C	A	D	C	
Approach Delay		27.0			8.0			15.9			36.0	
Approach LOS		C			A			B			D	
Queue Length 50th (ft)		130			17			57	0	80	47	
Queue Length 95th (ft)		253			45			116	43	143	132	
Internal Link Dist (ft)		1091			1007			368			187	
Turn Bay Length (ft)									250			
Base Capacity (vph)		1327			1236			480	623	309	483	
Starvation Cap Reductn		0			0			0	0	0	0	
Spillback Cap Reductn		0			0			0	0	0	0	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		0.53			0.20			0.36	0.34	0.70	0.30	

Intersection Summary

Area Type:	Other
Cycle Length:	100.9
Actuated Cycle Length:	74.1
Natural Cycle:	90
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.73
Intersection Signal Delay:	23.6
Intersection Capacity Utilization	47.8%
Analysis Period (min)	15
Intersection LOS:	C
ICU Level of Service	A

Splits and Phases: 3: Benham Rd. & Route 349 (Rainville Ave.)

Ø1	Ø2	Ø3	Ø4
13.1 s	39.3 s	23 s	25.5 s

Lane Group	Ø1	Ø3
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)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
 3: Benham Rd. & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 PM Background

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 				 	 	 	
Traffic Volume (vph)	67	489	11	97	51	48	3	110	175	132	122	0
Future Volume (vph)	67	489	11	97	51	48	3	110	175	132	122	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	14	10	10	10
Total Lost time (s)		5.2			3.1			5.5	5.5	5.5	5.5	
Lane Util. Factor		0.95			0.95			1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00			1.00			1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00	1.00	1.00	1.00	
Frt		0.99			0.96			1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.98			1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3263			3108			1736	1689	1652	1739	
Flt Permitted		0.85			0.56			0.99	1.00	0.64	1.00	
Satd. Flow (perm)		2792			1775			1728	1689	1115	1739	
Peak-hour factor, PHF	0.67	0.84	0.46	0.81	0.73	0.79	0.75	0.66	0.82	0.61	0.84	0.92
Adj. Flow (vph)	100	582	24	120	70	61	4	167	213	216	145	0
RTOR Reduction (vph)	0	3	0	0	29	0	0	0	155	0	0	0
Lane Group Flow (vph)	0	703	0	0	222	0	0	171	58	216	145	0
Confl. Peds. (#/hr)				2			3					
Turn Type	Perm	NA		D.Pm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			1 2			4			4	
Permitted Phases	2			2			4		4	4		
Actuated Green, G (s)		25.6			39.0			20.6	20.6	20.6	20.6	
Effective Green, g (s)		25.6			39.0			20.6	20.6	20.6	20.6	
Actuated g/C Ratio		0.34			0.52			0.27	0.27	0.27	0.27	
Clearance Time (s)		5.2						5.5	5.5	5.5	5.5	
Vehicle Extension (s)		3.0						2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)		947			918			472	461	304	475	
v/s Ratio Prot												0.08
v/s Ratio Perm		c0.25			c0.13			0.10	0.03	c0.19		
v/c Ratio		0.74			0.24			0.36	0.13	0.71	0.31	
Uniform Delay, d1		22.0			10.0			22.1	20.6	24.7	21.7	
Progression Factor		1.00			1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		3.2			0.1			0.3	0.1	7.1	0.3	
Delay (s)		25.2			10.2			22.4	20.7	31.8	22.0	
Level of Service		C			B			C	C	C	C	
Approach Delay (s)		25.2			10.2			21.5			27.9	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			22.7									C
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			75.4							15.8		
Intersection Capacity Utilization			47.8%									A
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings

Electric Boat - Groton, CT

4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

2024 PM Background



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	632	145	21	39	57	169	24	502	46	81	219	117
Future Volume (vph)	632	145	21	39	57	169	24	502	46	81	219	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	11	10	10	10	10	10	10	10	10	10
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			80		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor								1.00				
Frt		0.990				0.850		0.983				0.850
Flt Protected	0.950	0.972			0.980			0.998		0.950		
Satd. Flow (prot)	1569	1646	0	0	1704	1478	0	3241	0	1652	1739	1478
Flt Permitted	0.950	0.972			0.980			0.925		0.222		
Satd. Flow (perm)	1569	1646	0	0	1704	1478	0	3003	0	386	1739	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				235		9				136
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1087			427			507			1053	
Travel Time (s)		24.7			9.7			11.5			23.9	
Confl. Peds. (#/hr)							1					
Peak Hour Factor	0.80	0.80	0.62	0.73	0.74	0.72	0.72	0.88	0.59	0.68	0.89	0.86
Adj. Flow (vph)	790	181	34	53	77	235	33	570	78	119	246	136
Shared Lane Traffic (%)	37%											
Lane Group Flow (vph)	498	507	0	0	130	235	0	681	0	119	246	136
Turn Type	Split	NA		Split	NA	Prot	Perm	NA		pm+pt	NA	custom
Protected Phases	4	4		5	5	5		2		1	1 2	1 2 4
Permitted Phases							2			1 2		5
Detector Phase	4	4		5	5	5	2	2		1	1 2	1 2 4
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	6.0	6.0	15.0	15.0		6.0		
Minimum Split (s)	12.5	12.5		10.5	10.5	10.5	19.5	19.5		10.5		
Total Split (s)	52.3	52.3		20.8	20.8	20.8	46.3	46.3		10.5		
Total Split (%)	34.1%	34.1%		13.6%	13.6%	13.6%	30.2%	30.2%		6.8%		
Maximum Green (s)	47.8	47.8		16.3	16.3	16.3	41.8	41.8		6.0		
Yellow Time (s)	3.5	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	1.0	1.0	1.0		1.0		
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0		
Total Lost Time (s)	4.5	4.5			4.5	4.5		4.5		4.5		
Lead/Lag	Lag	Lag					Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0		
Recall Mode	None	None		None	None	None	Max	Max		None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	48.0	48.0			14.2	14.2		42.0		48.0	52.6	127.6
Actuated g/C Ratio	0.36	0.36			0.11	0.11		0.32		0.36	0.40	0.97
v/c Ratio	0.87	0.85			0.71	0.64		0.71		0.60	0.36	0.09

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	21.0
Total Split (s)	23.5
Total Split (%)	15%
Maximum Green (s)	21.5
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	57.4	53.7			78.8	15.4		45.1		44.1	31.3	0.4
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	57.4	53.7			78.8	15.4		45.1		44.1	31.3	0.4
LOS	E	D			E	B		D		D	C	A
Approach Delay		55.5			38.0			45.1			26.0	
Approach LOS		E			D			D			C	
Queue Length 50th (ft)	402	402			105	0		257		63	141	0
Queue Length 95th (ft)	#630	#618			162	21		395		99	263	9
Internal Link Dist (ft)		1007			347			427			973	
Turn Bay Length (ft)										100		
Base Capacity (vph)	570	599			211	388		961		198	692	1433
Starvation Cap Reductn	0	0			0	0		0		0	0	0
Spillback Cap Reductn	0	0			0	0		0		0	0	0
Storage Cap Reductn	0	0			0	0		0		0	0	0
Reduced v/c Ratio	0.87	0.85			0.62	0.61		0.71		0.60	0.36	0.09

Intersection Summary

Area Type: Other
 Cycle Length: 153.4
 Actuated Cycle Length: 132.1
 Natural Cycle: 120
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 44.4
 Intersection LOS: D
 Intersection Capacity Utilization 69.7%
 ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

10.5 s	46.3 s	20.8 s	23.5 s	52.3 s

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Electric Boat - Groton, CT

4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

2024 PM Background

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	632	145	21	39	57	169	24	502	46	81	219	117
Future Volume (vph)	632	145	21	39	57	169	24	502	46	81	219	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	10	10	10	10	10	10	10	10
Total Lost time (s)	4.5	4.5			4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.95	0.95			1.00	1.00		0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99			1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	0.97			0.98	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1569	1646			1704	1478		3239		1652	1739	1478
Flt Permitted	0.95	0.97			0.98	1.00		0.93		0.22	1.00	1.00
Satd. Flow (perm)	1569	1646			1704	1478		3004		386	1739	1478
Peak-hour factor, PHF	0.80	0.80	0.62	0.73	0.74	0.72	0.72	0.88	0.59	0.68	0.89	0.86
Adj. Flow (vph)	790	181	34	53	77	235	33	570	78	119	246	136
RTOR Reduction (vph)	0	1	0	0	0	210	0	6	0	0	0	15
Lane Group Flow (vph)	498	506	0	0	130	25	0	675	0	119	246	121
Confl. Peds. (#/hr)							1					
Turn Type	Split	NA		Split	NA	Prot	Perm	NA		pm+pt	NA	custom
Protected Phases	4	4		5	5	5		2		1	1 2	1 2 4
Permitted Phases							2			1 2		5
Actuated Green, G (s)	48.0	48.0			14.2	14.2		42.0		48.0	52.5	119.2
Effective Green, g (s)	48.0	48.0			14.2	14.2		42.0		48.0	52.5	119.2
Actuated g/C Ratio	0.36	0.36			0.11	0.11		0.31		0.36	0.39	0.89
Clearance Time (s)	4.5	4.5			4.5	4.5		4.5		4.5		
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0		3.0		
Lane Grp Cap (vph)	564	591			181	157		945		195	683	1369
v/s Ratio Prot	c0.32	0.31			c0.08	0.02				c0.03	0.14	0.07
v/s Ratio Perm								c0.22		0.19		0.01
v/c Ratio	0.88	0.86			0.72	0.16		0.71		0.61	0.36	0.09
Uniform Delay, d1	40.1	39.5			57.7	54.2		40.4		32.4	28.6	0.8
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	15.1	11.6			12.8	0.5		4.6		5.5	0.3	0.0
Delay (s)	55.2	51.2			70.5	54.7		45.0		38.0	29.0	0.9
Level of Service	E	D			E	D		D		D	C	A
Approach Delay (s)		53.2			60.3			45.0			23.5	
Approach LOS		D			E			D			C	
Intersection Summary												
HCM 2000 Control Delay			46.2									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			133.5									Sum of lost time (s) 20.0
Intersection Capacity Utilization			69.7%									ICU Level of Service C
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	43	94	16	80	23	175	51	7	5	27	4
Future Volume (vph)	4	43	94	16	80	23	175	51	7	5	27	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt			0.850		0.974			0.996			0.986	
Flt Protected		0.996			0.993			0.964			0.993	
Satd. Flow (prot)	0	1855	1583	0	1802	0	0	1789	0	0	1824	0
Flt Permitted		0.996			0.993			0.964			0.993	
Satd. Flow (perm)	0	1855	1583	0	1802	0	0	1789	0	0	1824	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102		12			2			4	
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		678			836			704			713	
Travel Time (s)		15.4			22.8			19.2			19.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	47	102	17	87	25	190	55	8	5	29	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	51	102	0	129	0	0	253	0	0	38	0
Turn Type	Split	NA	pt+ov	Split	NA		Split	NA		Split	NA	
Protected Phases	1	1	1 2	5	5		2	2		4	4	
Permitted Phases												
Detector Phase	1	1	1 2	5	5		2	2		4	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0		6.0	6.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		26.0	26.0		11.0	11.0	
Total Split (s)	20.0	20.0		20.0	20.0		26.0	26.0		20.0	20.0	
Total Split (%)	23.3%	23.3%		23.3%	23.3%		30.2%	30.2%		23.3%	23.3%	
Maximum Green (s)	15.0	15.0		15.0	15.0		20.0	20.0		15.0	15.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			6.0			5.0	
Lead/Lag	Lead	Lead					Lag	Lag				
Lead-Lag Optimize?	Yes	Yes					Yes	Yes				
Vehicle Extension (s)	2.0	2.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	None	
Act Effct Green (s)		8.4	37.5		10.1			26.7			7.1	
Actuated g/C Ratio		0.15	0.66		0.18			0.47			0.12	
v/c Ratio		0.19	0.10		0.39			0.30			0.17	
Control Delay		27.8	2.8		25.8			18.2			26.4	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		27.8	2.8		25.8			18.2			26.4	
LOS		C	A		C			B			C	
Approach Delay		11.1			25.8			18.2			26.4	
Approach LOS		B			C			B			C	
Queue Length 50th (ft)		14	0		33			56			10	
Queue Length 95th (ft)		52	22		93			161			40	
Internal Link Dist (ft)		598			756			624			633	

Lanes, Volumes, Timings
 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Background

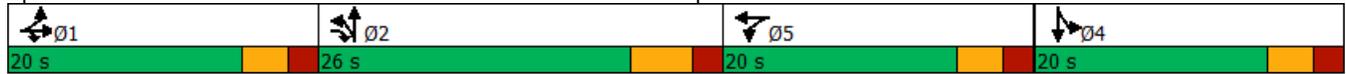
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)		506	1071		500			835			500	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.10	0.10		0.26			0.30			0.08	

Intersection Summary

Area Type: Other
 Cycle Length: 86
 Actuated Cycle Length: 57.2
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.39
 Intersection Signal Delay: 18.6
 Intersection Capacity Utilization 41.8%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.



HCM Signalized Intersection Capacity Analysis
 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Background

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	4	43	94	16	80	23	175	51	7	5	27	4	
Future Volume (vph)	4	43	94	16	80	23	175	51	7	5	27	4	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		5.0	5.0		5.0			6.0			5.0		
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00		
Frt		1.00	0.85		0.97			1.00			0.99		
Flt Protected		1.00	1.00		0.99			0.96			0.99		
Satd. Flow (prot)		1855	1583		1802			1788			1824		
Flt Permitted		1.00	1.00		0.99			0.96			0.99		
Satd. Flow (perm)		1855	1583		1802			1788			1824		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	4	47	102	17	87	25	190	55	8	5	29	4	
RTOR Reduction (vph)	0	0	43	0	11	0	0	1	0	0	4	0	
Lane Group Flow (vph)	0	51	59	0	118	0	0	252	0	0	34	0	
Turn Type	Split	NA	pt+ov	Split	NA		Split	NA		Split	NA		
Protected Phases	1	1	1 2	5	5		2	2		4	4		
Permitted Phases													
Actuated Green, G (s)		6.2	36.2		7.8			25.0			2.7		
Effective Green, g (s)		6.2	36.2		7.8			25.0			2.7		
Actuated g/C Ratio		0.10	0.58		0.12			0.40			0.04		
Clearance Time (s)		5.0			5.0			6.0			5.0		
Vehicle Extension (s)		2.0			3.0			3.0			3.0		
Lane Grp Cap (vph)		183	913		224			712			78		
v/s Ratio Prot		c0.03	0.04		c0.07			c0.14			c0.02		
v/s Ratio Perm													
v/c Ratio		0.28	0.06		0.53			0.35			0.44		
Uniform Delay, d1		26.2	5.8		25.7			13.2			29.3		
Progression Factor		1.00	1.00		1.00			1.00			1.00		
Incremental Delay, d2		0.3	0.0		2.3			1.4			3.9		
Delay (s)		26.5	5.8		28.0			14.6			33.2		
Level of Service		C	A		C			B			C		
Approach Delay (s)		12.7			28.0			14.6			33.2		
Approach LOS		B			C			B			C		
Intersection Summary													
HCM 2000 Control Delay			18.3									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.38										
Actuated Cycle Length (s)			62.7									Sum of lost time (s)	21.0
Intersection Capacity Utilization			41.8%									ICU Level of Service	A
Analysis Period (min)			15										

c Critical Lane Group

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↕					↕			↕		
Traffic Volume (vph)	127	49	29	4	14	15	41	134	18	312	11	78
Future Volume (vph)	127	49	29	4	14	15	41	134	18	312	11	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.979					0.911			0.996		
Flt Protected		0.971					0.993			0.997		
Satd. Flow (prot)	0	1771	0	0	0	0	1685	0	0	1850	0	0
Flt Permitted		0.528					0.933			0.997		
Satd. Flow (perm)	0	963	0	0	0	0	1583	0	0	1850	0	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)		1					68			1		
Link Speed (mph)		25					25			25		
Link Distance (ft)		836					602			696		
Travel Time (s)		22.8					16.4			19.0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	53	32	4	15	16	45	146	20	339	12	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	227	0	0	0	0	222	0	0	371	0	0
Turn Type	Perm	NA			Perm	Perm	NA		Split	NA		Split
Protected Phases		4					4		2	2		1
Permitted Phases	4				4	4						
Detector Phase	4	4			4	4	4		2	2		1
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0	8.0	8.0		10.0	10.0		20.0
Minimum Split (s)	13.0	13.0			13.0	13.0	13.0		15.0	15.0		25.0
Total Split (s)	25.0	25.0			25.0	25.0	25.0		30.0	30.0		25.0
Total Split (%)	20.5%	20.5%			20.5%	20.5%	20.5%		24.6%	24.6%		20.5%
Maximum Green (s)	20.0	20.0			20.0	20.0	20.0		25.0	25.0		20.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)		0.0					0.0			0.0		
Total Lost Time (s)		5.0					5.0			5.0		
Lead/Lag	Lag	Lag			Lag	Lag	Lag		Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		3.0
Recall Mode	None	None			None	None	None		Max	Max		Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		20.0					20.0			25.0		
Actuated g/C Ratio		0.21					0.21			0.26		
v/c Ratio		1.14					0.58			0.78		
Control Delay		144.0					30.8			46.2		
Queue Delay		0.0					0.0			0.0		
Total Delay		144.0					30.8			46.2		
LOS		F					C			D		
Approach Delay		144.0					30.8			46.2		
Approach LOS		F					C			D		

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Background

	↓	↙	↘	↖	↗	↘	Ø3
Lane Group	SBT	SBR	SBR2	NEL2	NEL	NER	Ø3
Lane Configurations	↖	↖			↖		
Traffic Volume (vph)	146	83	35	6	49	3	
Future Volume (vph)	146	83	35	6	49	3	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850			0.994		
Flt Protected	0.983				0.955		
Satd. Flow (prot)	1831	1583	0	0	1768	0	
Flt Permitted	0.983				0.955		
Satd. Flow (perm)	1831	1583	0	0	1768	0	
Right Turn on Red			Yes				
Satd. Flow (RTOR)		143					
Link Speed (mph)	25				25		
Link Distance (ft)	1056				667		
Travel Time (s)	28.8				18.2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	159	90	38	7	53	3	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	244	128	0	0	63	0	
Turn Type	NA	Prot		Prot	Prot		
Protected Phases	1	1		5	5	3	
Permitted Phases							
Detector Phase	1	1		5	5		
Switch Phase							
Minimum Initial (s)	20.0	20.0		6.0	6.0	5.0	
Minimum Split (s)	25.0	25.0		11.0	11.0	25.0	
Total Split (s)	25.0	25.0		17.0	17.0	25.0	
Total Split (%)	20.5%	20.5%		13.9%	13.9%	20%	
Maximum Green (s)	20.0	20.0		12.0	12.0	21.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	0.0	
Lost Time Adjust (s)	0.0	0.0			0.0		
Total Lost Time (s)	5.0	5.0			5.0		
Lead/Lag	Lead	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	
Vehicle Extension (s)	3.0	3.0		2.0	2.0	3.0	
Recall Mode	Max	Max		Max	Max	None	
Walk Time (s)						6.0	
Flash Dont Walk (s)						13.0	
Pedestrian Calls (#/hr)						0	
Act Effct Green (s)	20.0	20.0			12.0		
Actuated g/C Ratio	0.21	0.21			0.12		
v/c Ratio	0.65	0.29			0.29		
Control Delay	44.3	6.4			42.6		
Queue Delay	0.0	0.0			0.0		
Total Delay	44.3	6.4			42.6		
LOS	D	A			D		
Approach Delay	31.2				42.6		
Approach LOS	C				D		

Phase 2 should only be set to recall

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Background



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Queue Length 50th (ft)		~165					85			212		
Queue Length 95th (ft)		#314					163			#348		
Internal Link Dist (ft)		756					522			616		
Turn Bay Length (ft)												
Base Capacity (vph)		199					380			477		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		1.14					0.58			0.78		

Intersection Summary

Area Type: Other
 Cycle Length: 122
 Actuated Cycle Length: 97
 Natural Cycle: 120
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 56.5
 Intersection LOS: E
 Intersection Capacity Utilization 84.2%
 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: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Ø1	Ø2	Ø5	Ø3	Ø4
25 s	30 s	17 s	25 s	25 s

	↓	↙	↘	↶	↷	↘	
Lane Group	SBT	SBR	SBR2	NEL2	NEL	NER	Ø3
Queue Length 50th (ft)	139	0			36		
Queue Length 95th (ft)	222	38			76		
Internal Link Dist (ft)	976				587		
Turn Bay Length (ft)							
Base Capacity (vph)	377	439			218		
Starvation Cap Reductn	0	0			0		
Spillback Cap Reductn	0	0			0		
Storage Cap Reductn	0	0			0		
Reduced v/c Ratio	0.65	0.29			0.29		
Intersection Summary							

HCM Signalized Intersection Capacity Analysis
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Background

													
Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	
Lane Configurations		↕					↕			↕			
Traffic Volume (vph)	127	49	29	4	14	15	41	134	18	312	11	78	
Future Volume (vph)	127	49	29	4	14	15	41	134	18	312	11	78	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		5.0					5.0			5.0			
Lane Util. Factor		1.00					1.00			1.00			
Frt		0.98					0.91			1.00			
Flt Protected		0.97					0.99			1.00			
Satd. Flow (prot)		1769					1686			1850			
Flt Permitted		0.53					0.93			1.00			
Satd. Flow (perm)		962					1583			1850			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	138	53	32	4	15	16	45	146	20	339	12	85	
RTOR Reduction (vph)	0	1	0	0	0	0	54	0	0	1	0	0	
Lane Group Flow (vph)	0	226	0	0	0	0	168	0	0	370	0	0	
Turn Type	Perm	NA			Perm	Perm	NA		Split	NA		Split	
Protected Phases		4					4		2	2		1	
Permitted Phases	4				4	4							
Actuated Green, G (s)		20.0					20.0			25.0			
Effective Green, g (s)		20.0					20.0			25.0			
Actuated g/C Ratio		0.21					0.21			0.26			
Clearance Time (s)		5.0					5.0			5.0			
Vehicle Extension (s)		4.0					4.0			4.0			
Lane Grp Cap (vph)		198					326			476			
v/s Ratio Prot										c0.20			
v/s Ratio Perm		c0.24					0.11						
v/c Ratio		1.14					0.52			0.78			
Uniform Delay, d1		38.5					34.2			33.4			
Progression Factor		1.00					1.00			1.00			
Incremental Delay, d2		107.6					1.8			11.8			
Delay (s)		146.1					36.0			45.3			
Level of Service		F					D			D			
Approach Delay (s)		146.1					36.0			45.3			
Approach LOS		F					D			D			
Intersection Summary													
HCM 2000 Control Delay			60.0				HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			0.80										
Actuated Cycle Length (s)			97.0				Sum of lost time (s)		24.0				
Intersection Capacity Utilization			84.2%				ICU Level of Service		E				
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Background

	↓	↙	↘	↖	↗	↘
Movement	SBT	SBR	SBR2	NEL2	NEL	NER
Lane Configurations	↖	↘			↘	
Traffic Volume (vph)	146	83	35	6	49	3
Future Volume (vph)	146	83	35	6	49	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00			1.00	
Frt	1.00	0.85			0.99	
Flt Protected	0.98	1.00			0.95	
Satd. Flow (prot)	1831	1583			1767	
Flt Permitted	0.98	1.00			0.95	
Satd. Flow (perm)	1831	1583			1767	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	159	90	38	7	53	3
RTOR Reduction (vph)	0	102	0	0	0	0
Lane Group Flow (vph)	244	26	0	0	63	0
Turn Type	NA	Prot		Prot	Prot	
Protected Phases	1	1		5	5	
Permitted Phases						
Actuated Green, G (s)	20.0	20.0			12.0	
Effective Green, g (s)	20.0	20.0			12.0	
Actuated g/C Ratio	0.21	0.21			0.12	
Clearance Time (s)	5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			2.0	
Lane Grp Cap (vph)	377	326			218	
v/s Ratio Prot	c0.13	0.02			c0.04	
v/s Ratio Perm						
v/c Ratio	0.65	0.08			0.29	
Uniform Delay, d1	35.3	31.1			38.6	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	8.3	0.5			3.3	
Delay (s)	43.6	31.6			41.9	
Level of Service	D	C			D	
Approach Delay (s)	39.5				41.9	
Approach LOS	D				D	
Intersection Summary						

Lanes, Volumes, Timings
 7: M-Lot Driveway & Route 649 (Poquonnock Rd.)

Electric Boat - Groton, CT
 2024 PM Background



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↑↑	
Traffic Volume (vph)	419	22	4	449	97	49
Future Volume (vph)	419	22	4	449	97	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	15	15	15
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.991				0.947	
Flt Protected				0.999	0.970	
Satd. Flow (prot)	3858	0	0	3889	1882	0
Flt Permitted				0.999	0.970	
Satd. Flow (perm)	3858	0	0	3889	1882	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	504			552	258	
Travel Time (s)	13.7			15.1	7.0	
Confl. Peds. (#/hr)			2		4	
Peak Hour Factor	0.93	0.75	0.50	0.83	0.72	0.57
Adj. Flow (vph)	451	29	8	541	135	86
Shared Lane Traffic (%)						
Lane Group Flow (vph)	480	0	0	549	221	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 7: M-Lot Driveway & Route 649 (Poquonnock Rd.)

Electric Boat - Groton, CT
 2024 PM Background

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘↘	
Traffic Volume (veh/h)	419	22	4	449	97	49
Future Volume (Veh/h)	419	22	4	449	97	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.75	0.50	0.83	0.72	0.57
Hourly flow rate (vph)	451	29	8	541	135	86
Pedestrians	4			2		
Lane Width (ft)	15.0			15.0		
Walking Speed (ft/s)	3.5			3.5		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	504					
pX, platoon unblocked						
vC, conflicting volume			482			242
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			482			242
tC, single (s)			4.1			6.9
tC, 2 stage (s)						
tF (s)			2.2			3.3
p0 queue free %			99			89
cM capacity (veh/h)			1074			757
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	301	179	188	361	221	
Volume Left	0	0	8	0	135	
Volume Right	0	29	0	0	86	
cSH	1700	1700	1074	1700	431	
Volume to Capacity	0.18	0.11	0.01	0.21	0.51	
Queue Length 95th (ft)	0	0	1	0	71	
Control Delay (s)	0.0	0.0	0.4	0.0	21.8	
Lane LOS	A			C		
Approach Delay (s)	0.0		0.1	21.8		
Approach LOS				C		
Intersection Summary						
Average Delay			3.9			
Intersection Capacity Utilization			30.3%	ICU Level of Service	A	
Analysis Period (min)	15					

Lanes, Volumes, Timings
8: Mitchell St./North St. & Meridian St.

Electric Boat - Groton, CT
2024 PM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	69	12	64	43	120	23	758	205	113	373	4
Future Volume (vph)	67	69	12	64	43	120	23	758	205	113	373	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	95		0	60		115	60		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			180			30			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00					1.00					
Frt		0.989			0.893				0.850		0.999	
Flt Protected		0.978		0.950			0.950			0.950		
Satd. Flow (prot)	0	1982	0	1770	1663	0	1770	3539	1583	1770	1861	0
Flt Permitted		0.655		0.606			0.515			0.267		
Satd. Flow (perm)	0	1327	0	1129	1663	0	958	3539	1583	497	1861	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			132				219		1	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		834			697			953			634	
Travel Time (s)		19.0			19.0			21.7			14.4	
Confl. Peds. (#/hr)	1						2					
Peak Hour Factor	0.92	0.92	0.92	0.82	0.81	0.91	0.46	0.91	0.81	0.95	0.89	1.00
Adj. Flow (vph)	73	75	13	78	53	132	50	833	253	119	419	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	161	0	78	185	0	50	833	253	119	423	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	D.P+P	NA	
Protected Phases		4			4			2		1	1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	1	2
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		25.0	25.0	25.0	5.0		
Minimum Split (s)	12.0	12.0		12.0	12.0		30.0	30.0	30.0	8.1		
Total Split (s)	19.0	19.0		19.0	19.0		30.0	30.0	30.0	8.1		
Total Split (%)	24.3%	24.3%		24.3%	24.3%		38.4%	38.4%	38.4%	10.4%		
Maximum Green (s)	15.0	15.0		15.0	15.0		25.0	25.0	25.0	5.0		
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	0.1		
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)		4.0		4.0	4.0		5.0	5.0	5.0	3.1		
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		15.1		15.1	15.1		37.8	37.8	37.8	52.8	55.9	
Actuated g/C Ratio		0.19		0.19	0.19		0.48	0.48	0.48	0.68	0.72	
v/c Ratio		0.62		0.36	0.43		0.11	0.49	0.29	0.22	0.32	

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	27%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings
 8: Mitchell St./North St. & Meridian St.

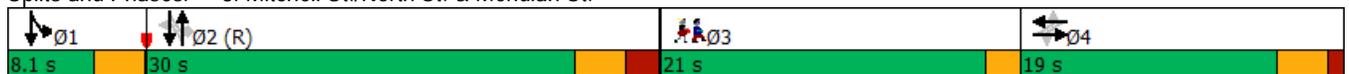
Electric Boat - Groton, CT
 2024 PM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		37.4		30.0	11.7		16.2	17.1	5.0	5.5	5.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		37.4		30.0	11.7		16.2	17.1	5.0	5.5	5.7	
LOS		D		C	B		B	B	A	A	A	
Approach Delay		37.4			17.1			14.3			5.7	
Approach LOS		D			B			B			A	
Queue Length 50th (ft)		71		34	22		12	133	8	14	60	
Queue Length 95th (ft)		116		57	53		21	253	46	41	138	
Internal Link Dist (ft)		754			617			873			554	
Turn Bay Length (ft)				95			60		115	60		
Base Capacity (vph)		293		246	467		464	1714	879	549	1333	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.55		0.32	0.40		0.11	0.49	0.29	0.22	0.32	

Intersection Summary

Area Type: Other
 Cycle Length: 78.1
 Actuated Cycle Length: 78.1
 Offset: 8.1 (10%), Referenced to phase 2:NBSB and 6:, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 14.2
 Intersection Capacity Utilization 72.6%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 8: Mitchell St./North St. & Meridian St.



Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 8: Mitchell St./North St. & Meridian St.

Electric Boat - Groton, CT
 2024 PM Background

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	69	12	64	43	120	23	758	205	113	373	4
Future Volume (vph)	67	69	12	64	43	120	23	758	205	113	373	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0		4.0	4.0		5.0	5.0	5.0	3.1	3.1	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	1.00	
Frbp, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.99		1.00	0.89		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1981		1770	1663		1768	3539	1583	1770	1860	
Flt Permitted		0.66		0.61	1.00		0.52	1.00	1.00	0.27	1.00	
Satd. Flow (perm)		1328		1129	1663		959	3539	1583	497	1860	
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.81	0.91	0.46	0.91	0.81	0.95	0.89	1.00
Adj. Flow (vph)	73	75	13	78	53	132	50	833	253	119	419	4
RTOR Reduction (vph)	0	4	0	0	106	0	0	0	113	0	0	0
Lane Group Flow (vph)	0	157	0	78	79	0	50	833	140	119	423	0
Confl. Peds. (#/hr)	1						2					
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	D.P+P	NA	
Protected Phases		4			4			2		1	1	2
Permitted Phases	4			4			2		2	2		
Actuated Green, G (s)		15.1		15.1	15.1		37.8	37.8	37.8	50.9	54.0	
Effective Green, g (s)		15.1		15.1	15.1		37.8	37.8	37.8	50.9	54.0	
Actuated g/C Ratio		0.19		0.19	0.19		0.48	0.48	0.48	0.65	0.69	
Clearance Time (s)		4.0		4.0	4.0		5.0	5.0	5.0	3.1		
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		256		218	321		464	1712	766	537	1286	
v/s Ratio Prot					0.05			c0.24		0.04	c0.23	
v/s Ratio Perm		c0.12		0.07			0.05		0.09	0.11		
v/c Ratio		0.61		0.36	0.24		0.11	0.49	0.18	0.22	0.33	
Uniform Delay, d1		28.8		27.3	26.7		11.0	13.6	11.4	5.6	4.8	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.3		1.0	0.4		0.5	1.0	0.5	0.2	0.2	
Delay (s)		33.1		28.3	27.1		11.4	14.6	11.9	5.8	5.0	
Level of Service		C		C	C		B	B	B	A	A	
Approach Delay (s)		33.1			27.4			13.9			5.1	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			14.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			78.1				Sum of lost time (s)			14.1		
Intersection Capacity Utilization			72.6%				ICU Level of Service			C		
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
9: North St. & Broad St.

Electric Boat - Groton, CT
2024 PM Background

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	12	14	148	25	3	13	737	132	1	290	18
Future Volume (vph)	11	12	14	148	25	3	13	737	132	1	290	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	11	11	11	11	11	11	12	14	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00				1.00				
Fr _t		0.955			0.968			0.977			0.991	
Fl _t Protected		0.981		0.950				0.999			0.999	
Satd. Flow (prot)	0	1978	0	1711	1743	0	0	3339	0	0	1967	0
Fl _t Permitted		0.887		0.710				0.944			0.990	
Satd. Flow (perm)	0	1787	0	1277	1743	0	0	3155	0	0	1949	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			8			61			11	
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		699			143			486			286	
Travel Time (s)		19.1			3.9			11.0			6.5	
Confl. Peds. (#/hr)	2			1			1					
Peak Hour Factor	0.39	0.60	0.58	0.90	0.86	0.38	0.54	0.89	0.87	0.25	0.92	0.75
Adj. Flow (vph)	28	20	24	164	29	8	24	828	152	4	315	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	72	0	164	37	0	0	1004	0	0	343	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		25.0	25.0		25.0	25.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		30.0	30.0		30.0	30.0	
Total Split (s)	19.0	19.0		19.0	19.0		30.0	30.0		30.0	30.0	
Total Split (%)	38.8%	38.8%		38.8%	38.8%		61.2%	61.2%		61.2%	61.2%	
Maximum Green (s)	15.0	15.0		15.0	15.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		11.0		11.0	11.0			29.1			29.1	
Actuated g/C Ratio		0.24		0.24	0.24			0.64			0.64	
v/c Ratio		0.16		0.53	0.09			0.49			0.28	
Control Delay		10.4		21.5	11.1			7.2			6.3	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		10.4		21.5	11.1			7.2			6.3	
LOS		B		C	B			A			A	
Approach Delay		10.4			19.6			7.2			6.3	
Approach LOS		B			B			A			A	

Lanes, Volumes, Timings
 9: North St. & Broad St.

Electric Boat - Groton, CT
 2024 PM Background

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		10		37	6			67			38	
Queue Length 95th (ft)		19		80	20			135			92	
Internal Link Dist (ft)		619			63			406			206	
Turn Bay Length (ft)												
Base Capacity (vph)		603		419	578			2030			1244	
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		0.12		0.39	0.06			0.49			0.28	

Intersection Summary

Area Type: Other
 Cycle Length: 49
 Actuated Cycle Length: 45.7
 Natural Cycle: 45
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 8.7
 Intersection Capacity Utilization 55.4%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 9: North St. & Broad St.



HCM Signalized Intersection Capacity Analysis
 9: North St. & Broad St.

Electric Boat - Groton, CT
 2024 PM Background

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	12	14	148	25	3	13	737	132	1	290	18
Future Volume (vph)	11	12	14	148	25	3	13	737	132	1	290	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	11	11	11	11	11	12	14	12
Total Lost time (s)		4.0		4.0	4.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			1.00	
Frbp, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.95		1.00	0.97			0.98			0.99	
Flt Protected		0.98		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1975		1707	1742			3340			1967	
Flt Permitted		0.89		0.71	1.00			0.94			0.99	
Satd. Flow (perm)		1786		1276	1742			3155			1948	
Peak-hour factor, PHF	0.39	0.60	0.58	0.90	0.86	0.38	0.54	0.89	0.87	0.25	0.92	0.75
Adj. Flow (vph)	28	20	24	164	29	8	24	828	152	4	315	24
RTOR Reduction (vph)	0	19	0	0	6	0	0	24	0	0	4	0
Lane Group Flow (vph)	0	53	0	164	31	0	0	980	0	0	339	0
Confl. Peds. (#/hr)	2			1				1				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2				2
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		9.4		9.4	9.4			28.1			28.1	
Effective Green, g (s)		9.4		9.4	9.4			28.1			28.1	
Actuated g/C Ratio		0.20		0.20	0.20			0.60			0.60	
Clearance Time (s)		4.0		4.0	4.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		361		257	352			1906			1177	
v/s Ratio Prot					0.02							
v/s Ratio Perm		0.03		c0.13				c0.31			0.17	
v/c Ratio		0.15		0.64	0.09			0.51			0.29	
Uniform Delay, d1		15.3		17.0	15.1			5.3			4.4	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.2		5.1	0.1			1.0			0.6	
Delay (s)		15.4		22.1	15.2			6.3			5.0	
Level of Service		B		C	B			A			A	
Approach Delay (s)		15.4			20.8			6.3			5.0	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.2									A
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			46.5								9.0	
Intersection Capacity Utilization			55.4%									B
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
2024 PM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	97	59	4	43	166	63	686	8	68	272	193
Future Volume (vph)	288	97	59	4	43	166	63	686	8	68	272	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	105		0	0		0	38		0	75		0
Storage Lanes	2		0	0		1	1		0	1		1
Taper Length (ft)	300			25			25			75		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Fr _t		0.950				0.850		0.998				0.850
Fl _t Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	3319	1770	0	0	1850	1583	1770	3532	0	1770	1863	1583
Fl _t Permitted	0.950				0.993		0.950			0.950		
Satd. Flow (perm)	3319	1770	0	0	1850	1583	1770	3532	0	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14				234		1				206
Link Speed (mph)		25			25			30				25
Link Distance (ft)		550			441			176				423
Travel Time (s)		15.0			12.0			4.0				11.5
Peak Hour Factor	0.96	0.74	0.91	0.50	0.88	0.71	0.95	0.83	0.67	0.79	0.92	0.87
Adj. Flow (vph)	300	131	65	8	49	234	66	827	12	86	296	222
Shared Lane Traffic (%)												
Lane Group Flow (vph)	300	196	0	0	57	234	66	839	0	86	296	222
Turn Type	Split	NA		Split	NA	pt+ov	Split	NA		Split	NA	Free
Protected Phases	4	4		5	5	15	2	2		1	1	
Permitted Phases												Free
Detector Phase	4	4		5	5	15	2	2		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0		15.0	15.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		25.0	25.0		20.0	20.0	
Total Split (s)	25.0	25.0		17.0	17.0		49.0	49.0		25.0	25.0	
Total Split (%)	17.4%	17.4%		11.8%	11.8%		34.0%	34.0%		17.4%	17.4%	
Maximum Green (s)	20.0	20.0		12.0	12.0		44.0	44.0		20.0	20.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag					Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		3.0	3.0		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	16.4	16.4			9.3	29.4	44.1	44.1		20.0	20.0	109.9
Actuated g/C Ratio	0.15	0.15			0.08	0.27	0.40	0.40		0.18	0.18	1.00
v/c Ratio	0.61	0.71			0.36	0.39	0.09	0.59		0.27	0.87	0.14
Control Delay	49.3	56.1			55.3	4.3	22.5	28.6		42.6	70.5	0.2
Queue Delay	0.0	0.0			0.0	0.0	0.0	1.0		0.0	0.0	0.0

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
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	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	19%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lanes, Volumes, Timings
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 PM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	49.3	56.1			55.3	4.3	22.5	29.6		42.6	70.5	0.2
LOS	D	E			E	A	C	C		D	E	A
Approach Delay		52.0			14.3			29.1			40.7	
Approach LOS		D			B			C			D	
Queue Length 50th (ft)	102	123			39	0	29	243		53	207	0
Queue Length 95th (ft)	152	163			80	11	62	297		91	#387	0
Internal Link Dist (ft)		470			361			96			343	
Turn Bay Length (ft)	105						38			75		
Base Capacity (vph)	605	334			202	627	710	1417		322	339	1583
Starvation Cap Reductn	0	0			0	0	0	313		0	0	0
Spillback Cap Reductn	0	0			0	0	0	0		0	0	0
Storage Cap Reductn	0	0			0	0	0	0		0	0	0
Reduced v/c Ratio	0.50	0.59			0.28	0.37	0.09	0.76		0.27	0.87	0.14

Intersection Summary

Area Type: Other
 Cycle Length: 144
 Actuated Cycle Length: 109.9
 Natural Cycle: 100
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.87
 Intersection Signal Delay: 35.2 Intersection LOS: D
 Intersection Capacity Utilization 59.1% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 10: North St./I-95 On/Off Ramps & Bridge St.

Ø1	Ø2	Ø5	Ø3	Ø4
25 s	49 s	17 s	28 s	25 s

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 PM Background

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	97	59	4	43	166	63	686	8	68	272	193
Future Volume (vph)	288	97	59	4	43	166	63	686	8	68	272	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00
Frt	1.00	0.95			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3319	1770			1850	1583	1770	3532		1770	1863	1583
Flt Permitted	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3319	1770			1850	1583	1770	3532		1770	1863	1583
Peak-hour factor, PHF	0.96	0.74	0.91	0.50	0.88	0.71	0.95	0.83	0.67	0.79	0.92	0.87
Adj. Flow (vph)	300	131	65	8	49	234	66	827	12	86	296	222
RTOR Reduction (vph)	0	12	0	0	0	172	0	1	0	0	0	0
Lane Group Flow (vph)	300	184	0	0	57	62	66	838	0	86	296	222
Turn Type	Split	NA		Split	NA	pt+ov	Split	NA		Split	NA	Free
Protected Phases	4	4		5	5	15	2	2		1	1	
Permitted Phases												Free
Actuated Green, G (s)	16.4	16.4			9.3	29.3	44.1	44.1		20.0	20.0	109.8
Effective Green, g (s)	16.4	16.4			9.3	29.3	44.1	44.1		20.0	20.0	109.8
Actuated g/C Ratio	0.15	0.15			0.08	0.27	0.40	0.40		0.18	0.18	1.00
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.5	2.5			3.0		3.0	3.0		2.5	2.5	
Lane Grp Cap (vph)	495	264			156	422	710	1418		322	339	1583
v/s Ratio Prot	0.09	c0.10			c0.03	0.04	0.04	c0.24		0.05	c0.16	
v/s Ratio Perm												0.14
v/c Ratio	0.61	0.70			0.37	0.15	0.09	0.59		0.27	0.87	0.14
Uniform Delay, d1	43.7	44.3			47.5	30.7	20.4	25.8		38.6	43.7	0.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.8	7.2			1.5	0.1	0.3	1.8		0.3	21.0	0.2
Delay (s)	45.5	51.5			48.9	30.8	20.7	27.6		38.9	64.7	0.2
Level of Service	D	D			D	C	C	C		D	E	A
Approach Delay (s)		47.9			34.4			27.1			37.3	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			35.2									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			109.8									Sum of lost time (s) 25.0
Intersection Capacity Utilization			59.1%									ICU Level of Service B
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings
 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Electric Boat - Groton, CT
 2024 PM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	96	53	55	98	79	35	1197	60	49	353	90
Future Volume (vph)	206	96	53	55	98	79	35	1197	60	49	353	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	230		0	90		90	120		150	130		120
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	300			120			150			300		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.95	1.00
Ped Bike Factor										1.00		
Fr _t		0.943				0.850		0.992				0.850
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1757	0	1770	1863	1583	1770	5045	0	1770	3539	1583
Fl _t Permitted	0.950			0.642			0.950			0.950		
Satd. Flow (perm)	3433	1757	0	1196	1863	1583	1770	5045	0	1765	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22				91		6				155
Link Speed (mph)		25			25			45				45
Link Distance (ft)		588			486			576				595
Travel Time (s)		16.0			13.3			8.7				9.0
Confl. Peds. (#/hr)										3		
Peak Hour Factor	0.85	0.84	0.77	0.90	0.86	0.88	0.71	0.91	0.78	0.71	0.90	0.58
Adj. Flow (vph)	242	114	69	61	114	90	49	1315	77	69	392	155
Shared Lane Traffic (%)												
Lane Group Flow (vph)	242	183	0	61	114	90	49	1392	0	69	392	155
Turn Type	Prot	NA		Perm	NA	pt+ov	Prot	NA		Prot	NA	custom
Protected Phases	4	4 8			8	5 8	1	6		5	2	2 4
Permitted Phases				8								6
Detector Phase	4	4 8		8	8	5 8	1	6		5	2	2 4
Switch Phase												
Minimum Initial (s)	5.0			9.0	9.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	10.9			14.7	14.7		11.8	20.0		11.8	20.0	
Total Split (s)	24.9			26.7	26.7		17.8	35.0		17.8	35.0	
Total Split (%)	17.4%			18.6%	18.6%		12.4%	24.4%		12.4%	24.4%	
Maximum Green (s)	19.0			21.0	21.0		11.0	30.0		11.0	30.0	
Yellow Time (s)	3.3			3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.6			2.4	2.4		3.8	2.0		3.8	2.0	
Lost Time Adjust (s)	0.0			0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.9			5.7	5.7		6.8	5.0		6.8	5.0	
Lead/Lag	Lag						Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes						Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.5		2.0	2.5	
Recall Mode	None			None	None		None	Max		None	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	11.4	28.0		10.9	10.9	24.5	7.0	30.2		7.9	36.4	53.7
Actuated g/C Ratio	0.14	0.33		0.13	0.13	0.29	0.08	0.36		0.09	0.43	0.64
v/c Ratio	0.52	0.30		0.40	0.47	0.17	0.33	0.76		0.42	0.26	0.14
Control Delay	38.5	19.6		43.1	42.0	6.0	44.2	28.3		45.1	18.6	2.0

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	39.0
Total Split (s)	39.0
Total Split (%)	27%
Maximum Green (s)	35.0
Yellow Time (s)	4.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	28.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lanes, Volumes, Timings
 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Electric Boat - Groton, CT
 2024 PM Background

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	38.5	19.6		43.1	42.0	6.0	44.2	28.3		45.1	18.6	2.0
LOS	D	B		D	D	A	D	C		D	B	A
Approach Delay		30.3			30.0			28.8			17.4	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	60	61		30	56	0	24	226		34	73	0
Queue Length 95th (ft)	98	106		73	110	31	49	#350		63	133	2
Internal Link Dist (ft)		508			406			496			515	
Turn Bay Length (ft)	230			90		90	120			130		120
Base Capacity (vph)	782	801		301	469	581	233	1820		233	1536	1201
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.31	0.23		0.20	0.24	0.15	0.21	0.76		0.30	0.26	0.13

Intersection Summary

Area Type: Other
 Cycle Length: 143.4
 Actuated Cycle Length: 83.9
 Natural Cycle: 120
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 26.6 Intersection LOS: C
 Intersection Capacity Utilization 63.9% ICU Level of Service B
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Ø1	Ø2	Ø3	Ø4	Ø8
17.8 s	35 s	39 s	24.9 s	26.7 s
Ø5	Ø6			
17.8 s	35 s			

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Electric Boat - Groton, CT
 2024 PM Background

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 					 		  			 	
Traffic Volume (vph)	206	96	53	55	98	79	35	1197	60	49	353	90
Future Volume (vph)	206	96	53	55	98	79	35	1197	60	49	353	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9		5.7	5.7	6.8	6.8	5.0		6.8	5.0	5.0
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1757		1770	1863	1583	1770	5043		1770	3539	1583
Flt Permitted	0.95	1.00		0.64	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1757		1196	1863	1583	1770	5043		1770	3539	1583
Peak-hour factor, PHF	0.85	0.84	0.77	0.90	0.86	0.88	0.71	0.91	0.78	0.71	0.90	0.58
Adj. Flow (vph)	242	114	69	61	114	90	49	1315	77	69	392	155
RTOR Reduction (vph)	0	15	0	0	0	71	0	4	0	0	0	61
Lane Group Flow (vph)	242	168	0	61	114	19	49	1388	0	69	392	94
Confl. Peds. (#/hr)										3		
Turn Type	Prot	NA		Perm	NA	pt+ov	Prot	NA		Prot	NA	custom
Protected Phases	4	4 8			8	5 8	1	6		5	2	2 4
Permitted Phases				8								6
Actuated Green, G (s)	11.4	28.2		10.9	10.9	24.5	4.7	33.2		7.9	36.4	52.8
Effective Green, g (s)	11.4	28.2		10.9	10.9	18.8	4.7	33.2		7.9	36.4	52.8
Actuated g/C Ratio	0.13	0.32		0.13	0.13	0.22	0.05	0.38		0.09	0.42	0.61
Clearance Time (s)	5.9			5.7	5.7		6.8	5.0		6.8	5.0	
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	450	570		150	233	342	95	1928		161	1484	962
v/s Ratio Prot	c0.07	0.10			c0.06	0.01	0.03	c0.28		c0.04	c0.11	0.06
v/s Ratio Perm				0.05								
v/c Ratio	0.54	0.29		0.41	0.49	0.06	0.52	0.72		0.43	0.26	0.10
Uniform Delay, d1	35.2	21.9		35.0	35.4	27.0	39.9	22.8		37.3	16.5	7.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1		0.7	0.6	0.0	2.0	2.4		0.7	0.4	0.0
Delay (s)	35.9	22.0		35.6	35.9	27.0	41.9	25.2		38.0	16.9	7.1
Level of Service	D	C		D	D	C	D	C		D	B	A
Approach Delay (s)		29.9			32.8			25.8			16.8	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			25.1									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			86.8									Sum of lost time (s) 27.4
Intersection Capacity Utilization			63.9%									ICU Level of Service B
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

Electric Boat - Groton, CT

12: Route 649 (Rainville Ave.)/Old Farms Rd. & Route 649 (Poquonnock Rd.) 2024 PM Background



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	171	14	317	195	34	10	22	257	13	18	8
Future Volume (vph)	22	171	14	317	195	34	10	22	257	13	18	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	11	11	11	15	15	15
Storage Length (ft)	155		0	0		0	0		85	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	135			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												1.00
Frt		0.987			0.976				0.850		0.960	
Flt Protected	0.950			0.950				0.979			0.986	
Satd. Flow (prot)	1711	1777	0	1652	1757	0	0	1763	1531	0	1940	0
Flt Permitted	0.578			0.617				0.830			0.881	
Satd. Flow (perm)	1041	1777	0	1073	1757	0	0	1495	1531	0	1729	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			16				352		20	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		529			504			284			348	
Travel Time (s)		12.0			11.5			6.5			7.9	
Confl. Peds. (#/hr)										5		
Peak Hour Factor	0.88	0.83	0.70	0.84	0.82	0.75	0.42	0.69	0.73	0.65	0.64	0.40
Adj. Flow (vph)	25	206	20	377	238	45	24	32	352	20	28	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	226	0	377	283	0	0	56	352	0	68	0
Turn Type	custom	NA		custom	NA		Perm	NA	custom	Perm	NA	
Protected Phases	1	1 2		3	2 3			5	5		5	
Permitted Phases	2			2			5		3	5		
Detector Phase	1	1 2		3	2 3		5	5	5	5	5	
Switch Phase												
Minimum Initial (s)	3.0			3.0			5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	7.0			7.2			11.2	11.2	11.2	11.2	11.2	
Total Split (s)	9.0			14.2			22.2	22.2	22.2	22.2	22.2	
Total Split (%)	11.1%			17.5%			27.3%	27.3%	27.3%	27.3%	27.3%	
Maximum Green (s)	5.0			10.0			16.0	16.0	16.0	16.0	16.0	
Yellow Time (s)	3.0			3.0			4.2	4.2	4.2	4.2	4.2	
All-Red Time (s)	1.0			1.2			2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0			0.0				0.0	0.0		0.0	
Total Lost Time (s)	4.0			4.2				6.2	6.2		6.2	
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	1.0			2.0			2.0	2.0	2.0	2.0	2.0	
Recall Mode	None			None			None	None	None	None	None	
Act Effct Green (s)	36.9	40.9		40.6	37.4			8.0	21.1		8.0	
Actuated g/C Ratio	0.51	0.57		0.56	0.52			0.11	0.29		0.11	
v/c Ratio	0.04	0.22		0.56	0.31			0.34	0.51		0.33	
Control Delay	8.6	9.0		9.2	6.1			35.4	5.1		26.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	8.6	9.0		9.2	6.1			35.4	5.1		26.8	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	20.8
Total Split (s)	35.8
Total Split (%)	44%
Maximum Green (s)	30.0
Yellow Time (s)	3.8
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	5.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A		A	A			D	A		C	
Approach Delay		9.0			7.9			9.3			26.8	
Approach LOS		A			A			A			C	
Queue Length 50th (ft)	4	44		39	29			24	0		20	
Queue Length 95th (ft)	16	86		89	63			42	19		35	
Internal Link Dist (ft)		449			424			204			268	
Turn Bay Length (ft)	155								85			
Base Capacity (vph)	578	989		700	944			332	685		399	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.04	0.23		0.54	0.30			0.17	0.51		0.17	

Intersection Summary

Area Type: Other
 Cycle Length: 81.2
 Actuated Cycle Length: 72.2
 Natural Cycle: 55
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 9.4
 Intersection Capacity Utilization 48.2%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 12: Route 649 (Rainville Ave.)/Old Farms Rd. & Route 649 (Poquonnock Rd.)

Ø1	Ø2	Ø5	Ø3
9 s	35.8 s	22.2 s	14.2 s

Lane Group	Ø2
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Electric Boat - Groton, CT

12: Route 649 (Rainville Ave.)/Old Farms Rd. & Route 649 (Poquonnock Rd.) 2024 PM Background

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	171	14	317	195	34	10	22	257	13	18	8
Future Volume (vph)	22	171	14	317	195	34	10	22	257	13	18	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	11	11	11	11	11	15	15	15
Total Lost time (s)	4.0	4.0		4.2	5.8			6.2	6.2		6.2	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Fr t	1.00	0.99		1.00	0.98			1.00	0.85		0.96	
Fl t Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.99	
Satd. Flow (prot)	1711	1777		1652	1758			1763	1531		1932	
Fl t Permitted	0.58	1.00		0.62	1.00			0.83	1.00		0.88	
Satd. Flow (perm)	1042	1777		1073	1758			1494	1531		1727	
Peak-hour factor, PHF	0.88	0.83	0.70	0.84	0.82	0.75	0.42	0.69	0.73	0.65	0.64	0.40
Adj. Flow (vph)	25	206	20	377	238	45	24	32	352	20	28	20
RTOR Reduction (vph)	0	4	0	0	7	0	0	0	270	0	18	0
Lane Group Flow (vph)	25	222	0	377	276	0	0	56	82	0	50	0
Confl. Peds. (#/hr)										5		
Turn Type	custom	NA		custom	NA		Perm	NA	custom	Perm	NA	
Protected Phases	1	1 2		3	2 3			5	5		5	
Permitted Phases	2			2			5		3	5		
Actuated Green, G (s)	35.1	39.1		39.0	39.0			8.0	16.9		8.0	
Effective Green, g (s)	35.1	39.1		39.0	39.0			8.0	16.9		8.0	
Actuated g/C Ratio	0.49	0.54		0.54	0.54			0.11	0.23		0.11	
Clearance Time (s)	4.0			4.2				6.2	6.2		6.2	
Vehicle Extension (s)	1.0			2.0				2.0	2.0		2.0	
Lane Grp Cap (vph)	552	962		650	949			165	489		191	
v/s Ratio Prot	0.00	c0.12		c0.07	0.16				0.02			
v/s Ratio Perm	0.02			c0.24				c0.04	0.04		0.03	
v/c Ratio	0.05	0.23		0.58	0.29			0.34	0.17		0.26	
Uniform Delay, d1	9.7	8.7		9.9	9.1			29.7	22.0		29.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.0		0.8	0.1			0.4	0.1		0.3	
Delay (s)	9.7	8.7		10.7	9.1			30.1	22.1		29.7	
Level of Service	A	A		B	A			C	C		C	
Approach Delay (s)		8.8			10.0			23.2			29.7	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	20.2
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Appendix D

Intersection Capacity Analysis Worksheets 2024 Combined Traffic Volumes Weekday Afternoon Peak Hour



Lanes, Volumes, Timings
 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Electric Boat - Groton, CT
 2024 PM Combined

								Ø3
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT		
Lane Configurations	 							
Traffic Volume (vph)	129	30	161	420	32	112		
Future Volume (vph)	129	30	161	420	32	112		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	12	12	11	11	12	15		
Storage Length (ft)	0	0		175	125			
Storage Lanes	2	0		1	1			
Taper Length (ft)	25				60			
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00		
Ped Bike Factor	0.85			0.99	0.99			
Frt	0.974			0.850				
Flt Protected	0.960				0.950			
Satd. Flow (prot)	3379	0	1801	1531	1770	2049		
Flt Permitted	0.960				0.560			
Satd. Flow (perm)	2877	0	1801	1510	1036	2049		
Right Turn on Red		Yes		Yes				
Satd. Flow (RTOR)	20			568				
Link Speed (mph)	30		25			25		
Link Distance (ft)	421		522			429		
Travel Time (s)	9.6		14.2			11.7		
Confl. Peds. (#/hr)	49			2	18			
Peak Hour Factor	0.61	0.66	0.57	0.74	0.60	0.60		
Adj. Flow (vph)	211	45	282	568	53	187		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	256	0	282	568	53	187		
Turn Type	Prot		NA	Perm	D.P+P	NA		
Protected Phases	4		2		1	1 2	3	
Permitted Phases				2	2			
Detector Phase	4		2	2	1	1 2		
Switch Phase								
Minimum Initial (s)	9.0		15.0	15.0	4.0		5.0	
Minimum Split (s)	14.2		20.6	20.6	7.1		24.0	
Total Split (s)	20.2		50.6	50.6	13.1		26.5	
Total Split (%)	18.3%		45.8%	45.8%	11.9%		24%	
Maximum Green (s)	15.0		45.0	45.0	10.0		24.5	
Yellow Time (s)	3.8		3.8	3.8	3.0		2.0	
All-Red Time (s)	1.4		1.8	1.8	0.1		0.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0			
Total Lost Time (s)	5.2		5.6	5.6	3.1			
Lead/Lag	Lag		Lag	Lag	Lead		Lead	
Lead-Lag Optimize?	Yes		Yes	Yes	Yes		Yes	
Vehicle Extension (s)	2.0		2.5	2.5	1.0		3.0	
Recall Mode	None		Min	Min	None		None	
Walk Time (s)							7.0	
Flash Dont Walk (s)							15.0	
Pedestrian Calls (#/hr)							8	
Act Effct Green (s)	10.6		20.4	20.4	29.4		32.8	
Actuated g/C Ratio	0.19		0.37	0.37	0.53		0.59	
v/c Ratio	0.39		0.42	0.62	0.08		0.15	

Lanes, Volumes, Timings
 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Electric Boat - Groton, CT
 2024 PM Combined



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	Ø3
Control Delay	23.4		17.3	5.3	7.3	7.1	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	23.4		17.3	5.3	7.3	7.1	
LOS	C		B	A	A	A	
Approach Delay	23.4		9.2			7.1	
Approach LOS	C		A			A	
Queue Length 50th (ft)	27		52	0	4	16	
Queue Length 95th (ft)	68		117	12	22	61	
Internal Link Dist (ft)	341		442			349	
Turn Bay Length (ft)				175	125		
Base Capacity (vph)	1022		1569	1388	753	1897	
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	0.25		0.18	0.41	0.07	0.10	

Intersection Summary

Area Type:	Other
Cycle Length:	110.4
Actuated Cycle Length:	55.3
Natural Cycle:	70
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	11.6
Intersection LOS:	B
Intersection Capacity Utilization:	37.6%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Ø1	Ø2	Ø3	Ø4
13.1 s	50.6 s	26.5 s	20.2 s

HCM Signalized Intersection Capacity Analysis
 1: Route 349 (Eastern Point Rd.) & Route 349 (Chester St.)

Electric Boat - Groton, CT
 2024 PM Combined

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	 				 	
Traffic Volume (vph)	129	30	161	420	32	112
Future Volume (vph)	129	30	161	420	32	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	11	11	12	15
Total Lost time (s)	5.2		5.6	5.6	3.1	3.1
Lane Util. Factor	0.97		1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Fr t	0.97		1.00	0.85	1.00	1.00
Fl t Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3379		1801	1510	1762	2049
Fl t Permitted	0.96		1.00	1.00	0.56	1.00
Satd. Flow (perm)	3379		1801	1510	1038	2049
Peak-hour factor, PHF	0.61	0.66	0.57	0.74	0.60	0.60
Adj. Flow (vph)	211	45	282	568	53	187
RTOR Reduction (vph)	16	0	0	360	0	0
Lane Group Flow (vph)	240	0	282	208	53	187
Confl. Peds. (#/hr)	49			2	18	
Turn Type	Prot		NA	Perm	D.P+P	NA
Protected Phases	4		2		1	1 2
Permitted Phases				2	2	
Actuated Green, G (s)	10.6		20.4	20.4	26.6	29.7
Effective Green, g (s)	10.6		20.4	20.4	26.6	29.7
Actuated g/C Ratio	0.19		0.37	0.37	0.48	0.53
Clearance Time (s)	5.2		5.6	5.6	3.1	
Vehicle Extension (s)	2.0		2.5	2.5	1.0	
Lane Grp Cap (vph)	644		660	554	577	1094
v/s Ratio Prot	c0.07		c0.16		0.01	c0.09
v/s Ratio Perm				0.14	0.03	
v/c Ratio	0.37		0.43	0.38	0.09	0.17
Uniform Delay, d1	19.6		13.2	12.9	7.8	6.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		0.3	0.3	0.0	0.0
Delay (s)	19.7		13.5	13.2	7.8	6.7
Level of Service	B		B	B	A	A
Approach Delay (s)	19.7		13.3			6.9
Approach LOS	B		B			A
Intersection Summary						
HCM 2000 Control Delay			13.4		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.35			
Actuated Cycle Length (s)			55.6		Sum of lost time (s)	15.9
Intersection Capacity Utilization			37.6%		ICU Level of Service	A
Analysis Period (min)			15			

c Critical Lane Group

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	59	314	10	19	142	31	2	23	104	60	9	34
Future Volume (vph)	59	314	10	19	142	31	2	23	104	60	9	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	12	12	12	15	15	15	15	15	15
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Fr _t		0.994			0.966			0.886			0.959	
Fl _t Protected		0.993			0.995			0.999			0.971	
Satd. Flow (prot)	0	3260	0	0	3402	0	0	1814	0	0	1908	0
Fl _t Permitted		0.993			0.995			0.999			0.971	
Satd. Flow (perm)	0	3260	0	0	3402	0	0	1814	0	0	1908	0
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		421			1171			266			576	
Travel Time (s)		9.6			26.6			7.3			15.7	
Confl. Peds. (#/hr)	38			176			54			36		
Peak Hour Factor	0.81	0.71	0.50	0.47	0.58	0.38	0.50	0.92	0.66	0.83	0.75	0.95
Adj. Flow (vph)	73	442	20	40	245	82	4	25	158	72	12	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	535	0	0	367	0	0	187	0	0	120	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 43.1%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
 2: Mumford Ave. & Route 349 (Chester St.)/Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 PM Combined

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	314	10	19	142	31	2	23	104	60	9	34
Future Volume (Veh/h)	59	314	10	19	142	31	2	23	104	60	9	34
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.71	0.50	0.47	0.58	0.38	0.50	0.92	0.66	0.83	0.75	0.95
Hourly flow rate (vph)	73	442	20	40	245	82	4	25	158	72	12	36
Pedestrians		54			36			176			38	
Lane Width (ft)		10.0			12.0			15.0			15.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		4			3			21			5	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		421			1171							
pX, platoon unblocked												
vC, conflicting volume	365			638			1072	1219	443	978	1188	256
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	365			638			1072	1219	443	978	1188	256
iC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
iC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			95			95	79	63	4	90	95
cM capacity (veh/h)	1136			744			87	120	429	75	125	680
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	294	241	162	204	187	120						
Volume Left	73	0	40	0	4	72						
Volume Right	0	20	0	82	158	36						
cSH	1136	1700	744	1700	300	109						
Volume to Capacity	0.06	0.14	0.05	0.12	0.62	1.11						
Queue Length 95th (ft)	5	0	4	0	97	187						
Control Delay (s)	2.5	0.0	2.9	0.0	35.0	192.7						
Lane LOS	A		A		D	F						
Approach Delay (s)	1.4		1.3		35.0	192.7						
Approach LOS					D	F						
Intersection Summary												
Average Delay			25.5									
Intersection Capacity Utilization			43.1%		ICU Level of Service				A			
Analysis Period (min)			15									

Lanes, Volumes, Timings
3: Benham Rd. & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
2024 PM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	614	11	97	148	48	3	110	175	132	122	0
Future Volume (vph)	67	614	11	97	148	48	3	110	175	132	122	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	14	10	10	10
Storage Length (ft)	0		0	0		0	0		250	0		0
Storage Lanes	0		0	0		0	0		1	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00			1.00				
Frt		0.996			0.976				0.850			
Flt Protected		0.994			0.985			0.999		0.950		
Satd. Flow (prot)	0	3270	0	0	3176	0	0	1737	1689	1652	1739	0
Flt Permitted		0.836			0.559			0.994		0.619		
Satd. Flow (perm)	0	2750	0	0	1802	0	0	1728	1689	1076	1739	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			30				213			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1171			1087			448			267	
Travel Time (s)		26.6			24.7			10.2			6.1	
Confl. Peds. (#/hr)				2			3					
Peak Hour Factor	0.67	0.84	0.46	0.81	0.73	0.79	0.75	0.66	0.82	0.61	0.84	0.92
Adj. Flow (vph)	100	731	24	120	203	61	4	167	213	216	145	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	855	0	0	384	0	0	171	213	216	145	0
Turn Type	Perm	NA		D.Pm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			1 2			4			4	
Permitted Phases	2			2			4		4	4		
Detector Phase	2	2		2	1 2		4	4	4	4	4	
Switch Phase												
Minimum Initial (s)	12.0	12.0		12.0			9.0	9.0	9.0	9.0	9.0	
Minimum Split (s)	17.2	17.2		17.2			14.5	14.5	14.5	14.5	14.5	
Total Split (s)	39.3	39.3		39.3			25.5	25.5	25.5	25.5	25.5	
Total Split (%)	38.9%	38.9%		38.9%			25.3%	25.3%	25.3%	25.3%	25.3%	
Maximum Green (s)	34.1	34.1		34.1			20.0	20.0	20.0	20.0	20.0	
Yellow Time (s)	4.2	4.2		4.2			3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0			2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)		0.0						0.0	0.0	0.0	0.0	
Total Lost Time (s)		5.2						5.5	5.5	5.5	5.5	
Lead/Lag	Lag	Lag		Lag			Lag	Lag	Lag	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0			2.5	2.5	2.5	2.5	2.5	
Recall Mode	Min	Min		Min			None	None	None	None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		32.0			47.5			20.3	20.3	20.3	20.3	
Actuated g/C Ratio		0.40			0.59			0.25	0.25	0.25	0.25	
v/c Ratio		0.78			0.36			0.39	0.36	0.79	0.33	

Lane Group	Ø1	Ø3
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Ideal Flow (vphpl)		
Lane Width (ft)		
Storage Length (ft)		
Storage Lanes		
Taper Length (ft)		
Lane Util. Factor		
Ped Bike Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Right Turn on Red		
Satd. Flow (RTOR)		
Link Speed (mph)		
Link Distance (ft)		
Travel Time (s)		
Confl. Peds. (#/hr)		
Peak Hour Factor		
Adj. Flow (vph)		
Shared Lane Traffic (%)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	1	3
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	6.0	5.0
Minimum Split (s)	9.1	23.0
Total Split (s)	13.1	23.0
Total Split (%)	13%	23%
Maximum Green (s)	10.0	21.0
Yellow Time (s)	3.0	2.0
All-Red Time (s)	0.1	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes
Vehicle Extension (s)	0.2	3.0
Recall Mode	Max	None
Walk Time (s)		7.0
Flash Dont Walk (s)		14.0
Pedestrian Calls (#/hr)		2
Act Effct Green (s)		
Actuated g/C Ratio		
v/c Ratio		

Lanes, Volumes, Timings
 3: Benham Rd. & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 PM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		28.2			10.2			30.8	6.6	53.3	29.8	
Queue Delay		0.0			0.0			0.0	0.0	0.0	0.0	
Total Delay		28.2			10.2			30.8	6.6	53.3	29.8	
LOS		C			B			C	A	D	C	
Approach Delay		28.2			10.2			17.4			43.9	
Approach LOS		C			B			B			D	
Queue Length 50th (ft)		170			36			69	0	97	57	
Queue Length 95th (ft)		#349			84			116	43	#153	132	
Internal Link Dist (ft)		1091			1007			368			187	
Turn Bay Length (ft)									250			
Base Capacity (vph)		1190			1137			437	586	272	440	
Starvation Cap Reductn		0			0			0	0	0	0	
Spillback Cap Reductn		0			0			0	0	0	0	
Storage Cap Reductn		0			0			0	0	0	0	
Reduced v/c Ratio		0.72			0.34			0.39	0.36	0.79	0.33	

Intersection Summary

Area Type: Other

Cycle Length: 100.9

Actuated Cycle Length: 80.2

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 25.5

Intersection LOS: C

Intersection Capacity Utilization 53.9%

ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 3: Benham Rd. & Route 349 (Rainville Ave.)

01	02	03	04
13.1 s	39.3 s	23 s	25.5 s

Lane Group	Ø1	Ø3
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)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
 3: Benham Rd. & Route 349 (Rainville Ave.)

Electric Boat - Groton, CT
 2024 PM Combined

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	67	614	11	97	148	48	3	110	175	132	122	0
Future Volume (vph)	67	614	11	97	148	48	3	110	175	132	122	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	14	10	10	10
Total Lost time (s)		5.2			3.1			5.5	5.5	5.5	5.5	
Lane Util. Factor		0.95			0.95			1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00			1.00			1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00	1.00	1.00	1.00	
Frt		1.00			0.98			1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.98			1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3270			3175			1736	1689	1652	1739	
Flt Permitted		0.84			0.56			0.99	1.00	0.62	1.00	
Satd. Flow (perm)		2751			1803			1728	1689	1077	1739	
Peak-hour factor, PHF	0.67	0.84	0.46	0.81	0.73	0.79	0.75	0.66	0.82	0.61	0.84	0.92
Adj. Flow (vph)	100	731	24	120	203	61	4	167	213	216	145	0
RTOR Reduction (vph)	0	2	0	0	13	0	0	0	160	0	0	0
Lane Group Flow (vph)	0	853	0	0	371	0	0	171	53	216	145	0
Confl. Peds. (#/hr)				2			3					
Turn Type	Perm	NA		D.Pm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		2			1 2			4			4	
Permitted Phases	2			2			4		4	4		
Actuated Green, G (s)		32.0			45.3			20.3	20.3	20.3	20.3	
Effective Green, g (s)		32.0			45.3			20.3	20.3	20.3	20.3	
Actuated g/C Ratio		0.39			0.56			0.25	0.25	0.25	0.25	
Clearance Time (s)		5.2						5.5	5.5	5.5	5.5	
Vehicle Extension (s)		3.0						2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)		1078			1000			429	420	267	432	
v/s Ratio Prot												0.08
v/s Ratio Perm		c0.31			c0.21			0.10	0.03	c0.20		
v/c Ratio		0.79			0.37			0.40	0.13	0.81	0.34	
Uniform Delay, d1		21.9			10.2			25.6	23.8	28.8	25.1	
Progression Factor		1.00			1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.0			0.2			0.4	0.1	15.9	0.3	
Delay (s)		25.9			10.4			26.0	23.9	44.7	25.5	
Level of Service		C			B			C	C	D	C	
Approach Delay (s)		25.9			10.4			24.8			37.0	
Approach LOS		C			B			C			D	
Intersection Summary												
HCM 2000 Control Delay			24.7									C
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			81.6							15.8		
Intersection Capacity Utilization			53.9%									A
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings

Electric Boat - Groton, CT

4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

2024 PM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	757	145	21	39	57	169	24	502	46	81	219	214
Future Volume (vph)	757	145	21	39	57	169	24	502	46	81	219	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	11	10	10	10	10	10	10	10	10	10
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			80		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor								1.00				
Frt		0.991				0.850		0.983				0.850
Flt Protected	0.950	0.969			0.980			0.998		0.950		
Satd. Flow (prot)	1569	1643	0	0	1704	1478	0	3241	0	1652	1739	1478
Flt Permitted	0.950	0.969			0.980			0.925		0.222		
Satd. Flow (perm)	1569	1643	0	0	1704	1478	0	3003	0	386	1739	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				235		9				249
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1087			427			507			1053	
Travel Time (s)		24.7			9.7			11.5			23.9	
Confl. Peds. (#/hr)							1					
Peak Hour Factor	0.80	0.80	0.62	0.73	0.74	0.72	0.72	0.88	0.59	0.68	0.89	0.86
Adj. Flow (vph)	946	181	34	53	77	235	33	570	78	119	246	249
Shared Lane Traffic (%)	39%											
Lane Group Flow (vph)	577	584	0	0	130	235	0	681	0	119	246	249
Turn Type	Split	NA		Split	NA	Prot	Perm	NA		pm+pt	NA	custom
Protected Phases	4	4		5	5	5		2		1	1 2	1 2 4
Permitted Phases							2			1 2		5
Detector Phase	4	4		5	5	5	2	2		1	1 2	1 2 4
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	6.0	6.0	15.0	15.0		6.0		
Minimum Split (s)	12.5	12.5		10.5	10.5	10.5	19.5	19.5		10.5		
Total Split (s)	52.3	52.3		20.8	20.8	20.8	46.3	46.3		10.5		
Total Split (%)	34.1%	34.1%		13.6%	13.6%	13.6%	30.2%	30.2%		6.8%		
Maximum Green (s)	47.8	47.8		16.3	16.3	16.3	41.8	41.8		6.0		
Yellow Time (s)	3.5	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	1.0	1.0	1.0		1.0		
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0		
Total Lost Time (s)	4.5	4.5			4.5	4.5		4.5		4.5		
Lead/Lag	Lag	Lag					Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0		
Recall Mode	None	None		None	None	None	Max	Max		None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	48.0	48.0			14.2	14.2		42.0		48.0	52.6	127.6
Actuated g/C Ratio	0.36	0.36			0.11	0.11		0.32		0.36	0.40	0.97
v/c Ratio	1.01	0.98			0.71	0.64		0.71		0.60	0.36	0.17

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	21.0
Total Split (s)	23.5
Total Split (%)	15%
Maximum Green (s)	21.5
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	82.7	73.2			78.8	15.4		45.1		44.1	31.3	0.4
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	82.7	73.2			78.8	15.4		45.1		44.1	31.3	0.4
LOS	F	E			E	B		D		D	C	A
Approach Delay		77.9			38.0			45.1			21.3	
Approach LOS		E			D			D			C	
Queue Length 50th (ft)	502	496			105	0		257		63	141	0
Queue Length 95th (ft)	#789	#776			162	21		395		99	263	11
Internal Link Dist (ft)		1007			347			427			973	
Turn Bay Length (ft)										100		
Base Capacity (vph)	570	598			211	388		961		198	692	1436
Starvation Cap Reductn	0	0			0	0		0		0	0	0
Spillback Cap Reductn	0	0			0	0		0		0	0	0
Storage Cap Reductn	0	0			0	0		0		0	0	0
Reduced v/c Ratio	1.01	0.98			0.62	0.61		0.71		0.60	0.36	0.17

Intersection Summary

Area Type: Other
 Cycle Length: 153.4
 Actuated Cycle Length: 132.1
 Natural Cycle: 150
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.01
 Intersection Signal Delay: 52.5
 Intersection LOS: D
 Intersection Capacity Utilization 73.1%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

01	02	05	03	04
10.5 s	46.3 s	20.8 s	23.5 s	52.3 s

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Electric Boat - Groton, CT

4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

2024 PM Combined

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	757	145	21	39	57	169	24	502	46	81	219	214
Future Volume (vph)	757	145	21	39	57	169	24	502	46	81	219	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	10	10	10	10	10	10	10	10
Total Lost time (s)	4.5	4.5			4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.95	0.95			1.00	1.00		0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99			1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	0.97			0.98	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1569	1644			1704	1478		3239		1652	1739	1478
Flt Permitted	0.95	0.97			0.98	1.00		0.93		0.22	1.00	1.00
Satd. Flow (perm)	1569	1644			1704	1478		3004		386	1739	1478
Peak-hour factor, PHF	0.80	0.80	0.62	0.73	0.74	0.72	0.72	0.88	0.59	0.68	0.89	0.86
Adj. Flow (vph)	946	181	34	53	77	235	33	570	78	119	246	249
RTOR Reduction (vph)	0	1	0	0	0	210	0	6	0	0	0	27
Lane Group Flow (vph)	577	583	0	0	130	25	0	675	0	119	246	222
Confl. Peds. (#/hr)							1					
Turn Type	Split	NA		Split	NA	Prot	Perm	NA		pm+pt	NA	custom
Protected Phases	4	4		5	5	5		2		1	1 2	1 2 4
Permitted Phases							2			1 2		5
Actuated Green, G (s)	48.0	48.0			14.2	14.2		42.0		48.0	52.5	119.2
Effective Green, g (s)	48.0	48.0			14.2	14.2		42.0		48.0	52.5	119.2
Actuated g/C Ratio	0.36	0.36			0.11	0.11		0.31		0.36	0.39	0.89
Clearance Time (s)	4.5	4.5			4.5	4.5		4.5		4.5		
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0		3.0		
Lane Grp Cap (vph)	564	591			181	157		945		195	683	1369
v/s Ratio Prot	c0.37	0.35			c0.08	0.02				c0.03	0.14	0.13
v/s Ratio Perm								c0.22		0.19		0.02
v/c Ratio	1.02	0.99			0.72	0.16		0.71		0.61	0.36	0.16
Uniform Delay, d1	42.8	42.4			57.7	54.2		40.4		32.4	28.6	0.9
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	43.9	33.2			12.8	0.5		4.6		5.5	0.3	0.1
Delay (s)	86.6	75.6			70.5	54.7		45.0		38.0	29.0	1.0
Level of Service	F	E			E	D		D		D	C	A
Approach Delay (s)		81.1			60.3			45.0			19.3	
Approach LOS		F			E			D			B	
Intersection Summary												
HCM 2000 Control Delay			56.2									HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			133.5									Sum of lost time (s) 20.0
Intersection Capacity Utilization			73.1%									ICU Level of Service D
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	43	94	16	80	23	175	80	7	5	50	4
Future Volume (vph)	4	43	94	16	80	23	175	80	7	5	50	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.974			0.996			0.991	
Flt Protected		0.996			0.993			0.968			0.996	
Satd. Flow (prot)	0	1855	1583	0	1802	0	0	1796	0	0	1839	0
Flt Permitted		0.996			0.993			0.968			0.996	
Satd. Flow (perm)	0	1855	1583	0	1802	0	0	1796	0	0	1839	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			102		12			2			3	
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		678			836			704			713	
Travel Time (s)		15.4			22.8			19.2			19.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	47	102	17	87	25	190	87	8	5	54	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	51	102	0	129	0	0	285	0	0	63	0
Turn Type	Split	NA	pt+ov	Split	NA		Split	NA		Split	NA	
Protected Phases	1	1	1 2	5	5		2	2		4	4	
Permitted Phases												
Detector Phase	1	1	1 2	5	5		2	2		4	4	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0		6.0	6.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		26.0	26.0		11.0	11.0	
Total Split (s)	20.0	20.0		20.0	20.0		26.0	26.0		20.0	20.0	
Total Split (%)	23.3%	23.3%		23.3%	23.3%		30.2%	30.2%		23.3%	23.3%	
Maximum Green (s)	15.0	15.0		15.0	15.0		20.0	20.0		15.0	15.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		4.0	4.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.0			5.0			6.0			5.0	
Lead/Lag	Lead	Lead					Lag	Lag				
Lead-Lag Optimize?	Yes	Yes					Yes	Yes				
Vehicle Extension (s)	2.0	2.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		None	None	
Act Effct Green (s)		8.5	37.8		10.2			27.1			7.9	
Actuated g/C Ratio		0.14	0.63		0.17			0.45			0.13	
v/c Ratio		0.20	0.10		0.41			0.35			0.26	
Control Delay		29.8	2.9		27.9			20.6			29.2	
Queue Delay		0.0	0.0		0.0			0.0			0.0	
Total Delay		29.8	2.9		27.9			20.6			29.2	
LOS		C	A		C			C			C	
Approach Delay		11.9			27.9			20.6			29.2	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)		19	0		44			94			23	
Queue Length 95th (ft)		53	23		95			189			59	
Internal Link Dist (ft)		598			756			624			633	

Lanes, Volumes, Timings
 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Combined

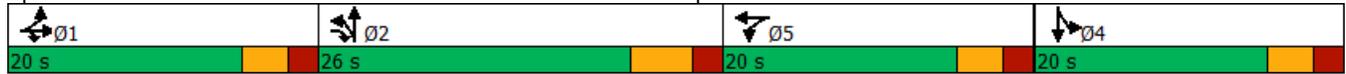
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)		482	1029		477			808			480	
Starvation Cap Reductn		0	0		0			0			0	
Spillback Cap Reductn		0	0		0			0			0	
Storage Cap Reductn		0	0		0			0			0	
Reduced v/c Ratio		0.11	0.10		0.27			0.35			0.13	

Intersection Summary

Area Type: Other
 Cycle Length: 86
 Actuated Cycle Length: 60.4
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.41
 Intersection Signal Delay: 20.8
 Intersection Capacity Utilization 43.3%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service A

Splits and Phases: 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.



HCM Signalized Intersection Capacity Analysis
 5: Eastern Point Rd./Smith St. & Thames St./Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Combined

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	43	94	16	80	23	175	80	7	5	50	4
Future Volume (vph)	4	43	94	16	80	23	175	80	7	5	50	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0			6.0			5.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Fr _t		1.00	0.85		0.97			1.00			0.99	
Fl _t Protected		1.00	1.00		0.99			0.97			1.00	
Satd. Flow (prot)		1855	1583		1802			1796			1839	
Fl _t Permitted		1.00	1.00		0.99			0.97			1.00	
Satd. Flow (perm)		1855	1583		1802			1796			1839	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	47	102	17	87	25	190	87	8	5	54	4
RTOR Reduction (vph)	0	0	45	0	11	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	51	57	0	118	0	0	284	0	0	60	0
Turn Type	Split	NA	pt+ov	Split	NA		Split	NA		Split	NA	
Protected Phases	1	1	1 2	5	5		2	2		4	4	
Permitted Phases												
Actuated Green, G (s)		6.2	36.6		7.9			25.4			4.6	
Effective Green, g (s)		6.2	36.6		7.9			25.4			4.6	
Actuated g/C Ratio		0.10	0.56		0.12			0.39			0.07	
Clearance Time (s)		5.0			5.0			6.0			5.0	
Vehicle Extension (s)		2.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		176	889		218			700			129	
v/s Ratio Prot		c0.03	0.04		c0.07			c0.16			c0.03	
v/s Ratio Perm												
v/c Ratio		0.29	0.06		0.54			0.41			0.47	
Uniform Delay, d ₁		27.4	6.5		26.9			14.4			29.1	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d ₂		0.3	0.0		2.8			1.7			2.7	
Delay (s)		27.7	6.5		29.7			16.1			31.7	
Level of Service		C	A		C			B			C	
Approach Delay (s)		13.6			29.7			16.1			31.7	
Approach LOS		B			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			19.8									
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			65.1									
Intersection Capacity Utilization			43.3%									
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

Electric Boat - Groton, CT

6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

2024 PM Combined

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↕					↕			↕		
Traffic Volume (vph)	146	49	29	4	14	15	41	134	18	312	11	78
Future Volume (vph)	146	49	29	4	14	15	41	134	18	312	11	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt		0.980					0.911			0.996		
Flt Protected		0.969					0.993			0.997		
Satd. Flow (prot)	0	1769	0	0	0	0	1685	0	0	1850	0	0
Flt Permitted		0.516					0.934			0.997		
Satd. Flow (perm)	0	942	0	0	0	0	1585	0	0	1850	0	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)		1					68			1		
Link Speed (mph)		25					25			25		
Link Distance (ft)		836					602			696		
Travel Time (s)		22.8					16.4			19.0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	159	53	32	4	15	16	45	146	20	339	12	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	248	0	0	0	0	222	0	0	371	0	0
Turn Type	Perm	NA			Perm	Perm	NA		Split	NA		Split
Protected Phases		4					4		2	2		1
Permitted Phases	4				4	4						
Detector Phase	4	4			4	4	4		2	2		1
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0	8.0	8.0		10.0	10.0		20.0
Minimum Split (s)	13.0	13.0			13.0	13.0	13.0		15.0	15.0		25.0
Total Split (s)	25.0	25.0			25.0	25.0	25.0		30.0	30.0		25.0
Total Split (%)	20.5%	20.5%			20.5%	20.5%	20.5%		24.6%	24.6%		20.5%
Maximum Green (s)	20.0	20.0			20.0	20.0	20.0		25.0	25.0		20.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)		0.0					0.0			0.0		
Total Lost Time (s)		5.0					5.0			5.0		
Lead/Lag	Lag	Lag			Lag	Lag	Lag		Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		3.0
Recall Mode	None	None			None	None	None		Max	Max		Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		20.0					20.0			25.0		
Actuated g/C Ratio		0.21					0.21			0.26		
v/c Ratio		1.27					0.58			0.78		
Control Delay		190.6					30.8			46.2		
Queue Delay		0.0					0.0			0.0		
Total Delay		190.6					30.8			46.2		
LOS		F					C			D		
Approach Delay		190.6					30.8			46.2		
Approach LOS		F					C			D		

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Combined

	↓	↙	↘	↖	↗	↘	Ø3
Lane Group	SBT	SBR	SBR2	NEL2	NEL	NER	Ø3
Lane Configurations	↕	↕			↕		
Traffic Volume (vph)	146	98	50	10	209	11	
Future Volume (vph)	146	98	50	10	209	11	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Fr _t		0.850			0.994		
Fl _t Protected	0.983				0.955		
Satd. Flow (prot)	1831	1583	0	0	1768	0	
Fl _t Permitted	0.983				0.955		
Satd. Flow (perm)	1831	1583	0	0	1768	0	
Right Turn on Red			Yes				
Satd. Flow (RTOR)		143					
Link Speed (mph)	25				25		
Link Distance (ft)	1056				667		
Travel Time (s)	28.8				18.2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	159	107	54	11	227	12	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	244	161	0	0	250	0	
Turn Type	NA	Prot		Prot	Prot		
Protected Phases	1	1		5	5	3	
Permitted Phases							
Detector Phase	1	1		5	5		
Switch Phase							
Minimum Initial (s)	20.0	20.0		6.0	6.0	5.0	
Minimum Split (s)	25.0	25.0		11.0	11.0	25.0	
Total Split (s)	25.0	25.0		17.0	17.0	25.0	
Total Split (%)	20.5%	20.5%		13.9%	13.9%	20%	
Maximum Green (s)	20.0	20.0		12.0	12.0	21.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	0.0	
Lost Time Adjust (s)	0.0	0.0			0.0		
Total Lost Time (s)	5.0	5.0			5.0		
Lead/Lag	Lead	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	
Vehicle Extension (s)	3.0	3.0		2.0	2.0	3.0	
Recall Mode	Max	Max		Max	Max	None	
Walk Time (s)						6.0	
Flash Dont Walk (s)						13.0	
Pedestrian Calls (#/hr)						0	
Act Effct Green (s)	20.0	20.0			12.0		
Actuated g/C Ratio	0.21	0.21			0.12		
v/c Ratio	0.65	0.37			1.15		
Control Delay	44.3	10.2			146.2		
Queue Delay	0.0	0.0			0.0		
Total Delay	44.3	10.2			146.2		
LOS	D	B			F		
Approach Delay	30.8				146.2		
Approach LOS	C				F		

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Combined



Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Queue Length 50th (ft)		~195					85			212		
Queue Length 95th (ft)		#350					163			#348		
Internal Link Dist (ft)		756					522			616		
Turn Bay Length (ft)												
Base Capacity (vph)		195					380			477		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		1.27					0.58			0.78		

Intersection Summary

Area Type: Other
 Cycle Length: 122
 Actuated Cycle Length: 97
 Natural Cycle: 150
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.27
 Intersection Signal Delay: 80.4
 Intersection LOS: F
 Intersection Capacity Utilization 93.1%
 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: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

01	02	05	03	04
25 s	30 s	17 s	25 s	25 s

	↓	↙	↘	↶	↷	↘	
Lane Group	SBT	SBR	SBR2	NEL2	NEL	NER	Ø3
Queue Length 50th (ft)	139	9			-182		
Queue Length 95th (ft)	222	62			#333		
Internal Link Dist (ft)	976				587		
Turn Bay Length (ft)							
Base Capacity (vph)	377	439			218		
Starvation Cap Reductn	0	0			0		
Spillback Cap Reductn	0	0			0		
Storage Cap Reductn	0	0			0		
Reduced v/c Ratio	0.65	0.37			1.15		
Intersection Summary							

HCM Signalized Intersection Capacity Analysis
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Combined

													
Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	
Lane Configurations		↕					↕			↕			
Traffic Volume (vph)	146	49	29	4	14	15	41	134	18	312	11	78	
Future Volume (vph)	146	49	29	4	14	15	41	134	18	312	11	78	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		5.0					5.0			5.0			
Lane Util. Factor		1.00					1.00			1.00			
Frt		0.98					0.91			1.00			
Flt Protected		0.97					0.99			1.00			
Satd. Flow (prot)		1770					1686			1850			
Flt Permitted		0.52					0.93			1.00			
Satd. Flow (perm)		942					1585			1850			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	159	53	32	4	15	16	45	146	20	339	12	85	
RTOR Reduction (vph)	0	1	0	0	0	0	54	0	0	1	0	0	
Lane Group Flow (vph)	0	247	0	0	0	0	168	0	0	370	0	0	
Turn Type	Perm	NA			Perm	Perm	NA		Split	NA		Split	
Protected Phases		4					4		2	2		1	
Permitted Phases	4				4	4							
Actuated Green, G (s)		20.0					20.0			25.0			
Effective Green, g (s)		20.0					20.0			25.0			
Actuated g/C Ratio		0.21					0.21			0.26			
Clearance Time (s)		5.0					5.0			5.0			
Vehicle Extension (s)		4.0					4.0			4.0			
Lane Grp Cap (vph)		194					326			476			
v/s Ratio Prot										c0.20			
v/s Ratio Perm		c0.26					0.11						
v/c Ratio		1.27					0.52			0.78			
Uniform Delay, d1		38.5					34.2			33.4			
Progression Factor		1.00					1.00			1.00			
Incremental Delay, d2		157.3					1.8			11.8			
Delay (s)		195.8					36.0			45.3			
Level of Service		F					D			D			
Approach Delay (s)		195.8					36.0			45.3			
Approach LOS		F					D			D			
Intersection Summary													
HCM 2000 Control Delay			84.5				HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			0.98										
Actuated Cycle Length (s)			97.0				Sum of lost time (s)		24.0				
Intersection Capacity Utilization			93.1%				ICU Level of Service		F				
Analysis Period (min)			15										

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Combined

	↓	↙	↘	↖	↗	↘
Movement	SBT	SBR	SBR2	NEL2	NEL	NER
Lane Configurations	↕	↙			↘	
Traffic Volume (vph)	146	98	50	10	209	11
Future Volume (vph)	146	98	50	10	209	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00			1.00	
Frt	1.00	0.85			0.99	
Flt Protected	0.98	1.00			0.95	
Satd. Flow (prot)	1831	1583			1767	
Flt Permitted	0.98	1.00			0.95	
Satd. Flow (perm)	1831	1583			1767	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	159	107	54	11	227	12
RTOR Reduction (vph)	0	114	0	0	0	0
Lane Group Flow (vph)	244	47	0	0	250	0
Turn Type	NA	Prot		Prot	Prot	
Protected Phases	1	1		5	5	
Permitted Phases						
Actuated Green, G (s)	20.0	20.0			12.0	
Effective Green, g (s)	20.0	20.0			12.0	
Actuated g/C Ratio	0.21	0.21			0.12	
Clearance Time (s)	5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			2.0	
Lane Grp Cap (vph)	377	326			218	
v/s Ratio Prot	c0.13	0.03			c0.14	
v/s Ratio Perm						
v/c Ratio	0.65	0.15			1.15	
Uniform Delay, d1	35.3	31.5			42.5	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	8.3	0.9			106.2	
Delay (s)	43.6	32.4			148.7	
Level of Service	D	C			F	
Approach Delay (s)	39.2				148.7	
Approach LOS	D				F	
Intersection Summary						

Lanes, Volumes, Timings
 7: M-Lot Driveway & Route 649 (Poquonnock Rd.)

Electric Boat - Groton, CT
 2024 PM Combined

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘↙	
Traffic Volume (vph)	419	22	4	449	97	49
Future Volume (vph)	419	22	4	449	97	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	15	15	15
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.991				0.947	
Flt Protected				0.999	0.970	
Satd. Flow (prot)	3858	0	0	3889	1882	0
Flt Permitted				0.999	0.970	
Satd. Flow (perm)	3858	0	0	3889	1882	0
Link Speed (mph)	25			25	25	
Link Distance (ft)	504			552	258	
Travel Time (s)	13.7			15.1	7.0	
Confl. Peds. (#/hr)			2		4	
Peak Hour Factor	0.93	0.75	0.50	0.83	0.72	0.57
Adj. Flow (vph)	451	29	8	541	135	86
Shared Lane Traffic (%)						
Lane Group Flow (vph)	480	0	0	549	221	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
 7: M-Lot Driveway & Route 649 (Poquonnock Rd.)

Electric Boat - Groton, CT
 2024 PM Combined

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘↙	
Traffic Volume (veh/h)	419	22	4	449	97	49
Future Volume (Veh/h)	419	22	4	449	97	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.75	0.50	0.83	0.72	0.57
Hourly flow rate (vph)	451	29	8	541	135	86
Pedestrians	4			2		
Lane Width (ft)	15.0			15.0		
Walking Speed (ft/s)	3.5			3.5		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	504					
pX, platoon unblocked						
vC, conflicting volume			482			758 242
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			482			758 242
tC, single (s)			4.1			6.8 6.9
tC, 2 stage (s)						
tF (s)			2.2			3.5 3.3
p0 queue free %			99			60 89
cM capacity (veh/h)			1074			338 757
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	
Volume Total	301	179	188	361	221	
Volume Left	0	0	8	0	135	
Volume Right	0	29	0	0	86	
cSH	1700	1700	1074	1700	431	
Volume to Capacity	0.18	0.11	0.01	0.21	0.51	
Queue Length 95th (ft)	0	0	1	0	71	
Control Delay (s)	0.0	0.0	0.4	0.0	21.8	
Lane LOS	A			C		
Approach Delay (s)	0.0		0.1	21.8		
Approach LOS				C		
Intersection Summary						
Average Delay			3.9			
Intersection Capacity Utilization			30.3%	ICU Level of Service		A
Analysis Period (min)	15					

Lanes, Volumes, Timings
8: Mitchell St./North St. & Meridian St.

Electric Boat - Groton, CT
2024 PM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	69	12	64	43	120	23	825	205	113	426	4
Future Volume (vph)	67	69	12	64	43	120	23	825	205	113	426	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	15	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	0		0	95		0	60		115	60		0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (ft)	25			180			30			60		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00					1.00					
Frt		0.989			0.893				0.850		0.999	
Flt Protected		0.978		0.950			0.950			0.950		
Satd. Flow (prot)	0	1982	0	1770	1663	0	1770	3539	1583	1770	1861	0
Flt Permitted		0.655		0.606			0.488			0.230		
Satd. Flow (perm)	0	1327	0	1129	1663	0	908	3539	1583	428	1861	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			132				201		1	
Link Speed (mph)		30			25			30			30	
Link Distance (ft)		834			697			953			634	
Travel Time (s)		19.0			19.0			21.7			14.4	
Confl. Peds. (#/hr)	1						2					
Peak Hour Factor	0.92	0.92	0.92	0.82	0.81	0.91	0.46	0.91	0.81	0.95	0.89	1.00
Adj. Flow (vph)	73	75	13	78	53	132	50	907	253	119	479	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	161	0	78	185	0	50	907	253	119	483	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	D.P+P	NA	
Protected Phases		4			4			2		1	1	2
Permitted Phases	4			4			2		2	2		
Detector Phase	4	4		4	4		2	2	2	1	1	2
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		25.0	25.0	25.0	5.0		
Minimum Split (s)	12.0	12.0		12.0	12.0		30.0	30.0	30.0	8.1		
Total Split (s)	19.0	19.0		19.0	19.0		30.0	30.0	30.0	8.1		
Total Split (%)	24.3%	24.3%		24.3%	24.3%		38.4%	38.4%	38.4%	10.4%		
Maximum Green (s)	15.0	15.0		15.0	15.0		25.0	25.0	25.0	5.0		
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0	2.0	0.1		
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0		
Total Lost Time (s)		4.0		4.0	4.0		5.0	5.0	5.0	3.1		
Lead/Lag	Lag	Lag		Lag	Lag		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0		
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		15.1		15.1	15.1		36.8	36.8	36.8	52.8	55.9	
Actuated g/C Ratio		0.19		0.19	0.19		0.47	0.47	0.47	0.68	0.72	
v/c Ratio		0.62		0.36	0.43		0.12	0.54	0.30	0.22	0.36	

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	27%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lanes, Volumes, Timings
 8: Mitchell St./North St. & Meridian St.

Electric Boat - Groton, CT
 2024 PM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		37.4		30.0	11.7		16.9	18.7	5.9	5.6	6.1	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		37.4		30.0	11.7		16.9	18.7	5.9	5.6	6.1	
LOS		D		C	B		B	B	A	A	A	
Approach Delay		37.4			17.1			15.9			6.0	
Approach LOS		D			B			B			A	
Queue Length 50th (ft)		71		34	22		13	154	13	14	71	
Queue Length 95th (ft)		116		57	53		21	282	53	41	163	
Internal Link Dist (ft)		754			617			873			554	
Turn Bay Length (ft)				95			60		115	60		
Base Capacity (vph)		293		246	467		427	1667	852	532	1333	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.55		0.32	0.40		0.12	0.54	0.30	0.22	0.36	

Intersection Summary

Area Type: Other
 Cycle Length: 78.1
 Actuated Cycle Length: 78.1
 Offset: 8.1 (10%), Referenced to phase 2:NBSB and 6:, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 14.9
 Intersection Capacity Utilization 75.4%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 8: Mitchell St./North St. & Meridian St.

8.1 s	30 s	21 s	19 s

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 8: Mitchell St./North St. & Meridian St.

Electric Boat - Groton, CT
 2024 PM Combined

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	69	12	64	43	120	23	825	205	113	426	4
Future Volume (vph)	67	69	12	64	43	120	23	825	205	113	426	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	15	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0		4.0	4.0		5.0	5.0	5.0	3.1	3.1	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	1.00	
Frpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.99		1.00	0.89		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1981		1770	1663		1768	3539	1583	1770	1860	
Flt Permitted		0.66		0.61	1.00		0.49	1.00	1.00	0.23	1.00	
Satd. Flow (perm)		1328		1129	1663		908	3539	1583	428	1860	
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.81	0.91	0.46	0.91	0.81	0.95	0.89	1.00
Adj. Flow (vph)	73	75	13	78	53	132	50	907	253	119	479	4
RTOR Reduction (vph)	0	4	0	0	106	0	0	0	106	0	0	0
Lane Group Flow (vph)	0	157	0	78	79	0	50	907	147	119	483	0
Confl. Peds. (#/hr)	1						2					
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	D.P+P	NA	
Protected Phases		4			4			2		1	1	2
Permitted Phases	4			4			2		2	2		
Actuated Green, G (s)		15.1		15.1	15.1		36.8	36.8	36.8	50.9	54.0	
Effective Green, g (s)		15.1		15.1	15.1		36.8	36.8	36.8	50.9	54.0	
Actuated g/C Ratio		0.19		0.19	0.19		0.47	0.47	0.47	0.65	0.69	
Clearance Time (s)		4.0		4.0	4.0		5.0	5.0	5.0	3.1		
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)		256		218	321		427	1667	745	521	1286	
v/s Ratio Prot					0.05			c0.26		0.04	c0.26	
v/s Ratio Perm		c0.12		0.07			0.06		0.09	0.11		
v/c Ratio		0.61		0.36	0.24		0.12	0.54	0.20	0.23	0.38	
Uniform Delay, d1		28.8		27.3	26.7		11.6	14.7	12.0	5.9	5.0	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.3		1.0	0.4		0.6	1.3	0.6	0.2	0.2	
Delay (s)		33.1		28.3	27.1		12.1	16.0	12.6	6.1	5.2	
Level of Service		C		C	C		B	B	B	A	A	
Approach Delay (s)		33.1			27.4			15.1			5.4	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			15.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			78.1			Sum of lost time (s)				14.1		
Intersection Capacity Utilization			75.4%			ICU Level of Service				D		
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
9: North St. & Broad St.

Electric Boat - Groton, CT
2024 PM Combined

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	12	14	148	25	3	13	804	132	1	343	18
Future Volume (vph)	11	12	14	148	25	3	13	804	132	1	343	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	16	12	11	11	11	11	11	11	12	14	12
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00				1.00				
Fr _t		0.955			0.968			0.979			0.992	
Fl _t Protected		0.981		0.950				0.999				
Satd. Flow (prot)	0	1978	0	1711	1743	0	0	3346	0	0	1971	0
Fl _t Permitted		0.887		0.710				0.943			0.991	
Satd. Flow (perm)	0	1787	0	1277	1743	0	0	3158	0	0	1953	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			8			55			10	
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		699			143			486			286	
Travel Time (s)		19.1			3.9			11.0			6.5	
Confl. Peds. (#/hr)	2			1			1					
Peak Hour Factor	0.39	0.60	0.58	0.90	0.86	0.38	0.54	0.89	0.87	0.25	0.92	0.75
Adj. Flow (vph)	28	20	24	164	29	8	24	903	152	4	373	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	72	0	164	37	0	0	1079	0	0	401	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Detector Phase	4	4		4	4		2	2		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		25.0	25.0		25.0	25.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		30.0	30.0		30.0	30.0	
Total Split (s)	19.0	19.0		19.0	19.0		30.0	30.0		30.0	30.0	
Total Split (%)	38.8%	38.8%		38.8%	38.8%		61.2%	61.2%		61.2%	61.2%	
Maximum Green (s)	15.0	15.0		15.0	15.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0			5.0			5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Act Effct Green (s)		11.0		11.0	11.0			29.1			29.1	
Actuated g/C Ratio		0.24		0.24	0.24			0.64			0.64	
v/c Ratio		0.16		0.53	0.09			0.53			0.32	
Control Delay		10.4		21.5	11.1			7.6			6.7	
Queue Delay		0.0		0.0	0.0			0.0			0.0	
Total Delay		10.4		21.5	11.1			7.6			6.7	
LOS		B		C	B			A			A	
Approach Delay		10.4			19.6			7.6			6.7	
Approach LOS		B			B			A			A	

Lanes, Volumes, Timings
9: North St. & Broad St.

Electric Boat - Groton, CT
2024 PM Combined

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)		10		37	6			76			47	
Queue Length 95th (ft)		19		80	20			151			110	
Internal Link Dist (ft)		619			63			406			206	
Turn Bay Length (ft)												
Base Capacity (vph)		603		419	578			2030			1247	
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		0.12		0.39	0.06			0.53			0.32	

Intersection Summary

Area Type:	Other
Cycle Length:	49
Actuated Cycle Length:	45.7
Natural Cycle:	45
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.53
Intersection Signal Delay:	8.9
Intersection LOS:	A
Intersection Capacity Utilization:	57.3%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 9: North St. & Broad St.



HCM Signalized Intersection Capacity Analysis
 9: North St. & Broad St.

Electric Boat - Groton, CT
 2024 PM Combined

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	12	14	148	25	3	13	804	132	1	343	18
Future Volume (vph)	11	12	14	148	25	3	13	804	132	1	343	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	11	11	11	11	11	11	12	14	12
Total Lost time (s)		4.0		4.0	4.0			5.0			5.0	
Lane Util. Factor		1.00		1.00	1.00			0.95			1.00	
Frpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00			1.00	
Frt		0.95		1.00	0.97			0.98			0.99	
Flt Protected		0.98		0.95	1.00			1.00			1.00	
Satd. Flow (prot)		1975		1707	1742			3345			1970	
Flt Permitted		0.89		0.71	1.00			0.94			0.99	
Satd. Flow (perm)		1786		1276	1742			3158			1952	
Peak-hour factor, PHF	0.39	0.60	0.58	0.90	0.86	0.38	0.54	0.89	0.87	0.25	0.92	0.75
Adj. Flow (vph)	28	20	24	164	29	8	24	903	152	4	373	24
RTOR Reduction (vph)	0	19	0	0	6	0	0	22	0	0	4	0
Lane Group Flow (vph)	0	53	0	164	31	0	0	1057	0	0	397	0
Confl. Peds. (#/hr)	2			1				1				
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2				2
Permitted Phases	4			4			2			2		
Actuated Green, G (s)		9.4		9.4	9.4			28.1			28.1	
Effective Green, g (s)		9.4		9.4	9.4			28.1			28.1	
Actuated g/C Ratio		0.20		0.20	0.20			0.60			0.60	
Clearance Time (s)		4.0		4.0	4.0			5.0			5.0	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		361		257	352			1908			1179	
v/s Ratio Prot					0.02							
v/s Ratio Perm		0.03		c0.13				c0.33			0.20	
v/c Ratio		0.15		0.64	0.09			0.55			0.34	
Uniform Delay, d1		15.3		17.0	15.1			5.5			4.6	
Progression Factor		1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2		0.2		5.1	0.1			1.2			0.8	
Delay (s)		15.4		22.1	15.2			6.6			5.3	
Level of Service		B		C	B			A			A	
Approach Delay (s)		15.4			20.8			6.6			5.3	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.3									A
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			46.5								9.0	
Intersection Capacity Utilization			57.3%									B
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 PM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	97	59	4	43	166	63	753	8	68	325	193
Future Volume (vph)	288	97	59	4	43	166	63	753	8	68	325	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	105		0	0		0	38		0	75		0
Storage Lanes	2		0	0		1	1		0	1		1
Taper Length (ft)	300			25			25			75		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Fr _t		0.950				0.850		0.998				0.850
Fl _t Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	3319	1770	0	0	1850	1583	1770	3532	0	1770	1863	1583
Fl _t Permitted	0.950				0.993		0.950			0.950		
Satd. Flow (perm)	3319	1770	0	0	1850	1583	1770	3532	0	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14				234		1				173
Link Speed (mph)		25			25			30				25
Link Distance (ft)		550			441			176				423
Travel Time (s)		15.0			12.0			4.0				11.5
Peak Hour Factor	0.96	0.74	0.91	0.50	0.88	0.71	0.95	0.83	0.67	0.79	0.92	0.87
Adj. Flow (vph)	300	131	65	8	49	234	66	907	12	86	353	222
Shared Lane Traffic (%)												
Lane Group Flow (vph)	300	196	0	0	57	234	66	919	0	86	353	222
Turn Type	Split	NA		Split	NA	pt+ov	Split	NA		Split	NA	Free
Protected Phases	4	4		5	5	15	2	2		1	1	
Permitted Phases												Free
Detector Phase	4	4		5	5	15	2	2		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0		15.0	15.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		25.0	25.0		20.0	20.0	
Total Split (s)	25.0	25.0		17.0	17.0		49.0	49.0		25.0	25.0	
Total Split (%)	17.4%	17.4%		11.8%	11.8%		34.0%	34.0%		17.4%	17.4%	
Maximum Green (s)	20.0	20.0		12.0	12.0		44.0	44.0		20.0	20.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag					Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		3.0	3.0		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	16.4	16.4			9.3	29.4	44.1	44.1		20.0	20.0	109.9
Actuated g/C Ratio	0.15	0.15			0.08	0.27	0.40	0.40		0.18	0.18	1.00
v/c Ratio	0.61	0.71			0.36	0.39	0.09	0.65		0.27	1.04	0.14
Control Delay	49.3	56.1			55.3	4.3	22.5	29.9		42.6	104.6	0.2
Queue Delay	0.0	0.0			0.0	0.0	0.0	1.5		0.0	0.0	0.0

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Flt	
Flt Protected	
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	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	19%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lanes, Volumes, Timings
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 PM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	49.3	56.1			55.3	4.3	22.5	31.4		42.6	104.6	0.2
LOS	D	E			E	A	C	C		D	F	A
Approach Delay		52.0			14.3			30.8			61.5	
Approach LOS		D			B			C			E	
Queue Length 50th (ft)	102	123			39	0	29	274		53	-273	0
Queue Length 95th (ft)	152	163			80	11	62	333		91	#486	0
Internal Link Dist (ft)		470			361			96			343	
Turn Bay Length (ft)	105						38			75		
Base Capacity (vph)	605	334			202	627	710	1417		322	339	1583
Starvation Cap Reductn	0	0			0	0	0	303		0	0	0
Spillback Cap Reductn	0	0			0	0	0	0		0	0	0
Storage Cap Reductn	0	0			0	0	0	0		0	0	0
Reduced v/c Ratio	0.50	0.59			0.28	0.37	0.09	0.82		0.27	1.04	0.14

Intersection Summary

Area Type: Other
 Cycle Length: 144
 Actuated Cycle Length: 109.9
 Natural Cycle: 120
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.04
 Intersection Signal Delay: 41.5 Intersection LOS: D
 Intersection Capacity Utilization 61.2% ICU Level of Service B
 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: 10: North St./I-95 On/Off Ramps & Bridge St.

01 25 s	02 49 s	05 17 s	03 28 s	04 25 s
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Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 PM Combined

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	 				 	 	 	 		 		 	
Traffic Volume (vph)	288	97	59	4	43	166	63	753	8	68	325	193	
Future Volume (vph)	288	97	59	4	43	166	63	753	8	68	325	193	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	11	12	12	12	12	12	12	12	12	12	12	12	
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	4.0	
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00	
Flt	1.00	0.95			1.00	0.85	1.00	1.00		1.00	1.00	0.85	
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3319	1770			1850	1583	1770	3532		1770	1863	1583	
Flt Permitted	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3319	1770			1850	1583	1770	3532		1770	1863	1583	
Peak-hour factor, PHF	0.96	0.74	0.91	0.50	0.88	0.71	0.95	0.83	0.67	0.79	0.92	0.87	
Adj. Flow (vph)	300	131	65	8	49	234	66	907	12	86	353	222	
RTOR Reduction (vph)	0	12	0	0	0	172	0	1	0	0	0	0	
Lane Group Flow (vph)	300	184	0	0	57	62	66	918	0	86	353	222	
Turn Type	Split	NA		Split	NA	pt+ov	Split	NA		Split	NA	Free	
Protected Phases	4	4		5	5	15	2	2		1	1		
Permitted Phases												Free	
Actuated Green, G (s)	16.4	16.4			9.3	29.3	44.1	44.1		20.0	20.0	109.8	
Effective Green, g (s)	16.4	16.4			9.3	29.3	44.1	44.1		20.0	20.0	109.8	
Actuated g/C Ratio	0.15	0.15			0.08	0.27	0.40	0.40		0.18	0.18	1.00	
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0		
Vehicle Extension (s)	2.5	2.5			3.0		3.0	3.0		2.5	2.5		
Lane Grp Cap (vph)	495	264			156	422	710	1418		322	339	1583	
v/s Ratio Prot	0.09	c0.10			c0.03	0.04	0.04	c0.26		0.05	c0.19		
v/s Ratio Perm												0.14	
v/c Ratio	0.61	0.70			0.37	0.15	0.09	0.65		0.27	1.04	0.14	
Uniform Delay, d1	43.7	44.3			47.5	30.7	20.4	26.6		38.6	44.9	0.0	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.8	7.2			1.5	0.1	0.3	2.3		0.3	60.0	0.2	
Delay (s)	45.5	51.5			48.9	30.8	20.7	28.9		38.9	104.9	0.2	
Level of Service	D	D			D	C	C	C		D	F	A	
Approach Delay (s)		47.9			34.4			28.3			61.2		
Approach LOS		D			C			C			E		
Intersection Summary													
HCM 2000 Control Delay			41.9									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.76										
Actuated Cycle Length (s)			109.8									Sum of lost time (s)	25.0
Intersection Capacity Utilization			61.2%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

Lanes, Volumes, Timings
 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Electric Boat - Groton, CT
 2024 PM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	96	53	55	98	79	35	1322	60	49	450	90
Future Volume (vph)	206	96	53	55	98	79	35	1322	60	49	450	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	230		0	90		90	120		150	130		120
Storage Lanes	2		0	1		1	1		1	1		1
Taper Length (ft)	300			120			150			300		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.91	0.91	1.00	0.95	1.00
Ped Bike Factor										1.00		
Fr _t		0.943				0.850		0.992				0.850
Fl _t Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1757	0	1770	1863	1583	1770	5045	0	1770	3539	1583
Fl _t Permitted	0.950			0.642			0.950			0.950		
Satd. Flow (perm)	3433	1757	0	1196	1863	1583	1770	5045	0	1765	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22				91		5				132
Link Speed (mph)		25			25			45				45
Link Distance (ft)		588			486			576				595
Travel Time (s)		16.0			13.3			8.7				9.0
Confl. Peds. (#/hr)										3		
Peak Hour Factor	0.85	0.84	0.77	0.90	0.86	0.88	0.71	0.91	0.78	0.71	0.90	0.58
Adj. Flow (vph)	242	114	69	61	114	90	49	1453	77	69	500	155
Shared Lane Traffic (%)												
Lane Group Flow (vph)	242	183	0	61	114	90	49	1530	0	69	500	155
Turn Type	Prot	NA		Perm	NA	pt+ov	Prot	NA		Prot	NA	custom
Protected Phases	4	4 8			8	5 8	1	6		5	2	2 4
Permitted Phases				8								6
Detector Phase	4	4 8		8	8	5 8	1	6		5	2	2 4
Switch Phase												
Minimum Initial (s)	5.0			9.0	9.0		5.0	15.0		5.0	15.0	
Minimum Split (s)	10.9			14.7	14.7		11.8	20.0		11.8	20.0	
Total Split (s)	24.9			26.7	26.7		17.8	35.0		17.8	35.0	
Total Split (%)	17.4%			18.6%	18.6%		12.4%	24.4%		12.4%	24.4%	
Maximum Green (s)	19.0			21.0	21.0		11.0	30.0		11.0	30.0	
Yellow Time (s)	3.3			3.3	3.3		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.6			2.4	2.4		3.8	2.0		3.8	2.0	
Lost Time Adjust (s)	0.0			0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.9			5.7	5.7		6.8	5.0		6.8	5.0	
Lead/Lag	Lag						Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes						Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.5		2.0	2.5	
Recall Mode	None			None	None		None	Max		None	Max	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	11.4	28.0		10.9	10.9	24.5	7.0	30.2		7.9	36.4	53.7
Actuated g/C Ratio	0.14	0.33		0.13	0.13	0.29	0.08	0.36		0.09	0.43	0.64
v/c Ratio	0.52	0.30		0.40	0.47	0.17	0.33	0.84		0.42	0.33	0.15
Control Delay	38.5	19.6		43.1	42.0	6.0	44.2	31.2		45.1	19.2	2.8

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	7.0
Minimum Split (s)	39.0
Total Split (s)	39.0
Total Split (%)	27%
Maximum Green (s)	35.0
Yellow Time (s)	4.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	28.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	

Lanes, Volumes, Timings
 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Electric Boat - Groton, CT
 2024 PM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	38.5	19.6		43.1	42.0	6.0	44.2	31.2		45.1	19.2	2.8
LOS	D	B		D	D	A	D	C		D	B	A
Approach Delay		30.3			30.0			31.6			18.2	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	60	61		30	56	0	24	259		34	96	5
Queue Length 95th (ft)	98	106		73	110	31	49	#436		63	170	8
Internal Link Dist (ft)		508			406			496			515	
Turn Bay Length (ft)	230			90		90	120			130		120
Base Capacity (vph)	782	801		301	469	581	233	1820		233	1536	1195
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.31	0.23		0.20	0.24	0.15	0.21	0.84		0.30	0.33	0.13

Intersection Summary

Area Type: Other
 Cycle Length: 143.4
 Actuated Cycle Length: 83.9
 Natural Cycle: 120
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 28.0 Intersection LOS: C
 Intersection Capacity Utilization 66.3% ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Ø1	Ø2	Ø3	Ø4	Ø8
17.8 s	35 s	39 s	24.9 s	26.7 s
Ø5	Ø6			
17.8 s	35 s			

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 11: Route 349 (Clarence B Sharp Hwy.) & Meridian St.

Electric Boat - Groton, CT
 2024 PM Combined

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	96	53	55	98	79	35	1322	60	49	450	90
Future Volume (vph)	206	96	53	55	98	79	35	1322	60	49	450	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9		5.7	5.7	6.8	6.8	5.0		6.8	5.0	5.0
Lane Util. Factor	0.97	1.00		1.00	1.00	1.00	1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1757		1770	1863	1583	1770	5047		1770	3539	1583
Flt Permitted	0.95	1.00		0.64	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1757		1196	1863	1583	1770	5047		1770	3539	1583
Peak-hour factor, PHF	0.85	0.84	0.77	0.90	0.86	0.88	0.71	0.91	0.78	0.71	0.90	0.58
Adj. Flow (vph)	242	114	69	61	114	90	49	1453	77	69	500	155
RTOR Reduction (vph)	0	15	0	0	0	71	0	3	0	0	0	52
Lane Group Flow (vph)	242	168	0	61	114	19	49	1527	0	69	500	103
Confl. Peds. (#/hr)										3		
Turn Type	Prot	NA		Perm	NA	pt+ov	Prot	NA		Prot	NA	custom
Protected Phases	4	4 8			8	5 8	1	6		5	2	2 4
Permitted Phases				8								6
Actuated Green, G (s)	11.4	28.2		10.9	10.9	24.5	4.7	33.2		7.9	36.4	52.8
Effective Green, g (s)	11.4	28.2		10.9	10.9	18.8	4.7	33.2		7.9	36.4	52.8
Actuated g/C Ratio	0.13	0.32		0.13	0.13	0.22	0.05	0.38		0.09	0.42	0.61
Clearance Time (s)	5.9			5.7	5.7		6.8	5.0		6.8	5.0	
Vehicle Extension (s)	2.0			2.0	2.0		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	450	570		150	233	342	95	1930		161	1484	962
v/s Ratio Prot	c0.07	0.10			c0.06	0.01	0.03	c0.30		c0.04	c0.14	0.07
v/s Ratio Perm				0.05								
v/c Ratio	0.54	0.29		0.41	0.49	0.06	0.52	0.79		0.43	0.34	0.11
Uniform Delay, d1	35.2	21.9		35.0	35.4	27.0	39.9	23.7		37.3	17.0	7.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1		0.7	0.6	0.0	2.0	3.4		0.7	0.6	0.0
Delay (s)	35.9	22.0		35.6	35.9	27.0	41.9	27.1		38.0	17.7	7.1
Level of Service	D	C		D	D	C	D	C		D	B	A
Approach Delay (s)		29.9			32.8			27.6			17.3	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			25.9									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			86.8									Sum of lost time (s) 27.4
Intersection Capacity Utilization			66.3%									ICU Level of Service C
Analysis Period (min)			15									
c Critical Lane Group												

Lanes, Volumes, Timings

Electric Boat - Groton, CT

12: Route 649 (Rainville Ave.)/Old Farms Rd. & Route 649 (Poquonnock Rd.) 2024 PM Combined

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	171	14	317	195	34	10	22	257	13	18	8
Future Volume (vph)	22	171	14	317	195	34	10	22	257	13	18	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	10	11	11	11	11	11	15	15	15
Storage Length (ft)	155		0	0		0	0		85	0		0
Storage Lanes	1		0	1		0	0		1	0		0
Taper Length (ft)	135			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												1.00
Frt		0.987			0.976				0.850		0.960	
Flt Protected	0.950			0.950				0.979			0.986	
Satd. Flow (prot)	1711	1777	0	1652	1757	0	0	1763	1531	0	1940	0
Flt Permitted	0.578			0.617				0.830			0.881	
Satd. Flow (perm)	1041	1777	0	1073	1757	0	0	1495	1531	0	1729	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			16				352			20
Link Speed (mph)		30			30				30			30
Link Distance (ft)		529			504				284			348
Travel Time (s)		12.0			11.5				6.5			7.9
Confl. Peds. (#/hr)											5	
Peak Hour Factor	0.88	0.83	0.70	0.84	0.82	0.75	0.42	0.69	0.73	0.65	0.64	0.40
Adj. Flow (vph)	25	206	20	377	238	45	24	32	352	20	28	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	226	0	377	283	0	0	56	352	0	68	0
Turn Type	custom	NA		custom	NA		Perm	NA	custom	Perm	NA	
Protected Phases	1	1 2		3	2 3			5	5		5	
Permitted Phases	2			2			5		3	5		
Detector Phase	1	1 2		3	2 3		5	5	5	5	5	
Switch Phase												
Minimum Initial (s)	3.0			3.0			5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	7.0			7.2			11.2	11.2	11.2	11.2	11.2	
Total Split (s)	9.0			14.2			22.2	22.2	22.2	22.2	22.2	
Total Split (%)	11.1%			17.5%			27.3%	27.3%	27.3%	27.3%	27.3%	
Maximum Green (s)	5.0			10.0			16.0	16.0	16.0	16.0	16.0	
Yellow Time (s)	3.0			3.0			4.2	4.2	4.2	4.2	4.2	
All-Red Time (s)	1.0			1.2			2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	0.0			0.0				0.0	0.0		0.0	
Total Lost Time (s)	4.0			4.2				6.2	6.2		6.2	
Lead/Lag	Lead											
Lead-Lag Optimize?	Yes											
Vehicle Extension (s)	1.0			2.0			2.0	2.0	2.0	2.0	2.0	
Recall Mode	None			None			None	None	None	None	None	
Act Effct Green (s)	36.9	40.9		40.6	37.4			8.0	21.1		8.0	
Actuated g/C Ratio	0.51	0.57		0.56	0.52			0.11	0.29		0.11	
v/c Ratio	0.04	0.22		0.56	0.31			0.34	0.51		0.33	
Control Delay	8.6	9.0		9.2	6.1			35.4	5.1		26.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	8.6	9.0		9.2	6.1			35.4	5.1		26.8	

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	20.8
Total Split (s)	35.8
Total Split (%)	44%
Maximum Green (s)	30.0
Yellow Time (s)	3.8
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	5.0
Recall Mode	Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	A	A		A	A			D	A		C	
Approach Delay		9.0			7.9			9.3			26.8	
Approach LOS		A			A			A			C	
Queue Length 50th (ft)	4	44		39	29			24	0		20	
Queue Length 95th (ft)	16	86		89	63			42	19		35	
Internal Link Dist (ft)		449			424			204			268	
Turn Bay Length (ft)	155								85			
Base Capacity (vph)	578	989		700	944			332	685		399	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.04	0.23		0.54	0.30			0.17	0.51		0.17	

Intersection Summary

Area Type: Other
 Cycle Length: 81.2
 Actuated Cycle Length: 72.2
 Natural Cycle: 55
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 9.4
 Intersection Capacity Utilization 48.2%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 12: Route 649 (Rainville Ave.)/Old Farms Rd. & Route 649 (Poquonnock Rd.)

Ø1	Ø2	Ø5	Ø3
9 s	35.8 s	22.2 s	14.2 s

Lane Group	Ø2
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Electric Boat - Groton, CT

12: Route 649 (Rainville Ave.)/Old Farms Rd. & Route 649 (Poquonnock Rd.) 2024 PM Combined

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	171	14	317	195	34	10	22	257	13	18	8
Future Volume (vph)	22	171	14	317	195	34	10	22	257	13	18	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	11	11	11	11	11	15	15	15
Total Lost time (s)	4.0	4.0		4.2	5.8			6.2	6.2		6.2	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Fr t	1.00	0.99		1.00	0.98			1.00	0.85		0.96	
Fl t Protected	0.95	1.00		0.95	1.00			0.98	1.00		0.99	
Satd. Flow (prot)	1711	1777		1652	1758			1763	1531		1932	
Fl t Permitted	0.58	1.00		0.62	1.00			0.83	1.00		0.88	
Satd. Flow (perm)	1042	1777		1073	1758			1494	1531		1727	
Peak-hour factor, PHF	0.88	0.83	0.70	0.84	0.82	0.75	0.42	0.69	0.73	0.65	0.64	0.40
Adj. Flow (vph)	25	206	20	377	238	45	24	32	352	20	28	20
RTOR Reduction (vph)	0	4	0	0	7	0	0	0	270	0	18	0
Lane Group Flow (vph)	25	222	0	377	276	0	0	56	82	0	50	0
Confl. Peds. (#/hr)										5		
Turn Type	custom	NA		custom	NA		Perm	NA	custom	Perm	NA	
Protected Phases	1	1 2		3	2 3			5	5		5	
Permitted Phases	2			2			5		3	5		
Actuated Green, G (s)	35.1	39.1		39.0	39.0			8.0	16.9		8.0	
Effective Green, g (s)	35.1	39.1		39.0	39.0			8.0	16.9		8.0	
Actuated g/C Ratio	0.49	0.54		0.54	0.54			0.11	0.23		0.11	
Clearance Time (s)	4.0			4.2				6.2	6.2		6.2	
Vehicle Extension (s)	1.0			2.0				2.0	2.0		2.0	
Lane Grp Cap (vph)	552	962		650	949			165	489		191	
v/s Ratio Prot	0.00	c0.12		c0.07	0.16				0.02			
v/s Ratio Perm	0.02			c0.24				c0.04	0.04		0.03	
v/c Ratio	0.05	0.23		0.58	0.29			0.34	0.17		0.26	
Uniform Delay, d1	9.7	8.7		9.9	9.1			29.7	22.0		29.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.0		0.8	0.1			0.4	0.1		0.3	
Delay (s)	9.7	8.7		10.7	9.1			30.1	22.1		29.7	
Level of Service	A	A		B	A			C	C		C	
Approach Delay (s)		8.8			10.0			23.2			29.7	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	20.2
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Appendix D

Intersection Capacity Analysis Worksheets 2024 Combined Improved Traffic Volumes Weekday Afternoon Peak Hour



Lanes, Volumes, Timings

Electric Boat - Groton, CT

4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

2024 PM Combined Imp.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	757	145	21	39	57	169	24	502	46	81	219	214
Future Volume (vph)	757	145	21	39	57	169	24	502	46	81	219	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	11	10	10	10	10	10	10	10	10	10
Storage Length (ft)	0		0	0		0	0		0	100		0
Storage Lanes	1		0	0		1	0		0	1		1
Taper Length (ft)	25			25			25			80		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor								1.00				
Frt		0.991				0.850		0.983				0.850
Flt Protected	0.950	0.969			0.980			0.998		0.950		
Satd. Flow (prot)	1569	1643	0	0	1704	1478	0	3241	0	1652	1739	1478
Flt Permitted	0.950	0.969			0.980			0.924		0.163		
Satd. Flow (perm)	1569	1643	0	0	1704	1478	0	3000	0	283	1739	1478
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2				235		9				249
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1087			427			507			1053	
Travel Time (s)		24.7			9.7			11.5			23.9	
Confl. Peds. (#/hr)							1					
Peak Hour Factor	0.80	0.80	0.62	0.73	0.74	0.72	0.72	0.88	0.59	0.68	0.89	0.86
Adj. Flow (vph)	946	181	34	53	77	235	33	570	78	119	246	249
Shared Lane Traffic (%)	39%											
Lane Group Flow (vph)	577	584	0	0	130	235	0	681	0	119	246	249
Turn Type	Split	NA		Split	NA	Prot	Perm	NA		pm+pt	NA	custom
Protected Phases	4	4		5	5	5		2		1	1 2	1 2 4
Permitted Phases							2			1 2		5
Detector Phase	4	4		5	5	5	2	2		1	1 2	1 2 4
Switch Phase												
Minimum Initial (s)	8.0	8.0		6.0	6.0	6.0	15.0	15.0		6.0		
Minimum Split (s)	12.5	12.5		10.5	10.5	10.5	19.5	19.5		10.5		
Total Split (s)	61.6	61.6		17.2	17.2	17.2	40.1	40.1		13.5		
Total Split (%)	40.2%	40.2%		11.2%	11.2%	11.2%	26.1%	26.1%		8.8%		
Maximum Green (s)	57.1	57.1		12.7	12.7	12.7	35.6	35.6		9.0		
Yellow Time (s)	3.5	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	1.0	1.0	1.0		1.0		
Lost Time Adjust (s)	0.0	0.0			0.0	0.0		0.0		0.0		
Total Lost Time (s)	4.5	4.5			4.5	4.5		4.5		4.5		
Lead/Lag	Lag	Lag					Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0		
Recall Mode	None	None		None	None	None	Max	Max		None		
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	57.1	57.1		12.7	12.7		35.7			44.8	49.3	131.9
Actuated g/C Ratio	0.42	0.42		0.09	0.09		0.26			0.33	0.36	0.97
v/c Ratio	0.88	0.85		0.82	0.67		0.86			0.65	0.39	0.17

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	21.0
Total Split (s)	21.0
Total Split (%)	14%
Maximum Green (s)	19.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	12.0
Pedestrian Calls (#/hr)	1
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	53.1	49.3			96.7	17.5		59.5		50.1	36.0	0.4
Queue Delay	0.0	0.0			0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	53.1	49.3			96.7	17.5		59.5		50.1	36.0	0.4
LOS	D	D			F	B		E		D	D	A
Approach Delay		51.2			45.7			59.5			24.3	
Approach LOS		D			D			E			C	
Queue Length 50th (ft)	462	456			111	0		288		69	154	0
Queue Length 95th (ft)	#703	#688			#194	21		#467		104	278	11
Internal Link Dist (ft)		1007			347			427			973	
Turn Bay Length (ft)										100		
Base Capacity (vph)	659	691			159	351		792		183	628	1431
Starvation Cap Reductn	0	0			0	0		0		0	0	0
Spillback Cap Reductn	0	0			0	0		0		0	0	0
Storage Cap Reductn	0	0			0	0		0		0	0	0
Reduced v/c Ratio	0.88	0.85			0.82	0.67		0.86		0.65	0.39	0.17

Intersection Summary

Area Type: Other
 Cycle Length: 153.4
 Actuated Cycle Length: 136.4
 Natural Cycle: 150
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.88
 Intersection Signal Delay: 46.6
 Intersection LOS: D
 Intersection Capacity Utilization 73.1%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

Ø1	Ø2	Ø5	Ø3	Ø4
13.5 s	40.1 s	17.2 s	21 s	61.6 s

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Electric Boat - Groton, CT

4: Brandegee Ave./Route 349 (CBS Hwy.) & Route 349 (Rainville Ave.)

2024 PM Combined Imp.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	757	145	21	39	57	169	24	502	46	81	219	214
Future Volume (vph)	757	145	21	39	57	169	24	502	46	81	219	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	11	10	10	10	10	10	10	10	10	10
Total Lost time (s)	4.5	4.5			4.5	4.5		4.5		4.5	4.5	4.5
Lane Util. Factor	0.95	0.95			1.00	1.00		0.95		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	0.99			1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	0.97			0.98	1.00		1.00		0.95	1.00	1.00
Satd. Flow (prot)	1569	1644			1704	1478		3239		1652	1739	1478
Flt Permitted	0.95	0.97			0.98	1.00		0.92		0.16	1.00	1.00
Satd. Flow (perm)	1569	1644			1704	1478		3000		283	1739	1478
Peak-hour factor, PHF	0.80	0.80	0.62	0.73	0.74	0.72	0.72	0.88	0.59	0.68	0.89	0.86
Adj. Flow (vph)	946	181	34	53	77	235	33	570	78	119	246	249
RTOR Reduction (vph)	0	1	0	0	0	213	0	7	0	0	0	26
Lane Group Flow (vph)	577	583	0	0	130	22	0	674	0	119	246	223
Confl. Peds. (#/hr)							1					
Turn Type	Split	NA		Split	NA	Prot	Perm	NA		pm+pt	NA	custom
Protected Phases	4	4		5	5	5		2		1	1 2	1 2 4
Permitted Phases							2			1 2		5
Actuated Green, G (s)	57.1	57.1			12.7	12.7		35.7		44.7	49.2	123.5
Effective Green, g (s)	57.1	57.1			12.7	12.7		35.7		44.7	49.2	123.5
Actuated g/C Ratio	0.41	0.41			0.09	0.09		0.26		0.32	0.36	0.90
Clearance Time (s)	4.5	4.5			4.5	4.5		4.5		4.5		
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0		3.0		
Lane Grp Cap (vph)	649	680			156	136		776		181	620	1371
v/s Ratio Prot	c0.37	0.35			c0.08	0.01				c0.04	0.14	0.13
v/s Ratio Perm								c0.22		0.17		0.02
v/c Ratio	0.89	0.86			0.83	0.16		0.87		0.66	0.40	0.16
Uniform Delay, d1	37.5	36.7			61.6	57.7		48.9		35.9	33.2	0.9
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	14.0	10.4			30.0	0.6		12.7		8.3	0.4	0.1
Delay (s)	51.5	47.1			91.6	58.2		61.5		44.2	33.7	0.9
Level of Service	D	D			F	E		E		D	C	A
Approach Delay (s)		49.3			70.1			61.5			22.4	
Approach LOS		D			E			E			C	
Intersection Summary												
HCM 2000 Control Delay			49.1									D
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			137.9							20.0		
Intersection Capacity Utilization			73.1%									D
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings
6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
2024 PM Combined Imp.

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↕					↕			↕		
Traffic Volume (vph)	146	49	29	4	14	15	41	134	18	312	11	78
Future Volume (vph)	146	49	29	4	14	15	41	134	18	312	11	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt		0.980					0.911			0.996		
Flt Protected		0.969					0.993			0.997		
Satd. Flow (prot)	0	1769	0	0	0	0	1685	0	0	1850	0	0
Flt Permitted		0.576					0.934			0.997		
Satd. Flow (perm)	0	1051	0	0	0	0	1585	0	0	1850	0	0
Right Turn on Red				Yes				Yes			Yes	
Satd. Flow (RTOR)		1					61			1		
Link Speed (mph)		25					25			25		
Link Distance (ft)		836					602			696		
Travel Time (s)		22.8					16.4			19.0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	159	53	32	4	15	16	45	146	20	339	12	85
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	248	0	0	0	0	222	0	0	371	0	0
Turn Type	Perm	NA			Perm	Perm	NA		Split	NA		Split
Protected Phases		4					4		2	2		1
Permitted Phases	4				4	4						
Detector Phase	4	4			4	4	4		2	2		1
Switch Phase												
Minimum Initial (s)	8.0	8.0			8.0	8.0	8.0		10.0	10.0		20.0
Minimum Split (s)	13.0	13.0			13.0	13.0	13.0		15.0	15.0		25.0
Total Split (s)	42.0	42.0			42.0	42.0	42.0		33.0	33.0		25.0
Total Split (%)	28.0%	28.0%			28.0%	28.0%	28.0%		22.0%	22.0%		16.7%
Maximum Green (s)	37.0	37.0			37.0	37.0	37.0		28.0	28.0		20.0
Yellow Time (s)	3.0	3.0			3.0	3.0	3.0		3.0	3.0		3.0
All-Red Time (s)	2.0	2.0			2.0	2.0	2.0		2.0	2.0		2.0
Lost Time Adjust (s)		0.0					0.0			0.0		
Total Lost Time (s)		5.0					5.0			5.0		
Lead/Lag	Lag	Lag			Lag	Lag	Lag		Lag	Lag		Lead
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		3.0
Recall Mode	None	None			None	None	None		Max	Max		Max
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		37.0					37.0			28.0		
Actuated g/C Ratio		0.30					0.30			0.22		
v/c Ratio		0.80					0.43			0.89		
Control Delay		60.4					28.4			71.7		
Queue Delay		0.0					0.0			0.0		
Total Delay		60.4					28.4			71.7		
LOS		E					C			E		
Approach Delay		60.4					28.4			71.7		
Approach LOS		E					C			E		

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Combined Imp.

	↓	↙	↘	↖	↗	↘	
Lane Group	SBT	SBR	SBR2	NEL2	NEL	NER	Ø3
Lane Configurations	↖	↘			↘		
Traffic Volume (vph)	146	98	50	10	209	11	
Future Volume (vph)	146	98	50	10	209	11	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.850			0.994		
Flt Protected	0.983				0.955		
Satd. Flow (prot)	1831	1583	0	0	1768	0	
Flt Permitted	0.983				0.955		
Satd. Flow (perm)	1831	1583	0	0	1768	0	
Right Turn on Red			Yes				
Satd. Flow (RTOR)		116					
Link Speed (mph)	25				25		
Link Distance (ft)	1056				667		
Travel Time (s)	28.8				18.2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	159	107	54	11	227	12	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	244	161	0	0	250	0	
Turn Type	NA	Prot		Prot	Prot		
Protected Phases	1	1		5	5	3	
Permitted Phases							
Detector Phase	1	1		5	5		
Switch Phase							
Minimum Initial (s)	20.0	20.0		6.0	6.0	5.0	
Minimum Split (s)	25.0	25.0		11.0	11.0	25.0	
Total Split (s)	25.0	25.0		25.0	25.0	25.0	
Total Split (%)	16.7%	16.7%		16.7%	16.7%	17%	
Maximum Green (s)	20.0	20.0		20.0	20.0	21.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0	0.0	
Lost Time Adjust (s)	0.0	0.0			0.0		
Total Lost Time (s)	5.0	5.0			5.0		
Lead/Lag	Lead	Lead				Lead	
Lead-Lag Optimize?	Yes	Yes				Yes	
Vehicle Extension (s)	3.0	3.0		2.0	2.0	3.0	
Recall Mode	Max	Max		Max	Max	None	
Walk Time (s)						6.0	
Flash Dont Walk (s)						13.0	
Pedestrian Calls (#/hr)						0	
Act Effct Green (s)	20.0	20.0			20.0		
Actuated g/C Ratio	0.16	0.16			0.16		
v/c Ratio	0.84	0.46			0.89		
Control Delay	75.2	20.0			82.9		
Queue Delay	0.0	0.0			0.0		
Total Delay	75.2	20.0			82.9		
LOS	E	B			F		
Approach Delay	53.2				82.9		
Approach LOS	D				F		

Lanes, Volumes, Timings
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Combined Imp.

Lane Group	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Queue Length 50th (ft)		184					104			292		
Queue Length 95th (ft)		#323					181			#471		
Internal Link Dist (ft)		756					522			616		
Turn Bay Length (ft)												
Base Capacity (vph)		311					512			415		
Starvation Cap Reductn		0					0			0		
Spillback Cap Reductn		0					0			0		
Storage Cap Reductn		0					0			0		
Reduced v/c Ratio		0.80					0.43			0.89		

Intersection Summary

Area Type:	Other
Cycle Length:	150
Actuated Cycle Length:	125
Natural Cycle:	150
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.89
Intersection Signal Delay:	60.3
Intersection LOS:	E
Intersection Capacity Utilization:	93.1%
ICU Level of Service:	F
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

01	02	05	03	04
25 s	33 s	25 s	25 s	42 s

	↓	↙	↘	↖	↗	↘	
Lane Group	SBT	SBR	SBR2	NEL2	NEL	NER	Ø3
Queue Length 50th (ft)	194	32			200		
Queue Length 95th (ft)	#332	100			#352		
Internal Link Dist (ft)	976				587		
Turn Bay Length (ft)							
Base Capacity (vph)	292	350			282		
Starvation Cap Reductn	0	0			0		
Spillback Cap Reductn	0	0			0		
Storage Cap Reductn	0	0			0		
Reduced v/c Ratio	0.84	0.46			0.89		
Intersection Summary							

HCM Signalized Intersection Capacity Analysis
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Combined Imp.

												
Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↕					↕			↕		
Traffic Volume (vph)	146	49	29	4	14	15	41	134	18	312	11	78
Future Volume (vph)	146	49	29	4	14	15	41	134	18	312	11	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0					5.0			5.0		
Lane Util. Factor		1.00					1.00			1.00		
Frt		0.98					0.91			1.00		
Flt Protected		0.97					0.99			1.00		
Satd. Flow (prot)		1770					1686			1850		
Flt Permitted		0.58					0.93			1.00		
Satd. Flow (perm)		1052					1585			1850		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	159	53	32	4	15	16	45	146	20	339	12	85
RTOR Reduction (vph)	0	1	0	0	0	0	43	0	0	1	0	0
Lane Group Flow (vph)	0	247	0	0	0	0	179	0	0	370	0	0
Turn Type	Perm	NA			Perm	Perm	NA		Split	NA		Split
Protected Phases		4					4		2	2		1
Permitted Phases	4				4	4						
Actuated Green, G (s)		37.0					37.0			28.0		
Effective Green, g (s)		37.0					37.0			28.0		
Actuated g/C Ratio		0.30					0.30			0.22		
Clearance Time (s)		5.0					5.0			5.0		
Vehicle Extension (s)		4.0					4.0			4.0		
Lane Grp Cap (vph)		311					469			414		
v/s Ratio Prot										c0.20		
v/s Ratio Perm		c0.24					0.11					
v/c Ratio		0.80					0.38			0.89		
Uniform Delay, d1		40.5					34.9			47.1		
Progression Factor		1.00					1.00			1.00		
Incremental Delay, d2		13.8					0.7			24.3		
Delay (s)		54.3					35.6			71.4		
Level of Service		D					D			E		
Approach Delay (s)		54.3					35.6			71.4		
Approach LOS		D					D			E		
Intersection Summary												
HCM 2000 Control Delay			63.1				HCM 2000 Level of Service			E		
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			125.0				Sum of lost time (s)			24.0		
Intersection Capacity Utilization			93.1%				ICU Level of Service			F		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 6: Chicago Ave. & Benham Rd./Mitchell St. & Poquonnock Rd.

Electric Boat - Groton, CT
 2024 PM Combined Imp.

	↓	↙	↘	↖	↗	↘
Movement	SBT	SBR	SBR2	NEL2	NEL	NER
Lane Configurations	↖	↘			↘	
Traffic Volume (vph)	146	98	50	10	209	11
Future Volume (vph)	146	98	50	10	209	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00			1.00	
Frt	1.00	0.85			0.99	
Flt Protected	0.98	1.00			0.95	
Satd. Flow (prot)	1831	1583			1767	
Flt Permitted	0.98	1.00			0.95	
Satd. Flow (perm)	1831	1583			1767	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	159	107	54	11	227	12
RTOR Reduction (vph)	0	97	0	0	0	0
Lane Group Flow (vph)	244	64	0	0	250	0
Turn Type	NA	Prot		Prot	Prot	
Protected Phases	1	1		5	5	
Permitted Phases						
Actuated Green, G (s)	20.0	20.0			20.0	
Effective Green, g (s)	20.0	20.0			20.0	
Actuated g/C Ratio	0.16	0.16			0.16	
Clearance Time (s)	5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			2.0	
Lane Grp Cap (vph)	292	253			282	
v/s Ratio Prot	c0.13	0.04			c0.14	
v/s Ratio Perm						
v/c Ratio	0.84	0.25			0.89	
Uniform Delay, d1	50.9	45.9			51.4	
Progression Factor	1.00	1.00			1.00	
Incremental Delay, d2	23.7	2.4			31.0	
Delay (s)	74.6	48.3			82.4	
Level of Service	E	D			F	
Approach Delay (s)	64.2				82.4	
Approach LOS	E				F	
Intersection Summary						

Lanes, Volumes, Timings
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 PM Combined Imp.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	97	59	4	43	166	63	753	8	68	325	193
Future Volume (vph)	288	97	59	4	43	166	63	753	8	68	325	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	105		0	0		0	38		0	75		0
Storage Lanes	2		0	0		1	1		0	1		1
Taper Length (ft)	300			25			25			75		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Fr _t		0.950				0.850		0.998				0.850
Fl _t Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	3319	1770	0	0	1850	1583	1770	3532	0	1770	1863	1583
Fl _t Permitted	0.950				0.993		0.950			0.950		
Satd. Flow (perm)	3319	1770	0	0	1850	1583	1770	3532	0	1770	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14				234		1				173
Link Speed (mph)		25			25			30				25
Link Distance (ft)		550			441			176				423
Travel Time (s)		15.0			12.0			4.0				11.5
Peak Hour Factor	0.96	0.74	0.91	0.50	0.88	0.71	0.95	0.83	0.67	0.79	0.92	0.87
Adj. Flow (vph)	300	131	65	8	49	234	66	907	12	86	353	222
Shared Lane Traffic (%)												
Lane Group Flow (vph)	300	196	0	0	57	234	66	919	0	86	353	222
Turn Type	Split	NA		Split	NA	pt+ov	Split	NA		Split	NA	Free
Protected Phases	4	4		5	5	15	2	2		1	1	
Permitted Phases												Free
Detector Phase	4	4		5	5	15	2	2		1	1	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0		15.0	15.0	
Minimum Split (s)	23.0	23.0		13.0	13.0		25.0	25.0		20.0	20.0	
Total Split (s)	23.0	23.0		13.0	13.0		45.0	45.0		35.0	35.0	
Total Split (%)	16.0%	16.0%		9.0%	9.0%		31.3%	31.3%		24.3%	24.3%	
Maximum Green (s)	18.0	18.0		8.0	8.0		40.0	40.0		30.0	30.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag	Lag	Lag					Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes					Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	2.5		3.0	3.0		3.0	3.0		2.5	2.5	
Recall Mode	None	None		None	None		Max	Max		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	16.2	16.2			8.0	35.1	40.1	40.1		27.1	27.1	111.5
Actuated g/C Ratio	0.15	0.15			0.07	0.31	0.36	0.36		0.24	0.24	1.00
v/c Ratio	0.62	0.73			0.43	0.36	0.10	0.72		0.20	0.78	0.14
Control Delay	51.4	59.4			62.1	3.5	26.2	35.6		35.0	52.7	0.2
Queue Delay	0.0	0.0			0.0	0.0	0.0	1.9		0.0	0.0	0.0

Lane Group	Ø3
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Frt	
Flt Protected	
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	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	3
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	5.0
Minimum Split (s)	28.0
Total Split (s)	28.0
Total Split (%)	19%
Maximum Green (s)	23.0
Yellow Time (s)	3.0
All-Red Time (s)	2.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lead
Lead-Lag Optimize?	Yes
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	6.0
Flash Dont Walk (s)	17.0
Pedestrian Calls (#/hr)	0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	

Lanes, Volumes, Timings
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 PM Combined Imp.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	51.4	59.4			62.1	3.5	26.2	37.5		35.0	52.7	0.2
LOS	D	E			E	A	C	D		D	D	A
Approach Delay		54.5			15.0			36.8			32.7	
Approach LOS		D			B			D			C	
Queue Length 50th (ft)	108	130			42	0	33	317		50	242	0
Queue Length 95th (ft)	155	166			84	10	66	353		81	352	0
Internal Link Dist (ft)		470			361			96			343	
Turn Bay Length (ft)	105						38			75		
Base Capacity (vph)	537	298			133	695	637	1272		477	502	1583
Starvation Cap Reductn	0	0			0	0	0	205		0	0	0
Spillback Cap Reductn	0	0			0	0	0	0		0	0	0
Storage Cap Reductn	0	0			0	0	0	0		0	0	0
Reduced v/c Ratio	0.56	0.66			0.43	0.34	0.10	0.86		0.18	0.70	0.14

Intersection Summary

Area Type:	Other
Cycle Length:	144
Actuated Cycle Length:	111.5
Natural Cycle:	130
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	36.7
Intersection LOS:	D
Intersection Capacity Utilization	61.2%
ICU Level of Service	B
Analysis Period (min)	15

Splits and Phases: 10: North St./I-95 On/Off Ramps & Bridge St.

35 s	45 s	13 s	28 s	23 s

Lane Group	Ø3
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)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
 10: North St./I-95 On/Off Ramps & Bridge St.

Electric Boat - Groton, CT
 2024 PM Combined Imp.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	288	97	59	4	43	166	63	753	8	68	325	193	
Future Volume (vph)	288	97	59	4	43	166	63	753	8	68	325	193	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	11	12	12	12	12	12	12	12	12	12	12	12	
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	5.0		5.0	5.0	4.0	
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	1.00	1.00	
Flt	1.00	0.95			1.00	0.85	1.00	1.00		1.00	1.00	0.85	
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3319	1770			1850	1583	1770	3532		1770	1863	1583	
Flt Permitted	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3319	1770			1850	1583	1770	3532		1770	1863	1583	
Peak-hour factor, PHF	0.96	0.74	0.91	0.50	0.88	0.71	0.95	0.83	0.67	0.79	0.92	0.87	
Adj. Flow (vph)	300	131	65	8	49	234	66	907	12	86	353	222	
RTOR Reduction (vph)	0	12	0	0	0	160	0	1	0	0	0	0	
Lane Group Flow (vph)	300	184	0	0	57	74	66	918	0	86	353	222	
Turn Type	Split	NA		Split	NA	pt+ov	Split	NA		Split	NA	Free	
Protected Phases	4	4		5	5	15	2	2		1	1		
Permitted Phases												Free	
Actuated Green, G (s)	16.2	16.2			8.0	35.1	40.1	40.1		27.1	27.1	111.4	
Effective Green, g (s)	16.2	16.2			8.0	35.1	40.1	40.1		27.1	27.1	111.4	
Actuated g/C Ratio	0.15	0.15			0.07	0.32	0.36	0.36		0.24	0.24	1.00	
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0		5.0	5.0		
Vehicle Extension (s)	2.5	2.5			3.0		3.0	3.0		2.5	2.5		
Lane Grp Cap (vph)	482	257			132	498	637	1271		430	453	1583	
v/s Ratio Prot	0.09	c0.10			c0.03	0.05	0.04	c0.26		0.05	c0.19		
v/s Ratio Perm												0.14	
v/c Ratio	0.62	0.72			0.43	0.15	0.10	0.72		0.20	0.78	0.14	
Uniform Delay, d1	44.7	45.4			49.5	27.4	23.7	30.8		33.5	39.4	0.0	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	2.2	8.5			2.3	0.1	0.3	3.6		0.2	7.9	0.2	
Delay (s)	46.9	54.0			51.8	27.5	24.0	34.4		33.7	47.3	0.2	
Level of Service	D	D			D	C	C	C		C	D	A	
Approach Delay (s)		49.7			32.3			33.7			29.7		
Approach LOS		D			C			C			C		
Intersection Summary													
HCM 2000 Control Delay			35.7									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.75										
Actuated Cycle Length (s)			111.4									Sum of lost time (s)	25.0
Intersection Capacity Utilization			61.2%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

Appendix E

Turning Movement Count (TMC) Data



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Eastern Point Road at Chester Street
Groton, Connecticut

File Name : 18033
Site Code : 18033
Start Date : 10/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

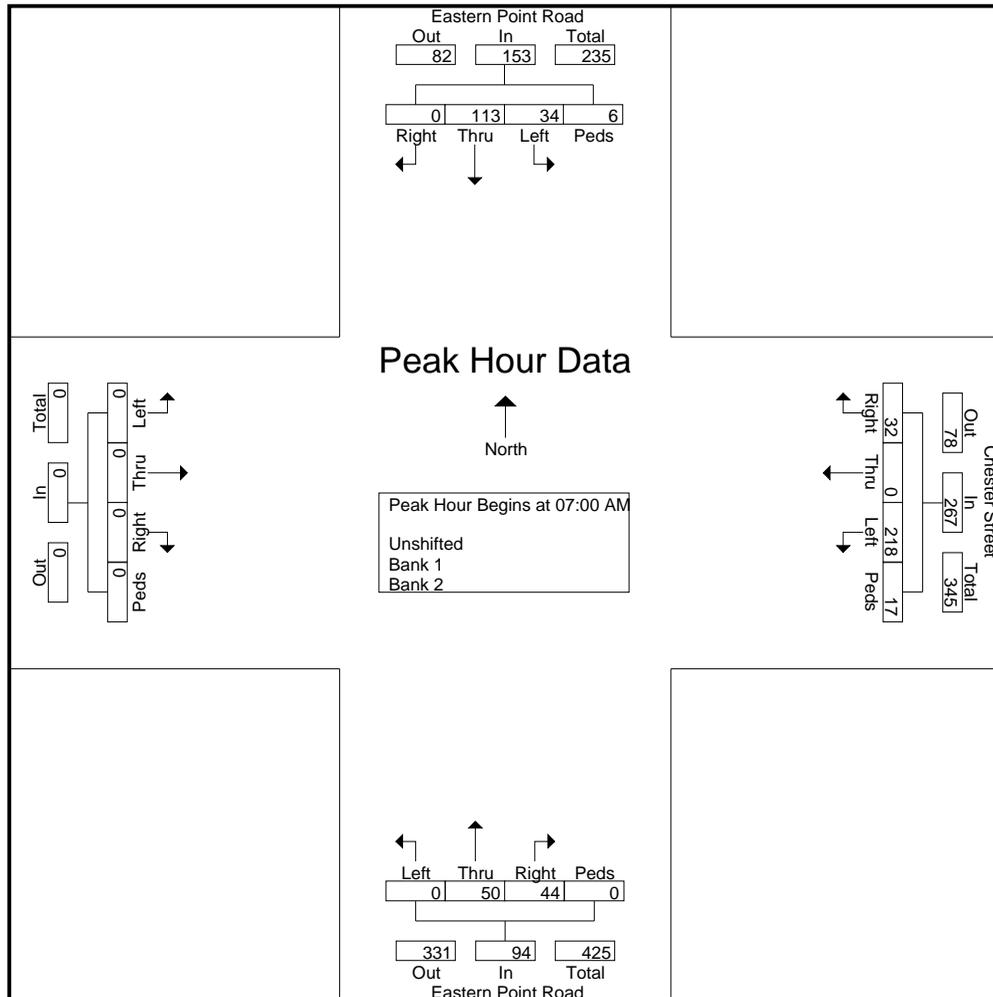
Start Time	Eastern Point Road From North					Chester Street From East					Eastern Point Road From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
06:00 AM	0	43	13	11	67	10	0	10	50	70	8	11	0	0	19	0	0	0	0	0	156
06:15 AM	0	20	11	6	37	10	0	5	13	28	9	8	0	0	17	0	0	0	0	0	82
06:30 AM	0	18	7	6	31	3	0	10	9	22	11	6	0	0	17	0	1	0	0	1	71
06:45 AM	0	29	12	10	51	9	0	10	10	29	15	8	0	0	23	0	0	0	0	0	103
Total	0	110	43	33	186	32	0	35	82	149	43	33	0	0	76	0	1	0	0	1	412
07:00 AM	0	43	25	2	70	14	0	34	9	57	16	22	0	0	38	0	0	0	0	0	165
07:15 AM	0	22	5	3	30	10	0	50	3	63	6	11	0	0	17	0	0	0	0	0	110
07:30 AM	0	20	2	0	22	5	0	55	2	62	12	9	0	0	21	0	0	0	0	0	105
07:45 AM	0	28	2	1	31	3	0	79	3	85	10	8	0	0	18	0	0	0	0	0	134
Total	0	113	34	6	153	32	0	218	17	267	44	50	0	0	94	0	0	0	0	0	514
08:00 AM	0	28	8	1	37	5	0	61	2	68	11	8	0	0	19	0	0	0	0	0	124
08:15 AM	0	19	4	0	23	7	0	81	2	90	7	5	0	0	12	0	0	0	0	0	125
08:30 AM	0	14	3	10	27	5	0	49	3	57	14	12	0	0	26	0	0	0	0	0	110
Grand Total	0	284	92	50	426	81	0	444	106	631	119	108	0	0	227	0	1	0	0	1	1285
Apprch %	0	66.7	21.6	11.7		12.8	0	70.4	16.8		52.4	47.6	0	0		0	100	0	0		
Total %	0	22.1	7.2	3.9	33.2	6.3	0	34.6	8.2	49.1	9.3	8.4	0	0	17.7	0	0.1	0	0	0.1	
Unshifted	0	277	87	50	414	79	0	427	106	612	108	105	0	0	213	0	1	0	0	1	1240
% Unshifted																					
Bank 1	0	7	2	0	9	2	0	16	0	18	9	3	0	0	12	0	0	0	0	0	39
% Bank 1	0	2.5	2.2	0	2.1	2.5	0	3.6	0	2.9	7.6	2.8	0	0	5.3	0	0	0	0	0	3
Bank 2	0	0	3	0	3	0	0	1	0	1	2	0	0	0	2	0	0	0	0	0	6
% Bank 2	0	0	3.3	0	0.7	0	0	0.2	0	0.2	1.7	0	0	0	0.9	0	0	0	0	0	0.5

Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18033
Site Code : 18033
Start Date : 10/18/2018
Page No : 2

Start Time	Eastern Point Road From North					Chester Street From East					Eastern Point Road 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 06:00 AM to 08:30 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	43	25	2	70	14	0	34	9	57	16	22	0	0	38	0	0	0	0	0	165
07:15 AM	0	22	5	3	30	10	0	50	3	63	6	11	0	0	17	0	0	0	0	0	110
07:30 AM	0	20	2	0	22	5	0	55	2	62	12	9	0	0	21	0	0	0	0	0	105
07:45 AM	0	28	2	1	31	3	0	79	3	85	10	8	0	0	18	0	0	0	0	0	134
Total Volume	0	113	34	6	153	32	0	218	17	267	44	50	0	0	94	0	0	0	0	0	514
% App. Total	0	73.9	22.2	3.9		12	0	81.6	6.4		46.8	53.2	0	0		0	0	0	0	0	
PHF	.000	.657	.340	.500	.546	.571	.000	.690	.472	.785	.688	.568	.000	.000	.618	.000	.000	.000	.000	.000	.779



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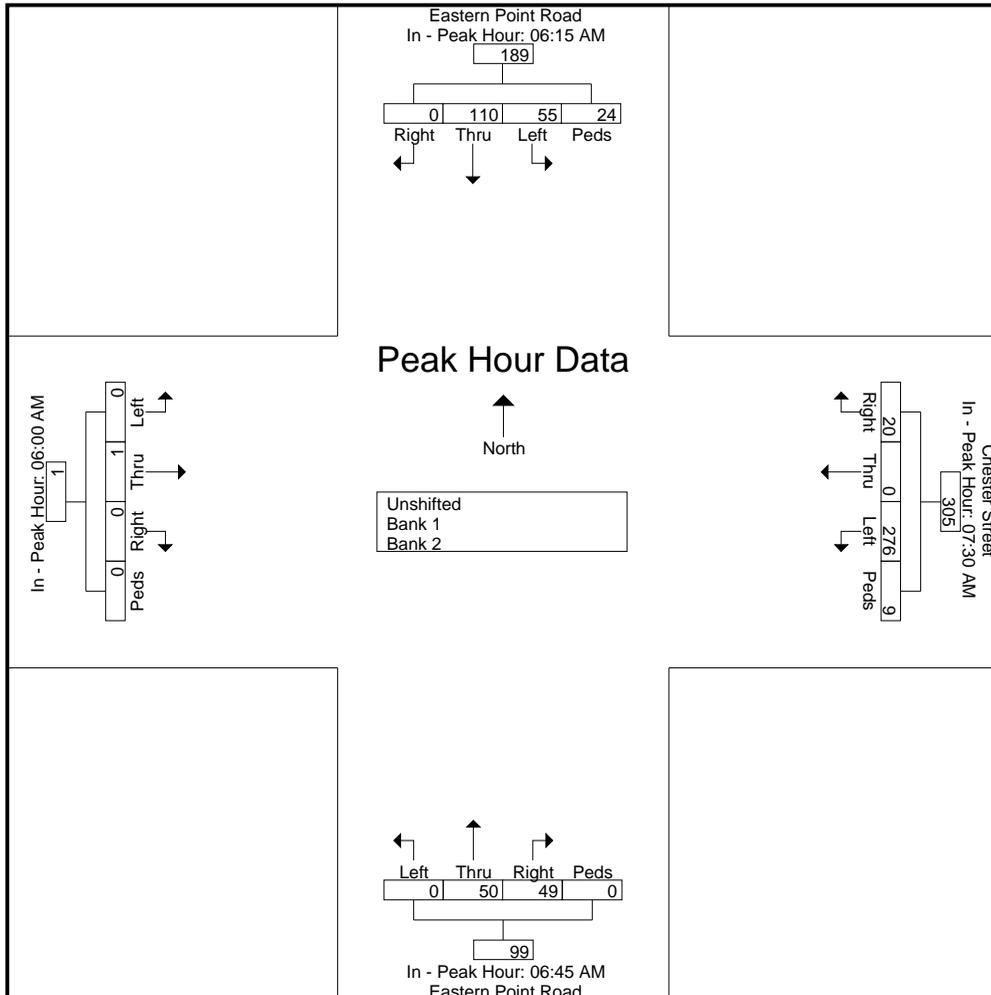
File Name : 18033
Site Code : 18033
Start Date : 10/18/2018
Page No : 3

Start Time	Eastern Point Road From North					Chester Street From East					Eastern Point Road 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 06:00 AM to 08:30 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	06:15 AM					07:30 AM					06:45 AM					06:00 AM				
+0 mins.	0	20	11	6	37	5	0	55	2	62	15	8	0	0	23	0	0	0	0	0
+15 mins.	0	18	7	6	31	3	0	79	3	85	16	22	0	0	38	0	0	0	0	0
+30 mins.	0	29	12	10	51	5	0	61	2	68	6	11	0	0	17	0	1	0	0	1
+45 mins.	0	43	25	2	70	7	0	81	2	90	12	9	0	0	21	0	0	0	0	0
Total Volume	0	110	55	24	189	20	0	276	9	305	49	50	0	0	99	0	1	0	0	1
% App. Total	0	58.2	29.1	12.7		6.6	0	90.5	3		49.5	50.5	0	0		0	100	0	0	
PHF	.000	.640	.550	.600	.675	.714	.000	.852	.750	.847	.766	.568	.000	.000	.651	.000	.250	.000	.000	.250



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Eastern Point Road at Chester Street
Groton, Connecticut

File Name : 18034
Site Code : 18034
Start Date : 10/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

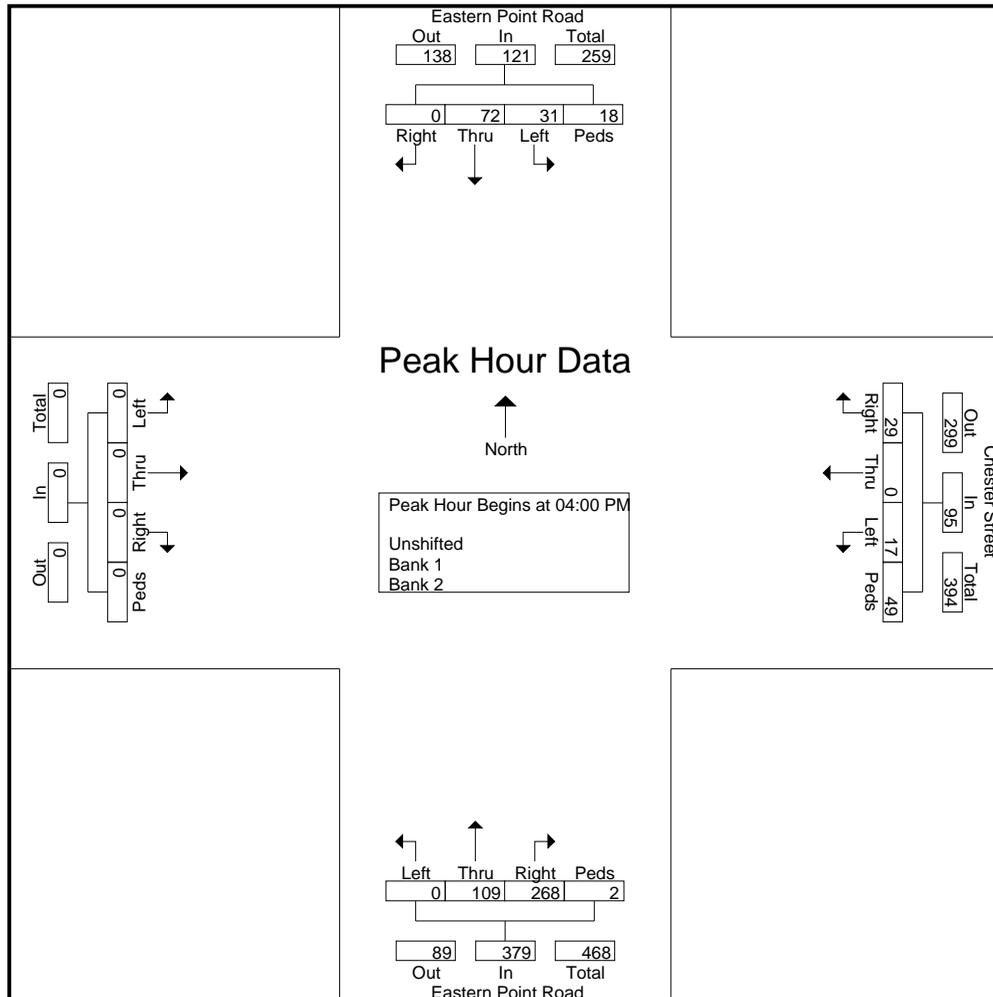
Start Time	Eastern Point Road From North					Chester Street From East					Eastern Point Road From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
03:00 PM	0	29	16	10	55	11	0	5	39	55	23	16	0	5	44	0	0	0	0	0	154
03:15 PM	0	13	10	3	26	6	0	4	14	24	27	24	0	3	54	0	0	0	0	0	104
03:30 PM	0	17	9	5	31	6	0	4	22	32	39	19	0	0	58	0	0	0	0	0	121
03:45 PM	0	13	12	2	27	2	0	8	8	18	39	21	0	0	60	0	0	0	0	0	105
Total	0	72	47	20	139	25	0	21	83	129	128	80	0	8	216	0	0	0	0	0	484
04:00 PM	0	30	13	10	53	11	0	2	29	42	90	48	0	2	140	0	0	0	0	0	235
04:15 PM	0	6	3	1	10	5	0	2	3	10	49	18	0	0	67	0	0	0	0	0	87
04:30 PM	0	19	7	3	29	8	0	6	6	20	69	19	0	0	88	0	0	0	0	0	137
04:45 PM	0	17	8	4	29	5	0	7	11	23	60	24	0	0	84	0	0	0	0	0	136
Total	0	72	31	18	121	29	0	17	49	95	268	109	0	2	379	0	0	0	0	0	595
05:00 PM	0	22	5	0	27	3	0	3	7	13	70	29	0	0	99	0	0	0	0	0	139
05:15 PM	0	15	8	3	26	4	0	4	5	13	67	27	0	0	94	0	0	0	0	0	133
05:30 PM	0	15	2	1	18	5	0	4	4	13	7	17	0	0	24	0	0	0	0	0	55
05:45 PM	0	16	9	0	25	4	0	3	3	10	4	12	0	0	16	0	0	0	0	0	51
Total	0	68	24	4	96	16	0	14	19	49	148	85	0	0	233	0	0	0	0	0	378
Grand Total	0	212	102	42	356	70	0	52	151	273	544	274	0	10	828	0	0	0	0	0	1457
Apprch %	0	59.6	28.7	11.8		25.6	0	19	55.3		65.7	33.1	0	1.2		0	0	0	0		
Total %	0	14.6	7	2.9	24.4	4.8	0	3.6	10.4	18.7	37.3	18.8	0	0.7	56.8	0	0	0	0	0	
Unshifted	0	209	101	42	352	69	0	47	151	267	541	272	0	10	823	0	0	0	0	0	1442
% Unshifted																					
Bank 1	0	3	1	0	4	0	0	3	0	3	3	2	0	0	5	0	0	0	0	0	12
% Bank 1	0	1.4	1	0	1.1	0	0	5.8	0	1.1	0.6	0.7	0	0	0.6	0	0	0	0	0	0.8
Bank 2	0	0	0	0	0	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	3
% Bank 2	0	0	0	0	0	1.4	0	3.8	0	1.1	0	0	0	0	0	0	0	0	0	0	0.2

Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18034
Site Code : 18034
Start Date : 10/18/2018
Page No : 2

Start Time	Eastern Point Road From North					Chester Street From East					Eastern Point Road 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 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	30	13	10	53	11	0	2	29	42	90	48	0	2	140	0	0	0	0	0	235
04:15 PM	0	6	3	1	10	5	0	2	3	10	49	18	0	0	67	0	0	0	0	0	87
04:30 PM	0	19	7	3	29	8	0	6	6	20	69	19	0	0	88	0	0	0	0	0	137
04:45 PM	0	17	8	4	29	5	0	7	11	23	60	24	0	0	84	0	0	0	0	0	136
Total Volume	0	72	31	18	121	29	0	17	49	95	268	109	0	2	379	0	0	0	0	0	595
% App. Total	0	59.5	25.6	14.9		30.5	0	17.9	51.6		70.7	28.8	0	0.5		0	0	0	0	0	
PHF	.000	.600	.596	.450	.571	.659	.000	.607	.422	.565	.744	.568	.000	.250	.677	.000	.000	.000	.000	.000	.633



Connecticut Counts LLC

Kensington, Connecticut 06037
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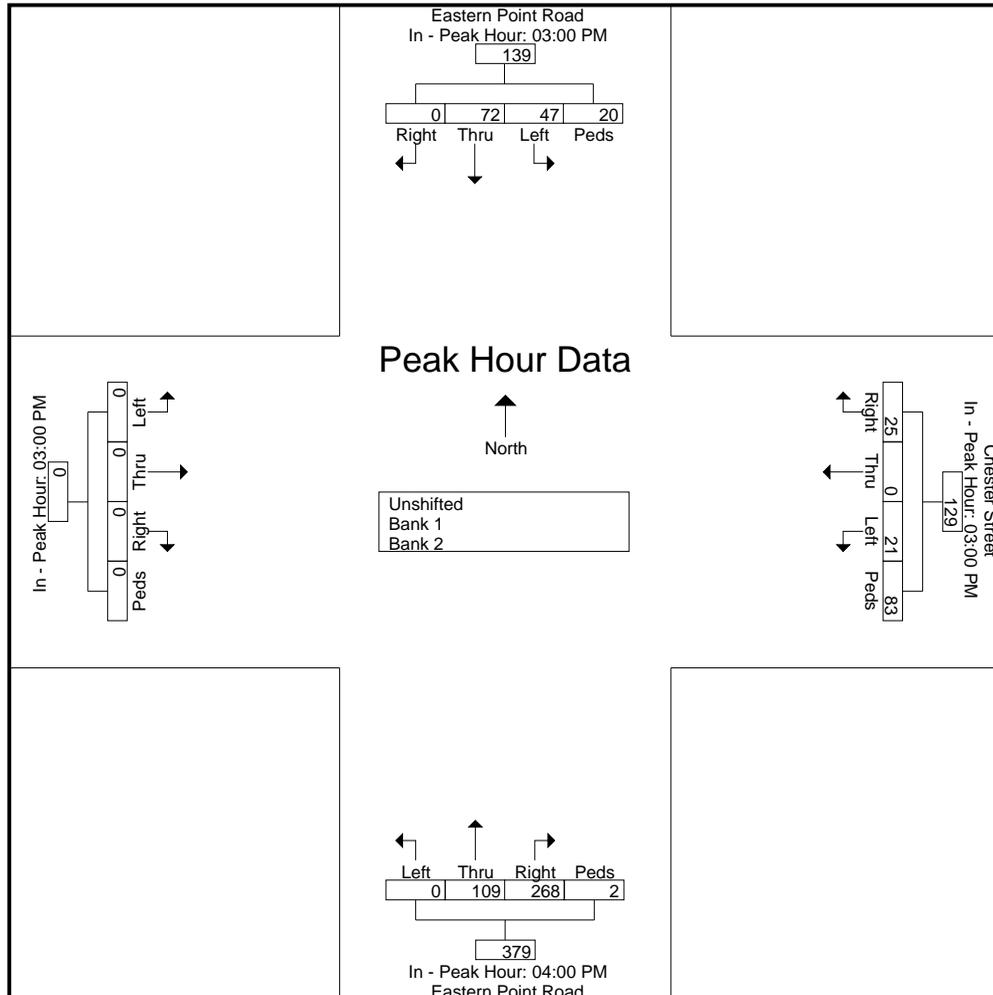
File Name : 18034
Site Code : 18034
Start Date : 10/18/2018
Page No : 3

Start Time	Eastern Point Road From North					Chester Street From East					Eastern Point Road 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 03:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:00 PM					03:00 PM					04:00 PM					03:00 PM				
+0 mins.	0	29	16	10	55	11	0	5	39	55	90	48	0	2	140	0	0	0	0	0
+15 mins.	0	13	10	3	26	6	0	4	14	24	49	18	0	0	67	0	0	0	0	0
+30 mins.	0	17	9	5	31	6	0	4	22	32	69	19	0	0	88	0	0	0	0	0
+45 mins.	0	13	12	2	27	2	0	8	8	18	60	24	0	0	84	0	0	0	0	0
Total Volume	0	72	47	20	139	25	0	21	83	129	268	109	0	2	379	0	0	0	0	0
% App. Total	0	51.8	33.8	14.4		19.4	0	16.3	64.3		70.7	28.8	0	0.5		0	0	0	0	
PHF	.000	.621	.734	.500	.632	.568	.000	.656	.532	.586	.744	.568	.000	.250	.677	.000	.000	.000	.000	.000



Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

Chester Street at Forrest/Mumford
Groton, Connecticut

File Name : 18039
Site Code : 18039
Start Date : 10/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	Forrest Street From North					Mumford Ave From East					Mumford Ave From South					Chester 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	
06:00 AM	4	15	6	52	77	4	19	37	79	139	3	0	0	0	3	2	16	1	6	25	244
06:15 AM	10	15	6	160	191	9	12	12	183	216	4	0	0	1	5	0	21	4	6	31	443
06:30 AM	7	4	11	48	70	4	12	2	91	109	2	1	2	5	10	0	17	4	2	23	212
06:45 AM	6	2	5	105	118	2	28	2	103	135	11	2	0	1	14	0	21	4	1	26	293
Total	27	36	28	365	456	19	71	53	456	599	20	3	2	7	32	2	75	13	15	105	1192
07:00 AM	8	5	12	67	92	4	31	3	62	100	14	5	0	6	25	0	21	6	5	32	249
07:15 AM	8	2	0	19	29	7	24	3	30	64	4	0	0	3	7	0	8	5	2	15	115
07:30 AM	10	1	3	8	22	7	59	4	8	78	3	0	0	1	4	0	8	2	4	14	118
07:45 AM	11	3	4	2	20	16	76	4	6	102	8	4	1	0	13	1	11	2	3	17	152
Total	37	11	19	96	163	34	190	14	106	344	29	9	1	10	49	1	48	15	14	78	634
08:00 AM	11	5	2	3	21	4	56	12	5	77	4	1	0	0	5	0	8	3	1	12	115
08:15 AM	11	4	10	2	27	8	54	4	1	67	2	4	1	1	8	1	12	5	0	18	120
08:30 AM	19	5	4	4	32	3	76	3	4	86	7	4	2	1	14	0	8	4	2	14	146
08:45 AM	11	7	5	1	24	5	49	3	3	60	5	4	2	1	12	0	11	4	2	17	113
Total	52	21	21	10	104	20	235	22	13	290	18	13	5	3	39	1	39	16	5	61	494
Grand Total	116	68	68	471	723	73	496	89	575	1233	67	25	8	20	120	4	162	44	34	244	2320
Apprch %	16	9.4	9.4	65.1		5.9	40.2	7.2	46.6		55.8	20.8	6.7	16.7		1.6	66.4	18	13.9		
Total %	5	2.9	2.9	20.3	31.2	3.1	21.4	3.8	24.8	53.1	2.9	1.1	0.3	0.9	5.2	0.2	7	1.9	1.5	10.5	
Unshifted	113	67	59	471	710	72	465	89	575	1201	67	25	7	20	119	4	140	43	34	221	2251
% Unshifted																					
Bank 1	2	0	0	0	2	0	16	0	0	16	0	0	0	0	0	0	9	1	0	10	28
% Bank 1	1.7	0	0	0	0.3	0	3.2	0	0	1.3	0	0	0	0	0	0	5.6	2.3	0	4.1	1.2
Bank 2	1	1	9	0	11	1	15	0	0	16	0	0	1	0	1	0	13	0	0	13	41
% Bank 2	0.9	1.5	13.2	0	1.5	1.4	3	0	0	1.3	0	0	12.5	0	0.8	0	8	0	0	5.3	1.8

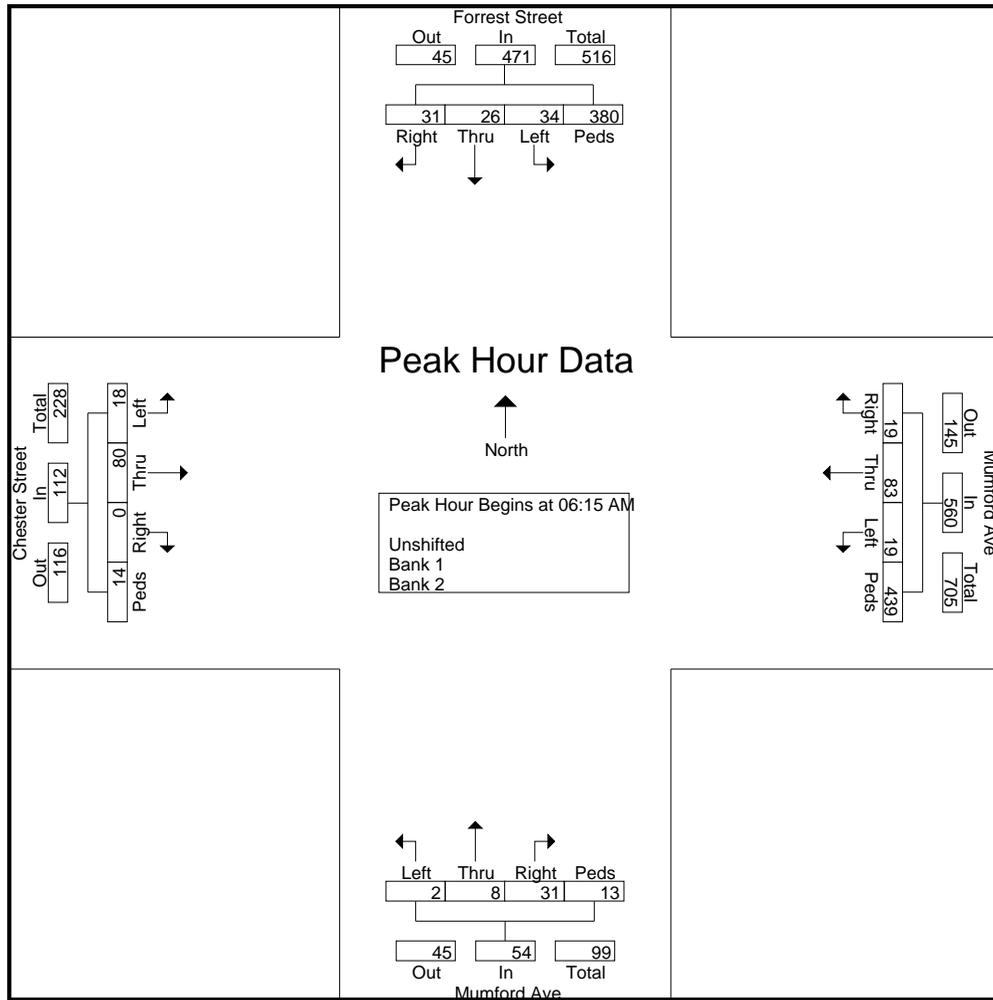
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18039
Site Code : 18039
Start Date : 10/18/2018
Page No : 2

Start Time	Forrest Street From North					Mumford Ave From East					Mumford Ave From South					Chester 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	
06:15 AM	10	15	6	160	191	9	12	12	183	216	4	0	0	1	5	0	21	4	6	31	443
06:30 AM	7	4	11	48	70	4	12	2	91	109	2	1	2	5	10	0	17	4	2	23	212
06:45 AM	6	2	5	105	118	2	28	2	103	135	11	2	0	1	14	0	21	4	1	26	293
07:00 AM	8	5	12	67	92	4	31	3	62	100	14	5	0	6	25	0	21	6	5	32	249
Total Volume	31	26	34	380	471	19	83	19	439	560	31	8	2	13	54	0	80	18	14	112	1197
% App. Total	6.6	5.5	7.2	80.7		3.4	14.8	3.4	78.4		57.4	14.8	3.7	24.1		0	71.4	16.1	12.5		
PHF	.775	.433	.708	.594	.616	.528	.669	.396	.600	.648	.554	.400	.250	.542	.540	.000	.952	.750	.583	.875	.676

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 06:15 AM



Connecticut Counts LLC

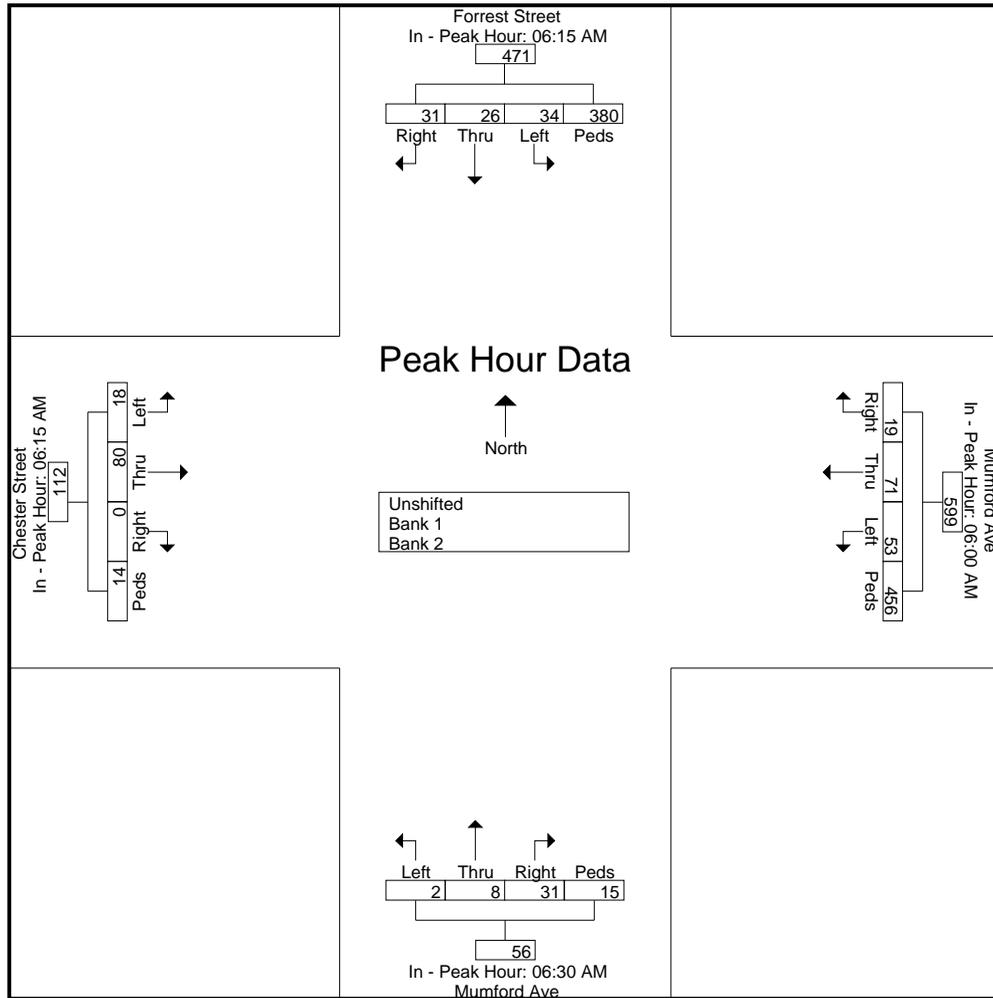
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18039
Site Code : 18039
Start Date : 10/18/2018
Page No : 3

Start Time	Forrest Street From North					Mumford Ave From East					Mumford Ave From South					Chester 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 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	06:15 AM					06:00 AM					06:30 AM					06:15 AM				
+0 mins.	10	15	6	160	191	4	19	37	79	139	2	1	2	5	10	0	21	4	6	31
+15 mins.	7	4	11	48	70	9	12	12	183	216	11	2	0	1	14	0	17	4	2	23
+30 mins.	6	2	5	105	118	4	12	2	91	109	14	5	0	6	25	0	21	4	1	26
+45 mins.	8	5	12	67	92	2	28	2	103	135	4	0	0	3	7	0	21	6	5	32
Total Volume	31	26	34	380	471	19	71	53	456	599	31	8	2	15	56	0	80	18	14	112
% App. Total	6.6	5.5	7.2	80.7		3.2	11.9	8.8	76.1		55.4	14.3	3.6	26.8		0	71.4	16.1	12.5	
PHF	.775	.433	.708	.594	.616	.528	.634	.358	.623	.693	.554	.400	.250	.625	.560	.000	.952	.750	.583	.875



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Chester Street at Forrest/Mumford Ave
Groton, Connecticut

File Name : 18040
Site Code : 18040
Start Date : 10/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	Forrest Street From North					Mumford Ave From East					Mumford Ave From South					Chester 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	
03:00 PM	5	2	18	6	31	20	19	10	49	98	38	6	1	18	63	5	35	11	6	57	249
03:15 PM	5	3	8	1	17	2	11	1	27	41	14	6	0	12	32	1	30	6	8	45	135
03:30 PM	5	2	16	17	40	4	8	5	53	70	19	6	1	12	38	3	54	12	11	80	228
03:45 PM	4	2	18	12	36	4	6	3	47	60	29	4	0	12	45	1	64	10	13	88	229
Total	19	9	60	36	124	30	44	19	176	269	100	22	2	54	178	10	183	39	38	270	841
04:00 PM	2	2	23	9	36	4	11	2	25	42	29	5	0	10	44	0	59	18	9	86	208
04:15 PM	3	1	9	2	15	5	6	5	22	38	14	1	1	11	27	1	65	16	9	91	171
04:30 PM	4	2	21	7	34	4	8	1	18	31	14	8	2	9	33	2	58	15	8	83	181
04:45 PM	5	1	11	1	18	5	7	1	11	24	7	2	0	4	13	0	57	10	5	72	127
Total	14	6	64	19	103	18	32	9	76	135	64	16	3	34	117	3	239	59	31	332	687
05:00 PM	2	2	17	4	25	1	5	0	10	16	16	6	0	6	28	0	63	10	7	80	149
05:15 PM	3	4	20	3	30	1	5	5	10	21	15	4	0	5	24	1	71	6	4	82	157
05:30 PM	5	4	14	2	25	2	3	2	5	12	11	1	2	4	18	0	8	1	6	15	70
05:45 PM	1	2	13	0	16	4	8	3	4	19	7	2	1	3	13	1	12	0	2	15	63
Total	11	12	64	9	96	8	21	10	29	68	49	13	3	18	83	2	154	17	19	192	439
Grand Total	44	27	188	64	323	56	97	38	281	472	213	51	8	106	378	15	576	115	88	794	1967
Apprch %	13.6	8.4	58.2	19.8		11.9	20.6	8.1	59.5		56.3	13.5	2.1	28		1.9	72.5	14.5	11.1		
Total %	2.2	1.4	9.6	3.3	16.4	2.8	4.9	1.9	14.3	24	10.8	2.6	0.4	5.4	19.2	0.8	29.3	5.8	4.5	40.4	
Unshifted	44	26	173	64	307	49	79	38	281	447	213	51	7	106	377	15	566	115	88	784	1915
% Unshifted																					
Bank 1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	3	5
% Bank 1	0	0	0	0	0	0	2.1	0	0	0.4	0	0	0	0	0	0	0.5	0	0	0.4	0.3
Bank 2	0	1	15	0	16	7	16	0	0	23	0	0	1	0	1	0	7	0	0	7	47
% Bank 2	0	3.7	8	0	5	12.5	16.5	0	0	4.9	0	0	12.5	0	0.3	0	1.2	0	0	0.9	2.4

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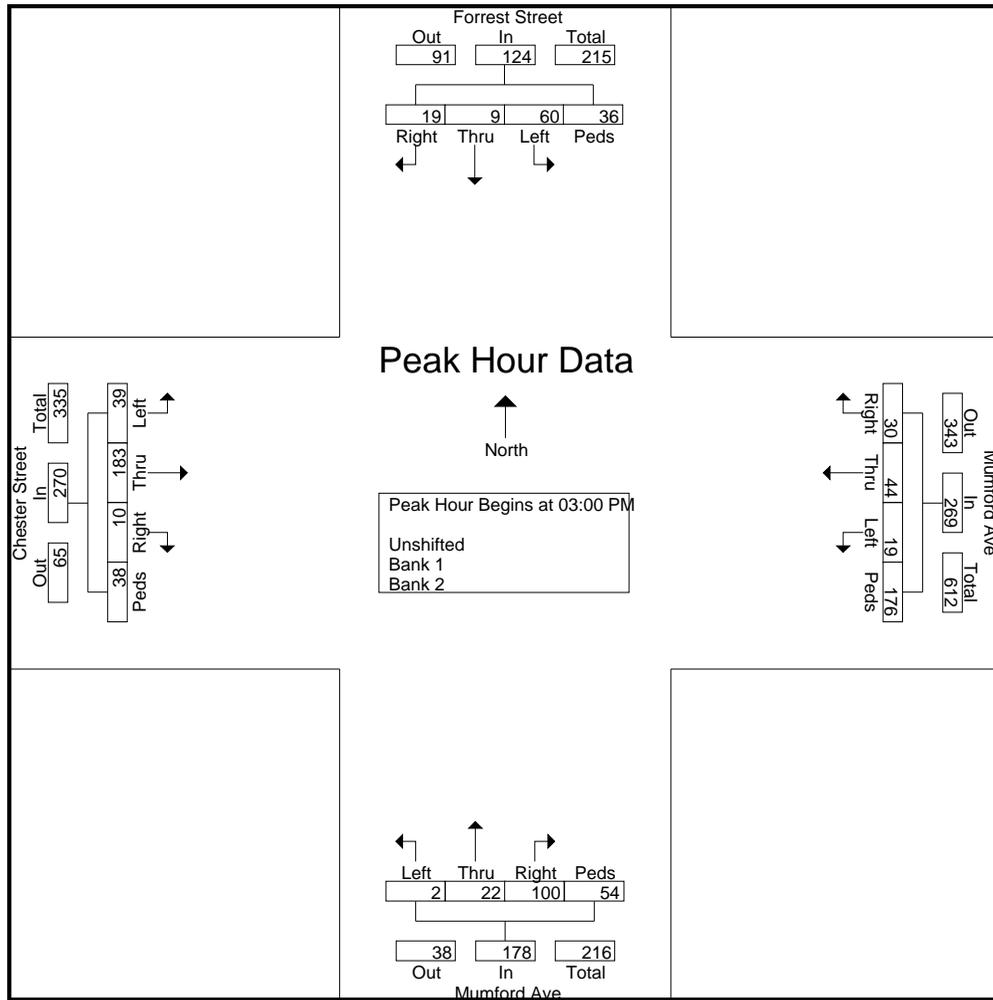
File Name : 18040
Site Code : 18040
Start Date : 10/18/2018
Page No : 2

Start Time	Forrest Street From North					Mumford Ave From East					Mumford Ave From South					Chester 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 03:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 03:00 PM

03:00 PM	5	2	18	6	31	20	19	10	49	98	38	6	1	18	63	5	35	11	6	57	249
03:15 PM	5	3	8	1	17	2	11	1	27	41	14	6	0	12	32	1	30	6	8	45	135
03:30 PM	5	2	16	17	40	4	8	5	53	70	19	6	1	12	38	3	54	12	11	80	228
03:45 PM	4	2	18	12	36	4	6	3	47	60	29	4	0	12	45	1	64	10	13	88	229
Total Volume	19	9	60	36	124	30	44	19	176	269	100	22	2	54	178	10	183	39	38	270	841
% App. Total	15.3	7.3	48.4	29		11.2	16.4	7.1	65.4		56.2	12.4	1.1	30.3		3.7	67.8	14.4	14.1		
PHF	.950	.750	.833	.529	.775	.375	.579	.475	.830	.686	.658	.917	.500	.750	.706	.500	.715	.813	.731	.767	.844



Connecticut Counts LLC

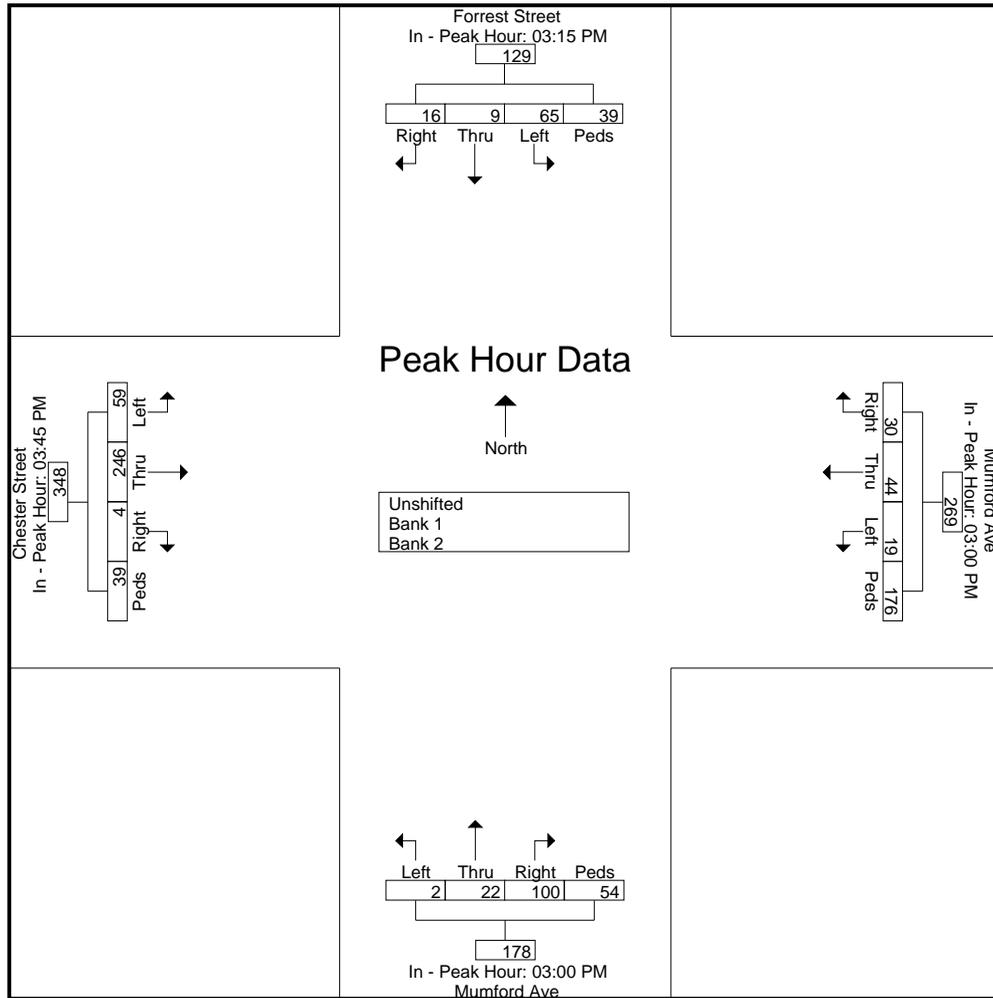
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18040
Site Code : 18040
Start Date : 10/18/2018
Page No : 3

Start Time	Forrest Street From North					Mumford Ave From East					Mumford Ave From South					Chester 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 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:15 PM					03:00 PM					03:00 PM					03:45 PM				
+0 mins.	5	3	8	1	17	20	19	10	49	98	38	6	1	18	63	1	64	10	13	88
+15 mins.	5	2	16	17	40	2	11	1	27	41	14	6	0	12	32	0	59	18	9	86
+30 mins.	4	2	18	12	36	4	8	5	53	70	19	6	1	12	38	1	65	16	9	91
+45 mins.	2	2	23	9	36	4	6	3	47	60	29	4	0	12	45	2	58	15	8	83
Total Volume	16	9	65	39	129	30	44	19	176	269	100	22	2	54	178	4	246	59	39	348
% App. Total	12.4	7	50.4	30.2		11.2	16.4	7.1	65.4		56.2	12.4	1.1	30.3		1.1	70.7	17	11.2	
PHF	.800	.750	.707	.574	.806	.375	.579	.475	.830	.686	.658	.917	.500	.750	.706	.500	.946	.819	.750	.956



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Mumford Ave at Benham Road
Groton, Connecticut

File Name : 18043
Site Code : 18043
Start Date : 10/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	Benham Road From North					Rainville Ave From East					Benham Road From South					Mumford Ave 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	
06:00 AM	25	23	6	0	54	29	118	36	0	183	9	7	1	1	18	0	13	0	0	13	268
06:15 AM	33	13	6	0	52	38	104	31	0	173	17	16	3	0	36	2	11	0	0	13	274
06:30 AM	26	17	16	0	59	31	79	39	0	149	15	16	0	0	31	2	13	4	0	19	258
06:45 AM	22	16	8	0	46	39	79	46	0	164	23	10	1	0	34	0	15	1	0	16	260
Total	106	69	36	0	211	137	380	152	0	669	64	49	5	1	119	4	52	5	0	61	1060
07:00 AM	4	32	14	0	50	27	69	53	0	149	25	21	1	1	48	1	22	1	0	24	271
07:15 AM	4	30	9	0	43	30	35	70	0	135	18	20	1	1	40	0	6	1	0	7	225
07:30 AM	3	34	6	0	43	31	60	51	0	142	23	16	1	0	40	1	19	0	0	20	245
07:45 AM	2	27	8	1	38	30	72	40	0	142	17	17	1	1	36	1	10	2	1	14	230
Total	13	123	37	1	174	118	236	214	0	568	83	74	4	3	164	3	57	4	1	65	971
08:00 AM	5	19	10	0	34	18	72	32	0	122	25	16	2	0	43	1	10	0	1	12	211
08:15 AM	1	30	9	0	40	15	55	53	0	123	19	20	1	1	41	1	17	1	2	21	225
08:30 AM	0	20	17	0	37	15	56	30	0	101	20	23	1	0	44	1	15	1	0	17	199
08:45 AM	3	17	4	0	24	14	38	42	1	95	20	12	0	0	32	2	11	1	0	14	165
Total	9	86	40	0	135	62	221	157	1	441	84	71	4	1	160	5	53	3	3	64	800
Grand Total	128	278	113	1	520	317	837	523	1	1678	231	194	13	5	443	12	162	12	4	190	2831
Apprch %	24.6	53.5	21.7	0.2		18.9	49.9	31.2	0.1		52.1	43.8	2.9	1.1		6.3	85.3	6.3	2.1		
Total %	4.5	9.8	4	0	18.4	11.2	29.6	18.5	0	59.3	8.2	6.9	0.5	0.2	15.6	0.4	5.7	0.4	0.1	6.7	
Unshifted	128	270	113	1	512	312	805	512	1	1630	224	188	13	5	430	12	140	10	4	166	2738
% Unshifted																					
Bank 1	0	5	0	0	5	2	18	4	0	24	4	3	0	0	7	0	12	0	0	12	48
% Bank 1	0	1.8	0	0	1	0.6	2.2	0.8	0	1.4	1.7	1.5	0	0	1.6	0	7.4	0	0	6.3	1.7
Bank 2	0	3	0	0	3	3	14	7	0	24	3	3	0	0	6	0	10	2	0	12	45
% Bank 2	0	1.1	0	0	0.6	0.9	1.7	1.3	0	1.4	1.3	1.5	0	0	1.4	0	6.2	16.7	0	6.3	1.6

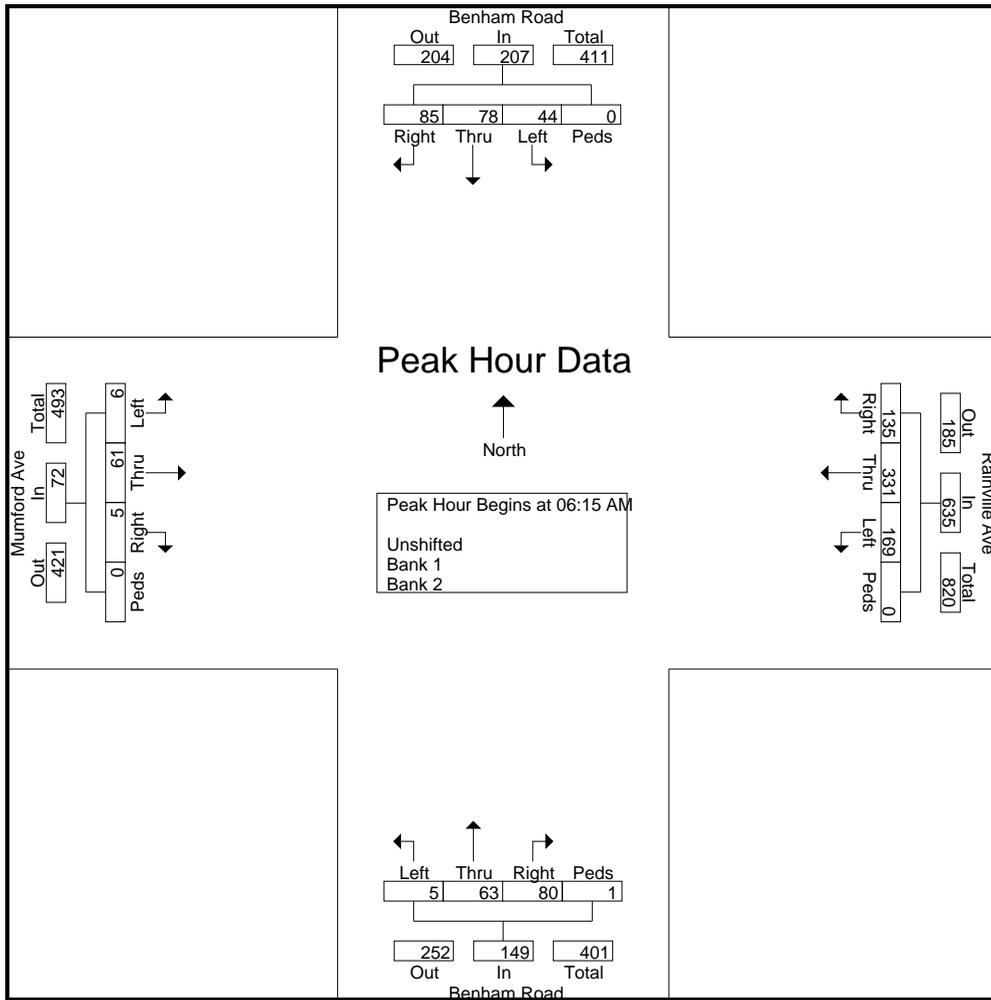
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18043
Site Code : 18043
Start Date : 10/18/2018
Page No : 2

Start Time	Benham Road From North					Rainville Ave From East					Benham Road From South					Mumford Ave 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	
06:15 AM	33	13	6	0	52	38	104	31	0	173	17	16	3	0	36	2	11	0	0	13	274
06:30 AM	26	17	16	0	59	31	79	39	0	149	15	16	0	0	31	2	13	4	0	19	258
06:45 AM	22	16	8	0	46	39	79	46	0	164	23	10	1	0	34	0	15	1	0	16	260
07:00 AM	4	32	14	0	50	27	69	53	0	149	25	21	1	1	48	1	22	1	0	24	271
Total Volume	85	78	44	0	207	135	331	169	0	635	80	63	5	1	149	5	61	6	0	72	1063
% App. Total	41.1	37.7	21.3	0		21.3	52.1	26.6	0		53.7	42.3	3.4	0.7		6.9	84.7	8.3	0		
PHF	.644	.609	.688	.000	.877	.865	.796	.797	.000	.918	.800	.750	.417	.250	.776	.625	.693	.375	.000	.750	.970

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 06:15 AM



Connecticut Counts LLC

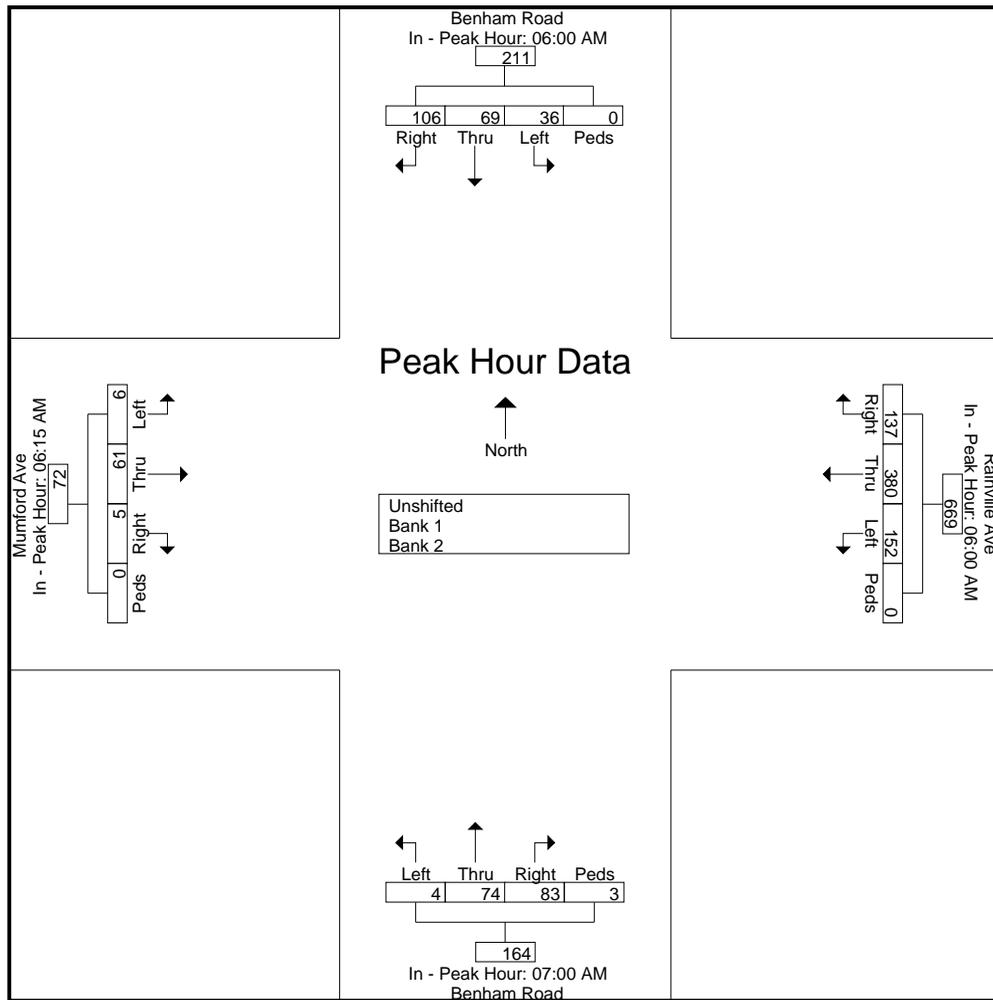
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18043
Site Code : 18043
Start Date : 10/18/2018
Page No : 3

Start Time	Benham Road From North					Rainville Ave From East					Benham Road From South					Mumford Ave 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 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	06:00 AM					06:00 AM					07:00 AM					06:15 AM				
+0 mins.	25	23	6	0	54	29	118	36	0	183	25	21	1	1	48	2	11	0	0	13
+15 mins.	33	13	6	0	52	38	104	31	0	173	18	20	1	1	40	2	13	4	0	19
+30 mins.	26	17	16	0	59	31	79	39	0	149	23	16	1	0	40	0	15	1	0	16
+45 mins.	22	16	8	0	46	39	79	46	0	164	17	17	1	1	36	1	22	1	0	24
Total Volume	106	69	36	0	211	137	380	152	0	669	83	74	4	3	164	5	61	6	0	72
% App. Total	50.2	32.7	17.1	0		20.5	56.8	22.7	0		50.6	45.1	2.4	1.8		6.9	84.7	8.3	0	
PHF	.803	.750	.563	.000	.894	.878	.805	.826	.000	.914	.830	.881	1.000	.750	.854	.625	.693	.375	.000	.750



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Mumford Ave at Benham Road
Groton, Connecticut

File Name : 18044
Site Code : 18044
Start Date : 10/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	Benham Road From North					Rainville Ave From East					Benham Road From South					Mumford Ave 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	
03:00 PM	0	20	25	0	45	18	28	35	2	83	43	44	3	2	92	5	102	17	0	124	344
03:15 PM	0	20	16	0	36	16	6	19	2	43	64	27	0	0	91	2	80	9	0	91	261
03:30 PM	0	25	23	0	48	11	9	14	0	34	50	34	0	0	84	1	91	11	0	103	269
03:45 PM	0	19	13	0	32	11	7	28	1	47	35	24	1	1	61	4	80	12	0	96	236
Total	0	84	77	0	161	56	50	96	5	207	192	129	4	3	328	12	353	49	0	414	1110
04:00 PM	0	33	49	0	82	12	12	16	0	40	48	40	1	2	91	6	134	25	0	165	378
04:15 PM	0	33	24	0	57	6	15	28	0	49	31	17	1	0	49	4	117	19	0	140	295
04:30 PM	0	35	23	0	58	10	7	22	1	40	42	22	0	0	64	0	111	13	0	124	286
04:45 PM	0	17	24	0	41	13	10	25	1	49	36	27	1	1	65	1	89	10	0	100	255
Total	0	118	120	0	238	41	44	91	2	178	157	106	3	3	269	11	451	67	0	529	1214
05:00 PM	0	26	21	0	47	5	5	27	1	38	49	24	0	1	74	3	88	8	0	99	258
05:15 PM	0	35	17	0	52	6	8	33	1	48	43	22	0	1	66	0	84	6	0	90	256
05:30 PM	1	49	10	0	60	6	9	37	0	52	46	31	0	1	78	0	48	5	1	54	244
05:45 PM	0	36	9	0	45	10	7	30	2	49	56	21	0	0	77	4	25	0	0	29	200
Total	1	146	57	0	204	27	29	127	4	187	194	98	0	3	295	7	245	19	1	272	958
Grand Total	1	348	254	0	603	124	123	314	11	572	543	333	7	9	892	30	1049	135	1	1215	3282
Apprch %	0.2	57.7	42.1	0		21.7	21.5	54.9	1.9		60.9	37.3	0.8	1		2.5	86.3	11.1	0.1		
Total %	0	10.6	7.7	0	18.4	3.8	3.7	9.6	0.3	17.4	16.5	10.1	0.2	0.3	27.2	0.9	32	4.1	0	37	
Unshifted	1	342	252	0	595	123	99	309	11	542	532	330	7	9	878	30	1025				
% Unshifted	100	98.3	99.2	0	98.7	99.2	80.5	98.4	100	94.8	98	99.1	100	100	98.4	100	97.7	99.3	100	97.9	97.7
Bank 1	0	4	1	0	5	0	5	2	0	7	7	0	0	0	7	0	7	0	0	7	26
% Bank 1	0	1.1	0.4	0	0.8	0	4.1	0.6	0	1.2	1.3	0	0	0	0.8	0	0.7	0	0	0.6	0.8
Bank 2	0	2	1	0	3	1	19	3	0	23	4	3	0	0	7	0	17	1	0	18	51
% Bank 2	0	0.6	0.4	0	0.5	0.8	15.4	1	0	4	0.7	0.9	0	0	0.8	0	1.6	0.7	0	1.5	1.6

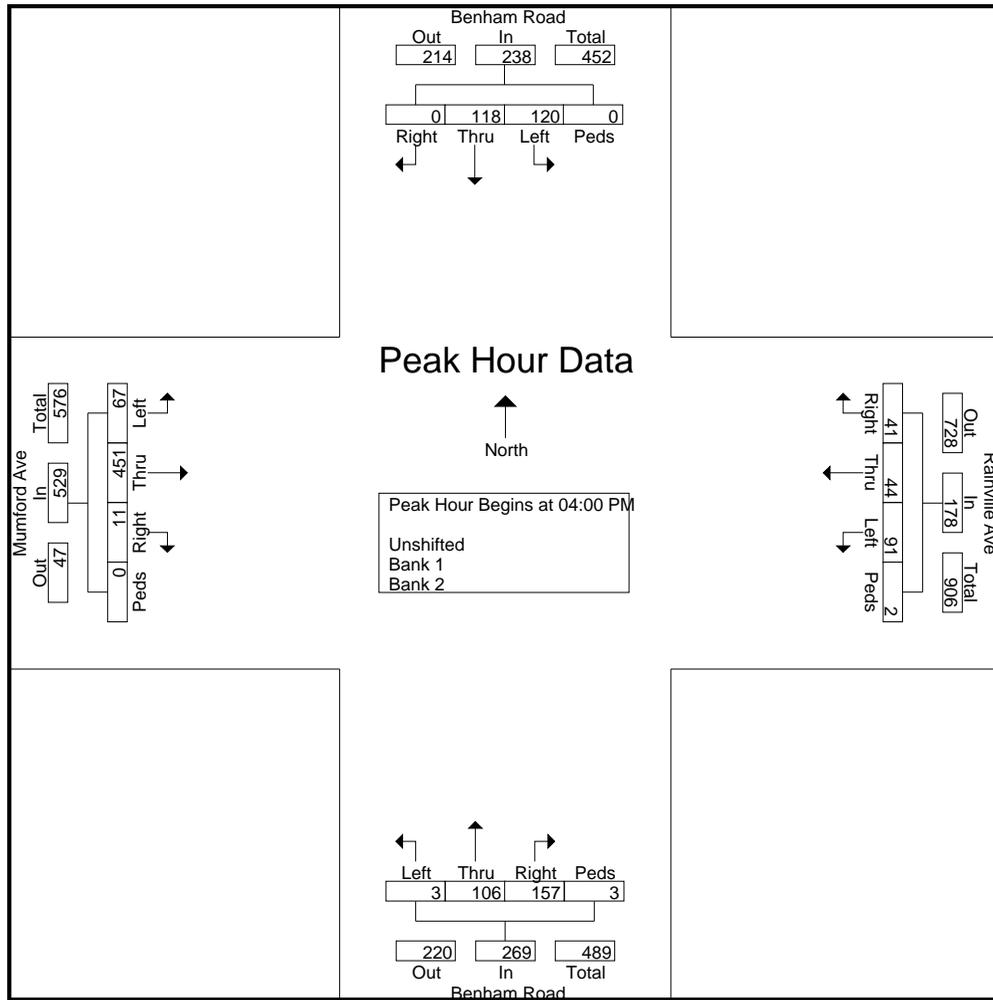
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18044
Site Code : 18044
Start Date : 10/18/2018
Page No : 2

Start Time	Benham Road From North					Rainville Ave From East					Benham Road From South					Mumford Ave 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	33	49	0	82	12	12	16	0	40	48	40	1	2	91	6	134	25	0	165	378
04:15 PM	0	33	24	0	57	6	15	28	0	49	31	17	1	0	49	4	117	19	0	140	295
04:30 PM	0	35	23	0	58	10	7	22	1	40	42	22	0	0	64	0	111	13	0	124	286
04:45 PM	0	17	24	0	41	13	10	25	1	49	36	27	1	1	65	1	89	10	0	100	255
Total Volume	0	118	120	0	238	41	44	91	2	178	157	106	3	3	269	11	451	67	0	529	1214
% App. Total	0	49.6	50.4	0		23	24.7	51.1	1.1		58.4	39.4	1.1	1.1		2.1	85.3	12.7	0		
PHF	.000	.843	.612	.000	.726	.788	.733	.813	.500	.908	.818	.663	.750	.375	.739	.458	.841	.670	.000	.802	.803

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:00 PM



Connecticut Counts LLC

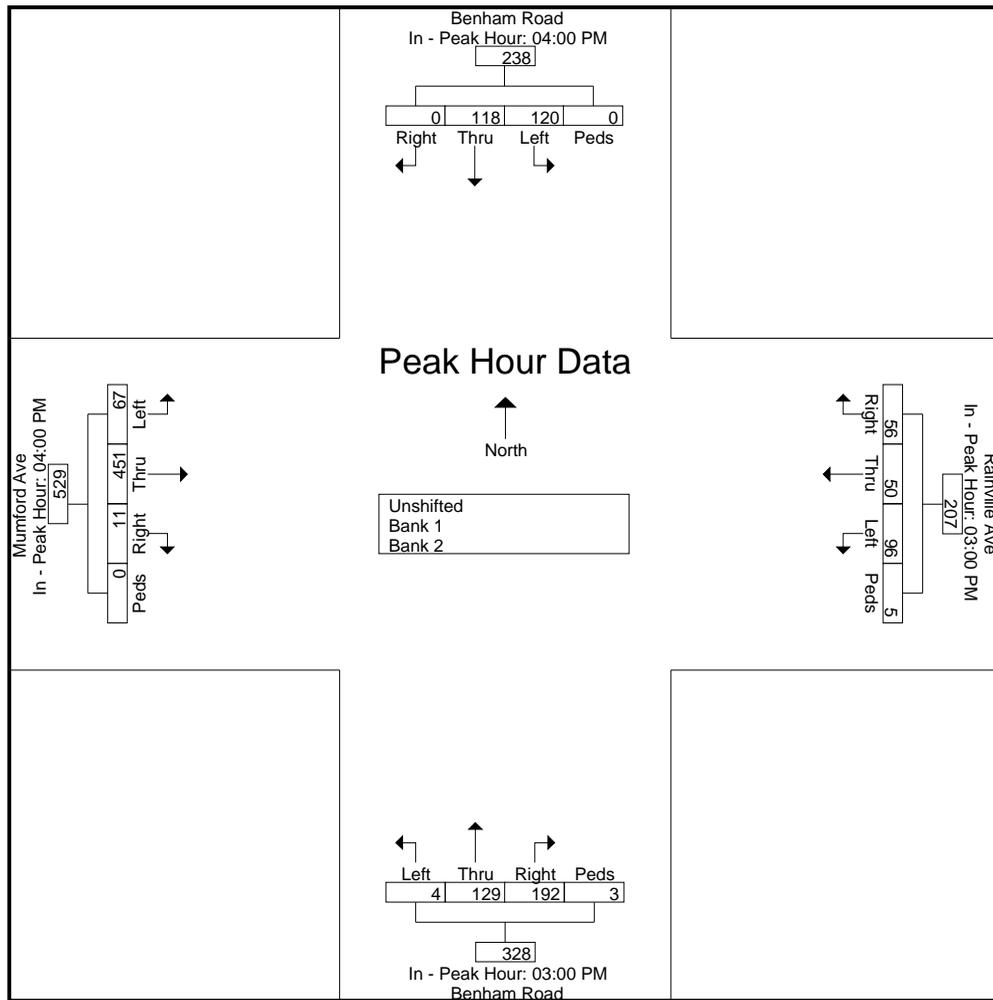
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18044
Site Code : 18044
Start Date : 10/18/2018
Page No : 3

Start Time	Benham Road From North					Rainville Ave From East					Benham Road From South					Mumford Ave 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 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM					03:00 PM					04:00 PM					04:00 PM				
+0 mins.	0	33	49	0	82	18	28	35	2	83	43	44	3	2	92	6	134	25	0	165
+15 mins.	0	33	24	0	57	16	6	19	2	43	64	27	0	0	91	4	117	19	0	140
+30 mins.	0	35	23	0	58	11	9	14	0	34	50	34	0	0	84	0	111	13	0	124
+45 mins.	0	17	24	0	41	11	7	28	1	47	35	24	1	1	61	1	89	10	0	100
Total Volume	0	118	120	0	238	56	50	96	5	207	192	129	4	3	328	11	451	67	0	529
% App. Total	0	49.6	50.4	0		27.1	24.2	46.4	2.4		58.5	39.3	1.2	0.9		2.1	85.3	12.7	0	
PHF	.000	.843	.612	.000	.726	.778	.446	.686	.625	.623	.750	.733	.333	.375	.891	.458	.841	.670	.000	.802



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Mumford Ave at Brandegee Ave
Groton, Connecticut

File Name : 18041
Site Code : 18041
Start Date : 10/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	randegee Ave From North					Mumford Ave From East					randegee Ave From South					Mumford Ave 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	
06:00 AM	158	30	17	14	219	8	26	1	0	35	3	20	3	0	26	0	11	16	0	27	307
06:15 AM	214	48	23	2	287	12	41	1	0	54	3	35	10	0	48	5	17	40	0	62	451
06:30 AM	90	38	17	0	145	6	23	2	0	31	0	26	1	0	27	0	9	25	0	34	237
06:45 AM	135	86	16	0	237	14	26	10	0	50	7	40	5	2	54	0	29	26	0	55	396
Total	597	202	73	16	888	40	116	14	0	170	13	121	19	2	155	5	66	107	0	178	1391
07:00 AM	83	95	36	0	214	9	22	12	0	43	7	62	5	0	74	5	21	45	0	71	402
07:15 AM	125	103	38	0	266	12	21	14	0	47	4	75	2	4	85	3	13	35	0	51	449
07:30 AM	125	122	37	0	284	23	17	26	0	66	4	69	2	2	77	1	22	30	0	53	480
07:45 AM	130	129	20	0	279	19	12	13	0	44	5	58	4	3	70	4	15	41	0	60	453
Total	463	449	131	0	1043	63	72	65	0	200	20	264	13	9	306	13	71	151	0	235	1784
08:00 AM	99	146	35	0	280	20	19	15	0	54	2	55	7	1	65	4	19	36	0	59	458
08:15 AM	123	117	29	0	269	20	16	10	0	46	5	53	0	0	58	5	17	29	0	51	424
08:30 AM	116	112	27	0	255	18	20	11	0	49	3	59	6	2	70	3	20	45	0	68	442
08:45 AM	87	120	24	0	231	17	24	10	0	51	5	43	6	0	54	6	12	34	0	52	388
Total	425	495	115	0	1035	75	79	46	0	200	15	210	19	3	247	18	68	144	0	230	1712
Grand Total	1485	1146	319	16	2966	178	267	125	0	570	48	595	51	14	708	36	205	402	0	643	4887
Apprch %	50.1	38.6	10.8	0.5		31.2	46.8	21.9	0		6.8	84	7.2	2		5.6	31.9	62.5	0		
Total %	30.4	23.4	6.5	0.3	60.7	3.6	5.5	2.6	0	11.7	1	12.2	1	0.3	14.5	0.7	4.2	8.2	0	13.2	
Unshifted	1457	1125																			
% Unshifted	98.1	98.2	98.7	93.8	98.2	92.1	92.5	88.8	0	91.6	95.8	96.3	94.1	100	96.2	91.7	89.3	95	0	93	96.4
Bank 1	20	0	3	0	23	1	2	3	0	6	0	2	0	0	2	0	2	16	0	18	49
% Bank 1	1.3	0	0.9	0	0.8	0.6	0.7	2.4	0	1.1	0	0.3	0	0	0.3	0	1	4	0	2.8	1
Bank 2	8	21	1	1	31	13	18	11	0	42	2	20	3	0	25	3	20	4	0	27	125
% Bank 2	0.5	1.8	0.3	6.2	1	7.3	6.7	8.8	0	7.4	4.2	3.4	5.9	0	3.5	8.3	9.8	1	0	4.2	2.6

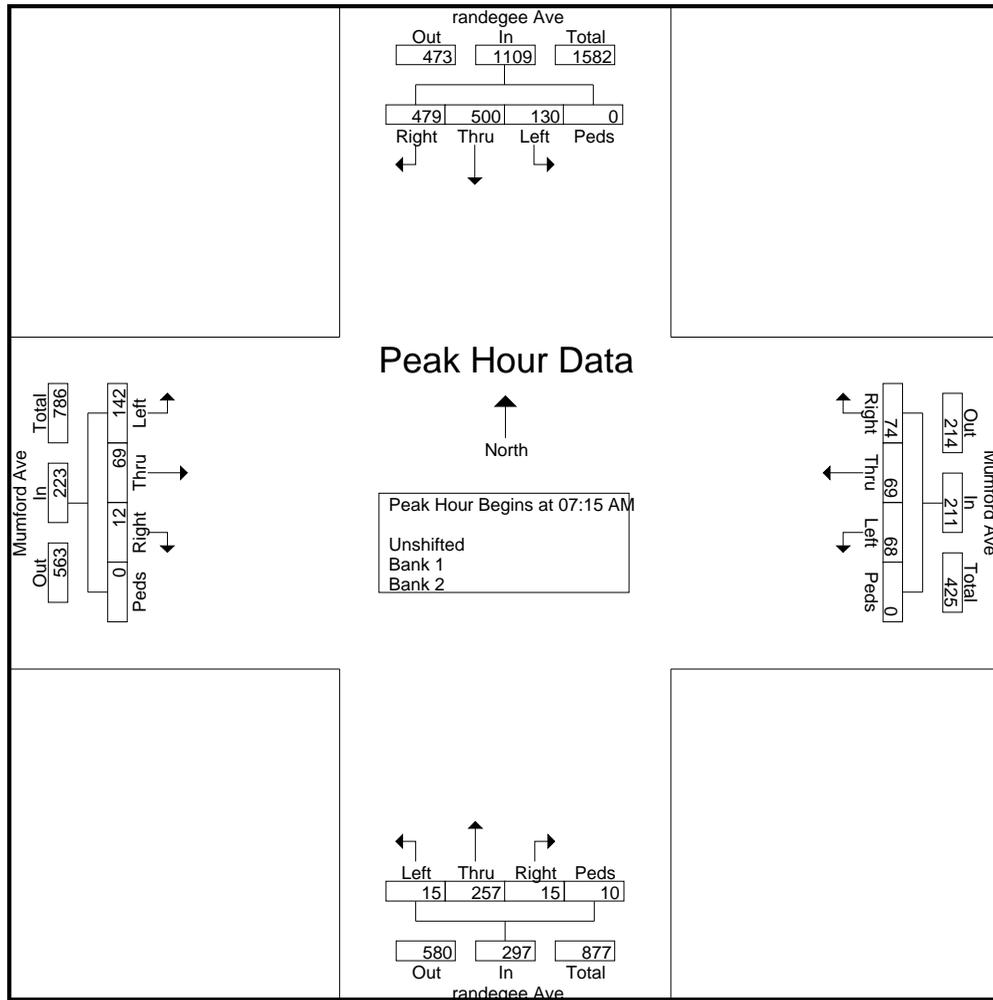
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18041
Site Code : 18041
Start Date : 10/18/2018
Page No : 2

Start Time	randegee Ave From North					Mumford Ave From East					randegee Ave From South					Mumford Ave 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	
07:15 AM	125	103	38	0	266	12	21	14	0	47	4	75	2	4	85	3	13	35	0	51	449
07:30 AM	125	122	37	0	284	23	17	26	0	66	4	69	2	2	77	1	22	30	0	53	480
07:45 AM	130	129	20	0	279	19	12	13	0	44	5	58	4	3	70	4	15	41	0	60	453
08:00 AM	99	146	35	0	280	20	19	15	0	54	2	55	7	1	65	4	19	36	0	59	458
Total Volume	479	500	130	0	1109	74	69	68	0	211	15	257	15	10	297	12	69	142	0	223	1840
% App. Total	43.2	45.1	11.7	0		35.1	32.7	32.2	0		5.1	86.5	5.1	3.4		5.4	30.9	63.7	0		
PHF	.921	.856	.855	.000	.976	.804	.821	.654	.000	.799	.750	.857	.536	.625	.874	.750	.784	.866	.000	.929	.958

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:15 AM



Connecticut Counts LLC

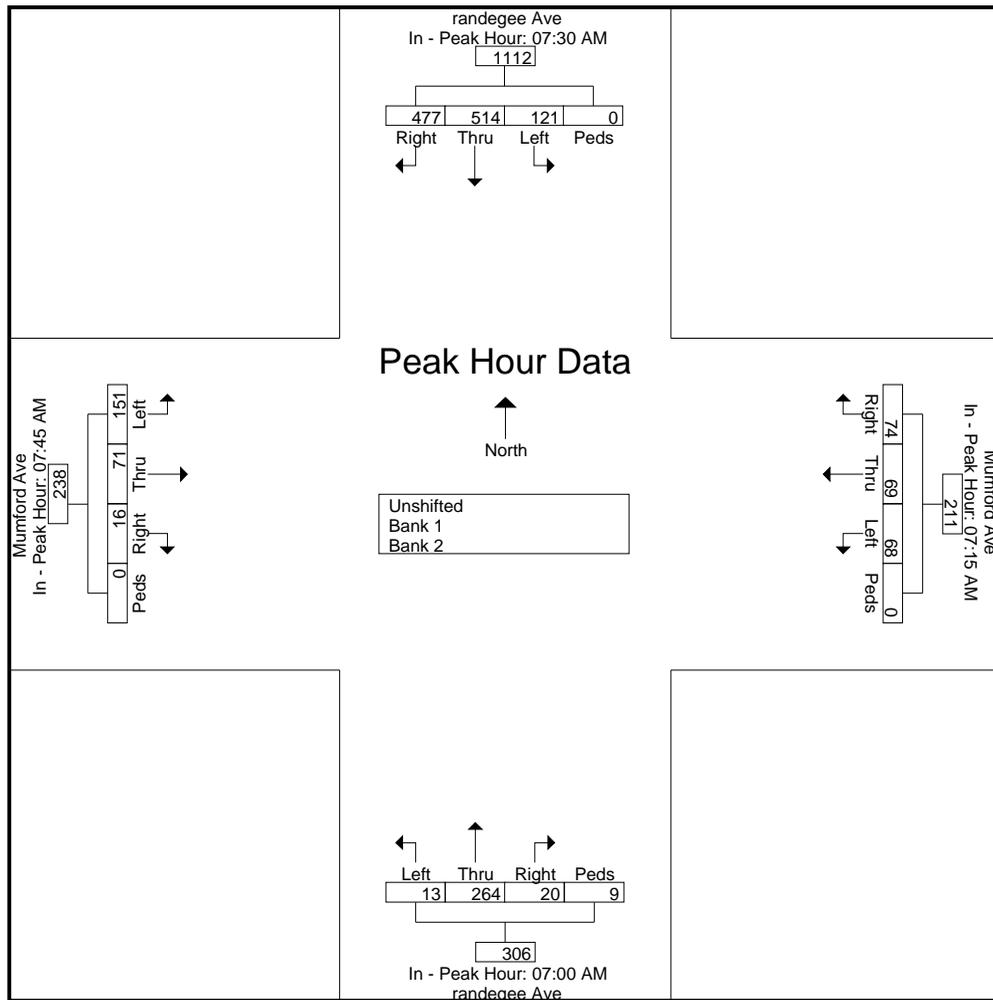
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18041
Site Code : 18041
Start Date : 10/18/2018
Page No : 3

Start Time	randegee Ave From North					Mumford Ave From East					randegee Ave From South					Mumford Ave 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 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM					07:15 AM					07:00 AM					07:45 AM				
+0 mins.	125	122	37	0	284	12	21	14	0	47	7	62	5	0	74	4	15	41	0	60
+15 mins.	130	129	20	0	279	23	17	26	0	66	4	75	2	4	85	4	19	36	0	59
+30 mins.	99	146	35	0	280	19	12	13	0	44	4	69	2	2	77	5	17	29	0	51
+45 mins.	123	117	29	0	269	20	19	15	0	54	5	58	4	3	70	3	20	45	0	68
Total Volume	477	514	121	0	1112	74	69	68	0	211	20	264	13	9	306	16	71	151	0	238
% App. Total	42.9	46.2	10.9	0		35.1	32.7	32.2	0		6.5	86.3	4.2	2.9		6.7	29.8	63.4	0	
PHF	.917	.880	.818	.000	.979	.804	.821	.654	.000	.799	.714	.880	.650	.563	.900	.800	.888	.839	.000	.875



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Mumford Ave at Brandegee Ave
Groton, Connecticut

File Name : 18042
Site Code : 18042
Start Date : 10/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	Brandegee Ave From North					Mumford Ave From East					Brandegee Ave From South					Mumford Ave 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	
03:00 PM	80	55	25	0	160	38	23	12	2	75	15	131	6	0	152	7	53	208	0	268	655
03:15 PM	27	53	23	0	103	22	20	14	1	57	8	97	4	0	109	4	24	131	0	159	428
03:30 PM	17	59	12	0	88	29	16	15	1	61	11	94	6	0	111	2	24	163	0	189	449
03:45 PM	30	57	19	0	106	34	17	6	0	57	9	111	8	0	128	6	31	117	0	154	445
Total	154	224	79	0	457	123	76	47	4	250	43	433	24	0	500	19	132	619	0	770	1977
04:00 PM	25	37	17	0	79	28	8	13	0	49	7	120	4	1	132	2	44	191	0	237	497
04:15 PM	25	60	29	0	114	45	12	9	0	66	10	118	3	0	131	8	30	143	0	181	492
04:30 PM	33	59	14	0	106	57	19	10	0	86	19	138	8	0	165	4	35	162	0	201	558
04:45 PM	28	39	15	0	82	19	7	13	0	39	14	110	5	1	130	6	19	126	0	151	402
Total	111	195	75	0	381	149	46	45	0	240	50	486	20	2	558	20	128	622	0	770	1949
05:00 PM	30	43	13	0	86	30	19	9	0	58	11	140	1	1	153	8	33	150	0	191	488
05:15 PM	34	52	26	0	112	31	20	7	0	58	20	124	2	2	148	1	33	159	0	193	511
05:30 PM	31	36	12	0	79	40	18	9	0	67	9	60	2	0	71	2	23	82	0	107	324
05:45 PM	29	52	14	0	95	21	17	13	0	51	4	89	4	0	97	4	18	86	0	108	351
Total	124	183	65	0	372	122	74	38	0	234	44	413	9	3	469	15	107	477	0	599	1674
Grand Total	389	602	219	0	1210	394	196	130	4	724	137	1332	53	5	1527	54	367	1718	0	2139	5600
Apprch %	32.1	49.8	18.1	0		54.4	27.1	18	0.6		9	87.2	3.5	0.3		2.5	17.2	80.3	0		
Total %	6.9	10.8	3.9	0	21.6	7	3.5	2.3	0.1	12.9	2.4	23.8	0.9	0.1	27.3	1	6.6	30.7	0	38.2	
Unshifted	385	594	199	0	1178	387	170	119	4	680	136	1322						1696			
% Unshifted	99	98.7	90.9	0	97.4	98.2	86.7	91.5	100	93.9	99.3	99.2	90.6	100	99	96.3	95.1	98.7	0	98	97.6
Bank 1	2	3	10	0	15	6	4	0	0	10	0	1	0	0	1	1	2	13	0	16	42
% Bank 1	0.5	0.5	4.6	0	1.2	1.5	2	0	0	1.4	0	0.1	0	0	0.1	1.9	0.5	0.8	0	0.7	0.8
Bank 2	2	5	10	0	17	1	22	11	0	34	1	9	5	0	15	1	16	9	0	26	92
% Bank 2	0.5	0.8	4.6	0	1.4	0.3	11.2	8.5	0	4.7	0.7	0.7	9.4	0	1	1.9	4.4	0.5	0	1.2	1.6

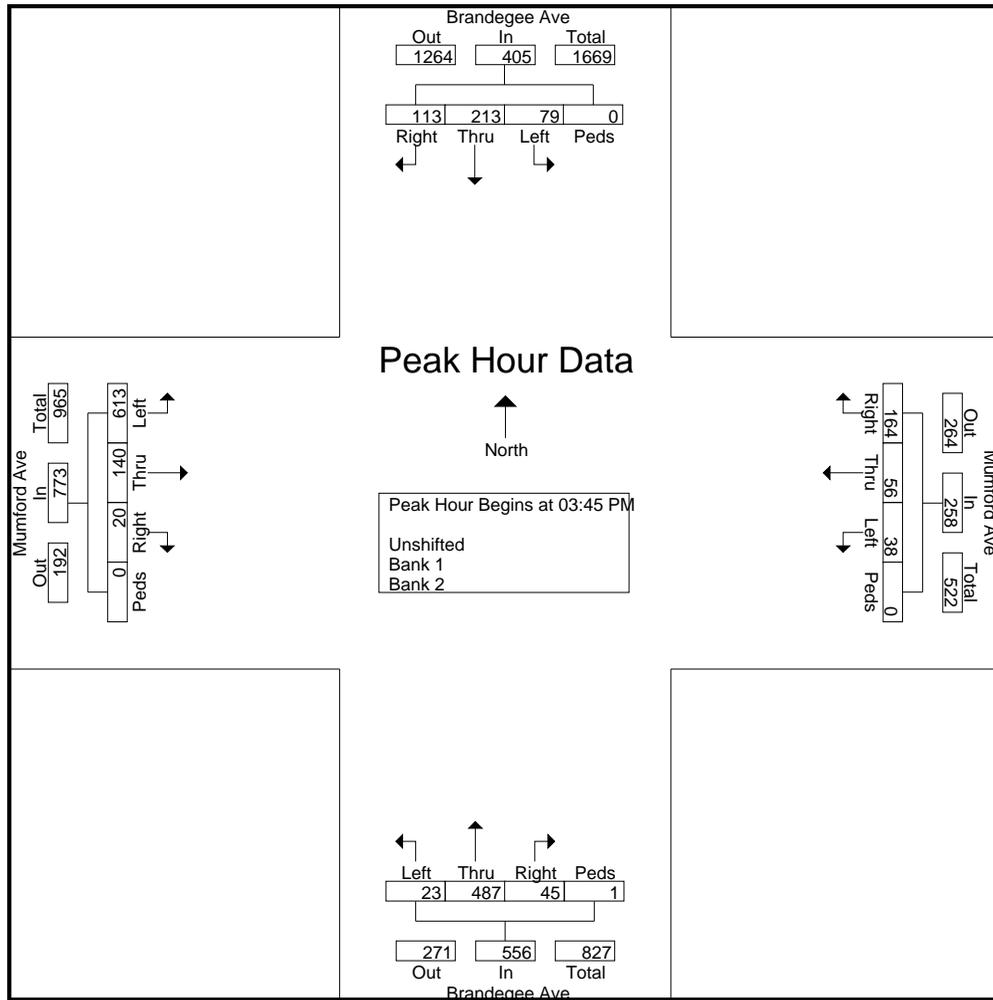
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18042
Site Code : 18042
Start Date : 10/18/2018
Page No : 2

Start Time	Brandegee Ave From North					Mumford Ave From East					Brandegee Ave From South					Mumford Ave 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	
03:45 PM	30	57	19	0	106	34	17	6	0	57	9	111	8	0	128	6	31	117	0	154	445
04:00 PM	25	37	17	0	79	28	8	13	0	49	7	120	4	1	132	2	44	191	0	237	497
04:15 PM	25	60	29	0	114	45	12	9	0	66	10	118	3	0	131	8	30	143	0	181	492
04:30 PM	33	59	14	0	106	57	19	10	0	86	19	138	8	0	165	4	35	162	0	201	558
Total Volume	113	213	79	0	405	164	56	38	0	258	45	487	23	1	556	20	140	613	0	773	1992
% App. Total	27.9	52.6	19.5	0		63.6	21.7	14.7	0		8.1	87.6	4.1	0.2		2.6	18.1	79.3	0		
PHF	.856	.888	.681	.000	.888	.719	.737	.731	.000	.750	.592	.882	.719	.250	.842	.625	.795	.802	.000	.815	.892

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 03:45 PM



Connecticut Counts LLC

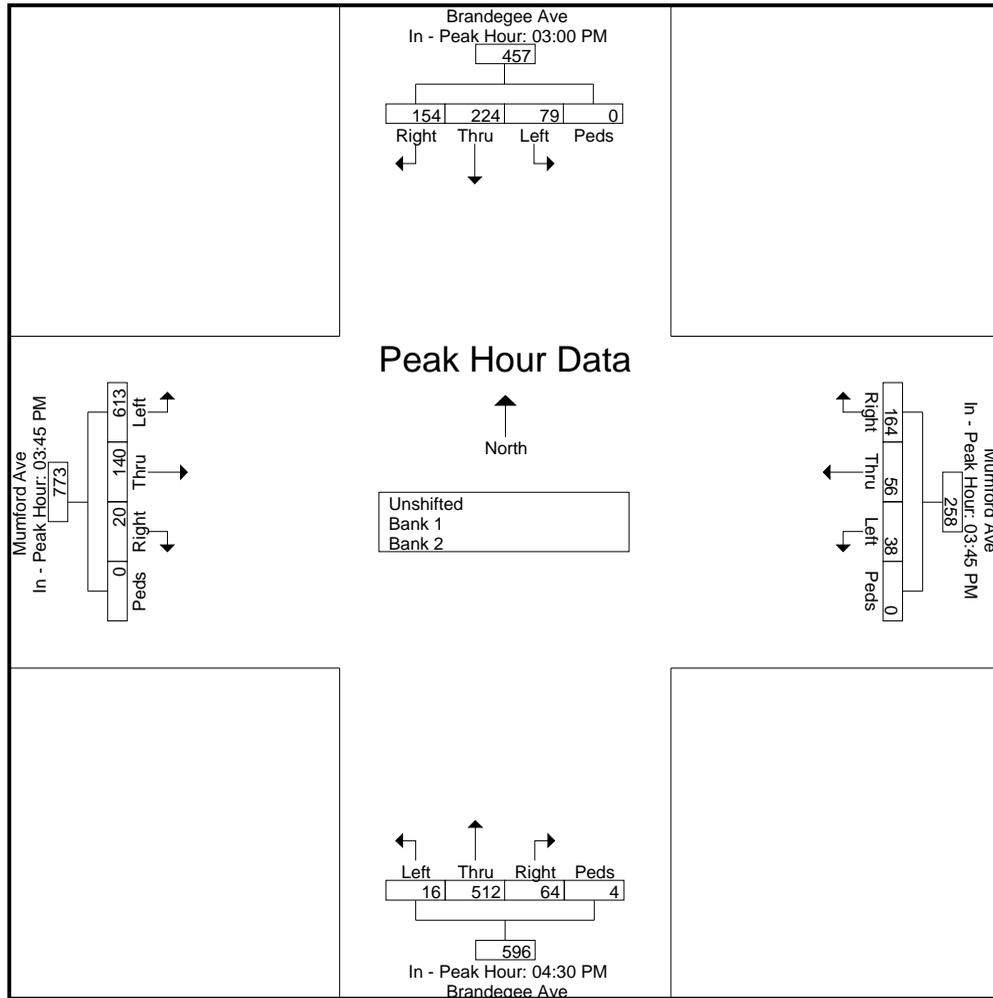
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18042
Site Code : 18042
Start Date : 10/18/2018
Page No : 3

Start Time	Brandegee Ave From North					Mumford Ave From East					Brandegee Ave From South					Mumford Ave 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 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM					03:45 PM					04:30 PM					03:45 PM				
+0 mins.	80	55	25	0	160	34	17	6	0	57	19	138	8	0	165	6	31	117	0	154
+15 mins.	27	53	23	0	103	28	8	13	0	49	14	110	5	1	130	2	44	191	0	237
+30 mins.	17	59	12	0	88	45	12	9	0	66	11	140	1	1	153	8	30	143	0	181
+45 mins.	30	57	19	0	106	57	19	10	0	86	20	124	2	2	148	4	35	162	0	201
Total Volume	154	224	79	0	457	164	56	38	0	258	64	512	16	4	596	20	140	613	0	773
% App. Total	33.7	49	17.3	0		63.6	21.7	14.7	0		10.7	85.9	2.7	0.7		2.6	18.1	79.3	0	
PHF	.481	.949	.790	.000	.714	.719	.737	.731	.000	.750	.800	.914	.500	.500	.903	.625	.795	.802	.000	.815



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Eastern Point Rd at Poquonock/Thames St
Groton, Connecticut

File Name : 18035
Site Code : 18035
Start Date : 10/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

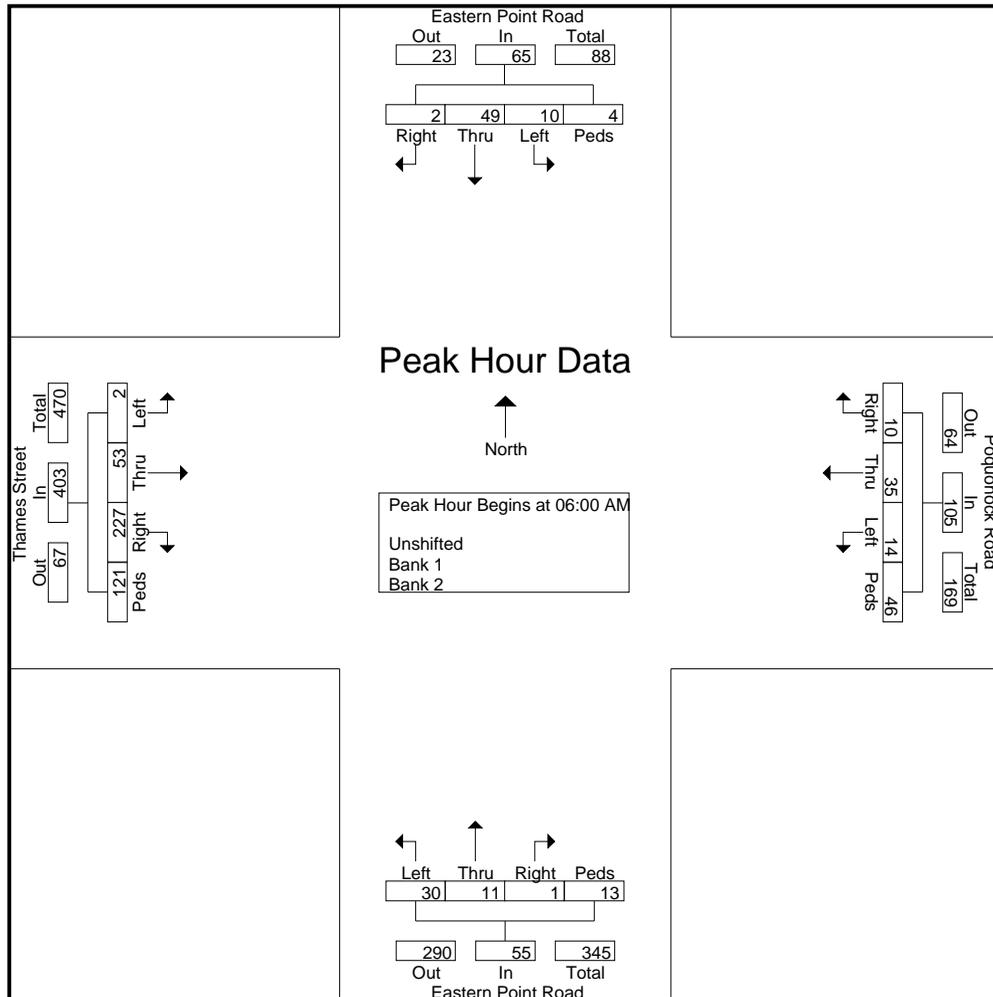
Start Time	Eastern Point Road From North					Poquonock Road From East					Eastern Point Road From South					Thames Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
06:00 AM	1	25	4	4	34	3	7	5	18	33	0	2	5	1	8	100	24	2	71	197	272
06:15 AM	0	4	0	0	4	2	10	3	19	34	0	5	2	11	18	42	11	0	31	84	140
06:30 AM	0	8	2	0	10	0	9	3	3	15	0	1	12	1	14	51	7	0	6	64	103
06:45 AM	1	12	4	0	17	5	9	3	6	23	1	3	11	0	15	34	11	0	13	58	113
Total	2	49	10	4	65	10	35	14	46	105	1	11	30	13	55	227	53	2	121	403	628
07:00 AM	0	12	0	0	12	0	15	5	2	22	0	4	15	1	20	60	11	0	14	85	139
07:15 AM	0	8	2	0	10	1	13	7	5	26	0	7	14	0	21	35	16	1	14	66	123
07:30 AM	0	7	3	0	10	0	9	3	3	15	0	2	6	0	8	33	11	0	9	53	86
07:45 AM	0	11	2	0	13	1	9	2	2	14	0	4	15	0	19	30	7	0	2	39	85
Total	0	38	7	0	45	2	46	17	12	77	0	17	50	1	68	158	45	1	39	243	433
08:00 AM	0	9	0	2	11	1	7	3	3	14	0	2	9	0	11	37	17	1	9	64	100
08:15 AM	1	3	2	0	6	1	10	1	1	13	0	6	9	0	15	33	6	0	6	45	79
08:30 AM	1	6	0	0	7	0	10	8	2	20	0	0	10	0	10	23	10	0	3	36	73
08:45 AM	2	8	1	1	12	5	15	1	2	23	0	3	14	1	18	20	9	0	14	43	96
Total	4	26	3	3	36	7	42	13	8	70	0	11	42	1	54	113	42	1	32	188	348
Grand Total	6	113	20	7	146	19	123	44	66	252	1	39	122	15	177	498	140	4	192	834	1409
Apprch %	4.1	77.4	13.7	4.8		7.5	48.8	17.5	26.2		0.6	22	68.9	8.5		59.7	16.8	0.5	23		
Total %	0.4	8	1.4	0.5	10.4	1.3	8.7	3.1	4.7	17.9	0.1	2.8	8.7	1.1	12.6	35.3	9.9	0.3	13.6	59.2	
Unshifted	6	112	17	7	142	19	114	42	66	241	1	39	118	15	173	491	137	4	192	824	1380
% Unshifted																					
Bank 1	0	1	1	0	2	0	1	2	0	3	0	0	4	0	4	6	2	0	0	8	17
% Bank 1	0	0.9	5	0	1.4	0	0.8	4.5	0	1.2	0	0	3.3	0	2.3	1.2	1.4	0	0	1	1.2
Bank 2	0	0	2	0	2	0	8	0	0	8	0	0	0	0	0	1	1	0	0	2	12
% Bank 2	0	0	10	0	1.4	0	6.5	0	0	3.2	0	0	0	0	0	0.2	0.7	0	0	0.2	0.9

Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18035
Site Code : 18035
Start Date : 10/18/2018
Page No : 2

Start Time	Eastern Point Road From North					Poquonock Road From East					Eastern Point Road From South					Thames 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 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 06:00 AM																					
06:00 AM	1	25	4	4	34	3	7	5	18	33	0	2	5	1	8	100	24	2	71	197	272
06:15 AM	0	4	0	0	4	2	10	3	19	34	0	5	2	11	18	42	11	0	31	84	140
06:30 AM	0	8	2	0	10	0	9	3	3	15	0	1	12	1	14	51	7	0	6	64	103
06:45 AM	1	12	4	0	17	5	9	3	6	23	1	3	11	0	15	34	11	0	13	58	113
Total Volume	2	49	10	4	65	10	35	14	46	105	1	11	30	13	55	227	53	2	121	403	628
% App. Total	3.1	75.4	15.4	6.2		9.5	33.3	13.3	43.8		1.8	20	54.5	23.6		56.3	13.2	0.5	30		
PHF	.500	.490	.625	.250	.478	.500	.875	.700	.605	.772	.250	.550	.625	.295	.764	.568	.552	.250	.426	.511	.577



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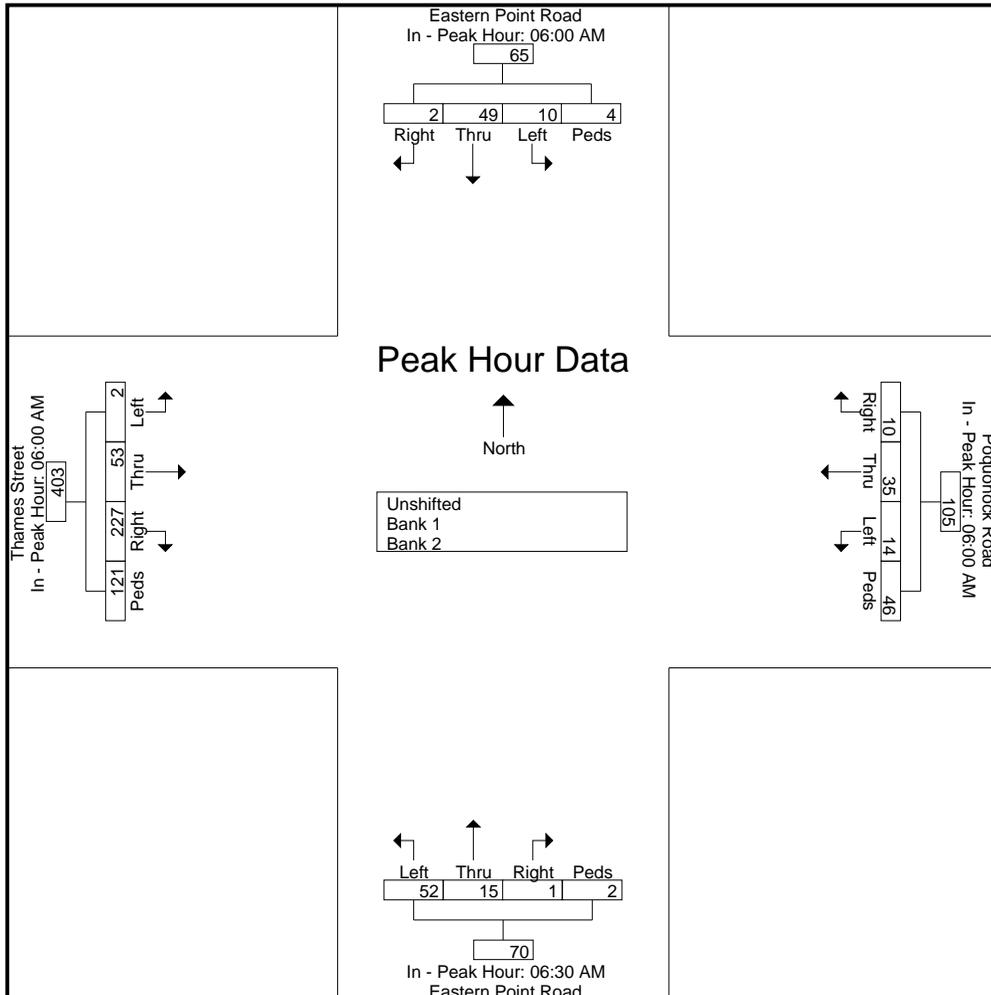
File Name : 18035
Site Code : 18035
Start Date : 10/18/2018
Page No : 3

	Eastern Point Road From North					Poquonock Road From East					Eastern Point Road From South					Thames Street From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	06:00 AM					06:00 AM					06:30 AM					06:00 AM				
+0 mins.	1	25	4	4	34	3	7	5	18	33	0	1	12	1	14	100	24	2	71	197
+15 mins.	0	4	0	0	4	2	10	3	19	34	1	3	11	0	15	42	11	0	31	84
+30 mins.	0	8	2	0	10	0	9	3	3	15	0	4	15	1	20	51	7	0	6	64
+45 mins.	1	12	4	0	17	5	9	3	6	23	0	7	14	0	21	34	11	0	13	58
Total Volume	2	49	10	4	65	10	35	14	46	105	1	15	52	2	70	227	53	2	121	403
% App. Total	3.1	75.4	15.4	6.2		9.5	33.3	13.3	43.8		1.4	21.4	74.3	2.9		56.8	13.2	0.5	30	
PHF	.500	.490	.625	.250	.478	.500	.875	.700	.605	.772	.250	.536	.867	.500	.833	.568	.552	.250	.426	.511



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Eastern Point Rd at Poquonock Rd/Thames
Groton, Connecticut

File Name : 18036
Site Code : 18036
Start Date : 10/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

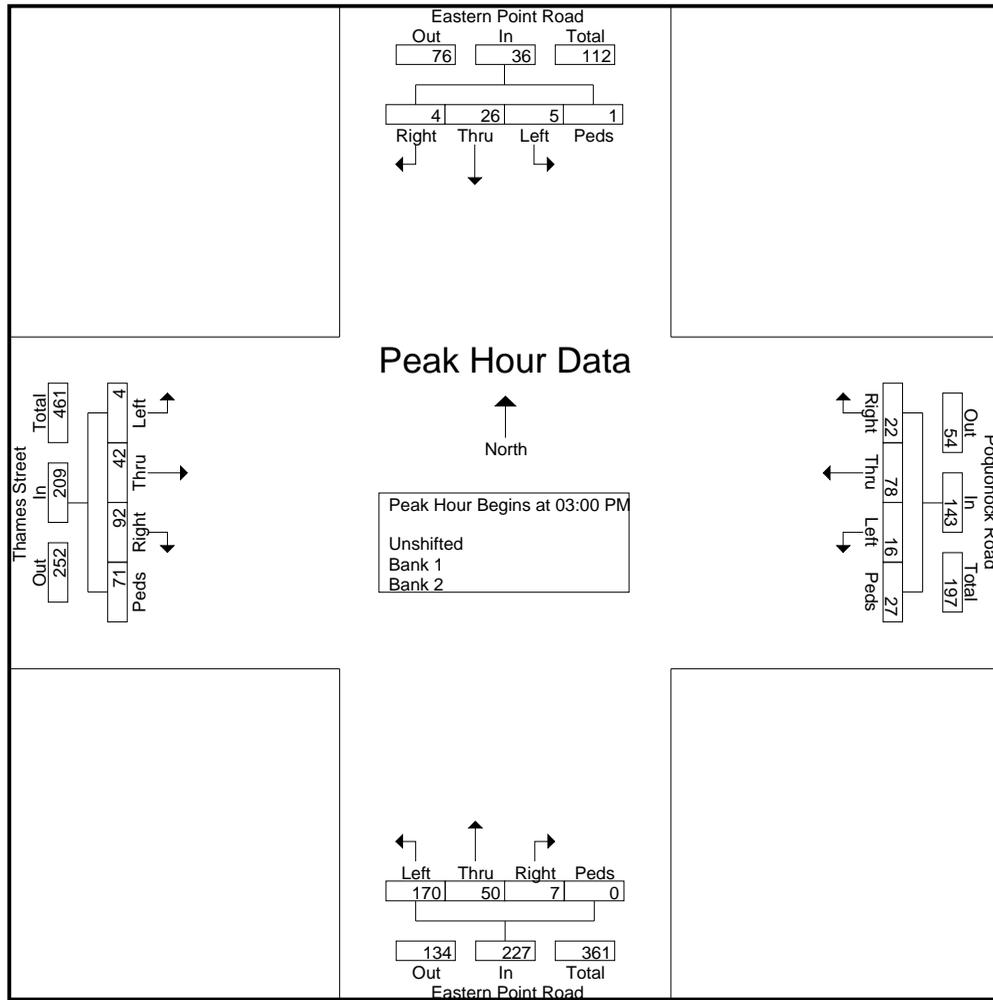
Start Time	Eastern Point Road From North					Poquonock Road From East					Eastern Point Road From South					Thames Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
03:00 PM	2	11	2	0	15	10	22	7	6	45	2	16	38	0	56	37	13	3	27	80	196
03:15 PM	0	10	1	1	12	4	18	5	9	36	3	9	46	0	58	20	9	0	16	45	151
03:30 PM	2	0	0	0	2	7	21	3	7	38	1	13	55	0	69	22	8	0	14	44	153
03:45 PM	0	5	2	0	7	1	17	1	5	24	1	12	31	0	44	13	12	1	14	40	115
Total	4	26	5	1	36	22	78	16	27	143	7	50	170	0	227	92	42	4	71	209	615
04:00 PM	0	6	2	0	8	6	21	1	3	31	3	23	56	0	82	25	11	0	7	43	164
04:15 PM	0	3	1	0	4	2	24	3	9	38	1	15	43	0	59	21	11	0	7	39	140
04:30 PM	2	4	0	0	6	1	6	3	1	11	3	10	23	0	36	13	12	1	7	33	86
04:45 PM	0	2	0	0	2	3	13	1	0	17	1	13	27	1	42	14	7	1	8	30	91
Total	2	15	3	0	20	12	64	8	13	97	8	61	149	1	219	73	41	2	29	145	481
05:00 PM	0	3	3	2	8	5	18	4	2	29	0	14	36	0	50	18	14	1	5	38	125
05:15 PM	0	3	0	1	4	3	13	2	2	20	2	8	27	0	37	11	3	0	7	21	82
05:30 PM	1	1	0	1	3	1	9	1	3	14	1	9	21	0	31	17	3	0	3	23	71
05:45 PM	1	4	1	1	7	2	7	0	3	12	0	7	17	0	24	12	5	0	1	18	61
Total	2	11	4	5	22	11	47	7	10	75	3	38	101	0	142	58	25	1	16	100	339
Grand Total	8	52	12	6	78	45	189	31	50	315	18	149	420	1	588	223	108	7	116	454	1435
Apprch %	10.3	66.7	15.4	7.7		14.3	60	9.8	15.9		3.1	25.3	71.4	0.2		49.1	23.8	1.5	25.6		
Total %	0.6	3.6	0.8	0.4	5.4	3.1	13.2	2.2	3.5	22	1.3	10.4	29.3	0.1	41	15.5	7.5	0.5	8.1	31.6	
Unshifted	8	52	11	6	77	44	186	31	50	311	18	149	415	1	583	219	101	7	116	443	1414
% Unshifted																					
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	4	0	0	0	4	8
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.7	1.8	0	0	0	0.9	0.6
Bank 2	0	0	1	0	1	1	3	0	0	4	0	0	1	0	1	0	7	0	0	7	13
% Bank 2	0	0	8.3	0	1.3	2.2	1.6	0	0	1.3	0	0	0.2	0	0.2	0	6.5	0	0	1.5	0.9

Connecticut Counts LLC

Kensington, Connecticut 06037
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File Name : 18036
Site Code : 18036
Start Date : 10/18/2018
Page No : 2

Start Time	Eastern Point Road From North					Poquonock Road From East					Eastern Point Road From South					Thames 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 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	2	11	2	0	15	10	22	7	6	45	2	16	38	0	56	37	13	3	27	80	196
03:15 PM	0	10	1	1	12	4	18	5	9	36	3	9	46	0	58	20	9	0	16	45	151
03:30 PM	2	0	0	0	2	7	21	3	7	38	1	13	55	0	69	22	8	0	14	44	153
03:45 PM	0	5	2	0	7	1	17	1	5	24	1	12	31	0	44	13	12	1	14	40	115
Total Volume	4	26	5	1	36	22	78	16	27	143	7	50	170	0	227	92	42	4	71	209	615
% App. Total	11.1	72.2	13.9	2.8		15.4	54.5	11.2	18.9		3.1	22	74.9	0		44	20.1	1.9	34		
PHF	.500	.591	.625	.250	.600	.550	.886	.571	.750	.794	.583	.781	.773	.000	.822	.622	.808	.333	.657	.653	.784



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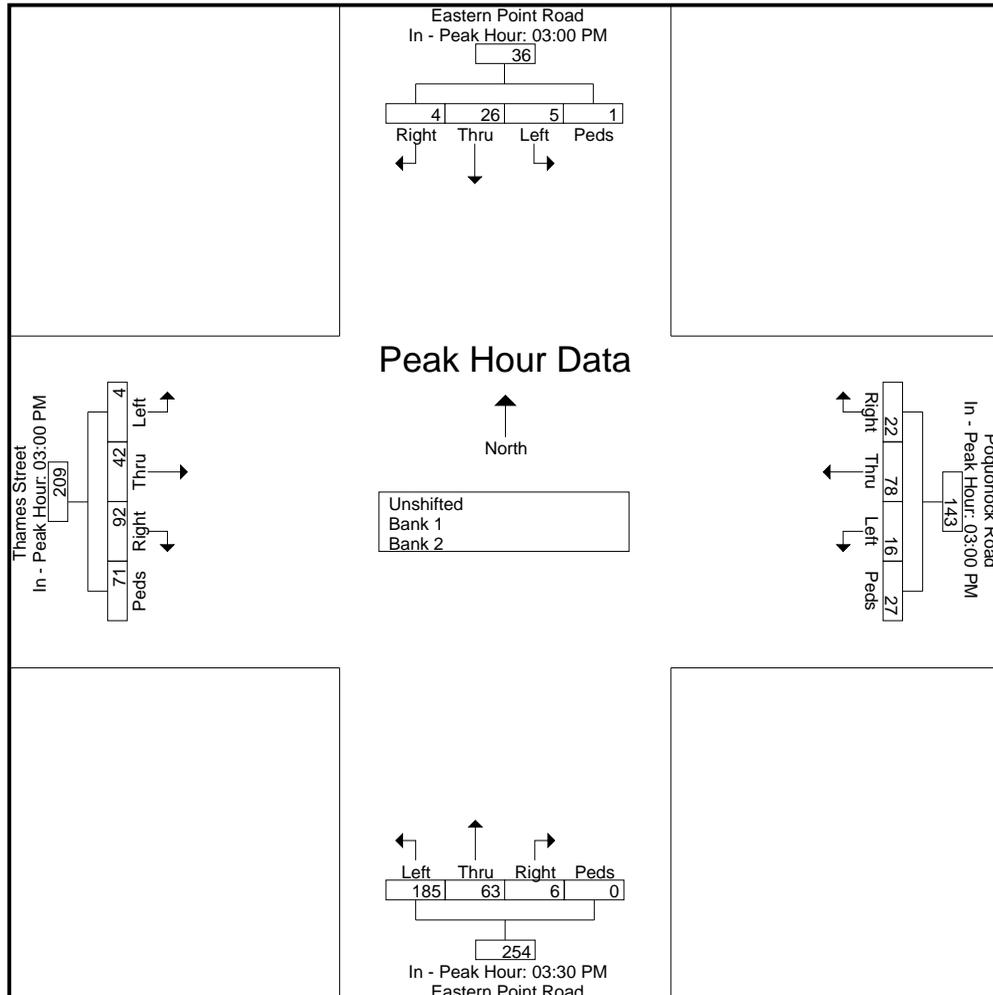
File Name : 18036
Site Code : 18036
Start Date : 10/18/2018
Page No : 3

Start Time	Eastern Point Road From North					Poquonock Road From East					Eastern Point Road From South					Thames 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 03:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:00 PM					03:00 PM					03:30 PM					03:00 PM				
+0 mins.	2	11	2	0	15	10	22	7	6	45	1	13	55	0	69	37	13	3	27	80
+15 mins.	0	10	1	1	12	4	18	5	9	36	1	12	31	0	44	20	9	0	16	45
+30 mins.	2	0	0	0	2	7	21	3	7	38	3	23	56	0	82	22	8	0	14	44
+45 mins.	0	5	2	0	7	1	17	1	5	24	1	15	43	0	59	13	12	1	14	40
Total Volume	4	26	5	1	36	22	78	16	27	143	6	63	185	0	254	92	42	4	71	209
% App. Total	11.1	72.2	13.9	2.8		15.4	54.5	11.2	18.9		2.4	24.8	72.8	0		44	20.1	1.9	34	
PHF	.500	.591	.625	.250	.600	.550	.886	.571	.750	.794	.500	.685	.826	.000	.774	.622	.808	.333	.657	.653



Connecticut Counts LLC

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Poquonock Rd at Chicago/Benham/Mitchell
Groton, Connecticut

File Name : 18037
Site Code : 18037
Start Date : 10/18/2018
Page No : 1

Groups Printed- Poquonock at Benham

Start Time	Mitchell Street From North					Poquonock Road From East					Chicago/Benham From South					Poquonock Road 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	
06:00 AM	0	54	0	0	54	0	0	0	0	0	1	12	3	0	16	6	0	0	0	6	76
06:15 AM	0	72	0	0	72	0	0	0	0	0	0	19	2	1	22	2	0	0	0	2	96
06:30 AM	0	47	0	0	47	0	0	2	0	2	0	15	6	3	24	4	0	0	0	4	77
06:45 AM	8	41	0	0	49	0	0	3	0	3	2	29	5	2	38	7	0	0	0	7	97
Total	8	214	0	0	222	0	0	5	0	5	3	75	16	6	100	19	0	0	0	19	346
07:00 AM	0	53	0	0	53	0	0	0	0	0	3	24	3	1	31	2	0	0	0	2	86
07:15 AM	0	49	0	0	49	0	0	0	0	0	1	39	7	0	47	5	0	0	0	5	101
07:30 AM	0	43	0	0	43	0	0	3	0	3	2	24	2	1	29	2	0	0	0	2	77
07:45 AM	0	44	0	0	44	0	0	0	0	0	2	26	3	0	31	2	0	0	0	2	77
Total	0	189	0	0	189	0	0	3	0	3	8	113	15	2	138	11	0	0	0	11	341
08:00 AM	0	36	0	0	36	0	0	2	0	2	2	36	3	0	41	5	0	0	0	5	84
08:15 AM	0	40	0	0	40	0	0	0	0	0	1	25	2	0	28	3	0	0	0	3	71
08:30 AM	0	28	1	0	29	0	0	2	0	2	2	31	4	0	37	2	0	0	0	2	70
08:45 AM	0	35	2	0	37	0	0	0	0	0	3	23	2	2	30	4	0	0	0	4	71
Total	0	139	3	0	142	0	0	4	0	4	8	115	11	2	136	14	0	0	0	14	296
Grand Total	8	542	3	0	553	0	0	12	0	12	19	303	42	10	374	44	0	0	0	44	983
Apprch %	1.4	98	0.5	0		0	0	100	0		5.1	81	11.2	2.7		100	0	0	0		
Total %	0.8	55.1	0.3	0	56.3	0	0	1.2	0	1.2	1.9	30.8	4.3	1	38	4.5	0	0	0	4.5	

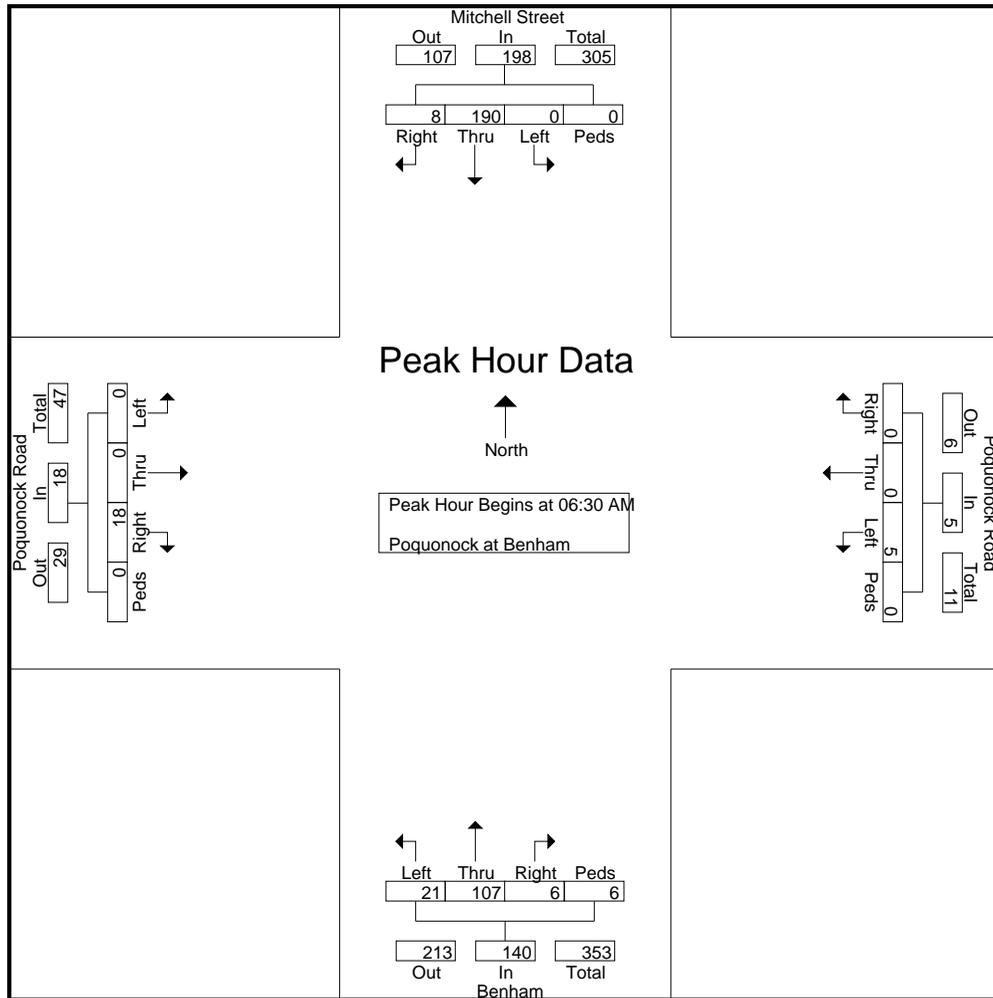
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File Name : 18037
Site Code : 18037
Start Date : 10/18/2018
Page No : 2

Start Time	Mitchell Street From North					Poquonock Road From East					Chicago/Benham From South					Poquonock Road 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	
06:30 AM	0	47	0	0	47	0	0	2	0	2	0	15	6	3	24	4	0	0	0	4	77
06:45 AM	8	41	0	0	49	0	0	3	0	3	2	29	5	2	38	7	0	0	0	7	97
07:00 AM	0	53	0	0	53	0	0	0	0	0	3	24	3	1	31	2	0	0	0	2	86
07:15 AM	0	49	0	0	49	0	0	0	0	0	1	39	7	0	47	5	0	0	0	5	101
Total Volume	8	190	0	0	198	0	0	5	0	5	6	107	21	6	140	18	0	0	0	18	361
% App. Total	4	96	0	0		0	0	100	0		4.3	76.4	15	4.3		100	0	0	0		
PHF	.250	.896	.000	.000	.934	.000	.000	.417	.000	.417	.500	.686	.750	.500	.745	.643	.000	.000	.000	.643	.894

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 06:30 AM



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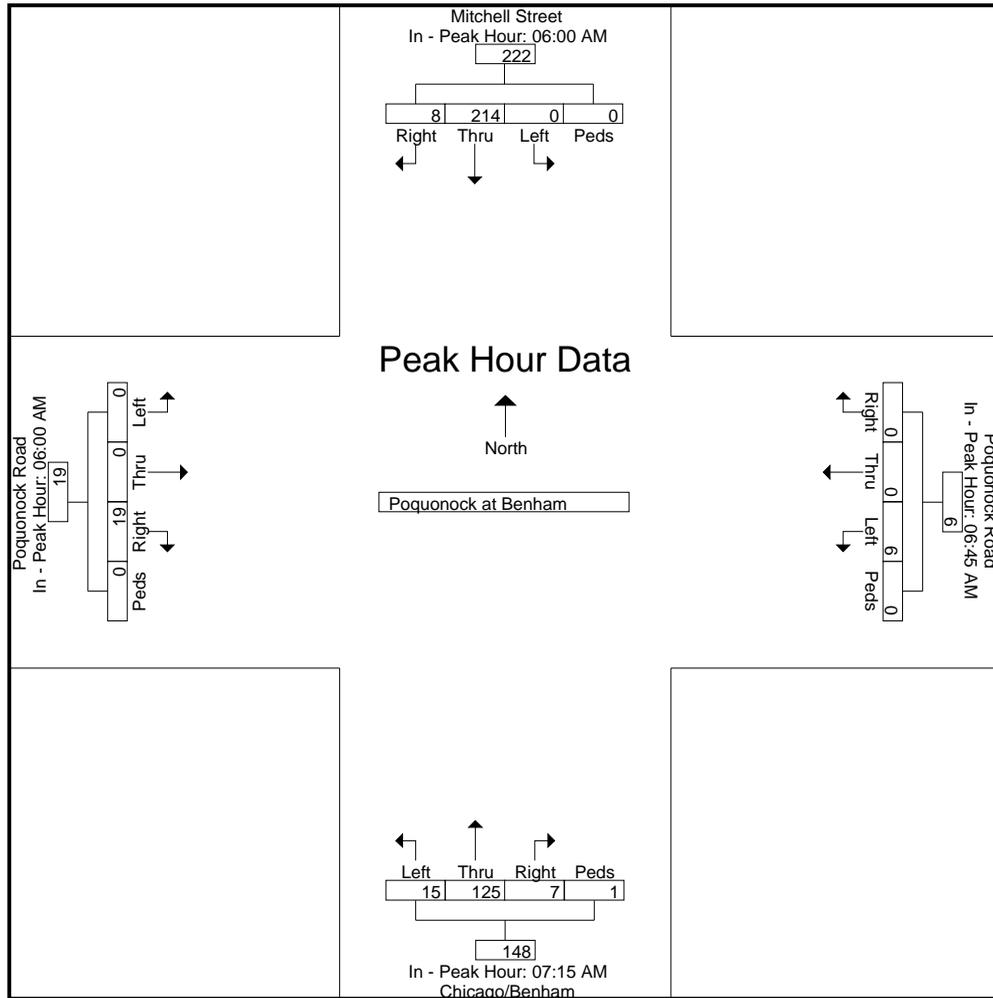
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File Name : 18037
Site Code : 18037
Start Date : 10/18/2018
Page No : 3

Start Time	Mitchell Street From North					Poquonock Road From East					Chicago/Benham From South					Poquonock Road 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 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	06:00 AM					06:45 AM					07:15 AM					06:00 AM				
+0 mins.	0	54	0	0	54	0	0	3	0	3	1	39	7	0	47	6	0	0	0	6
+15 mins.	0	72	0	0	72	0	0	0	0	0	2	24	2	1	29	2	0	0	0	2
+30 mins.	0	47	0	0	47	0	0	0	0	0	2	26	3	0	31	4	0	0	0	4
+45 mins.	8	41	0	0	49	0	0	3	0	3	2	36	3	0	41	7	0	0	0	7
Total Volume	8	214	0	0	222	0	0	6	0	6	7	125	15	1	148	19	0	0	0	19
% App. Total	3.6	96.4	0	0		0	0	100	0		4.7	84.5	10.1	0.7		100	0	0	0	
PHF	.250	.743	.000	.000	.771	.000	.000	.500	.000	.500	.875	.801	.536	.250	.787	.679	.000	.000	.000	.679



Connecticut Counts LLC

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Poquonock Rd at Chicago/Benham/Mitchell
Groton, Connecticut

File Name : 18038
Site Code : 18038
Start Date : 10/18/2018
Page No : 1

Groups Printed- Poquonock at Benham

Start Time	Mitchell Street From North					Poquonock ROad From East					Chicago/ Benham From South					Poquonock ROad 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		
03:00 PM	0	28	0	0	28	0	0	2	0	2	1	82	3	1	87	4	0	0	0	4	4	121
03:15 PM	0	25	0	0	25	0	0	2	0	2	1	63	5	2	71	9	0	0	0	9	107	
03:30 PM	0	41	0	0	41	0	0	3	0	3	0	67	6	0	73	5	0	0	0	5	122	
03:45 PM	0	33	2	0	35	0	0	4	0	4	6	64	1	3	74	4	0	2	0	6	119	
Total	0	127	2	0	129	0	0	11	0	11	8	276	15	6	305	22	0	2	0	24	469	
04:00 PM	6	42	1	0	49	0	0	5	0	5	4	108	6	0	118	10	2	0	0	12	184	
04:15 PM	0	35	0	0	35	0	0	3	0	3	6	55	2	0	63	1	0	0	0	1	102	
04:30 PM	0	31	0	0	31	0	0	1	0	1	1	56	1	0	58	4	0	0	0	4	94	
04:45 PM	0	32	1	0	33	0	0	2	0	2	3	62	4	0	69	5	0	0	0	5	109	
Total	6	140	2	0	148	0	0	11	0	11	14	281	13	0	308	20	2	0	0	22	489	
05:00 PM	0	35	0	0	35	0	0	3	0	3	2	62	2	0	66	4	0	0	0	4	108	
05:15 PM	0	44	1	0	45	0	0	3	0	3	4	59	0	1	64	4	0	0	0	4	116	
05:30 PM	0	57	0	0	57	0	0	3	0	3	1	45	3	4	53	2	0	0	0	2	115	
05:45 PM	0	40	1	0	41	0	0	2	0	2	2	34	1	0	37	5	0	0	0	5	85	
Total	0	176	2	0	178	0	0	11	0	11	9	200	6	5	220	15	0	0	0	15	424	
Grand Total	6	443	6	0	455	0	0	33	0	33	31	757	34	11	833	57	2	2	0	61	1382	
Apprch %	1.3	97.4	1.3	0		0	0	100	0		3.7	90.9	4.1	1.3		93.4	3.3	3.3	0			
Total %	0.4	32.1	0.4	0	32.9	0	0	2.4	0	2.4	2.2	54.8	2.5	0.8	60.3	4.1	0.1	0.1	0	4.4		

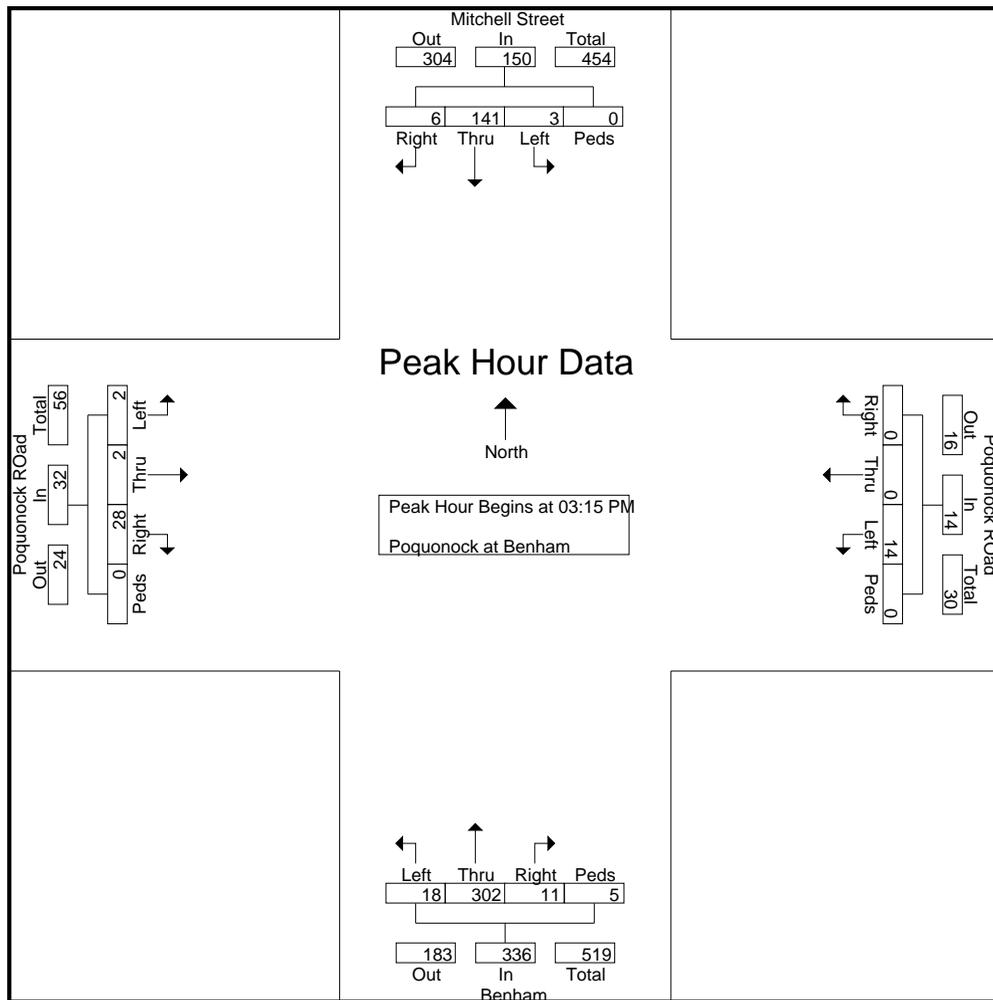
Connecticut Counts LLC

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File Name : 18038
Site Code : 18038
Start Date : 10/18/2018
Page No : 2

Start Time	Mitchell Street From North					Poquonock ROad From East					Chicago/ Benham From South					Poquonock ROad 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	
03:15 PM	0	25	0	0	25	0	0	2	0	2	1	63	5	2	71	9	0	0	0	9	107
03:30 PM	0	41	0	0	41	0	0	3	0	3	0	67	6	0	73	5	0	0	0	5	122
03:45 PM	0	33	2	0	35	0	0	4	0	4	6	64	1	3	74	4	0	2	0	6	119
04:00 PM	6	42	1	0	49	0	0	5	0	5	4	108	6	0	118	10	2	0	0	12	184
Total Volume	6	141	3	0	150	0	0	14	0	14	11	302	18	5	336	28	2	2	0	32	532
% App. Total	4	94	2	0		0	0	100	0		3.3	89.9	5.4	1.5		87.5	6.2	6.2	0		
PHF	.250	.839	.375	.000	.765	.000	.000	.700	.000	.700	.458	.699	.750	.417	.712	.700	.250	.250	.000	.667	.723

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 03:15 PM



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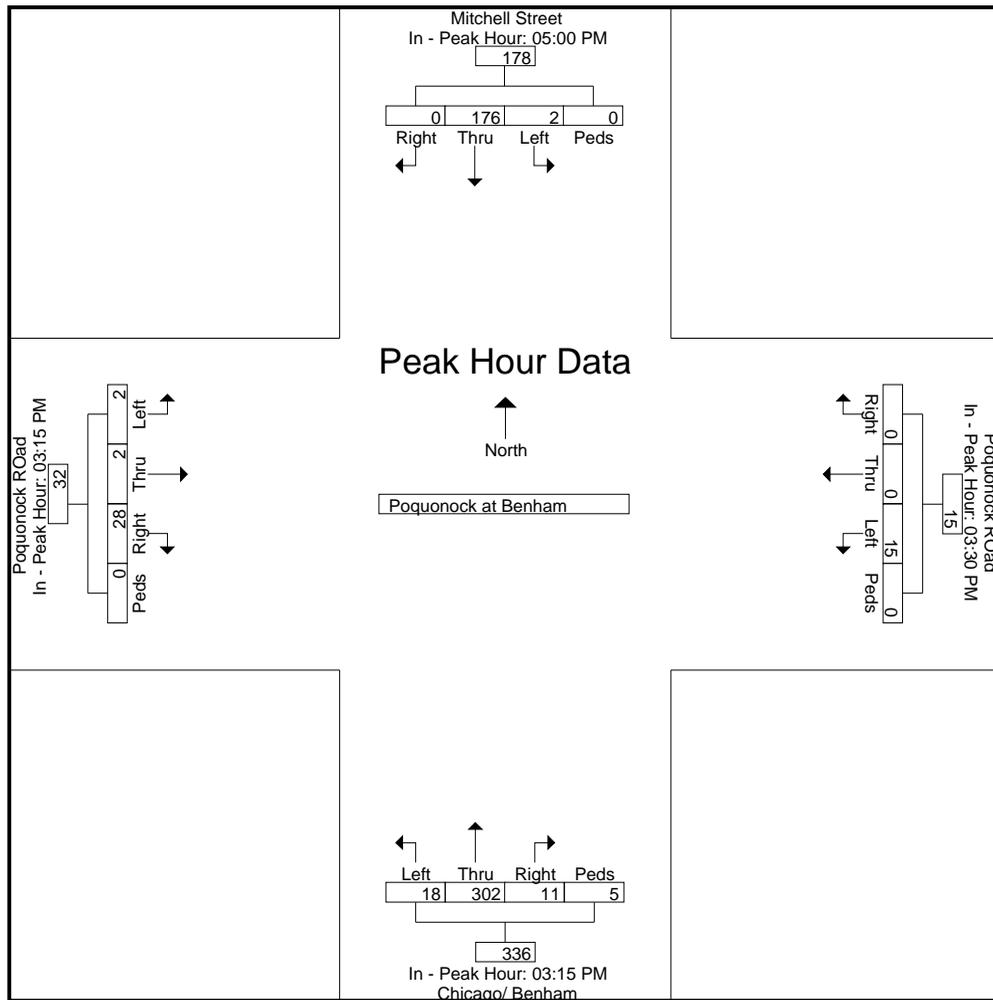
Kensington, Connecticut 06037
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File Name : 18038
Site Code : 18038
Start Date : 10/18/2018
Page No : 3

Start Time	Mitchell Street From North					Poquonock ROad From East					Chicago/ Benham From South					Poquonock ROad 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 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM					03:30 PM					03:15 PM					03:15 PM				
+0 mins.	0	35	0	0	35	0	0	3	0	3	1	63	5	2	71	9	0	0	0	9
+15 mins.	0	44	1	0	45	0	0	4	0	4	0	67	6	0	73	5	0	0	0	5
+30 mins.	0	57	0	0	57	0	0	5	0	5	6	64	1	3	74	4	0	2	0	6
+45 mins.	0	40	1	0	41	0	0	3	0	3	4	108	6	0	118	10	2	0	0	12
Total Volume	0	176	2	0	178	0	0	15	0	15	11	302	18	5	336	28	2	2	0	32
% App. Total	0	98.9	1.1	0		0	0	100	0		3.3	89.9	5.4	1.5		87.5	6.2	6.2	0	
PHF	.000	.772	.500	.000	.781	.000	.000	.750	.000	.750	.458	.699	.750	.417	.712	.700	.250	.250	.000	.667



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Poquonock Rd at Chicago/Benham/Mitchell
Groton, Connecticut

File Name : 18037
Site Code : 18037
Start Date : 10/18/2018
Page No : 1

Groups Printed- Poquonock at Mitchell/Chicago

Start Time	Mitchell Street From North					Poquonock Road From East					Chicago/Benham From South					Poquonock Road 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	
06:00 AM	32	49	13	0	94	13	10	0	0	23	0	7	0	1	8	0	3	5	0	8	133
06:15 AM	32	59	13	4	108	11	8	2	1	22	0	11	1	6	18	3	3	6	0	12	160
06:30 AM	27	37	7	0	71	11	5	5	0	21	1	16	0	5	22	2	4	6	0	12	126
06:45 AM	24	44	9	2	79	16	6	3	1	26	1	5	0	2	8	4	4	3	0	11	124
Total	115	189	42	6	352	51	29	10	2	92	2	39	1	14	56	9	14	20	0	43	543
07:00 AM	34	25	12	0	71	16	8	3	0	27	2	20	1	0	23	1	3	14	1	19	140
07:15 AM	34	33	19	0	86	12	14	4	0	30	0	11	3	0	14	1	7	10	1	19	149
07:30 AM	37	48	15	0	100	22	8	4	0	34	1	5	0	0	6	0	7	5	0	12	152
07:45 AM	35	35	20	0	90	15	8	2	1	26	0	6	2	0	8	1	2	3	0	6	130
Total	140	141	66	0	347	65	38	13	1	117	3	42	6	0	51	3	19	32	2	56	571
08:00 AM	21	47	21	0	89	13	6	1	0	20	0	5	2	1	8	1	5	6	1	13	130
08:15 AM	15	34	12	0	61	16	7	1	1	25	1	10	0	1	12	0	6	5	0	11	109
08:30 AM	19	32	20	0	71	12	9	1	1	23	1	13	2	0	16	0	6	2	0	8	118
08:45 AM	14	32	17	0	63	26	10	1	1	38	1	9	4	2	16	2	3	2	0	7	124
Total	69	145	70	0	284	67	32	4	3	106	3	37	8	4	52	3	20	15	1	39	481
Grand Total	324	475	178	6	983	183	99	27	6	315	8	118	15	18	159	15	53	67	3	138	1595
Apprch %	33	48.3	18.1	0.6		58.1	31.4	8.6	1.9		5	74.2	9.4	11.3		10.9	38.4	48.6	2.2		
Total %	20.3	29.8	11.2	0.4	61.6	11.5	6.2	1.7	0.4	19.7	0.5	7.4	0.9	1.1	10	0.9	3.3	4.2	0.2	8.7	

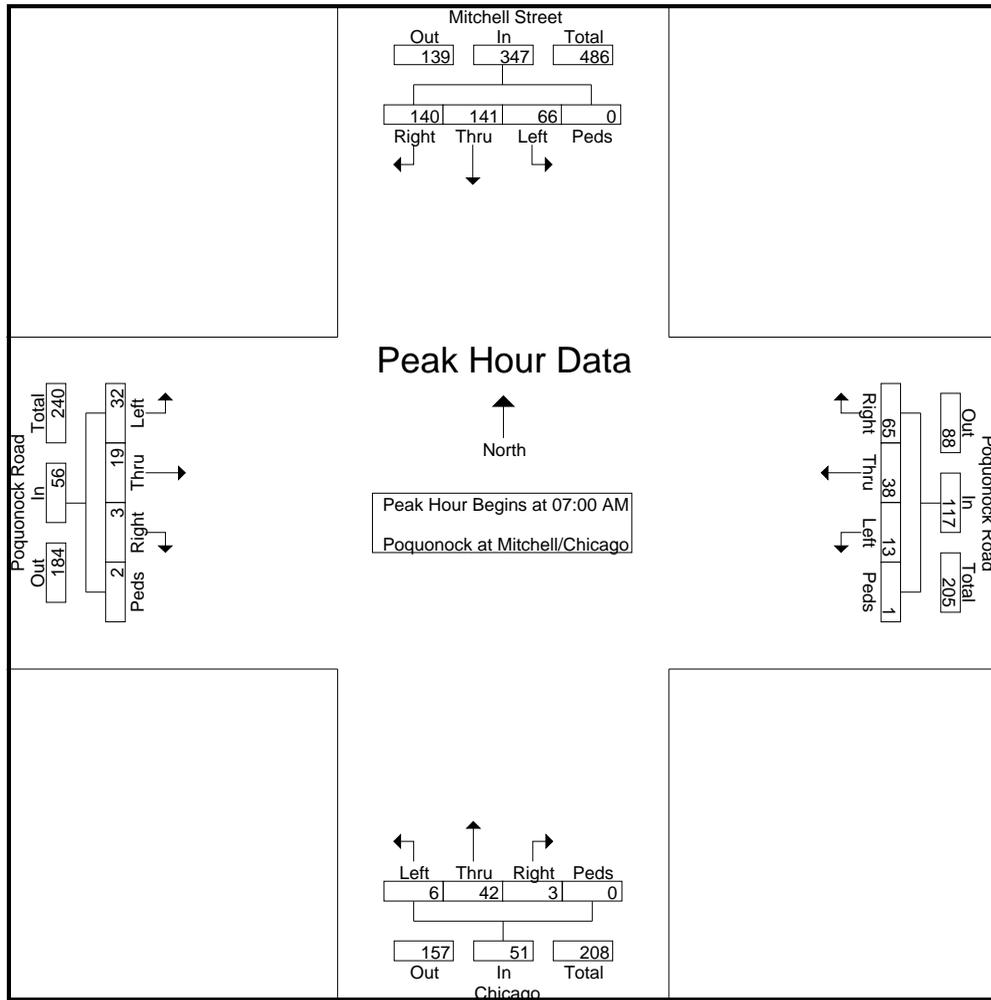
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18037
Site Code : 18037
Start Date : 10/18/2018
Page No : 2

Start Time	Mitchell Street From North					Poquonock Road From East					Chicago/Benham From South					Poquonock Road 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	34	25	12	0	71	16	8	3	0	27	2	20	1	0	23	1	3	14	1	19	140
07:15 AM	34	33	19	0	86	12	14	4	0	30	0	11	3	0	14	1	7	10	1	19	149
07:30 AM	37	48	15	0	100	22	8	4	0	34	1	5	0	0	6	0	7	5	0	12	152
07:45 AM	35	35	20	0	90	15	8	2	1	26	0	6	2	0	8	1	2	3	0	6	130
Total Volume	140	141	66	0	347	65	38	13	1	117	3	42	6	0	51	3	19	32	2	56	571
% App. Total	40.3	40.6	19	0		55.6	32.5	11.1	0.9		5.9	82.4	11.8	0		5.4	33.9	57.1	3.6		
PHF	.946	.734	.825	.000	.868	.739	.679	.813	.250	.860	.375	.525	.500	.000	.554	.750	.679	.571	.500	.737	.939

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:00 AM



Connecticut Counts LLC

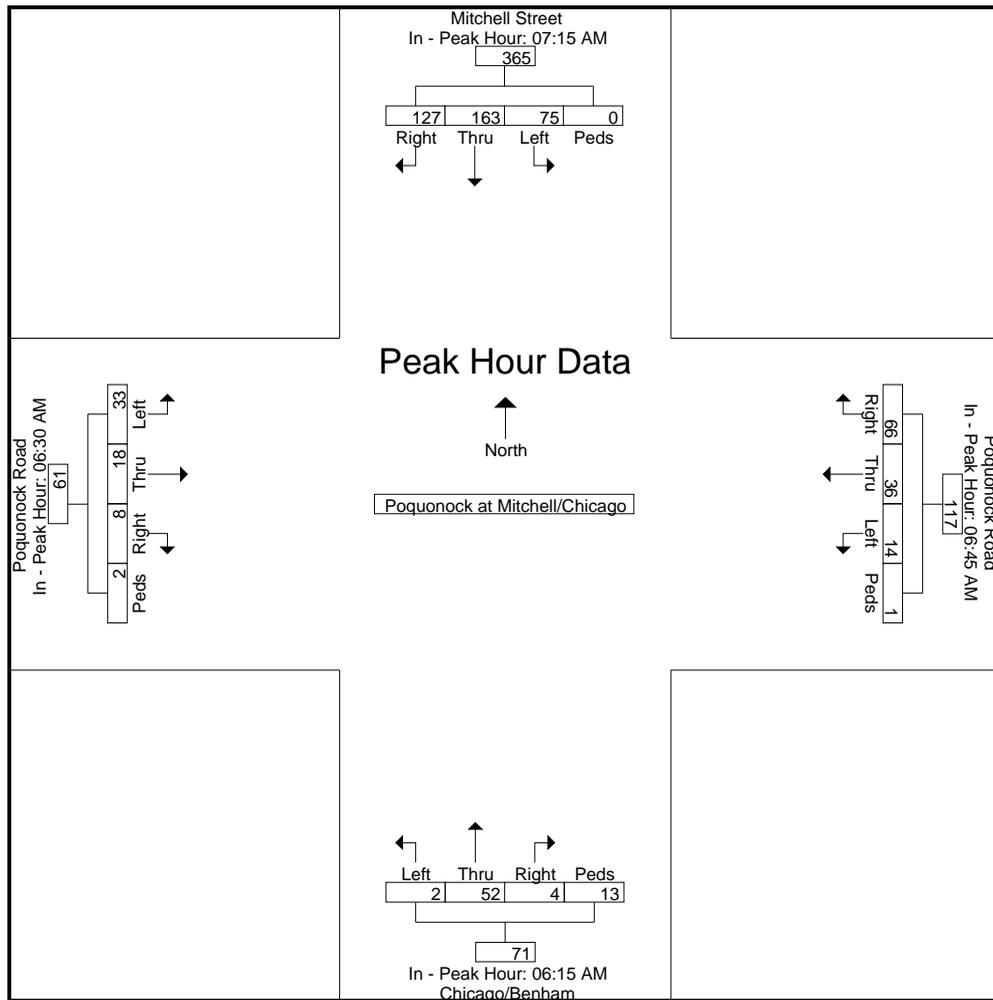
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18037
Site Code : 18037
Start Date : 10/18/2018
Page No : 3

Start Time	Mitchell Street From North					Poquonock Road From East					Chicago/Benham From South					Poquonock Road 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 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM					06:45 AM					06:15 AM					06:30 AM				
+0 mins.	34	33	19	0	86	16	6	3	1	26	0	11	1	6	18	2	4	6	0	12
+15 mins.	37	48	15	0	100	16	8	3	0	27	1	16	0	5	22	4	4	3	0	11
+30 mins.	35	35	20	0	90	12	14	4	0	30	1	5	0	2	8	1	3	14	1	19
+45 mins.	21	47	21	0	89	22	8	4	0	34	2	20	1	0	23	1	7	10	1	19
Total Volume	127	163	75	0	365	66	36	14	1	117	4	52	2	13	71	8	18	33	2	61
% App. Total	34.8	44.7	20.5	0		56.4	30.8	12	0.9		5.6	73.2	2.8	18.3		13.1	29.5	54.1	3.3	
PHF	.858	.849	.893	.000	.913	.750	.643	.875	.250	.860	.500	.650	.500	.542	.772	.500	.643	.589	.500	.803



Connecticut Counts LLC

Kensington, Connecticut 06037

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Poquonock Rd at Chicago/Benham/Mitchell
Groton, Connecticut

File Name : 18038
Site Code : 18038
Start Date : 10/18/2018
Page No : 1

Groups Printed- Poquonock at Chicago/Mitchell

Start Time	Mitchell Street From North					Poquonock ROad From East					Chicago/ Benham From South					Poquonock ROad 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	
03:00 PM	10	26	27	1	64	42	13	5	2	62	2	50	4	1	57	2	10	31	4	47	230
03:15 PM	16	28	17	0	61	26	12	4	1	43	2	39	0	0	41	4	13	30	0	47	192
03:30 PM	5	8	21	0	34	32	7	2	4	45	4	51	5	1	61	1	11	32	0	44	184
03:45 PM	3	19	11	0	33	30	8	4	0	42	3	44	1	2	50	0	14	29	0	43	168
Total	34	81	76	1	192	130	40	15	7	192	11	184	10	4	209	7	48	122	4	181	774
04:00 PM	6	24	38	0	68	38	8	1	0	47	2	62	3	0	67	2	14	26	0	42	224
04:15 PM	7	7	21	0	35	26	8	2	1	37	2	43	3	1	49	3	15	33	1	52	173
04:30 PM	5	12	30	0	47	31	4	3	1	39	2	51	0	0	53	5	10	30	0	45	184
04:45 PM	2	22	29	1	54	37	7	0	0	44	2	46	3	0	51	2	10	27	0	39	188
Total	20	65	118	1	204	132	27	6	2	167	8	202	9	1	220	12	49	116	1	178	769
05:00 PM	5	16	20	0	41	36	9	1	7	53	0	44	1	0	45	1	15	35	0	51	190
05:15 PM	3	11	28	0	42	24	10	1	1	36	2	32	3	2	39	2	6	29	0	37	154
05:30 PM	1	7	19	0	27	36	5	3	1	45	1	26	0	1	28	0	5	17	0	22	122
05:45 PM	1	7	24	0	32	23	5	1	4	33	1	17	0	0	18	0	5	13	0	18	101
Total	10	41	91	0	142	119	29	6	13	167	4	119	4	3	130	3	31	94	0	128	567
Grand Total	64	187	285	2	538	381	96	27	22	526	23	505	23	8	559	22	128	332	5	487	2110
Apprch %	11.9	34.8	53	0.4		72.4	18.3	5.1	4.2		4.1	90.3	4.1	1.4		4.5	26.3	68.2	1		
Total %	3	8.9	13.5	0.1	25.5	18.1	4.5	1.3	1	24.9	1.1	23.9	1.1	0.4	26.5	1	6.1	15.7	0.2	23.1	

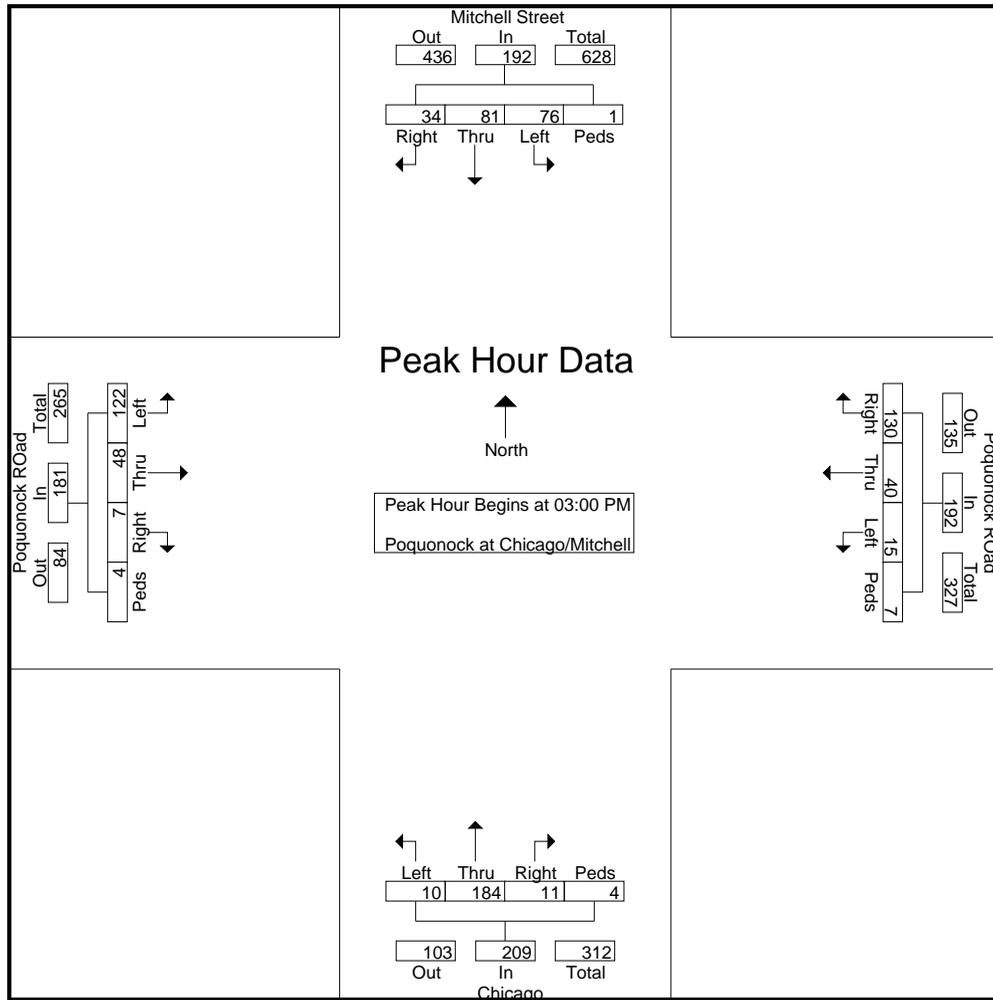
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18038
Site Code : 18038
Start Date : 10/18/2018
Page No : 2

Start Time	Mitchell Street From North					Poquonock ROad From East					Chicago/ Benham From South					Poquonock ROad 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	
03:00 PM	10	26	27	1	64	42	13	5	2	62	2	50	4	1	57	2	10	31	4	47	230
03:15 PM	16	28	17	0	61	26	12	4	1	43	2	39	0	0	41	4	13	30	0	47	192
03:30 PM	5	8	21	0	34	32	7	2	4	45	4	51	5	1	61	1	11	32	0	44	184
03:45 PM	3	19	11	0	33	30	8	4	0	42	3	44	1	2	50	0	14	29	0	43	168
Total Volume	34	81	76	1	192	130	40	15	7	192	11	184	10	4	209	7	48	122	4	181	774
% App. Total	17.7	42.2	39.6	0.5		67.7	20.8	7.8	3.6		5.3	88	4.8	1.9		3.9	26.5	67.4	2.2		
PHF	.531	.723	.704	.250	.750	.774	.769	.750	.438	.774	.688	.902	.500	.500	.857	.438	.857	.953	.250	.963	.841

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 03:00 PM



Connecticut Counts LLC

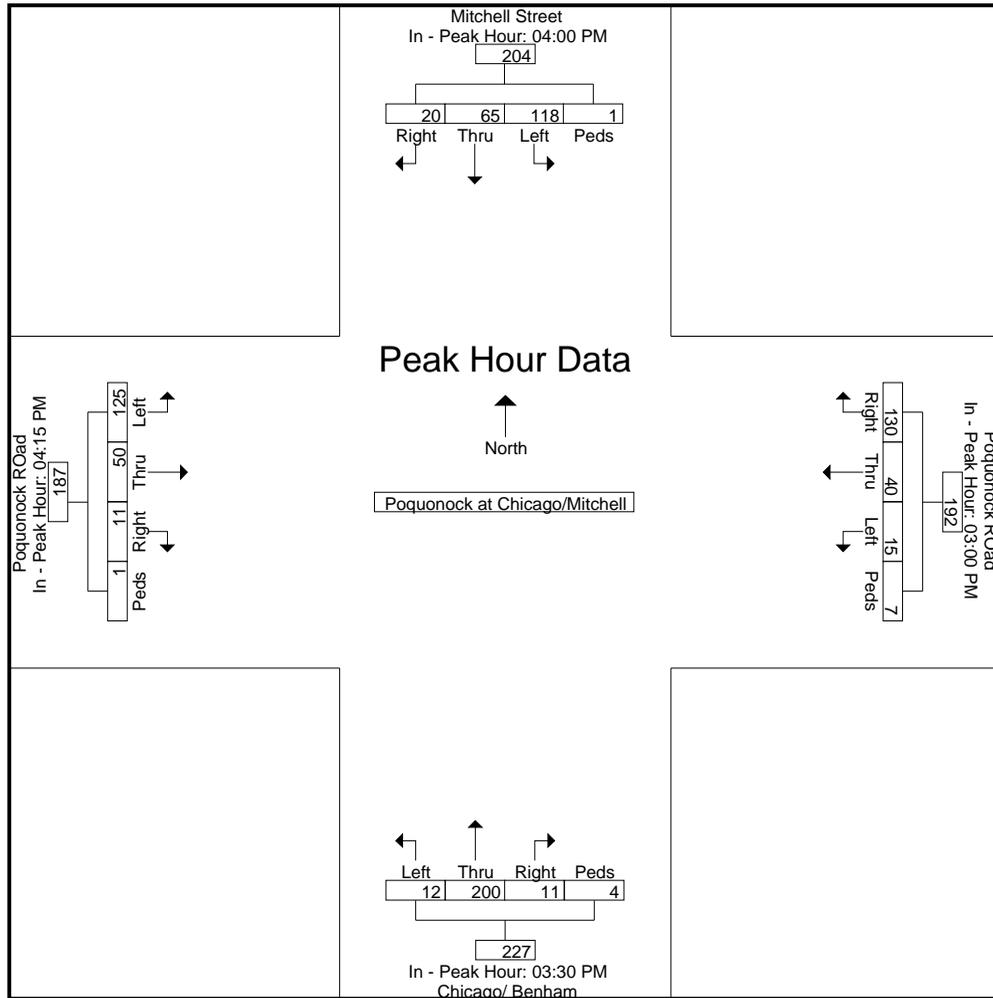
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18038
Site Code : 18038
Start Date : 10/18/2018
Page No : 3

Start Time	Mitchell Street From North					Poquonock ROad From East					Chicago/ Benham From South					Poquonock ROad 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 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM					03:00 PM					03:30 PM					04:15 PM				
+0 mins.	6	24	38	0	68	42	13	5	2	62	4	51	5	1	61	3	15	33	1	52
+15 mins.	7	7	21	0	35	26	12	4	1	43	3	44	1	2	50	5	10	30	0	45
+30 mins.	5	12	30	0	47	32	7	2	4	45	2	62	3	0	67	2	10	27	0	39
+45 mins.	2	22	29	1	54	30	8	4	0	42	2	43	3	1	49	1	15	35	0	51
Total Volume	20	65	118	1	204	130	40	15	7	192	11	200	12	4	227	11	50	125	1	187
% App. Total	9.8	31.9	57.8	0.5		67.7	20.8	7.8	3.6		4.8	88.1	5.3	1.8		5.9	26.7	66.8	0.5	
PHF	.714	.677	.776	.250	.750	.774	.769	.750	.438	.774	.688	.806	.600	.500	.847	.550	.833	.893	.250	.899



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Poquonock Road at E.B. Parking Lot Dr
Groton, Connecticut

File Name : 18045
Site Code : 18045
Start Date : 10/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	From North					Poquonock Road From East					E.B. Parking Lot Dr From South					Poquonock Road 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	
06:00 AM	0	0	0	0	0	0	55	4	0	59	0	1	2	0	3	8	54	0	0	62	124
06:15 AM	0	0	1	0	1	0	51	6	0	57	5	0	2	0	7	9	49	0	0	58	123
06:30 AM	0	0	0	0	0	0	52	7	0	59	0	0	4	0	4	15	34	0	0	49	112
06:45 AM	0	0	1	0	1	0	59	14	0	73	4	0	5	0	9	21	56	1	0	78	161
Total	0	0	2	0	2	0	217	31	0	248	9	1	13	0	23	53	193	1	0	247	520
07:00 AM	0	0	0	0	0	1	65	17	0	83	1	1	5	0	7	45	49	0	0	94	184
07:15 AM	0	3	0	0	3	0	57	12	0	69	1	0	6	0	7	36	41	0	0	77	156
07:30 AM	0	1	0	0	1	0	69	15	0	84	0	0	6	0	6	38	55	0	1	94	185
07:45 AM	0	0	0	0	0	0	51	7	0	58	1	0	3	0	4	24	52	0	0	76	138
Total	0	4	0	0	4	1	242	51	0	294	3	1	20	0	24	143	197	0	1	341	663
08:00 AM	0	1	0	0	1	0	57	4	0	61	0	1	2	0	3	22	65	0	0	87	152
08:15 AM	0	0	0	0	0	0	60	6	0	66	1	0	5	0	6	15	54	0	0	69	141
08:30 AM	0	0	0	0	0	0	60	6	0	66	0	0	0	0	0	14	88	0	0	102	168
08:45 AM	0	1	0	0	1	0	97	6	0	103	0	0	1	0	1	11	74	0	0	85	190
Total	0	2	0	0	2	0	274	22	0	296	1	1	8	0	10	62	281	0	0	343	651
Grand Total	0	6	2	0	8	1	733	104	0	838	13	3	41	0	57	258	671	1	1	931	1834
Apprch %	0	75	25	0		0.1	87.5	12.4	0		22.8	5.3	71.9	0		27.7	72.1	0.1	0.1		
Total %	0	0.3	0.1	0	0.4	0.1	40	5.7	0	45.7	0.7	0.2	2.2	0	3.1	14.1	36.6	0.1	0.1	50.8	
Unshifted	0	0	0	0	0	0	709	99	0	808	2	0	41	0	43	258	647	0	1	906	1757
% Unshifted																					
Bank 1	0	4	1	0	5	0	5	2	0	7	7	0	0	0	7	0	7	0	0	7	26
% Bank 1	0	66.7	50	0	62.5	0	0.7	1.9	0	0.8	53.8	0	0	0	12.3	0	1	0	0	0.8	1.4
Bank 2	0	2	1	0	3	1	19	3	0	23	4	3	0	0	7	0	17	1	0	18	51
% Bank 2	0	33.3	50	0	37.5	100	2.6	2.9	0	2.7	30.8	100	0	0	12.3	0	2.5	100	0	1.9	2.8

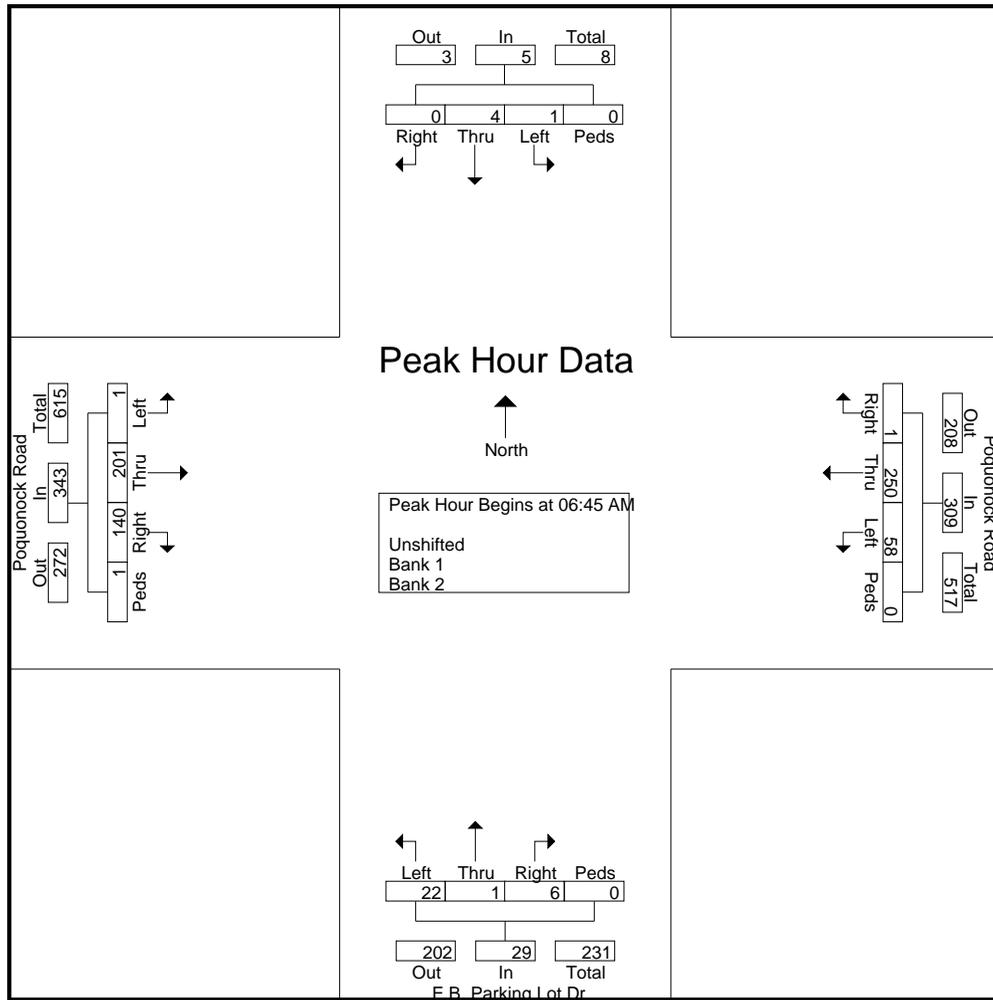
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18045
Site Code : 18045
Start Date : 10/18/2018
Page No : 2

Start Time	From North					Poquonock Road From East					E.B. Parking Lot Dr From South					Poquonock Road 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	
06:45 AM	0	0	1	0	1	0	59	14	0	73	4	0	5	0	9	21	56	1	0	78	161
07:00 AM	0	0	0	0	0	1	65	17	0	83	1	1	5	0	7	45	49	0	0	94	184
07:15 AM	0	3	0	0	3	0	57	12	0	69	1	0	6	0	7	36	41	0	0	77	156
07:30 AM	0	1	0	0	1	0	69	15	0	84	0	0	6	0	6	38	55	0	1	94	185
Total Volume	0	4	1	0	5	1	250	58	0	309	6	1	22	0	29	140	201	1	1	343	686
% App. Total	0	.80	.20	0		0.3	80.9	18.8	0		20.7	3.4	75.9	0		40.8	58.6	0.3	0.3		
PHF	.000	.333	.250	.000	.417	.250	.906	.853	.000	.920	.375	.250	.917	.000	.806	.778	.897	.250	.250	.912	.927

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 06:45 AM



Connecticut Counts LLC

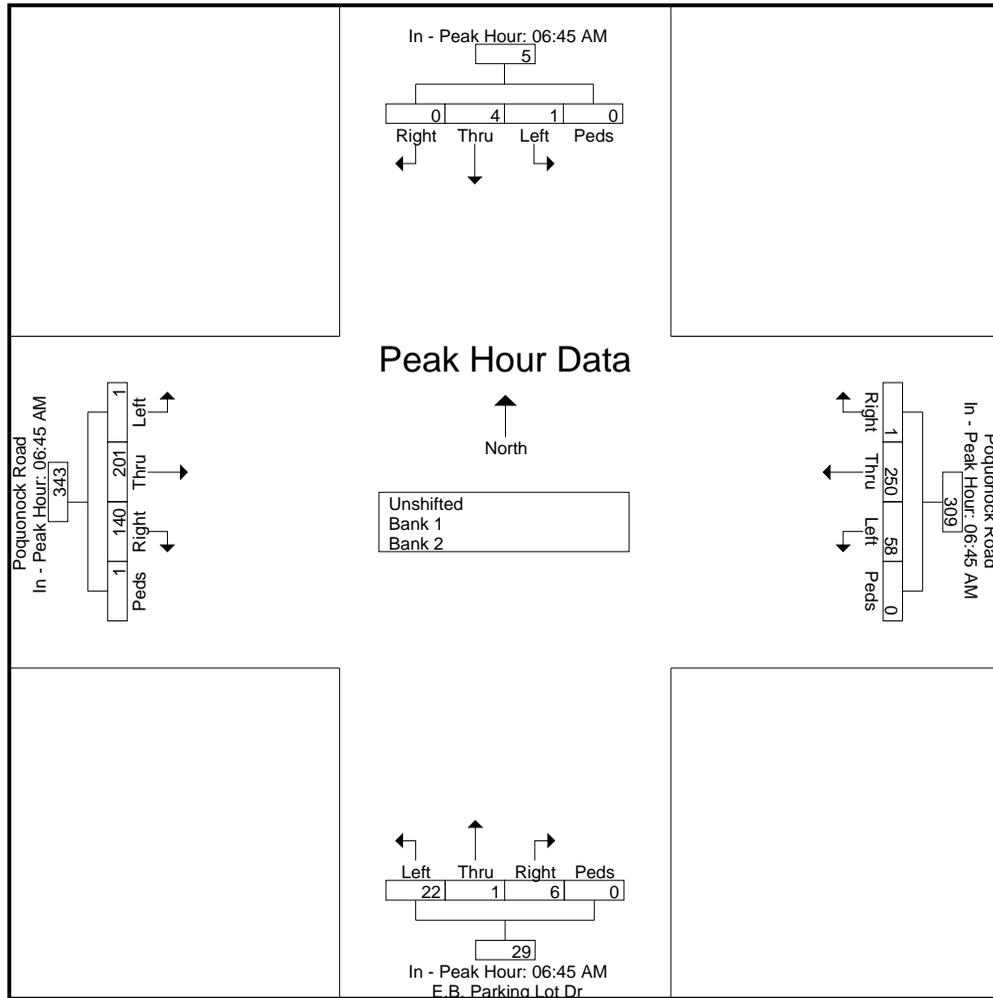
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18045
Site Code : 18045
Start Date : 10/18/2018
Page No : 3

Start Time	From North					Poquonock Road From East					E.B. Parking Lot Dr From South					Poquonock Road 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 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	06:45 AM					06:45 AM					06:45 AM					06:45 AM				
+0 mins.	0	0	1	0	1	0	59	14	0	73	4	0	5	0	9	21	56	1	0	78
+15 mins.	0	0	0	0	0	1	65	17	0	83	1	1	5	0	7	45	49	0	0	94
+30 mins.	0	3	0	0	3	0	57	12	0	69	1	0	6	0	7	36	41	0	0	77
+45 mins.	0	1	0	0	1	0	69	15	0	84	0	0	6	0	6	38	55	0	1	94
Total Volume	0	4	1	0	5	1	250	58	0	309	6	1	22	0	29	140	201	1	1	343
% App. Total	0	80	20	0		0.3	80.9	18.8	0		20.7	3.4	75.9	0		40.8	58.6	0.3	0.3	
PHF	.000	.333	.250	.000	.417	.250	.906	.853	.000	.920	.375	.250	.917	.000	.806	.778	.897	.250	.250	.912



Connecticut Counts LLC

Kensington, Connecticut 06037
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Poquonock Road at E.B. Parking Lot Dr
Groton, Connecticut

File Name : 18046
Site Code : 18046
Start Date : 10/18/2018
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	From North					Poquonock Road From East					E.B. Parking Lot Dr From South					Poquonock Road 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	
03:00 PM	0	0	0	0	0	0	119	0	0	119	12	0	18	1	31	6	113	0	0	119	269
03:15 PM	0	0	0	0	0	0	112	1	0	113	9	0	15	0	24	7	95	0	0	102	239
03:30 PM	0	0	0	0	0	0	92	0	0	92	7	0	16	0	23	7	74	0	0	81	196
03:45 PM	0	0	0	0	0	0	91	0	0	91	9	0	24	0	33	5	87	0	0	92	216
Total	0	0	0	0	0	0	414	1	0	415	37	0	73	1	111	25	369	0	0	394	920
04:00 PM	0	0	0	0	0	0	88	0	0	88	3	0	21	0	24	5	97	0	0	102	214
04:15 PM	0	0	0	0	0	1	86	2	1	90	14	1	22	0	37	7	98	1	0	106	233
04:30 PM	0	0	0	0	0	0	108	2	0	110	21	0	33	1	55	6	100	0	0	106	271
04:45 PM	0	0	0	0	0	0	74	0	0	74	11	0	22	3	36	3	109	0	0	112	222
Total	0	0	0	0	0	1	356	4	1	362	49	1	98	4	152	21	404	1	0	426	940
05:00 PM	0	0	0	0	0	0	91	0	1	92	2	0	18	0	20	5	100	0	0	105	217
05:15 PM	0	0	0	0	0	0	75	0	0	75	11	0	21	0	32	5	93	0	1	99	206
05:30 PM	0	0	0	0	0	0	85	0	0	85	8	0	27	0	35	2	67	0	0	69	189
05:45 PM	0	0	0	0	0	0	60	0	0	60	0	0	8	0	8	1	69	0	0	70	138
Total	0	0	0	0	0	0	311	0	1	312	21	0	74	0	95	13	329	0	1	343	750
Grand Total	0	0	0	0	0	1	1081	5	2	1089	107	1	245	5	358	59	1102	1	1	1163	2610
Apprch %	0	0	0	0		0.1	99.3	0.5	0.2		29.9	0.3	68.4	1.4		5.1	94.8	0.1	0.1		
Total %	0	0	0	0	0	0	41.4	0.2	0.1	41.7	4.1	0	9.4	0.2	13.7	2.3	42.2	0	0	44.6	
Unshifted	0	0	0	0	0	1	1056										1065				
% Unshifted	0	0	0	0	0	100	97.7	100	100	97.7	100	100	91.4	100	94.1	66.1	96.6	100	100	95.1	96.1
Bank 1	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	12	0	0	12	18
% Bank 1	0	0	0	0	0	0	0.6	0	0	0.6	0	0	0	0	0	0	1.1	0	0	1	0.7
Bank 2	0	0	0	0	0	0	19	0	0	19	0	0	21	0	21	20	25	0	0	45	85
% Bank 2	0	0	0	0	0	0	1.8	0	0	1.7	0	0	8.6	0	5.9	33.9	2.3	0	0	3.9	3.3

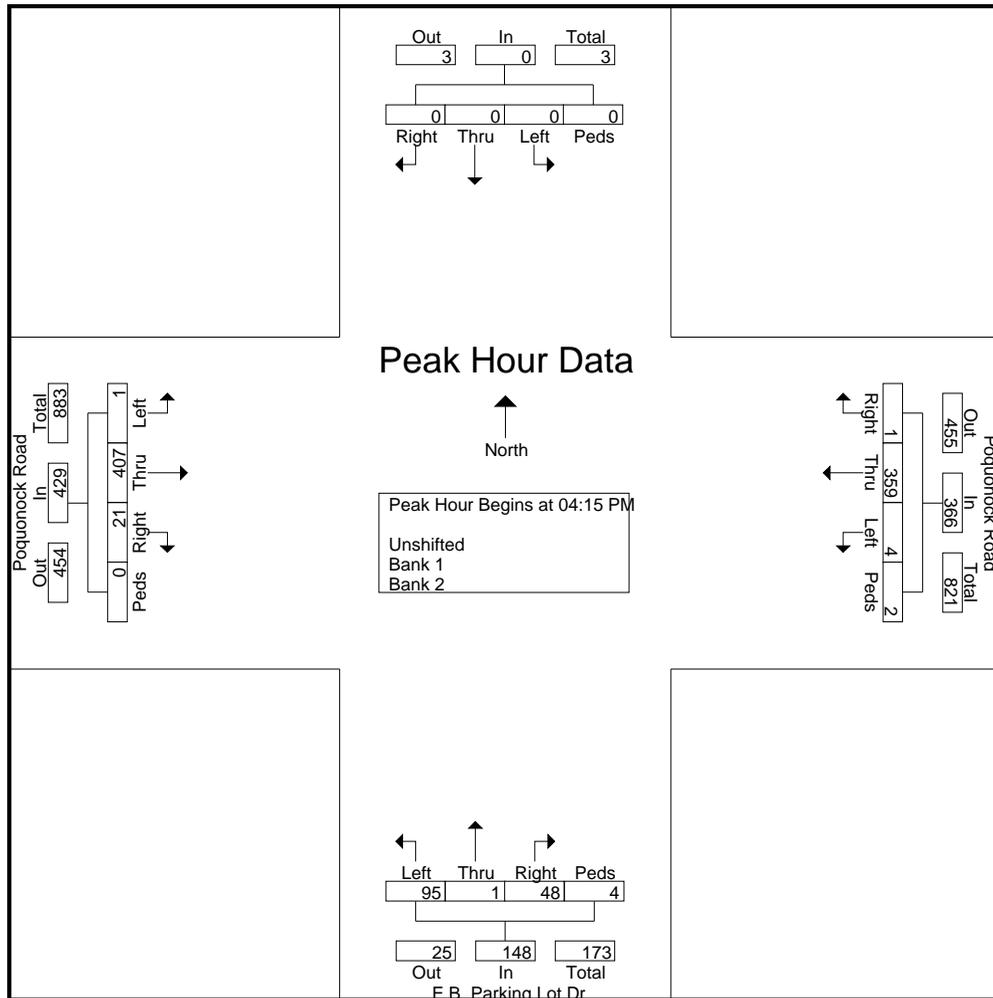
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18046
Site Code : 18046
Start Date : 10/18/2018
Page No : 2

Start Time	From North					Poquonock Road From East					E.B. Parking Lot Dr From South					Poquonock Road 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	
04:15 PM	0	0	0	0	0	1	86	2	1	90	14	1	22	0	37	7	98	1	0	106	233
04:30 PM	0	0	0	0	0	0	108	2	0	110	21	0	33	1	55	6	100	0	0	106	271
04:45 PM	0	0	0	0	0	0	74	0	0	74	11	0	22	3	36	3	109	0	0	112	222
05:00 PM	0	0	0	0	0	0	91	0	1	92	2	0	18	0	20	5	100	0	0	105	217
Total Volume	0	0	0	0	0	1	359	4	2	366	48	1	95	4	148	21	407	1	0	429	943
% App. Total	0	0	0	0	0	0.3	98.1	1.1	0.5		32.4	0.7	64.2	2.7		4.9	94.9	0.2	0		
PHF	.000	.000	.000	.000	.000	.250	.831	.500	.500	.832	.571	.250	.720	.333	.673	.750	.933	.250	.000	.958	.870

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:15 PM



Connecticut Counts LLC

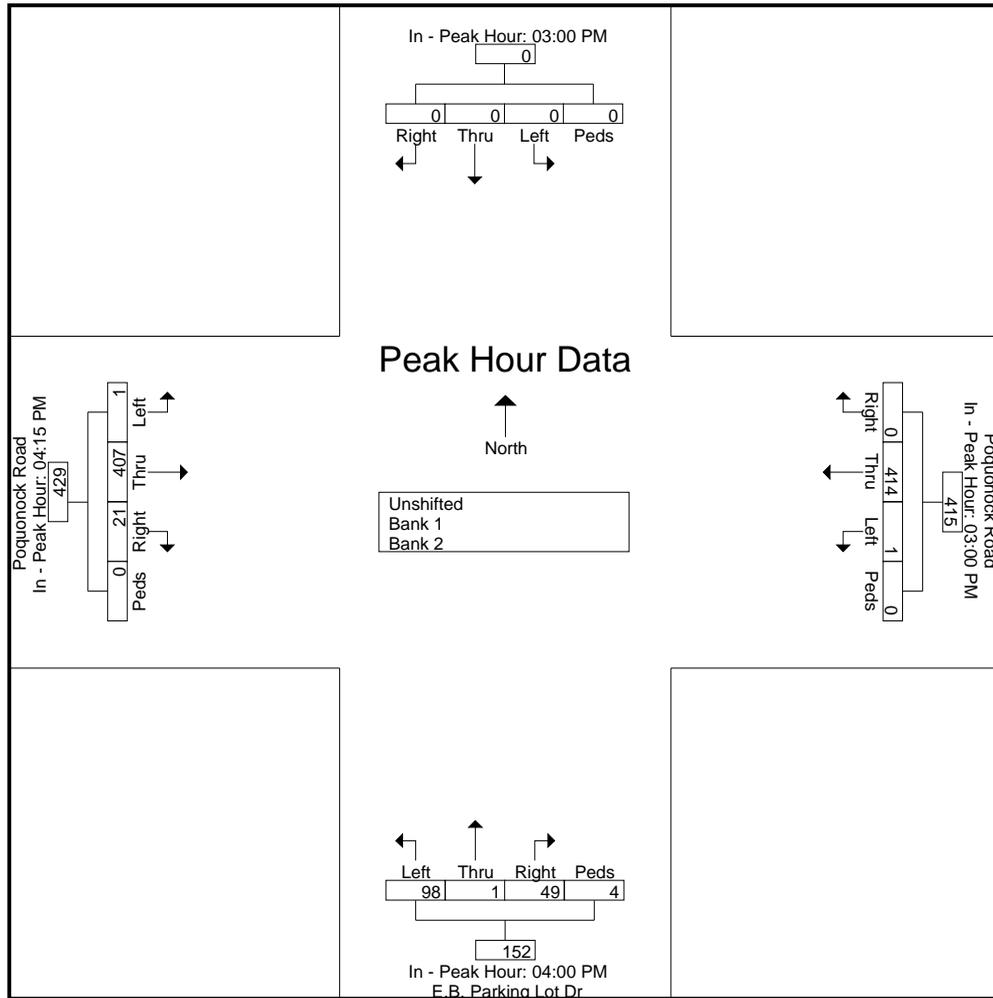
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18046
Site Code : 18046
Start Date : 10/18/2018
Page No : 3

Start Time	From North					Poquonock Road From East					E.B. Parking Lot Dr From South					Poquonock Road 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 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM					03:00 PM					04:00 PM					04:15 PM				
+0 mins.	0	0	0	0	0	0	119	0	0	119	3	0	21	0	24	7	98	1	0	106
+15 mins.	0	0	0	0	0	0	112	1	0	113	14	1	22	0	37	6	100	0	0	106
+30 mins.	0	0	0	0	0	0	92	0	0	92	21	0	33	1	55	3	109	0	0	112
+45 mins.	0	0	0	0	0	0	91	0	0	91	11	0	22	3	36	5	100	0	0	105
Total Volume	0	0	0	0	0	0	414	1	0	415	49	1	98	4	152	21	407	1	0	429
% App. Total	0	0	0	0	0	0	99.8	0.2	0		32.2	0.7	64.5	2.6		4.9	94.9	0.2	0	
PHF	.000	.000	.000	.000	.000	.000	.870	.250	.000	.872	.583	.250	.742	.333	.691	.750	.933	.250	.000	.958



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

North Street at Meridian Street
Groton, Connecticut

File Name : 18647
Site Code : 18647
Start Date : 3/28/2019
Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	North Street From North					Meridian Street From East					North Street From South					Meridian 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	
06:00 AM	3	182	8	0	193	5	8	50	1	64	5	26	0	0	31	1	4	3	0	8	296
06:15 AM	2	203	11	0	216	2	5	38	0	45	4	29	1	0	34	1	0	2	0	3	298
06:30 AM	0	154	8	2	164	11	3	26	0	40	7	57	0	0	64	2	7	2	0	11	279
06:45 AM	2	128	13	0	143	11	8	27	0	46	13	50	0	0	63	2	8	4	0	14	266
Total	7	667	40	2	716	29	24	141	1	195	29	162	1	0	192	6	19	11	0	36	1139
07:00 AM	0	126	14	0	140	13	7	32	0	52	17	78	0	0	95	0	11	5	0	16	303
07:15 AM	3	147	15	0	165	11	7	32	1	51	12	65	0	0	77	2	9	3	1	15	308
07:30 AM	2	128	25	0	155	14	6	35	2	57	13	65	0	0	78	0	7	3	0	10	300
07:45 AM	0	132	38	0	170	12	6	40	0	58	21	63	0	0	84	1	3	0	0	4	316
Total	5	533	92	0	630	50	26	139	3	218	63	271	0	0	334	3	30	11	1	45	1227
08:00 AM	6	108	18	0	132	15	5	27	0	47	17	47	0	0	64	3	9	7	0	19	262
08:15 AM	0	116	27	0	143	7	6	34	0	47	20	64	1	0	85	2	14	5	0	21	296
08:30 AM	1	138	18	0	157	8	10	33	0	51	25	59	10	0	94	1	9	1	0	11	313
08:45 AM	3	88	16	0	107	12	2	16	0	30	16	72	2	0	90	0	11	5	0	16	243
Total	10	450	79	0	539	42	23	110	0	175	78	242	13	0	333	6	43	18	0	67	1114
Grand Total	22	1650	211	2	1885	121	73	390	4	588	170	675	14	0	859	15	92	40	1	148	3480
Apprch %	1.2	87.5	11.2	0.1		20.6	12.4	66.3	0.7		19.8	78.6	1.6	0		10.1	62.2	27	0.7		
Total %	0.6	47.4	6.1	0.1	54.2	3.5	2.1	11.2	0.1	16.9	4.9	19.4	0.4	0	24.7	0.4	2.6	1.1	0	4.3	
Lights	20	1637																			
% Lights	90.9	99.2	97.2	100	98.9	94.2	94.5	98.5	100	97.1	96.5	98.2	100	0	97.9	73.3	97.8	100	100	95.9	98.2
Buses	1	11	6	0	18	7	4	3	0	14	4	11	0	0	15	4	2	0	0	6	53
% Buses	4.5	0.7	2.8	0	1	5.8	5.5	0.8	0	2.4	2.4	1.6	0	0	1.7	26.7	2.2	0	0	4.1	1.5
Trucks	1	2	0	0	3	0	0	3	0	3	2	1	0	0	3	0	0	0	0	0	9
% Trucks	4.5	0.1	0	0	0.2	0	0	0.8	0	0.5	1.2	0.1	0	0	0.3	0	0	0	0	0	0.3

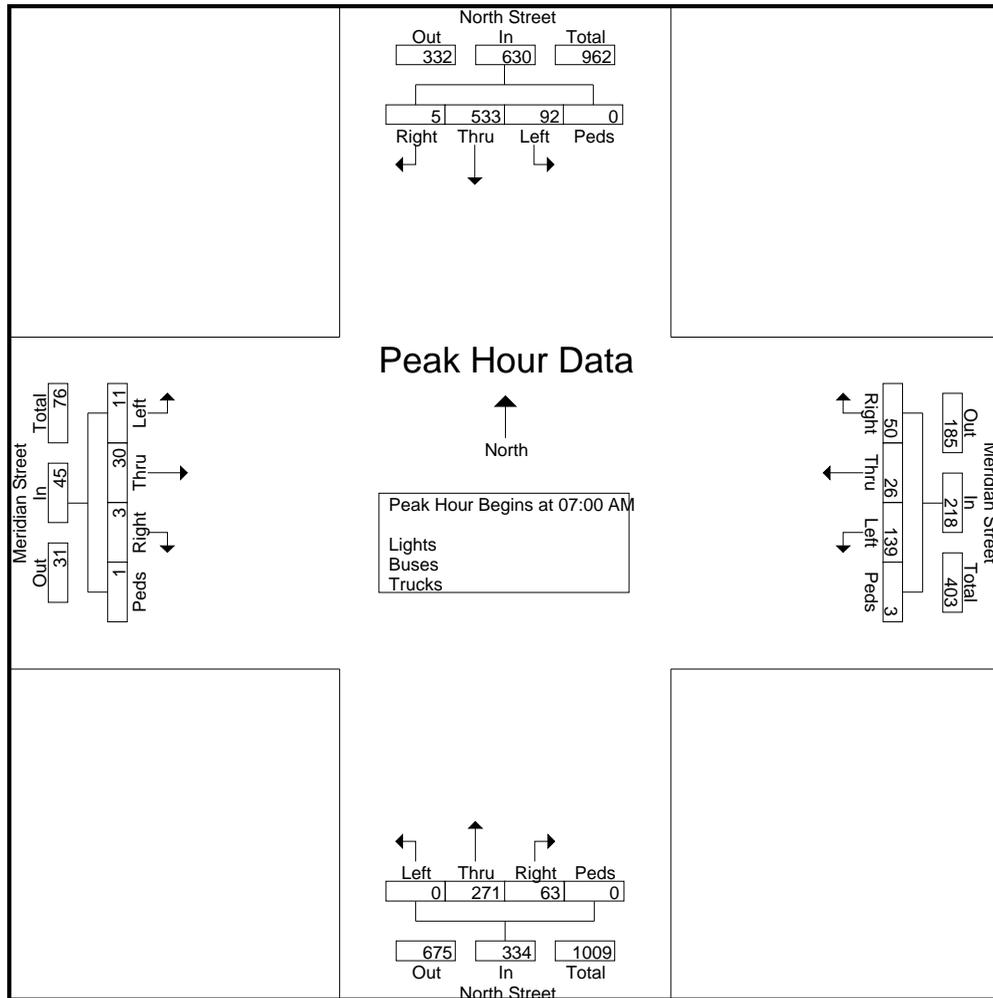
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18647
Site Code : 18647
Start Date : 3/28/2019
Page No : 2

Start Time	North Street From North					Meridian Street From East					North Street From South					Meridian 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	126	14	0	140	13	7	32	0	52	17	78	0	0	95	0	11	5	0	16	303
07:15 AM	3	147	15	0	165	11	7	32	1	51	12	65	0	0	77	2	9	3	1	15	308
07:30 AM	2	128	25	0	155	14	6	35	2	57	13	65	0	0	78	0	7	3	0	10	300
07:45 AM	0	132	38	0	170	12	6	40	0	58	21	63	0	0	84	1	3	0	0	4	316
Total Volume	5	533	92	0	630	50	26	139	3	218	63	271	0	0	334	3	30	11	1	45	1227
% App. Total	0.8	84.6	14.6	0		22.9	11.9	63.8	1.4		18.9	81.1	0	0		6.7	66.7	24.4	2.2		
PHF	.417	.906	.605	.000	.926	.893	.929	.869	.375	.940	.750	.869	.000	.000	.879	.375	.682	.550	.250	.703	.971

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:00 AM



Connecticut Counts LLC

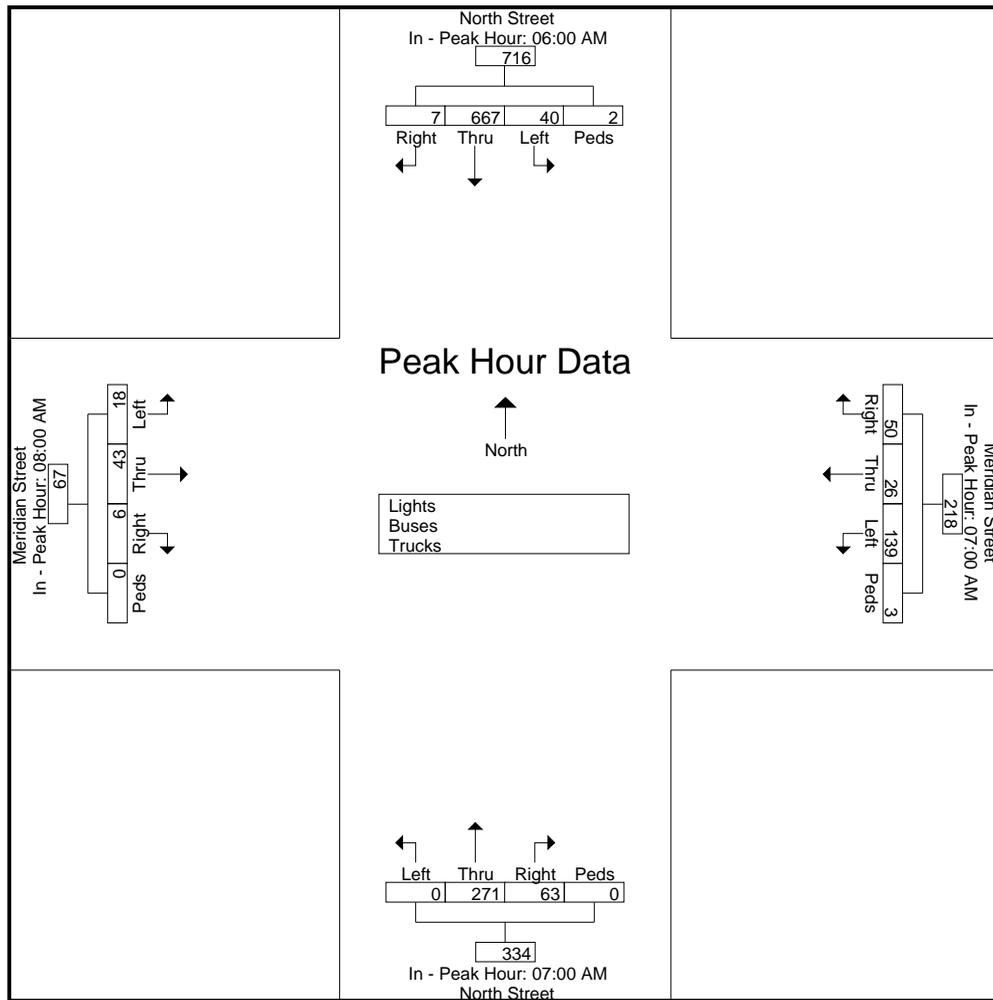
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18647
Site Code : 18647
Start Date : 3/28/2019
Page No : 3

Start Time	North Street From North					Meridian Street From East					North Street From South					Meridian 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 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	06:00 AM					07:00 AM					07:00 AM					08:00 AM				
+0 mins.	3	182	8	0	193	13	7	32	0	52	17	78	0	0	95	3	9	7	0	19
+15 mins.	2	203	11	0	216	11	7	32	1	51	12	65	0	0	77	2	14	5	0	21
+30 mins.	0	154	8	2	164	14	6	35	2	57	13	65	0	0	78	1	9	1	0	11
+45 mins.	2	128	13	0	143	12	6	40	0	58	21	63	0	0	84	0	11	5	0	16
Total Volume	7	667	40	2	716	50	26	139	3	218	63	271	0	0	334	6	43	18	0	67
% App. Total	1	93.2	5.6	0.3		22.9	11.9	63.8	1.4		18.9	81.1	0	0		9	64.2	26.9	0	
PHF	.583	.821	.769	.250	.829	.893	.929	.869	.375	.940	.750	.869	.000	.000	.879	.500	.768	.643	.000	.798



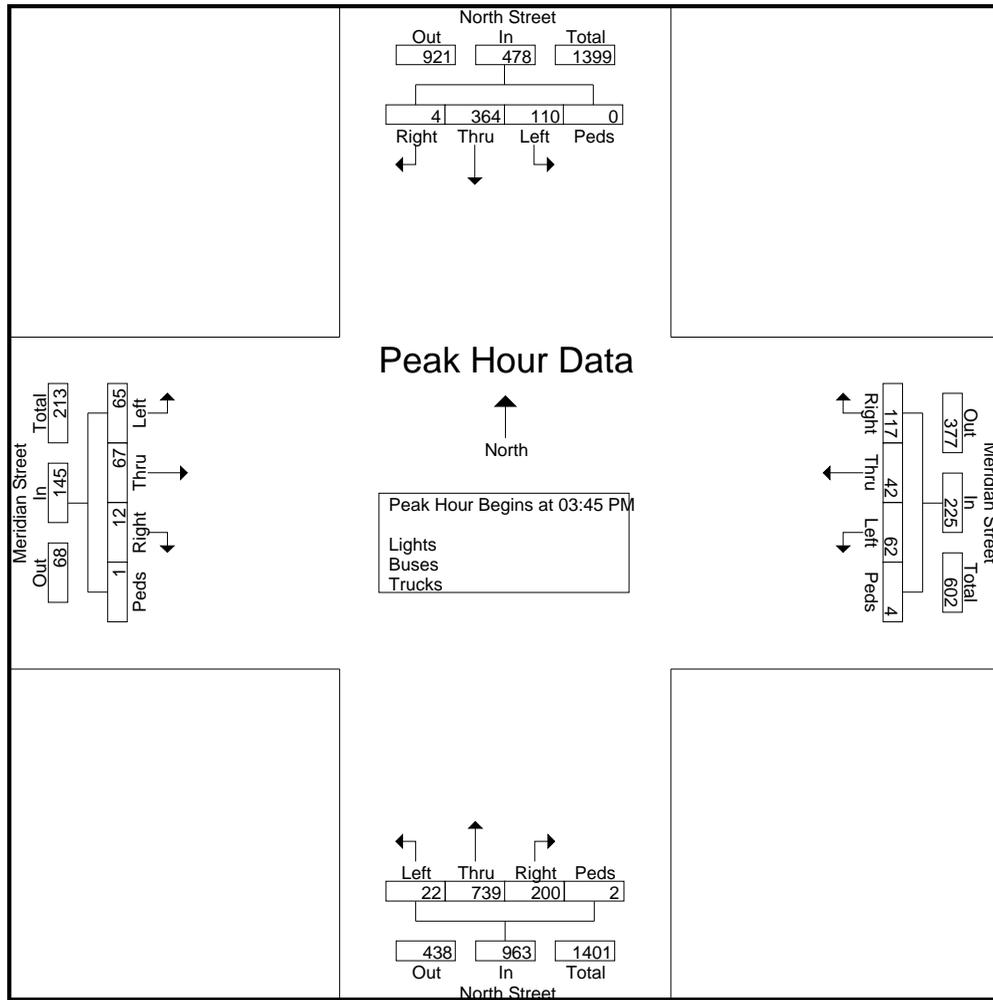
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18648
Site Code : 18648
Start Date : 3/27/2019
Page No : 2

Start Time	North Street From North					Meridian Street From East					North Street From South					Meridian 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	
03:45 PM	1	91	27	0	119	32	13	14	1	60	44	165	12	1	222	2	15	17	0	34	435
04:00 PM	1	101	29	0	131	25	11	15	1	52	47	204	1	1	253	5	20	22	0	47	483
04:15 PM	1	70	27	0	98	32	10	19	0	61	62	191	3	0	256	2	18	11	0	31	446
04:30 PM	1	102	27	0	130	28	8	14	2	52	47	179	6	0	232	3	14	15	1	33	447
Total Volume	4	364	110	0	478	117	42	62	4	225	200	739	22	2	963	12	67	65	1	145	1811
% App. Total	0.8	76.2	23	0		52	18.7	27.6	1.8		20.8	76.7	2.3	0.2		8.3	46.2	44.8	0.7		
PHF	1.00	.892	.948	.000	.912	.914	.808	.816	.500	.922	.806	.906	.458	.500	.940	.600	.838	.739	.250	.771	.937

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 03:45 PM



Connecticut Counts LLC

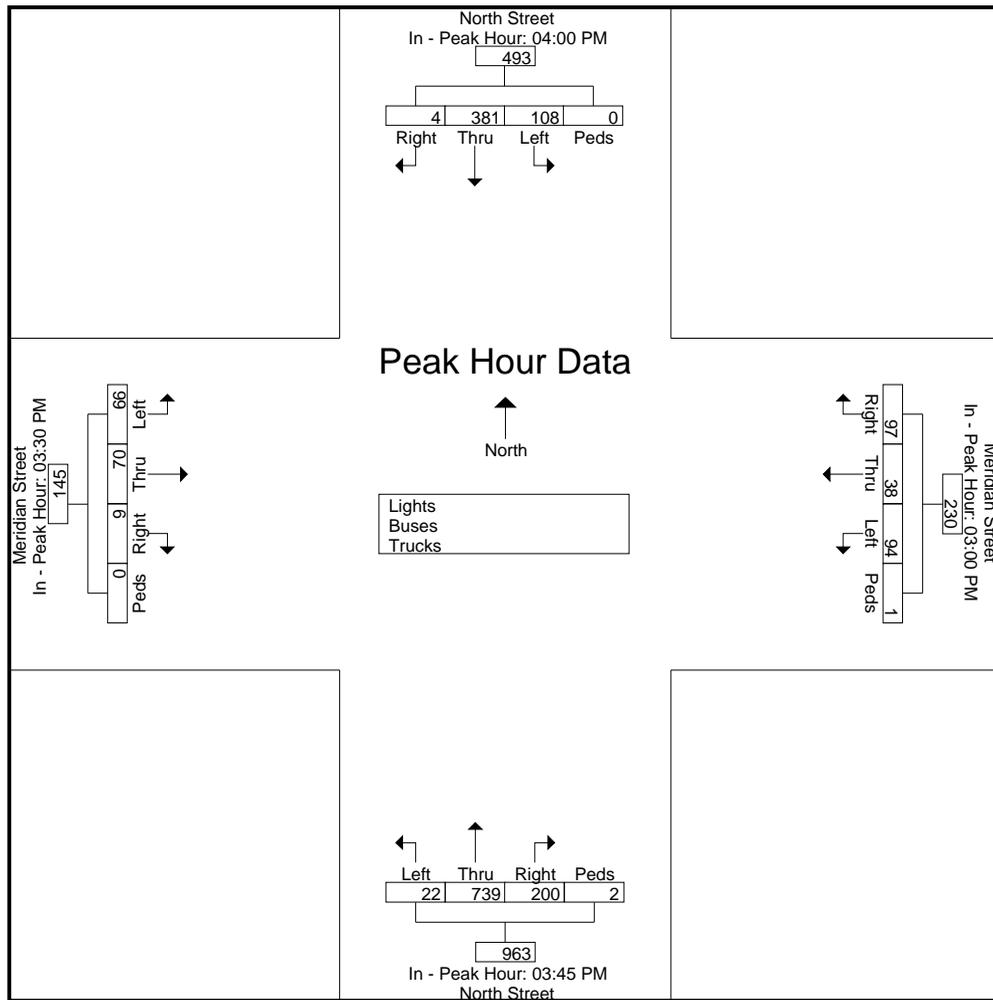
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18648
Site Code : 18648
Start Date : 3/27/2019
Page No : 3

Start Time	North Street From North					Meridian Street From East					North Street From South					Meridian 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 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM					03:00 PM					03:45 PM					03:30 PM				
+0 mins.	1	101	29	0	131	25	10	38	0	73	44	165	12	1	222	0	17	16	0	33
+15 mins.	1	70	27	0	98	26	10	19	0	55	47	204	1	1	253	2	15	17	0	34
+30 mins.	1	102	27	0	130	14	5	23	0	42	62	191	3	0	256	5	20	22	0	47
+45 mins.	1	108	25	0	134	32	13	14	1	60	47	179	6	0	232	2	18	11	0	31
Total Volume	4	381	108	0	493	97	38	94	1	230	200	739	22	2	963	9	70	66	0	145
% App. Total	0.8	77.3	21.9	0		42.2	16.5	40.9	0.4		20.8	76.7	2.3	0.2		6.2	48.3	45.5	0	
PHF	1.000	.882	.931	.000	.920	.758	.731	.618	.250	.788	.806	.906	.458	.500	.940	.450	.875	.750	.000	.771



Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

North Street at Broad Street
Groton, Connecticut

File Name : 18645
Site Code : 18645
Start Date : 3/28/2019
Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	North Street From North					Broad Street From East					North Street From South					Broad 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		
06:00 AM	0	169	0	0	169	0	2	40	0	42	5	31	0	0	36	0	0	2	0	2	2	249
06:15 AM	1	153	0	0	154	0	1	45	0	46	5	28	0	0	33	2	2	3	0	7	7	240
06:30 AM	0	130	0	0	130	0	1	41	0	42	10	55	2	0	67	1	7	0	0	8	8	247
06:45 AM	0	119	0	0	119	0	2	38	0	40	12	56	0	1	69	3	2	3	1	9	9	237
Total	1	571	0	0	572	0	6	164	0	170	32	170	2	1	205	6	11	8	1	26	26	973
07:00 AM	0	102	0	0	102	0	2	32	0	34	20	81	2	0	103	1	2	2	0	5	5	244
07:15 AM	2	152	0	0	154	1	2	28	0	31	16	70	0	0	86	2	3	5	3	13	13	284
07:30 AM	2	117	0	1	120	0	1	34	0	35	8	68	1	1	78	3	3	8	3	17	17	250
07:45 AM	1	129	1	0	131	0	3	48	0	51	11	63	1	0	75	3	3	7	0	13	13	270
Total	5	500	1	1	507	1	8	142	0	151	55	282	4	1	342	9	11	22	6	48	48	1048
08:00 AM	0	113	0	0	113	1	4	30	0	35	14	58	2	0	74	1	3	2	0	6	6	228
08:15 AM	1	108	0	0	109	0	7	35	0	42	19	62	0	0	81	0	1	1	0	2	2	234
08:30 AM	3	122	1	0	126	0	1	49	0	50	17	69	1	0	87	2	4	3	0	9	9	272
08:45 AM	1	98	0	0	99	3	4	20	0	27	14	75	1	0	90	1	5	2	0	8	8	224
Total	5	441	1	0	447	4	16	134	0	154	64	264	4	0	332	4	13	8	0	25	25	958
Grand Total	11	1512	2	1	1526	5	30	440	0	475	151	716	10	2	879	19	35	38	7	99	99	2979
Apprch %	0.7	99.1	0.1	0.1		1.1	6.3	92.6	0		17.2	81.5	1.1	0.2		19.2	35.4	38.4	7.1			
Total %	0.4	50.8	0.1	0	51.2	0.2	1	14.8	0	15.9	5.1	24	0.3	0.1	29.5	0.6	1.2	1.3	0.2	3.3		
Lights	11	1501																				
% Lights	100	99.3	100	100	99.3	100	96.7	96.8	0	96.8	96.7	98.2	80	100	97.7	84.2	97.1	97.4	100	94.9	98.3	98.3
Buses	0	7	0	0	7	0	0	8	0	8	5	13	2	0	20	3	1	1	0	5	5	40
% Buses	0	0.5	0	0	0.5	0	0	1.8	0	1.7	3.3	1.8	20	0	2.3	15.8	2.9	2.6	0	5.1	1.3	1.3
Trucks	0	4	0	0	4	0	1	6	0	7	0	0	0	0	0	0	0	0	0	0	0	11
% Trucks	0	0.3	0	0	0.3	0	3.3	1.4	0	1.5	0	0	0	0	0	0	0	0	0	0	0	0.4

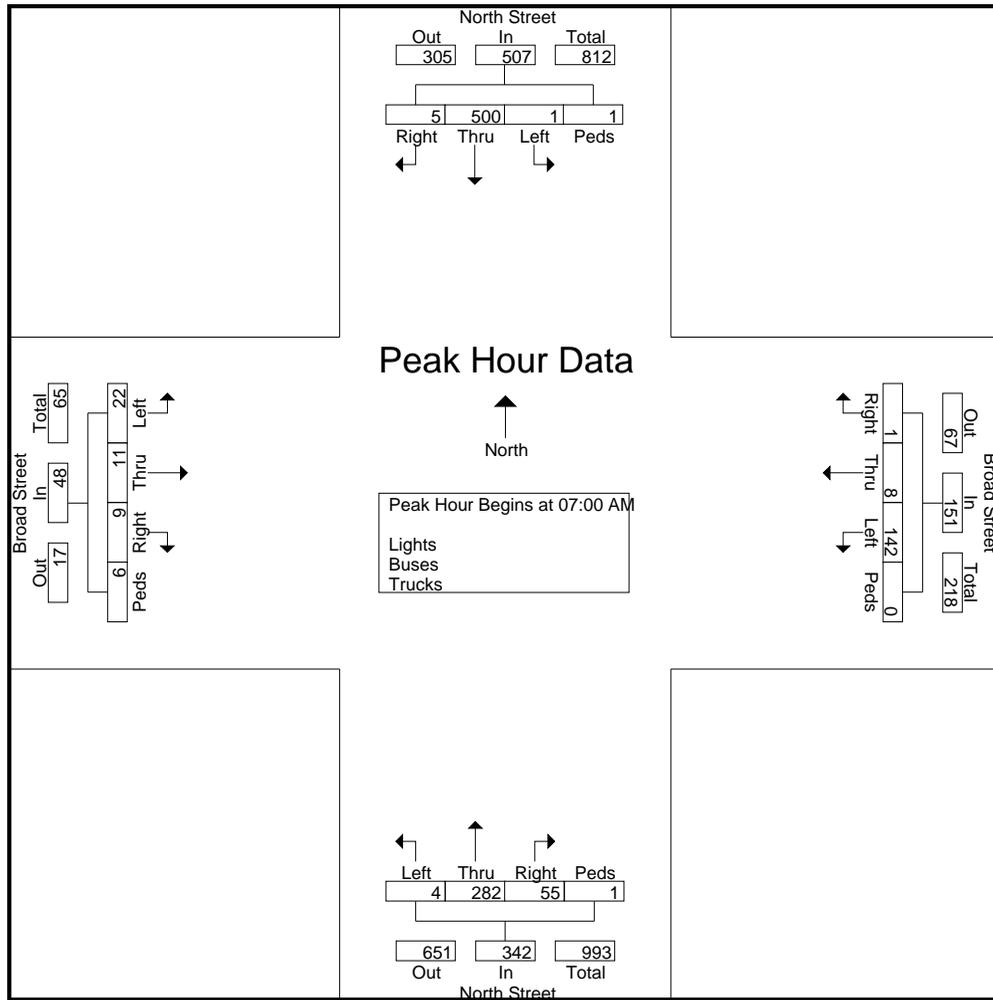
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18645
Site Code : 18645
Start Date : 3/28/2019
Page No : 2

Start Time	North Street From North					Broad Street From East					North Street From South					Broad 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	102	0	0	102	0	2	32	0	34	20	81	2	0	103	1	2	2	0	5	244
07:15 AM	2	152	0	0	154	1	2	28	0	31	16	70	0	0	86	2	3	5	3	13	284
07:30 AM	2	117	0	1	120	0	1	34	0	35	8	68	1	1	78	3	3	8	3	17	250
07:45 AM	1	129	1	0	131	0	3	48	0	51	11	63	1	0	75	3	3	7	0	13	270
Total Volume	5	500	1	1	507	1	8	142	0	151	55	282	4	1	342	9	11	22	6	48	1048
% App. Total	1	98.6	0.2	0.2		0.7	5.3	94	0		16.1	82.5	1.2	0.3		18.8	22.9	45.8	12.5		
PHF	.625	.822	.250	.250	.823	.250	.667	.740	.000	.740	.688	.870	.500	.250	.830	.750	.917	.688	.500	.706	.923

Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:00 AM



Connecticut Counts LLC

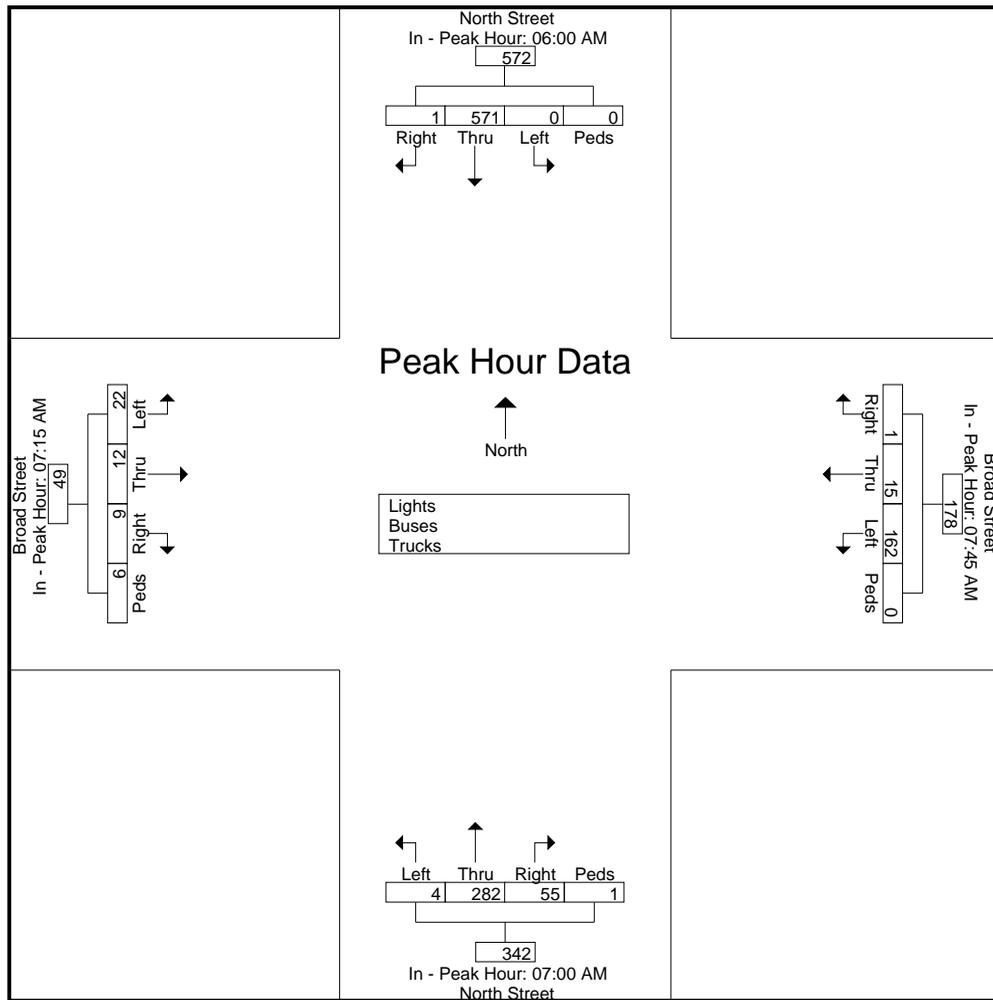
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18645
Site Code : 18645
Start Date : 3/28/2019
Page No : 3

Start Time	North Street From North					Broad Street From East					North Street From South					Broad 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 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	06:00 AM					07:45 AM					07:00 AM					07:15 AM				
+0 mins.	0	169	0	0	169	0	3	48	0	51	20	81	2	0	103	2	3	5	3	13
+15 mins.	1	153	0	0	154	1	4	30	0	35	16	70	0	0	86	3	3	8	3	17
+30 mins.	0	130	0	0	130	0	7	35	0	42	8	68	1	1	78	3	3	7	0	13
+45 mins.	0	119	0	0	119	0	1	49	0	50	11	63	1	0	75	1	3	2	0	6
Total Volume	1	571	0	0	572	1	15	162	0	178	55	282	4	1	342	9	12	22	6	49
% App. Total	0.2	99.8	0	0		0.6	8.4	91	0		16.1	82.5	1.2	0.3		18.4	24.5	44.9	12.2	
PHF	.250	.845	.000	.000	.846	.250	.536	.827	.000	.873	.688	.870	.500	.250	.830	.750	1.000	.688	.500	.721



Connecticut Counts LLC

Kensington, Connecticut 06037

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North Street at Broad Street
Groton, Connecticut

File Name : 18646
Site Code : 18646
Start Date : 3/27/2019
Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	North Street From North					Broad Street From East					North Street From South					Broad 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	
03:00 PM	1	113	0	0	114	0	1	41	0	42	35	209	2	0	246	2	5	1	0	8	410
03:15 PM	2	77	0	0	79	1	3	33	0	37	26	179	2	0	207	1	7	2	0	10	333
03:30 PM	1	62	0	0	63	0	2	31	0	33	23	167	1	0	191	3	6	2	0	11	298
03:45 PM	4	68	0	0	72	0	7	40	0	47	37	161	5	0	203	2	2	1	0	5	327
Total	8	320	0	0	328	1	13	145	0	159	121	716	10	0	847	8	20	6	0	34	1368
04:00 PM	4	77	1	0	82	0	6	32	1	39	36	202	0	0	238	6	2	7	1	16	375
04:15 PM	6	63	0	0	69	2	5	36	0	43	25	180	6	0	211	3	3	1	0	7	330
04:30 PM	4	75	0	0	79	1	6	36	0	43	31	176	2	1	210	3	5	2	1	11	343
04:45 PM	7	76	0	0	83	0	6	43	0	49	28	148	1	0	177	2	2	0	0	4	313
Total	21	291	1	0	313	3	23	147	1	174	120	706	9	1	836	14	12	10	2	38	1361
05:00 PM	3	47	2	0	52	1	10	32	0	43	26	148	3	1	178	3	6	1	1	11	284
05:15 PM	7	73	0	0	80	1	6	33	0	40	27	136	7	0	170	0	3	2	0	5	295
05:30 PM	4	50	2	0	56	2	5	21	1	29	18	123	2	0	143	2	2	2	0	6	234
05:45 PM	4	62	0	0	66	1	3	29	0	33	26	99	6	0	131	3	4	2	0	9	239
Total	18	232	4	0	254	5	24	115	1	145	97	506	18	1	622	8	15	7	1	31	1052
Grand Total	47	843	5	0	895	9	60	407	2	478	338	1928	37	2	2305	30	47	23	3	103	3781
Apprch %	5.3	94.2	0.6	0		1.9	12.6	85.1	0.4		14.7	83.6	1.6	0.1		29.1	45.6	22.3	2.9		
Total %	1.2	22.3	0.1	0	23.7	0.2	1.6	10.8	0.1	12.6	8.9	51	1	0.1	61	0.8	1.2	0.6	0.1	2.7	
Lights	47	840	3	0	890	9	60	401	2	472	334	1921				90	95.7	95.7	100	94.2	99.3
% Lights	100	99.6	60	0	99.4	100	100	98.5	100	98.7	98.8	99.6	100	100	99.5	90	95.7	95.7	100	94.2	99.3
Buses	0	2	0	0	2	0	0	3	0	3	4	7	0	0	11	3	2	1	0	6	22
% Buses	0	0.2	0	0	0.2	0	0	0.7	0	0.6	1.2	0.4	0	0	0.5	10	4.3	4.3	0	5.8	0.6
Trucks	0	1	2	0	3	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	6
% Trucks	0	0.1	40	0	0.3	0	0	0.7	0	0.6	0	0	0	0	0	0	0	0	0	0	0.2

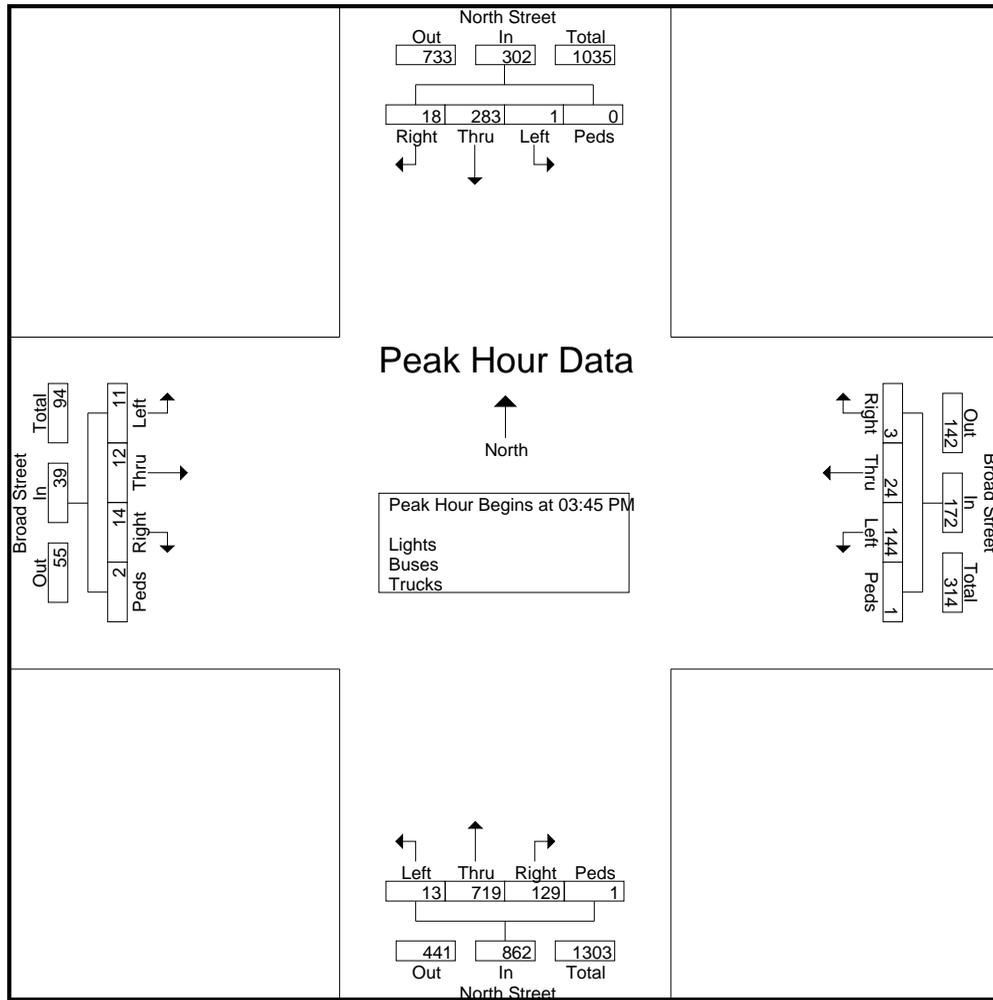
Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18646
Site Code : 18646
Start Date : 3/27/2019
Page No : 2

Start Time	North Street From North					Broad Street From East					North Street From South					Broad 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	
03:45 PM	4	68	0	0	72	0	7	40	0	47	37	161	5	0	203	2	2	1	0	5	327
04:00 PM	4	77	1	0	82	0	6	32	1	39	36	202	0	0	238	6	2	7	1	16	375
04:15 PM	6	63	0	0	69	2	5	36	0	43	25	180	6	0	211	3	3	1	0	7	330
04:30 PM	4	75	0	0	79	1	6	36	0	43	31	176	2	1	210	3	5	2	1	11	343
Total Volume	18	283	1	0	302	3	24	144	1	172	129	719	13	1	862	14	12	11	2	39	1375
% App. Total	6	93.7	0.3	0		1.7	14	83.7	0.6		15	83.4	1.5	0.1		35.9	30.8	28.2	5.1		
PHF	.750	.919	.250	.000	.921	.375	.857	.900	.250	.915	.872	.890	.542	.250	.905	.583	.600	.393	.500	.609	.917

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 03:45 PM



Connecticut Counts LLC

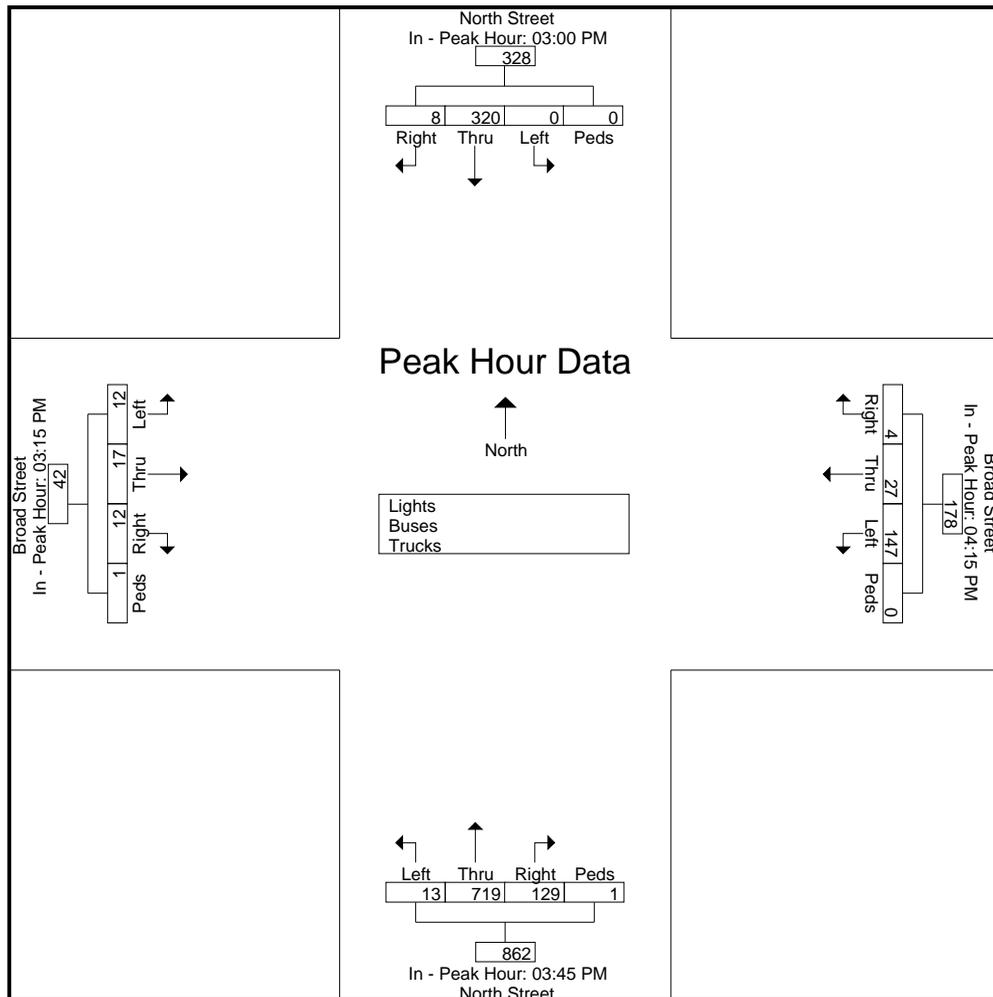
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18646
Site Code : 18646
Start Date : 3/27/2019
Page No : 3

Start Time	North Street From North					Broad Street From East					North Street From South					Broad 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 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM					04:15 PM					03:45 PM					03:15 PM				
+0 mins.	1	113	0	0	114	2	5	36	0	43	37	161	5	0	203	1	7	2	0	10
+15 mins.	2	77	0	0	79	1	6	36	0	43	36	202	0	0	238	3	6	2	0	11
+30 mins.	1	62	0	0	63	0	6	43	0	49	25	180	6	0	211	2	2	1	0	5
+45 mins.	4	68	0	0	72	1	10	32	0	43	31	176	2	1	210	6	2	7	1	16
Total Volume	8	320	0	0	328	4	27	147	0	178	129	719	13	1	862	12	17	12	1	42
% App. Total	2.4	97.6	0	0		2.2	15.2	82.6	0		15	83.4	1.5	0.1		28.6	40.5	28.6	2.4	
PHF	.500	.708	.000	.000	.719	.500	.675	.855	.000	.908	.872	.890	.542	.250	.905	.500	.607	.429	.250	.656



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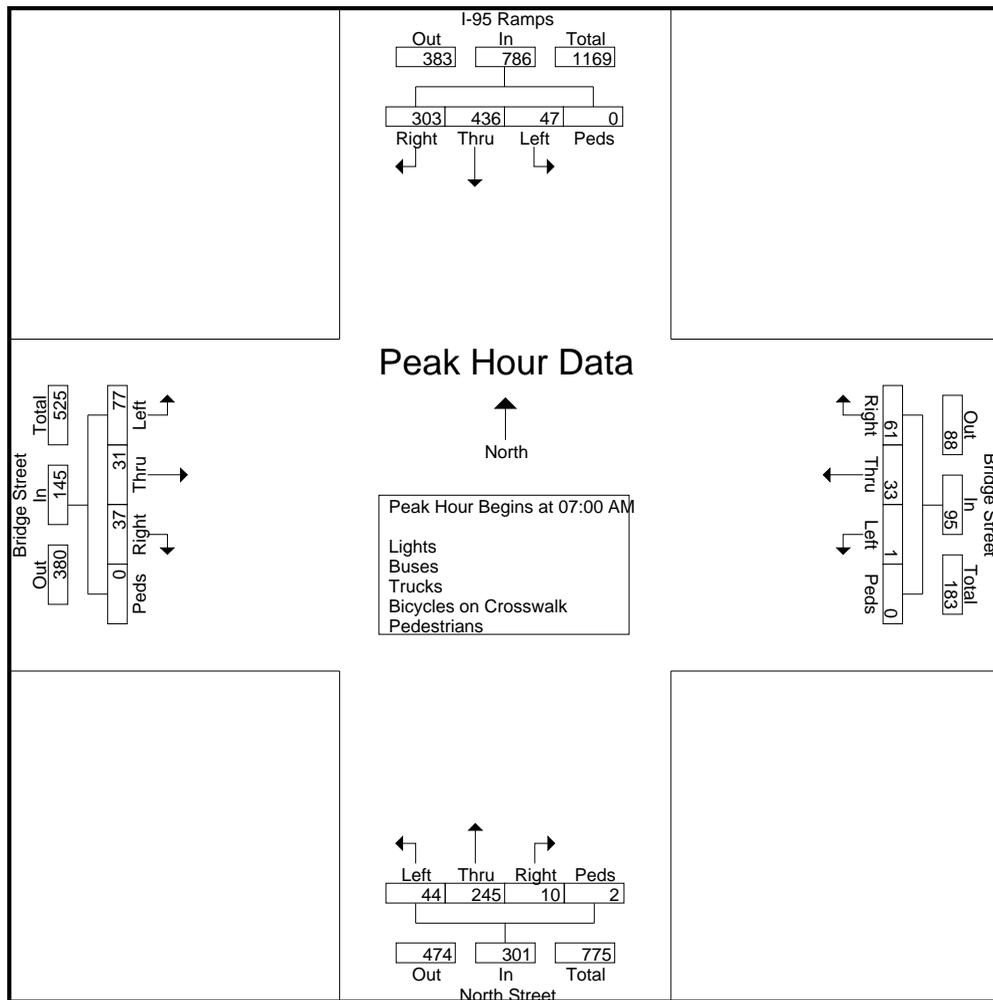
File Name : 18643
Site Code : 18643
Start Date : 3/28/2019
Page No : 2

Start Time	I-95 Ramps From North					Bridge Street From East					North Street From South					Bridge 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 06:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM

07:00 AM	71	89	7	0	167	9	14	0	0	23	0	62	12	0	74	8	10	23	0	41	305
07:15 AM	78	138	11	0	227	17	2	0	0	19	0	57	13	0	70	11	8	17	0	36	352
07:30 AM	72	101	18	0	191	16	1	1	0	18	5	67	12	0	84	8	7	21	0	36	329
07:45 AM	82	108	11	0	201	19	16	0	0	35	5	59	7	2	73	10	6	16	0	32	341
Total Volume	303	436	47	0	786	61	33	1	0	95	10	245	44	2	301	37	31	77	0	145	1327
% App. Total	38.5	55.5	6	0		64.2	34.7	1.1	0		3.3	81.4	14.6	0.7		25.5	21.4	53.1	0		
PHF	.924	.790	.653	.000	.866	.803	.516	.250	.000	.679	.500	.914	.846	.250	.896	.841	.775	.837	.000	.884	.942



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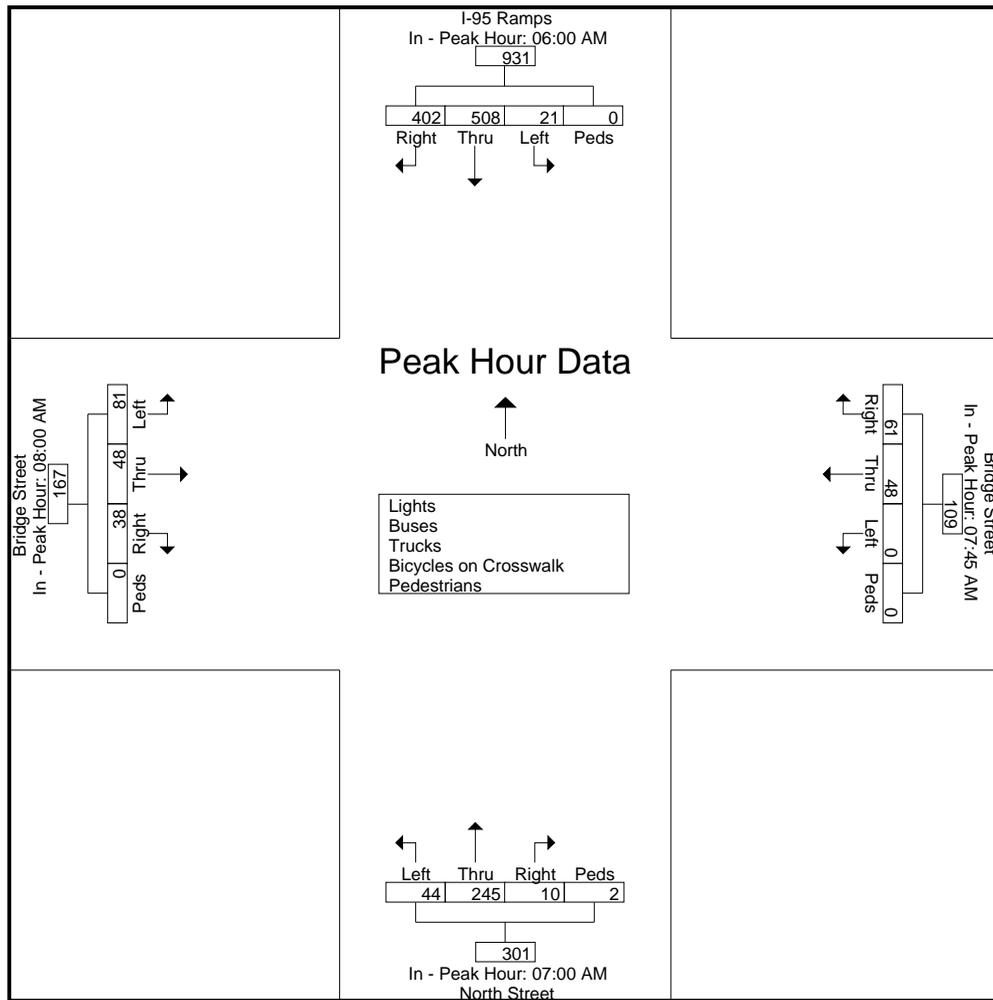
Kensington, Connecticut 06037
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File Name : 18643
Site Code : 18643
Start Date : 3/28/2019
Page No : 3

Start Time	I-95 Ramps From North					Bridge Street From East					North Street From South					Bridge 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 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	06:00 AM					07:45 AM					07:00 AM					08:00 AM				
+0 mins.	124	153	4	0	281	19	16	0	0	35	0	62	12	0	74	5	14	14	0	33
+15 mins.	121	142	4	0	267	11	7	0	0	18	0	57	13	0	70	12	10	20	0	42
+30 mins.	87	110	6	0	203	15	13	0	0	28	5	67	12	0	84	11	13	30	0	54
+45 mins.	70	103	7	0	180	16	12	0	0	28	5	59	7	2	73	10	11	17	0	38
Total Volume	402	508	21	0	931	61	48	0	0	109	10	245	44	2	301	38	48	81	0	167
% App. Total	43.2	54.6	2.3	0		56	44	0	0		3.3	81.4	14.6	0.7		22.8	28.7	48.5	0	
PHF	.810	.830	.750	.000	.828	.803	.750	.000	.000	.779	.500	.914	.846	.250	.896	.792	.857	.675	.000	.773



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Bridge Street at North St/I-95 Ramps
Groton, Connecticut

File Name : 18644
Site Code : 18644
Start Date : 3/27/2019
Page No : 1

Groups Printed- Lights - Buses - Trucks - Bicycles on Crosswalk - Pedestrians

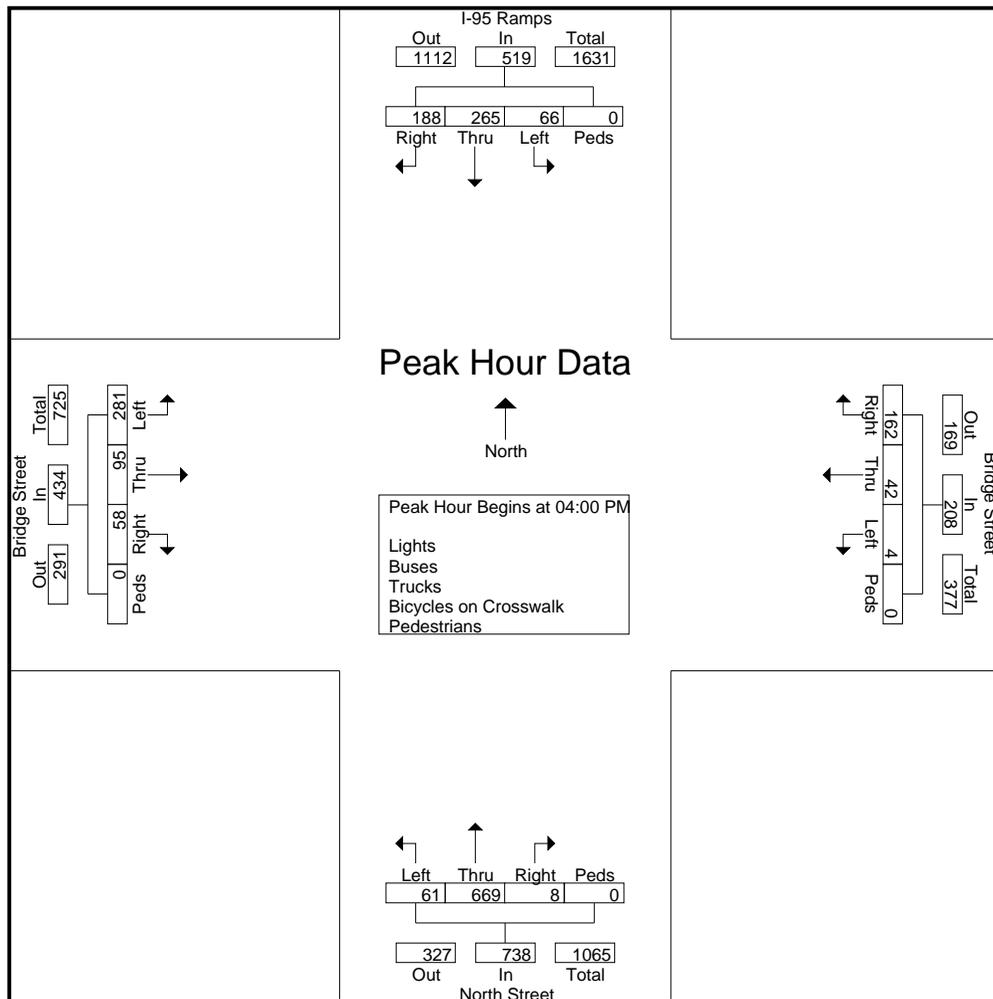
Start Time	I-95 Ramps From North					Bridge Street From East					North Street From South					Bridge Street From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
03:00 PM	54	88	10	0	152	32	14	3	0	49	1	184	14	0	199	25	23	89	0	137	537
03:15 PM	52	67	14	0	133	25	11	0	0	36	2	170	17	1	190	11	23	57	0	91	450
03:30 PM	50	50	9	0	109	41	13	0	0	54	1	148	16	0	165	16	21	79	1	117	445
03:45 PM	50	57	8	0	115	32	8	1	0	41	1	157	10	0	168	13	24	65	0	102	426
Total	206	262	41	0	509	130	46	4	0	180	5	659	57	1	722	65	91	290	1	447	1858
04:00 PM	40	70	21	0	131	57	10	2	0	69	2	201	16	0	219	16	19	71	0	106	525
04:15 PM	54	53	18	0	125	40	8	1	0	49	3	162	14	0	179	14	26	73	0	113	466
04:30 PM	45	70	13	0	128	33	12	1	0	46	2	162	16	0	180	14	32	68	0	114	468
04:45 PM	49	72	14	0	135	32	12	0	0	44	1	144	15	0	160	14	18	69	0	101	440
Total	188	265	66	0	519	162	42	4	0	208	8	669	61	0	738	58	95	281	0	434	1899
05:00 PM	54	40	14	0	108	39	12	0	0	51	1	124	12	0	137	8	20	57	0	85	381
05:15 PM	48	67	9	0	124	25	12	0	0	37	3	126	14	0	143	14	24	56	0	94	398
05:30 PM	35	52	9	0	96	29	14	3	0	46	1	119	10	0	130	4	12	42	0	58	330
05:45 PM	25	59	8	0	92	21	6	0	0	27	5	91	8	0	104	5	21	40	0	66	289
Total	162	218	40	0	420	114	44	3	0	161	10	460	44	0	514	31	77	195	0	303	1398
Grand Total	556	745	147	0	1448	406	132	11	0	549	23	1788	162	1	1974	154	263	766	1	1184	5155
Apprch %	38.4	51.5	10.2	0		74	24	2	0		1.2	90.6	8.2	0.1		13	22.2	64.7	0.1		
Total %	10.8	14.5	2.9	0	28.1	7.9	2.6	0.2	0	10.6	0.4	34.7	3.1	0	38.3	3	5.1	14.9	0	23	
Lights	549	737	138	0	1424	401	129	10	0	540	22	1771									
% Lights	98.7	98.9	93.9	0	98.3	98.8	97.7	90.9	0	98.4	95.7	99	99.4	0	99	98.7	98.5	99.3	0	99	98.7
Buses	2	2	4	0	8	4	1	1	0	6	0	9	1	0	10	1	1	2	0	4	28
% Buses	0.4	0.3	2.7	0	0.6	1	0.8	9.1	0	1.1	0	0.5	0.6	0	0.5	0.6	0.4	0.3	0	0.3	0.5
Trucks	5	6	5	0	16	1	2	0	0	3	1	8	0	0	9	1	3	3	0	7	35
% Trucks	0.9	0.8	3.4	0	1.1	0.2	1.5	0	0	0.5	4.3	0.4	0	0	0.5	0.6	1.1	0.4	0	0.6	0.7
Bicycles on Crosswalk																					
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0.1	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0.1	0	0	0	0	0	0

Connecticut Counts LLC

Kensington, Connecticut 06037
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File Name : 18644
Site Code : 18644
Start Date : 3/27/2019
Page No : 2

Start Time	I-95 Ramps From North					Bridge Street From East					North Street From South					Bridge 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 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	40	70	21	0	131	57	10	2	0	69	2	201	16	0	219	16	19	71	0	106	525
04:15 PM	54	53	18	0	125	40	8	1	0	49	3	162	14	0	179	14	26	73	0	113	466
04:30 PM	45	70	13	0	128	33	12	1	0	46	2	162	16	0	180	14	32	68	0	114	468
04:45 PM	49	72	14	0	135	32	12	0	0	44	1	144	15	0	160	14	18	69	0	101	440
Total Volume	188	265	66	0	519	162	42	4	0	208	8	669	61	0	738	58	95	281	0	434	1899
% App. Total	36.2	51.1	12.7	0		77.9	20.2	1.9	0		1.1	90.7	8.3	0		13.4	21.9	64.7	0		
PHF	.870	.920	.786	.000	.961	.711	.875	.500	.000	.754	.667	.832	.953	.000	.842	.906	.742	.962	.000	.952	.904



Connecticut Counts LLC

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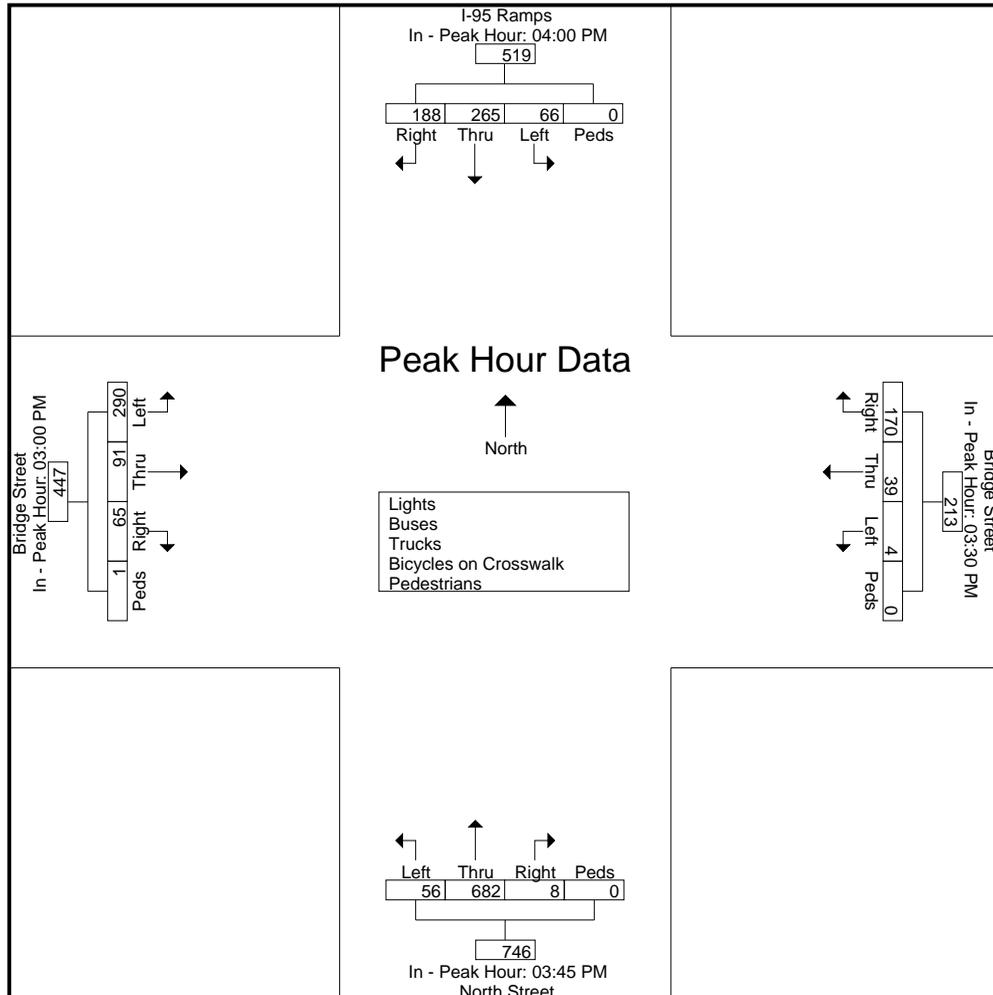
File Name : 18644
Site Code : 18644
Start Date : 3/27/2019
Page No : 3

Start Time	I-95 Ramps From North					Bridge Street From East					North Street From South					Bridge 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 03:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM					03:30 PM					03:45 PM					03:00 PM				
+0 mins.	40	70	21	0	131	41	13	0	0	54	1	157	10	0	168	25	23	89	0	137
+15 mins.	54	53	18	0	125	32	8	1	0	41	2	201	16	0	219	11	23	57	0	91
+30 mins.	45	70	13	0	128	57	10	2	0	69	3	162	14	0	179	16	21	79	1	117
+45 mins.	49	72	14	0	135	40	8	1	0	49	2	162	16	0	180	13	24	65	0	102
Total Volume	188	265	66	0	519	170	39	4	0	213	8	682	56	0	746	65	91	290	1	447
% App. Total	36.2	51.1	12.7	0		79.8	18.3	1.9	0		1.1	91.4	7.5	0		14.5	20.4	64.9	0.2	
PHF	.870	.920	.786	.000	.961	.746	.750	.500	.000	.772	.667	.848	.875	.000	.852	.650	.948	.815	.250	.816



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Poquonock Rd at Rainville/Old Farm Rd
Groton, Connecticut

File Name : 18651
Site Code : 18651
Start Date : 3/28/2019
Page No : 1

Groups Printed- Lights - Buses - Trucks - Bicycles on Crosswalk - Pedestrians

Start Time	Old Farm Road From North					Poquonock Road From East					Rainville Ave From South					Poquonock Road 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	
06:00 AM	4	1	5	0	10	0	18	47	0	65	37	1	0	0	38	3	14	1	0	18	131
06:15 AM	4	5	5	1	15	1	18	39	0	58	44	1	0	0	45	0	16	0	0	16	134
06:30 AM	4	2	2	1	9	0	15	37	0	52	47	0	0	0	47	4	13	1	0	18	126
06:45 AM	7	7	6	2	22	2	21	40	0	63	89	1	1	0	91	0	39	3	0	42	218
Total	19	15	18	4	56	3	72	163	0	238	217	3	1	0	221	7	82	5	0	94	609
07:00 AM	1	4	3	1	9	2	20	45	0	67	71	1	2	0	74	1	41	1	0	43	193
07:15 AM	3	6	2	0	11	1	20	54	0	75	60	0	0	0	60	0	24	3	0	27	173
07:30 AM	7	10	4	1	22	3	27	47	0	77	72	5	0	0	77	2	23	3	0	28	204
07:45 AM	3	6	2	1	12	0	22	42	0	64	68	1	1	0	70	1	29	2	0	32	178
Total	14	26	11	3	54	6	89	188	0	283	271	7	3	0	281	4	117	9	0	130	748
08:00 AM	2	4	2	0	8	1	28	48	0	77	51	2	0	0	53	4	24	1	0	29	167
08:15 AM	1	4	0	2	7	1	33	38	0	72	62	2	0	0	64	5	23	0	0	28	171
08:30 AM	3	3	5	1	12	2	37	47	0	86	66	2	0	0	68	4	33	1	0	38	204
08:45 AM	2	4	10	1	17	3	44	59	0	106	60	4	0	0	64	3	32	0	0	35	222
Total	8	15	17	4	44	7	142	192	0	341	239	10	0	0	249	16	112	2	0	130	764
Grand Total	41	56	46	11	154	16	303	543	0	862	727	20	4	0	751	27	311	16	0	354	2121
Apprch %	26.6	36.4	29.9	7.1		1.9	35.2	63	0		96.8	2.7	0.5	0		7.6	87.9	4.5	0		
Total %	1.9	2.6	2.2	0.5	7.3	0.8	14.3	25.6	0	40.6	34.3	0.9	0.2	0	35.4	1.3	14.7	0.8	0	16.7	
Lights	39	51	42	0	132	14	285	493	0	792	678	16	3	0	697	25	295	10	0	330	1951
% Lights	95.1	91.1	91.3	0	85.7	87.5	94.1	90.8	0	91.9	93.3	80	75	0	92.8	92.6	94.9	62.5	0	93.2	92
Buses	0	5	3	0	8	1	12	46	0	59	40	3	1	0	44	2	13	5	0	20	131
% Buses	0	8.9	6.5	0	5.2	6.2	4	8.5	0	6.8	5.5	15	25	0	5.9	7.4	4.2	31.2	0	5.6	6.2
Trucks	2	0	1	0	3	1	6	4	0	11	9	1	0	0	10	0	3	1	0	4	28
% Trucks	4.9	0	2.2	0	1.9	6.2	2	0.7	0	1.3	1.2	5	0	0	1.3	0	1	6.2	0	1.1	1.3
Bicycles on Crosswalk																					
% Bicycles on Crosswalk	0	0	0	9.1	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
% Pedestrians	0	0	0	90.9	6.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5

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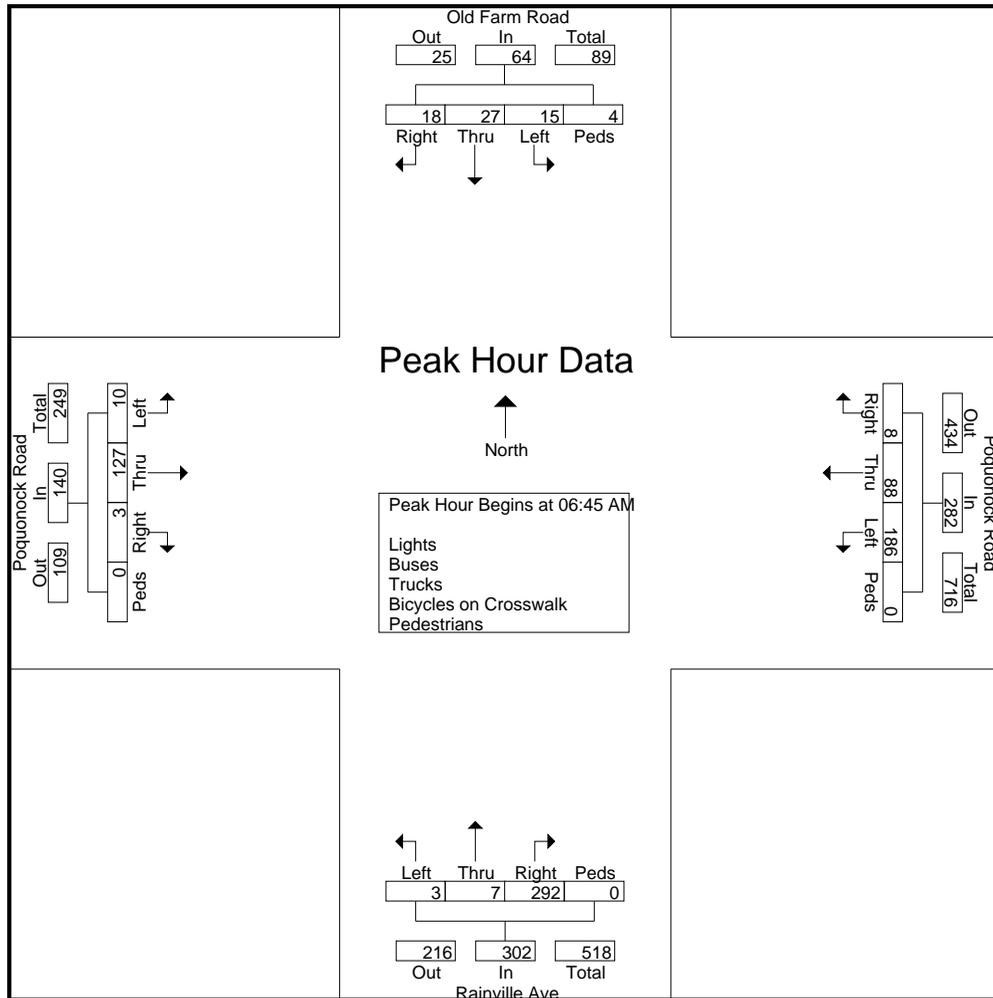
File Name : 18651
Site Code : 18651
Start Date : 3/28/2019
Page No : 2

Start Time	Old Farm Road From North					Poquonock Road From East					Rainville Ave From South					Poquonock Road 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 06:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 06:45 AM

06:45 AM	7	7	6	2	22	2	21	40	0	63	89	1	1	0	91	0	39	3	0	42	218
07:00 AM	1	4	3	1	9	2	20	45	0	67	71	1	2	0	74	1	41	1	0	43	193
07:15 AM	3	6	2	0	11	1	20	54	0	75	60	0	0	0	60	0	24	3	0	27	173
07:30 AM	7	10	4	1	22	3	27	47	0	77	72	5	0	0	77	2	23	3	0	28	204
Total Volume	18	27	15	4	64	8	88	186	0	282	292	7	3	0	302	3	127	10	0	140	788
% App. Total	28.1	42.2	23.4	6.2		2.8	31.2	66	0		96.7	2.3	1	0		2.1	90.7	7.1	0		
PHF	.643	.675	.625	.500	.727	.667	.815	.861	.000	.916	.820	.350	.375	.000	.830	.375	.774	.833	.000	.814	.904



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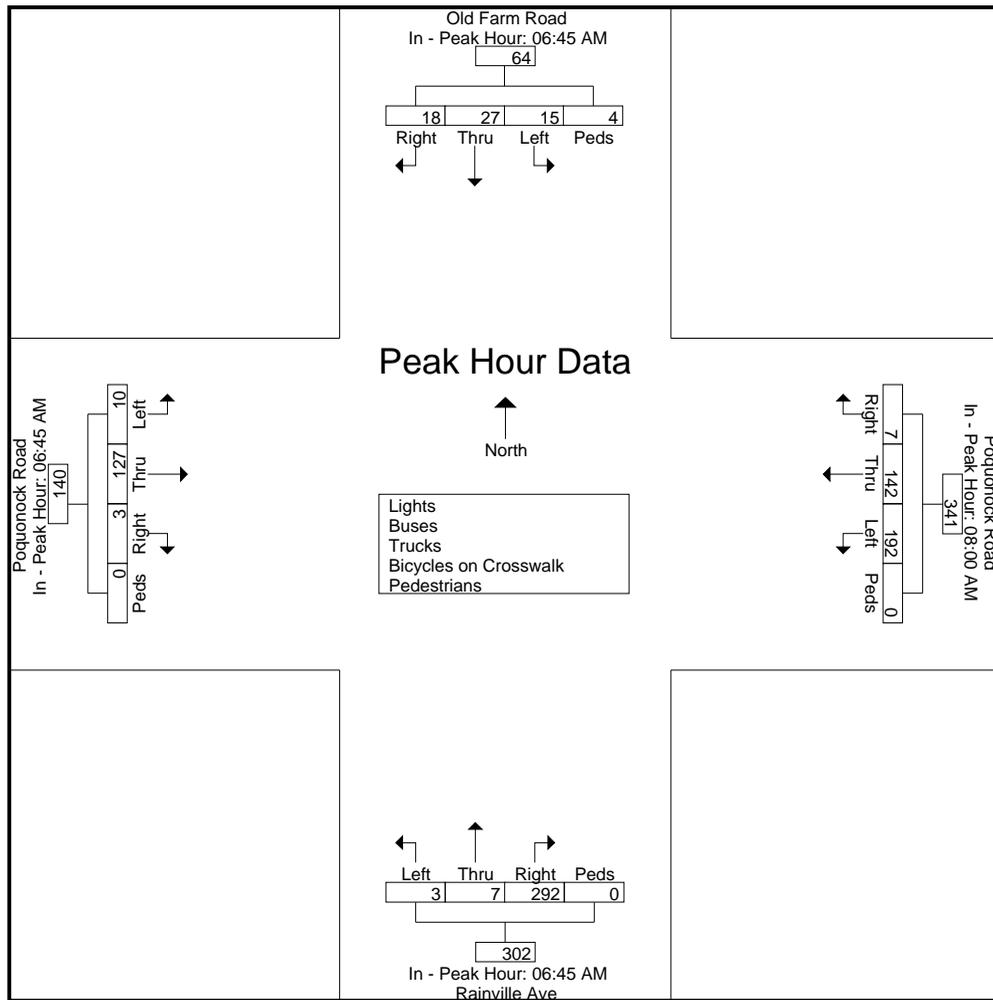
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18651
Site Code : 18651
Start Date : 3/28/2019
Page No : 3

Start Time	Old Farm Road From North					Poquonock Road From East					Rainville Ave From South					Poquonock Road 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 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	06:45 AM					08:00 AM					06:45 AM					06:45 AM				
+0 mins.	7	7	6	2	22	1	28	48	0	77	89	1	1	0	91	0	39	3	0	42
+15 mins.	1	4	3	1	9	1	33	38	0	72	71	1	2	0	74	1	41	1	0	43
+30 mins.	3	6	2	0	11	2	37	47	0	86	60	0	0	0	60	0	24	3	0	27
+45 mins.	7	10	4	1	22	3	44	59	0	106	72	5	0	0	77	2	23	3	0	28
Total Volume	18	27	15	4	64	7	142	192	0	341	292	7	3	0	302	3	127	10	0	140
% App. Total	28.1	42.2	23.4	6.2		2.1	41.6	56.3	0		96.7	2.3	1	0		2.1	90.7	7.1	0	
PHF	.643	.675	.625	.500	.727	.583	.807	.814	.000	.804	.820	.350	.375	.000	.830	.375	.774	.833	.000	.814



Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

Poquonock Rd at Rainville/Old Farm Rd
Groton, Connecticut

File Name : 18652
Site Code : 18652
Start Date : 3/27/2019
Page No : 1

Groups Printed- Lights - Buses - Trucks - Bicycles on Crosswalk - Pedestrians

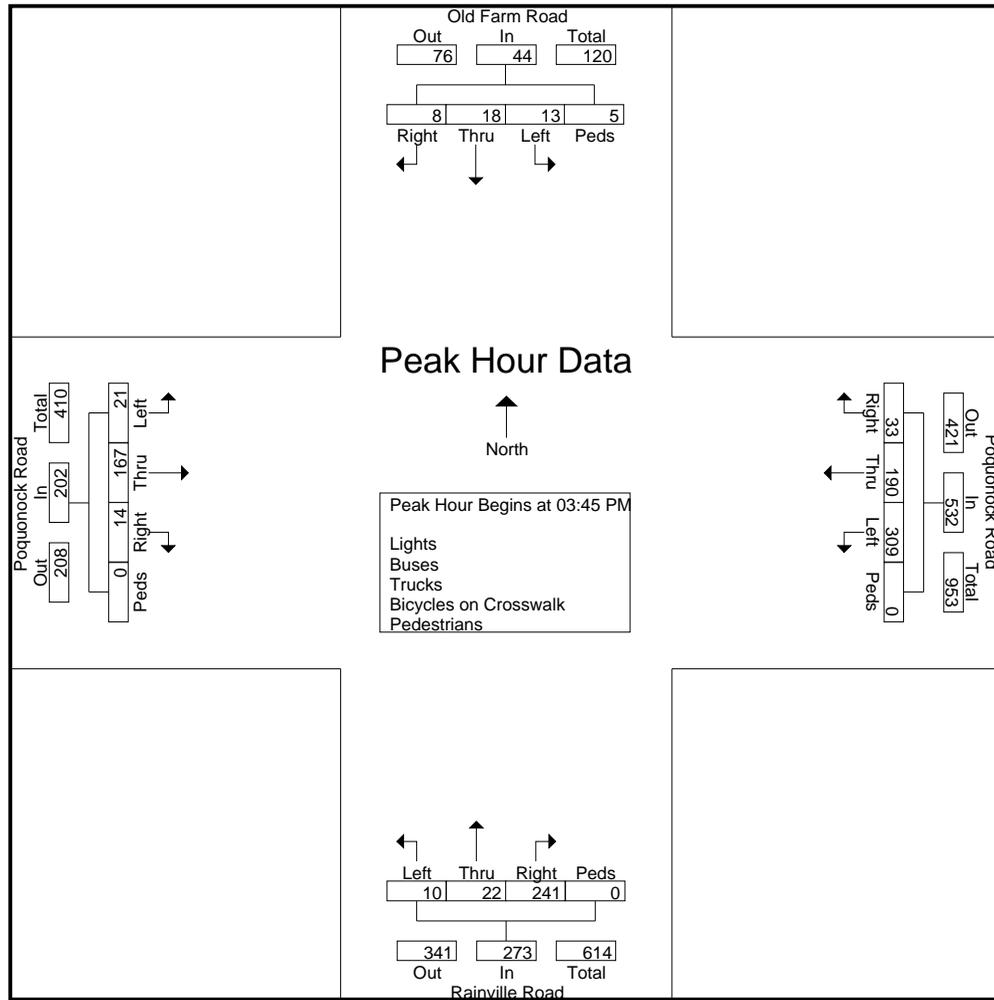
Start Time	Old Farm Road From North					Poquonock Road From East					Rainville Road From South					Poquonock Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
03:00 PM	2	6	2	0	10	3	69	74	2	148	87	2	3	0	92	3	42	8	0	53	303
03:15 PM	1	3	2	2	8	6	56	57	0	119	48	2	0	0	50	5	32	5	0	42	219
03:30 PM	6	1	6	0	13	6	38	66	0	110	64	6	1	0	71	2	49	5	2	58	252
03:45 PM	1	4	4	3	12	8	51	92	0	151	46	2	6	0	54	5	35	5	0	45	262
Total	10	14	14	5	43	23	214	289	2	528	245	12	10	0	267	15	158	23	2	198	1036
04:00 PM	1	4	5	2	12	11	38	55	0	104	59	7	1	0	67	1	50	4	0	55	238
04:15 PM	5	3	2	0	10	7	43	79	0	129	82	8	3	0	93	4	41	6	0	51	283
04:30 PM	1	7	2	0	10	7	58	83	0	148	54	5	0	0	59	4	41	6	0	51	268
04:45 PM	2	2	2	0	6	7	62	67	0	136	47	6	2	0	55	3	46	3	0	52	249
Total	9	16	11	2	38	32	201	284	0	517	242	26	6	0	274	12	178	19	0	209	1038
05:00 PM	5	8	6	1	20	7	33	58	0	98	57	7	2	0	66	3	36	3	0	42	226
05:15 PM	1	3	2	3	9	4	53	46	0	103	52	5	3	0	60	6	38	6	0	50	222
05:30 PM	1	3	0	2	6	7	37	81	0	125	66	2	2	0	70	1	26	4	0	31	232
05:45 PM	4	6	4	1	15	9	36	58	0	103	32	4	1	0	37	1	19	6	0	26	181
Total	11	20	12	7	50	27	159	243	0	429	207	18	8	0	233	11	119	19	0	149	861
Grand Total	30	50	37	14	131	82	574	816	2	1474	694	56	24	0	774	38	455	61	2	556	2935
Apprch %	22.9	38.2	28.2	10.7		5.6	38.9	55.4	0.1		89.7	7.2	3.1	0		6.8	81.8	11	0.4		
Total %	1	1.7	1.3	0.5	4.5	2.8	19.6	27.8	0.1	50.2	23.6	1.9	0.8	0	26.4	1.3	15.5	2.1	0.1	18.9	
Lights	29	47	37	0	113	80	566	777	0	1423	651	55	23	0	729	37	441	60	0	538	2803
% Lights	96.7	94	100	0	86.3	97.6	98.6	95.2	0	96.5	93.8	98.2	95.8	0	94.2	97.4	96.9	98.4	0	96.8	95.5
Buses	1	2	0	0	3	2	4	32	0	38	33	0	0	0	33	0	9	1	0	10	84
% Buses	3.3	4	0	0	2.3	2.4	0.7	3.9	0	2.6	4.8	0	0	0	4.3	0	2	1.6	0	1.8	2.9
Trucks	0	1	0	0	1	0	4	7	0	11	10	1	1	0	12	1	5	0	0	6	30
% Trucks	0	2	0	0	0.8	0	0.7	0.9	0	0.7	1.4	1.8	4.2	0	1.6	2.6	1.1	0	0	1.1	1
Bicycles on Crosswalk																					
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	14	14	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2	18
% Pedestrians	0	0	0	100	10.7	0	0	0	100	0.1	0	0	0	0	0	0	0	0	100	0.4	0.6

Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 18652
Site Code : 18652
Start Date : 3/27/2019
Page No : 2

Start Time	Old Farm Road From North					Poquonock Road From East					Rainville Road From South					Poquonock Road 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 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	1	4	4	3	12	8	51	92	0	151	46	2	6	0	54	5	35	5	0	45	262
04:00 PM	1	4	5	2	12	11	38	55	0	104	59	7	1	0	67	1	50	4	0	55	238
04:15 PM	5	3	2	0	10	7	43	79	0	129	82	8	3	0	93	4	41	6	0	51	283
04:30 PM	1	7	2	0	10	7	58	83	0	148	54	5	0	0	59	4	41	6	0	51	268
Total Volume	8	18	13	5	44	33	190	309	0	532	241	22	10	0	273	14	167	21	0	202	1051
% App. Total	18.2	40.9	29.5	11.4		6.2	35.7	58.1	0		88.3	8.1	3.7	0		6.9	82.7	10.4	0		
PHF	.400	.643	.650	.417	.917	.750	.819	.840	.000	.881	.735	.688	.417	.000	.734	.700	.835	.875	.000	.918	.928



Connecticut Counts LLC

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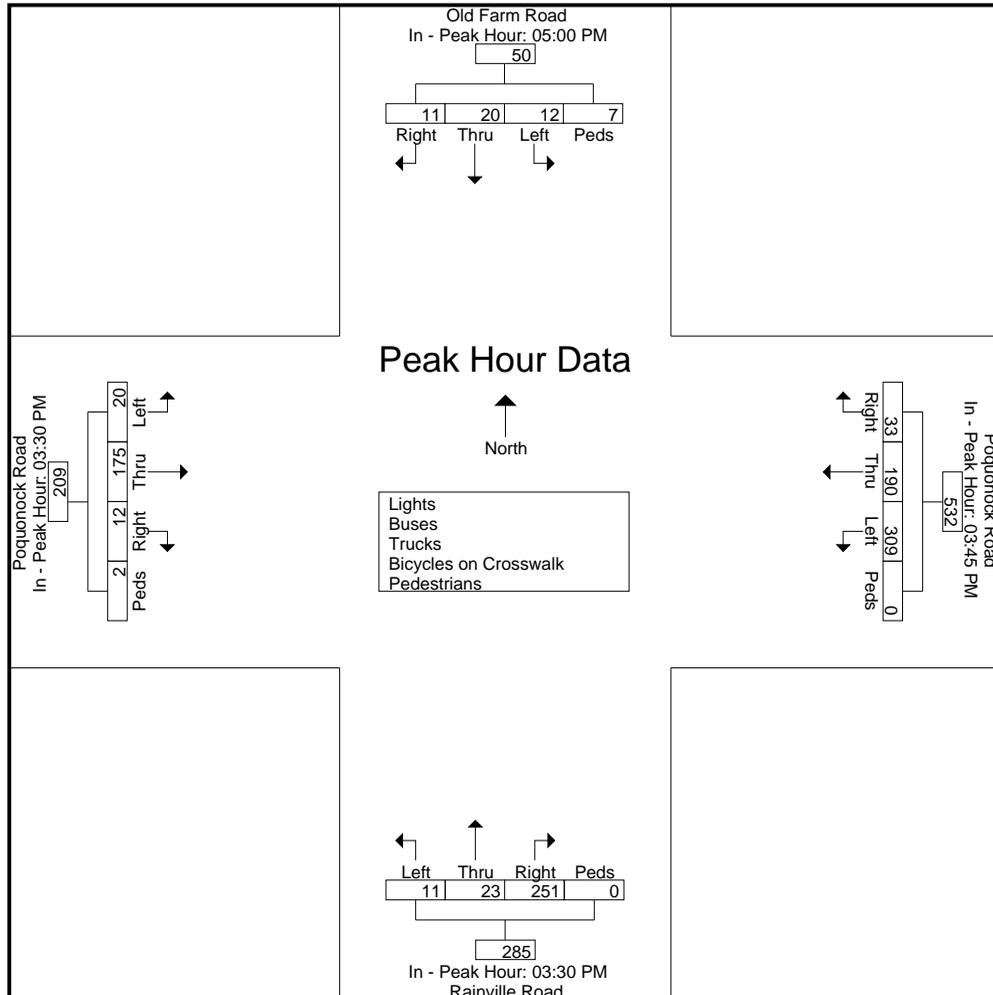
File Name : 18652
Site Code : 18652
Start Date : 3/27/2019
Page No : 3

	Old Farm Road From North					Poquonock Road From East					Rainville Road From South					Poquonock Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total

Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM					03:45 PM					03:30 PM					03:30 PM				
+0 mins.	5	8	6	1	20	8	51	92	0	151	64	6	1	0	71	2	49	5	2	58
+15 mins.	1	3	2	3	9	11	38	55	0	104	46	2	6	0	54	5	35	5	0	45
+30 mins.	1	3	0	2	6	7	43	79	0	129	59	7	1	0	67	1	50	4	0	55
+45 mins.	4	6	4	1	15	7	58	83	0	148	82	8	3	0	93	4	41	6	0	51
Total Volume	11	20	12	7	50	33	190	309	0	532	251	23	11	0	285	12	175	20	2	209
% App. Total	22	40	24	14		6.2	35.7	58.1	0		88.1	8.1	3.9	0		5.7	83.7	9.6	1	
PHF	.550	.625	.500	.583	.625	.750	.819	.840	.000	.881	.765	.719	.458	.000	.766	.600	.875	.833	.250	.901



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Route 349 at Meridian Street
Groton, Connecticut

File Name : 18649
Site Code : 18649
Start Date : 3/28/2019
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	Route 349 From North					Meridian Street From East					Route 349 From South					Meridian 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	
06:00 AM	41	151	1	0	193	5	6	10	0	21	2	32	1	0	35	5	1	8	0	14	263
06:15 AM	41	253	3	0	297	8	3	12	0	23	2	58	0	0	60	10	1	6	0	17	397
06:30 AM	27	177	1	0	205	16	11	8	0	35	0	74	4	4	82	5	5	9	0	19	341
06:45 AM	35	208	5	0	248	21	9	12	0	42	1	77	3	0	81	9	10	10	0	29	400
Total	144	789	10	0	943	50	29	42	0	121	5	241	8	4	258	29	17	33	0	79	1401
07:00 AM	34	181	9	0	224	19	13	20	0	52	3	109	3	1	116	9	14	28	0	51	443
07:15 AM	28	235	5	0	268	11	9	16	2	38	3	98	0	1	102	16	10	19	0	45	453
07:30 AM	30	266	5	0	301	15	9	18	0	42	3	124	8	0	135	21	6	17	0	44	522
07:45 AM	51	319	8	0	378	17	16	25	0	58	4	101	11	0	116	26	9	26	0	61	613
Total	143	1001	27	0	1171	62	47	79	2	190	13	432	22	2	469	72	39	90	0	201	2031
08:00 AM	27	195	6	0	228	15	22	14	1	52	3	91	11	0	105	9	10	17	0	36	421
08:15 AM	35	295	13	0	343	20	17	13	0	50	4	98	2	0	104	30	18	26	0	74	571
08:30 AM	27	279	4	0	310	24	12	21	0	57	1	92	2	0	95	14	15	25	0	54	516
08:45 AM	16	198	10	0	224	13	13	19	0	45	2	103	4	0	109	12	8	25	0	45	423
Total	105	967	33	0	1105	72	64	67	1	204	10	384	19	0	413	65	51	93	0	209	1931
Grand Total	392	2757	70	0	3219	184	140	188	3	515	28	1057	49	6	1140	166	107	216	0	489	5363
Apprch %	12.2	85.6	2.2	0		35.7	27.2	36.5	0.6		2.5	92.7	4.3	0.5		33.9	21.9	44.2	0		
Total %	7.3	51.4	1.3	0	60	3.4	2.6	3.5	0.1	9.6	0.5	19.7	0.9	0.1	21.3	3.1	2	4	0	9.1	
Unshifted	390	2726													1020						
% Unshifted	99.5	98.9	100	0	99	98.9	90.7	95.7	100	95.5	96.4	96.5	83.7	100	96	93.4	93.5	98.6	0	95.7	97.7
Bank 1	2	18	0	0	20	1	3	4	0	8	0	14	0	0	14	1	3	2	0	6	48
% Bank 1	0.5	0.7	0	0	0.6	0.5	2.1	2.1	0	1.6	0	1.3	0	0	1.2	0.6	2.8	0.9	0	1.2	0.9
Bank 2	0	13	0	0	13	1	10	4	0	15	1	23	8	0	32	10	4	1	0	15	75
% Bank 2	0	0.5	0	0	0.4	0.5	7.1	2.1	0	2.9	3.6	2.2	16.3	0	2.8	6	3.7	0.5	0	3.1	1.4

Connecticut Counts LLC

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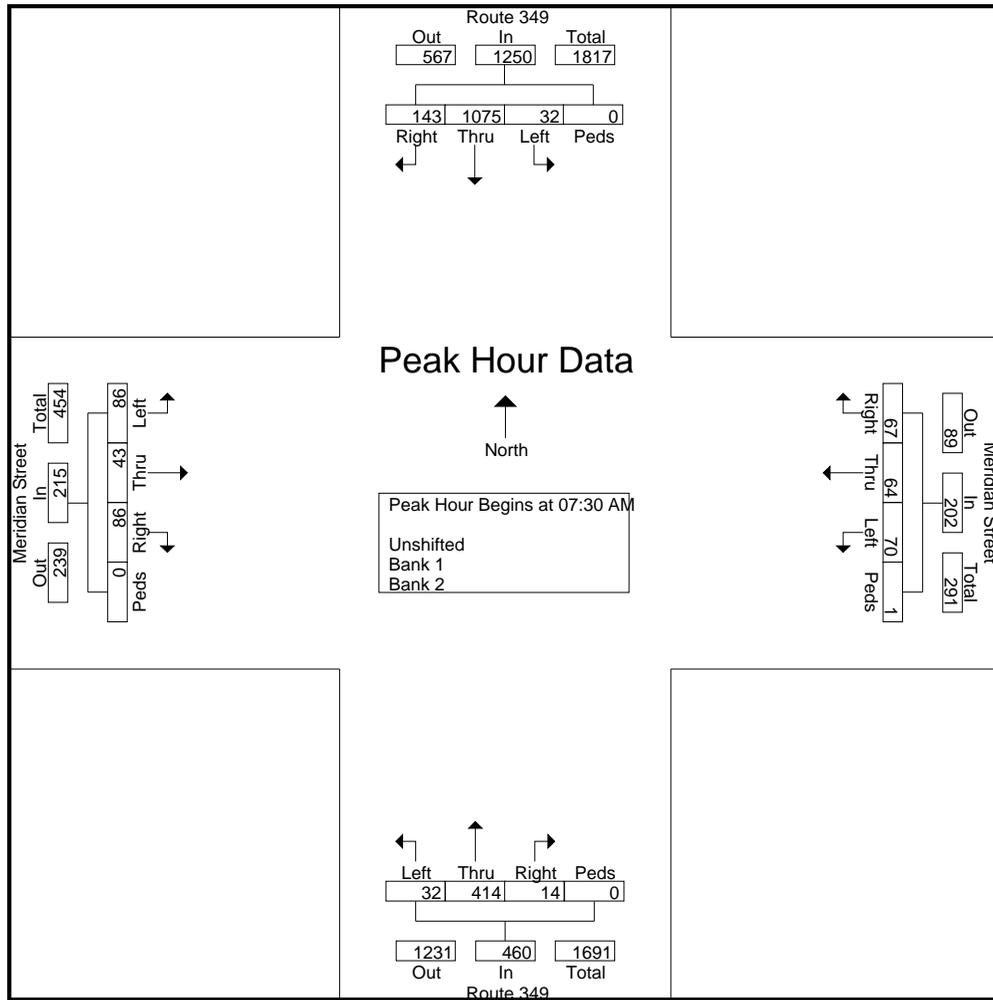
File Name : 18649
Site Code : 18649
Start Date : 3/28/2019
Page No : 2

Start Time	Route 349 From North					Meridian Street From East					Route 349 From South					Meridian 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 06:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

07:30 AM	30	266	5	0	301	15	9	18	0	42	3	124	8	0	135	21	6	17	0	44	522
07:45 AM	51	319	8	0	378	17	16	25	0	58	4	101	11	0	116	26	9	26	0	61	613
08:00 AM	27	195	6	0	228	15	22	14	1	52	3	91	11	0	105	9	10	17	0	36	421
08:15 AM	35	295	13	0	343	20	17	13	0	50	4	98	2	0	104	30	18	26	0	74	571
Total Volume	143	1075	32	0	1250	67	64	70	1	202	14	414	32	0	460	86	43	86	0	215	2127
% App. Total	11.4	86	2.6	0		33.2	31.7	34.7	0.5		3	90	7	0		40	20	40	0		
PHF	.701	.842	.615	.000	.827	.838	.727	.700	.250	.871	.875	.835	.727	.000	.852	.717	.597	.827	.000	.726	.867



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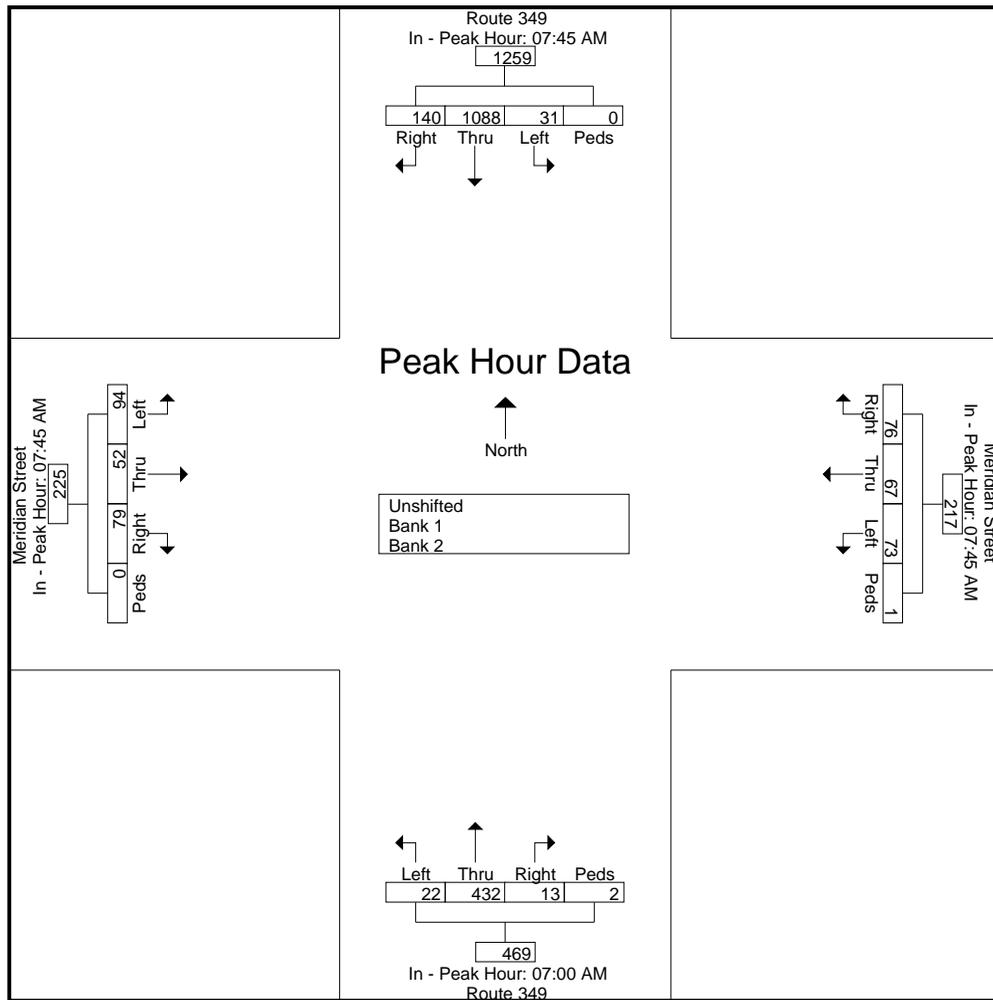
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18649
Site Code : 18649
Start Date : 3/28/2019
Page No : 3

Start Time	Route 349 From North					Meridian Street From East					Route 349 From South					Meridian 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 06:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM					07:45 AM					07:00 AM					07:45 AM				
+0 mins.	51	319	8	0	378	17	16	25	0	58	3	109	3	1	116	26	9	26	0	61
+15 mins.	27	195	6	0	228	15	22	14	1	52	3	98	0	1	102	9	10	17	0	36
+30 mins.	35	295	13	0	343	20	17	13	0	50	3	124	8	0	135	30	18	26	0	74
+45 mins.	27	279	4	0	310	24	12	21	0	57	4	101	11	0	116	14	15	25	0	54
Total Volume	140	1088	31	0	1259	76	67	73	1	217	13	432	22	2	469	79	52	94	0	225
% App. Total	11.1	86.4	2.5	0		35	30.9	33.6	0.5		2.8	92.1	4.7	0.4		35.1	23.1	41.8	0	
PHF	.686	.853	.596	.000	.833	.792	.761	.730	.250	.935	.813	.871	.500	.500	.869	.658	.722	.904	.000	.760



Connecticut Counts LLC

Kensington, Connecticut 06037

(860) 828-1693

Route 349 at Meridian Street
Groton, Connecticut

File Name : 18650
Site Code : 18650
Start Date : 3/28/2019
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

Start Time	Route 359 From North					Meridian Street From East					Route 359 From South					Meridian 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	
03:00 PM	16	91	10	0	117	14	22	17	0	53	17	313	11	0	341	19	19	64	1	103	614
03:15 PM	18	95	9	0	122	15	26	10	0	51	11	302	2	1	316	19	33	64	0	116	605
03:30 PM	11	56	8	0	75	8	17	7	0	32	3	198	6	0	207	11	27	29	0	67	381
03:45 PM	15	75	15	0	105	25	26	12	0	63	13	252	13	0	278	9	32	50	0	91	537
Total	60	317	42	0	419	62	91	46	0	199	44	1065	32	1	1142	58	111	207	1	377	2137
04:00 PM	13	62	15	0	90	13	23	16	0	52	16	268	10	0	294	10	23	62	0	95	531
04:15 PM	19	82	17	1	119	13	20	12	0	45	19	320	9	0	348	10	17	53	0	80	592
04:30 PM	38	73	8	2	121	22	24	12	0	58	10	266	5	0	281	17	28	59	0	104	564
04:45 PM	17	96	10	0	123	21	24	15	0	60	16	307	12	0	335	9	27	43	0	79	597
Total	87	313	50	3	453	69	91	55	0	215	61	1161	36	0	1258	46	95	217	0	358	2284
05:00 PM	14	93	13	0	120	21	28	15	0	64	14	275	8	0	297	16	22	46	0	84	565
05:15 PM	11	88	17	0	116	19	19	18	0	56	19	235	6	1	261	12	19	38	0	69	502
05:30 PM	21	61	11	0	93	15	19	12	0	46	12	223	9	0	244	18	16	27	0	61	444
05:45 PM	19	62	12	0	93	12	25	11	0	48	13	198	6	0	217	11	19	31	0	61	419
Total	65	304	53	0	422	67	91	56	0	214	58	931	29	1	1019	57	76	142	0	275	1930
Grand Total	212	934	145	3	1294	198	273	157	0	628	163	3157	97	2	3419	161	282	566	1	1010	6351
Apprch %	16.4	72.2	11.2	0.2		31.5	43.5	25	0		4.8	92.3	2.8	0.1		15.9	27.9	56	0.1		
Total %	3.3	14.7	2.3	0	20.4	3.1	4.3	2.5	0	9.9	2.6	49.7	1.5	0	53.8	2.5	4.4	8.9	0	15.9	
Unshifted	212	917	145	3	1277	197	267	152	0	616	162	3133				161	282	566	1	1010	6351
% Unshifted	100	98.2	100	100	98.7	99.5	97.8	96.8	0	98.1	99.4	99.2	93.8	100	99.1	96.9	99.3	99.8	100	99.2	98.9
Bank 1	0	6	0	0	6	1	0	3	0	4	0	13	0	0	13	0	0	1	0	1	24
% Bank 1	0	0.6	0	0	0.5	0.5	0	1.9	0	0.6	0	0.4	0	0	0.4	0	0	0.2	0	0.1	0.4
Bank 2	0	11	0	0	11	0	6	2	0	8	1	11	6	0	18	5	2	0	0	7	44
% Bank 2	0	1.2	0	0	0.9	0	2.2	1.3	0	1.3	0.6	0.3	6.2	0	0.5	3.1	0.7	0	0	0.7	0.7

Connecticut Counts LLC

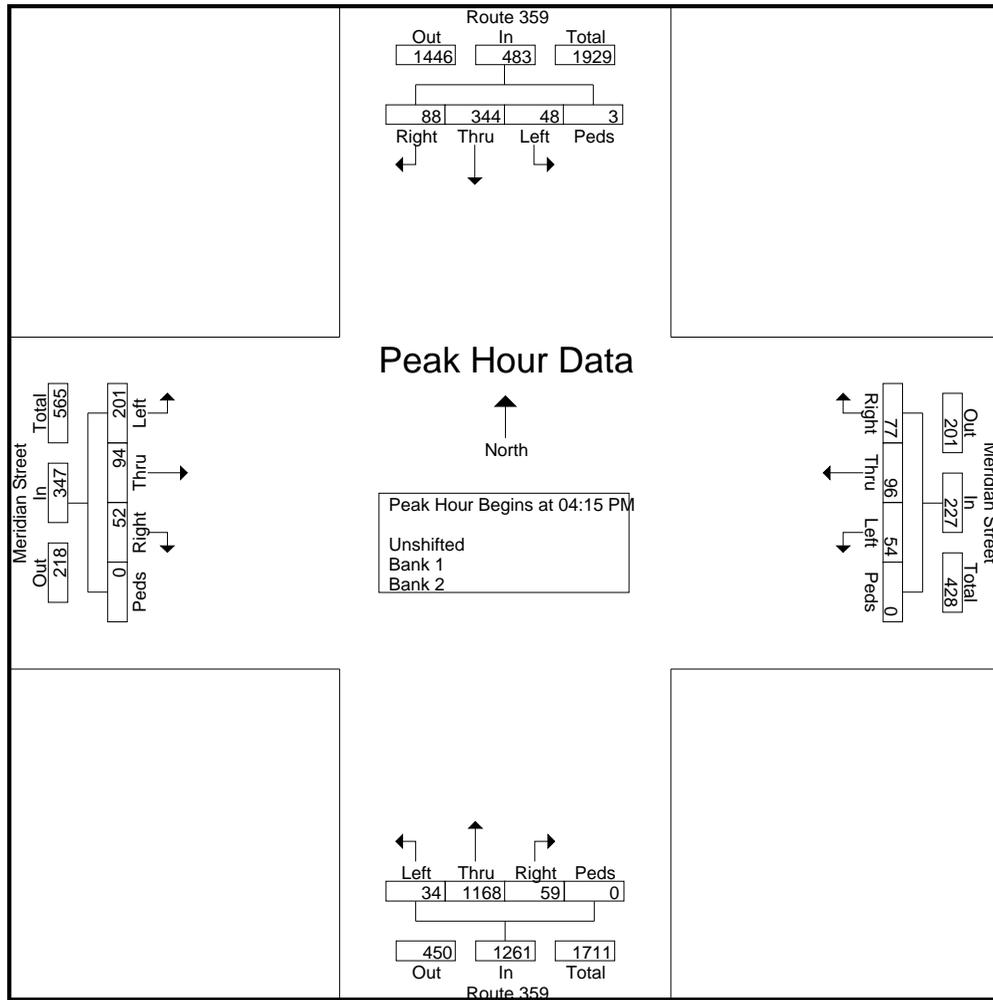
Kensington, Connecticut 06037
(860) 828-1693

File Name : 18650
Site Code : 18650
Start Date : 3/28/2019
Page No : 2

Start Time	Route 359 From North					Meridian Street From East					Route 359 From South					Meridian 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	
04:15 PM	19	82	17	1	119	13	20	12	0	45	19	320	9	0	348	10	17	53	0	80	592
04:30 PM	38	73	8	2	121	22	24	12	0	58	10	266	5	0	281	17	28	59	0	104	564
04:45 PM	17	96	10	0	123	21	24	15	0	60	16	307	12	0	335	9	27	43	0	79	597
05:00 PM	14	93	13	0	120	21	28	15	0	64	14	275	8	0	297	16	22	46	0	84	565
Total Volume	88	344	48	3	483	77	96	54	0	227	59	1168	34	0	1261	52	94	201	0	347	2318
% App. Total	18.2	71.2	9.9	0.6		33.9	42.3	23.8	0		4.7	92.6	2.7	0		15	27.1	57.9	0		
PHF	.579	.896	.706	.375	.982	.875	.857	.900	.000	.887	.776	.913	.708	.000	.906	.765	.839	.852	.000	.834	.971

Peak Hour Analysis From 03:00 PM to 05:30 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:15 PM



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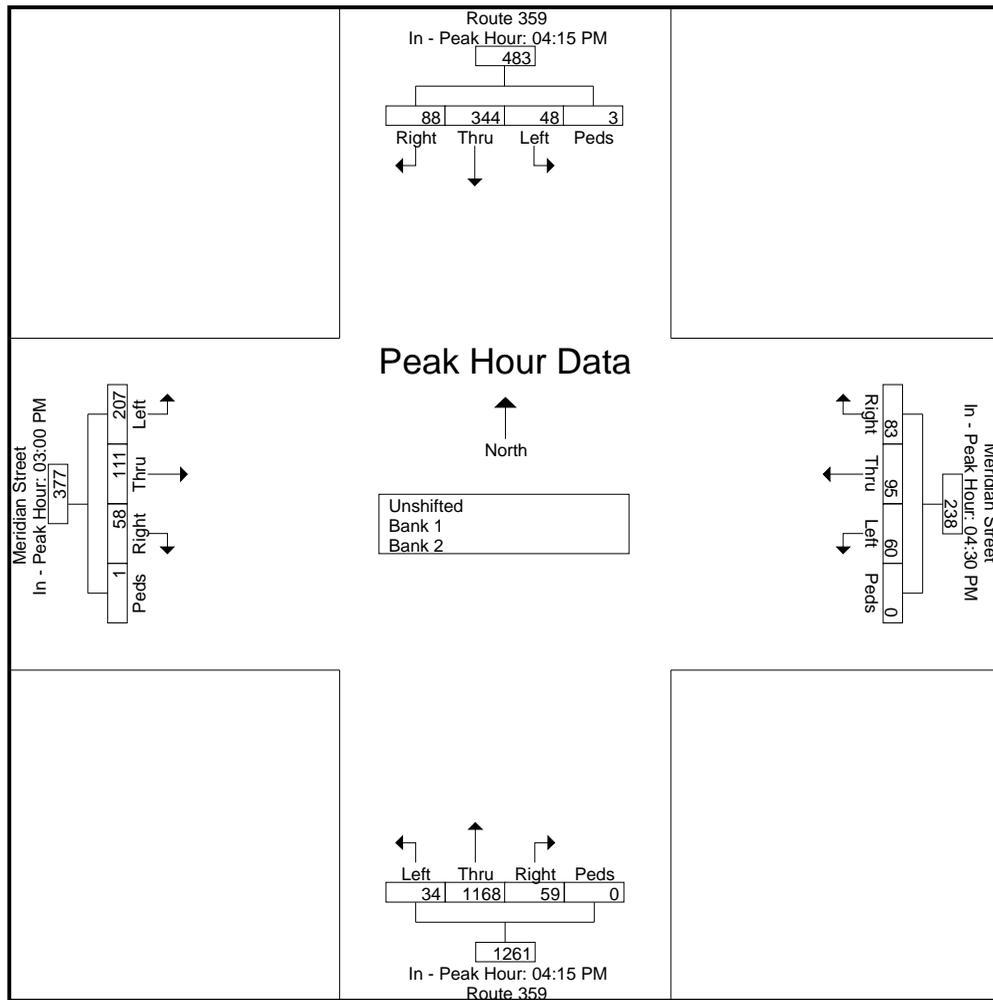
File Name : 18650
Site Code : 18650
Start Date : 3/28/2019
Page No : 3

Start Time	Route 359 From North					Meridian Street From East					Route 359 From South					Meridian 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 03:00 PM to 05:30 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:15 PM					04:30 PM					04:15 PM					03:00 PM				
+0 mins.	19	82	17	1	119	22	24	12	0	58	19	320	9	0	348	19	19	64	1	103
+15 mins.	38	73	8	2	121	21	24	15	0	60	10	266	5	0	281	19	33	64	0	116
+30 mins.	17	96	10	0	123	21	28	15	0	64	16	307	12	0	335	11	27	29	0	67
+45 mins.	14	93	13	0	120	19	19	18	0	56	14	275	8	0	297	9	32	50	0	91
Total Volume	88	344	48	3	483	83	95	60	0	238	59	1168	34	0	1261	58	111	207	1	377
% App. Total	18.2	71.2	9.9	0.6		34.9	39.9	25.2	0		4.7	92.6	2.7	0		15.4	29.4	54.9	0.3	
PHF	.579	.896	.706	.375	.982	.943	.848	.833	.000	.930	.776	.913	.708	.000	.906	.763	.841	.809	.250	.813



Appendix F

Crash Data Table



UCONN Crash Data
 Electric Boat - Assembly Building
 Groton, Connecticut
 11/20/2015 - 11/20/2018

Date Of Crash	Time Of Crash	Severity	No. of Veh.	Town	Mileage	Roadway	Intersecting Roadway	Collision Type	Weather	Light Condition	Road Surface Condition	Contributing Circumstances
1) CT Route 349 at Eastern Point Road												
12/13/2017	11:22:00	PDO	2	Groton	0	EASTERN POINT RD	RT 349-CHESTER ST	Angle	Clear	Daylight	Dry	None
2) CT Route 349 at Mumford Avenue												
6/29/2017	16:50:00	PDO	2	Groton	0	MUMFORD AVE	RT 349-RAINVILLE AV	Front to rear	Clear	Daylight	Dry	Other
12/7/2018	15:50:00	PDO	2	Groton	1.86	349-N	MUMFORD AV NO 1	Unknown	Clear	Daylight	Dry	None
3) CT Route 349 at Benham Road												
4/6/2016	11:24:00	PDO	2	Groton	0.49	BENHAM RD	RT 349-RAINVILLE AV	Front to rear	Clear	Daylight	Dry	None
9/29/2016	11:39:00	PDO	2	Groton	0.49	BENHAM RD	RT 349-RAINVILLE AV	Sideswipe, same direction	Clear	Daylight	Dry	Other
10/14/2016	18:06:00	PDO	2	Groton	0.5	BENHAM RD	unknown	Front to rear	Clear	Daylight	Dry	None
12/26/2016	9:51:00	PDO	2	Groton	1.27	RAINVILLE AVE	unknown	Front to rear	Clear	Daylight	Dry	Not Applicable
5/25/2017	15:02:00	PDO	2	Groton	1.29	RAINVILLE AVE	unknown	Angle	Rain	Other	Wet	None
8/14/2017	18:36:00	Possible Inj.	2	Groton	1.29	RAINVILLE AVE	S JCT BENHAM RD	Angle	Clear	Daylight	Dry	None
8/18/2017	14:38:00	Possible Inj.	2	Groton	0.49	BENHAM RD	RT 349-RAINVILLE AV	Front to rear	Cloudy	Daylight	Wet	None
1/30/2018	5:25:00	PDO	2	Groton	0.49	BENHAM RD	349-N	Other	Snow	Dark-Lighted	Snow	Weather Conditions
2/12/2018	13:41:00	Suspected Inj.	2	Groton	0.49	BENHAM RD	349-N	Other	Clear	Daylight	Dry	None
6/8/2018	8:06:00	PDO	2	Groton	0.49	BENHAM RD	349-N	Front to rear	Clear	Daylight	Dry	None
6/21/2018	13:10:00	Suspected Inj.	2	Groton	0.49	BENHAM RD	349-N	Front to front	Clear	Daylight	Dry	None
10/11/2018	15:59:00	PDO	1	Groton	0.51	BENHAM RD	unknown	Not Applicable	Clear	Daylight	Dry	None
10/20/2018	21:52:00	PDO	2	Groton	0.49	BENHAM RD	349-N	Sideswipe, same direction	Clear	Dark-Not Lighted	Dry	None
12/10/2018	7:27:00	Suspected Inj.	3	Groton	0.49	BENHAM RD	349-N	Front to front	Clear	Daylight	Dry	None
4) CT Route 349 at Route 649 and Brandegee Avenue												
2/17/2016	5:46:00	PDO	2	Groton	0	CLARENCE B. SHARP HWY	RT 349(RAINVILLE AVE)(NB)	Angle	Clear	Dark-Lighted	Dry	None
1/16/2016	12:13:00	PDO	2	Groton	0.52	BRANDEGEE AVE	RT 349-CLARENCE B SHARP	Angle	Clear	Daylight	Wet	Weather Conditions
11/14/2016	8:37:00	PDO	2	Groton	2.3	RAINVILLE AVE	BRANDEGEE AVE	Angle	Clear	Daylight	Dry	None
11/17/2016	8:54:00	PDO	2	Groton	2.3	CLARENCE B. SHARP HWY	SR 649(RAINVILLE AVE)	Other	Clear	Daylight	Dry	None
4/3/2017	13:11:00	PDO	2	Groton	0.51	BRANDEGEE AVE	unknown	Angle	Clear	Daylight	Dry	None
4/13/2017	17:28:00	PDO	2	Groton	2.29	RAINVILLE AVE	unknown	Front to rear	Clear	Daylight	Dry	Unknown
4/18/2017	15:37:00	PDO	2	Groton	0.52	BRANDEGEE AVE	RT 349-RAINVILLE AV	Front to rear	Clear	Daylight	Dry	None
5/12/2017	17:49:00	PDO	2	Groton	2.34	CLARENCE B. SHARP HWY	unknown	Angle	Cloudy	Daylight	Dry	None
6/30/2017	20:43:00	PDO	2	Groton	0	RAINVILLE AVE	BRANDEGEE AVE	Front to rear	Rain	Dark-Unknown Lighting	Wet	Weather Conditions
9/6/2017	14:29:00	PDO	2	Groton	2.3	CLARENCE B. SHARP HWY	SR 649(RAINVILLE AVE)	Angle	Cloudy	Daylight	Wet	Weather Conditions
5/11/2018	10:17:00	Suspected Inj.	2	Groton	0	649-E	BRANDEGEE AV	Angle	Clear	Daylight	Dry	None
5/3/2018	16:53:00	PDO	2	Groton	2.3	349-N	BRANDEGEE AV	Front to rear	Clear	Daylight	Dry	None
5/17/2018	12:12:00	PDO	2	Groton	2.3	349-N	BRANDEGEE AV	Not Applicable	Cloudy	Daylight	Wet	Weather Conditions
5/25/2018	21:04:00	Suspected Inj.	2	Groton	0.52	BRANDEGEE AV	unknown	Other	Clear	Dark-Lighted	Dry	None
7/18/2018	14:44:00	PDO	1	Groton	2.3	349-N	BRANDEGEE AV	Front to rear	Clear	Daylight	Dry	None
8/1/2018	5:34:00	PDO	2	Groton	2.3	349-N	BRANDEGEE AV	Other	Clear	Daylight	Dry	None
9/26/2018	14:13:00	PDO	2	Groton	2.3	349-N	BRANDEGEE AV	Front to rear	Cloudy	Daylight	Dry	None
9/28/2018	18:02:00	PDO	2	Groton	2.3	349-N	BRANDEGEE AV	Angle	Clear	Daylight	Dry	None
5) Eastern Point Rd. at Thames St., Smith St. and Poquonnock Rd.												
11/16/2018	15:27:00	PDO	2	Groton	-	EASTERN POINT RD	unknown	Front to rear	Clear	Daylight	Dry	None
6) Poquonnock Rd. at Chicago Ave, Benham Rd, and Mitchell St.												
2/23/2016	11:26:00	PDO	2	Groton	0.16	POQUONNOCK RD	MITCHELL ST	Front to rear	Cloudy	Daylight	Dry	None
11/22/2016	20:43:00	PDO	3	Groton	0	MITCHELL ST	POQUONNOCK RD NO 1	Angle	Clear	Dark-Lighted	Dry	None
12/16/2016	16:57:00	PDO	2	Groton	0	MITCHELL ST	POQUONNOCK RD NO 1	Front to rear	Clear	Dark-Lighted	Dry	None
1/7/2017	12:59:00	PDO	2	Groton	0	MITCHELL ST	POQUONNOCK RD NO 1	Angle	Snow	Daylight	Snow	Road Surface
10/15/2018	16:50:00	PDO	2	Groton	0	MITCHELL ST	BENHAM RD	Front to rear	Clear	Daylight	Dry	None
11/5/2018	12:56:00	PDO	2	Groton	0.15	POQUONNOCK RD NO 1	CHICAGO AV	Sideswipe, same direction	Rain	Daylight	Wet	None
7) Poquonnock Rd. at EB Parking Lot (M-Lot)												
12/30/2017	19:53:00	PDO	1	Groton	0.1	POQUONNOCK RD	unknown	Not Applicable	Snow	Dark-Not Lighted	Snow	Weather Conditions
12/5/2018	8:30:00	PDO	2	Groton	-	525 POQUONNOCK RD	unknown	Front to rear	Clear	Daylight	Dry	Glare
8) North St. at Meridian St. and Mitchell St.												
2/12/2016	7:16:00	PDO	2	Groton	0.68	MITCHELL ST	MERIDIAN ST	Sideswipe, opposite direction	Clear	Daylight	Dry	None
2/23/2017	5:33:00	Possible Inj.	2	Groton	0.68	MITCHELL ST	MERIDIAN ST	Other	Fog, Smog, Smoke	Dark-Lighted	Wet	Weather Conditions
10/15/2017	9:01:00	PDO	2	Groton	0.19	MERIDIAN ST	MITCHELL ST	Front to rear	Clear	Daylight	Dry	None
1/19/2018	17:15:00	PDO	2	Groton	0	NORTH ST NO 1	MERIDIAN ST	Sideswipe, same direction	Clear	Dark-Lighted	Dry	None
6/26/2018	15:26:00	PDO	2	Groton	0	NORTH ST NO 1	MERIDIAN ST	Front to rear	Clear	Daylight	Dry	None

Date Of Crash	Time Of Crash	Severity	No. of Veh.	Town	Mileage	Roadway	Intersecting Roadway	Collision Type	Weather	Light Condition	Road Surface Condition	Contributing Circumstances
9) North St. at Broad St.												
9/21/2017	6:41:00	PDO	2	Groton	0.32	BROAD ST	unknown	Sideswipe, same direction	Clear	Dark-Lighted	Dry	None
10/24/2017	17:10:00	PDO	2	Groton	0.35	BROAD ST	NORTH ST NO 1	Front to rear	Rain	Daylight	Wet	None
11/22/2017	19:22:00	PDO	2	Groton	0.33	BROAD ST	NORTH ST NO 1	Front to rear	Rain	Dark-Lighted	Wet	Road Surface
10/24/2018	16:32:00	Suspected Inj.	2	Groton	0.21	NORTH ST NO 1	BROAD ST	Front to front	Clear	Daylight	Dry	None
9/28/2018	14:44:00	PDO	2	Groton	0.2	NORTH ST NO 1	unknown	Sideswipe, same direction	Cloudy	Daylight	Wet	Backup Due to Regular Congestion
10) Bridge St. at North St. and I-95 Ramps												
2/19/2016	6:21:00	PDO	2	Groton	102.37	RT 1	NB EXIT TO BRIDGE ST #1(001) : Exit -	Front to rear	Clear	Daylight	Dry	None
3/9/2017	13:02:00	Possible Inj.	2	Groton	0.66	BRIDGE ST	unknown	Front to rear	Clear	Daylight	Dry	None
6/5/2017	11:20:00	PDO	2	Groton	0.6	BRIDGE ST	unknown	Front to rear	Clear	Daylight	Dry	None
8/22/2017	16:53:00	PDO	2	Groton	0.64	BRIDGE ST	NORTH ST NO 1	Front to rear	Clear	Daylight	Dry	None
8/30/2017	17:33:00	PDO	2	Groton	0.64	BRIDGE ST	NORTH ST NO 1	Front to rear	Clear	Daylight	Dry	None
10/5/2017	15:22:00	PDO	1	Groton	0.64	BRIDGE ST	NORTH ST NO 1	Not Applicable	Clear	Daylight	Dry	None
12/5/2017	19:46:00	PDO	2	Groton	0.64	BRIDGE ST	NORTH ST NO 1	Angle	Rain	Dark-Lighted	Wet	None
5/10/2018	12:33:00	PDO	2	Groton	0.29	NORTH ST NO 1	BRIDGE ST NO 1	Other	Clear	Daylight	Dry	None
6/29/2018	11:07:00	PDO	2	Groton	0.07	1-N-1A	BRIDGE ST NO 1	Other	Clear	Daylight	Dry	None
11/15/2018	17:51:00	PDO	3	Groton	0.24	1-N-1	BRIDGE ST NO 1	Front to rear	Snow	Dark-Lighted	Snow	None
12/6/2018	23:50:00	PDO	2	Groton	0.02	95-S-313	unknown	Front to rear	Clear	Dark-Lighted	Dry	None
12/19/2018	5:56:00	PDO	2	Groton	0.24	1-N-1	BRIDGE ST NO 1	Front to rear	Clear	Dark-Unknown Lighting	Dry	None
11) CT Route 349 and Meridian St. and Meridian St. Ext.												
1/25/2016	22:50:00	PDO	2	Groton	3.07	CLARENCE B. SHARP HWY	MERIDIAN ST EXT	Angle	Clear	Dark-Lighted	Dry	None
1/28/2016	7:40:00	PDO	2	Groton	3.07	CLARENCE B. SHARP HWY	MERIDIAN ST EXT	Front to rear	Clear	Daylight	Dry	Unknown
1/8/2016	0:17:00	PDO	1	Groton	3.07	CLARENCE B. SHARP HWY	MERIDIAN ST EXT	Not Applicable	Clear	Dark-Lighted	Dry	None
1/25/2016	22:50:00	PDO	2	Groton	3.07	CLARENCE B. SHARP HWY	MERIDIAN ST EXT	Angle	Clear	Dark-Lighted	Dry	None
1/5/2016	17:32:00	PDO	2	Groton	3.07	CLARENCE B. SHARP HWY	MERIDIAN ST EXT	Front to rear	Clear	Dark-Lighted	Dry	None
12/4/2016	18:09:00	PDO	2	Groton	3.07	CLARENCE B. SHARP HWY	MERIDIAN ST EXT	Angle	Clear	Dark-Lighted	Dry	None
11/30/2016	12:36:00	PDO	4	Groton	3.07	CLARENCE B. SHARP HWY	MERIDIAN ST EXT	Front to rear	Cloudy	Daylight	Dry	None
5/18/2017	17:09:00	PDO	2	Groton	0.12	MERIDIAN ST	RT 349-CLARENCE B SHARP	Angle	Clear	Daylight	Dry	None
6/17/2017	12:28:00	PDO	2	Groton	3.03	RAINVILLE AVE	unknown	Sideswipe, same direction	Clear	Daylight	Dry	None
8/9/2017	18:05:00	PDO	2	Groton	3.07	CLARENCE B. SHARP HWY	MERIDIAN ST EXT	Front to rear	Clear	Daylight	Dry	None
10/19/2017	12:58:00	Possible Inj.	2	Groton	3.07	CLARENCE B. SHARP HWY	MERIDIAN ST EXT	Angle	Clear	Daylight	Dry	None
10/18/2017	12:29:00	PDO	2	Groton	3.07	CLARENCE B. SHARP HWY	MERIDIAN ST EXT	Angle	Clear	Daylight	Dry	Visual Obstruction(s)
1/24/2017	17:38:00	PDO	2	Groton	0.12	MERIDIAN STREET EXT	RT 349-CLARENCE B SHARP	Front to rear	Rain	Dark-Lighted	Wet	Weather Conditions
12/10/2017	19:07:00	PDO	1	Groton	3.07	CLARENCE B. SHARP HWY	MERIDIAN ST EXT	Not Applicable	Clear	Dark-Lighted	Dry	None
12/13/2017	9:58:00	PDO	2	Groton	3.13	Clarence B Sharp Hwy	unknown	Front to rear	Clear	Daylight	Dry	None
12/15/2017	10:31:00	Suspected Inj.	3	Groton	3.3	CLARENCE B. SHARP HWY	unknown	Front to rear	Clear	Daylight	Dry	None
1/3/2018	9:13:00	PDO	2	Groton	3.07	349-S	MERIDIAN ST EXT	Front to rear	Clear	Daylight	Dry	None
1/3/2018	16:26:00	PDO	2	Groton	3.07	349-S	MERIDIAN ST EXT	Angle	Clear	Daylight	Ice / Frost	Weather Conditions
1/24/2018	6:17:00	PDO	2	Groton	3.1	349-S	unknown	Front to rear	Clear	Dawn	Dry	None
4/6/2018	11:37:00	PDO	2	Groton	3.07	349-N	MERIDIAN ST EXT	Front to rear	Snow	Daylight	Wet	Unknown
4/26/2018	11:29:00	PDO	2	Groton	3.07	349-S	MERIDIAN ST EXT	Sideswipe, same direction	Clear	Daylight	Dry	None
4/28/2018	7:53:00	PDO	1	Groton	3.07	349-S	MERIDIAN ST EXT	Not Applicable	Fog, Smog, Smoke	Daylight	Wet	None
6/8/2018	6:34:00	PDO	2	Groton	3.07	349-S	MERIDIAN ST EXT	Front to rear	Clear	Daylight	Dry	None
6/15/2018	15:21:00	PDO	3	Groton	3.09	349-N	unknown	Sideswipe, same direction	Clear	Daylight	Dry	Unknown
6/16/2018	21:44:00	PDO	2	Groton	0.13	MERIDIAN ST EXT	349-N	Rear to side	Clear	Dark-Lighted	Dry	None
7/2/2018	12:45:00	PDO	1	Groton	3.07	349-S	MERIDIAN ST EXT	Not Applicable	Clear	Daylight	Dry	None
8/13/2018	16:04:00	PDO	2	Groton	3.05	349-N	unknown	Front to rear	Rain	Daylight	Wet	Weather Conditions
8/24/2018	9:37:00	PDO	2	Groton	3.07	349-N	MERIDIAN ST EXT	Front to rear	Clear	Daylight	Dry	None
10/14/2018	12:24:00	PDO	1	Groton	3.07	349-N	MERIDIAN ST EXT	Not Applicable	Clear	Daylight	Dry	None
10/16/2018	15:28:00	PDO	2	Groton	3.07	349-S	MERIDIAN ST EXT	Rear to side	Clear	Daylight	Dry	None
12) CT Route 649 at Rainville Ave. and Old Farm Rd.												
10/21/2016	17:15:00	Possible Inj.	1	Groton	0.21	POQUONNOCK RD	OLD FARM RD	Not Applicable	Rain	Dusk	Wet	None
10/22/2016	10:52:00	Suspected Inj.	2	Groton	0	POQUONNOCK RD	(SR 649 - RAINVILLE AVE)	Sideswipe, same direction	Rain	Daylight	Wet	None
2/23/2017	19:58:00	PDO	2	Groton	0.21	POQUONNOCK RD	OLD FARM RD	Sideswipe, opposite direction	Fog, Smog, Smoke	Dark-Lighted	Wet	None
5/9/2017	13:20:00	PDO	2	Groton	0.23	POQUONNOCK RD	unknown	Angle	Clear	Daylight	Dry	None
5/13/2017	20:02:00	PDO	2	Groton	0.21	RAINVILLE AVE	OLD FARM RD	Sideswipe, opposite direction	Rain	Dark-Lighted	Wet	Weather Conditions
6/12/2017	5:43:00	Suspected Inj.	1	Groton	0.16	RAINVILLE AVE	unknown	Not Applicable	Clear	Daylight	Oil	None
12/9/2016	14:41:00	PDO	2	Groton	0.21	POQUONNOCK RD	POQUONNOCK RD #1	Front to rear	Clear	Daylight	Dry	None
8/18/2017	9:55:00	PDO	2	Groton	0	OLD FARM RD	SR 649-POQUONNOCK RD	Front to rear	Clear	Daylight	Dry	None
10/29/2017	5:59:00	Suspected Inj.	2	Groton	0.21	POQUONNOCK RD	OLD FARM RD	Angle	Clear	Dark-Lighted	Dry	None
11/1/2018	15:37:00	PDO	2	Groton	-	POQUONNOCK RD	unknown	Unknown	Clear	Daylight	Dry	Unknown

PDO- Property Damage only

Appendix G

Parking Inventory Map
Table 7 – EB Employee Projections
Table 8 – EB Employees vs Electric Boat Parking Projections



PARKING SUMMARY

OWNER	NUMBER OF PARKING SPACES
ELECTRIC BOAT CORP	3,818



LEGEND	
	500' PROPERTY LINE OFFSET FOR PARKING FACILITIES (CITY OF GROTON PARKING REGULATIONS)
	ELECTRIC BOAT PROPERTY LINE
	PROPERTY LINE
	THIRD PARTY PARKING LOTS
	TO BE DEMOLISHED
	TO BE RELOCATED
	ELECTRIC BOAT BUILDING NUMBER (BUILDING SUMMARY UNDER SEPARATE COVER)

File Path: J:\DWG\9797570A11\CivilTraffic\Figures\1997570A11_Parking Map.dwg Layout: P-MAP (NO 3RD PARTY) Plotted: Wed, April 10, 2019 - 5:21 PM User: mmanchini
 Plotter: DWG TO PDF PC3 CTB File: FO.STB
 LAYER STATE:

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
 HORZ.: 1" = 150'
 VERT.:
 DATUM:
 HORZ.:
 VERT.:

 GRAPHIC SCALE

FUSS & O'NEILL
 146 HARTFORD ROAD
 MANCHESTER, CONNECTICUT 06040
 860.646.2469
 www.fando.com

ELECTRIC BOAT CORPORATION
 PARKING INVENTORY
 75 EASTERN POINT ROAD
 GROTON CONNECTICUT

PROJ. No.: 1997570.A11
 DATE: APRIL 2019
P-MAP

Table 7

Electric Boat Employee Projections
 Electric Boat – Assembly Building Development
 Groton, Connecticut

Year	Employees									
	Total	Office	Shipyard Trades	Supships	DXC	Café & Other Long Term	Navy Crew	1st Shift	2nd Shift	3rd Shift
2019	8,010	4,146	2,864	350	100	50	500	6,578	1,146	286
2020	8,026	3,779	3,247	350	100	50	500	6,403	1,299	325
2021	8,301	3,536	3,765	350	100	50	500	6,419	1,506	377
2022	8,309	3,917	3,392	350	100	50	500	6,613	1,357	339
2023	8,455	3,984	3,446	375	100	50	500	6,732	1,378	345
2024	8,854	4,094	3,637	400	100	50	573	7,036	1,455	364
2025	9,042	4,225	3,614	425	100	50	628	7,235	1,446	361
2026	9,098	3,878	4,131	150	100	50	789	7,033	1,652	413
2027	9,662	4,073	4,081	475	100	50	883	7,622	1,632	408
2028	10,042	3,637	4,897	475	100	50	883	7,594	1,959	490
2029	10,882	3,789	5,415	500	100	50	1,028	8,175	2,166	542
2030	10,168	3,950	4,769	500	100	50	799	7,784	1,908	477

Notes:

1. Assumes Engineering, Finance, HR, etc. are all on 1st shift and the shipyard trades are broken down by 50% 1st shift, 40% 2nd shift, and 10% 3rd shift.
2. 1st Shift Employees include Supship, DXC Café & Long Term Employees and Navy crew members
3. Additional Navy crew members starting in the year 2024

Table 8

Electric Boat Employees vs EB Parking Projections
 Electric Boat – Assembly Building Development
 Groton, Connecticut

Year	Employees		Parking Spaces	Parking Rate
	Total	1st Shift	EB Total	Spaces : Employees
2019	8,010	6,578	3,818	1: 1.7
2020	8,026	6,403	3,818	1: 1.7
2021	8,301	6,419	3,818	1: 1.7
2022	8,309	6,613	3,818	1: 1.7
2023	8,455	6,732	3,818	1: 1.8
2024	8,854	7,036	3,818	1: 1.8
2025	9,042	7,235	3,818	1: 1.9
2026	9,098	7,033	3,818	1: 1.8
2027	9,662	7,622	3,818	1: 2.0
2028	10,042	7,594	3,818	1: 2.0
2029	10,882	8,175	3,818	1: 2.1
2030	10,168	7,784	3,818	1: 2.0

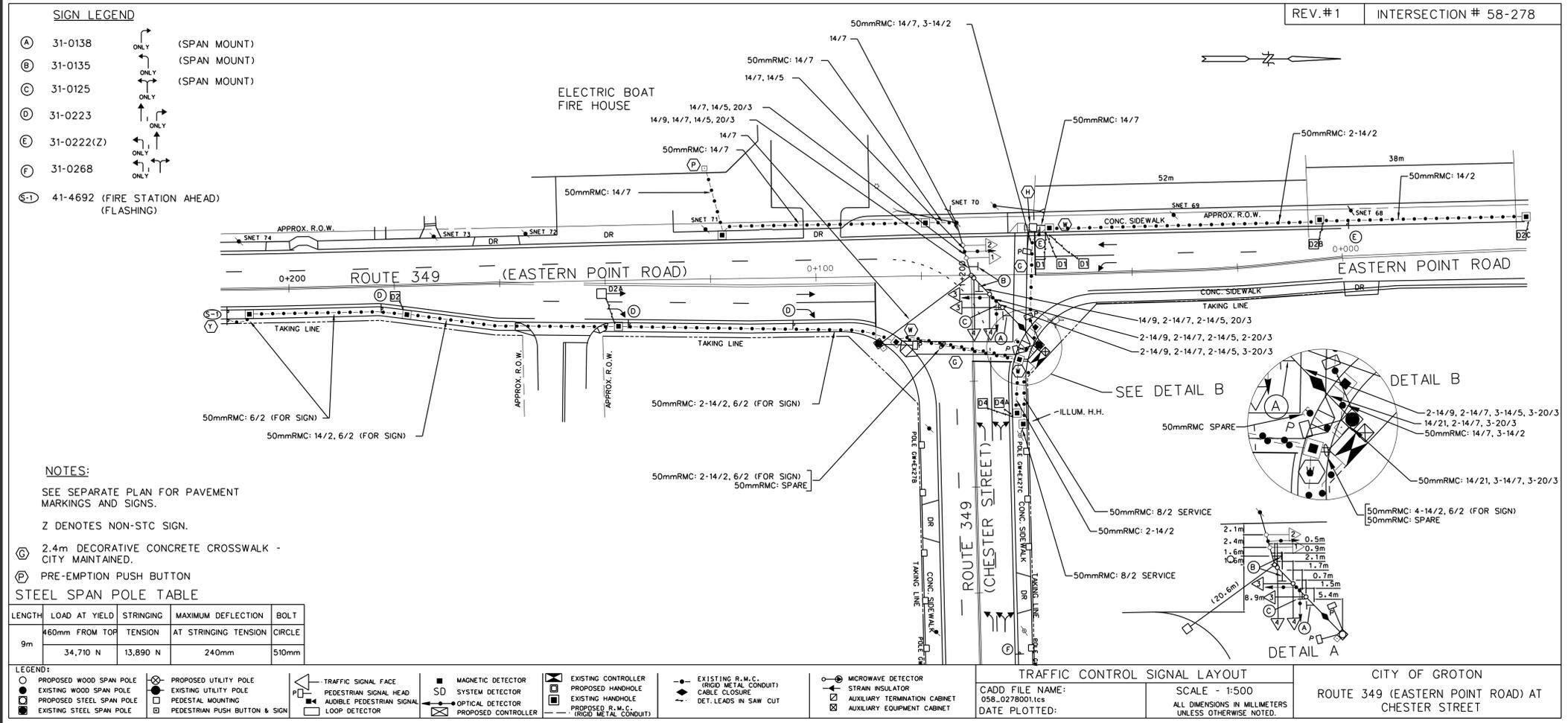
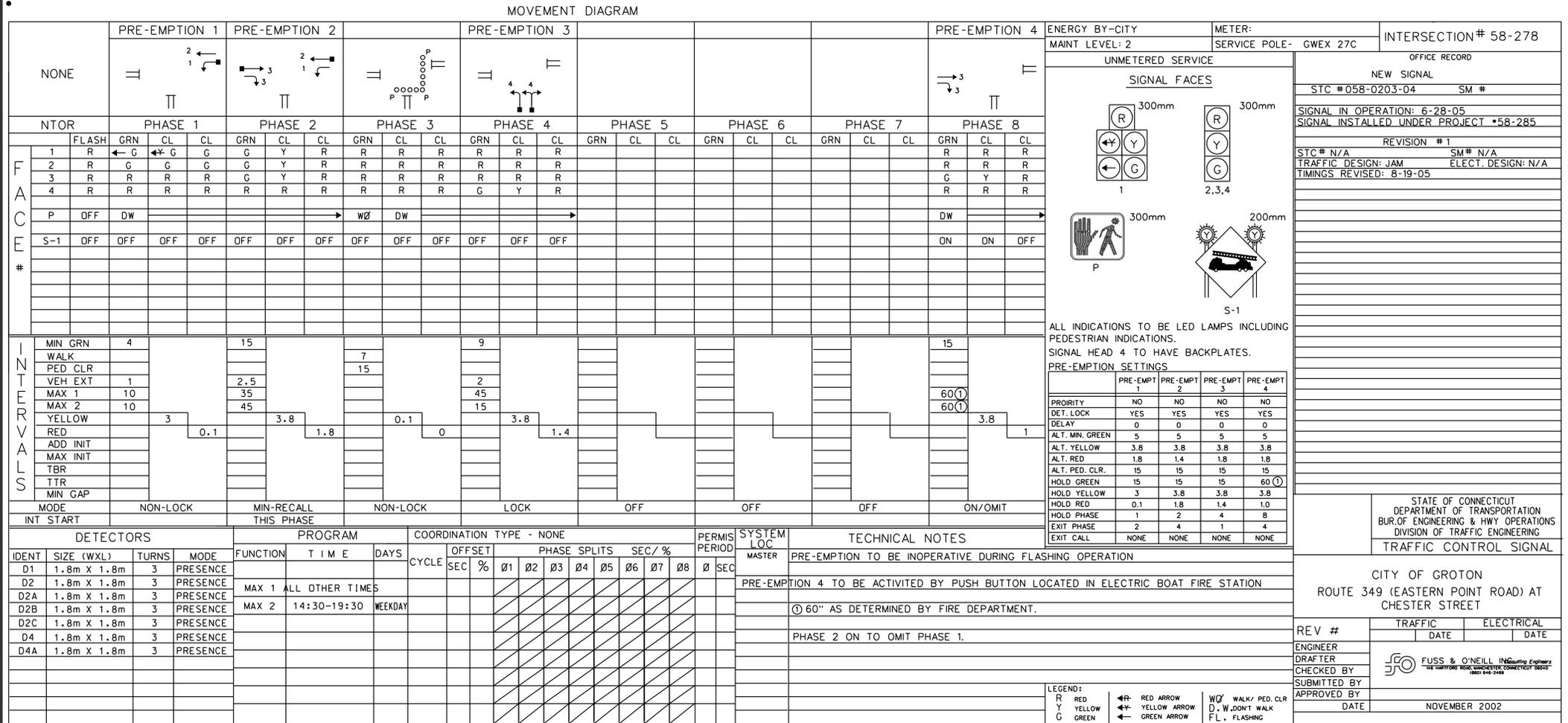
Notes:

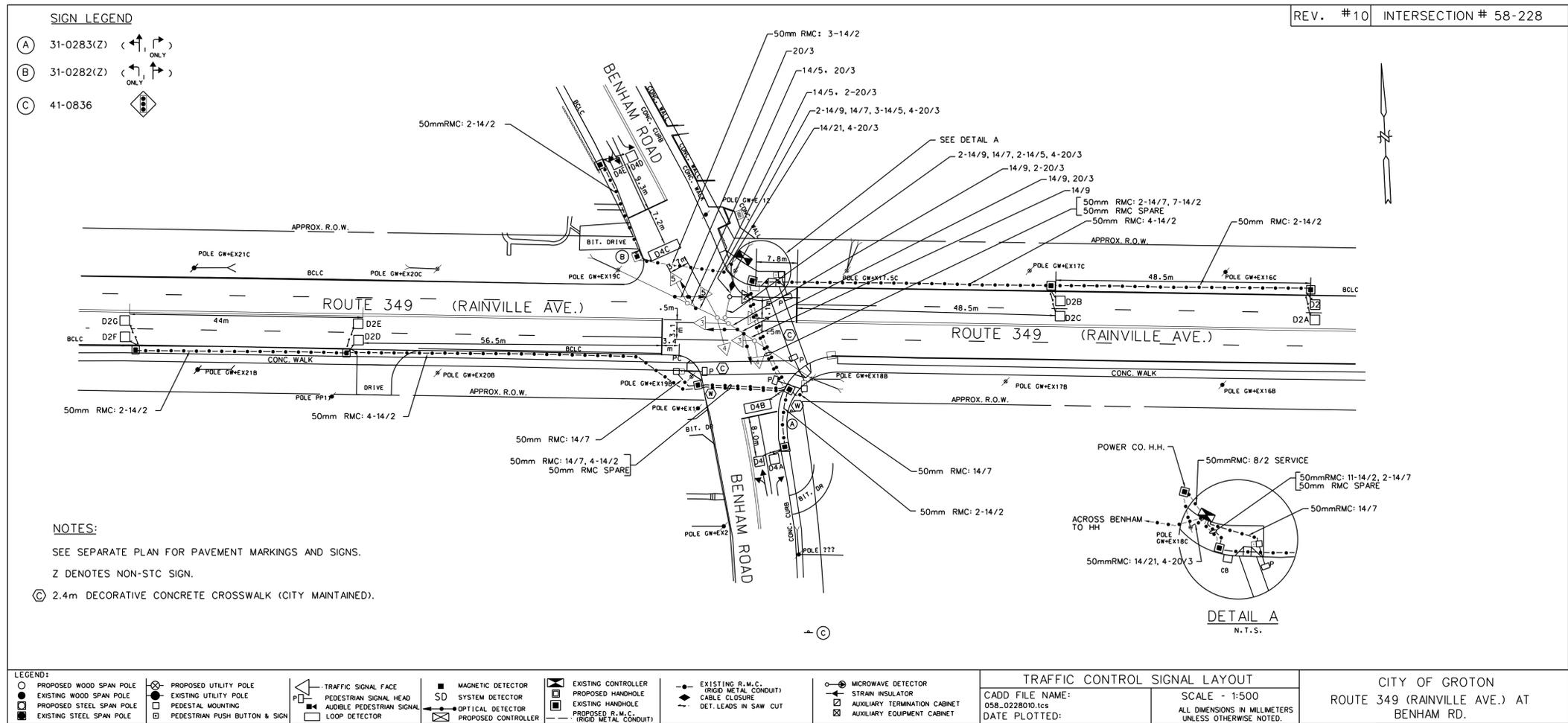
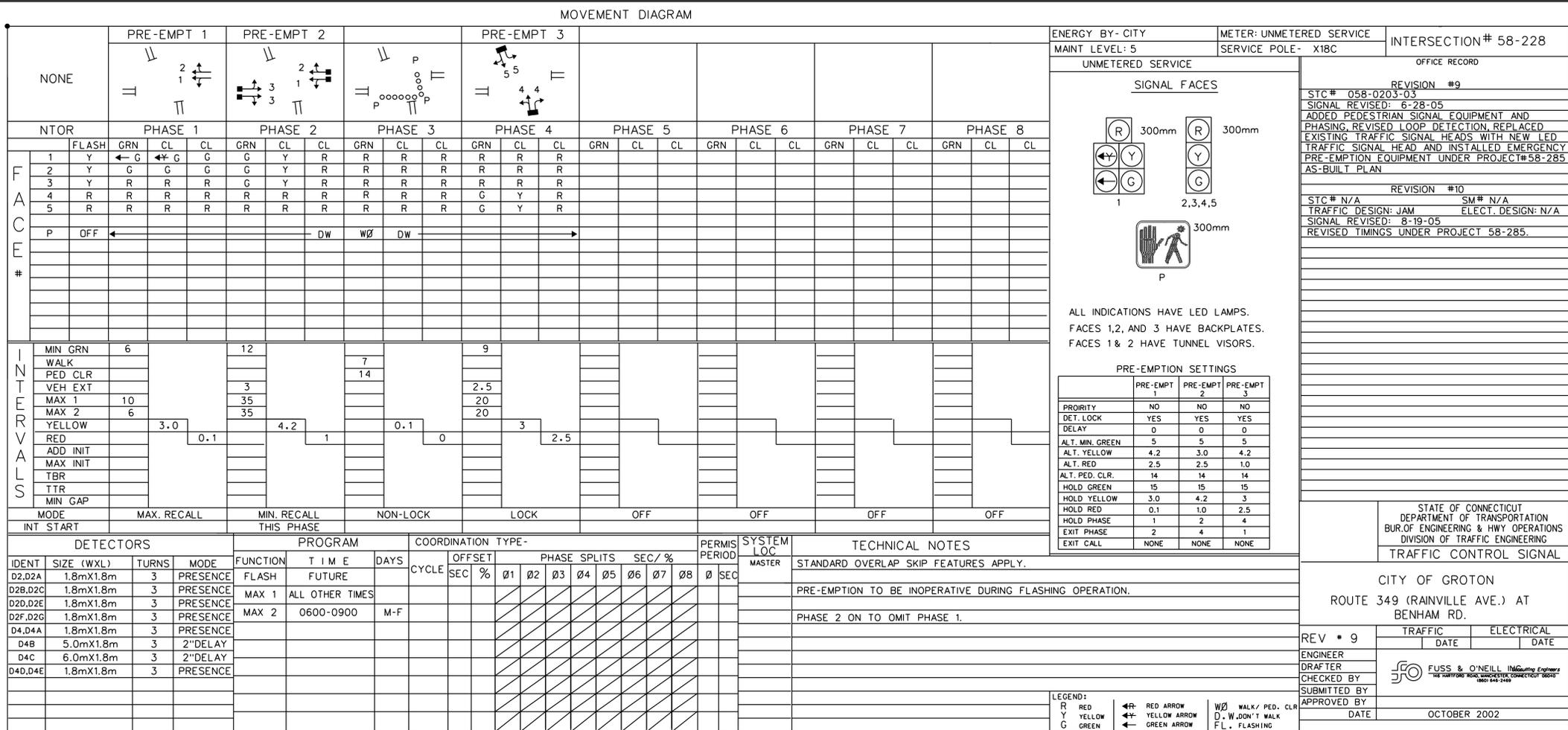
1. Assumes Engineering, Finance, HR, etc. are all on 1st shift and the shipyard trades are broken down by 50% 1st shift, 40% 2nd shift, and 10% 3rd shift.
2. Parking rate based on number of 1st shift employees
3. City of Groton Parking Regulation: 1 parking space for every 3 employees on largest shift (1:3)
4. 1st Shift Employees include Supship, DXC Café & Long Term Employees and Navy crew members
5. 1st Shift Employees includes additional Navy crew members starting in the year 2024
6. Number of parking spaces does not include 210 spaces internal to the EB campus

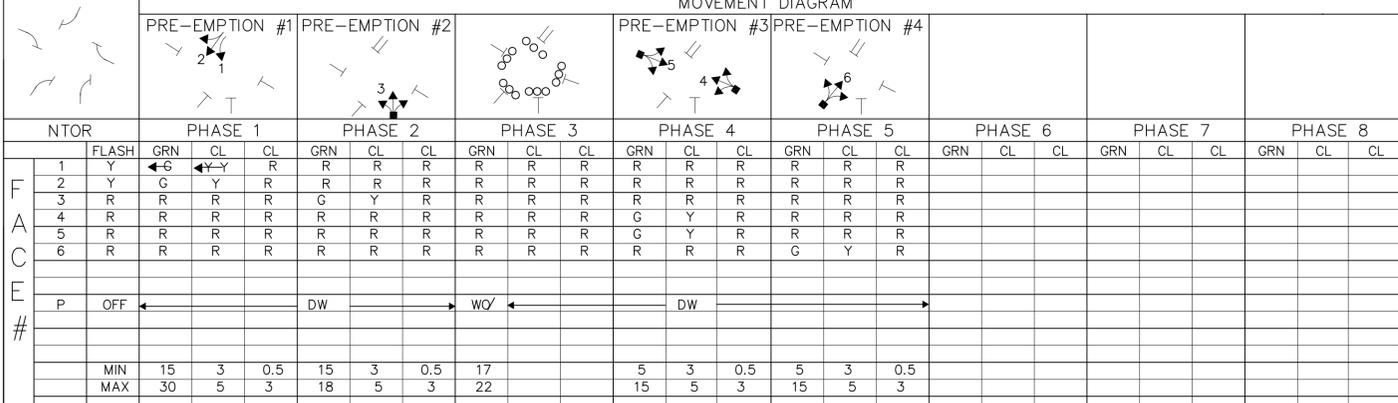
Appendix H

Traffic Signal Plans



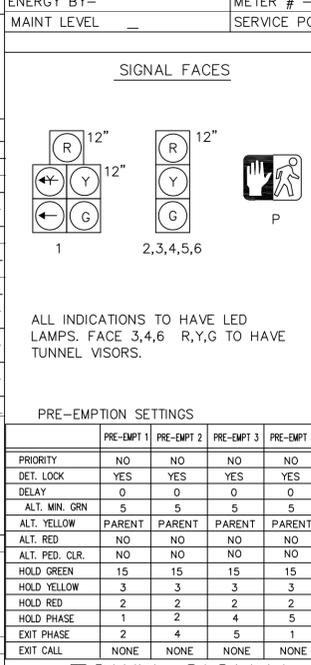






F A C E #	NTOR	PHASE 1			PHASE 2			PHASE 3			PHASE 4			PHASE 5			PHASE 6			PHASE 7			PHASE 8			
		FLASH	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL
1	Y	←G	←Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
2	Y	G	←Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
3	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
4	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
5	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
6	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
P		OFF	DW			WO			DW			DW			DW			DW			DW			DW		
MIN		15	3	0.5	15	3	0.5	17	5			3	0.5	5	3	0.5										
MAX		30	5	3	18	5	3	22	15			5	3	15	5	3										

I N T E R V A L S	MODE	MAX-RECALL	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	OFF	OFF	OFF	DETECTORS		PROGRAM		COORDINATION TYPE-		PERMIS PERIOD	SYSTEM LOC MASTER	TECHNICAL NOTES
										IDENT	SIZE (WXL)	FUNCTION	T I M E	DAYS	CYCLE			
MIN GRN		20								D2	6'x6'	3	PRESENCE	FLASH	FUTURE			
WALK										D2A	6'x6'	3	PRESENCE	MAX 1	ALL	ALL		
PED CLR										D4	6'x6'	3	PRESENCE	MAX 2	FUTURE			
VEH EXT										D4A	6'x6'	3	PRESENCE					
MAX 1		20								D4B	6'x6'	3	PRESENCE					
MAX 2		30								D4C	6'x6'	3	PRESENCE					
YELLOW			3		3		0.1		0	D5	6'x6'	3	PRESENCE					
RED				2						D5A	6'x6'	3	PRESENCE					
ADD INIT																		
MAX INIT																		
TBR																		
TTR																		
MIN GAP																		



	PRE-EMPT 1	PRE-EMPT 2	PRE-EMPT 3	PRE-EMPT 3
PRIORITY	NO	NO	NO	NO
DET. LOCK	YES	YES	YES	YES
DELAY	0	0	0	0
ALT. MIN. GRN	5	5	5	5
ALT. YELLOW	PARENT	PARENT	PARENT	PARENT
ALT. RED	NO	NO	NO	NO
ALT. PED. CLR.	NO	NO	NO	NO
HOLD GREEN	15	15	15	15
HOLD YELLOW	3	3	3	3
HOLD RED	2	2	2	2
HOLD PHASE	1	2	4	5
EXIT PHASE	2	4	5	1
EXIT CALL	NONE	NONE	NONE	NONE

ENERGY BY- MAINT LEVEL _____ METER # - _____ SERVICE POLE- _____ INTERSECTION # _____ OFFICE RECORD _____

STC # _____ SM # _____
 REVISED TRAFFIC SIGNAL SEQUENCE AND UPGRADED EQUIPMENT ADDED ADVANCE GREEN AND ADDED FIRE PRE-EMPTION

STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION
 BUR. OF ENGINEERING & HWY OPERATIONS
 DIVISION OF TRAFFIC ENGINEERING
 TRAFFIC CONTROL SIGNAL

TOWN OF GROTON
 MITCHELL STREET AND BENHAM ROAD
 AT CHICAGO AVENUE AND POQUONNOCK ROAD.

REV #	DATE	TRAFFIC	ELECTRICAL

ENGINEER: _____
 DRAFTER: _____
 CHECKED BY: _____
 SUBMITTED BY: _____
 APPROVED BY: _____
 DATE: _____

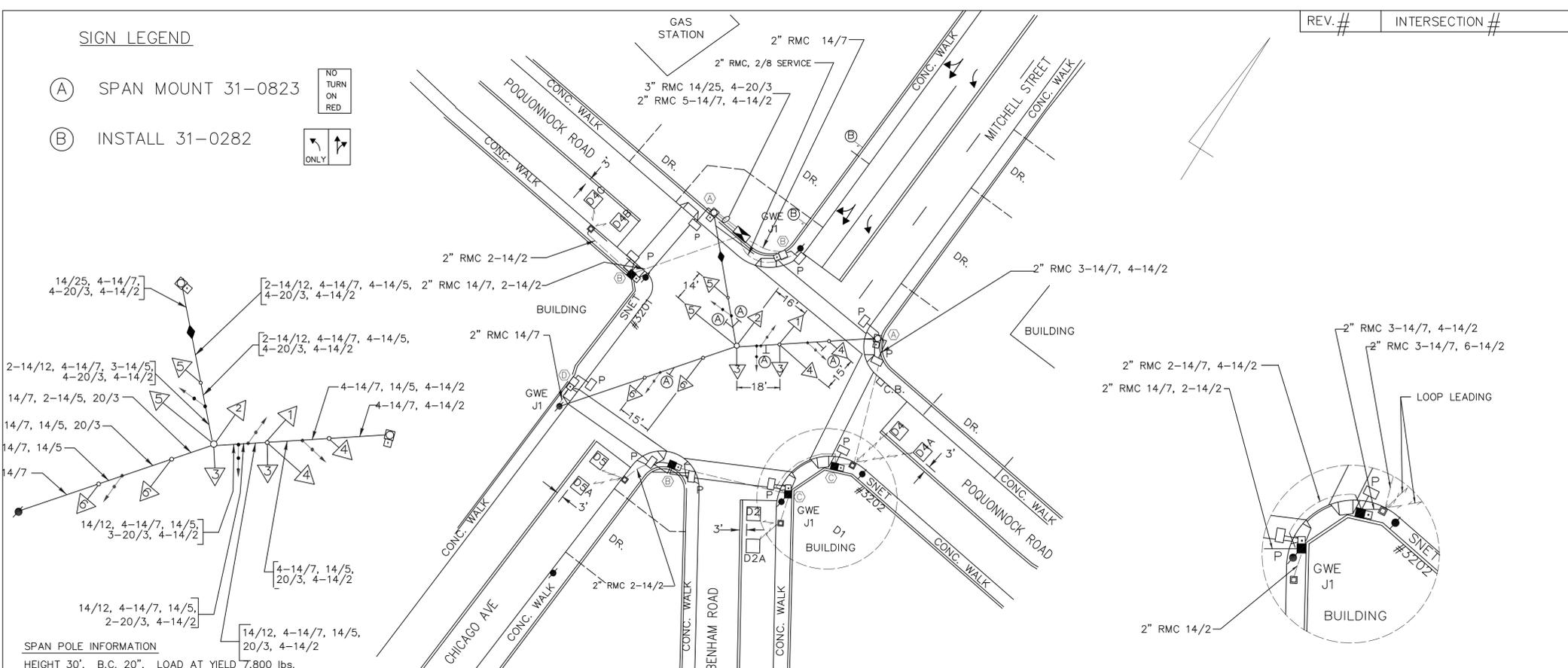
LEGEND:
 R RED ARROW
 Y YELLOW ARROW
 G GREEN ARROW
 W/WALK / PED. CLR.
 D/W. DON'T WALK
 FL. FLASHING

CONSTRUCTION NOTES

- ALL TRAFFIC SIGNAL EQUIPMENT IS NEW UNLESS NOTED
- REMOVE ALL ABANDONED TRAFFIC SIGNAL EQUIPMENT INCLUDING FOUNDATIONS, HANDHOLES, CONDUIT RISERS AND CABLE, SPAN WIRE, MESSENGER, STEEL POLES AND PEDESTALS.
- SIGNAL APPURTENANCES (SPAN POLES, PEDESTALS AND HAND HOLE) SHALL PROVIDE A FREE PATH OF 3' IN SIDEWALK AREA.
- ALL LOOP DETECTORS TO BE INSTALLED 8' APART.
- SEGMENTED LOOP DETECTORS TO BE INSTALLED IN SERIES.
- INSTALL HANDHOLES APPROXIMATELY 1' BEHIND CURB.
- SIDEWALKS SHALL BE REPLACED IN KIND IF EXCAVATED FOR TRAFFIC SIGNAL APPURTENANCES.
- PRE-EMPTION IS TO OPERATE THRU THE INTERNAL PRE-EMPTION OF THE CONTROLLER AND INSTALL SWITCH IN CONTROLLER CABINET TO EFFECTIVELY DISCONNECT PRE-EMPTION EQUIPMENT IF NECESSARY.
- CENTERLINES, CROSSWALKS, STOP BARS TO REMAIN UNLESS NOTED.
- STOPBAR ON POQUONNOCK ROAD (EAST SIDE) WESTBOUND TO BE PUSHED BACK 10. TO ALLOW A 40' CLEARANCE TO THE INSIDE TRAFFIC SIGNAL HEAD #4.

- (A) INSTALL PEDESTRIAN SIGNAL, PUSH-BUTTON AND SIGN ON NEW 30' STEEL POLE.
- (B) INSTALL 8' ALLUMINUM PEDESTAL WITH PEDESTRIAN SIGNAL, PUSH-BUTTON AND SIGN ON NEW FOUNDATION ON BACK EDGE OF SIDEWALK ADJACENT TO EXISTING PEDESTAL
- (C) INSTALL 8' ALLUMINUM PEDESTAL WITH PEDESTRIAN SIGNAL, PUSH-BUTTON AND SIGN ON NEW FOUNDATION ON BACK EDGE OF SIDEWALK.
- (D) INSTALL NEW 8' ALLUMINUM PEDESTAL WITH PEDESTRIAN SIGNAL AND PUSH BUTTON ON EXISTING FOUNDATION. USE EXISTING RMC TO CARRY 14/7.

ALL PEDESTALS AND STEEL POLES TO BE LOCATED IN FIELD BY GROTON UTILITIES AND RDS ASSOCIATES PRIOR TO EXCAVATION.



NO.	DATE	INIT.	DESCRIPTION

REV. # _____ INTERSECTION # _____

TOWN SIGNAL

PROJECT TITLE: _____

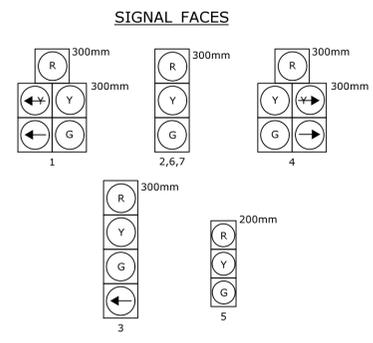
TOWN: _____ PROJECT NO.: _____

DRAWING TITLE: TRAFFIC SIGNAL PLAN SHEET DRAWING NO.: _____

SHEET NO.: _____

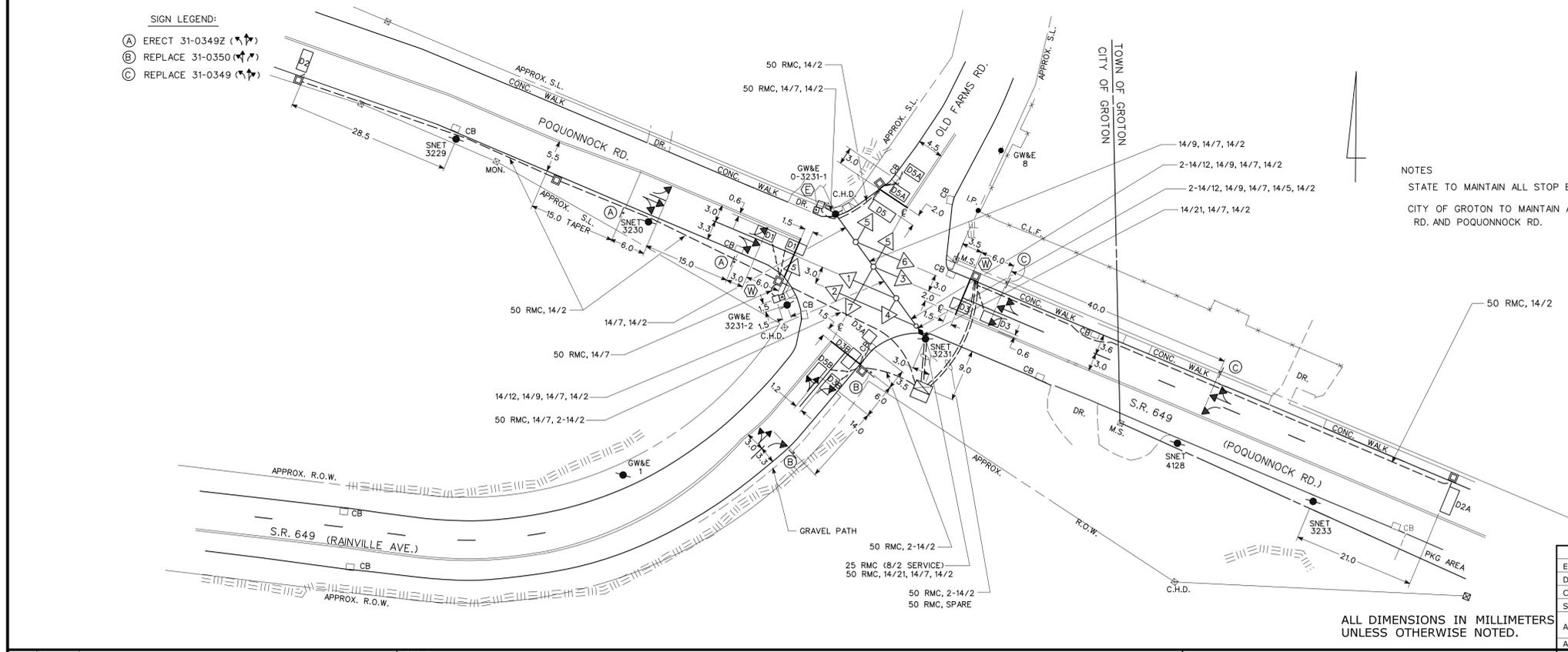
MOVEMENT DIAGRAM																						
NTOR	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6	PHASE 7	PHASE 8														
NONE																						
	FLASH	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL	GRN	CL	CL
F A C E #	1	Y	←	←	G	G	G	Y	R	R	R	R										
	2	Y	←	←	G	G	G	Y	R	R	R	R										
	3	Y	←	←	G	G	G	Y	R	R	R	R										
	4	R	←	←	R	R	R	←	←	←	←	←										
	5	R	←	←	R	R	R	←	←	←	←	←										
	6	Y	←	←	G	G	G	Y	R	R	R	R										
	7	R	←	←	R	R	R	←	←	←	←	←										
I N T E R V A L S	MIN GRN	3			15			3														
	WALK																					
	PED CLR																					
	VEH EXT	1			5			2														
	MAX 1	5			30			10														
	MAX 2	5			30			10														
	YELLOW		3.0			3.8			3.0													
	RED			1.0			2.0			3.0	1.2											
	ADD INIT					1.5																
	MAX INIT					26																
TBR																						
TTR																						
MIN GAP																						
MODE		MIN RECALL			MIN RECALL			NON-LOCK			OFF			LOCK			OFF			OFF		
INT START					THIS PHASE																	

TECHNICAL NOTES		OFFICE RECORD	
STANDARD OVERLAP SKIP FEATURES APPLY		REV # 4	TIR # N/A SM # 101091
PHASE 2 ON TO OMIT PHASE 1		REVISOR: 10/15/2018	
① TO BE "R" IF PHASE 1 IS NEXT			
② TO BE "R" IF PHASE 1 IS NEXT			
③ TO BE "R" IF PHASE 1 IS NEXT			
D3A & D3B TO EXTEND, NOT CALL PHASE 3			



ALL INDICATIONS HAVE LED LAMPS

IDENT	DETECTORS		SYSTEM LOC	COORDINATION TYPE: NONE	PROGRAM			CYCLE	OFFSET	
	SIZE (WXL)	TURNS			MODE	FUNCTION	TIME		DAYS	SEC
D1	1.8m x 3.3m	3	PRESENCE		FLASH	NONE				
D2	3.6m x 1.8m	4	PRESENCE		MAX 1	ALL TIMES				
D2A	4.5m x 1.8m	4	PRESENCE		MAX 2	FUTURE				
D3	1.8m x 3.3m	3	PRESENCE							
D3A	1.8m x 1.8m	3	PRESENCE							
D3B	1.8m x 3.3m	3	PRESENCE							
D5	4.5m x 1.8m	3	8" DELAY							
D5A	3.0m x 1.8m	3	8" DELAY							
D5B	1.8m x 3.3m	3	PRESENCE							



NOTES

STATE TO MAINTAIN ALL STOP BARS AND PAVEMENT MARKINGS ON S.R. 649

CITY OF GROTON TO MAINTAIN ALL PAVEMENT MARKINGS ON OLD FARMS RD. AND POQUONNOCK RD.

CLEARANCE INTERVALS
DESIGNED BY:
BETA GROUP, INC.
ENGINEER'S SEAL & SIGNATURE
APPLY TO CLEARANCE
INTERVALS ONLY.



ENGINEER	TRAFFIC	DATE	ELECTRICAL	DATE	REV #4	INTERSECTION # 058-253
DRAWN BY			ENERGY BY - CITY			
CHECKED BY			ADDRESS #			
SUBMITTED BY			MAINT LEVEL 5			
APPROVED BY			SERVICE POLE - SNET 3231			
APPROVED DATE			UNMETERED SERVICE			

<p>LEGEND:</p> <ul style="list-style-type: none"> R RED Y YELLOW G GREEN ← RED ARROW ← Y YELLOW ARROW ← G GREEN ARROW WALK PED. CLR D.W. DON'T WALK FL. FLASHING 		<ul style="list-style-type: none"> ○ PROPOSED WOOD SPAN POLE ● EXISTING WOOD SPAN POLE □ PROPOSED STEEL SPAN POLE ○ EXISTING STEEL SPAN POLE ○ PROPOSED UTILITY POLE ● EXISTING UTILITY POLE □ PEDESTAL MOUNTING □ PEDESTRIAN PUSH BUTTON & SIGN □ DIRECTIONAL ARW. FOR PUSH BUTTON 		<ul style="list-style-type: none"> □ TRAFFIC SIGNAL FACE □ PEDESTRIAN SIGNAL FACE DET. LEADS IN SAW CUT — PROPOSED RMC (RIGID METAL CONDUIT) — EXISTING RMC (RIGID METAL CONDUIT) □ AUXILIARY TERMINATION CABINET □ AUXILIARY EQUIPMENT CABINET □ VIDEO DETECTION ZONE 		<ul style="list-style-type: none"> □ PROPOSED CONTROLLER □ EXISTING CONTROLLER □ LOOP DETECTOR □ SD SYSTEM DETECTOR □ MAGNETIC DETECTOR □ OPTICAL DETECTOR □ VIDEO DETECTOR □ AUDIO DETECTOR 		<ul style="list-style-type: none"> □ SIDEWALK RAMP □ CABLE CLOSURE □ WIRELESS SENSOR □ WIRELESS RECEIVER □ WIRELESS TRANSMITTER □ GUY WIRE □ PROPOSED HANDHOLE □ EXISTING HANDHOLE 		<p>STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION</p> <p>S.R. 649 (RAINVILLE AVE. AND POQUONNOCK RD.) AT OLD FARMS RD. AND POQUONNOCK RD.</p>		<p>CITY: GROTON</p> <p>PROJECT NO. 172-440</p> <p>DRAWING NO. TRAFFIC CONTROL SIGNAL PLAN</p> <p>SHEET NO.</p>	
--	--	--	--	--	--	--	--	--	--	--	--	--	--

NO.	DATE	REVISION DESCRIPTION

SCALE 1mm = 500mm

DATE PLOTTED : 3/1/2019 \\DOT-SDCENG07V\CTDOT_Projects\0172-0440\Traffic\3-Final Design\058 Groton FD\Microstation files\TR_TCS_058_253_004.dgn