

1. Agenda & Minutes

Documents:

[JULY 22 2025 DRB AGENDA.PDF](#)
[MARCH 11 2025 DRB MINUTES.PDF](#)

2. PL-25-8 Project LEARN School

Documents:

[PL-25-8 2025-07-11 LEARN - PANDZ RESUBMISSION PLANS COMBINED.PDF](#)
[PL-25-8 2025-07-11 SLR REVIEW - COMMENT RESPONSE LETTER.PDF](#)
[PL-25-8 2025-0501 LEARN EARLY CHILDHOOD SCHOOL TIS.PDF](#)
[PL-25-8 2025-0507 - LEARN - APPLICATION PACKAGE.PDF](#)
[PL-25-8 LEARN SCHOOL TRAFFIC REPOSE.PDF](#)
[PL-25-8 REPORT OF ACTION TO PZC 6 17 025.PDF](#)
[PL-25-8 STAFF REPORT.PDF](#)

FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886



PHONE: 860-442-0553
www.waterfordct.org

RECEIVED FOR RECORD
WATERFORD, CT
2025 JUL 17 P 4:00 P.m.
ATTEST: David J. Langston
TOWN CLERK

AGENDA

**Design Review Board
Town Hall**

Meeting Documents

https://www.waterfordct.org/AgendaCenter/Design-Review-Board-7/?#_07222025-2150

ITEM #1 CALL TO ORDER/APPOINTMENT OF ALTERNATES

ITEM #2 PLAN REVIEWS

PL-25-8 – Request of LEARN, applicant; Town of Waterford, owner; for site plan approval for a new School located at 51 Daniels Avenue, R-40 zone, in accordance with Section 5.1.3 and 22 of the Zoning Regulations and as shown on plans entitled "LEARN – Early Childhood School, 51 Daniels Avenue, Waterford, CT State Project Number: 245-0090 MAG/N/PF" dated 05/05/2025.

ACTION REQUIRED BY: 7/17/2025
EXTENSION GRANTED TO: 7/22/2025

ITEM #3 APPROVAL OF THE March 11, 2025 MEETING MINUTES

ITEM #4 ADJOURNMENT

RECEIVED FOR RECORD
WATERFORD, CT

2025 MAR 14 P 12:11

ATTEST: *David L. Campese*
TOWN CLERK

**DESIGN REVIEW BOARD
MEETING MINUTES**

Design Review Board
Town Hall

March 11, 2025
4:00 PM

Members Present: Chairman -John O'Neill, Robert Nye, Joy Merrill and Michael Elbaum,
Members Absent: Edward Pellegrini
Staff Present: Jonathan Mullen, AICP, Planning Director, Mark Wujtewicz, Planner

ITEM #1 CALL TO ORDER AND APPOINTMENT OF ALTERNATES

Chairman, John O'Neill called the meeting to order at 4:00 p.m.

ITEM #2 PLAN REVIEWS

#PL-25-3 – Request of the Town of Waterford, owner and applicant, for a site plan review and approval for a new Oswegatchie Fire Station on property located at 439 and 441 Boston Post Road, NBPO zone in accordance with sections 7a.2.3, 22 and 25.4 of the Zoning Regulations and as shown on plans titled "Oswegatchie Fire Station, 441 Boston Post Road, Waterford, Connecticut, Site Plan/Design Review/Coastal Site Plan Application" dated revised 2/7/2025.

ACTION REQUIRED BY: 4/16/25

Brian Phillips, PE from Langan Engineering and Eric Cantor representing Silver Petrucelli & Associates presented the project to the Board. B. Phillips described the existing site conditions and stated that the construction will be phased in order to maintain operation of the existing fire house facility during construction of the new facility.

The redesign of the site will decrease the amount of impervious surface and increase the amount of landscaping than what currently exists on the site thereby improving stormwater impacts.

Eric Cantor from Silver Petrucelli & Associates presented the design of the building to the Board. He stated that the building was designed to reflect the site surroundings and uses. It will have a gable shingled roof and fiber cement board siding. The building is designed to support the fire services and also provide community space for the public. Access to the fire service side of the building will be limited to the fire support services while the public portion of the building will be open and accessible to the general public. The exterior of the two sections of the building will be distinguished by the difference in design and siding type and color. E. Cantor stated that the roof of the building will be designed to support the installation of photovoltaic solar panels in the future. The front doors to the three apparatus bays are bi-fold

style rather than typical overhead doors. He stated that the bi-fold style doors typically have a faster opening time than the overhead door style.

J. Merrill expressed concerns regarding fading of the fiber board color over time especially with the front of the building having a southerly face. E. Cantor stated that if the fiber board color is incorporated into the product then the effect of fading will be minimal over time. However, if the color is painted on, then over a period of time the siding may need to be repainted.

M. Elbaum asked about the parking lot lighting. B. Phillips stated that all exterior lighting, including the parking lot lighting is rated dark skies compliant.

J. O'Neill asked whether the running bond colonial brick will be real brick. E. Cantor confirmed that the brick will be real.

M. Elbaum inquired as to whether there will be any irrigation on the site to maintain the landscaping. B. Phillips stated that there will not be any irrigation installed.

MOTION: Motion made by R. Nye, seconded by M. Elbaum, to submit a positive recommendation to the Planning and Zoning Commission for the new Oswegatchie Fire Station on property located at 439 and 441 Boston Post Road as shown on plans titled "Oswegatchie Fire Station, 441 Boston Post Road, Waterford, Connecticut, Site Plan/Design Review/Coastal Site Plan Application" dated revised 2/7/2025.

VOTE: 4-0

ITEM #3 APPROVAL OF THE January 14, 2025 MEETING MINUTES

MOTION: Motion made by J. Merrill, seconded by R. Nye, to approve the January 14, 2025 meeting minutes as written.

VOTE: 4-0

ITEM #4 ADJOURNMENT

MOTION: Motion made by J. Merrill, seconded by R. Nye, to adjourn the meeting at 4:25 pm.

VOTE: 4-0

Respectfully Submitted,


Mark Wujtewicz
Planner

ZONING CHART

ZONE: LOW DENSITY RESIDENTIAL DISTRICT (R-40)

LAND USE: PUBLIC SCHOOL

PARCEL AREA: ±15.36 ACRES TOTAL BUILDING FOOTPRINT: ±87,640 SF

CRITERIA	LOT/BUILDING			SECTION
	REQUIRED	EXISTING	PROPOSED	
MIN. LOT AREA [SQ. FT]	40,000	854,656	669,075	5.1
MIN. FRONTAGE [FT]	100	534	348	5.3
MIN. LOT WIDTH [FT]	125	576	364	5.3
FRONT YARD SETBACK [FT]	50	139	311	5.4.1
SIDE YARD SETBACK [FT]	25	125	60	5.4.2
REAR YARD SETBACK [FT]	50	712	423	5.4.3
MAX. BUILDING COVERAGE [%]	20	4.90%	13.10%	5.5
MAX. BUILDING HEIGHT [FT]	35	-	<35	5.6
PARKING				
MIN. STANDARD SPACE DIMENSIONS [FT]	9 X 18	-	9 X 18	20.2a
MIN. NUMBER OF PARKING SPACES	66 ^{1/2}	89	233	20.3a
MIN. NUMBER OF ACCESSIBLE SPACES	7 (2 VAN)	-	7 (6 VAN)	2010 ADA STANDARDS
MIN. NUMBER OF EV SPACES	47 ³	-	47	CT CLEAN AIR ACT

- NOTES:**
- PUBLIC SCHOOL - 2 SPACES FOR EACH CLASSROOM PLUS 1 SPACE FOR EVERY 4 FIXED SEATS IN AUDITORIUMS, GYMNASIUMS OR OTHER PLACES OF PUBLIC ASSEMBLY.
KINDERGARTENS & CHILD CARE CENTERS - 2 SPACES FOR EACH CLASSROOM, BUT NOT LESS THAN 6 SPACES FOR ANY ONE BUILDING.
 - PROPOSED SCHOOL INCLUDES 33 MAIN CLASSROOMS.
 - PROVIDE LEVEL TWO EV CHARGERS IN AT LEAST 20% OF PARKING SPOTS.

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PHASE:
WATERFORD PLANNING AND ZONING COMMISSION

REVISIONS

NO	DATE	DESCRIPTION
1	07/11/2025	RESPONSE TO COMMENTS

PROJECT NAME:
LEARN - EARLY CHILDHOOD SCHOOL

PROJECT ADDRESS:
51 DANIELS AVE, WATERFORD, CT 06385

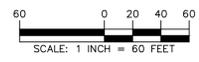
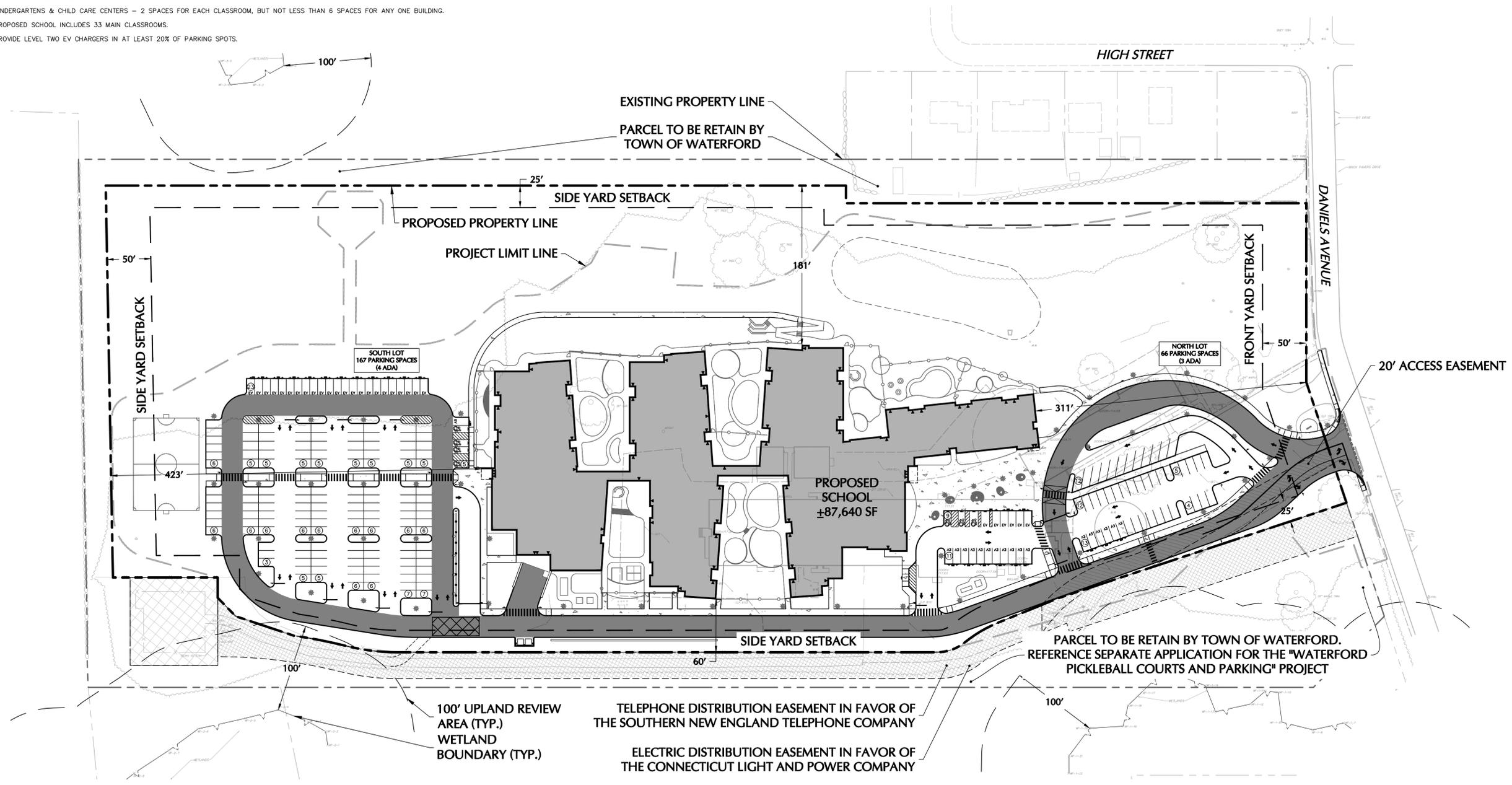
STATE PROJECT NUMBER:
245-0090 MAG/N/PF

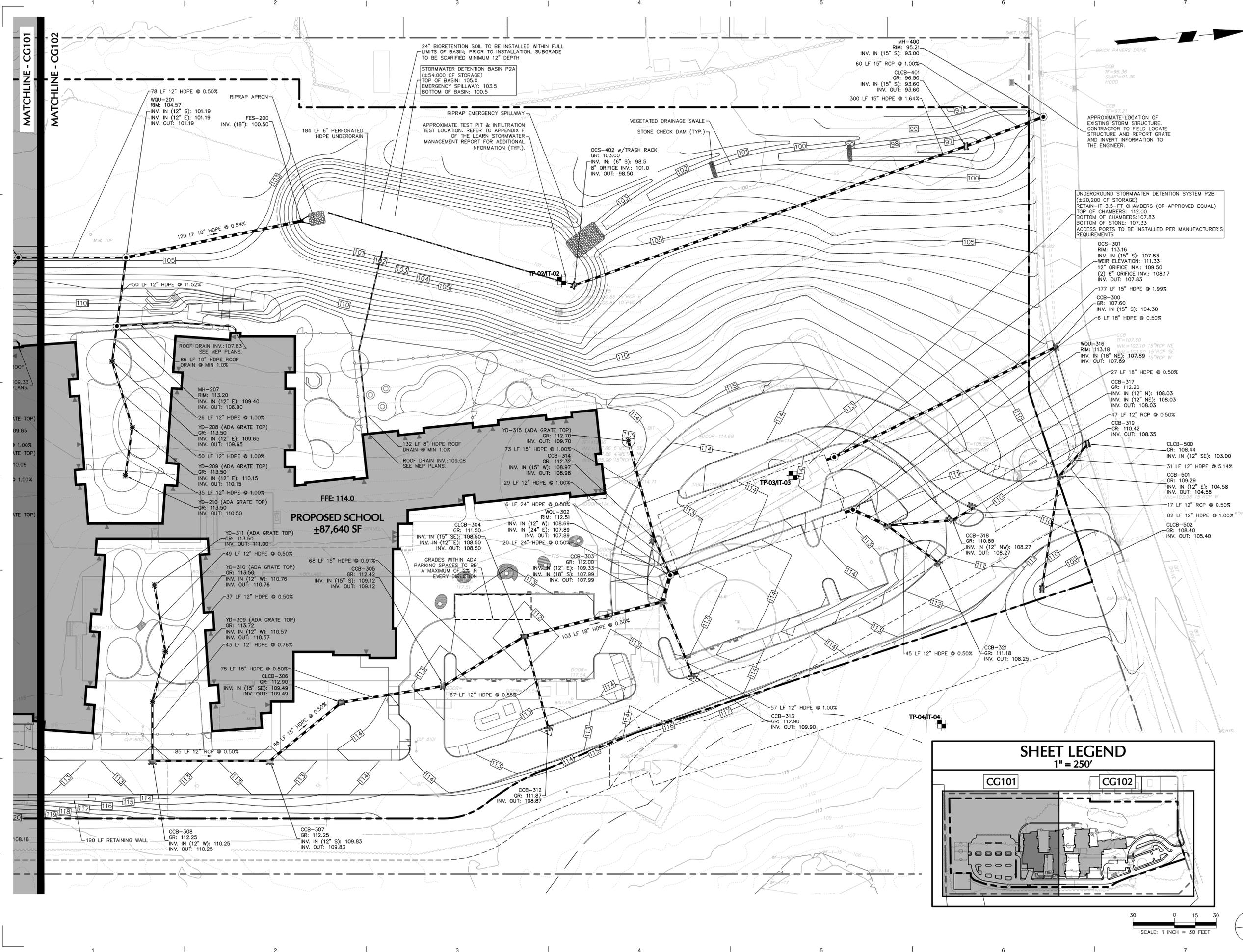
NEWMAN PROJECT NUMBER:
20240069

DRAWING TITLE:
OVERALL SITE PLAN

SCALE: As indicated	DRAWN BY: BTW
DATE: 05/01/2025	CHECKED BY: KEG

DRAWING NUMBER:
CS100





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REVISIONS

NO	DATE	DESCRIPTION
1	07/11/2025	RESPONSE TO COMMENTS

PROJECT NAME:
LEARN - EARLY CHILDHOOD SCHOOL

PROJECT ADDRESS:
51 DANIELS AVE, WATERFORD, CT 06385

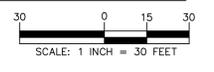
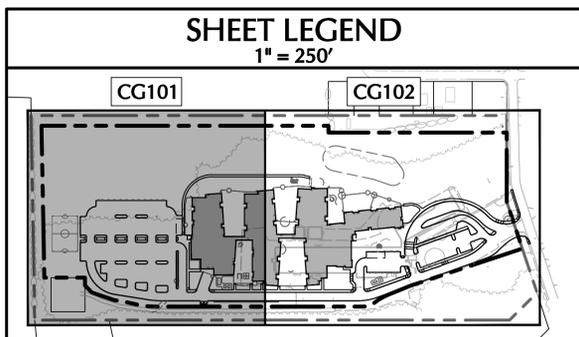
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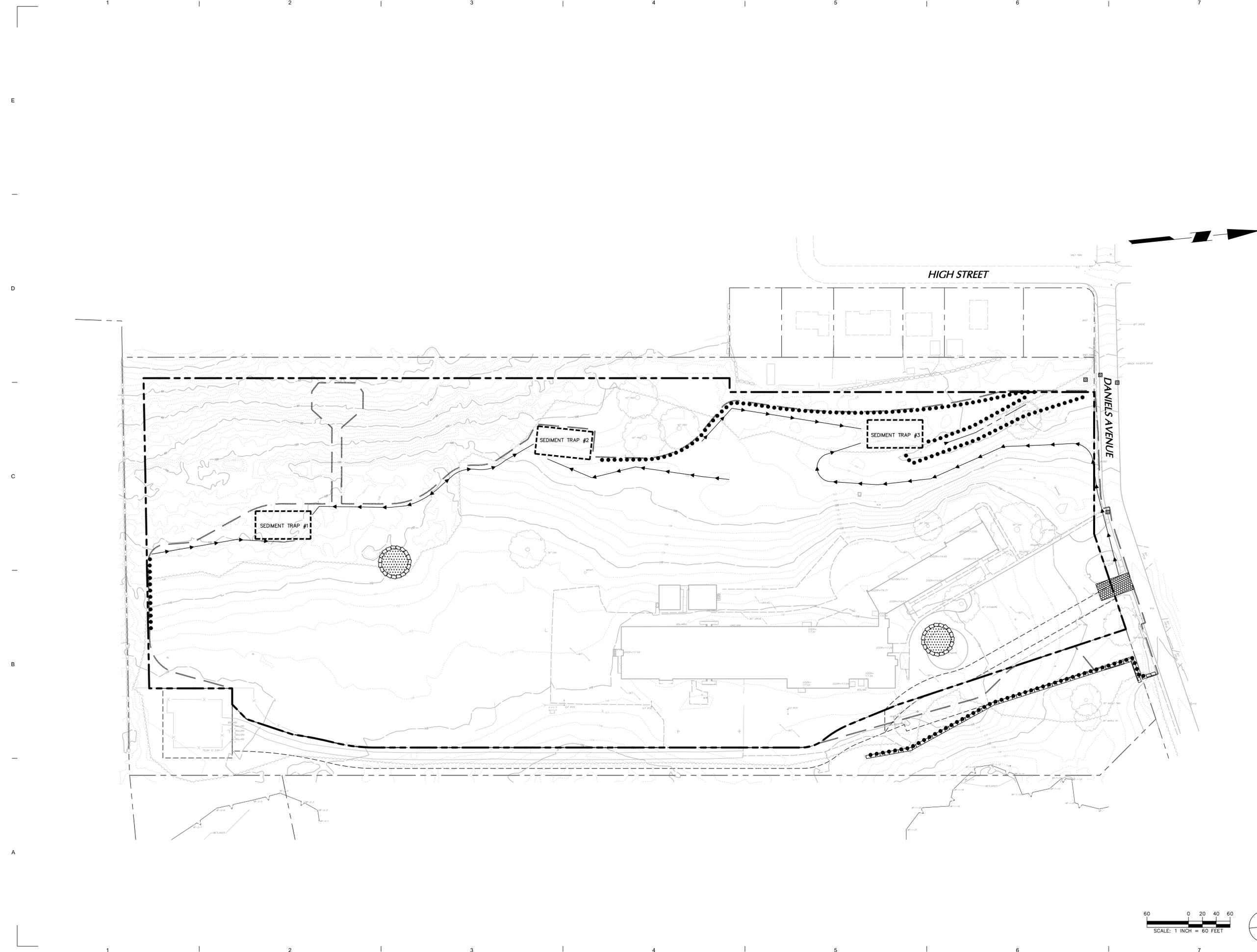
NEWMAN PROJECT NUMBER:
20240069

DRAWING TITLE:
GRADING AND DRAINAGE PLAN II

SCALE: As indicated	DRAWN BY: BTW
DATE: 05/01/2025	CHECKED BY: KEG

DRAWING NUMBER:
CG102





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REVISIONS

NO	DATE	DESCRIPTION
1	07/11/2025	RESPONSE TO COMMENTS

NO	DATE	DESCRIPTION

PROJECT NAME:
LEARN - EARLY CHILDHOOD SCHOOL

PROJECT ADDRESS:
51 DANIELS AVE, WATERFORD, CT 06385

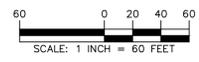
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245-0090 MAG/N/PF

NEWMAN PROJECT NUMBER:
20240069

DRAWING TITLE:
OVERALL SOIL EROSION & SEDIMENT CONTROL PLAN PHASE 1

SCALE: **As indicated** DRAWN BY: **SGS**
 DATE: **07/03/2025** CHECKED BY: **KEG**

DRAWING NUMBER:
CE100



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NO	DATE	DESCRIPTION
1	07/11/2025	RESPONSE TO COMMENTS

PROJECT NAME:
LEARN - EARLY CHILDHOOD SCHOOL

PROJECT ADDRESS:
**51 DANIELS AVE,
 WATERFORD, CT 06385**

STATE PROJECT NUMBER:
245-0090 MAG/N/PF

NEWMAN PROJECT NUMBER:
20240069

DRAWING TITLE:
SOIL EROSION & SEDIMENT CONTROL PLAN II PHASE 1

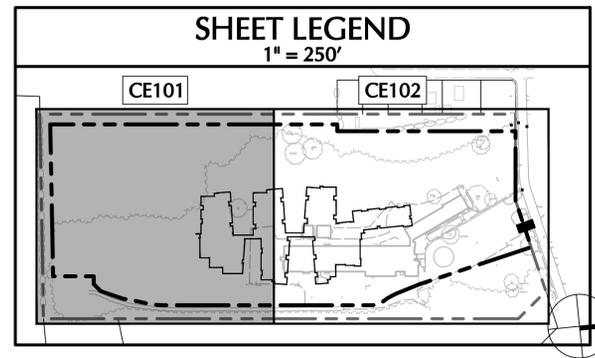
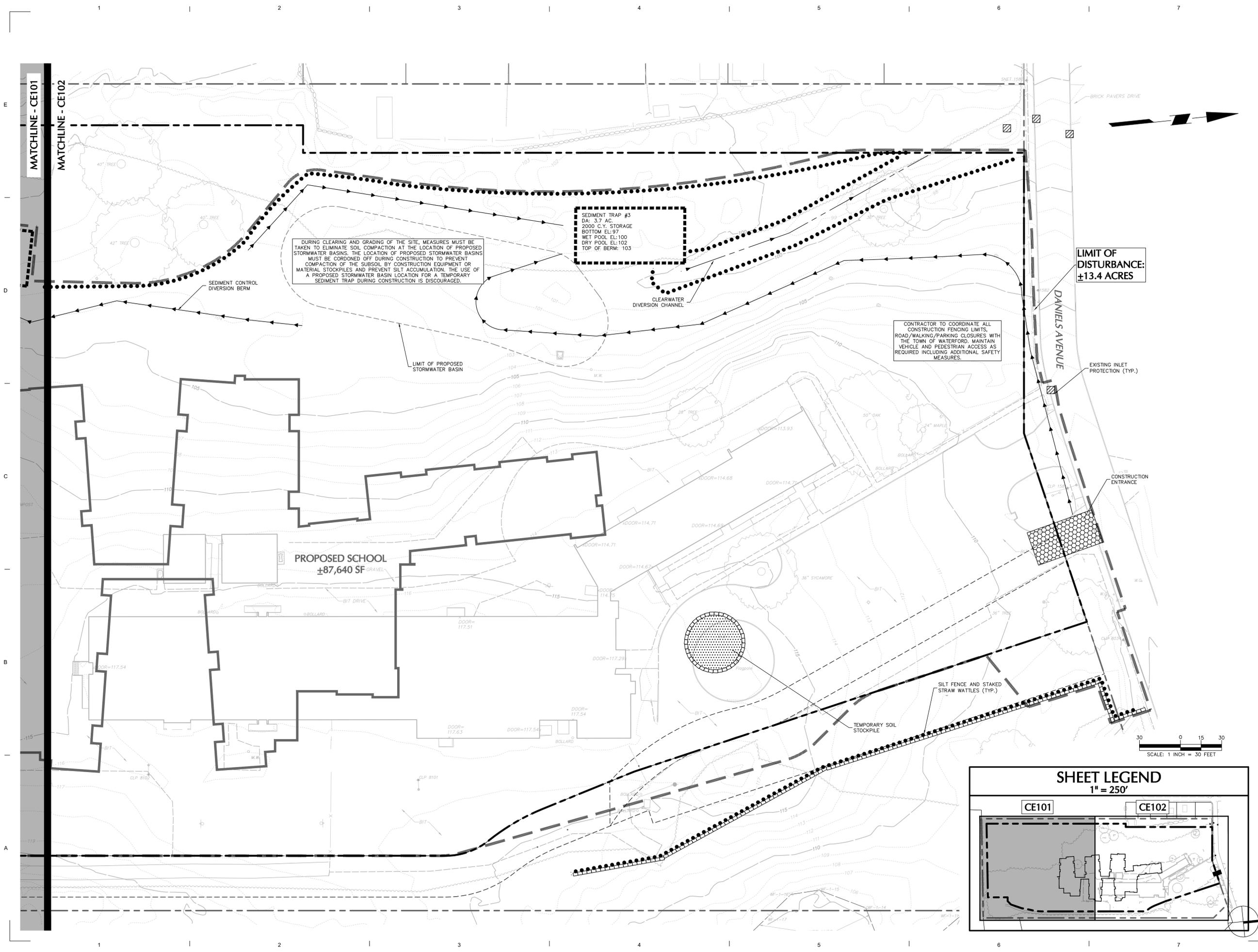
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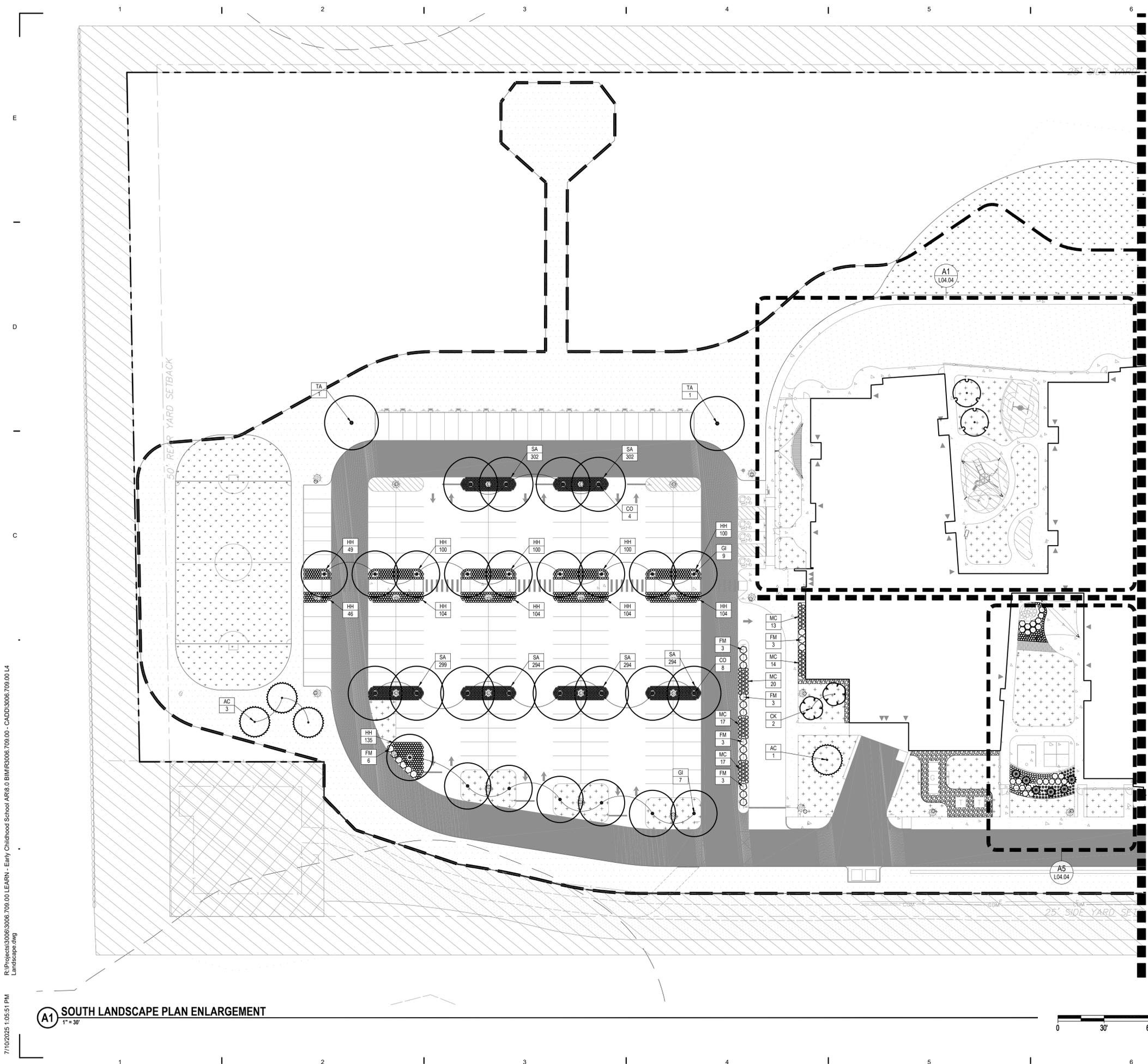
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BTW

DATE:
05/01/2025

CHECKED BY:
KEG

DRAWING NUMBER:
CE102





NOTE: REFER TO SHEET G0.00 FOR SYMBOLS & ABBREVIATIONS AND SHEET G0.01 FOR GENERAL NOTES.

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PHASE:
WATERFORD SUBMISSION

REVISIONS

NO	DATE	DESCRIPTION
1	7/11/2025	RESPONSE TO COMMENTS

PROJECT NAME:

LEARN EARLY CHILDHOOD SCHOOL

PROJECT ADDRESS:
**51 DANIELS AVE.
 WATERFORD, CT 06385**

STATE PROJECT NUMBER:
245-0090 MAG/N/PF

NEWMAN PROJECT NUMBER:
PROJECT NO 20240069

DRAWING TITLE:
SOUTH LANDSCAPE PLAN ENLARGEMENT

SCALE: 1" = 30'	DRAWN BY: EH
DATE: 05/05/2025	CHECKED BY: AM

DRAWING NUMBER:
L04.02

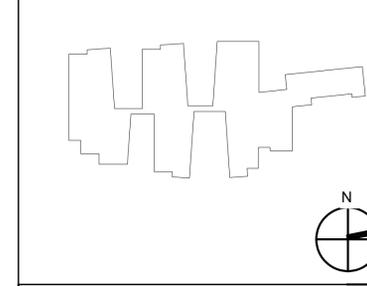
PLANTING LEGEND

- PROPOSED PROPERTY LINE
- SOO, SEE SPECS
- BRECKENTON SEED, SEE SPECS
- ROCK MULCH
- TURF SEED, SEE SPECS
- NATIVE SEED, SEE SPECS

MATERIALS LEGEND

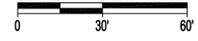
- FENCE
- CONCRETE TRAILS AND SIDEWALKS, SEE CIVIL
- POURED-IN-PLACE RUBBERIZED SAFETY SURFACING
- PROPOSED PROPERTY LINE
- ASPHALT ROADS AND PARKING, SEE CIVIL
- DECKING

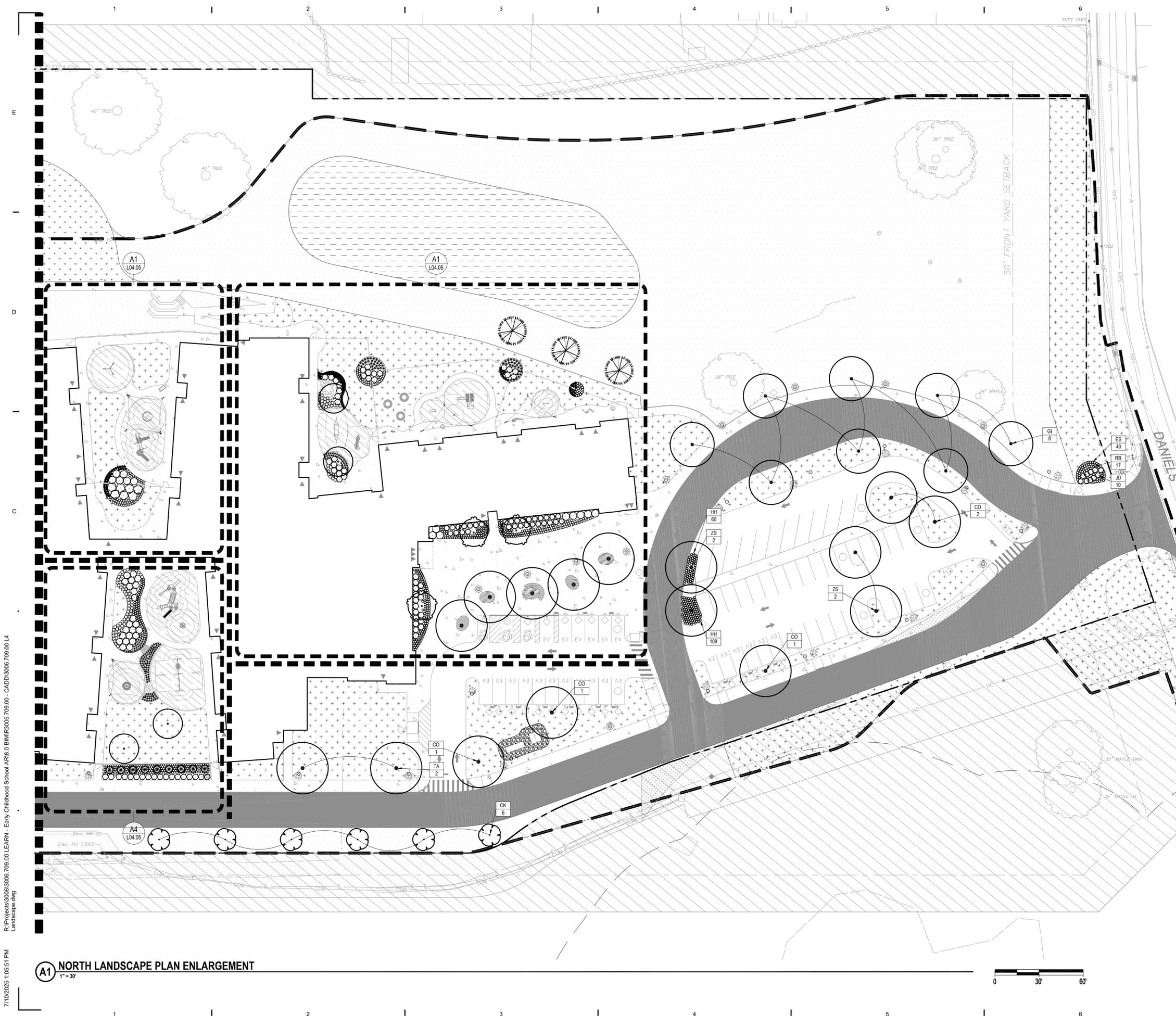
KEYPLAN



R:\Projects\3006\3006_709.00 LEARN - Early Childhood School ARI8.0 BIM\3006_709.00 - CADD\3006_709.00 L4 Landscape.dwg
 7/10/2025 1:05:51 PM

A1 SOUTH LANDSCAPE PLAN ENLARGEMENT
 1" = 30'





NOTE: REFER TO SHEET G0.00 FOR SYMBOLS & ABBREVIATIONS AND SHEET G0.01 FOR GENERAL NOTES.

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PHASE:
WATERFORD SUBMISSION

REVISIONS

NO	DATE	DESCRIPTION
1	7/11/2025	RESPONSE TO COMMENTS

PROJECT NAME:
LEARN EARLY CHILDHOOD SCHOOL

PROJECT ADDRESS:
51 DANIELS AVE. WATERFORD, CT 06385

STATE PROJECT NUMBER:
245-0090 MAG/N/PF

NEWMAN PROJECT NUMBER:
PROJECT NO 20240069

DRAWING TITLE:
NORTH LANDSCAPE PLAN ENLARGEMENT

SCALE: 1" = 30'	DRAWN BY: EH
DATE: 05/05/2025	CHECKED BY: AM

DRAWING NUMBER:
L04.03

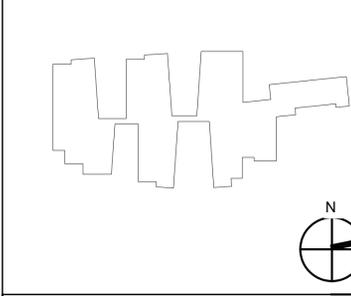
PLANTING LEGEND

- PROPOSED PROPERTY LINE
- SOO, SEE SPECS
- BRETENTION SEED, SEE SPECS
- ROCK MULCH
- TURF SEED, SEE SPECS
- NATIVE SEED, SEE SPECS

MATERIALS LEGEND

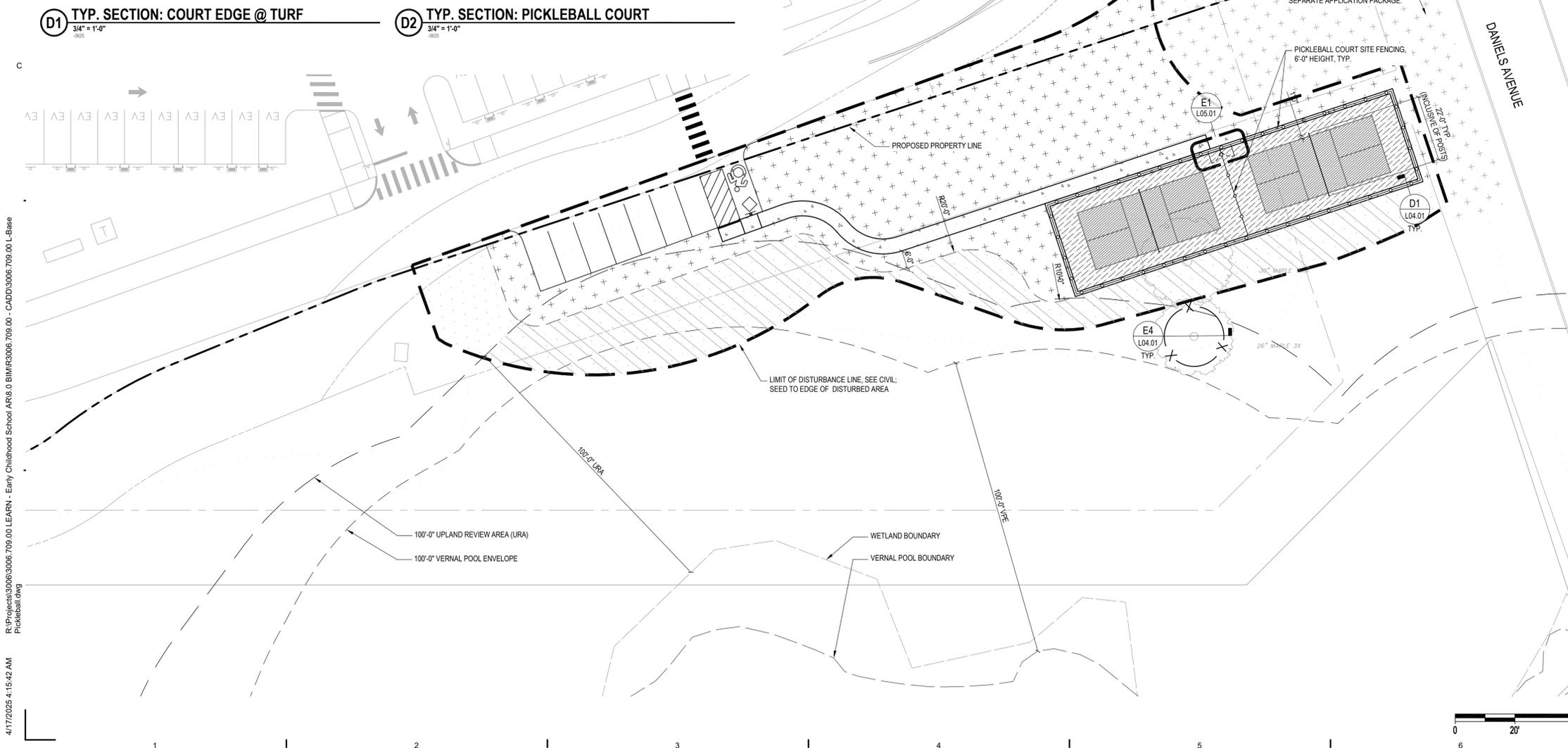
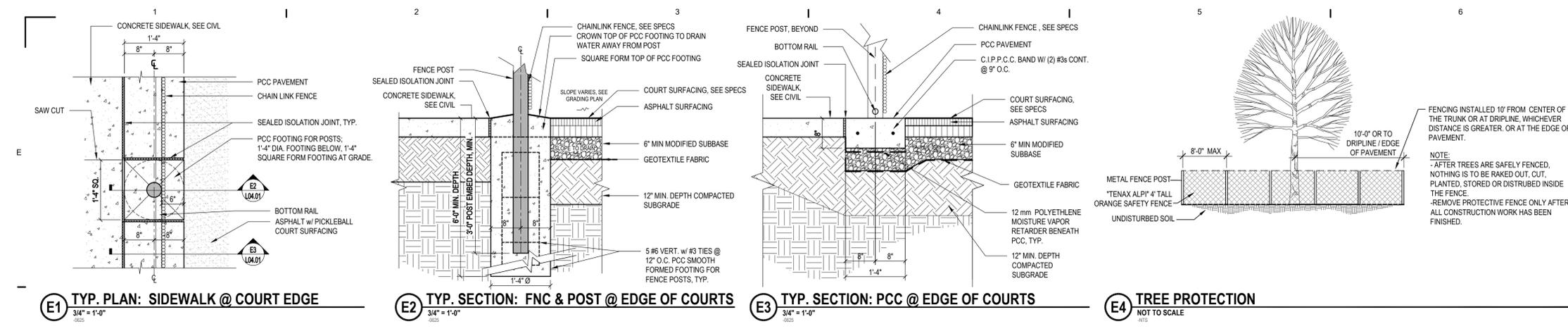
- FENCE
- CONCRETE TRAILS AND SIDEWALKS, SEE CIVIL
- POLURED-IN-PLACE RUBBERIZED SAFETY SURFACING
- PROPOSED PROPERTY LINE
- ASPHALT ROADS AND PARKING, SEE CIVIL
- DECKING

KEYPLAN



R:\Projects\3006\3006_709.00 LEARN - Early Childhood School AR18.0 BIM\3006_709.00 - CADD\3006_709.00 L4 Landscape.dwg
 7/10/2025 1:05:51 PM

A1 NORTH LANDSCAPE PLAN ENLARGEMENT
 1" = 30'



SITE PLANTING PLAN NOTES

- Finish grades in all landscape areas are to be reviewed by the Landscape Architect prior to any seeding, sodding, or planting. The Contractor shall submit a written request for review five (5) days prior to the desired date of review. No compensation for re-seeding, re-sodding, or re-planting of an area requiring remedial grading shall be allowed resulting from failure to comply with this requirement.
- The Contractor shall preserve areas of existing vegetation, including grass, that occur within the Contract Limits but are not needed for construction. Repair all of these existing areas to their original condition which are disturbed during construction at no cost to the Owner.
- All areas disturbed during construction, outside of the Contract Limits, shall be repaired to their original condition at no expense to the Owner.
- Prior to planting, verify that soil adjacent to pavements and curbs are at the correct elevation to assure a level transition from the pavement to the mulched beds. No compensation for removal and replacement of installed plants and mulch, due to unacceptable transition from one surface to the other (i.e. plant bed too high or too low), will be allowed resulting from failure to comply with this requirement.
- The Landscape Contractor shall be responsible for all trees to be straight and vertical at the time of the final inspection scheduled at the end of the one year warranty period. Should the Contractor choose to stake or guy the trees, staking and guying shall be placed per the Contract Documents and the Contractor is responsible for removing and off-site disposal of all stakes, wires, cables, and anchors immediately before the one year warranty inspection.
- The \$8,000 SF enhancement area will consist of planting with select native shrubs and trees following grading activities and placement of topsoil to establish a dense buffer of woody plants that will enhance water quality and wildlife habitat functions for the adjacent wetland and vernal pool habitat.
- Planting stock used in the enhancement area shall be inspected for pests, disease and overall health to ensure suitable specimens are used. Unsuitable specimens will be rejected and replaced with suitable specimens. Any planting substitutions must be approved by the Project Wetland Scientist. Only plant materials native and indigenous to Connecticut shall be used. Invasive plant species will not be used in the mitigation area.
- Undersow enhancement area with a New England Conservation/Wildlife Seed Mix (New England Wetland Plants, Inc. or approved equivalent). Seed mix shall be applied at the manufacturer's recommended seeding rate and protected with a weed-free straw mulch or hydroseeded with a bonded fiber matrix. Permanent cover of native grasses and forbs will provide both good erosion control and wildlife habitat value.
- All plant materials installed shall meet or exceed the specifications of the "American Standards for Nursery Stock" by the American Association of Nurserymen. All plant materials shall be guaranteed for one year following date of final acceptance. No cultivars of the native plants identified in the planting schedule shall be used unless approved by the Project Wetland Scientist.
- Tree and shrub spacing is provided for general purposes. Actual locations of plants to be adjusted in the field based on available space. The Project Wetland Scientist will assist in selecting planting locations and spacing to simulate nature growth patterns.
- Plant black chokeberry, serviceberry, and bayberry along edge of clearing as species prefer full sun in order to set heavier fruit. All other trees and shrubs are shade tolerant.

TABLE 1 - PLANTING SCHEDULE

Quantity	Botanical Name	Common Name	Size	Spacing
10	<i>Acer rubrum</i>	Red Maple	6-8"	10-20 feet
20	<i>Amelanchier canadensis</i>	Serviceberry	3-4"	7-10 feet
40	<i>Cornus racemosa</i>	Gray Dogwood	3-4"	7-10 feet
40	<i>Hibiscus pennsylvanicus</i>	Bayberry	3-4"	7-10 feet
40	<i>Photinia melanocarpa</i>	Black chokeberry	3-4"	7-10 feet
40	<i>Viburnum lentago</i>	Nannyberry	3-4"	7-10 feet

REVISIONS

NO	DATE	DESCRIPTION
1	7/11/2025	RESPONSE TO COMMENTS

PROJECT NAME:
WATERFORD PICKLEBALL COURTS AND PARKING

PROJECT ADDRESS:
51 DANIELS AVE. WATERFORD, CT 06385

STATE PROJECT NUMBER:
245-0090 MAG/A/PF

NEWMAN PROJECT NUMBER:
20240069

MATERIALS LEGEND

- TREE
- FENCE
- CONCRETE TRAILS AND SIDEWALKS
- SOD
- NEW ENGLAND CONSERVATION/WILDLIFE SEED MIX AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS, INC.
- 8,000 SF UPLAND REVIEW / VERNAL POOL TERRESTRIAL ENHANCEMENT AREA; SEE TABLE 1 FOR QUANTITIES
- PROPOSED PROPERTY LINE
- PICKLEBALL COURT SURFACING, COLOR ONE
- PICKLEBALL COURT SURFACING, COLOR TWO

SCALE: **1" = 20'**

DATE: **05/01/2025**

DRAWING NUMBER: **L04.01**

NEWMAN

NEWMAN ARCHITECTS, PC
265 Church Street, 15th Floor
New Haven, CT 06510
203.772.1990 Fax: 203.772.1997
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NOT FOR CONSTRUCTION

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THE GREEN ENGINEER
23 BRADFORD
CONCORD, MA 01742
(978) 369-8978

DRAWING TITLE:
OVERALL SITE LANDSCAPE PLAN

SCALE: **1" = 20'**

DATE: **05/01/2025**

DRAWING NUMBER: **L04.01**

DRAWN BY: **EH**

CHECKED BY: **AM**

July 14, 2025

Mr. Ryan McEvoy, PE
Principal Civil Engineer
SLR International Corporation
99 Realty Drive
Cheshire, CT 06410

**RE: Peer Review – Site Plan & Stormwater Management Applications
51 Daniels Avenue
Waterford, Connecticut
Langan Project No.: 140310301**

Enclosed please find our responses to your letter dated June 25, 2025. Below please find each comment followed by our response in **bold**.

Review Comments

1. The applicant's engineer should confirm the amount of cover over the proposed underground Retain-It® systems. Specifically for System P1A near CCB-112, there is potential for less than 1 foot of cover over the system. For System P2B, the top of the concrete chambers is close to proposed finished grade at the southern end of the system.

COMMENT RESPONSE: The systems have been designed to meet the minimum cover requirements allowed for a Retain-It chamber. Per Retain-It manufacturer guidance, the precast concrete systems allow for a minimum cover of 6". The systems will be reviewed and approved by the Retain-It manufacturer prior to construction. At the lowest point of finished grade, Systems P1A and P2B have approximately 9" of cover.

2. Based on a site visit by SLR, there is an existing catch basin in a low point in the northwest corner of the property near Daniels Avenue that captures a majority of the runoff from Existing Watershed 2. This existing catch basin on site drains to the existing catch basin (TF=96.36) in Daniels Avenue. We recommend the location of the existing catch basin on site is added to the site plans along with the inverts for this catch basin and existing catch basin within Daniels Avenue. Coordination with Waterford Public Works might be needed to remove inserts from the catch basin within Daniels Avenue to obtain pipe inverts and sizes accurately.

COMMENT RESPONSE: A callout has been added to sheet CG101 noting the location of this existing catch basin. Prior to construction the contractor will be required report the location and invert information to Langan. The structure will be maintained and protected during construction.

3. In order to mimic existing site hydrology, consideration should be given to directing the discharge from Stormwater Basin P2A to the existing swale/depression noted in Comment #2. Presently, Existing Watershed-2 (EXWS-2) ultimately discharges to the depression and inlet structure, connecting to CCB (TF=96.36). The proposed condition stormwater design connects to existing storm drainage upgradient of the CCB noted above.

COMMENT RESPONSE: This option was considered; however, the existing structure is located outside of the proposed property limits. The design intent is to avoid the installation of any stormwater structures, pipes and grading disturbance on the portion of the existing property that is to be retained by the Town.

4. The hydrology analysis in the Stormwater Management Report has included the entirety of the school roof area with Proposed Watershed 2A and directed to Stormwater Detention Basin P2A. Please note that Sheets CG101 and CG102 contain a note that states, "Connect all roof leaders to nearest storm structure or nearest drainage pipe at minimum 0.5%." Absent are any specifically routed pipes on the east of the building that connect to Basin P2A, and roof leaders could be directed to storm drainage routed to underground system Basin P2B. We recommend that either 1) storm drainage is provided along the east side of the building, directed to Basin P2A, or 2) modify the hydrology model to direct a portion of the east side of the building to Basin P2B.

COMMENT RESPONSE: The note on sheets CG101 and CG102 will be removed and was an error. The entirety of the roof area runoff will be collected and conveyed through the four roof drains located on the western side of the building. The stormwater model reflects this routing, and the routing has been confirmed with the project MEP.

5. For Existing Watershed 1, the stormwater runoff from this watershed is dispersed over a large area with no apparent concentration to a single swale, watercourse, storm structure etc. Under proposed conditions, peak runoff rates are being decreased compared to existing conditions, but a concentration of runoff is being proposed via the proposed level spreader/scour hole. For example, for the 100-year storm under existing conditions there is a peak runoff rate of 35.44 cubic feet per second (cfs) for Watershed 1. Under proposed conditions there is a peak runoff rate of 28.67 cfs with 17.40 cfs being discharged by the proposed level spreader/scour hole. There is potential for properties downgradient of the level spreader/scour hole to receive an increase in peak runoff rates under proposed conditions compared to existing conditions due to the proposed concentration of stormwater discharge. The applicant's engineer should consider increasing the length of the level spreader and/or disperse the discharge in more than one area to attempt to better mimic existing runoff conditions.

COMMENT RESPONSE: The outfall location has been selected during the Wetland Commission review and approval, in consultation with the commission, to reduce the potential for downgradient properties to receive stormwater runoff by ensuring discharge from HW-100 will reach the existing off-site wetland to the west. The discharge from system P1A will be routed through a drop manhole structure, scour

hole and 50-foot level spreader to unconcentrated flows and provide additional energy dissipation. The flow rate over the level spreader for the 100-year storm is approximately 1.57 fps (see Appendix B).

6. Computations for the Level Spreader/Scour Hole at HW-100 should be provided to demonstrate non-erosive velocities over the curb.

COMMENT RESPONSE: Flow over the 50-foot level spreader for the 100-year storm is approximately 1.57 fps (see Appendix B), which is below the allowable velocity threshold of 2.5 fps for sandy soils per the 2024 Connecticut Guidelines for Soil Erosion & Sediment Control Manual. Additionally, the Manual states the general rule of thumb for level spreaders is to provide 4 feet of length for every 1 cfs for the 10-year storm. The P1A 10-year peak flow rate = 7.26 cfs which requires a minimum level spreader length of 29 feet. As noted above and in Appendix B, the velocity exiting the level spreader is below the guideline level.

7. We recommend that the invert elevation of HW-100 is lowered to be lower than the top of curb elevation of the level spreader.

COMMENT RESPONSE: Noted – the invert elevation for HW-100 has been lowered below the top of curb elevation. See revised HW-100 invert on sheet CG101.

8. The applicant's engineer should consider isolator rows for the proposed underground systems P1A and P2B.

COMMENT RESPONSE: Isolator rows were considered; however, due to the configuration of system P1A, ease of maintenance, and the use of prefabricated concrete chambers rather than plastic arch chambers, it was determined that water quality units are a more effective pretreatment device. Water quality units are provided at all inlet locations for systems P1A and P2B.

9. Specifications for the Bioretention Soil for Stormwater Detention Basin P2A should be provided.

COMMENT RESPONSE: Refer to bioretention soil specifications provided under detail 3 on sheet CG503. This specification calls for a mixture of 60% sand and 40% horticultural soil. This blend will promote infiltration, support plant growth and stabilization within the basin.

10. The planting schedule or seed mixes for Stormwater Detention Basin P2A should be provided.

COMMENT RESPONSE: Refer to sheet L04.03 for the location of Basin P2A seeding information. The Turf and Grasses specification calls for New England Erosion Control/Restoration Mix. This mix is appropriate for detention basins not holding standing water, and the mix is formulated for ecologically sensitive restorations that will do well in recently disturbed sites to stabilize the soil surface.

11. According to Section 25.6.5.8 Conveyance Criteria of the Stormwater Management and Low Impact Development Standards in the Town of Waterford Zoning Regulations, "Emergency outlets must safely pass the post-development peak runoff from the 100-year storm event in a controlled manner without erosion of the outlet works or downstream drainage system and provide a freeboard of at least one (1) foot.". Less than 1 foot of freeboard is provided for Stormwater Basin P2A for the 10-year storm through 100-year storm.

COMMENT RESPONSE: The proposed infiltration basin berm elevation has been raised to elevation 105. The peak elevation in Basin P2A during the 100-year storm is approximately ±103.56. As a result, the revised plans provide about 1.44 feet of freeboard.

12. The top of frame elevation specified for Trench Drain 114 does not appear to match with nearby proposed grading.

COMMENT RESPONSE: The previously called out TD-114 frame elevation was an error. The revised frame elevation has been revised (see sheet CG101).

13. Based on the Test Pit Log for TP-01, there is potential for groundwater to be within a foot or two of the bottom of System P1A. The applicant's engineer should consider a dewatering underdrain set within the stone below the Retain-It chambers to ensure the system drains out in between rain events.

COMMENT RESPONSE: TP-01 indicates groundwater approximately 9 feet below existing grade. This relative groundwater elevation was assumed to be consistent at the proposed location of System P1A (i.e., assumed GW elevation 97.5 feet). The bottom of chamber elevation for system P1A was set at elevation 101.33 feet to provide the minimum 3-foot clearance to groundwater. If groundwater is encountered above the anticipated elevation during excavation, modifications – such as a shallower infiltration system or alternative improvements – will be incorporated if requested by the Commission.

14. Chapter 10 - General Design Guidance for Stormwater Infiltration Systems: General Design Guidance - Vertical Separation to Groundwater and Bedrock of the 2024 Connecticut Stormwater Quality Manual states, "The 3-foot vertical separation distance from the bottom of the infiltration system to the SHGT and bedrock may be reduced to 2 feet in the following situations: ...For Stormwater Retrofits where the minimum 3-foot separation cannot be met due to existing site constraints and there is little risk to groundwater quality from the infiltrated stormwater". System P1A should be modeled without infiltration due to the presence of groundwater less than 2 feet below the bottom of the system.

COMMENT RESPONSE: As noted in comment response 13, based on the Test Pit Log data, the 3-foot clearance has been provided. If groundwater is encountered above the anticipated elevation during excavation, modifications – such as a

shallower infiltration system or alternative improvements – will be incorporated if requested by the Commission.

15. The applicant's engineer should consider using high strength, high-density polyethylene (HDPE) pipe or Class V reinforced concrete pipe (RCP) for the proposed piping upgradient of CLCB 401 and in between MH 400 and CLCB 401.

COMMENT RESPONSE: The pipe between MH-400 and CLCB-401 has been changed to Class V RCP. The pipe upgradient of CLCB-401 is ADS N-12 HDPE. This pipe is rated for a minimum of 12" of cover and will have no vehicular loading.

16. Due to the addition of a berm for the vegetated drainage swale, the time of concentration flow path for Proposed Watershed 2C is no longer valid. We recommend the applicant's engineer update the HydroCAD model to account for the likely revised time of concentration path.

COMMENT RESPONSE: The time of concentration and watershed boundary for PRWS-2C has been revised to reflect the accurate time of concentration. The HydroCAD model has been updated accordingly (see Appendix B).

17. The existing condition hydrology analysis uses a 'fair' condition for grassed areas (50 to 75% coverage), while under proposed conditions, much of the grassed areas classified as 'good' condition (>75% coverage) or meadow. 'Good' grass and meadow areas have a lower curve number, which helps to reduce the flow rates under proposed conditions. Therefore, we would ask the applicant's engineer to provide the justification for the use of the 'fair' grass under existing conditions, as opposed to 'good' grass or meadow under proposed conditions.

COMMENT RESPONSE: All existing grass in the existing HydroCAD model has been changed from 'fair' to 'good' as requested (see Appendix B).

18. The applicant's engineer should clarify if the proposed stormwater detention basin will be utilized as a sediment trap during construction. If yes, notes on the conversion of the basin from sediment trap to bioretention basin should be provided.

COMMENT RESPONSE: The location of the proposed stormwater basin P2A will not be utilized as a sediment trap. Clear instructions have been included on the plan sheets to keep this area clear of material stockpiles, heavy machinery, and any compaction of existing soils (see notes on sheets CS003 and CE102).

Sincerely,

Langan CT, Inc.

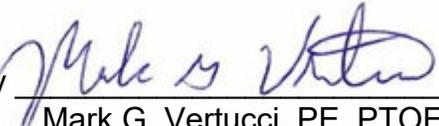
Bill Willsey, PE
Senior Staff Engineer

Traffic Impact Study LEARN Early Childhood School Waterford, Connecticut

April 2025

Town of Waterford Planning and Zoning Commission

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

Approved by  License No. 23761
Mark G. Vertucci, PE, PTOE

Prepared for:

Ms. Katelyn Chapin
Newman Architects, PC
265 Church Street 15th Floor
New Haven, CT 06510

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LEARN Early Childhood School
Waterford, Connecticut**

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Traffic Impact Study LEARN Early Childhood School Waterford, Connecticut

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End of Report

Appendix A - Tables

1. Peak Hour Site Generated Traffic Volumes
2. Intersection Crash Data Summary
3. Unsignalized Intersection Level of Service Summary
4. Signalized Intersection Level of Service Summary
5. Weekday Morning Peak Hour Queue Length Summary
6. Weekday Afternoon Peak Hour Queue Length Summary

Appendix B - Figures

1. Site Location Map
2. 2026 Background Traffic Volumes
3. Site Generated Traffic Arrival/Departure Distribution
4. Site Generated Traffic Volumes
5. 2026 Combined Traffic Volumes

Appendix C

Intersection Capacity Analysis Worksheets – Weekday Morning Peak Hour

Appendix D

Intersection Capacity Analysis Worksheets – Weekday Afternoon Peak Hour

Appendix E

Turning Movement Count (TMC) Data

Appendix F

Crash Data Records

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:

LEARN Regional Education Service Center

Site Acreage:

+/-16

Development Size/Type:

526 Student Charter Elementary School

48 Student Day Care Center

Parking:

233 total parking spaces (7 handicap parking spaces)

Applications:

Town of Waterford Planning and Zoning Commission

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

Build Year:

2026

Background Traffic Growth Factor:

0.7%

Traffic Counts:

Fuss & O'Neill -- October 12, 2022 (Turning Movement Counts)

Peak Hours Analyzed:

Weekday Morning Peak Hour -- 7:45 A.M. to 8:45 A.M.

Weekday Afternoon Peak Hour -- 3:00 P.M. to 4:00 P.M.

Expected Trip Generation:

Weekday Morning Peak Hour -- 590 trips (307 entering, 283 exiting)

Weekday Afternoon Peak Hour -- 414 trips (202 entering, 212 exiting)

Capacity Analysis:

Technique -- Highway Capacity Manual 6th Edition

Execution -- Synchro and SimTraffic Professional Software, Version 11.0

1 Introduction

LEARN Regional Education Service Center plans to demolish the existing 41,946 square foot school located at 51 Daniels Avenue in Waterford, Connecticut and replace it with a combined magnet elementary school and daycare. The combined magnet elementary school and daycare will consist of 574 students, with 526 students expected to occupy the magnet elementary school and 48 students to occupy the daycare center. The proposed development will consist of 233 total parking spaces, with 7 of those being ADA compliant spaces. The existing development is located on the south side of Daniels Avenue and is accessed via two one-way driveways, one entering and one exiting. Upon construction of the combined magnet elementary school and daycare development, full access to the site will be provided via Daniels Avenue across a single two-way site driveway. Internal connection between the developments will be provided as shown on the site location map, *Figure No. 1 of Appendix B*. The development is expected to be constructed in 2026.

Fuss & O'Neill has been retained to study the impact of the proposed development on traffic conditions throughout the adjacent roadway network. This report has been prepared to document the findings of the study and is being submitted to the Town of Waterford Planning and Zoning Commission in support of local permitting efforts. This report will also be submitted to the Office of the State Traffic Administration (OSTA) in support of an Administrative Decision Review.

2 Existing Condition

2.1 Site of Development

LEARN Regional Education Service Center intends to demolish the existing 41,946 square foot school located at 51 Daniels Avenue in Waterford, Connecticut and replace it with a combined magnet elementary school and daycare with a total of 574 students. It should be noted that the existing 41,946 square foot school located on the site was closed in June 2020. The existing parcel, currently zoned for Residential (R), is +/-19 acres in size of which +/- 16 acres will be transferred to LEARN and developed for school and daycare purposes. The site is bounded by residential land uses across all directions.

2.2 Adjacent Roadway Network

The adjacent roadway network consists of the following roadways:

- Route 1 (Boston Post Road)
- Route 156 (Rope Ferry Road)
- Daniels Avenue
- Niantic River Road
- Spithead Road
- Cross Road
- Sunnycrest Drive
- West Street

All adjacent roadways are classified by the Connecticut Department of Transportation as either arterial or major collector roads except Sunnycrest Drive.

Route 1 (Boston Post Road) is an east to west roadway under state jurisdiction that enters the study area at the western intersection of Sill Lane at Route 1 (Lyme Street) and Route 1 (Boston Post Road) and extends east 13.6 miles to the Waterford and New London town lines. Route 1 (Boston Post Road) provides access to commercial, residential, industrial, and business land uses in the vicinity of the site. In the vicinity of the site, Route 1 (Boston Post Road) is classified by the Connecticut Department of Transportation as a principal arterial that provides one 12-foot lane of travel in each direction at the study area intersections. The speed limit is 40 miles per hour (mph) on Route 1 (Boston Post Road) in the vicinity of the study area intersections. Sidewalks and crosswalks are available along Route 1 (Boston Post Road).

Route 156 (Rope Ferry Road) is an east to west roadway under state jurisdiction that enters the study area from the west at the East Lyme/Waterford town line and extends east 2.9 miles to its intersection with Route 1 (Boston Post Road) and Vivian Street. Route 156 (Rope Ferry Road) provides access to commercial, residential, industrial, and business land uses in the vicinity of the site. In the vicinity of the site, Route 156 (Rope Ferry Road) is classified by the Connecticut Department of Transportation as a minor arterial roadway that provides one 12-foot lane of travel in each direction. The speed limit is 35 miles per hour on Route 156 (Rope Ferry Road). Sidewalks and crosswalks are available along Route 156 (Rope Ferry Road).

Daniels Avenue is a two-lane undivided roadway that runs east to west under town jurisdiction and extends from the western intersection of Daniels Avenue at Niantic River Road east approximately 0.7 miles to the intersection of Daniels Avenue at Spithead Road. Daniels Avenue provides access to residential land uses. Daniels Avenue is classified by the Connecticut Department of Transportation as major collector roadway and has a posted speed limit of 25 miles per hour. Sidewalks and crosswalks are available along Daniels Avenue.

Niantic River Road is a two-lane undivided roadway that runs north to south under town jurisdiction that extends from the southern intersection of Niantic River Road at Rope Ferry Road north approximately 2.4 miles to the intersection of Niantic River Road at Route 1 (Boston Post Road). Niantic River Road provides access to commercial, residential, industrial and business land uses in the vicinity of the site. Niantic River Road is classified by the Connecticut Department of Transportation as a major collector roadway and has a posted speed limit of 30 miles per hour. Sidewalks and crosswalks are available along Niantic River Road.

Spithead Road is a two-lane undivided roadway that runs north to south under town jurisdiction that extends from the southern intersection of Spithead Road at Route 156 (Rope Ferry Road) north approximately 1.75 miles to the intersection of Spithead Road at Route 1 (Boston Post Road) and Cross Road. Spithead Road provides access to mostly residential land uses in the vicinity of the site. Spithead Road is classified by the Connecticut Department of Transportation as a major collector roadway. The speed limit on Spithead Road is 25 miles per hour south of its intersection with Daniels Avenue and 30 miles per hour north of its intersection with Daniels Avenue. Sidewalks and crosswalks are available along Spithead Road.

Cross Road is a two-lane undivided roadway that runs north to south under town jurisdiction that extends from the southern intersection of Cross Road at Spithead Road and Route 1 (Boston Post Road)/Sunniecrest Drive north approximately 2.2 miles to the intersection of Cross Road at Route 85 (Hartford Turnpike). Cross Road provides access to commercial, residential, industrial and business land uses. Cross Road is classified by the Connecticut Department of Transportation as a major collector roadway and has a posted speed limit of 30 miles per hour. Sidewalks are available along Cross Road.

Sunniecrest Drive is a two-lane undivided roadway that runs east to west under town jurisdiction that extends from the western intersection of Cross Road at Spithead Road and Route 1 (Boston Post Road)/Sunniecrest

Drive east approximately 750 feet its terminus at a cul-de-sac. Sunnecrest Drive provides access to residential land uses. Sunnecrest Drive is classified by the Connecticut Department of Transportation as a local roadway. The speed limit is not posted. Sidewalks and crosswalks are not available along Sunnecrest Drive.

West Street is a two-lane undivided connector roadway that runs east to west under town jurisdiction that extends from the western intersection of West Street at Niantic River Road east approximately 450 feet to the intersection of West Street at Route 156 (Rope Ferry Road). West Street provides access to primarily residential land uses and is classified by the Connecticut Department of Transportation as a major collector roadway. The speed limit is not posted. Sidewalks and crosswalks are available along West Street.

2.3 Study Area Intersections

The following study area intersections were reviewed:

- Daniels Avenue at Site Driveway
- Daniels Avenue at Niantic River Road
- Daniels Avenue at Spithead Road
- Route 156 (Rope Ferry Road) at Spithead Road
- Route 156 (Rope Ferry Road) at West Street
- Niantic River Road at West Street
- Route 1 (Boston Post Road) at Niantic River Road
- Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunnecrest Drive

Daniels Avenue at the Site Driveway is an unsignalized t-intersection that provides full movement access to the existing development with stop control along the northbound approach. The eastbound and westbound approaches of Daniels Avenue are uncontrolled. The eastbound approach of Daniels Avenue contains a shared through/right turn lane, and the westbound approach of Daniels Avenue contains a shared left/through lane into the site. The northbound approach of the existing Site Driveway will provide a combined left/right turn lane out of the development.

Daniels Avenue at Niantic River Road is an unsignalized t-intersection with Daniels Avenue providing the westbound approach while Niantic River Road provides the northbound/southbound approaches. Along the northbound approach of the intersection, Niantic River Road contains a shared through/right turn lane while the southbound approach of Niantic River Road contains a shared through/left turn lane. Along the stop-controlled westbound approach of the intersection, Daniels Avenue provides a shared left/right turn lane. A crosswalk is provided across the westbound approach, allowing people to cross Daniels Avenue.

Daniels Avenue at Spithead Road is an unsignalized t-intersection with Daniels Avenue providing the eastbound approach while Spithead Road provides the northbound/southbound approaches. Along the northbound approach of the intersection, Spithead Road contains a shared left/through lane while the southbound approach of Niantic River Road contains a shared through/right turn lane. Along the stop-controlled eastbound approach of the intersection, Daniels Avenue provides a shared left/right turn lane. A crosswalk is provided across the eastbound approach, allowing people to cross Daniels Avenue.

Route 156 (Rope Ferry Road) at Spithead Road is an unsignalized t-intersection with Spithead Road providing the southbound approach while Route 156 (Rope Ferry Road) provides the eastbound/westbound approaches. Along the eastbound approach of the intersection, Route 156 (Rope Ferry Road) provides a shared left/through

lane while the westbound approach of Route 156 (Rope Ferry Road) contains a shared through/right turn lane. Along the stop-controlled southbound approach of the intersection, Spithead Road provides a shared left/right turn lane. A crosswalk is provided across the southbound approach, allowing people to cross Spithead Road.

Route 156 (Rope Ferry Road) at West Street is a signalized t-intersection that is not part of a coordinated signal system along Route 156 (Rope Ferry Road). The intersection provides eastbound/westbound approaches on Route 156 (Rope Ferry Road) and a southbound approach on West Street. The eastbound approach of Route 156 (Rope Ferry Road) provides a dedicated left turn lane and through lane while the westbound approach of Route 156 (Rope Ferry Road) provides a dedicated right turn lane and a through lane. The southbound approach of West Street provides a shared left/right turn lane. A crosswalk is provided across the southbound approach, allowing people to cross West Street.

Niantic River Road at West Street is an unsignalized t-intersection with West Street providing the westbound approach while Niantic River Road provides the northbound/southbound approaches. Along the northbound approach of the intersection, Niantic River Road contains a shared through/right turn lane while the southbound approach of Niantic River Road contains a shared through/left turn lane. Along the stop-controlled westbound approach of the intersection, West Street provides a shared left/right turn lane. A crosswalk is provided across the westbound approach, allowing people to cross West Street.

Route 1 (Boston Post Road) at Niantic River Road is a signalized t-intersection that is not part of a coordinated signal system along Route 1 (Boston Post Road). The intersection provides eastbound/westbound approaches on Route 1 (Boston Post Road) and a northbound approach on Niantic River Road. The eastbound approach of Route 1 (Boston Post Road) provides a shared through/right turn lane while the westbound approach of Route 1 (Boston Post Road) provides a shared through/left turn lane. The northbound approach of Niantic River Road provides a shared left/right turn lane. A crosswalk is provided across the eastbound approach, allowing people to cross Route 1 (Boston Post Road).

Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive is a five-legged signalized intersection that is not part of a coordinated signal system along Route 1 (Boston Post Road). The intersection provides eastbound/westbound approaches on Route 1 (Boston Post Road), a northbound approach on Spithead Road, a southbound approach on Cross Road and a southwestbound approach on Sunniecrest Drive. The northbound approach of Spithead Road provides a shared left/through/right turn lane while the southbound approach of Cross Road provides a shared left/through/right turn lane. The eastbound approach of Route 1 (Boston Post Road) provides a dedicated left turn lane and a separate through/right turn while the westbound approach of Route 1 (Boston Post Road) provides a dedicated through/left turn lane and an exclusive right turn lane. The southwest approach on Sunniecrest Drive provides a shared left/through/right turn lane. A crosswalk is provided across the eastbound approach, allowing people to cross Route 1 (Boston Post Road).

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 school peak hours, the periods when commuter and/or school 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 Wednesday October 12th, 2022, at the eight intersections in the study area. The traffic count data collected indicates that the weekday morning peak hour of traffic is 7:45 A.M. to 8:45 A.M. and the weekday afternoon peak hour is 3:00 P.M. to 4:00 P.M. These peak hours were subsequently

analyzed for impacts. It is worth noting that should the proposed elementary magnet school hours occur outside of the adjacent roadway peak hours indicated by the traffic count data, the analysis conducted in this report would be considered conservative. Copies of the TMC traffic data have been included in *Appendix F* of this report.

3 Background Traffic Conditions

3.1 Growth Rate

Upon consultation with the Connecticut Department of Transportation (CTDOT) the 2022 existing traffic volumes were projected to the 2026 design year using a 0.7 percent per year peak hour growth factor to account for normal traffic growth in the study area. These grown volumes represent the projected Background traffic volumes as shown in *Figure No. 2 of Appendix B*.

3.2 Other Developments

Fuss & O'Neill contacted the Office of the State Traffic Administration (OSTA) and the Town of Waterford Planning and Zoning respective offices to identify any other pending or approved developments having site related traffic in the study area. Upon consultation, neither OSTA nor the Town of Waterford has knowledge of any plans for developments that would have site related traffic in the vicinity of the study area.

3.3 Planned Roadway Improvement Projects

Fuss & O'Neill contacted the Office of State Traffic Administration (OSTA) and the Town of Waterford Planning Department to identify any planned roadway improvement projects in the study area. Upon consultation, neither OSTA nor the Town of Waterford has knowledge of any roadway improvements within the study area.

4 Proposed Conditions

4.1 Development

LEARN Regional Education Service Center intends to demolish the existing 41,946 square foot school located at 51 Daniels Avenue in Waterford, Connecticut and replace it with a combined magnet elementary school and daycare. The combined magnet elementary school and daycare will consist of 574 students, with 526 students expected to occupy the magnet elementary school and 48 students to occupy the daycare center. The proposed development will consist of 233 total parking spaces, with 7 of those being ADA compliant spaces. The development is depicted on the site location map, *Figure No. 1 of Appendix B* and is expected to be constructed in 2026.

4.2 Site Access and Circulation

Access to the combined magnet elementary school and daycare will be provided at the reconstructed stop-controlled driveway located along Daniels Avenue. The site driveway will provide full access and dedicated left turn and right turn lanes along the northbound approach with stop control to access Daniels Avenue. Internal connection between the facilities will be provided as shown on the site location map, *Figure No. 1 of Appendix B*.

4.3 Trip Generation

The expected site generated traffic data was calculated using existing empirical data from the Institute of Transportation Engineers (ITE) publication Trip Generation, 11th edition, 2021. This publication is an industry-accepted resource for determining trip generation. Trip generation for the weekday morning and weekday afternoon peak hour was calculated using the ITE land use codes 536 "Charter Elementary School" and 565 "Day Care Center." As a conservative approach, no credit was taken for families that may have students dropping off or picking up in both the school and the daycare.

As previously noted, LEARN Regional Education Service Center intends to demolish the existing 41,946 square foot school and replace it with a combined magnet elementary school and daycare. The combined magnet elementary school and daycare will consist of 574 students, with 526 students expected to occupy the magnet elementary school and 48 students to occupy the daycare center.

Using the ITE land use code 520 "Elementary School," the previous 41,946 square foot school was estimated to generate a total of 281 vehicle trips (152 entering, 129 exiting) during the weekday morning peak hour and a total of 171 vehicle trips (79 entering, 92 exiting) during the weekday afternoon peak hour. It should be noted that the weekday afternoon peak hour used the generator calculations as published in *Trip Generation*, 11th Edition, 2021.

For a charter elementary school comprised of 526 students, a total of 550 vehicle trips (286 entering, 264 exiting) are anticipated during the weekday morning peak hour and a total of 374 vehicle trips (183 entering, 191 exiting) are anticipated during the weekday afternoon peak hour. As for a daycare center comprised of 48 students, a total of 40 vehicle trips (21 entering, 19 exiting) are anticipated during the weekday morning peak hour and a total of 40 vehicle trips (19 entering, 21 exiting) are anticipated during the weekday afternoon peak hour. Overall, the site will generate 590 total vehicle trips in the weekday morning peak hour (307 entering, 283 exiting) and 414 total vehicle trips in the weekday afternoon peak hour (202 entering, 212 exiting).

The proposed charter elementary school and day care center are therefore expected to result in a net increase of 309 trips during the weekday morning peak hour and 243 trips during the afternoon peak hour in comparison to the previous school use on the site. Thus, a significant portion of the proposed LEARN development site traffic will not be "new" to the study area intersections as these trips were already on the road network in the past when the previous elementary school was in operation.

It is important to note that the site generated traffic for the proposed daycare and school uses will only minimally overlap during the morning and afternoon peak periods. However, for the purposes of this analysis, traffic for the two uses was conservatively estimated to occur during the same school peak hours. It should also be noted that with the proposed charter elementary school year expected to operate from late August to middle of June, a significant reduction in site trips associated with the LEARN development is anticipated for the summer months across the network.

A summary of the ITE peak hour site trip generation for the proposed facility is shown in *Figure No. 4 of Appendix B* and also summarized in *Table 1 of Appendix A*.

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:

- 30% from the west on Route 1 (Boston Post Road)
- 20% from the north on Cross Road
- 5% from the east of Route 1 (Boston Post Road)
- 25% from the west of Route 156 (Rope Ferry Road)
- 15% from the east of Route 156 (Rope Ferry Road)
- 5% from the south of Niantic River Road

A regional arrival/departure distribution for the newly anticipated site generated traffic traveling to and from the project site is shown in *Figure No. 3 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. 4 of Appendix B*. These volumes were then added to the background volumes to yield the year 2026 peak hour Combined traffic volumes shown in *Figure No. 5 of Appendix B*.

5 Analyses

5.1 Crash Analysis

Crash data was gathered from CTDOT via the University of Connecticut Crash Data Repository for the following intersections and roadway segments:

- Daniels Avenue at Site Driveway
- Daniels Avenue at Niantic River Road
- Daniels Avenue at Spithead Road
- Route 156 (Rope Ferry Road) at Spithead Road
- Route 156 (Rope Ferry Road) at West Street
- Niantic River Road at West Street
- Route 1 (Boston Post Road) at Niantic River Road
- Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive

The records were gathered for the most recent three years of available data, 2022 through 2024. A summary of the crash data per intersection is provided in *Table 2 of Appendix A*. Copies of the crash data records have been provided in *Appendix F*.

The unsignalized intersection of Daniels Avenue at Site Driveway experienced no record of crash history within the most recent three years of crash data history from 2022 through 2024.

The unsignalized intersection of Daniels Avenue at Niantic River Road experienced an average of just under one crash per year. The intersection experienced one angle crash, and one crash classified as “not applicable” where

the driver drove through guardrail and into the Niantic River. Of the total crashes reported, the two resulted in possible injuries.

The unsignalized intersection of Daniels Avenue at Spithead Road experienced an average of one crash per year. The intersection experienced one crash where the driver drove into the embankment, one curb collision, and one that involved a utility pole collision. Of the total crashes reported, one resulted in minor injury while the remainder were property damage only collisions.

The unsignalized intersection of Route 156 (Rope Ferry Road) at Spithead Road experienced an average of one crash per year. The majority of these crashes (2) were front-to-rear collisions. Additionally, the intersection experienced one angle crash. Of the total crashes reported, all were property damage only collisions.

The signalized intersection of Route 156 (Rope Ferry Road) at West Street experienced no record of crash history within the most recent three years of crash data history from 2022 through 2024.

The unsignalized intersection of Niantic River Road at West Street experienced no record of crash history within the most recent three years of crash data history from 2022 through 2024.

The signalized intersection of Route 1 (Boston Post Road) at Niantic River Road experienced an average of just above three crashes per year. The majority of these crashes (4) were front-to-rear collisions. Additionally, the intersection experienced one angle crash, one rear-to-side collision, two opposite direction sideswipes, one same direction sideswipe and one collision classified as “not applicable” where the driver collided with the signal pole. Of the total crashes reported, two resulted in minor injury and two resulted in possible injury, while the remainder were property damage only collisions.

The signalized intersection of Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive experienced an average of just below seven crashes per year. The majority of these crashes (10) were front-to-rear collisions. Additionally, the intersection experienced five angle crashes, one front-to-rear collision, three same direction sideswipes and one collision classified as “not applicable” where a bus collided with a signal pole. Of the total crashes reported, three resulted in possible injury, while the remainder were property damage only collisions.

The type and frequency of crashes reported at the study area intersections is not considered abnormal for the traffic volumes and geometric characteristics of the study intersections along a signalized arterial corridor.

5.2 Intersection Sight Distance Analysis

Intersection sight distances were measured at the proposed site driveway location in accordance with criteria set forth in the 2023 CTDOT *Highway Design Manual*. The sight distance is measured from a point 15 feet back from the edge of the travel-way at a height of 3.5 feet, the standard height of a driver's eye.

Daniels Avenue has a posted speed limit of 25 miles per hour in both directions in the vicinity of the proposed development. A design speed of 30 miles per hour, five (5) miles per hour above the posted speed limit, was utilized for analysis.

For the design speed of 30 miles per hour on Daniels Avenue, 335 feet of intersection sight distance is required for a passenger car and 420 feet for a single unit box truck turning right or left onto a two-lane facility. Per coordination with the developer, the AASHTO S-BUS 40 was conservatively analyzed as the largest vehicle

movement for access to the site. Therefore, a single unit truck was analyzed for intersection sight distance purposes.

At the site driveway location on Daniels Avenue, the intersection sight distance looking right (east) offers 550 feet and looking left (west) offers 425 feet. Further sight distance is limited by the horizontal curvature in the road looking right (east), and vertical curvature in the road looking left (west). The site driveway location at Daniels Avenue is in substantially the same location as the existing school driveway and will exceed CTDOT sight distance criteria for the roadway design speed and provide safe egress for vehicles turning onto Daniels Avenue.

It should be noted that field observations revealed the intersection sight distances at the existing unsignalized Town maintained intersection of Daniels Avenue at Spithead Road appear to be impacted by the existing vertical and horizontal curvature of Spithead Road. Therefore, on the morning of April 16, 2025, Fuss & O'Neill measured intersection sight distances on the Daniels Avenue approach to Spithead Road in accordance with the same criteria mentioned above set forth in the 2003 CTDOT *Highway Design Manual*.

Spithead Road has a posted speed limit of 30 miles per hour in the southbound direction and a posted speed limit of 25 miles per hour in the northbound direction in the vicinity of the intersection. Therefore, design speeds of 30 and 35 miles per hour, respectively, were utilized for this analysis.

For the design speed of 30 miles per hour southbound on Spithead Road, the following intersection sight distances are required for a vehicle turning right onto Spithead Road:

- 335 feet of intersection sight distance for a passenger car
- 420 feet of intersection sight distance for a single-unity truck

For the design speed of 35 miles per hour northbound on Spithead Road, the following intersection sight distances are required for a vehicle turning left onto Spithead Road:

- 390 feet of intersection sight distance for a passenger car
- 490 feet of intersection sight distance for a single-unity truck

Approximately 230 feet of intersection sight distance is provided looking left from Daniels Avenue (north) which falls short of CTDOT requirements for a 30 mile per hour design speed due to existing vegetation, a berm, and the horizontal curvature of Spithead Road north of the intersection. Upon removal of the vegetation along the roadway, intersection sight distance can be improved slightly but it is still expected to fall below the threshold due to the horizontal curve constraints along the existing roadway. Looking right out of Daniels Avenue, there is approximately 330 feet of intersection sight distance provided looking south along Spithead Road which also falls short of CTDOT requirements for a 35 mile per hour design speed due to existing horizontal and vertical curve constraints.

Given these existing intersection constraints and noted concern for safe egress of the additional passenger cars and single unit trucks/busses being generated onto Spithead Road by the new school, we recommend that the intersection be converted to an all-way stop-controlled intersection by adding stop and stop ahead signs on both Spithead approaches that are in accordance with MUTCD distance guidelines.

5.3 Intersection Capacity Analysis

Capacity analyses for both signalized and unsignalized intersections were conducted using Synchro Professional Software, version 11.0.

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.

In discussing two-way stop controlled unsignalized intersection capacity analyses, LOS is used to provide a description of the delay and operational characteristics of the turns from the minor street (stop sign controlled) to the major street, and turns from the major street to the minor street. Through vehicles are not delayed by the minor street and do not experience delay, therefore they are not rated with a level of service.

Using the above referenced methodologies, weekday morning and weekday afternoon peak hour capacity analyses were conducted at the following signalized intersections:

- Route 156 (Rope Ferry Road) at West Street
- Route 1 (Boston Post Road) at Niantic River Road
- Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive

Weekday morning and weekday afternoon peak hour capacity analyses were also conducted at the following unsignalized intersections:

- Daniels Avenue at Site Driveway
- Daniels Avenue at Niantic River Road
- Daniels Avenue at Spithead Road
- Route 156 (Rope Ferry Road) at Spithead Road
- Niantic River Road at West Street

Tables No. 3 and 4 of Appendix A presents a summary of the levels of service at the unsignalized and signalized intersections, for both Background and Combined Conditions traffic volumes. Copies of the analysis worksheets can be found in *Appendices C and D*, for the weekday morning and weekday afternoon peak hours respectively.

The determination of the traffic impact from the proposed development is made through a comparison of the Background Conditions LOS (without the proposed development) versus the Combined Conditions LOS (with the proposed development).

The signalized intersection of Route 156 (Rope Ferry Road) at West Street operates at LOS A during the weekday morning and afternoon peak hours under 2026 background conditions. With the addition of the LEARN Early Childhood School development site traffic and minor signal timing adjustments, the signalized intersection of Route 156 (Rope Ferry Road) at West Street is expected to maintain these same LOS operations with minimal increases in v/c.

The signalized intersection of Route 1 (Boston Post Road) at Niantic River Road operates at LOS B during the weekday morning and afternoon peak hours under 2026 background conditions. With the addition of the LEARN Early Childhood School development site traffic and minor signal timing adjustments, the signalized intersection of Route 1 (Boston Post Road) at Niantic River Road is expected to maintain these same LOS operations with minimal increases in v/c.

The signalized intersection of Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive operates at LOS E during the weekday morning and afternoon peak hours under 2026 background conditions. With the addition of the LEARN Early Childhood School development site traffic and minor signal timing adjustments, the signalized intersection of Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive is expected to operate at LOS E during the weekday morning peak hour and LOS F during the weekday afternoon peak hour. However, under 2026 background conditions, the northbound and southbound approaches already operate at LOS F during both peak hours and the v/c ratio during the weekday afternoon peak hour is only 0.4 away from capacity. It should also be noted that the LEARN Early Childhood School development site traffic is less than 6% of the overall intersection volume during the weekday afternoon peak hour. The majority of the site traffic added to this intersection is on the southbound approach of Cross Street (approximately a 20% increase), however given the existing constraints and single lane arrangement along the southbound approach, it is understandable that any increase in traffic along this approach would degrade the LOS. It is also important to note that the increase in vehicle delays at this intersection during weekday afternoons will be confined to a portion of the afternoon school peak hour before and after dismissal.

At the unsignalized intersection of Daniels Avenue at Site Driveway the northbound approach of the site driveway is expected to operate acceptably at LOS D in during the morning peak hour and LOS B during the afternoon peak hour under 2026 combined conditions. As discussed previously, the site driveway will provide dedicated left turn and right turn lanes along the northbound approach with stop control to access Daniels Avenue. The westbound left turn of Daniels Avenue is expected to operate at LOS A during both peak hours under 2026 background and combined conditions.

At the unsignalized intersection of Daniels Avenue at Niantic River Road, the westbound approach of Daniels Avenue operates efficiently at LOS B or better during the weekday morning and weekday afternoon peak hours under 2026 background conditions and is expected to operate acceptably at LOS C during both peak hours with the addition of the LEARN Early Childhood School development site traffic. The southbound left turn of Niantic River Road operates efficiently at LOS A during all peak hours under 2026 background and 2026 combined conditions. There will be no significant reduction in LOS at this intersection as a result of the proposed development traffic.

At the existing unsignalized intersection of Daniels Avenue at Spithead Road the eastbound stop controlled approach of Daniels Avenue operates efficiently at LOS B or better during all peak hours under 2026 background and 2026 combined conditions. The northbound left turn from Spithead Road operates efficiently at LOS A during all peak hours under 2026 background and 2026 combined conditions. As a result of the sight line evaluation conducted at this intersection, implementation of all-way stop control is recommended as noted above in Section 5.2. Under all-way stop control, all three approaches will operate efficiently at LOS A during both the morning and afternoon peak hours in the combined conditions.

At the unsignalized intersection of Route 156 (Rope Ferry Road) at Spithead Road the southbound approach of Spithead Road operates efficiently at LOS B during the weekday morning peak hour and acceptably at LOS C during the weekday afternoon peak hour under 2026 background conditions. With the addition of the LEARN Early Childhood School development site traffic, the southbound approach of Spithead Road is expected to operate with similar LOS delays during the weekday morning and afternoon peak hours. The eastbound left turn of Route 156 (Rope Ferry Road) operates efficiently at LOS A during all peak hours under 2026 background and 2026 combined conditions. There will be no significant reduction in LOS at this intersection as a result of the proposed development traffic.

At the unsignalized intersection of Niantic River Road at West Street the westbound approach of West Street operates efficiently at LOS B or better during all peak hours under 2026 background and 2026 combined conditions. The southbound left turn of Niantic River Road operates efficiently at LOS A during all peak hours under 2026 background and 2026 combined conditions. There will be no significant reduction in LOS at this intersection as a result of the proposed development traffic.

5.4 Queue Analysis

Background and Combined 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. The queue lengths are provided in the Synchro capacity analysis worksheets, which are located in *Appendix C and D. Tables 5 and 6 of Appendix A* provide a summary of the queue lengths for the critical lanes at each intersection.

The majority of the approaches at the study are intersections that experience minimal queue length increases of four vehicle lengths or less upon the addition of the LEARN Early Childhood School site trips with the exception of the eastbound approach of Route 1 (Boston Post Road) at the intersection of Route 1 (Boston Post Road) at Niantic River Road during the weekday morning peak hour. The eastbound approach of Route 1 (Boston Post Road) is expected to experience a queue length increase of just under five vehicles or less. In addition, there are three approaches that experience queue length increases greater than four vehicle lengths at the intersection of Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive. For instance, the westbound through/left turn approach experiences an increase of just under five vehicles during the weekday morning peak hour and just under six vehicles during the weekday afternoon peak hour. However, this approach already exceeds its provided queue storage under background conditions and are not significantly impacted by the traffic generated from the proposed development. It is important to note that these queue increases are brief in nature and confined to a portion of the morning and afternoon school peak hours.

The northbound approach of the unsignalized intersection of Daniels Avenue at Site Driveway is also expected to experience a queue length increase of seven vehicles or less during the weekday morning peak hour upon the addition of the LEARN Early Childhood School site trips. However, this queue is anticipated to occur for

approximately 20 to 30 minutes during drop off and dismissal and can be adequately stored on site. This is common for school land uses as peak pick up and drop off times typically occur over a short time period just before the start of school and immediately after school dismissal.

The southbound approach of Cross Road during the weekday morning and weekday afternoon peak hours experiences an increase of just over four vehicles or less during the weekday morning peak hour and just under seven vehicles or less during the weekday afternoon peak hour. However, as stated previously, the existing single lane arrangement of Cross Road already creates significant queues along this approach. The northbound approach of Spithead Road during the weekday afternoon peak hour also experiences an increase of just over four vehicles or less during the weekday afternoon peak hour.

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 for a charter elementary school comprised of 526 students, a total of 550 vehicle trips (286 entering, 264 exiting) are anticipated during the weekday morning peak hour and a total of 374 vehicle trips (183 entering, 191 exiting) are anticipated during the weekday afternoon peak hour. As for a daycare center comprised of 48 students, a total of 40 vehicle trips (21 entering, 19 exiting) are anticipated during the weekday morning peak hour and a total of 40 vehicle trips (19 entering, 21 exiting) are anticipated during the weekday afternoon peak hour.

It is important to note that the trip generation projections in this study should be considered conservative as they assumed the daycare and school uses would peak during the same peak hours and they also did not take credit for parents dropping off children at both the school and daycare at the same time. In addition, no trip credit was taken for the previous school use that was in operation on the site and generated substantial traffic volume on the adjacent road network in the past.

The capacity analysis revealed that the majority of the intersections in the study area operate acceptably and will not sustain a significant decrease in LOS after inclusion of the site generated traffic. However, minor signal timings and optimization are recommended at the three signalized intersections within the study area and are located most remotely from the school. The site driveway is expected to operate at acceptable LOS during the school peak hours. Peak hour queueing on the driveway is expected to extend to 175 feet, however this queue is only anticipated to occur for approximately 20 to 30 minutes during drop off and dismissal and can be adequately stored on site. This is common for school land uses as peak pick up and drop off times typically occur over a short time period just before the start of school and immediately after school dismissal.

The addition of vehicular trips generated by the proposed development expansion will also result in temporary and minimal queue increases at several intersection approaches within the study area during a portion of the school peak hours. These queue increases are brief in nature and quickly dissipate following the morning and afternoon school peak hours.

Review of the most recent three years of available crash data provided by the University of Connecticut Crash Data Repository indicated that the number and type of collisions at the study intersection is not abnormal for the traffic volumes experienced. The increase in traffic expected at the study intersections is not anticipated to have detrimental impact to roadway safety.

Sight lines and intersection safety were reviewed at the site driveway location along Daniels Avenue. Field measurements revealed that sufficient intersection sight distance exists for vehicles looking right (east) and left (west) at the proposed site drive to allow for safe egress of vehicles attempting to turn right or left from the proposed driveway onto Daniels Avenue.

Sight lines and intersection safety were also reviewed at the existing, unsignalized Town maintained intersection of Daniels Avenue at Spithead Road given the horizontal and vertical curvature constraints that are present on Spithead Road in the vicinity of this intersection. Under the existing intersection geometry and existing traffic control (stop control on Daniels Avenue approach only), there have been no identifiable crash patterns and no abnormal crash frequencies observed at the intersection of Spithead Road and Daniel Avenue. As noted in the Crash Analysis, the intersection has averaged one crash per year over the latest three years of available data. However, while the intersection has been operating safely, the intersection sight distances from the Daniels Avenue approach to Spithead Road looking left from Daniels Avenue (north) and looking right from Daniels Avenue (south) falls short of CTDOT requirements as a result of the existing vegetation, horizontal and vertical curvature constraints noted above.

Given the existing intersection constraints and noted concern for safe egress of the additional passenger cars and single unit trucks/busses being generated onto Spithead Road by the new school, we recommend that the intersection be converted to an all-way stop-controlled intersection by adding stop and stop ahead signs on both Spithead approaches that are in accordance with MUTCD distance guidelines.

Based on the results of the foregoing analysis, the following off-site improvements are recommended:

1. Signal Timing and cycle length optimizations at the intersections of Route 156 (Rope Ferry Road) at West Street, Route 1 (Boston Post Road) at Niantic River Road, and Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive
2. Implementation of all-way stop control at the intersection of Spithead Road at Daniels Avenue

Upon implementation of these off-site improvements, it is the professional opinion of Fuss & O'Neill, Inc. that the proposed development will not have a significant impact to traffic operations within the study area.

Appendix A

Tables

Table 1

**Peak Hour Site Generated Traffic Volumes
LEARN Early Childhood School
Waterford, Connecticut**

	Quantity (Students)	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
		Total Trips	Trips Entering	Trips Exiting	Total Trips	Trips Entering	Trips Exiting
Charter Elementary School	526	550	286	264	374	183	191
Day Care Center	48	40	21	19	40	19	21
Total Vehicle Trips		590	307	283	414	202	212

NOTE: Trip generation based on Fitted Curve Equation per Land Use Code 536 (Charter Elementary School) and Land Use Code 565 (Day Care Center) for the weekday morning peak hour, as published in *Trip Generation*, 11th Edition, 2021 using adjacent street calculations. It should be noted that the weekday afternoon peak hour used the generator calculations as published in *Trip Generation*, 11th Edition, 2021.

Table 2

**Intersection Crash Data Summary
LEARN Early Childhood School
Waterford, Connecticut**

Intersections	Crashes Per Year			
	2022	2023	2024	Average/Year
Daniels Avenue at Site Driveway	0	0	0	0
Daniels Avenue at Niantic River Road	0	1	1	0.67
Daniels Avenue at Spithead Road	2	1	0	1
Route 156 (Rope Ferry Road) at Spithead Road	2	0	1	1
Route 156 (Rope Ferry Road) at West Street	0	0	0	0
Niantic River Road at West Street	0	0	0	0
Route 1 (Boston Post Road) at Niantic River Road	6	4	0	3.33
Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive	11	6	3	6.67

NOTE: Values indicated are number of crashes within 200 feet of each intersection during time period shown. Data provided by the Connecticut Department of Transportation via UConn Crash Data Repository.

Table 3

**Unsignalized Intersection Level Of Service Summary
LEARN Early Childhood School
Waterford, Connecticut**

Two-Way Stop Controlled Intersections (Critical Movements)	2026 Weekday Morning Peak Hour			2026 Weekday Afternoon Peak Hour		
	Background	Combined	Combined + Improved	Background	Combined	Combined + Improved
Daniels Avenue at Site Driveway						
Northbound Approach	LOS A	LOS D	N/A	LOS A	LOS B	N/A
Northbound Left Turn	N/A	LOS E	N/A	N/A	LOS B	N/A
Northbound Right Turn	N/A	LOS B	N/A	N/A	LOS A	N/A
Westbound Left Turn	LOS A	LOS A	N/A	LOS A	LOS A	N/A
Daniels Avenue at Niantic River Road						
Westbound Approach	LOS A	LOS C	N/A	LOS B	LOS C	N/A
Southbound Left Turn	LOS A	LOS A	N/A	LOS A	LOS A	N/A
Daniels Avenue at Spithead Road						
Northbound Left Turn	LOS A	LOS A	N/A	LOS A	LOS A	N/A
Northbound Approach	N/A	N/A	* LOS A	N/A	N/A	* LOS A
Eastbound Approach	LOS A	LOS B	* LOS A	LOS B	LOS B	* LOS A
Southbound Approach	N/A	N/A	* LOS A	N/A	N/A	* LOS A
Route 156 (Rope Ferry Road) at Spithead Road						
Eastbound Left Turn	LOS A	LOS A	N/A	LOS A	LOS A	N/A

Two-Way Stop Controlled Intersections (Critical Movements)	2026 Weekday Morning Peak Hour			2026 Weekday Afternoon Peak Hour		
	Background	Combined	Combined + Improved	Background	Combined	Combined + Improved
Southbound Approach	LOS B	LOS B	N/A	LOS C	LOS C	N/A
Niantic River Road at West Street						
Westbound Approach	LOS A	LOS B	N/A	LOS B	LOS B	N/A
Southbound Left Turn	LOS A	LOS A	N/A	LOS A	LOS A	N/A

NOTE: Values indicated are critical movement Level of Service (LOS) using HCM 2000 Control Delay
 * Values indicated using HCM 6th All-Way Stop-Control (AWSC)

Table 4

**Signalized Intersection Level of Service Summary
LEARN Early Childhood School
Waterford, Connecticut**

Signalized Intersections	2026 Weekday Morning Peak Hour		2026 Weekday Afternoon Peak Hour	
	Background	Combined	Background	Combined
Route 156 (Rope Ferry Road) at West Street*	0.28/LOS A	0.30/LOS A	0.35/LOS A	0.36/LOS A
EB Approach	LOS A	LOS A	LOS A	LOS A
WB Approach	LOS A	LOS A	LOS A	LOS B
SB Approach	LOS C	LOS C	LOS C	LOS C
Route 1 (Boston Post Road) at Niantic River Road*	0.54/LOS B	0.69/LOS B	0.62/LOS B	0.75/LOS B
EB Approach	LOS B	LOS B	LOS B	LOS C
WB Approach	LOS A	LOS A	LOS A	LOS A
NB Approach	LOS B	LOS C	LOS C	LOS C
Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive*	0.86/LOS E	0.96/LOS E	0.96/LOS E	1.06/LOS F
EB Approach	LOS C	LOS C	LOS D	LOS D
WB Approach	LOS D	LOS E	LOS E	LOS F
NB Approach	LOS F	LOS F	LOS F	LOS F
SB Approach	LOS F	LOS F	LOS F	LOS F
SWB Approach	LOS D	LOS D	LOS A	LOS A

NOTE: Values indicated are intersection v/c Ratio/LOS Delay using HCM 2000 Control Delay

*Values indicated include optimized signal timings under an uncoordinated signal system

Table 5

**Weekday Morning Peak Hour Queue Length Summary
LEARN Early Childhood School
Waterford, Connecticut**

Intersection	Approach Lane	2026 Background Queue (ft)	2026 Combined Queue (ft)	2026 Combined + Improved Queue (ft)	Available Storage [Proposed] (ft)
Daniels Avenue at Site Driveway	Site Driveway - Northbound Approach	0	N/A	N/A	200
	Site Driveway - Northbound Left Turn	N/A	175	N/A	200
	Site Driveway - Northbound Right Turn	N/A	30	N/A	200
	Daniels Avenue - Westbound Left Turn	0	15	N/A	>1,000
Daniels Avenue at Niantic River Road	Daniels Avenue - Westbound Approach	5	95	N/A	>1,000
	Niantic River Road - Southbound Left Turn	0	10	N/A	>1,000
Daniels Avenue at Spithead Road	Spithead Road - Northbound Left Turn	0	5	N/A	>1,000
	Spithead Road - Northbound Approach	N/A	N/A	15	>1,000
	Daniels Avenue - Eastbound Approach	10	40	35	>1,000
	Spithead Road - Southbound Approach	N/A	N/A	25	>1,000
Route 156 (Rope Ferry Road) at Spithead Road	Route 156 - Eastbound Left Turn	5	5	N/A	>1,000
	Spithead Road - Southbound Approach	15	35	N/A	>1,000
Route 156 (Rope Ferry Road) at West Street*	Route 156 - Eastbound Left Turn	10	25	N/A	100
	Route 156 - Eastbound Through	45	50	N/A	>1,000
	Route 156 - Westbound Through	90	100	N/A	>1,000
	Route 156 - Westbound Right Turn	10	10	N/A	500
	West Street - Southbound Approach	50	55	N/A	515
Niantic River Road at West Street	West Street - Westbound Approach	10	25	N/A	515
	Niantic River Road - Southbound Left Turn	5	10	N/A	>1,000

Route 1 (Boston Post Road) at Niantic River Road*	Route 1 - Eastbound Approach	205	315	N/A	>1,000
	Route 1 - Westbound Approach	100	120	N/A	>1,000
	Niantic River Road - Northbound Approach	65	125	N/A	>1,000
Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive*	Route 1 - Eastbound Through/Left Turn	55	65	N/A	175
	Route 1 - Eastbound Through/Right Turn	230	275	N/A	>1,000
	Route 1 - Westbound Through/Left Turn	335	440	N/A	300
	Route 1 - Westbound Through/Right Turn	275	280	N/A	>1,000
	Spithead Road - Northbound Approach	195	295	N/A	>1,000
	Cross Road - Southbound Approach	340	445	N/A	>1,000
	Sunniecrest Drive - Southwest Approach	10	15	N/A	675

NOTE: Values indicated represent 95th percentile (design) vehicle queue lengths. Values are rounded to the nearest 5 feet.

*Values indicated include optimized signal timings under an uncoordinated signal system

Table 5

**Weekday Afternoon Peak Hour Queue Length Summary
LEARN Early Childhood School
Waterford, Connecticut**

Intersection	Approach Lane	2026 Background Queue (ft)	2026 Combined Queue (ft)	2026 Combined + Improved (ft)	Available Storage [Proposed] (ft)
Daniels Avenue at Site Driveway	Site Driveway - Northbound Approach	0	N/A	N/A	200
	Site Driveway - Northbound Left Turn	N/A	30	N/A	200
	Site Driveway - Northbound Right Turn	N/A	10	N/A	200
	Daniels Avenue - Westbound Left Turn	0	5	N/A	>1,000
Daniels Avenue at Niantic River Road	Daniels Avenue - Westbound Approach	5	50	N/A	>1,000
	Niantic River Road - Southbound Left Turn	0	5	N/A	>1,000
Daniels Avenue at Spithead Road	Spithead Road - Northbound Left Turn	0	5	N/A	>1,000
	Spithead Road - Northbound Approach	N/A	N/A	25	>1,000
	Daniels Avenue - Eastbound Approach	10	30	25	>1,000
	Spithead Road - Southbound Approach	N/A	N/A	25	>1,000
Route 156 (Rope Ferry Road) at Spithead Road	Route 156 - Eastbound Left Turn	10	10	N/A	>1,000
	Spithead Road - Southbound Approach	30	60	N/A	>1,000
Route 156 (Rope Ferry Road) at West Street*	Route 156 - Eastbound Left Turn	15	25	N/A	100
	Route 156 - Eastbound Through	55	60	N/A	>1,000
	Route 156 - Westbound Through	135	135	N/A	>1,000
	Route 156 - Westbound Right Turn	20	20	N/A	500
	West Street - Southbound Approach	45	55	N/A	515
Niantic River Road at West Street	West Street - Westbound Approach	20	35	N/A	515
	Niantic River Road - Southbound Left Turn	5	10	N/A	>1,000

Route 1 (Boston Post Road) at Niantic River Road*	Route 1 - Eastbound Approach	230	320	N/A	>1,000
	Route 1 - Westbound Approach	140	140	N/A	>1,000
	Niantic River Road - Northbound Approach	95	140	N/A	>1,000
Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive*	Route 1 - Eastbound Through/Left Turn	75	85	N/A	175
	Route 1 - Eastbound Through/Right Turn	370	415	N/A	>1,000
	Route 1 - Westbound Through/Left Turn	610	740	N/A	300
	Route 1 - Westbound Through/Right Turn	355	390	N/A	>1,000
	Spithead Road - Northbound Approach	250	360	N/A	>1,000
	Cross Road - Southbound Approach	575	745	N/A	>1,000
	Sunniecrest Drive - Southwest Approach	0	0	N/A	675

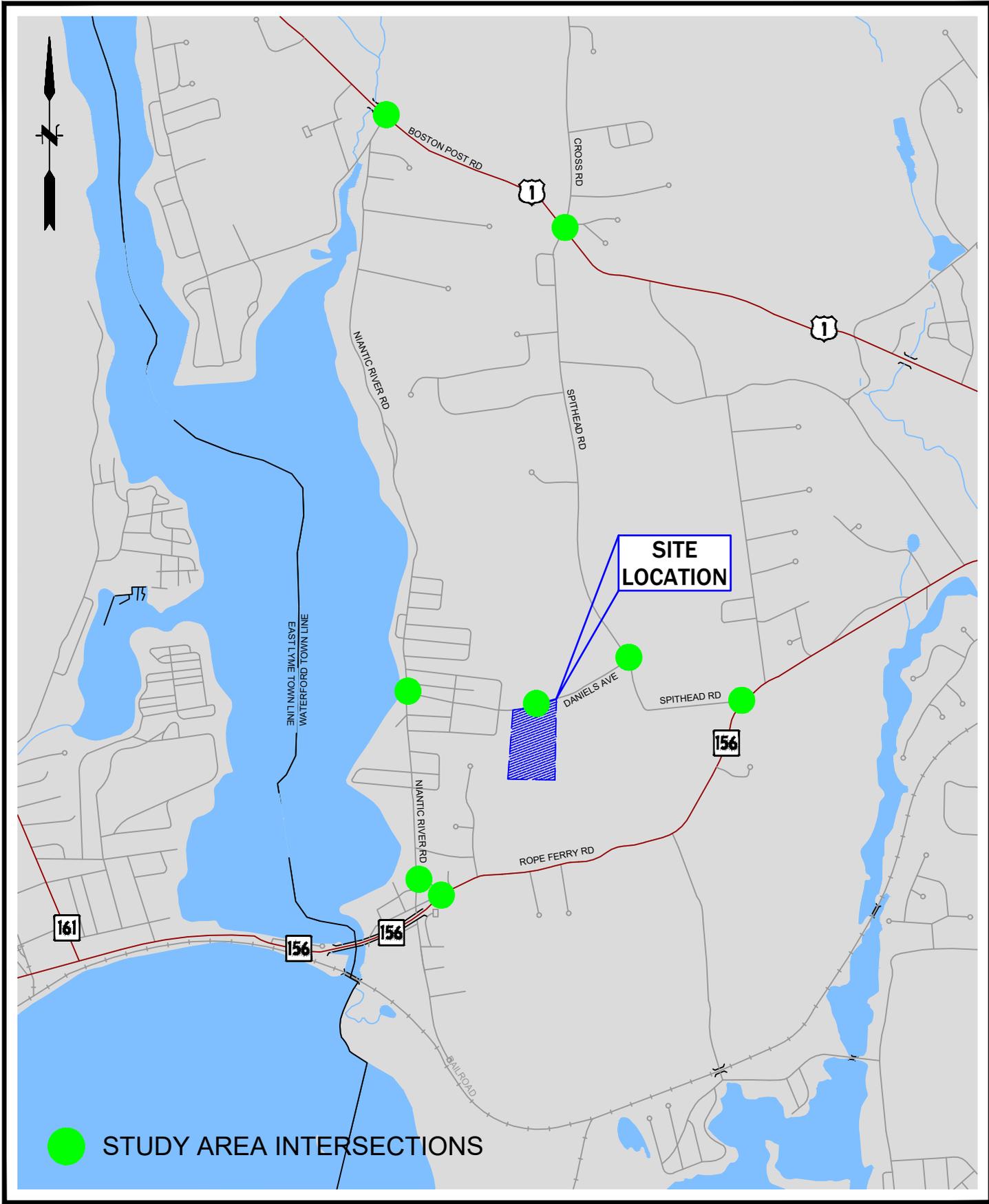
NOTE: Values indicated represent 95th percentile (design) vehicle queue lengths. Values are rounded to the nearest 5 feet.

*Values indicated include optimized signal timings under an uncoordinated signal system

Appendix B

Figures

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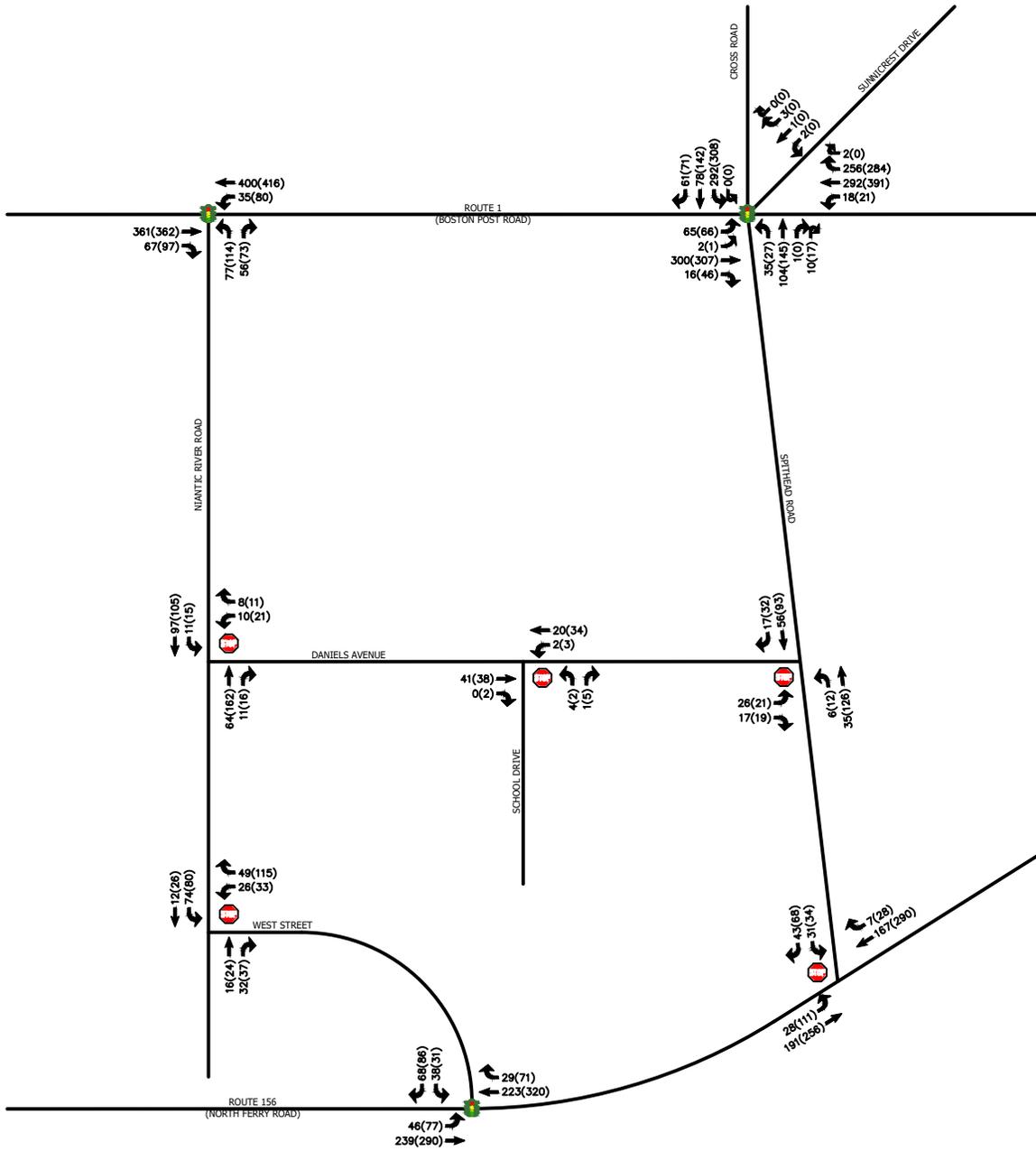


SCALE:	
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VERT.:	-
DATUM:	
HORZ.:	-
VERT.:	-
GRAPHIC SCALE	

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NEWMAN ARCHITECTS, PC
 SITE LOCATION MAP
 LEARN EARLY CHILDHOOD SCHOOL TIS
 WATERFORD CONNECTICUT

PROJ. No.: 20220883_A50
 DATE: 03/20/2025
FIG. 1



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

*A 0.7% GROWTH RATE WAS APPLIED TO THE 2022 TRAFFIC COUNTS.

File: J:\DWG\2022\0883\A50\Civil\Traffic\Figures\2022\0883_A50_TV\F01.dwg Layout: FIG 2 Plotted: 2025-04-29 9:04 PM Saved: 2025-04-29 9:04 PM User: Jack.Lowe
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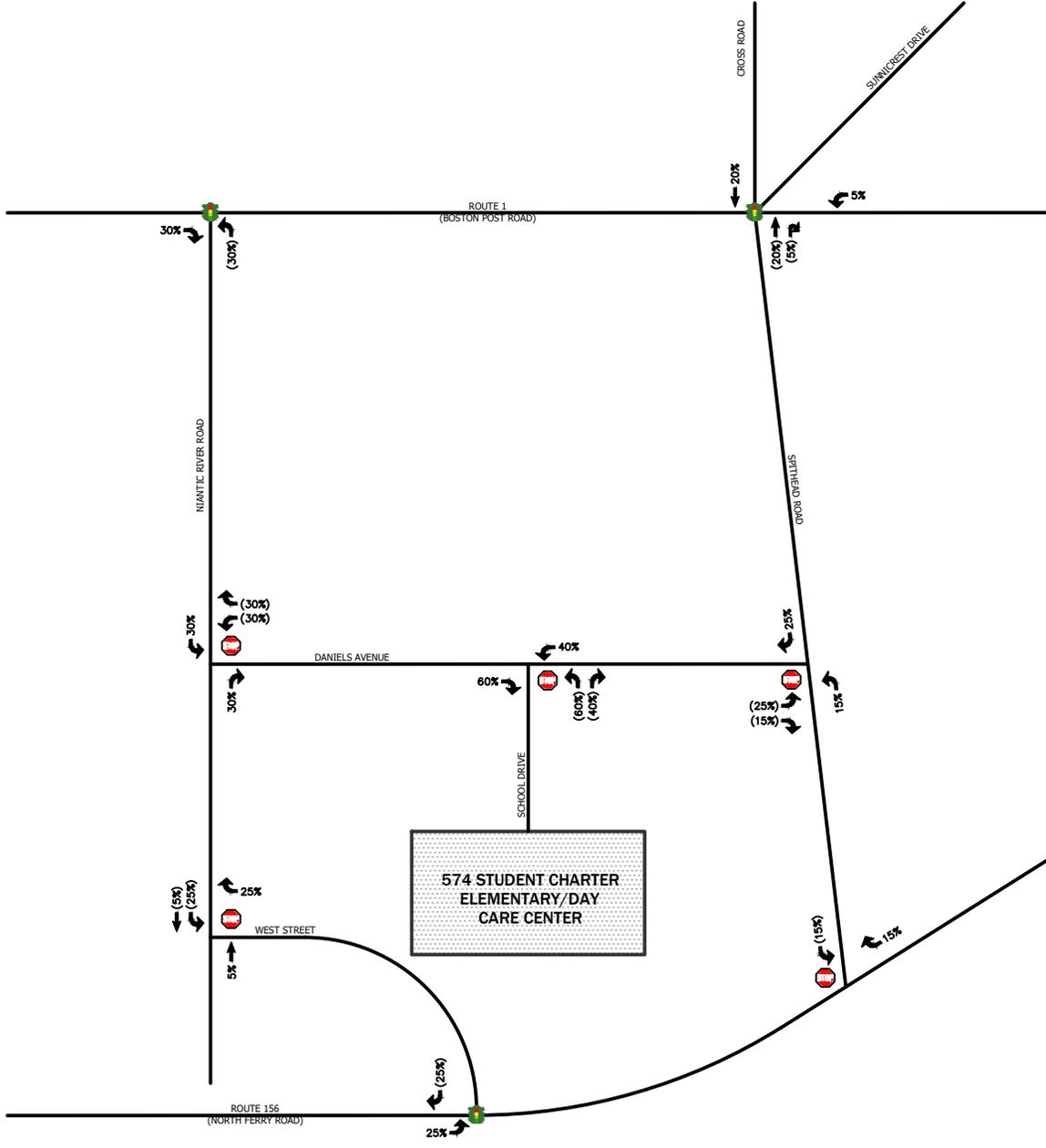
2026 BACKGROUND TRAFFIC VOLUMES

LEARN EARLY CHILDHOOD SCHOOL TIS

WATERFORD CONNECTICUT

PROJ. No.: 20220883_A50
 DATE: 04/29/2025

FIG. 2



XX(XX) = ENTERING TRAFFIC (EXITING TRAFFIC)

File: J:\DWG\20220883\A50\Civil\Traffic Figures\20220883_A50_TV\F01.dwg Layout: FIG 3 Plotted: 2025-04-29 9:04 PM Saved: 2025-04-29 9:04 PM User: Jack.Lowe
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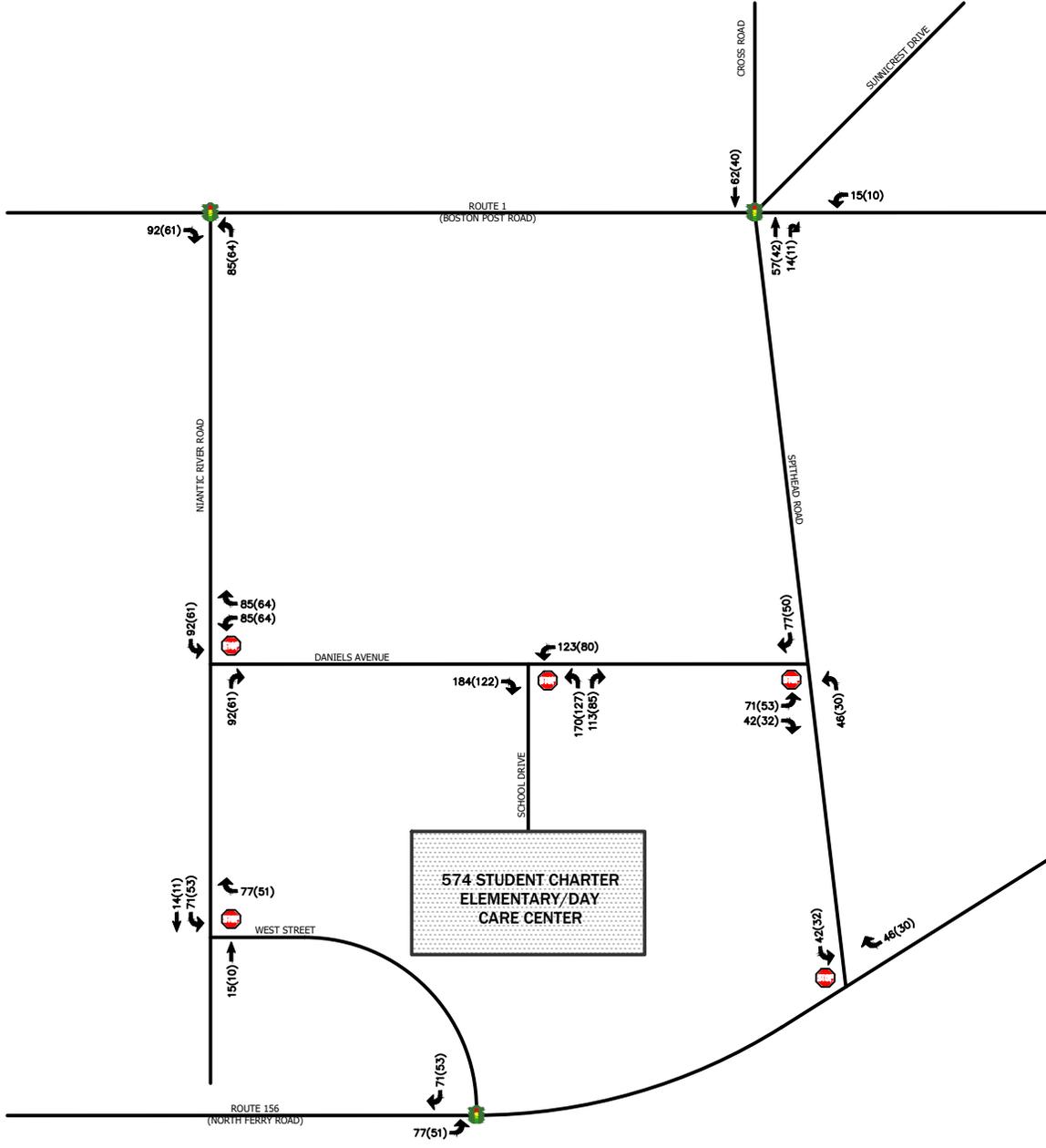
SITE GENERATED TRAFFIC ARRIVAL/DEPARTURE DISTRIBUTION

LEARN EARLY CHILDHOOD SCHOOL TIS

WATERFORD CONNECTICUT

PROJ. No.: 20220883_A50
 DATE: 04/29/2025

FIG. 3



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

SITE GENERATED TRAFFIC VOLUMES							
LAND USE CODE	QUANTITY	AM PEAK HOUR			PM PEAK HOUR		
		ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
LUC 536 - CHARTER ELEMENTARY SCHOOL	526 STUDENTS	286	264	550	183	191	374
LUC 565 - DAY CARE CENTER	48 STUDENTS	21	19	40	19	21	40
SUBTOTAL		307	283	590	202	212	414

File: J:\DWG\2022\0883\A50\CivilTraffic Figures\20220883_A50_TV\F01.dwg Layout: FIG 4 Plotted: 2025-04-29 9:04 PM Saved: 2025-04-29 9:04 PM User: Jack Lowe
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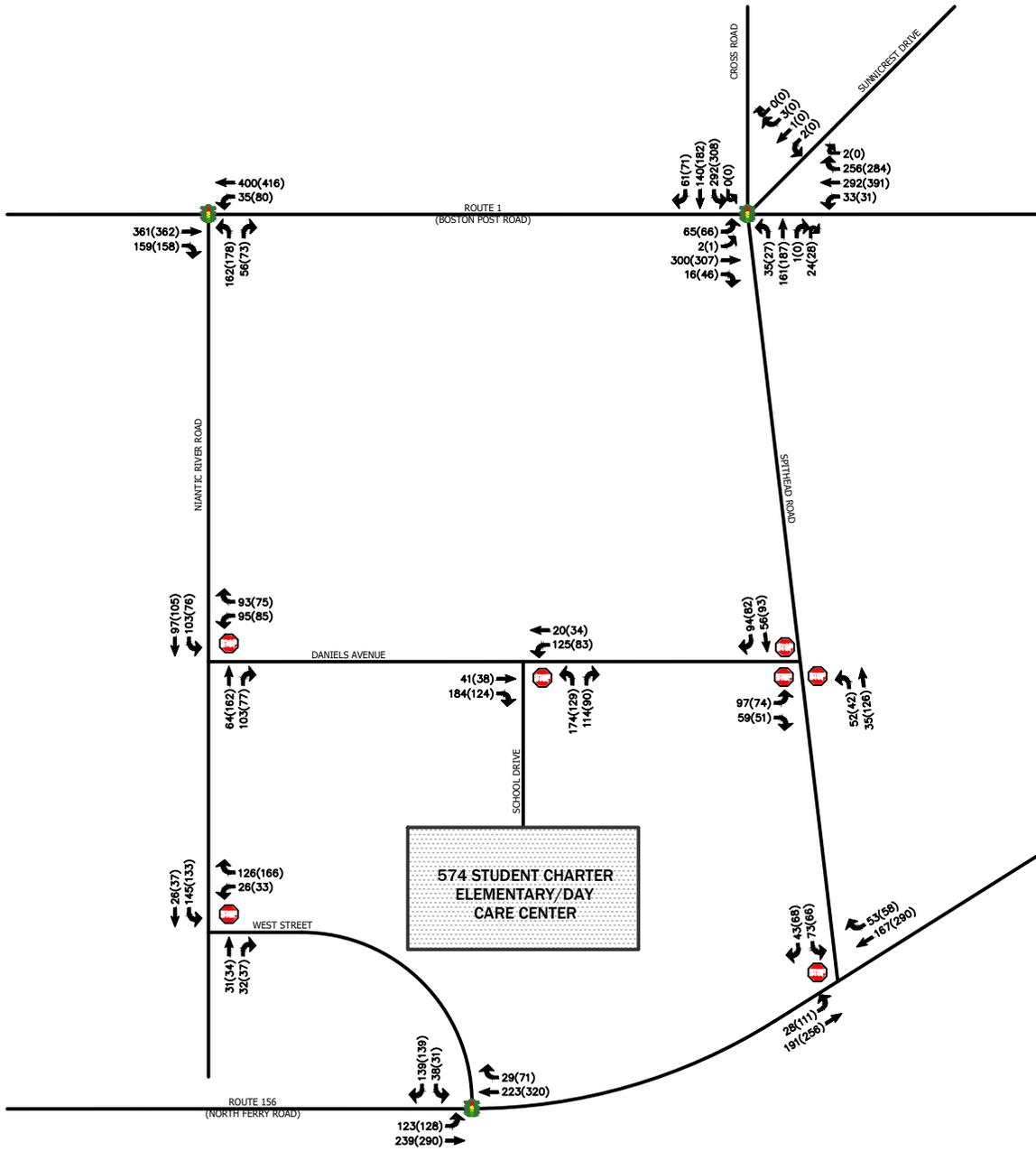
SITE GENERATED TRAFFIC VOLUMES

LEARN EARLY CHILDHOOD SCHOOL TIS

WATERFORD CONNECTICUT

PROJ. No.: 20220883.A50
 DATE: 04/29/2025

FIG. 4



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

*A 0.7% GROWTH RATE WAS APPLIED TO THE 2022 TRAFFIC COUNTS.

File: J:\DWG\20220883\A50\CivilTraffic\Figures\20220883_A50_TV\F01.dwg Layout: FIG 5 Plotted: 2025-04-29 9:04 PM Saved: 2025-04-29 9:04 PM User: Jack.Lowe
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DATUM:	HORIZ.: -
	VERT.: -

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2026 COMBINED TRAFFIC VOLUMES

LEARN EARLY CHILDHOOD SCHOOL TIS

WATERFORD CONNECTICUT

PROJ. No.: 20220883_A50
 DATE: 04/29/2025

FIG. 5

Appendix C

Intersection Capacity Analysis Worksheets
2026 Background Traffic Volumes
Weekday Morning Peak Hour

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	41	0	2	20	4	1
Future Volume (vph)	41	0	2	20	4	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Friction						0.970
Flt Protected				0.995	0.963	
Satd. Flow (prot)	1900	0	0	1754	1654	0
Flt Permitted				0.995	0.963	
Satd. Flow (perm)	1900	0	0	1754	1654	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1860			1746	1444	
Travel Time (s)	42.3			39.7	32.8	
Peak Hour Factor	0.57	0.57	0.69	0.69	0.58	0.58
Heavy Vehicles (%)	0%	0%	25%	6%	0%	33%
Adj. Flow (vph)	72	0	3	29	7	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	72	0	0	32	9	0
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		↔
Traffic Vol, veh/h	41	0	2	20	4	1
Future Vol, veh/h	41	0	2	20	4	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	57	57	69	69	58	58
Heavy Vehicles, %	0	0	25	6	0	33
Mvmt Flow	72	0	3	29	7	2
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	72	0	107	72
Stage 1	-	-	-	-	72	-
Stage 2	-	-	-	-	35	-
Critical Hdwy	-	-	4.35	-	6.4	6.53
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.425	-	3.5	3.597
Pot Cap-1 Maneuver	-	-	1394	-	895	910
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	993	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1394	-	893	910
Mov Cap-2 Maneuver	-	-	-	-	893	-
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	991	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.7	9.1			
HCM LOS						A
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	896	-	-	1394	-	
HCM Lane V/C Ratio	0.01	-	-	0.002	-	
HCM Control Delay (s)	9.1	-	-	7.6	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	10	8	64	11	11	97
Future Volume (vph)	10	8	64	11	11	97
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	0.940		0.980			
Flt Protected	0.973					0.995
Satd. Flow (prot)	1738	0	1831	0	0	1890
Flt Permitted	0.973					0.995
Satd. Flow (perm)	1738	0	1831	0	0	1890
Link Speed (mph)	30		30			30
Link Distance (ft)	1860		2865			1586
Travel Time (s)	42.3		65.1			36.0
Peak Hour Factor	0.53	0.53	0.73	0.73	0.85	0.85
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%
Adj. Flow (vph)	19	15	88	15	13	114
Shared Lane Traffic (%)						
Lane Group Flow (vph)	34	0	103	0	0	127
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	10	8	64	11	11	97
Future Vol, veh/h	10	8	64	11	11	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	53	53	73	73	85	85
Heavy Vehicles, %	0	0	2	0	0	0
Mvmt Flow	19	15	88	15	13	114

Major/Minor	Minor1	Major1	Major2	Major2	Major2	Major2
Conflicting Flow All	236	96	0	0	103	0
Stage 1	96	-	-	-	-	-
Stage 2	140	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	757	966	-	-	1502	-
Stage 1	933	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	750	966	-	-	1502	-
Mov Cap-2 Maneuver	750	-	-	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	884	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	833	1502	-
HCM Lane V/C Ratio	-	-	0.041	0.009	-
HCM Control Delay (s)	-	-	9.5	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	26	17	6	35	56	17
Future Volume (vph)	26	17	6	35	56	17
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	0.947			0.969		
Flt Protected	0.971			0.993		
Satd. Flow (prot)	1726	0	0	1860	1810	0
Flt Permitted	0.971			0.993		
Satd. Flow (perm)	1726	0	0	1860	1810	0
Link Speed (mph)	30			30		
Link Distance (ft)	1746			2377		
Travel Time (s)	39.7			54.0		
Peak Hour Factor	0.61	0.61	0.73	0.73	0.74	0.74
Heavy Vehicles (%)	2%	0%	10%	0%	1%	4%
Adj. Flow (vph)	43	28	8	48	76	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	71	0	0	56	99	0
Sign Control	Stop			Free		Free

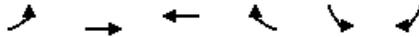
Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	16.9% ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	3.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑	↑	
Traffic Vol, veh/h	26	17	6	35	56	17
Future Vol, veh/h	26	17	6	35	56	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	61	61	73	73	74	74
Heavy Vehicles, %	2	0	10	0	1	4
Mvmt Flow	43	28	8	48	76	23

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	152	88	99	0	0
Stage 1	88	-	-	-	-
Stage 2	64	-	-	-	-
Critical Hdwy	6.42	6.2	4.2	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.29	-	-
Pot Cap-1 Maneuver	840	976	1445	-	-
Stage 1	935	-	-	-	-
Stage 2	959	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	835	976	1445	-	-
Mov Cap-2 Maneuver	835	-	-	-	-
Stage 1	929	-	-	-	-
Stage 2	959	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1445	-	886	-	-
HCM Lane V/C Ratio	0.006	-	0.08	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

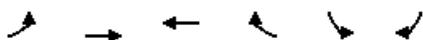


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	28	191	167	7	31	43
Future Volume (vph)	28	191	167	7	31	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.995		0.922	
Flt Protected		0.994			0.979	
Satd. Flow (prot)	0	1889	1869	0	1691	0
Flt Permitted		0.994			0.979	
Satd. Flow (perm)	0	1889	1869	0	1691	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		1560	1746		2377	
Travel Time (s)		35.5	39.7		54.0	
Peak Hour Factor	0.82	0.82	0.84	0.84	0.65	0.65
Heavy Vehicles (%)	0%	0%	1%	5%	2%	1%
Adj. Flow (vph)	34	233	199	8	48	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	267	207	0	114	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	28	191	167	7	31	43
Future Vol, veh/h	28	191	167	7	31	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	84	84	65	65
Heavy Vehicles, %	0	0	1	5	2	1
Mvmt Flow	34	233	199	8	48	66
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	207	0	-	0	504	203
Stage 1	-	-	-	-	203	-
Stage 2	-	-	-	-	301	-
Critical Hdwy	4.1	-	-	-	6.42	6.21
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.309
Pot Cap-1 Maneuver	1376	-	-	-	528	840
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	751	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1376	-	-	-	513	840
Mov Cap-2 Maneuver	-	-	-	-	513	-
Stage 1	-	-	-	-	808	-
Stage 2	-	-	-	-	751	-
Approach	EB	WB	SB			
HCM Control Delay, s	1	0	11.6			
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1376	-	-	-	663	
HCM Lane V/C Ratio	0.025	-	-	-	0.172	
HCM Control Delay (s)	7.7	0	-	-	11.6	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	

Lanes, Volumes, Timings
5: Route 156 (Rope Ferry Road) & West Street



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	46	239	223	29	38	68
Future Volume (vph)	46	239	223	29	38	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			500	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	50				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.913	
Flt Protected	0.950				0.982	
Satd. Flow (prot)	1805	1900	1881	1615	1687	0
Flt Permitted	0.596				0.982	
Satd. Flow (perm)	1132	1900	1881	1615	1687	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				35	70	
Link Speed (mph)		30	30		30	
Link Distance (ft)		1327	1665		516	
Travel Time (s)		30.2	37.8		11.7	
Peak Hour Factor	0.83	0.83	0.84	0.84	0.97	0.97
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Adj. Flow (vph)	55	288	265	35	39	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	55	288	265	35	109	0
Turn Type	D.P+P	NA	NA	Prot	Prot	
Protected Phases	1	1 2	2	2	4	
Permitted Phases	2					
Detector Phase	1	1 2	2	2	4	
Switch Phase						
Minimum Initial (s)	5.0		15.0	15.0	7.0	
Minimum Split (s)	9.0		22.5	22.5	11.0	
Total Split (s)	11.0		33.0	33.0	16.0	
Total Split (%)	18.3%		55.0%	55.0%	26.7%	
Maximum Green (s)	7.0		25.5	25.5	12.0	
Yellow Time (s)	3.0		4.8	4.8	3.0	
All-Red Time (s)	1.0		2.7	2.7	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		7.5	7.5	4.0	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	2.0		3.0	3.0	2.0	
Recall Mode	None		Max	Max	None	
Act Effct Green (s)	35.9	40.9	25.8	25.8	7.5	
Actuated g/C Ratio	0.68	0.77	0.49	0.49	0.14	
v/c Ratio	0.06	0.20	0.29	0.04	0.36	
Control Delay	2.7	2.9	10.4	3.9	14.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.7	2.9	10.4	3.9	14.2	
LOS	A	A	B	A	B	
Approach Delay		2.9	9.7		14.2	
Approach LOS		A	A		B	
Queue Length 50th (ft)	4	21	50	0	12	
Queue Length 95th (ft)	11	43	92	11	48	
Internal Link Dist (ft)		1247	1585		436	
Turn Bay Length (ft)	100			500		
Base Capacity (vph)	872	1430	920	808	442	
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	0.20	0.29	0.04	0.25	

Intersection Summary

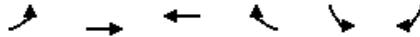
Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 52.8
 Natural Cycle: 45
 Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.36	
Intersection Signal Delay: 7.2	Intersection LOS: A
Intersection Capacity Utilization 35.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Route 156 (Rope Ferry Road) & West Street



HCM Signalized Intersection Capacity Analysis
 5: Route 156 (Rope Ferry Road) & West Street



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	46	239	223	29	38	68
Future Volume (vph)	46	239	223	29	38	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	7.5	7.5	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.91	
Flt Protected	0.95	1.00	1.00	1.00	0.98	
Satd. Flow (prot)	1805	1900	1881	1615	1688	
Flt Permitted	0.60	1.00	1.00	1.00	0.98	
Satd. Flow (perm)	1132	1900	1881	1615	1688	
Peak-hour factor, PHF	0.83	0.83	0.84	0.84	0.97	0.97
Adj. Flow (vph)	55	288	265	35	39	70
RTOR Reduction (vph)	0	0	0	18	62	0
Lane Group Flow (vph)	55	288	265	17	47	0
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type	D.P+P	NA	NA	Prot	Prot	
Protected Phases	1	1 2	2	2	4	
Permitted Phases	2					
Actuated Green, G (s)	32.3	36.3	25.8	25.8	5.8	
Effective Green, g (s)	32.3	36.3	25.8	25.8	5.8	
Actuated g/C Ratio	0.60	0.68	0.48	0.48	0.11	
Clearance Time (s)	4.0		7.5	7.5	4.0	
Vehicle Extension (s)	2.0		3.0	3.0	2.0	
Lane Grp Cap (vph)	763	1286	905	777	182	
v/s Ratio Prot	0.01	c0.15	c0.14	0.01	c0.03	
v/s Ratio Perm	0.03					
v/c Ratio	0.07	0.22	0.29	0.02	0.26	
Uniform Delay, d1	4.4	3.3	8.4	7.3	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.0	0.8	0.1	0.3	
Delay (s)	4.4	3.3	9.2	7.3	22.2	
Level of Service	A	A	A	A	C	
Approach Delay (s)		3.5	9.0		22.2	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			8.4		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.28			
Actuated Cycle Length (s)			53.6		Sum of lost time (s)	15.5
Intersection Capacity Utilization			35.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	49	16	32	74	12
Future Volume (vph)	26	49	16	32	74	12
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	0.912		0.909			
Flt Protected	0.983					0.959
Satd. Flow (prot)	1692	0	1672	0	0	1804
Flt Permitted	0.983					0.959
Satd. Flow (perm)	1692	0	1672	0	0	1804
Link Speed (mph)	30		30			30
Link Distance (ft)	516		1202			2865
Travel Time (s)	11.7		27.3			65.1
Peak Hour Factor	0.64	0.64	0.83	0.83	0.93	0.93
Heavy Vehicles (%)	2%	0%	6%	2%	0%	7%
Adj. Flow (vph)	41	77	19	39	80	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	118	0	58	0	0	93
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	22.5%
ICU Level of Service	A
Analysis Period (min)	15

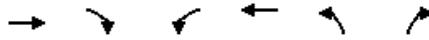
Intersection						
Int Delay, s/veh	6.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	26	49	16	32	74	12
Future Vol, veh/h	26	49	16	32	74	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	64	64	83	83	93	93
Heavy Vehicles, %	2	0	6	2	0	7
Mvmt Flow	41	77	19	39	80	13

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	212	39	0	0	58
Stage 1	39	-	-	-	-
Stage 2	173	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	4.1
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2
Pot Cap-1 Maneuver	776	1038	-	-	1559
Stage 1	983	-	-	-	-
Stage 2	857	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	736	1038	-	-	1559
Mov Cap-2 Maneuver	736	-	-	-	-
Stage 1	983	-	-	-	-
Stage 2	812	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	6.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	909	1559	-
HCM Lane V/C Ratio	-	-	0.129	0.051	-
HCM Control Delay (s)	-	-	9.5	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.2	-

Lanes, Volumes, Timings
7: Niantic River Road & Route 1 (Boston Post Road)



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	361	67	35	400	77	56
Future Volume (vph)	361	67	35	400	77	56
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	0.979				0.943	
Flt Protected				0.996	0.972	
Satd. Flow (prot)	1814	0	0	1875	1707	0
Flt Permitted				0.966	0.972	
Satd. Flow (perm)	1814	0	0	1819	1707	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	18				58	
Link Speed (mph)	30			30	30	
Link Distance (ft)	1367			3259	1593	
Travel Time (s)	31.1			74.1	36.2	
Peak Hour Factor	0.91	0.91	0.88	0.88	0.81	0.81
Heavy Vehicles (%)	3%	0%	0%	1%	2%	2%
Adj. Flow (vph)	397	74	40	455	95	69
Shared Lane Traffic (%)						
Lane Group Flow (vph)	471	0	0	495	164	0
Turn Type	NA		D.P+P	NA	Prot	
Protected Phases	2		1	1 2	4	
Permitted Phases			2			
Detector Phase	2		1	1 2	4	
Switch Phase						
Minimum Initial (s)	18.0		5.0		9.0	
Minimum Split (s)	23.9		8.1		18.2	
Total Split (s)	29.0		12.0		19.0	
Total Split (%)	48.3%		20.0%		31.7%	
Maximum Green (s)	23.1		8.9		14.8	
Yellow Time (s)	4.3		3.0		3.2	
All-Red Time (s)	1.6		0.1		1.0	
Lost Time Adjust (s)	0.0				0.0	
Total Lost Time (s)	5.9				4.2	
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.5		2.0		1.5	
Recall Mode	Min		Min		None	
Walk Time (s)					7.0	
Flash Dont Walk (s)					7.0	
Pedestrian Calls (#/hr)					0	
Act Effct Green (s)	20.8			31.8	9.9	
Actuated g/C Ratio	0.43			0.66	0.20	
v/c Ratio	0.60			0.41	0.42	
Control Delay	15.8			5.0	17.2	
Queue Delay	0.0			0.0	0.0	
Total Delay	15.8			5.0	17.2	
LOS	B			A	B	
Approach Delay	15.8			5.0	17.2	
Approach LOS	B			A	B	
Queue Length 50th (ft)	106			48	28	
Queue Length 95th (ft)	204			100	65	
Internal Link Dist (ft)	1287			3179	1513	
Turn Bay Length (ft)						
Base Capacity (vph)	909			1339	582	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.52			0.37	0.28	

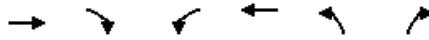
Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 48.5
 Natural Cycle: 60
 Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 64.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: Niantic River Road & Route 1 (Boston Post Road)





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	361	67	35	400	77	56
Future Volume (vph)	361	67	35	400	77	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9			3.1	4.2	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.98			1.00	0.94	
Flt Protected	1.00			1.00	0.97	
Satd. Flow (prot)	1814			1875	1707	
Flt Permitted	1.00			0.97	0.97	
Satd. Flow (perm)	1814			1818	1707	
Peak-hour factor, PHF	0.91	0.91	0.88	0.88	0.81	0.81
Adj. Flow (vph)	397	74	40	455	95	69
RTOR Reduction (vph)	10	0	0	0	50	0
Lane Group Flow (vph)	461	0	0	495	114	0
Heavy Vehicles (%)	3%	0%	0%	1%	2%	2%
Turn Type	NA		D.P+P	NA	Prot	
Protected Phases	2		1	1 2	4	
Permitted Phases			2			
Actuated Green, G (s)	20.8			28.9	7.1	
Effective Green, g (s)	20.8			28.9	7.1	
Actuated g/C Ratio	0.42			0.59	0.14	
Clearance Time (s)	5.9				4.2	
Vehicle Extension (s)	2.5				1.5	
Lane Grp Cap (vph)	766			1077	246	
v/s Ratio Prot	c0.25			c0.08	c0.07	
v/s Ratio Perm				0.19		
v/c Ratio	0.60			0.46	0.46	
Uniform Delay, d1	11.0			5.7	19.3	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.1			0.1	0.5	
Delay (s)	12.1			5.9	19.8	
Level of Service	B			A	B	
Approach Delay (s)	12.1			5.9	19.8	
Approach LOS	B			A	B	
Intersection Summary						
HCM 2000 Control Delay			10.5		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			49.2		Sum of lost time (s)	13.2
Intersection Capacity Utilization			64.5%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						



Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT
Lane Configurations		↔	↔			↕	↕			↕				↕
Traffic Volume (vph)	65	2	300	16	18	292	256	2	35	104	1	10	292	78
Future Volume (vph)	65	2	300	16	18	292	256	2	35	104	1	10	292	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		175		0	0		300		0		0		0	
Storage Lanes		1		0	0		1		0		0		0	
Taper Length (ft)		25			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	1.00	1.00
Frt			0.992				0.850			0.990				0.981
Flt Protected		0.950				0.997				0.989				0.967
Satd. Flow (prot)	0	1788	1885	0	0	1894	1615	0	0	1847	0	0	0	1770
Flt Permitted		0.283				0.952				0.902				0.515
Satd. Flow (perm)	0	533	1885	0	0	1809	1615	0	0	1685	0	0	0	943
Right Turn on Red				No				No					No	
Satd. Flow (RTOR)														10
Link Speed (mph)			30			30				30				30
Link Distance (ft)			3259			1659				1121				1156
Travel Time (s)			74.1			37.7				25.5				26.3
Peak Hour Factor	0.84	0.84	0.84	0.84	0.87	0.87	0.87	0.87	0.79	0.79	0.79	0.79	0.82	0.82
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Adj. Flow (vph)	77	2	357	19	21	336	294	2	44	132	1	13	356	95
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	79	376	0	0	357	296	0	0	190	0	0	0	525
Turn Type	D.P+P	D.P+P	NA		Perm	NA	Perm		Perm	NA			D.P+P	NA
Protected Phases	1	1	1 2			2				5			4	4 5
Permitted Phases	2	2			2		2		5				5	
Detector Phase	1	1	1 2		2	2	2		5	5			4	4 5
Switch Phase														
Minimum Initial (s)	5.0	5.0			15.0	15.0	15.0		9.0	9.0			5.0	
Minimum Split (s)	9.0	9.0			22.8	22.8	22.8		15.2	15.2			19.1	
Total Split (s)	9.0	9.0			28.0	28.0	28.0		17.0	17.0			23.0	
Total Split (%)	10.0%	10.0%			31.1%	31.1%	31.1%		18.9%	18.9%			25.6%	
Maximum Green (s)	5.0	5.0			20.2	20.2	20.2		10.8	10.8			18.9	
Yellow Time (s)	3.0	3.0			4.4	4.4	4.4		3.5	3.5			3.1	
All-Red Time (s)	1.0	1.0			3.4	3.4	3.4		2.7	2.7			1.0	
Lost Time Adjust (s)		0.0				0.0	0.0			0.0				
Total Lost Time (s)		4.0				7.8	7.8			6.2				
Lead/Lag	Lead	Lead			Lag	Lag	Lag		Lead	Lead				
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes				
Vehicle Extension (s)	1.5	1.5			2.5	2.5	2.5		1.5	1.5			1.5	
Recall Mode	Min	Min			Min	Min	Min		None	None			None	
Walk Time (s)														7.0
Flash Dont Walk (s)														8.0
Pedestrian Calls (#/hr)														0
Act Effct Green (s)		28.4	32.4			19.6	19.6			10.8				31.8
Actuated g/C Ratio		0.32	0.36			0.22	0.22			0.12				0.36
v/c Ratio		0.33	0.55			0.90	0.84			0.94				1.02
Control Delay		23.1	26.4			61.4	55.2			90.0				71.9
Queue Delay		0.0	0.0			0.0	0.0			0.0				0.0
Total Delay		23.1	26.4			61.4	55.2			90.0				71.9
LOS		C	C			E	E			F				E
Approach Delay			25.8			58.6				90.0				71.9
Approach LOS			C			E				F				E
Queue Length 50th (ft)		29	166			197	161			109				~222
Queue Length 95th (ft)		56	232			#333	#277			#194				#341
Internal Link Dist (ft)			3179			1579				1041				1076
Turn Bay Length (ft)		175					300							
Base Capacity (vph)		239	696			409	364			203				516
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		0.33	0.54			0.87	0.81			0.94				1.02

Intersection Summary

Area Type: Other

Cycle Length: 90



Lane Group	SBR	SWL2	SWL	SWR
Lane Configurations				
Traffic Volume (vph)	61	2	1	3
Future Volume (vph)	61	2	1	3
Ideal Flow (vphpl)	1900	1900	1900	1900
Storage Length (ft)	0		0	0
Storage Lanes	0		1	0
Taper Length (ft)			25	
Lane Util. Factor	1.00	1.00	1.00	1.00
Frt			0.932	
Flt Protected			0.976	
Satd. Flow (prot)	0	0	1728	0
Flt Permitted			0.976	
Satd. Flow (perm)	0	0	1728	0
Right Turn on Red	Yes			
Satd. Flow (RTOR)				
Link Speed (mph)			30	
Link Distance (ft)			1316	
Travel Time (s)			29.9	
Peak Hour Factor	0.82	0.38	0.38	0.38
Heavy Vehicles (%)	7%	0%	0%	0%
Adj. Flow (vph)	74	5	3	8
Shared Lane Traffic (%)				
Lane Group Flow (vph)	0	0	16	0
Turn Type		Prot	Prot	
Protected Phases		6	6	
Permitted Phases				
Detector Phase		6	6	
Switch Phase				
Minimum Initial (s)		5.0	5.0	
Minimum Split (s)		9.1	9.1	
Total Split (s)		13.0	13.0	
Total Split (%)		14.4%	14.4%	
Maximum Green (s)		8.9	8.9	
Yellow Time (s)		3.1	3.1	
All-Red Time (s)		1.0	1.0	
Lost Time Adjust (s)			0.0	
Total Lost Time (s)			4.1	
Lead/Lag		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	
Vehicle Extension (s)		1.5	1.5	
Recall Mode		Max	Max	
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)			8.9	
Actuated g/C Ratio			0.10	
v/c Ratio			0.09	
Control Delay			38.3	
Queue Delay			0.0	
Total Delay			38.3	
LOS			D	
Approach Delay			38.3	
Approach LOS			D	
Queue Length 50th (ft)			8	
Queue Length 95th (ft)			12	
Internal Link Dist (ft)			1236	
Turn Bay Length (ft)				
Base Capacity (vph)			171	
Starvation Cap Reductn			0	
Spillback Cap Reductn			0	
Storage Cap Reductn			0	
Reduced v/c Ratio			0.09	
Intersection Summary				



Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT	
Lane Configurations		↔	↔			↔	↔			↔				↔	
Traffic Volume (vph)	65	2	300	16	18	292	256	2	35	104	1	10	292	78	
Future Volume (vph)	65	2	300	16	18	292	256	2	35	104	1	10	292	78	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0			7.8	7.8			6.2				4.1	
Lane Util. Factor		1.00	1.00			1.00	1.00			1.00				1.00	
Fr _t		1.00	0.99			1.00	0.85			0.99				0.98	
Fl _t Protected		0.95	1.00			1.00	1.00			0.99				0.97	
Satd. Flow (prot)		1788	1886			1894	1615			1847				1770	
Fl _t Permitted		0.28	1.00			0.95	1.00			0.90				0.52	
Satd. Flow (perm)		533	1886			1809	1615			1684				943	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.87	0.87	0.87	0.87	0.79	0.79	0.79	0.79	0.82	0.82	
Adj. Flow (vph)	77	2	357	19	21	336	294	2	44	132	1	13	356	95	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	0	7	
Lane Group Flow (vph)	0	79	376	0	0	357	296	0	0	190	0	0	0	518	
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	
Turn Type	D.P+P	D.P+P	NA		Perm	NA	Perm		Perm	NA			D.P+P	NA	
Protected Phases	1	1	1 2			2				5			4	4 5	
Permitted Phases	2	2			2		2		5				5		
Actuated Green, G (s)		24.6	28.6			19.6	19.6			10.8				29.7	
Effective Green, g (s)		24.6	28.6			19.6	19.6			10.8				29.7	
Actuated g/C Ratio		0.28	0.32			0.22	0.22			0.12				0.33	
Clearance Time (s)		4.0				7.8	7.8			6.2					
Vehicle Extension (s)		1.5				2.5	2.5			1.5					
Lane Grp Cap (vph)		216	603			396	354			203				488	
v/s Ratio Prot		0.02	c0.20											c0.22	
v/s Ratio Perm		0.08				c0.20	0.18			0.11				c0.13	
v/c Ratio		0.37	0.62			0.90	0.84			0.94				1.06	
Uniform Delay, d1		25.1	25.8			34.0	33.4			39.0				29.9	
Progression Factor		1.00	1.00			1.00	1.00			1.00				1.00	
Incremental Delay, d2		0.4	1.5			23.0	15.3			44.5				58.2	
Delay (s)		25.5	27.3			57.0	48.7			83.5				88.1	
Level of Service		C	C			E	D			F				F	
Approach Delay (s)			27.0			53.2				83.5				88.1	
Approach LOS			C			D				F				F	
Intersection Summary															
HCM 2000 Control Delay			59.7			HCM 2000 Level of Service				E					
HCM 2000 Volume to Capacity ratio			0.86												
Actuated Cycle Length (s)			89.4	Sum of lost time (s)							26.2				
Intersection Capacity Utilization			84.6%	ICU Level of Service				E							
Analysis Period (min)			15												
c Critical Lane Group															



Movement	SBR	SWL2	SWL	SWR
Lane Configurations				
Traffic Volume (vph)	61	2	1	3
Future Volume (vph)	61	2	1	3
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			4.1	
Lane Util. Factor			1.00	
Frt			0.93	
Flt Protected			0.98	
Satd. Flow (prot)			1729	
Flt Permitted			0.98	
Satd. Flow (perm)			1729	
Peak-hour factor, PHF	0.82	0.38	0.38	0.38
Adj. Flow (vph)	74	5	3	8
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	16	0
Heavy Vehicles (%)	7%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		6	6	
Permitted Phases				
Actuated Green, G (s)			8.9	
Effective Green, g (s)			8.9	
Actuated g/C Ratio			0.10	
Clearance Time (s)			4.1	
Vehicle Extension (s)			1.5	
Lane Grp Cap (vph)			172	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.09	
Uniform Delay, d1			36.6	
Progression Factor			1.00	
Incremental Delay, d2			1.1	
Delay (s)			37.7	
Level of Service			D	
Approach Delay (s)			37.7	
Approach LOS			D	
Intersection Summary				

Appendix C

Intersection Capacity Analysis Worksheets
2026 Combined Traffic Volumes
Weekday Morning Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	41	184	125	20	174	114
Future Volume (vph)	41	184	125	20	174	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	75
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.890					0.850
Flt Protected				0.959	0.950	
Satd. Flow (prot)	1691	0	0	1489	1805	1214
Flt Permitted				0.959	0.950	
Satd. Flow (perm)	1691	0	0	1489	1805	1214
Link Speed (mph)	30			30	30	
Link Distance (ft)	1860			1746	1444	
Travel Time (s)	42.3			39.7	32.8	
Peak Hour Factor	0.57	0.57	0.69	0.69	0.58	0.58
Heavy Vehicles (%)	0%	0%	25%	6%	0%	33%
Adj. Flow (vph)	72	323	181	29	300	197
Shared Lane Traffic (%)						
Lane Group Flow (vph)	395	0	0	210	300	197
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.1%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	15.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Vol, veh/h	41	184	125	20	174	114
Future Vol, veh/h	41	184	125	20	174	114
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	57	57	69	69	58	58
Heavy Vehicles, %	0	0	25	6	0	33
Mvmt Flow	72	323	181	29	300	197

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	0	0	395	625
Stage 1	-	-	-	234
Stage 2	-	-	-	391
Critical Hdwy	-	4.35	-	6.53
Critical Hdwy Stg 1	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	5.4
Follow-up Hdwy	-	2.425	-	3.597
Pot Cap-1 Maneuver	-	1049	-	734
Stage 1	-	-	-	810
Stage 2	-	-	-	688
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	1049	-	734
Mov Cap-2 Maneuver	-	-	-	373
Stage 1	-	-	-	810
Stage 2	-	-	-	568

Approach	EB	WB	NB
HCM Control Delay, s	0	7.9	31.4
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	373	734	-	-	1049	-
HCM Lane V/C Ratio	0.804	0.268	-	-	0.173	-
HCM Control Delay (s)	44.3	11.7	-	-	9.1	0
HCM Lane LOS	E	B	-	-	A	A
HCM 95th %tile Q(veh)	7	1.1	-	-	0.6	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	95	93	64	103	103	97
Future Volume (vph)	95	93	64	103	103	97
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	0.933		0.917			
Flt Protected	0.975					0.975
Satd. Flow (prot)	1728	0	1729	0	0	1852
Flt Permitted	0.975					0.975
Satd. Flow (perm)	1728	0	1729	0	0	1852
Link Speed (mph)	30		30			30
Link Distance (ft)	1860		2865			1586
Travel Time (s)	42.3		65.1			36.0
Peak Hour Factor	0.53	0.53	0.73	0.73	0.85	0.85
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%
Adj. Flow (vph)	179	175	88	141	121	114
Shared Lane Traffic (%)						
Lane Group Flow (vph)	354	0	229	0	0	235
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.5%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	9.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	95	93	64	103	103	97
Future Vol, veh/h	95	93	64	103	103	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	53	53	73	73	85	85
Heavy Vehicles, %	0	0	2	0	0	0
Mvmt Flow	179	175	88	141	121	114

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	515	159	0	0	229
Stage 1	159	-	-	-	-
Stage 2	356	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	523	892	-	-	1351
Stage 1	875	-	-	-	-
Stage 2	713	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	473	892	-	-	1351
Mov Cap-2 Maneuver	473	-	-	-	-
Stage 1	875	-	-	-	-
Stage 2	645	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.5	0	4.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	616	1351	-
HCM Lane V/C Ratio	-	-	0.576	0.09	-
HCM Control Delay (s)	-	-	18.5	7.9	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	3.7	0.3	-



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑	↓	
Traffic Volume (vph)	97	59	52	35	56	94
Future Volume (vph)	97	59	52	35	56	94
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	0.949			0.916		
Flt Protected	0.970			0.971		
Satd. Flow (prot)	1728			1741	1692	0
Flt Permitted	0.970			0.971		
Satd. Flow (perm)	1728			1741	1692	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1746			2377	1139	
Travel Time (s)	39.7			54.0	25.9	
Peak Hour Factor	0.61	0.61	0.73	0.73	0.74	0.74
Heavy Vehicles (%)	2%	0%	10%	0%	1%	4%
Adj. Flow (vph)	159	97	71	48	76	127
Shared Lane Traffic (%)						
Lane Group Flow (vph)	256	0	0	119	203	0
Sign Control	Stop			Free	Free	

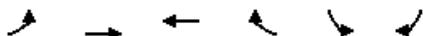
Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.4% ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	6.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑	↑	
Traffic Vol, veh/h	97	59	52	35	56	94
Future Vol, veh/h	97	59	52	35	56	94
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	61	61	73	73	74	74
Heavy Vehicles, %	2	0	10	0	1	4
Mvmt Flow	159	97	71	48	76	127

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	330	140	203	0	0
Stage 1	140	-	-	-	-
Stage 2	190	-	-	-	-
Critical Hdwy	6.42	6.2	4.2	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.29	-	-
Pot Cap-1 Maneuver	665	913	1322	-	-
Stage 1	887	-	-	-	-
Stage 2	842	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	628	913	1322	-	-
Mov Cap-2 Maneuver	628	-	-	-	-
Stage 1	838	-	-	-	-
Stage 2	842	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	4.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1322	-	712	-	-
HCM Lane V/C Ratio	0.054	-	0.359	-	-
HCM Control Delay (s)	7.9	0	12.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.6	-	-

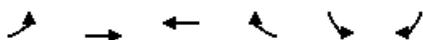


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	28	191	167	53	73	43
Future Volume (vph)	28	191	167	53	73	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.968		0.950	
Fl _t Protected		0.994			0.969	
Satd. Flow (prot)	0	1889	1804	0	1721	0
Fl _t Permitted		0.994			0.969	
Satd. Flow (perm)	0	1889	1804	0	1721	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		1560	1746		2377	
Travel Time (s)		35.5	39.7		54.0	
Peak Hour Factor	0.82	0.82	0.84	0.84	0.65	0.65
Heavy Vehicles (%)	0%	0%	1%	5%	2%	1%
Adj. Flow (vph)	34	233	199	63	112	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	267	262	0	178	0
Sign Control		Free	Free		Stop	

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

Intersection						
Int Delay, s/veh	3.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	28	191	167	53	73	43
Future Vol, veh/h	28	191	167	53	73	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	84	84	65	65
Heavy Vehicles, %	0	0	1	5	2	1
Mvmt Flow	34	233	199	63	112	66
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	262	0	-	0	532	231
Stage 1	-	-	-	-	231	-
Stage 2	-	-	-	-	301	-
Critical Hdwy	4.1	-	-	-	6.42	6.21
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.309
Pot Cap-1 Maneuver	1314	-	-	-	508	811
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	751	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1314	-	-	-	493	811
Mov Cap-2 Maneuver	-	-	-	-	493	-
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	751	-
Approach	EB	WB	SB			
HCM Control Delay, s	1	0	14			
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1314	-	-	-	577	
HCM Lane V/C Ratio	0.026	-	-	-	0.309	
HCM Control Delay (s)	7.8	0	-	-	14	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	1.3	

Lanes, Volumes, Timings
5: Route 156 (Rope Ferry Road) & West Street



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↗	↖	↖	↖
Traffic Volume (vph)	123	239	223	29	38	139
Future Volume (vph)	123	239	223	29	38	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			500	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	50				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.894	
Flt Protected	0.950				0.989	
Satd. Flow (prot)	1805	1900	1881	1615	1663	0
Flt Permitted	0.596				0.989	
Satd. Flow (perm)	1132	1900	1881	1615	1663	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				35	143	
Link Speed (mph)		30	30		30	
Link Distance (ft)		1327	1665		516	
Travel Time (s)		30.2	37.8		11.7	
Peak Hour Factor	0.83	0.83	0.84	0.84	0.97	0.97
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Adj. Flow (vph)	148	288	265	35	39	143
Shared Lane Traffic (%)						
Lane Group Flow (vph)	148	288	265	35	182	0
Turn Type	D.P+P	NA	NA	Prot	Prot	
Protected Phases	1	1 2	2	2	4	
Permitted Phases	2					
Detector Phase	1	1 2	2	2	4	
Switch Phase						
Minimum Initial (s)	5.0		15.0	15.0	7.0	
Minimum Split (s)	9.0		22.5	22.5	11.0	
Total Split (s)	12.0		31.0	31.0	17.0	
Total Split (%)	20.0%		51.7%	51.7%	28.3%	
Maximum Green (s)	8.0		23.5	23.5	13.0	
Yellow Time (s)	3.0		4.8	4.8	3.0	
All-Red Time (s)	1.0		2.7	2.7	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		7.5	7.5	4.0	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	2.0		3.0	3.0	2.0	
Recall Mode	None		Max	Max	None	
Act Effct Green (s)	34.3	39.4	23.9	23.9	7.9	
Actuated g/C Ratio	0.66	0.76	0.46	0.46	0.15	
v/c Ratio	0.18	0.20	0.30	0.05	0.48	
Control Delay	3.5	3.2	11.6	4.4	11.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	3.5	3.2	11.6	4.4	11.9	
LOS	A	A	B	A	B	
Approach Delay		3.3	10.8		11.9	
Approach LOS		A	B		B	
Queue Length 50th (ft)	10	21	51	0	11	
Queue Length 95th (ft)	26	48	100	12	57	
Internal Link Dist (ft)		1247	1585		436	
Turn Bay Length (ft)	100			500		
Base Capacity (vph)	886	1402	870	766	532	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.17	0.21	0.30	0.05	0.34	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 51.6
 Natural Cycle: 45
 Control Type: Semi Act-Uncoord

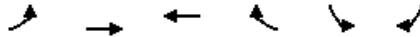
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 42.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Route 156 (Rope Ferry Road) & West Street



HCM Signalized Intersection Capacity Analysis
 5: Route 156 (Rope Ferry Road) & West Street

LEARN Early Childhood School TIS
 2026 Combined AM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	123	239	223	29	38	139
Future Volume (vph)	123	239	223	29	38	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	7.5	7.5	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Fr _t	1.00	1.00	1.00	0.85	0.89	
Fl _t Protected	0.95	1.00	1.00	1.00	0.99	
Satd. Flow (prot)	1805	1900	1881	1615	1664	
Fl _t Permitted	0.60	1.00	1.00	1.00	0.99	
Satd. Flow (perm)	1132	1900	1881	1615	1664	
Peak-hour factor, PHF	0.83	0.83	0.84	0.84	0.97	0.97
Adj. Flow (vph)	148	288	265	35	39	143
RTOR Reduction (vph)	0	0	0	19	126	0
Lane Group Flow (vph)	148	288	265	16	56	0
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type	D.P+P	NA	NA	Prot	Prot	
Protected Phases	1	1 2	2	2	4	
Permitted Phases	2					
Actuated Green, G (s)	30.8	34.8	23.9	23.9	6.1	
Effective Green, g (s)	30.8	34.8	23.9	23.9	6.1	
Actuated g/C Ratio	0.59	0.66	0.46	0.46	0.12	
Clearance Time (s)	4.0		7.5	7.5	4.0	
Vehicle Extension (s)	2.0		3.0	3.0	2.0	
Lane Grp Cap (vph)	753	1261	857	736	193	
v/s Ratio Prot	0.03	c0.15	c0.14	0.01	c0.03	
v/s Ratio Perm	0.09					
v/c Ratio	0.20	0.23	0.31	0.02	0.29	
Uniform Delay, d ₁	4.8	3.5	9.0	7.8	21.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d ₂	0.0	0.0	0.9	0.1	0.3	
Delay (s)	4.9	3.5	10.0	7.9	21.5	
Level of Service	A	A	A	A	C	
Approach Delay (s)		4.0	9.7		21.5	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			9.3		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.30			
Actuated Cycle Length (s)			52.4		Sum of lost time (s)	15.5
Intersection Capacity Utilization			42.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	126	31	32	145	26
Future Volume (vph)	26	126	31	32	145	26
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	0.888		0.931			
Flt Protected	0.991					0.959
Satd. Flow (prot)	1666	0	1702	0	0	1803
Flt Permitted	0.991					0.959
Satd. Flow (perm)	1666	0	1702	0	0	1803
Link Speed (mph)	30		30			30
Link Distance (ft)	516		1202			2865
Travel Time (s)	11.7		27.3			65.1
Peak Hour Factor	0.64	0.64	0.83	0.83	0.93	0.93
Heavy Vehicles (%)	2%	0%	6%	2%	0%	7%
Adj. Flow (vph)	41	197	37	39	156	28
Shared Lane Traffic (%)						
Lane Group Flow (vph)	238	0	76	0	0	184
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	31.9%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	7.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	26	126	31	32	145	26
Future Vol, veh/h	26	126	31	32	145	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	64	64	83	83	93	93
Heavy Vehicles, %	2	0	6	2	0	7
Mvmt Flow	41	197	37	39	156	28

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	397	57	0	0	76
Stage 1	57	-	-	-	-
Stage 2	340	-	-	-	-
Critical Hdwy	6.42	6.2	-	-	4.1
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.3	-	-	2.2
Pot Cap-1 Maneuver	608	1015	-	-	1536
Stage 1	966	-	-	-	-
Stage 2	721	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	545	1015	-	-	1536
Mov Cap-2 Maneuver	545	-	-	-	-
Stage 1	966	-	-	-	-
Stage 2	647	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	6.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	885	1536	-
HCM Lane V/C Ratio	-	-	0.268	0.102	-
HCM Control Delay (s)	-	-	10.6	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.3	-

Lanes, Volumes, Timings
7: Niantic River Road & Route 1 (Boston Post Road)



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕			↕		↕
Traffic Volume (vph)	361	159	35	400	162	56
Future Volume (vph)	361	159	35	400	162	56
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	0.959			0.965		
Flt Protected				0.996	0.964	
Satd. Flow (prot)	1785	0	0	1875	1733	0
Flt Permitted				0.956	0.964	
Satd. Flow (perm)	1785	0	0	1800	1733	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	44				27	
Link Speed (mph)	30			30	30	
Link Distance (ft)	1367			3259	1593	
Travel Time (s)	31.1			74.1	36.2	
Peak Hour Factor	0.91	0.91	0.88	0.88	0.81	0.81
Heavy Vehicles (%)	3%	0%	0%	1%	2%	2%
Adj. Flow (vph)	397	175	40	455	200	69
Shared Lane Traffic (%)						
Lane Group Flow (vph)	572	0	0	495	269	0
Turn Type	NA		D.P+P	NA	Prot	
Protected Phases	2		1	1 2	4	
Permitted Phases			2			
Detector Phase	2		1	1 2	4	
Switch Phase						
Minimum Initial (s)	18.0		5.0		9.0	
Minimum Split (s)	23.9		8.1		18.2	
Total Split (s)	30.0		11.0		19.0	
Total Split (%)	50.0%		18.3%		31.7%	
Maximum Green (s)	24.1		7.9		14.8	
Yellow Time (s)	4.3		3.0		3.2	
All-Red Time (s)	1.6		0.1		1.0	
Lost Time Adjust (s)	0.0				0.0	
Total Lost Time (s)	5.9				4.2	
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.5		2.0		1.5	
Recall Mode	Min		Min		None	
Walk Time (s)					7.0	
Flash Dont Walk (s)					7.0	
Pedestrian Calls (#/hr)					0	
Act Effct Green (s)	21.9			32.6	11.7	
Actuated g/C Ratio	0.40			0.59	0.21	
v/c Ratio	0.77			0.46	0.69	
Control Delay	22.5			6.9	28.1	
Queue Delay	0.0			0.0	0.0	
Total Delay	22.5			6.9	28.1	
LOS	C			A	C	
Approach Delay	22.5			6.9	28.1	
Approach LOS	C			A	C	
Queue Length 50th (ft)	143			61	77	
Queue Length 95th (ft)	#315			121	125	
Internal Link Dist (ft)	1287			3179	1513	
Turn Bay Length (ft)						
Base Capacity (vph)	817			1165	492	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.70			0.42	0.55	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 54.8
 Natural Cycle: 60
 Control Type: Semi Act-Uncoord

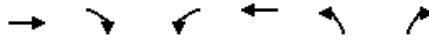
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 69.2%	ICU Level of Service C
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 7: Niantic River Road & Route 1 (Boston Post Road)



HCM Signalized Intersection Capacity Analysis
 7: Niantic River Road & Route 1 (Boston Post Road)

LEARN Early Childhood School TIS
 2026 Combined AM



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	361	159	35	400	162	56
Future Volume (vph)	361	159	35	400	162	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9			3.1	4.2	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.96			1.00	0.97	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	1784			1875	1734	
Flt Permitted	1.00			0.96	0.96	
Satd. Flow (perm)	1784			1799	1734	
Peak-hour factor, PHF	0.91	0.91	0.88	0.88	0.81	0.81
Adj. Flow (vph)	397	175	40	455	200	69
RTOR Reduction (vph)	26	0	0	0	21	0
Lane Group Flow (vph)	546	0	0	495	248	0
Heavy Vehicles (%)	3%	0%	0%	1%	2%	2%
Turn Type	NA		D.P+P	NA	Prot	
Protected Phases	2		1	1 2	4	
Permitted Phases			2			
Actuated Green, G (s)	21.9			29.7	11.7	
Effective Green, g (s)	21.9			29.7	11.7	
Actuated g/C Ratio	0.40			0.54	0.21	
Clearance Time (s)	5.9				4.2	
Vehicle Extension (s)	2.5				1.5	
Lane Grp Cap (vph)	715			989	371	
v/s Ratio Prot	c0.31			c0.07	c0.14	
v/s Ratio Perm				0.20		
v/c Ratio	0.76			0.50	0.67	
Uniform Delay, d1	14.1			7.8	19.7	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	4.6			0.1	3.5	
Delay (s)	18.7			7.9	23.2	
Level of Service	B			A	C	
Approach Delay (s)	18.7			7.9	23.2	
Approach LOS	B			A	C	
Intersection Summary						
HCM 2000 Control Delay			15.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.69			
Actuated Cycle Length (s)			54.6		Sum of lost time (s)	13.2
Intersection Capacity Utilization			69.2%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						



Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT
Lane Configurations		↔	↔			↔	↔			↔				↔
Traffic Volume (vph)	65	2	300	16	33	292	256	2	35	161	1	24	292	140
Future Volume (vph)	65	2	300	16	33	292	256	2	35	161	1	24	292	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		175		0	0		300		0		0		0	
Storage Lanes		1		0	0		1		0		0		0	
Taper Length (ft)		25			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	1.00	1.00
Frnt			0.992				0.850			0.985				0.983
Flt Protected		0.950				0.995				0.992				0.971
Satd. Flow (prot)	0	1788	1885	0	0	1890	1615	0	0	1843	0	0	0	1783
Flt Permitted		0.263				0.791				0.905				0.402
Satd. Flow (perm)	0	495	1885	0	0	1503	1615	0	0	1681	0	0	0	738
Right Turn on Red				No				No					No	
Satd. Flow (RTOR)														8
Link Speed (mph)			30			30				30				30
Link Distance (ft)			3259			1659				1121				1156
Travel Time (s)			74.1			37.7				25.5				26.3
Peak Hour Factor	0.84	0.84	0.84	0.84	0.87	0.87	0.87	0.87	0.79	0.79	0.79	0.79	0.82	0.82
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Adj. Flow (vph)	77	2	357	19	38	336	294	2	44	204	1	30	356	171
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	79	376	0	0	374	296	0	0	279	0	0	0	601
Turn Type	D.P+P	D.P+P	NA		Perm	NA	Perm		Perm	NA			D.P+P	NA
Protected Phases	1	1	1 2			2				5			4	4 5
Permitted Phases	2	2			2		2		5				5	
Detector Phase	1	1	1 2		2	2	2		5	5			4	4 5
Switch Phase														
Minimum Initial (s)	5.0	5.0			15.0	15.0	15.0		9.0	9.0			5.0	
Minimum Split (s)	9.0	9.0			22.8	22.8	22.8		15.2	15.2			19.1	
Total Split (s)	9.0	9.0			35.0	35.0	35.0		25.0	25.0			31.0	
Total Split (%)	8.2%	8.2%			31.8%	31.8%	31.8%		22.7%	22.7%			28.2%	
Maximum Green (s)	5.0	5.0			27.2	27.2	27.2		18.8	18.8			26.9	
Yellow Time (s)	3.0	3.0			4.4	4.4	4.4		3.5	3.5			3.1	
All-Red Time (s)	1.0	1.0			3.4	3.4	3.4		2.7	2.7			1.0	
Lost Time Adjust (s)		0.0				0.0	0.0			0.0				
Total Lost Time (s)		4.0				7.8	7.8			6.2				
Lead/Lag	Lead	Lead			Lag	Lag	Lag		Lead	Lead				
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes		Yes	Yes				
Vehicle Extension (s)	1.5	1.5			2.5	2.5	2.5		1.5	1.5			1.5	
Recall Mode	Min	Min			Min	Min	Min		None	None			None	
Walk Time (s)														7.0
Flash Dont Walk (s)														8.0
Pedestrian Calls (#/hr)														0
Act Effct Green (s)		36.0	40.0			27.2	27.2			18.8				47.8
Actuated g/C Ratio		0.33	0.36			0.25	0.25			0.17				0.43
v/c Ratio		0.36	0.55			1.01	0.74			0.97				1.04
Control Delay		28.6	31.5			91.0	50.9			92.9				79.5
Queue Delay		0.0	0.0			0.0	0.0			0.0				0.0
Total Delay		28.6	31.5			91.0	50.9			92.9				79.5
LOS		C	C			F	D			F				E
Approach Delay			31.0			73.3				92.9				79.5
Approach LOS			C			E				F				E
Queue Length 50th (ft)		37	209			~268	193			198				~348
Queue Length 95th (ft)		66	277			#439	282			#295				#444
Internal Link Dist (ft)			3179			1579				1041				1076
Turn Bay Length (ft)		175					300							
Base Capacity (vph)		220	685			371	399			287				580
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		0.36	0.55			1.01	0.74			0.97				1.04

Intersection Summary

Area Type: Other

Cycle Length: 110



Lane Group	SBR	SWL2	SWL	SWR
Lane Configurations				
Traffic Volume (vph)	61	2	1	3
Future Volume (vph)	61	2	1	3
Ideal Flow (vphpl)	1900	1900	1900	1900
Storage Length (ft)	0		0	0
Storage Lanes	0		1	0
Taper Length (ft)			25	
Lane Util. Factor	1.00	1.00	1.00	1.00
Frt			0.932	
Flt Protected			0.976	
Satd. Flow (prot)	0	0	1728	0
Flt Permitted			0.976	
Satd. Flow (perm)	0	0	1728	0
Right Turn on Red	Yes			
Satd. Flow (RTOR)				
Link Speed (mph)			30	
Link Distance (ft)			1316	
Travel Time (s)			29.9	
Peak Hour Factor	0.82	0.38	0.38	0.38
Heavy Vehicles (%)	7%	0%	0%	0%
Adj. Flow (vph)	74	5	3	8
Shared Lane Traffic (%)				
Lane Group Flow (vph)	0	0	16	0
Turn Type		Prot	Prot	
Protected Phases		6	6	
Permitted Phases				
Detector Phase		6	6	
Switch Phase				
Minimum Initial (s)		5.0	5.0	
Minimum Split (s)		9.1	9.1	
Total Split (s)		10.0	10.0	
Total Split (%)		9.1%	9.1%	
Maximum Green (s)		5.9	5.9	
Yellow Time (s)		3.1	3.1	
All-Red Time (s)		1.0	1.0	
Lost Time Adjust (s)			0.0	
Total Lost Time (s)			4.1	
Lead/Lag		Lag	Lag	
Lead-Lag Optimize?		Yes	Yes	
Vehicle Extension (s)		1.5	1.5	
Recall Mode		Max	Max	
Walk Time (s)				
Flash Dont Walk (s)				
Pedestrian Calls (#/hr)				
Act Effct Green (s)			5.9	
Actuated g/C Ratio			0.05	
v/c Ratio			0.17	
Control Delay			54.3	
Queue Delay			0.0	
Total Delay			54.3	
LOS			D	
Approach Delay			54.3	
Approach LOS			D	
Queue Length 50th (ft)			11	
Queue Length 95th (ft)			15	
Internal Link Dist (ft)			1236	
Turn Bay Length (ft)				
Base Capacity (vph)			92	
Starvation Cap Reductn			0	
Spillback Cap Reductn			0	
Storage Cap Reductn			0	
Reduced v/c Ratio			0.17	
Intersection Summary				



Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL	SBT
Lane Configurations														
Traffic Volume (vph)	65	2	300	16	33	292	256	2	35	161	1	24	292	140
Future Volume (vph)	65	2	300	16	33	292	256	2	35	161	1	24	292	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			7.8	7.8			6.2				4.1
Lane Util. Factor		1.00	1.00			1.00	1.00			1.00				1.00
Fr _t		1.00	0.99			1.00	0.85			0.98				0.98
Fl _t Protected		0.95	1.00			0.99	1.00			0.99				0.97
Satd. Flow (prot)		1788	1886			1890	1615			1843				1784
Fl _t Permitted		0.26	1.00			0.79	1.00			0.90				0.40
Satd. Flow (perm)		496	1886			1503	1615			1681				738
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.87	0.87	0.87	0.87	0.79	0.79	0.79	0.79	0.82	0.82
Adj. Flow (vph)	77	2	357	19	38	336	294	2	44	204	1	30	356	171
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Lane Group Flow (vph)	0	79	376	0	0	374	296	0	0	279	0	0	0	596
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	D.P+P	D.P+P	NA		Perm	NA	Perm		Perm	NA			D.P+P	NA
Protected Phases	1	1	1 2			2				5			4	4 5
Permitted Phases	2	2			2		2		5				5	
Actuated Green, G (s)		32.2	36.2			27.2	27.2			18.8				45.7
Effective Green, g (s)		32.2	36.2			27.2	27.2			18.8				45.7
Actuated g/C Ratio		0.29	0.33			0.25	0.25			0.17				0.42
Clearance Time (s)		4.0				7.8	7.8			6.2				
Vehicle Extension (s)		1.5				2.5	2.5			1.5				
Lane Grp Cap (vph)		203	620			371	399			287				562
v/s Ratio Prot		0.02	c0.20											c0.26
v/s Ratio Perm		0.10				c0.25	0.18			0.17				c0.18
v/c Ratio		0.39	0.61			1.01	0.74			0.97				1.06
Uniform Delay, d1		29.7	30.9			41.4	38.2			45.3				32.1
Progression Factor		1.00	1.00			1.00	1.00			1.00				1.00
Incremental Delay, d2		0.5	1.2			48.8	6.9			45.1				55.2
Delay (s)		30.2	32.1			90.2	45.1			90.4				87.3
Level of Service		C	C			F	D			F				F
Approach Delay (s)			31.8			70.2				90.4				87.3
Approach LOS			C			E				F				F
Intersection Summary														
HCM 2000 Control Delay			69.3			HCM 2000 Level of Service				E				
HCM 2000 Volume to Capacity ratio			0.96											
Actuated Cycle Length (s)			110.0			Sum of lost time (s)				26.2				
Intersection Capacity Utilization			99.1%			ICU Level of Service				F				
Analysis Period (min)			15											
c Critical Lane Group														



Movement	SBR	SWL2	SWL	SWR
Lane Configurations				
Traffic Volume (vph)	61	2	1	3
Future Volume (vph)	61	2	1	3
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)			4.1	
Lane Util. Factor			1.00	
Frt			0.93	
Flt Protected			0.98	
Satd. Flow (prot)			1729	
Flt Permitted			0.98	
Satd. Flow (perm)			1729	
Peak-hour factor, PHF	0.82	0.38	0.38	0.38
Adj. Flow (vph)	74	5	3	8
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	16	0
Heavy Vehicles (%)	7%	0%	0%	0%
Turn Type		Prot	Prot	
Protected Phases		6	6	
Permitted Phases				
Actuated Green, G (s)			5.9	
Effective Green, g (s)			5.9	
Actuated g/C Ratio			0.05	
Clearance Time (s)			4.1	
Vehicle Extension (s)			1.5	
Lane Grp Cap (vph)			92	
v/s Ratio Prot			c0.01	
v/s Ratio Perm				
v/c Ratio			0.17	
Uniform Delay, d1			49.7	
Progression Factor			1.00	
Incremental Delay, d2			4.1	
Delay (s)			53.8	
Level of Service			D	
Approach Delay (s)			53.8	
Approach LOS			D	
Intersection Summary				

Appendix C

Intersection Capacity Analysis Worksheets
2026 Combined + Improved Traffic Volumes
Weekday Morning Peak Hour

Lanes, Volumes, Timings
3: Spithead Road & Daniels Avenue

LEARN Early Childhood School TIS
2026 Combined + Improved AM



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	97	59	52	35	56	94
Future Volume (vph)	97	59	52	35	56	94
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	0.949				0.916	
Fl _t Protected	0.970			0.971		
Satd. Flow (prot)	1728	0	0	1741	1692	0
Fl _t Permitted	0.970			0.971		
Satd. Flow (perm)	1728	0	0	1741	1692	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1746			2377	1139	
Travel Time (s)	39.7			54.0	25.9	
Peak Hour Factor	0.61	0.61	0.73	0.73	0.74	0.74
Heavy Vehicles (%)	2%	0%	10%	0%	1%	4%
Adj. Flow (vph)	159	97	71	48	76	127
Shared Lane Traffic (%)						
Lane Group Flow (vph)	256	0	0	119	203	0
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	32.4%
ICU Level of Service	A
Analysis Period (min)	15

Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	97	59	52	35	56	94
Future Vol, veh/h	97	59	52	35	56	94
Peak Hour Factor	0.61	0.61	0.73	0.73	0.74	0.74
Heavy Vehicles, %	2	0	10	0	1	4
Mvmt Flow	159	97	71	48	76	127
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.8	9.1	8.7
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	60%	62%	0%
Vol Thru, %	40%	0%	37%
Vol Right, %	0%	38%	63%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	87	156	150
LT Vol	52	97	0
Through Vol	35	0	56
RT Vol	0	59	94
Lane Flow Rate	119	256	203
Geometry Grp	1	1	1
Degree of Util (X)	0.166	0.324	0.242
Departure Headway (Hd)	5.027	4.566	4.305
Convergence, Y/N	Yes	Yes	Yes
Cap	713	788	833
Service Time	3.066	2.6	2.338
HCM Lane V/C Ratio	0.167	0.325	0.244
HCM Control Delay	9.1	9.8	8.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	1.4	0.9

Appendix D

Intersection Capacity Analysis Worksheets
2026 Background Traffic Volumes
Weekday Afternoon Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	38	2	3	34	2	5
Future Volume (vph)	38	2	3	34	2	5
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	0.994				0.910	
Flt Protected				0.996	0.984	
Satd. Flow (prot)	1852	0	0	1852	1561	0
Flt Permitted				0.996	0.984	
Satd. Flow (perm)	1852	0	0	1852	1561	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1860			1746	1444	
Travel Time (s)	42.3			39.7	32.8	
Peak Hour Factor	0.82	0.82	0.83	0.83	0.78	0.78
Heavy Vehicles (%)	2%	2%	14%	1%	5%	11%
Adj. Flow (vph)	46	2	4	41	3	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	48	0	0	45	9	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.3% ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		↔
Traffic Vol, veh/h	38	2	3	34	2	5
Future Vol, veh/h	38	2	3	34	2	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	83	83	78	78
Heavy Vehicles, %	2	2	14	1	5	11
Mvmt Flow	46	2	4	41	3	6

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	48	0	96
Stage 1	-	-	-	-	47
Stage 2	-	-	-	-	49
Critical Hdwy	-	-	4.24	-	6.45
Critical Hdwy Stg 1	-	-	-	-	5.45
Critical Hdwy Stg 2	-	-	-	-	5.45
Follow-up Hdwy	-	-	2.326	-	3.545
Pot Cap-1 Maneuver	-	-	1485	-	896
Stage 1	-	-	-	-	968
Stage 2	-	-	-	-	966
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1485	-	893
Mov Cap-2 Maneuver	-	-	-	-	893
Stage 1	-	-	-	-	968
Stage 2	-	-	-	-	963

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	965	-	-	1485	-
HCM Lane V/C Ratio	0.009	-	-	0.002	-
HCM Control Delay (s)	8.8	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T	R		R
Traffic Volume (vph)	21	11	162	16	15	105
Future Volume (vph)	21	11	162	16	15	105
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	0.955		0.988			
Flt Protected	0.968					0.994
Satd. Flow (prot)	1745	0	1860	0	0	1872
Flt Permitted	0.968					0.994
Satd. Flow (perm)	1745	0	1860	0	0	1872
Link Speed (mph)	30		30			30
Link Distance (ft)	1860		2865			1586
Travel Time (s)	42.3		65.1			36.0
Peak Hour Factor	0.71	0.71	0.75	0.75	0.92	0.92
Heavy Vehicles (%)	1%	0%	1%	0%	0%	1%
Adj. Flow (vph)	30	15	216	21	16	114
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	0	237	0	0	130
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.2%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	21	11	162	16	15	105
Future Vol, veh/h	21	11	162	16	15	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	71	71	75	75	92	92
Heavy Vehicles, %	1	0	1	0	0	1
Mvmt Flow	30	15	216	21	16	114

Major/Minor	Minor1	Major1	Major2	Minor2	Major3	Minor3
Conflicting Flow All	373	227	0	0	237	0
Stage 1	227	-	-	-	-	-
Stage 2	146	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	630	817	-	-	1342	-
Stage 1	813	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	622	817	-	-	1342	-
Mov Cap-2 Maneuver	622	-	-	-	-	-
Stage 1	813	-	-	-	-	-
Stage 2	873	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	678	1342	-
HCM Lane V/C Ratio	-	-	0.066	0.012	-
HCM Control Delay (s)	-	-	10.7	7.7	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	21	19	12	126	93	32
Future Volume (vph)	21	19	12	126	93	32
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	0.936			0.965		
Flt Protected	0.974			0.996		
Satd. Flow (prot)	1708	0	0	1842	1820	0
Flt Permitted	0.974			0.996		
Satd. Flow (perm)	1708	0	0	1842	1820	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1746			2377	1139	
Travel Time (s)	39.7			54.0	25.9	
Peak Hour Factor	0.63	0.63	0.88	0.88	0.85	0.85
Heavy Vehicles (%)	0%	3%	0%	3%	1%	0%
Adj. Flow (vph)	33	30	14	143	109	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	63	0	0	157	147	0
Sign Control	Stop			Free	Free	

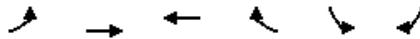
Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	26.6% ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑		↓
Traffic Vol, veh/h	21	19	12	126	93	32
Future Vol, veh/h	21	19	12	126	93	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	88	88	85	85
Heavy Vehicles, %	0	3	0	3	1	0
Mvmt Flow	33	30	14	143	109	38

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	299	128	147	0	-	0
Stage 1	128	-	-	-	-	-
Stage 2	171	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.2	-	-	-
Pot Cap-1 Maneuver	697	919	1447	-	-	-
Stage 1	903	-	-	-	-	-
Stage 2	864	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	689	919	1447	-	-	-
Mov Cap-2 Maneuver	689	-	-	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	864	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1447	-	782	-	-
HCM Lane V/C Ratio	0.009	-	0.081	-	-
HCM Control Delay (s)	7.5	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

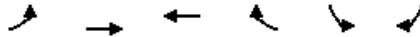


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	111	256	290	28	34	68
Future Volume (vph)	111	256	290	28	34	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t			0.988		0.910	
Fl _t Protected		0.985			0.984	
Satd. Flow (prot)	0	1853	1854	0	1690	0
Fl _t Permitted		0.985			0.984	
Satd. Flow (perm)	0	1853	1854	0	1690	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		1560	1746		2377	
Travel Time (s)		35.5	39.7		54.0	
Peak Hour Factor	0.84	0.84	0.79	0.79	0.83	0.83
Heavy Vehicles (%)	1%	1%	1%	4%	2%	0%
Adj. Flow (vph)	132	305	367	35	41	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	437	402	0	123	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	52.6%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	111	256	290	28	34	68
Future Vol, veh/h	111	256	290	28	34	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	79	79	83	83
Heavy Vehicles, %	1	1	1	4	2	0
Mvmt Flow	132	305	367	35	41	82
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	402	0	-	0	954	385
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	569	-
Critical Hdwy	4.11	-	-	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.209	-	-	-	3.518	3.3
Pot Cap-1 Maneuver	1162	-	-	-	287	667
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	566	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1162	-	-	-	248	667
Mov Cap-2 Maneuver	-	-	-	-	248	-
Stage 1	-	-	-	-	594	-
Stage 2	-	-	-	-	566	-
Approach	EB	WB	SB			
HCM Control Delay, s	2.6	0	16.8			
HCM LOS			C			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1162	-	-	-	427	
HCM Lane V/C Ratio	0.114	-	-	-	0.288	
HCM Control Delay (s)	8.5	0	-	-	16.8	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.4	-	-	-	1.2	

Lanes, Volumes, Timings
5: Route 156 (Rope Ferry Road) & West Street



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	77	290	320	71	31	86
Future Volume (vph)	77	290	320	71	31	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			500	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	50				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.900	
Flt Protected	0.950				0.987	
Satd. Flow (prot)	1805	1881	1900	1615	1671	0
Flt Permitted	0.544				0.987	
Satd. Flow (perm)	1034	1881	1900	1615	1671	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				81	101	
Link Speed (mph)		30	30		30	
Link Distance (ft)		1327	1665		516	
Travel Time (s)		30.2	37.8		11.7	
Peak Hour Factor	0.94	0.94	0.88	0.88	0.85	0.85
Heavy Vehicles (%)	0%	1%	0%	0%	1%	1%
Adj. Flow (vph)	82	309	364	81	36	101
Shared Lane Traffic (%)						
Lane Group Flow (vph)	82	309	364	81	137	0
Turn Type	D.P+P	NA	NA	Prot	Prot	
Protected Phases	1	1 2	2	2	4	
Permitted Phases	2					
Detector Phase	1	1 2	2	2	4	
Switch Phase						
Minimum Initial (s)	5.0		15.0	15.0	7.0	
Minimum Split (s)	9.0		22.5	22.5	11.0	
Total Split (s)	11.0		35.0	35.0	14.0	
Total Split (%)	18.3%		58.3%	58.3%	23.3%	
Maximum Green (s)	7.0		27.5	27.5	10.0	
Yellow Time (s)	3.0		4.8	4.8	3.0	
All-Red Time (s)	1.0		2.7	2.7	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		7.5	7.5	4.0	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	2.0		3.0	3.0	2.0	
Recall Mode	None		Max	Max	None	
Act Effct Green (s)	37.9	42.9	27.8	27.8	7.7	
Actuated g/C Ratio	0.69	0.78	0.51	0.51	0.14	
v/c Ratio	0.10	0.21	0.38	0.09	0.43	
Control Delay	2.9	3.0	11.1	3.0	13.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.9	3.0	11.1	3.0	13.5	
LOS	A	A	B	A	B	
Approach Delay		3.0	9.6		13.5	
Approach LOS		A	A		B	
Queue Length 50th (ft)	5	23	73	0	11	
Queue Length 95th (ft)	16	54	137	18	47	
Internal Link Dist (ft)		1247	1585		436	
Turn Bay Length (ft)	100			500		
Base Capacity (vph)	822	1427	961	857	389	
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	0.22	0.38	0.09	0.35	

Intersection Summary

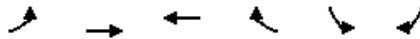
Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 55
 Natural Cycle: 45
 Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 41.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Route 156 (Rope Ferry Road) & West Street



HCM Signalized Intersection Capacity Analysis
 5: Route 156 (Rope Ferry Road) & West Street



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	77	290	320	71	31	86
Future Volume (vph)	77	290	320	71	31	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	7.5	7.5	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.90	
Flt Protected	0.95	1.00	1.00	1.00	0.99	
Satd. Flow (prot)	1805	1881	1900	1615	1672	
Flt Permitted	0.54	1.00	1.00	1.00	0.99	
Satd. Flow (perm)	1034	1881	1900	1615	1672	
Peak-hour factor, PHF	0.94	0.94	0.88	0.88	0.85	0.85
Adj. Flow (vph)	82	309	364	81	36	101
RTOR Reduction (vph)	0	0	0	41	90	0
Lane Group Flow (vph)	82	309	364	40	47	0
Heavy Vehicles (%)	0%	1%	0%	0%	1%	1%
Turn Type	D.P+P	NA	NA	Prot	Prot	
Protected Phases	1	1 2	2	2	4	
Permitted Phases	2					
Actuated Green, G (s)	34.3	38.3	27.8	27.8	6.0	
Effective Green, g (s)	34.3	38.3	27.8	27.8	6.0	
Actuated g/C Ratio	0.61	0.69	0.50	0.50	0.11	
Clearance Time (s)	4.0		7.5	7.5	4.0	
Vehicle Extension (s)	2.0		3.0	3.0	2.0	
Lane Grp Cap (vph)	725	1291	946	804	179	
v/s Ratio Prot	0.01	c0.16	c0.19	0.02	c0.03	
v/s Ratio Perm	0.06					
v/c Ratio	0.11	0.24	0.38	0.05	0.26	
Uniform Delay, d1	4.3	3.3	8.7	7.2	22.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.0	1.2	0.1	0.3	
Delay (s)	4.4	3.3	9.9	7.3	23.2	
Level of Service	A	A	A	A	C	
Approach Delay (s)		3.5	9.4		23.2	
Approach LOS		A	A		C	
Intersection Summary						
HCM 2000 Control Delay			9.0		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.35			
Actuated Cycle Length (s)			55.8		Sum of lost time (s)	15.5
Intersection Capacity Utilization			41.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	33	115	24	37	80	26
Future Volume (vph)	33	115	24	37	80	26
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	0.895		0.918			
Flt Protected	0.989					0.964
Satd. Flow (prot)	1644	0	1720	0	0	1823
Flt Permitted	0.989					0.964
Satd. Flow (perm)	1644	0	1720	0	0	1823
Link Speed (mph)	30		30			30
Link Distance (ft)	516		1202			2865
Travel Time (s)	11.7		27.3			65.1
Peak Hour Factor	0.77	0.77	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	3%	2%	1%	0%	2%
Adj. Flow (vph)	43	149	29	45	96	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	192	0	74	0	0	127
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	28.0%
ICU Level of Service	A
Analysis Period (min)	15

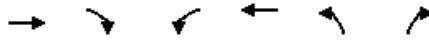
Intersection						
Int Delay, s/veh	6.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	33	115	24	37	80	26
Future Vol, veh/h	33	115	24	37	80	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	83	83	83	83
Heavy Vehicles, %	0	3	2	1	0	2
Mvmt Flow	43	149	29	45	96	31

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	275	52	0	0	74
Stage 1	52	-	-	-	-
Stage 2	223	-	-	-	-
Critical Hdwy	6.4	6.23	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.327	-	-	2.2
Pot Cap-1 Maneuver	719	1013	-	-	1538
Stage 1	976	-	-	-	-
Stage 2	819	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	673	1013	-	-	1538
Mov Cap-2 Maneuver	673	-	-	-	-
Stage 1	976	-	-	-	-
Stage 2	767	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	5.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	910	1538	-
HCM Lane V/C Ratio	-	-	0.211	0.063	-
HCM Control Delay (s)	-	-	10	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.2	-

Lanes, Volumes, Timings
7: Niantic River Road & Route 1 (Boston Post Road)



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		↔
Traffic Volume (vph)	362	97	80	416	114	73
Future Volume (vph)	362	97	80	416	114	73
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.972			0.947		
Flt Protected				0.992	0.970	
Satd. Flow (prot)	1829	0	0	1866	1728	0
Flt Permitted				0.893	0.970	
Satd. Flow (perm)	1829	0	0	1680	1728	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	26				51	
Link Speed (mph)	30			30	30	
Link Distance (ft)	1367			3259	1593	
Travel Time (s)	31.1			74.1	36.2	
Peak Hour Factor	0.94	0.94	0.93	0.93	0.75	0.75
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	385	103	86	447	152	97
Shared Lane Traffic (%)						
Lane Group Flow (vph)	488	0	0	533	249	0
Turn Type	NA		D.P+P	NA	Prot	
Protected Phases	2		1	1 2	4	
Permitted Phases			2			
Detector Phase	2		1	1 2	4	
Switch Phase						
Minimum Initial (s)	18.0		5.0		9.0	
Minimum Split (s)	23.9		8.1		18.2	
Total Split (s)	29.0		12.0		19.0	
Total Split (%)	48.3%		20.0%		31.7%	
Maximum Green (s)	23.1		8.9		14.8	
Yellow Time (s)	4.3		3.0		3.2	
All-Red Time (s)	1.6		0.1		1.0	
Lost Time Adjust (s)	0.0				0.0	
Total Lost Time (s)	5.9				4.2	
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.5		2.0		1.5	
Recall Mode	Min		Min		None	
Walk Time (s)					7.0	
Flash Dont Walk (s)					7.0	
Pedestrian Calls (#/hr)					0	
Act Effct Green (s)	20.6			32.1	11.1	
Actuated g/C Ratio	0.38			0.60	0.21	
v/c Ratio	0.68			0.52	0.63	
Control Delay	19.1			7.3	23.4	
Queue Delay	0.0			0.0	0.0	
Total Delay	19.1			7.3	23.4	
LOS	B			A	C	
Approach Delay	19.1			7.3	23.4	
Approach LOS	B			A	C	
Queue Length 50th (ft)	114			61	58	
Queue Length 95th (ft)	229			139	95	
Internal Link Dist (ft)	1287			3179	1513	
Turn Bay Length (ft)						
Base Capacity (vph)	808			1129	517	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.60			0.47	0.48	

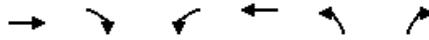
Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 53.7
 Natural Cycle: 60
 Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 73.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 7: Niantic River Road & Route 1 (Boston Post Road)





Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	362	97	80	416	114	73
Future Volume (vph)	362	97	80	416	114	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9			3.1	4.2	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.97			1.00	0.95	
Flt Protected	1.00			0.99	0.97	
Satd. Flow (prot)	1828			1866	1729	
Flt Permitted	1.00			0.89	0.97	
Satd. Flow (perm)	1828			1679	1729	
Peak-hour factor, PHF	0.94	0.94	0.93	0.93	0.75	0.75
Adj. Flow (vph)	385	103	86	447	152	97
RTOR Reduction (vph)	16	0	0	0	40	0
Lane Group Flow (vph)	472	0	0	533	209	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	NA		D.P+P	NA	Prot	
Protected Phases	2		1	1 2	4	
Permitted Phases			2			
Actuated Green, G (s)	20.6			29.3	11.1	
Effective Green, g (s)	20.6			29.3	11.1	
Actuated g/C Ratio	0.38			0.55	0.21	
Clearance Time (s)	5.9				4.2	
Vehicle Extension (s)	2.5				1.5	
Lane Grp Cap (vph)	702			948	358	
v/s Ratio Prot	c0.26			c0.09	c0.12	
v/s Ratio Perm				0.22		
v/c Ratio	0.67			0.56	0.58	
Uniform Delay, d1	13.7			8.0	19.2	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	2.3			0.5	1.6	
Delay (s)	16.0			8.4	20.7	
Level of Service	B			A	C	
Approach Delay (s)	16.0			8.4	20.7	
Approach LOS	B			A	C	
Intersection Summary						
HCM 2000 Control Delay			13.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.62			
Actuated Cycle Length (s)			53.6		Sum of lost time (s)	13.2
Intersection Capacity Utilization			73.8%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						



Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWL
Lane Configurations														
Traffic Volume (vph)	66	1	307	46	21	391	284	27	145	17	308	142	71	0
Future Volume (vph)	66	1	307	46	21	391	284	27	145	17	308	142	71	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		175		0	0		300	0			0		0	0
Storage Lanes		1		0	0		1	0			0		0	1
Taper Length (ft)		25			25			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	1.00	1.00
Frnt			0.980				0.850		0.988			0.982		
Flt Protected		0.950				0.997			0.993			0.971		
Satd. Flow (prot)	0	1736	1845	0	0	1894	1615	0	1840	0	0	1796	0	1900
Flt Permitted		0.152				0.888			0.916			0.372		
Satd. Flow (perm)	0	278	1845	0	0	1687	1615	0	1697	0	0	688	0	1900
Right Turn on Red				No						No			Yes	
Satd. Flow (RTOR)												8		
Link Speed (mph)			30			30			30			30		30
Link Distance (ft)			3259			1659			1121			1156		1316
Travel Time (s)			74.1			37.7			25.5			26.3		29.9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.90	0.90	0.90	0.69	0.69	0.69	0.82	0.82	0.82	0.90
Heavy Vehicles (%)	4%	0%	0%	7%	0%	0%	0%	8%	0%	2%	1%	0%	2%	0%
Adj. Flow (vph)	74	1	345	52	23	434	316	39	210	25	376	173	87	0
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	75	397	0	0	457	316	0	274	0	0	636	0	0
Turn Type	D.P+P	D.P+P	NA		Perm	NA	Perm	Perm	NA		D.P+P	NA		Prot
Protected Phases	1	1	1 2			2			5		4	4 5		6
Permitted Phases	2	2			2		2	5			5			
Detector Phase	1	1	1 2		2	2	2	5	5		4	4 5		6
Switch Phase														
Minimum Initial (s)	5.0	5.0			15.0	15.0	15.0	9.0	9.0		5.0			5.0
Minimum Split (s)	9.0	9.0			22.8	22.8	22.8	15.2	15.2		19.1			9.1
Total Split (s)	9.0	9.0			43.0	43.0	43.0	28.0	28.0		39.0			11.0
Total Split (%)	6.9%	6.9%			33.1%	33.1%	33.1%	21.5%	21.5%		30.0%			8.5%
Maximum Green (s)	5.0	5.0			35.2	35.2	35.2	21.8	21.8		34.9			6.9
Yellow Time (s)	3.0	3.0			4.4	4.4	4.4	3.5	3.5		3.1			3.1
All-Red Time (s)	1.0	1.0			3.4	3.4	3.4	2.7	2.7		1.0			1.0
Lost Time Adjust (s)		0.0				0.0	0.0		0.0					0.0
Total Lost Time (s)		4.0				7.8	7.8		6.2					4.1
Lead/Lag	Lead	Lead			Lag	Lag	Lag	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes	Yes	Yes					Yes
Vehicle Extension (s)	1.5	1.5			2.5	2.5	2.5	1.5	1.5		1.5			1.5
Recall Mode	Min	Min			Min	Min	Min	None	None		None			Max
Walk Time (s)											7.0			
Flash Dont Walk (s)											8.0			
Pedestrian Calls (#/hr)											0			
Act Effct Green (s)		44.0	48.0			35.2	35.2		21.8			58.8		
Actuated g/C Ratio		0.34	0.37			0.27	0.27		0.17			0.45		
v/c Ratio		0.50	0.58			1.00	0.72		0.96			1.04		
Control Delay		39.9	37.2			90.0	53.8		98.9			83.7		
Queue Delay		0.0	0.0			0.0	0.0		0.0			0.0		
Total Delay		39.9	37.2			90.0	53.8		98.9			83.7		
LOS		D	D			F	D		F			F		
Approach Delay			37.6			75.2			98.9			83.7		
Approach LOS			D			E			F			F		
Queue Length 50th (ft)		41	267			~387	242		232			~459		
Queue Length 95th (ft)		77	368			#612	354		#250			#573		
Internal Link Dist (ft)			3179			1579			1041			1076		1236
Turn Bay Length (ft)		175					300							
Base Capacity (vph)		150	681			456	437		284			613		
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		0.50	0.58			1.00	0.72		0.96			1.04		

Intersection Summary

Area Type: Other

Cycle Length: 130

														
Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWL
Lane Configurations														
Traffic Volume (vph)	66	1	307	46	21	391	284	27	145	17	308	142	71	0
Future Volume (vph)	66	1	307	46	21	391	284	27	145	17	308	142	71	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			7.8	7.8		6.2			4.1		
Lane Util. Factor		1.00	1.00			1.00	1.00		1.00			1.00		
Fr't		1.00	0.98			1.00	0.85		0.99			0.98		
Flt Protected		0.95	1.00			1.00	1.00		0.99			0.97		
Satd. Flow (prot)		1736	1846			1895	1615		1839			1796		
Flt Permitted		0.15	1.00			0.89	1.00		0.92			0.37		
Satd. Flow (perm)		279	1846			1688	1615		1696			687		
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.90	0.90	0.90	0.69	0.69	0.69	0.82	0.82	0.82	0.90
Adj. Flow (vph)	74	1	345	52	23	434	316	39	210	25	376	173	87	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	5	0	0
Lane Group Flow (vph)	0	75	397	0	0	457	316	0	274	0	0	631	0	0
Heavy Vehicles (%)	4%	0%	0%	7%	0%	0%	0%	8%	0%	2%	1%	0%	2%	0%
Turn Type	D.P+P	D.P+P	NA		Perm	NA	Perm	Perm	NA		D.P+P	NA		Prot
Protected Phases	1	1	1 2			2			5		4	4 5		6
Permitted Phases	2	2			2		2	5			5			
Actuated Green, G (s)		40.2	44.2			35.2	35.2		21.8			56.7		
Effective Green, g (s)		40.2	44.2			35.2	35.2		21.8			56.7		
Actuated g/C Ratio		0.31	0.34			0.27	0.27		0.17			0.44		
Clearance Time (s)		4.0				7.8	7.8		6.2					
Vehicle Extension (s)		1.5				2.5	2.5		1.5					
Lane Grp Cap (vph)		142	627			457	437		284			597		
v/s Ratio Prot		0.02	c0.22									c0.28		
v/s Ratio Perm		0.14				c0.27	0.20		0.16			c0.18		
v/c Ratio		0.53	0.63			1.00	0.72		0.96			1.06		
Uniform Delay, d1		34.9	36.1			47.4	43.0		53.7			36.6		
Progression Factor		1.00	1.00			1.00	1.00		1.00			1.00		
Incremental Delay, d2		1.6	1.5			42.1	5.5		43.2			53.1		
Delay (s)		36.6	37.6			89.5	48.5		96.9			89.7		
Level of Service		D	D			F	D		F			F		
Approach Delay (s)			37.5			72.7			96.9			89.7		0.0
Approach LOS			D			E			F			F		A
Intersection Summary														
HCM 2000 Control Delay			73.1			HCM 2000 Level of Service			E					
HCM 2000 Volume to Capacity ratio			0.96											
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			26.2					
Intersection Capacity Utilization			98.1%			ICU Level of Service			F					
Analysis Period (min)			15											
c Critical Lane Group														

Appendix D

Intersection Capacity Analysis Worksheets
2026 Combined Traffic Volumes
Weekday Afternoon Peak Hour



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↘		↙	↔	↘
Traffic Volume (vph)	38	124	83	34	129	90
Future Volume (vph)	38	124	83	34	129	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		0	75
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.897					0.850
Flt Protected				0.966	0.950	
Satd. Flow (prot)	1671	0	0	1665	1719	1455
Flt Permitted				0.966	0.950	
Satd. Flow (perm)	1671	0	0	1665	1719	1455
Link Speed (mph)	30			30	30	
Link Distance (ft)	1860			1746	1444	
Travel Time (s)	42.3			39.7	32.8	
Peak Hour Factor	0.82	0.82	0.83	0.83	0.78	0.78
Heavy Vehicles (%)	2%	2%	14%	1%	5%	11%
Adj. Flow (vph)	46	151	100	41	165	115
Shared Lane Traffic (%)						
Lane Group Flow (vph)	197	0	0	141	165	115
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.2%
	ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	6.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Vol, veh/h	38	124	83	34	129	90
Future Vol, veh/h	38	124	83	34	129	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	83	83	78	78
Heavy Vehicles, %	2	2	14	1	5	11
Mvmt Flow	46	151	100	41	165	115

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	197	0	363
Stage 1	-	-	-	-	122
Stage 2	-	-	-	-	241
Critical Hdwy	-	-	4.24	-	6.45
Critical Hdwy Stg 1	-	-	-	-	5.45
Critical Hdwy Stg 2	-	-	-	-	5.45
Follow-up Hdwy	-	-	2.326	-	3.545
Pot Cap-1 Maneuver	-	-	1307	-	630
Stage 1	-	-	-	-	896
Stage 2	-	-	-	-	792
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1307	-	581
Mov Cap-2 Maneuver	-	-	-	-	581
Stage 1	-	-	-	-	896
Stage 2	-	-	-	-	730

Approach	EB	WB	NB
HCM Control Delay, s	0	5.7	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	581	905	-	-	1307	-
HCM Lane V/C Ratio	0.285	0.127	-	-	0.077	-
HCM Control Delay (s)	13.6	9.6	-	-	8	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	1.2	0.4	-	-	0.2	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	85	75	162	77	76	105
Future Volume (vph)	85	75	162	77	76	105
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	0.937		0.956			
Flt Protected	0.974					0.979
Satd. Flow (prot)	1725	0	1804	0	0	1849
Flt Permitted	0.974					0.979
Satd. Flow (perm)	1725	0	1804	0	0	1849
Link Speed (mph)	30		30			30
Link Distance (ft)	1860		2865			1586
Travel Time (s)	42.3		65.1			36.0
Peak Hour Factor	0.71	0.71	0.75	0.75	0.92	0.92
Heavy Vehicles (%)	1%	0%	1%	0%	0%	1%
Adj. Flow (vph)	120	106	216	103	83	114
Shared Lane Traffic (%)						
Lane Group Flow (vph)	226	0	319	0	0	197
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.3%
ICU Level of Service	A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	5.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	85	75	162	77	76	105
Future Vol, veh/h	85	75	162	77	76	105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	71	71	75	75	92	92
Heavy Vehicles, %	1	0	1	0	0	1
Mvmt Flow	120	106	216	103	83	114

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	548	268	0	0	319
Stage 1	268	-	-	-	-
Stage 2	280	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1
Critical Hdwy Stg 1	5.41	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2
Pot Cap-1 Maneuver	499	776	-	-	1252
Stage 1	779	-	-	-	-
Stage 2	770	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	464	776	-	-	1252
Mov Cap-2 Maneuver	464	-	-	-	-
Stage 1	779	-	-	-	-
Stage 2	715	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	3.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	572	1252	-
HCM Lane V/C Ratio	-	-	0.394	0.066	-
HCM Control Delay (s)	-	-	15.3	8.1	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.9	0.2	-



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑	↓	
Traffic Volume (vph)	74	51	42	126	93	82
Future Volume (vph)	74	51	42	126	93	82
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	0.945				0.937	
Flt Protected	0.971			0.988		
Satd. Flow (prot)	1722	0	0	1836	1771	0
Flt Permitted	0.971			0.988		
Satd. Flow (perm)	1722	0	0	1836	1771	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1746			2377	1139	
Travel Time (s)	39.7			54.0	25.9	
Peak Hour Factor	0.63	0.63	0.88	0.88	0.85	0.85
Heavy Vehicles (%)	0%	3%	0%	3%	1%	0%
Adj. Flow (vph)	117	81	48	143	109	96
Shared Lane Traffic (%)						
Lane Group Flow (vph)	198	0	0	191	205	0
Sign Control	Stop			Free	Free	

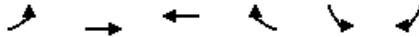
Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.1% ICU Level of Service A
Analysis Period (min)	15

Intersection						
Int Delay, s/veh	4.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑		↓
Traffic Vol, veh/h	74	51	42	126	93	82
Future Vol, veh/h	74	51	42	126	93	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	88	88	85	85
Heavy Vehicles, %	0	3	0	3	1	0
Mvmt Flow	117	81	48	143	109	96

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	396	157	205	0	-	0
Stage 1	157	-	-	-	-	-
Stage 2	239	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.2	-	-	-
Pot Cap-1 Maneuver	613	886	1378	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	590	886	1378	-	-	-
Mov Cap-2 Maneuver	590	-	-	-	-	-
Stage 1	843	-	-	-	-	-
Stage 2	805	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	1.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1378	-	683	-	-
HCM Lane V/C Ratio	0.035	-	0.291	-	-
HCM Control Delay (s)	7.7	0	12.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.2	-	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (vph)	111	256	290	58	66	68
Future Volume (vph)	111	256	290	58	66	68
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			0.978		0.932	
Fl _t Protected		0.985			0.976	
Satd. Flow (prot)	0	1853	1831	0	1711	0
Fl _t Permitted		0.985			0.976	
Satd. Flow (perm)	0	1853	1831	0	1711	0
Link Speed (mph)		30	30		30	
Link Distance (ft)		1560	1746		2377	
Travel Time (s)		35.5	39.7		54.0	
Peak Hour Factor	0.84	0.84	0.79	0.79	0.83	0.83
Heavy Vehicles (%)	1%	1%	1%	4%	2%	0%
Adj. Flow (vph)	132	305	367	73	80	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	437	440	0	162	0
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	56.2% ICU Level of Service B
Analysis Period (min)	15

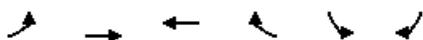
Intersection						
Int Delay, s/veh	4.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	111	256	290	58	66	68
Future Vol, veh/h	111	256	290	58	66	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	79	79	83	83
Heavy Vehicles, %	1	1	1	4	2	0
Mvmt Flow	132	305	367	73	80	82

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	440	0	-	0	973 404
Stage 1	-	-	-	-	404 -
Stage 2	-	-	-	-	569 -
Critical Hdwy	4.11	-	-	-	6.42 6.2
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.209	-	-	-	3.518 3.3
Pot Cap-1 Maneuver	1125	-	-	-	280 651
Stage 1	-	-	-	-	674 -
Stage 2	-	-	-	-	566 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1125	-	-	-	241 651
Mov Cap-2 Maneuver	-	-	-	-	241 -
Stage 1	-	-	-	-	579 -
Stage 2	-	-	-	-	566 -

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	23.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1125	-	-	-	354
HCM Lane V/C Ratio	0.117	-	-	-	0.456
HCM Control Delay (s)	8.6	0	-	-	23.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	-	2.3

Lanes, Volumes, Timings
5: Route 156 (Rope Ferry Road) & West Street



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	128	290	320	71	31	139
Future Volume (vph)	128	290	320	71	31	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			500	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	50				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.889	
Flt Protected	0.950				0.991	
Satd. Flow (prot)	1805	1881	1900	1615	1657	0
Flt Permitted	0.544				0.991	
Satd. Flow (perm)	1034	1881	1900	1615	1657	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				81	164	
Link Speed (mph)		30	30		30	
Link Distance (ft)		1327	1665		516	
Travel Time (s)		30.2	37.8		11.7	
Peak Hour Factor	0.94	0.94	0.88	0.88	0.85	0.85
Heavy Vehicles (%)	0%	1%	0%	0%	1%	1%
Adj. Flow (vph)	136	309	364	81	36	164
Shared Lane Traffic (%)						
Lane Group Flow (vph)	136	309	364	81	200	0
Turn Type	D.P+P	NA	NA	Prot	Prot	
Protected Phases	1	1 2	2	2	4	
Permitted Phases	2					
Detector Phase	1	1 2	2	2	4	
Switch Phase						
Minimum Initial (s)	5.0		15.0	15.0	7.0	
Minimum Split (s)	9.0		22.5	22.5	11.0	
Total Split (s)	10.0		35.0	35.0	15.0	
Total Split (%)	16.7%		58.3%	58.3%	25.0%	
Maximum Green (s)	6.0		27.5	27.5	11.0	
Yellow Time (s)	3.0		4.8	4.8	3.0	
All-Red Time (s)	1.0		2.7	2.7	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	4.0		7.5	7.5	4.0	
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	2.0		3.0	3.0	2.0	
Recall Mode	None		Max	Max	None	
Act Effct Green (s)	36.9	40.9	27.5	27.5	7.9	
Actuated g/C Ratio	0.65	0.72	0.48	0.48	0.14	
v/c Ratio	0.18	0.23	0.40	0.10	0.54	
Control Delay	3.4	3.4	11.3	3.0	12.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	3.4	3.4	11.3	3.0	12.5	
LOS	A	A	B	A	B	
Approach Delay		3.4	9.8		12.5	
Approach LOS		A	A		B	
Queue Length 50th (ft)	9	23	70	0	11	
Queue Length 95th (ft)	27	59	137	18	53	
Internal Link Dist (ft)		1247	1585		436	
Turn Bay Length (ft)	100			500		
Base Capacity (vph)	754	1329	919	823	452	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.18	0.23	0.40	0.10	0.44	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 56.9
 Natural Cycle: 45
 Control Type: Semi Act-Uncoord

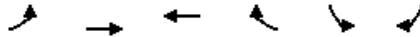
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 47.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Route 156 (Rope Ferry Road) & West Street



HCM Signalized Intersection Capacity Analysis
 5: Route 156 (Rope Ferry Road) & West Street

LEARN Early Childhood School TIS
 2026 Combined PM



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	128	290	320	71	31	139
Future Volume (vph)	128	290	320	71	31	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	7.5	7.5	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.89	
Flt Protected	0.95	1.00	1.00	1.00	0.99	
Satd. Flow (prot)	1805	1881	1900	1615	1658	
Flt Permitted	0.54	1.00	1.00	1.00	0.99	
Satd. Flow (perm)	1034	1881	1900	1615	1658	
Peak-hour factor, PHF	0.94	0.94	0.88	0.88	0.85	0.85
Adj. Flow (vph)	136	309	364	81	36	164
RTOR Reduction (vph)	0	0	0	42	141	0
Lane Group Flow (vph)	136	309	364	39	59	0
Heavy Vehicles (%)	0%	1%	0%	0%	1%	1%
Turn Type	D.P+P	NA	NA	Prot	Prot	
Protected Phases	1	1 2	2	2	4	
Permitted Phases	2					
Actuated Green, G (s)	33.4	37.4	27.5	27.5	7.9	
Effective Green, g (s)	33.4	37.4	27.5	27.5	7.9	
Actuated g/C Ratio	0.59	0.66	0.48	0.48	0.14	
Clearance Time (s)	4.0		7.5	7.5	4.0	
Vehicle Extension (s)	2.0		3.0	3.0	2.0	
Lane Grp Cap (vph)	688	1238	919	781	230	
v/s Ratio Prot	0.02	c0.16	c0.19	0.02	c0.04	
v/s Ratio Perm	0.10					
v/c Ratio	0.20	0.25	0.40	0.05	0.26	
Uniform Delay, d1	5.2	4.0	9.4	7.7	21.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.0	1.3	0.1	0.2	
Delay (s)	5.3	4.0	10.6	7.9	22.0	
Level of Service	A	A	B	A	C	
Approach Delay (s)		4.4	10.1		22.0	
Approach LOS		A	B		C	
Intersection Summary						
HCM 2000 Control Delay			10.0		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.36			
Actuated Cycle Length (s)			56.8		Sum of lost time (s)	15.5
Intersection Capacity Utilization			47.1%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	33	166	34	37	133	37
Future Volume (vph)	33	166	34	37	133	37
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	0.887		0.929			
Flt Protected	0.992					0.962
Satd. Flow (prot)	1631	0	1739	0	0	1820
Flt Permitted	0.992					0.962
Satd. Flow (perm)	1631	0	1739	0	0	1820
Link Speed (mph)	30		30			30
Link Distance (ft)	516		1202			2865
Travel Time (s)	11.7		27.3			65.1
Peak Hour Factor	0.77	0.77	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	3%	2%	1%	0%	2%
Adj. Flow (vph)	43	216	41	45	160	45
Shared Lane Traffic (%)						
Lane Group Flow (vph)	259	0	86	0	0	205
Sign Control	Stop		Free			Free

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.7%
ICU Level of Service	A
Analysis Period (min)	15

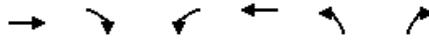
Intersection						
Int Delay, s/veh	7.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	33	166	34	37	133	37
Future Vol, veh/h	33	166	34	37	133	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	77	77	83	83	83	83
Heavy Vehicles, %	0	3	2	1	0	2
Mvmt Flow	43	216	41	45	160	45

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	429	64	0	0	86
Stage 1	64	-	-	-	-
Stage 2	365	-	-	-	-
Critical Hdwy	6.4	6.23	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.327	-	-	2.2
Pot Cap-1 Maneuver	587	998	-	-	1523
Stage 1	964	-	-	-	-
Stage 2	707	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	524	998	-	-	1523
Mov Cap-2 Maneuver	524	-	-	-	-
Stage 1	964	-	-	-	-
Stage 2	631	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	868	1523	-
HCM Lane V/C Ratio	-	-	0.298	0.105	-
HCM Control Delay (s)	-	-	10.9	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.3	0.4	-

Lanes, Volumes, Timings
7: Niantic River Road & Route 1 (Boston Post Road)



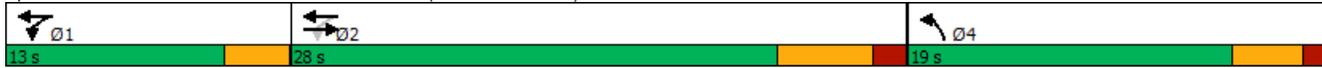
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Traffic Volume (vph)	362	158	80	416	178	73
Future Volume (vph)	362	158	80	416	178	73
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.959			0.961		
Flt Protected				0.992	0.966	
Satd. Flow (prot)	1804	0	0	1866	1746	0
Flt Permitted				0.797	0.966	
Satd. Flow (perm)	1804	0	0	1499	1746	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	41				33	
Link Speed (mph)	30			30	30	
Link Distance (ft)	1367			3259	1593	
Travel Time (s)	31.1			74.1	36.2	
Peak Hour Factor	0.94	0.94	0.93	0.93	0.75	0.75
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	385	168	86	447	237	97
Shared Lane Traffic (%)						
Lane Group Flow (vph)	553	0	0	533	334	0
Turn Type	NA		D.P+P	NA	Prot	
Protected Phases	2		1	1 2	4	
Permitted Phases			2			
Detector Phase	2		1	1 2	4	
Switch Phase						
Minimum Initial (s)	18.0		5.0		9.0	
Minimum Split (s)	23.9		8.1		18.2	
Total Split (s)	28.0		13.0		19.0	
Total Split (%)	46.7%		21.7%		31.7%	
Maximum Green (s)	22.1		9.9		14.8	
Yellow Time (s)	4.3		3.0		3.2	
All-Red Time (s)	1.6		0.1		1.0	
Lost Time Adjust (s)	0.0				0.0	
Total Lost Time (s)	5.9				4.2	
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	2.5		2.0		1.5	
Recall Mode	Min		Min		None	
Walk Time (s)					7.0	
Flash Dont Walk (s)					7.0	
Pedestrian Calls (#/hr)					0	
Act Effct Green (s)	21.0			33.3	12.9	
Actuated g/C Ratio	0.37			0.59	0.23	
v/c Ratio	0.80			0.57	0.79	
Control Delay	26.2			8.6	34.3	
Queue Delay	0.0			0.0	0.0	
Total Delay	26.2			8.6	34.3	
LOS	C			A	C	
Approach Delay	26.2			8.6	34.3	
Approach LOS	C			A	C	
Queue Length 50th (ft)	161			83	100	
Queue Length 95th (ft)	#321			139	139	
Internal Link Dist (ft)	1287			3179	1513	
Turn Bay Length (ft)						
Base Capacity (vph)	734			992	483	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.75			0.54	0.69	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 56.7
 Natural Cycle: 55
 Control Type: Semi Act-Uncoord

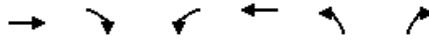
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 21.5	Intersection LOS: C
Intersection Capacity Utilization 81.1%	ICU Level of Service D
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.	

Splits and Phases: 7: Niantic River Road & Route 1 (Boston Post Road)



HCM Signalized Intersection Capacity Analysis
 7: Niantic River Road & Route 1 (Boston Post Road)

LEARN Early Childhood School TIS
 2026 Combined PM



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Traffic Volume (vph)	362	158	80	416	178	73
Future Volume (vph)	362	158	80	416	178	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9		3.1		4.2	
Lane Util. Factor	1.00		1.00		1.00	
Frt	0.96		1.00		0.96	
Flt Protected	1.00		0.99		0.97	
Satd. Flow (prot)	1804		1866		1746	
Flt Permitted	1.00		0.80		0.97	
Satd. Flow (perm)	1804		1499		1746	
Peak-hour factor, PHF	0.94	0.94	0.93	0.93	0.75	0.75
Adj. Flow (vph)	385	168	86	447	237	97
RTOR Reduction (vph)	26	0	0	0	25	0
Lane Group Flow (vph)	527	0	0	533	309	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	NA		D.P+P		NA Prot	
Protected Phases	2		1		1 2 4	
Permitted Phases			2			
Actuated Green, G (s)	21.0		30.4		12.9	
Effective Green, g (s)	21.0		30.4		12.9	
Actuated g/C Ratio	0.37		0.54		0.23	
Clearance Time (s)	5.9				4.2	
Vehicle Extension (s)	2.5				1.5	
Lane Grp Cap (vph)	670		867		398	
v/s Ratio Prot	c0.29		c0.10		c0.18	
v/s Ratio Perm			0.23			
v/c Ratio	0.79		0.61		0.78	
Uniform Delay, d1	15.8		9.0		20.4	
Progression Factor	1.00		1.00		1.00	
Incremental Delay, d2	5.9		0.9		8.4	
Delay (s)	21.6		9.9		28.8	
Level of Service	C		A		C	
Approach Delay (s)	21.6		9.9		28.8	
Approach LOS	C		A		C	
Intersection Summary						
HCM 2000 Control Delay			18.9		HCM 2000 Level of Service B	
HCM 2000 Volume to Capacity ratio			0.75			
Actuated Cycle Length (s)			56.5		Sum of lost time (s) 13.2	
Intersection Capacity Utilization			81.1%		ICU Level of Service D	
Analysis Period (min)			15			
c Critical Lane Group						

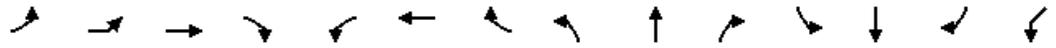


Lane Group	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWL
Lane Configurations														
Traffic Volume (vph)	66	1	307	46	31	391	284	27	187	28	308	182	71	0
Future Volume (vph)	66	1	307	46	31	391	284	27	187	28	308	182	71	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		175		0	0		300	0			0		0	0
Storage Lanes		1		0	0		1	0			0		0	1
Taper Length (ft)		25			25			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	1.00	1.00
Frt			0.980				0.850		0.984			0.983		
Flt Protected		0.950				0.996			0.994			0.973		
Satd. Flow (prot)	0	1736	1845	0	0	1892	1615	0	1838	0	0	1803	0	1900
Flt Permitted		0.154				0.775			0.922			0.319		
Satd. Flow (perm)	0	281	1845	0	0	1472	1615	0	1705	0	0	591	0	1900
Right Turn on Red				No						No			Yes	
Satd. Flow (RTOR)												7		
Link Speed (mph)			30			30			30			30		30
Link Distance (ft)			3259			1659			1121			1156		1316
Travel Time (s)			74.1			37.7			25.5			26.3		29.9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.90	0.90	0.90	0.69	0.69	0.69	0.82	0.82	0.82	0.90
Heavy Vehicles (%)	4%	0%	0%	7%	0%	0%	0%	8%	0%	2%	1%	0%	2%	0%
Adj. Flow (vph)	74	1	345	52	34	434	316	39	271	41	376	222	87	0
Shared Lane Traffic (%)														
Lane Group Flow (vph)	0	75	397	0	0	468	316	0	351	0	0	685	0	0
Turn Type	D.P+P	D.P+P	NA		Perm	NA	Perm	Perm	NA		D.P+P	NA		Prot
Protected Phases	1	1	1 2			2			5		4	4 5		6
Permitted Phases	2	2			2		2	5			5			
Detector Phase	1	1	1 2		2	2	2	5	5		4	4 5		6
Switch Phase														
Minimum Initial (s)	5.0	5.0			15.0	15.0	15.0	9.0	9.0		5.0			5.0
Minimum Split (s)	9.0	9.0			22.8	22.8	22.8	15.2	15.2		19.1			9.1
Total Split (s)	9.0	9.0			51.0	51.0	51.0	36.0	36.0		44.0			10.0
Total Split (%)	6.0%	6.0%			34.0%	34.0%	34.0%	24.0%	24.0%		29.3%			6.7%
Maximum Green (s)	5.0	5.0			43.2	43.2	43.2	29.8	29.8		39.9			5.9
Yellow Time (s)	3.0	3.0			4.4	4.4	4.4	3.5	3.5		3.1			3.1
All-Red Time (s)	1.0	1.0			3.4	3.4	3.4	2.7	2.7		1.0			1.0
Lost Time Adjust (s)		0.0				0.0	0.0		0.0					0.0
Total Lost Time (s)		4.0				7.8	7.8		6.2					4.1
Lead/Lag	Lead	Lead			Lag	Lag	Lag	Lead	Lead					Lag
Lead-Lag Optimize?	Yes	Yes			Yes	Yes	Yes	Yes	Yes					Yes
Vehicle Extension (s)	1.5	1.5			2.5	2.5	2.5	1.5	1.5		1.5			1.5
Recall Mode	Min	Min			Min	Min	Min	None	None		None			Max
Walk Time (s)												7.0		
Flash Dont Walk (s)												8.0		
Pedestrian Calls (#/hr)												0		
Act Effct Green (s)		52.0	56.0			43.2	43.2		29.8			71.8		
Actuated g/C Ratio		0.35	0.37			0.29	0.29		0.20			0.48		
v/c Ratio		0.52	0.58			1.11	0.68		1.04			1.13		
Control Delay		45.3	41.6			124.2	55.9		116.3			117.1		
Queue Delay		0.0	0.0			0.0	0.0		0.0			0.0		
Total Delay		45.3	41.6			124.2	55.9		116.3			117.1		
LOS		D	D			F	E		F			F		
Approach Delay			42.2			96.7			116.3			117.1		
Approach LOS			D			F			F			F		
Queue Length 50th (ft)		48	309			~519	275		~368			~639		
Queue Length 95th (ft)		85	416			#742	388		#358			#742		
Internal Link Dist (ft)			3179			1579			1041			1076		1236
Turn Bay Length (ft)		175					300							
Base Capacity (vph)		145	688			423	465		338			608		
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		0.52	0.58			1.11	0.68		1.04			1.13		

Intersection Summary

Area Type: Other

Cycle Length: 150



Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWL
Lane Configurations														
Traffic Volume (vph)	66	1	307	46	31	391	284	27	187	28	308	182	71	0
Future Volume (vph)	66	1	307	46	31	391	284	27	187	28	308	182	71	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			7.8	7.8		6.2			4.1		
Lane Util. Factor		1.00	1.00			1.00	1.00		1.00			1.00		
Fr't		1.00	0.98			1.00	0.85		0.98			0.98		
Flt Protected		0.95	1.00			1.00	1.00		0.99			0.97		
Satd. Flow (prot)		1736	1846			1893	1615		1839			1803		
Flt Permitted		0.15	1.00			0.77	1.00		0.92			0.32		
Satd. Flow (perm)		282	1846			1472	1615		1705			591		
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.90	0.90	0.90	0.69	0.69	0.69	0.82	0.82	0.82	0.90
Adj. Flow (vph)	74	1	345	52	34	434	316	39	271	41	376	222	87	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	4	0	0
Lane Group Flow (vph)	0	75	397	0	0	468	316	0	351	0	0	681	0	0
Heavy Vehicles (%)	4%	0%	0%	7%	0%	0%	0%	8%	0%	2%	1%	0%	2%	0%
Turn Type	D.P+P	D.P+P	NA		Perm	NA	Perm	Perm	NA		D.P+P	NA		Prot
Protected Phases	1	1	1 2			2			5		4	4 5		6
Permitted Phases	2	2			2		2	5			5			
Actuated Green, G (s)		48.2	52.2			43.2	43.2		29.8			69.7		
Effective Green, g (s)		48.2	52.2			43.2	43.2		29.8			69.7		
Actuated g/C Ratio		0.32	0.35			0.29	0.29		0.20			0.46		
Clearance Time (s)		4.0				7.8	7.8		6.2					
Vehicle Extension (s)		1.5				2.5	2.5		1.5					
Lane Grp Cap (vph)		139	642			423	465		338			597		
v/s Ratio Prot		0.02	c0.22									c0.30		
v/s Ratio Perm		0.16				c0.32	0.20		0.21			c0.23		
v/c Ratio		0.54	0.62			1.11	0.68		1.04			1.14		
Uniform Delay, d1		39.3	40.6			53.4	47.3		60.1			40.1		
Progression Factor		1.00	1.00			1.00	1.00		1.00			1.00		
Incremental Delay, d2		2.0	1.3			75.8	3.6		59.3			82.3		
Delay (s)		41.3	41.9			129.2	50.8		119.4			122.5		
Level of Service		D	D			F	D		F			F		
Approach Delay (s)			41.8			97.6			119.4			122.5		0.0
Approach LOS			D			F			F			F		A
Intersection Summary														
HCM 2000 Control Delay			96.9			HCM 2000 Level of Service			F					
HCM 2000 Volume to Capacity ratio			1.06											
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			26.2					
Intersection Capacity Utilization			103.6%			ICU Level of Service			G					
Analysis Period (min)			15											
c Critical Lane Group														

Appendix D

Intersection Capacity Analysis Worksheets
2026 Combined + Improved Traffic Volumes
Weekday Afternoon Peak Hour

Lanes, Volumes, Timings
 3: Spithead Road & Daniels Avenue



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	74	51	42	126	93	82
Future Volume (vph)	74	51	42	126	93	82
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	0.945			0.937		
Fl _t Protected	0.971			0.988		
Satd. Flow (prot)	1722	0	0	1836	1771	0
Fl _t Permitted	0.971			0.988		
Satd. Flow (perm)	1722	0	0	1836	1771	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	1746			2377	1139	
Travel Time (s)	39.7			54.0	25.9	
Peak Hour Factor	0.63	0.63	0.88	0.88	0.85	0.85
Heavy Vehicles (%)	0%	3%	0%	3%	1%	0%
Adj. Flow (vph)	117	81	48	143	109	96
Shared Lane Traffic (%)						
Lane Group Flow (vph)	198	0	0	191	205	0
Sign Control	Stop			Stop	Stop	

Intersection Summary

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

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	74	51	42	126	93	82
Future Vol, veh/h	74	51	42	126	93	82
Peak Hour Factor	0.63	0.63	0.88	0.88	0.85	0.85
Heavy Vehicles, %	0	3	0	3	1	0
Mvmt Flow	117	81	48	143	109	96
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.3	9.2	8.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	25%	59%	0%
Vol Thru, %	75%	0%	53%
Vol Right, %	0%	41%	47%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	168	125	175
LT Vol	42	74	0
Through Vol	126	0	93
RT Vol	0	51	82
Lane Flow Rate	191	198	206
Geometry Grp	1	1	1
Degree of Util (X)	0.247	0.257	0.248
Departure Headway (Hd)	4.656	4.66	4.339
Convergence, Y/N	Yes	Yes	Yes
Cap	769	770	826
Service Time	2.691	2.698	2.373
HCM Lane V/C Ratio	0.248	0.257	0.249
HCM Control Delay	9.2	9.3	8.8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1	1	1

Appendix E

Turning Movement Count (TMC) Data

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

Daniels Road at School Drive
 Waterford, Connecticut

File Name : 23537
 Site Code : 23537
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Private Drive From North					Daniels Avenue From East					School Drives From South					Daniels Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	1	0	0	0	1	0	1	0	0	1	1	0	0	0	1	0	20	0	0	20	23
07:15 AM	0	0	0	0	0	0	3	2	0	5	1	0	0	0	1	1	6	0	0	7	13
07:30 AM	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	0	7	0	0	7	10
07:45 AM	1	0	0	0	1	0	7	1	0	8	0	0	3	0	3	0	6	0	0	6	18
Total	2	0	1	0	3	0	13	3	0	16	2	0	3	0	5	1	39	0	0	40	64
08:00 AM	0	0	0	0	0	0	6	1	0	7	1	0	0	0	1	0	8	0	0	8	16
08:15 AM	0	0	0	0	0	0	5	0	0	5	0	0	1	2	3	0	8	0	1	9	17
08:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	17	0	1	18	20
08:45 AM	0	0	0	1	1	0	5	0	0	5	0	0	0	0	0	0	5	0	0	5	11
Total	0	0	0	1	1	0	18	1	0	19	1	0	1	2	4	0	38	0	2	40	64
Grand Total	2	0	1	1	4	0	31	4	0	35	3	0	4	2	9	1	77	0	2	80	128
Apprch %	50	0	25	25		0	88.6	11.4	0		33.3	0	44.4	22.2		1.2	96.2	0	2.5		
Total %	1.6	0	0.8	0.8	3.1	0	24.2	3.1	0	27.3	2.3	0	3.1	1.6	7	0.8	60.2	0	1.6	62.5	
Lights	2	0	1	1	4	0	29	3	0	32	2	0	4	2	8	1	77	0	2	80	124
% Lights	100	0	100	100	100	0	93.5	75	0	91.4	66.7	0	100	100	88.9	100	100	0	100	100	96.9
Buses	0	0	0	0	0	0	1	1	0	2	1	0	0	0	1	0	0	0	0	0	3
% Buses	0	0	0	0	0	0	3.2	25	0	5.7	33.3	0	0	0	11.1	0	0	0	0	0	2.3
Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% Trucks	0	0	0	0	0	0	3.2	0	0	2.9	0	0	0	0	0	0	0	0	0	0	0.8

Connecticut Counts LLC

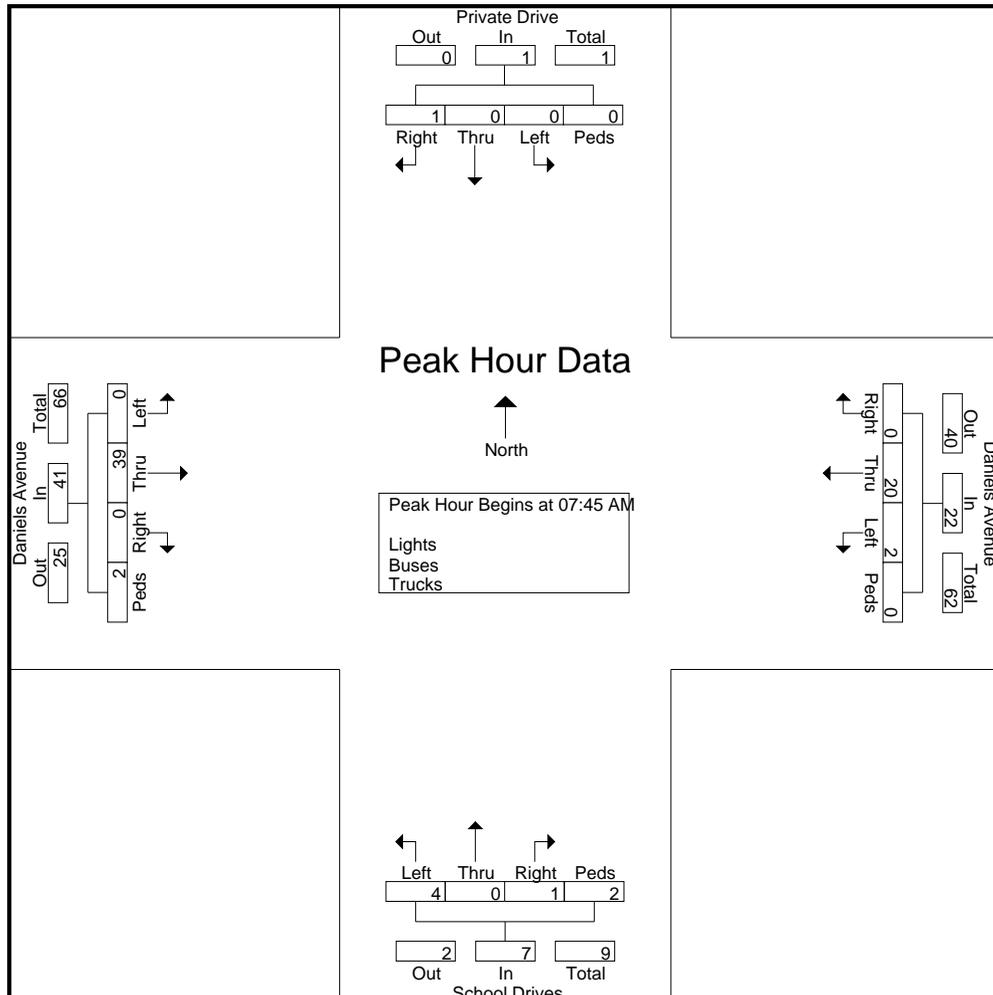
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23537
Site Code : 23537
Start Date : 10/12/2022
Page No : 2

Start Time	Private Drive From North					Daniels Avenue From East					School Drives From South					Daniels Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

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

07:45 AM	1	0	0	0	1	0	7	1	0	8	0	0	3	0	3	0	6	0	0	6	18
08:00 AM	0	0	0	0	0	0	6	1	0	7	1	0	0	0	1	0	8	0	0	8	16
08:15 AM	0	0	0	0	0	0	5	0	0	5	0	0	1	2	3	0	8	0	1	9	17
08:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	17	0	1	18	20
Total Volume	1	0	0	0	1	0	20	2	0	22	1	0	4	2	7	0	39	0	2	41	71
% App. Total	100	0	0	0		0	90.9	9.1	0		14.3	0	57.1	28.6		0	95.1	0	4.9		
PHF	.250	.000	.000	.000	.250	.000	.714	.500	.000	.688	.250	.000	.333	.250	.583	.000	.574	.000	.500	.569	.888



Connecticut Counts LLC

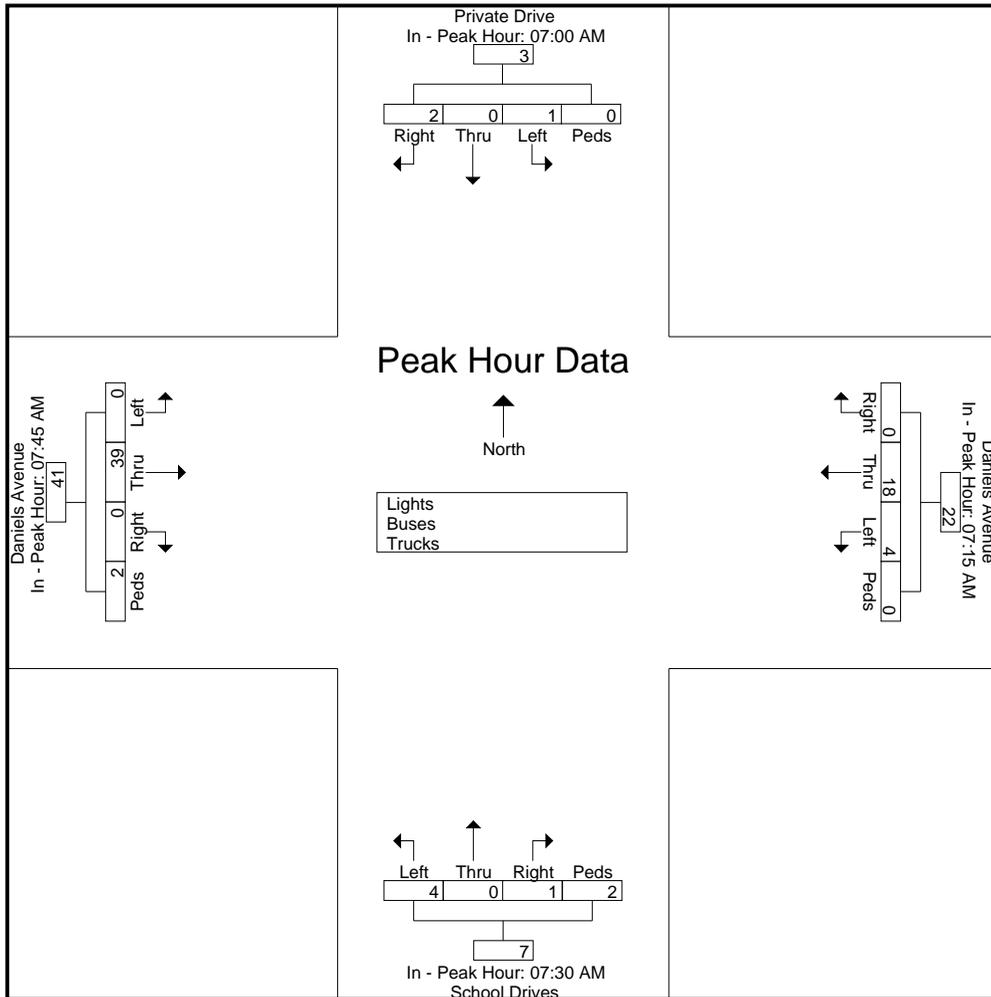
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23537
Site Code : 23537
Start Date : 10/12/2022
Page No : 3

Start Time	Private Drive From North					Daniels Avenue From East					School Drives From South					Daniels Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

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

	07:00 AM					07:15 AM					07:30 AM					07:45 AM				
+0 mins.	1	0	0	0	1	0	3	2	0	5	0	0	0	0	0	0	6	0	0	6
+15 mins.	0	0	0	0	0	0	2	0	0	2	0	0	3	0	3	0	8	0	0	8
+30 mins.	0	0	1	0	1	0	7	1	0	8	1	0	0	0	1	0	8	0	1	9
+45 mins.	1	0	0	0	1	0	6	1	0	7	0	0	1	2	3	0	17	0	1	18
Total Volume	2	0	1	0	3	0	18	4	0	22	1	0	4	2	7	0	39	0	2	41
% App. Total	66.7	0	33.3	0		0	81.8	18.2	0		14.3	0	57.1	28.6		0	95.1	0	4.9	
PHF	.500	.000	.250	.000	.750	.000	.643	.500	.000	.688	.250	.000	.333	.250	.583	.000	.574	.000	.500	.569



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

Niantic River Road at Daniels Road
 Waterford, Connecticut

File Name : 23535
 Site Code : 23535
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Niantic River Road From North					Daniels Road From East					Niantic River 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	
07:00 AM	0	11	8	0	19	1	0	0	2	3	5	13	0	0	18	0	0	0	0	0	40
07:15 AM	0	19	0	0	19	3	0	0	1	4	1	12	0	0	13	0	0	0	0	0	36
07:30 AM	0	15	3	0	18	6	0	2	1	9	2	15	0	0	17	0	0	0	0	0	44
07:45 AM	0	28	2	0	30	6	0	3	1	10	2	16	0	0	18	0	0	0	0	0	58
Total	0	73	13	0	86	16	0	5	5	26	10	56	0	0	66	0	0	0	0	0	178
08:00 AM	0	19	1	0	20	1	0	3	1	5	3	22	0	0	25	0	0	0	0	0	50
08:15 AM	0	23	2	0	25	1	0	4	0	5	2	14	0	0	16	0	0	0	0	0	46
08:30 AM	0	25	6	0	31	0	0	0	1	1	4	10	0	0	14	0	0	0	0	0	46
08:45 AM	0	19	3	0	22	0	0	3	0	3	1	12	0	0	13	0	0	0	0	0	38
Total	0	86	12	0	98	2	0	10	2	14	10	58	0	0	68	0	0	0	0	0	180
Grand Total	0	159	25	0	184	18	0	15	7	40	20	114	0	0	134	0	0	0	0	0	358
Apprch %	0	86.4	13.6	0		45	0	37.5	17.5		14.9	85.1	0	0		0	0	0	0		
Total %	0	44.4	7	0	51.4	5	0	4.2	2	11.2	5.6	31.8	0	0	37.4	0	0	0	0	0	
Lights	0	159	25	0	184	18	0	15	7	40	20	112	0	0	132	0	0	0	0	0	356
% Lights	0	100	100	0	100	100	0	100	100	100	100	98.2	0	0	98.5	0	0	0	0	0	99.4
Buses	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
% Buses	0	0	0	0	0	0	0	0	0	0	0	1.8	0	0	1.5	0	0	0	0	0	0.6
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Connecticut Counts LLC

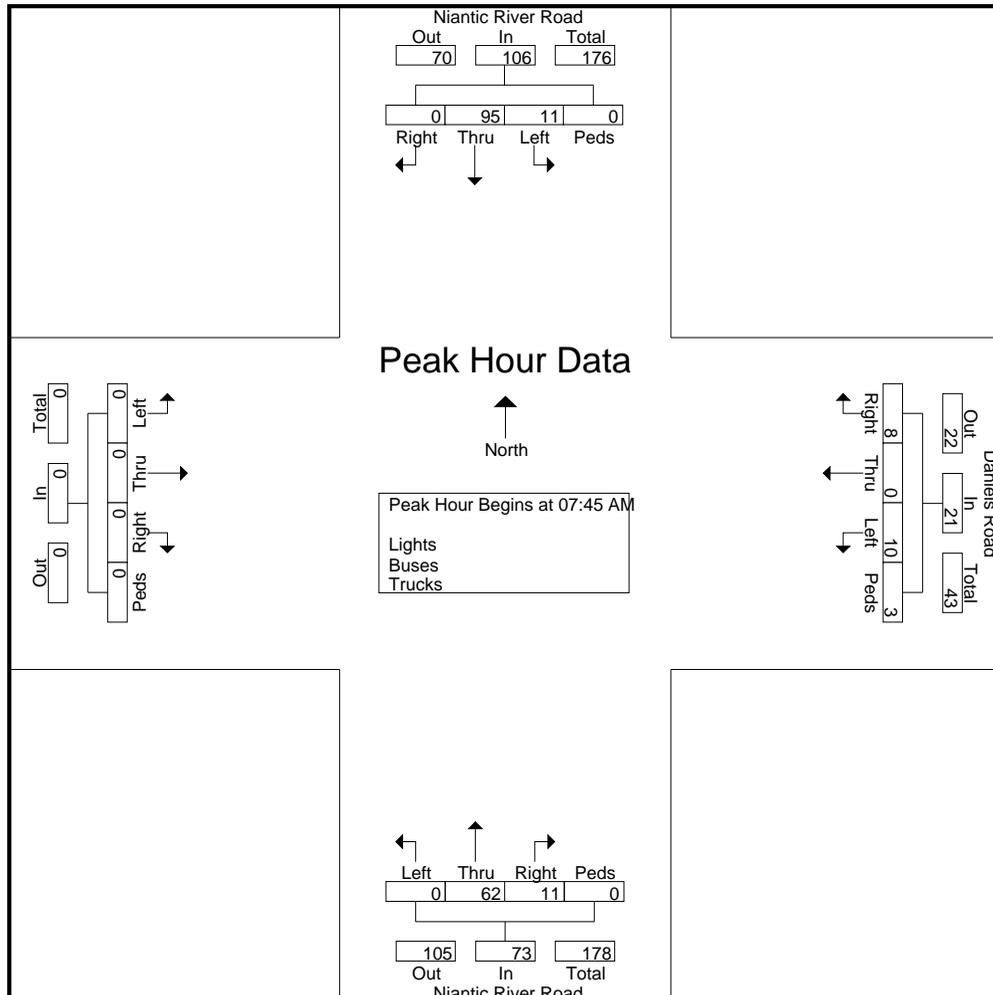
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23535
Site Code : 23535
Start Date : 10/12/2022
Page No : 2

Start Time	Niantic River Road From North					Daniels Road From East					Niantic River 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 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	0	28	2	0	30	6	0	3	1	10	2	16	0	0	18	0	0	0	0	0	58
08:00 AM	0	19	1	0	20	1	0	3	1	5	3	22	0	0	25	0	0	0	0	0	50
08:15 AM	0	23	2	0	25	1	0	4	0	5	2	14	0	0	16	0	0	0	0	0	46
08:30 AM	0	25	6	0	31	0	0	0	1	1	4	10	0	0	14	0	0	0	0	0	46
Total Volume	0	95	11	0	106	8	0	10	3	21	11	62	0	0	73	0	0	0	0	0	200
% App. Total	0	89.6	10.4	0		38.1	0	47.6	14.3		15.1	84.9	0	0		0	0	0	0		
PHF	.000	.848	.458	.000	.855	.333	.000	.625	.750	.525	.688	.705	.000	.000	.730	.000	.000	.000	.000	.000	.862



Connecticut Counts LLC

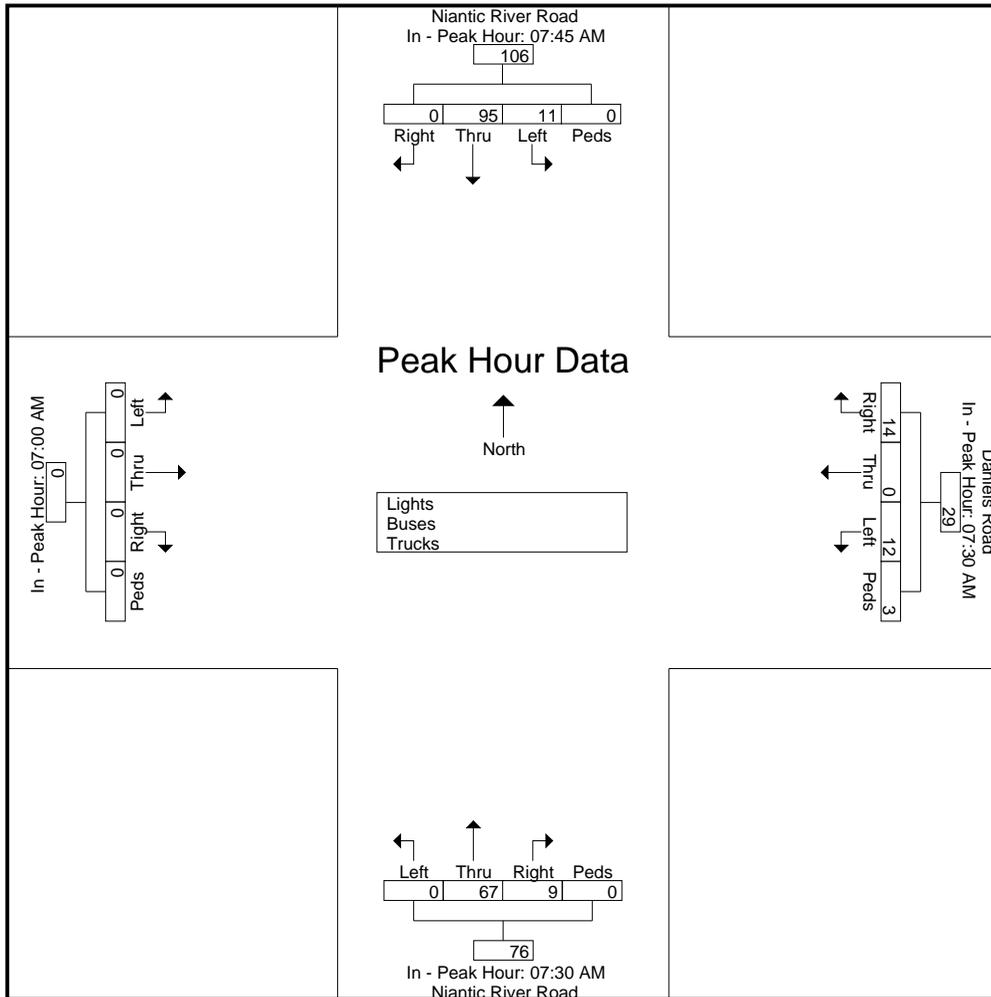
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23535
Site Code : 23535
Start Date : 10/12/2022
Page No : 3

Start Time	Niantic River Road From North					Daniels Road From East					Niantic River 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 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM					07:30 AM					07:00 AM									
+0 mins.	0	28	2	0	30	6	0	2	1	9	2	15	0	0	17	0	0	0	0	0
+15 mins.	0	19	1	0	20	6	0	3	1	10	2	16	0	0	18	0	0	0	0	0
+30 mins.	0	23	2	0	25	1	0	3	1	5	3	22	0	0	25	0	0	0	0	0
+45 mins.	0	25	6	0	31	1	0	4	0	5	2	14	0	0	16	0	0	0	0	0
Total Volume	0	95	11	0	106	14	0	12	3	29	9	67	0	0	76	0	0	0	0	0
% App. Total	0	89.6	10.4	0		48.3	0	41.4	10.3		11.8	88.2	0	0		0	0	0	0	
PHF	.000	.848	.458	.000	.855	.583	.000	.750	.750	.725	.750	.761	.000	.000	.760	.000	.000	.000	.000	.000



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

Rope Ferry Road at West Street
 Waterford, Connecticut

File Name : 23529
 Site Code : 23529
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	West Street From North					Rope Ferry Road From East					From South					Rope Ferry 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	9	0	12	0	21	3	40	0	1	44	0	0	0	0	0	0	44	8	0	52	117
07:15 AM	8	0	15	3	26	2	58	0	0	60	0	0	0	0	0	0	49	9	0	58	144
07:30 AM	9	0	10	2	21	4	38	0	0	42	0	0	0	0	0	0	52	15	0	67	130
07:45 AM	15	0	12	0	27	5	53	0	0	58	0	0	0	0	0	0	70	11	0	81	166
Total	41	0	49	5	95	14	189	0	1	204	0	0	0	0	0	0	215	43	0	258	557
08:00 AM	18	0	9	0	27	10	50	0	0	60	0	0	0	0	0	0	52	9	0	61	148
08:15 AM	19	0	6	1	26	2	51	0	0	53	0	0	0	0	0	0	64	7	0	71	150
08:30 AM	14	0	9	2	25	9	63	0	0	72	0	0	0	0	0	0	47	10	0	57	154
08:45 AM	16	0	5	2	23	6	65	0	0	71	0	0	0	0	0	0	54	11	0	65	159
Total	67	0	29	5	101	27	229	0	0	256	0	0	0	0	0	0	217	37	0	254	611
Grand Total	108	0	78	10	196	41	418	0	1	460	0	0	0	0	0	0	432	80	0	512	1168
Apprch %	55.1	0	39.8	5.1		8.9	90.9	0	0.2		0	0	0	0		0	84.4	15.6	0		
Total %	9.2	0	6.7	0.9	16.8	3.5	35.8	0	0.1	39.4	0	0	0	0	0	0	37	6.8	0	43.8	
Lights	107	0	77	10	194	41	417	0	1	459	0	0	0	0	0	0	432	80	0	512	1165
% Lights	99.1	0	98.7	100	99	100	99.8	0	100	99.8	0	0	0	0	0	0	100	100	0	100	99.7
Buses	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Buses	0	0	1.3	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
Trucks	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
% Trucks	0.9	0	0	0	0.5	0	0.2	0	0	0.2	0	0	0	0	0	0	0	0	0	0	0.2

Connecticut Counts LLC

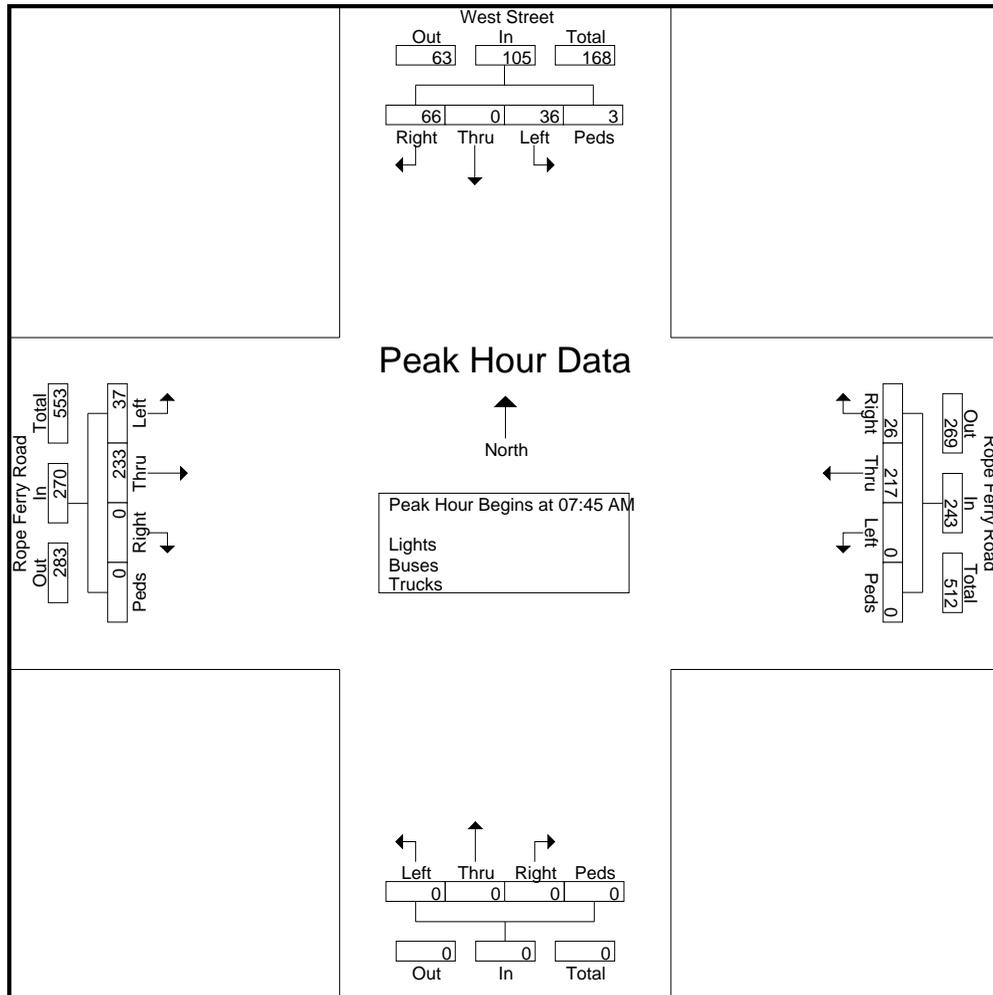
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23529
Site Code : 23529
Start Date : 10/12/2022
Page No : 2

Start Time	West Street From North					Rope Ferry Road From East					From South					Rope Ferry 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 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	15	0	12	0	27	5	53	0	0	58	0	0	0	0	0	0	70	11	0	81	166
08:00 AM	18	0	9	0	27	10	50	0	0	60	0	0	0	0	0	0	52	9	0	61	148
08:15 AM	19	0	6	1	26	2	51	0	0	53	0	0	0	0	0	0	64	7	0	71	150
08:30 AM	14	0	9	2	25	9	63	0	0	72	0	0	0	0	0	0	47	10	0	57	154
Total Volume	66	0	36	3	105	26	217	0	0	243	0	0	0	0	0	0	233	37	0	270	618
% App. Total	62.9	0	34.3	2.9		10.7	89.3	0	0		0	0	0	0		0	86.3	13.7	0		
PHF	.868	.000	.750	.375	.972	.650	.861	.000	.000	.844	.000	.000	.000	.000	.000	.000	.832	.841	.000	.833	.931



Connecticut Counts LLC

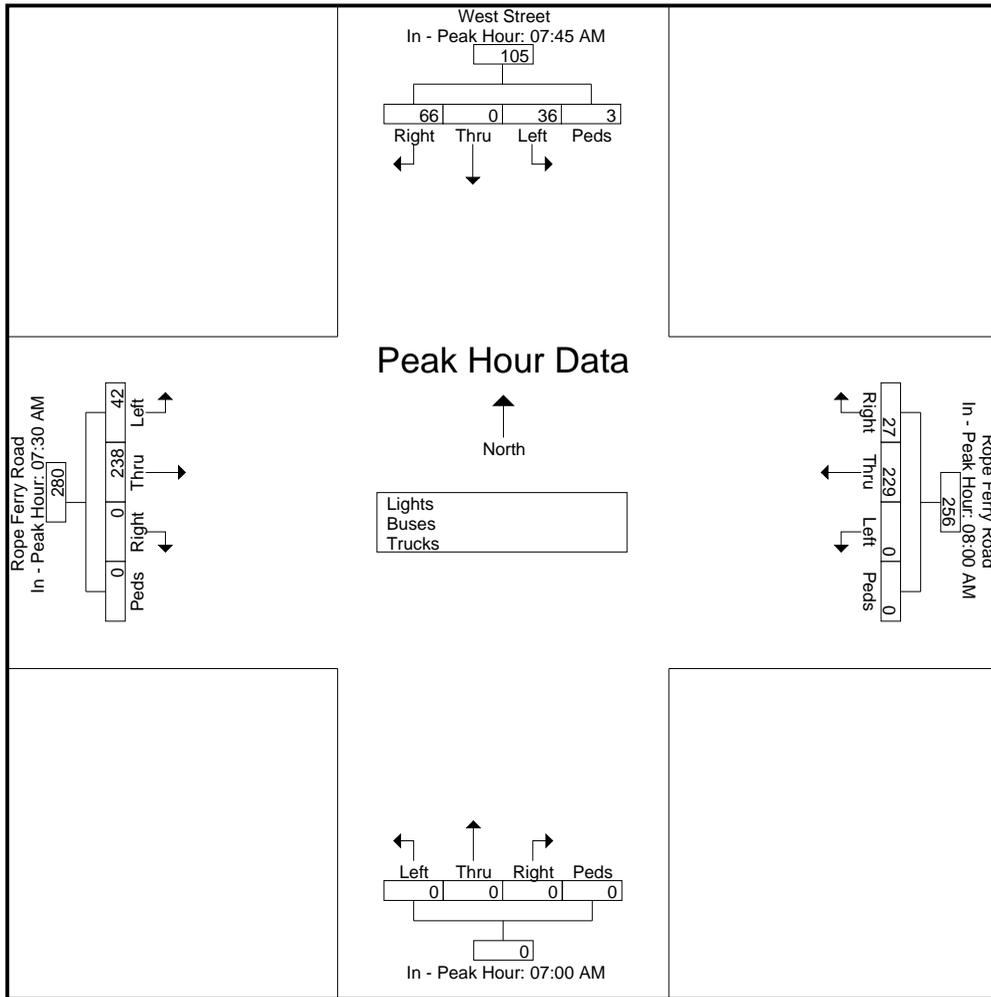
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File Name : 23529
Site Code : 23529
Start Date : 10/12/2022
Page No : 3

Start Time	West Street From North					Rope Ferry Road From East					From South					Rope Ferry 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 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM					08:00 AM					07:00 AM					07:30 AM				
+0 mins.	15	0	12	0	27	10	50	0	0	60	0	0	0	0	0	0	52	15	0	67
+15 mins.	18	0	9	0	27	2	51	0	0	53	0	0	0	0	0	0	70	11	0	81
+30 mins.	19	0	6	1	26	9	63	0	0	72	0	0	0	0	0	0	52	9	0	61
+45 mins.	14	0	9	2	25	6	65	0	0	71	0	0	0	0	0	0	64	7	0	71
Total Volume	66	0	36	3	105	27	229	0	0	256	0	0	0	0	0	0	238	42	0	280
% App. Total	62.9	0	34.3	2.9		10.5	89.5	0	0		0	0	0	0		0	85	15	0	
PHF	.868	.000	.750	.375	.972	.675	.881	.000	.000	.889	.000	.000	.000	.000	.000	.000	.850	.700	.000	.864



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Route 1 at Niantic River Road
 Waterford, Connecticut

File Name : 23541
 Site Code : 23541
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	From North					Route 1 From East					Niantic River Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	62	6	0	68	25	0	18	0	43	9	58	0	0	67	178
07:15 AM	0	0	0	0	0	0	76	12	0	88	22	0	11	0	33	14	67	0	0	81	202
07:30 AM	0	0	0	0	0	0	97	8	0	105	18	0	23	0	41	14	81	0	0	95	241
07:45 AM	0	0	0	0	0	0	78	7	0	85	19	0	21	0	40	19	73	0	0	92	217
Total	0	0	0	0	0	0	313	33	0	346	84	0	73	0	157	56	279	0	0	335	838
08:00 AM	0	0	0	0	0	0	95	10	0	105	15	0	25	0	40	18	83	0	0	101	246
08:15 AM	0	0	0	0	0	0	108	5	0	113	9	0	16	0	25	12	102	0	0	114	252
08:30 AM	0	0	0	0	0	0	108	13	0	121	11	0	13	0	24	16	93	0	0	109	254
08:45 AM	0	0	0	0	0	0	62	6	0	68	15	0	6	0	21	17	54	0	0	71	160
Total	0	0	0	0	0	0	373	34	0	407	50	0	60	0	110	63	332	0	0	395	912
Grand Total	0	0	0	0	0	0	686	67	0	753	134	0	133	0	267	119	611	0	0	730	1750
Apprch %	0	0	0	0	0	0	91.1	8.9	0		50.2	0	49.8	0		16.3	83.7	0	0		
Total %	0	0	0	0	0	0	39.2	3.8	0	43	7.7	0	7.6	0	15.3	6.8	34.9	0	0	41.7	
Lights	0	0	0	0	0	0	676	67	0	743	132	0	131	0	263	119	596	0	0	715	1721
% Lights	0	0	0	0	0	0	98.5	100	0	98.7	98.5	0	98.5	0	98.5	100	97.5	0	0	97.9	98.3
Buses	0	0	0	0	0	0	5	0	0	5	2	0	2	0	4	0	9	0	0	9	18
% Buses	0	0	0	0	0	0	0.7	0	0	0.7	1.5	0	1.5	0	1.5	0	1.5	0	0	1.2	1
Trucks	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	6	0	0	6	11
% Trucks	0	0	0	0	0	0	0.7	0	0	0.7	0	0	0	0	0	0	1	0	0	0.8	0.6

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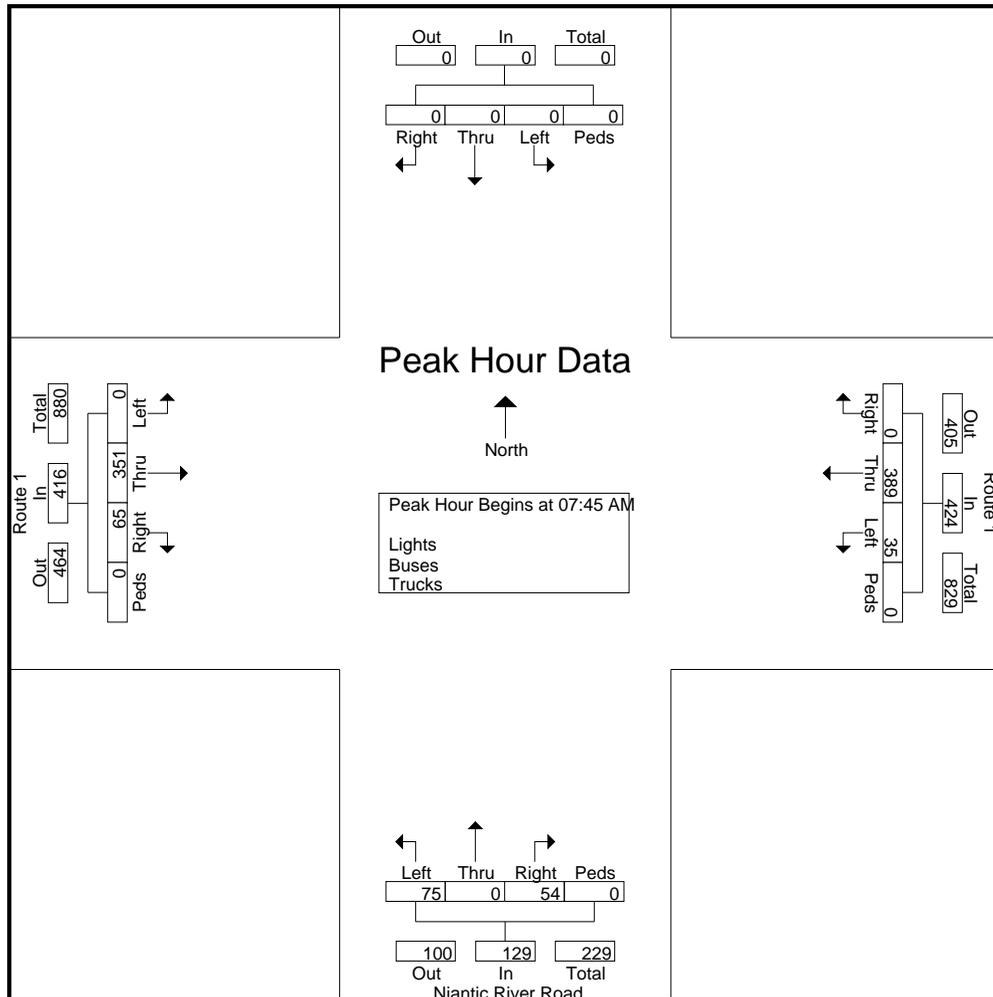
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File Name : 23541
Site Code : 23541
Start Date : 10/12/2022
Page No : 2

Start Time	From North					Route 1 From East					Niantic River Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

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

07:45 AM	0	0	0	0	0	0	78	7	0	85	19	0	21	0	40	19	73	0	0	92	217
08:00 AM	0	0	0	0	0	0	95	10	0	105	15	0	25	0	40	18	83	0	0	101	246
08:15 AM	0	0	0	0	0	0	108	5	0	113	9	0	16	0	25	12	102	0	0	114	252
08:30 AM	0	0	0	0	0	0	108	13	0	121	11	0	13	0	24	16	93	0	0	109	254
Total Volume	0	0	0	0	0	0	389	35	0	424	54	0	75	0	129	65	351	0	0	416	969
% App. Total	0	0	0	0	0	0	91.7	8.3	0		41.9	0	58.1	0		15.6	84.4	0	0		
PHF	.000	.000	.000	.000	.000	.000	.900	.673	.000	.876	.711	.000	.750	.000	.806	.855	.860	.000	.000	.912	.954



Connecticut Counts LLC
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Route 1 at Spithead Road
 Waterford, Connecticut

File Name : 23539
 Site Code : 23539
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Lights - Trucks - Buses

Start Time	Spithead Rd/Sunnicrest Dr From North					Route 1 From East					Spithead Road From South					Route 1 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	3	16	35	0	54	66	58	1	1	126	5	27	8	0	40	0	68	12	0	80	300
07:15 AM	7	9	46	0	62	65	77	3	0	145	5	23	6	0	34	3	70	12	0	85	326
07:30 AM	13	15	59	0	87	86	72	3	0	161	3	24	8	0	35	3	66	13	0	82	365
07:45 AM	13	16	80	0	109	65	59	6	0	130	3	19	5	0	27	3	83	10	0	96	362
Total	36	56	220	0	312	282	266	13	1	562	16	93	27	0	136	9	287	47	0	343	1353
08:00 AM	13	22	55	1	91	63	66	0	0	129	4	35	11	0	50	1	62	16	0	79	349
08:15 AM	16	15	40	0	71	48	79	9	1	137	2	28	16	0	46	5	82	22	0	109	363
08:30 AM	17	13	50	0	80	73	80	3	0	156	1	20	3	0	24	7	65	15	0	87	347
08:45 AM	10	10	51	0	71	49	68	2	1	120	7	17	3	0	27	1	66	13	0	80	298
Total	56	60	196	1	313	233	293	14	2	542	14	100	33	0	147	14	275	66	0	355	1357
Grand Total	92	116	416	1	625	515	559	27	3	1104	30	193	60	0	283	23	562	113	0	698	2710
Apprch %	14.7	18.6	66.6	0.2		46.6	50.6	2.4	0.3		10.6	68.2	21.2	0		3.3	80.5	16.2	0		
Total %	3.4	4.3	15.4	0	23.1	19	20.6	1	0.1	40.7	1.1	7.1	2.2	0	10.4	0.8	20.7	4.2	0	25.8	
Lights	86	115	413	1	615	514	559	27	3	1103	30	192	60	0	282	23	562	112	0	697	2697
% Lights	93.5	99.1	99.3	100	98.4	99.8	100	100	100	99.9	100	99.5	100	0	99.6	100	100	99.1	0	99.9	99.5
Trucks	6	1	3	0	10	1	0	0	0	1	0	1	0	0	1	0	0	1	0	1	13
% Trucks	6.5	0.9	0.7	0	1.6	0.2	0	0	0	0.1	0	0.5	0	0	0.4	0	0	0.9	0	0.1	0.5
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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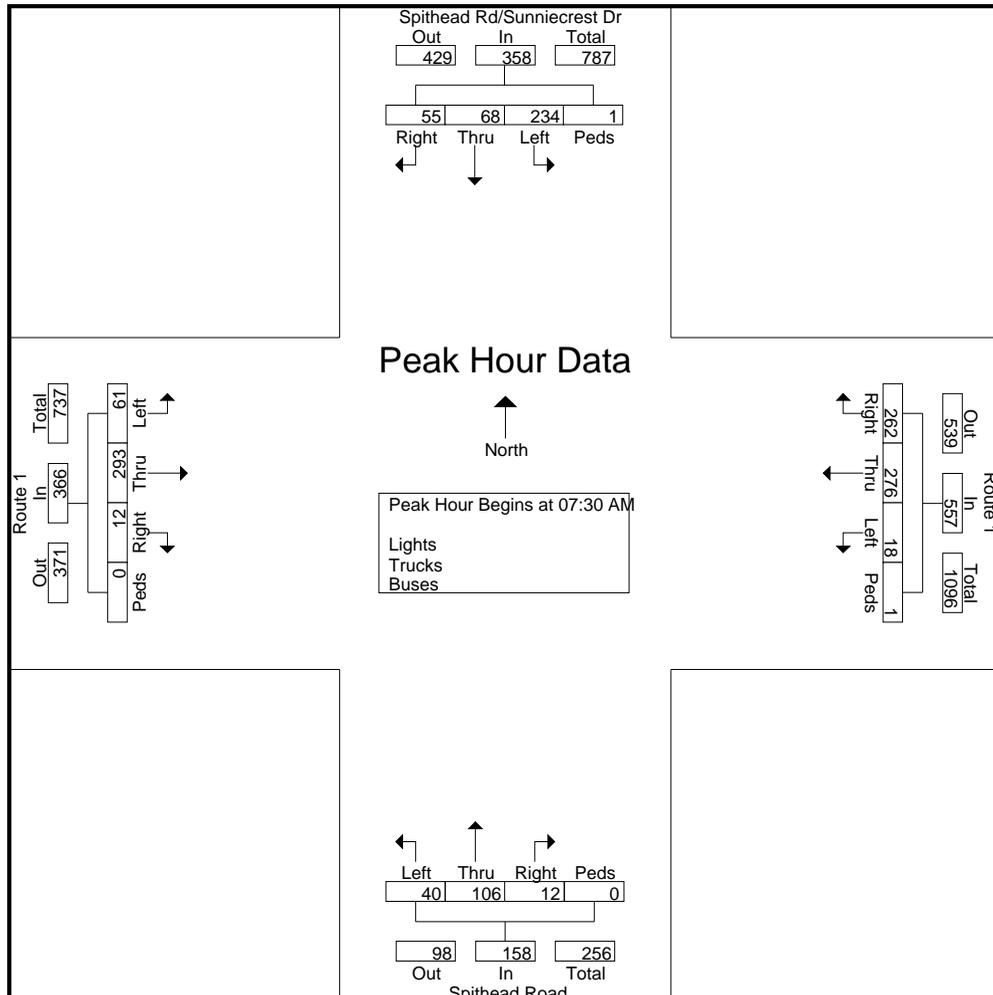
File Name : 23539
Site Code : 23539
Start Date : 10/12/2022
Page No : 2

Start Time	Spithead Rd/Sunnicrest Dr From North					Route 1 From East					Spithead Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

07:30 AM	13	15	59	0	87	86	72	3	0	161	3	24	8	0	35	3	66	13	0	82	365
07:45 AM	13	16	80	0	109	65	59	6	0	130	3	19	5	0	27	3	83	10	0	96	362
08:00 AM	13	22	55	1	91	63	66	0	0	129	4	35	11	0	50	1	62	16	0	79	349
08:15 AM	16	15	40	0	71	48	79	9	1	137	2	28	16	0	46	5	82	22	0	109	363
Total Volume	55	68	234	1	358	262	276	18	1	557	12	106	40	0	158	12	293	61	0	366	1439
% App. Total	15.4	19	65.4	0.3		47	49.6	3.2	0.2		7.6	67.1	25.3	0		3.3	80.1	16.7	0		
PHF	.859	.773	.731	.250	.821	.762	.873	.500	.250	.865	.750	.757	.625	.000	.790	.600	.883	.693	.000	.839	.986



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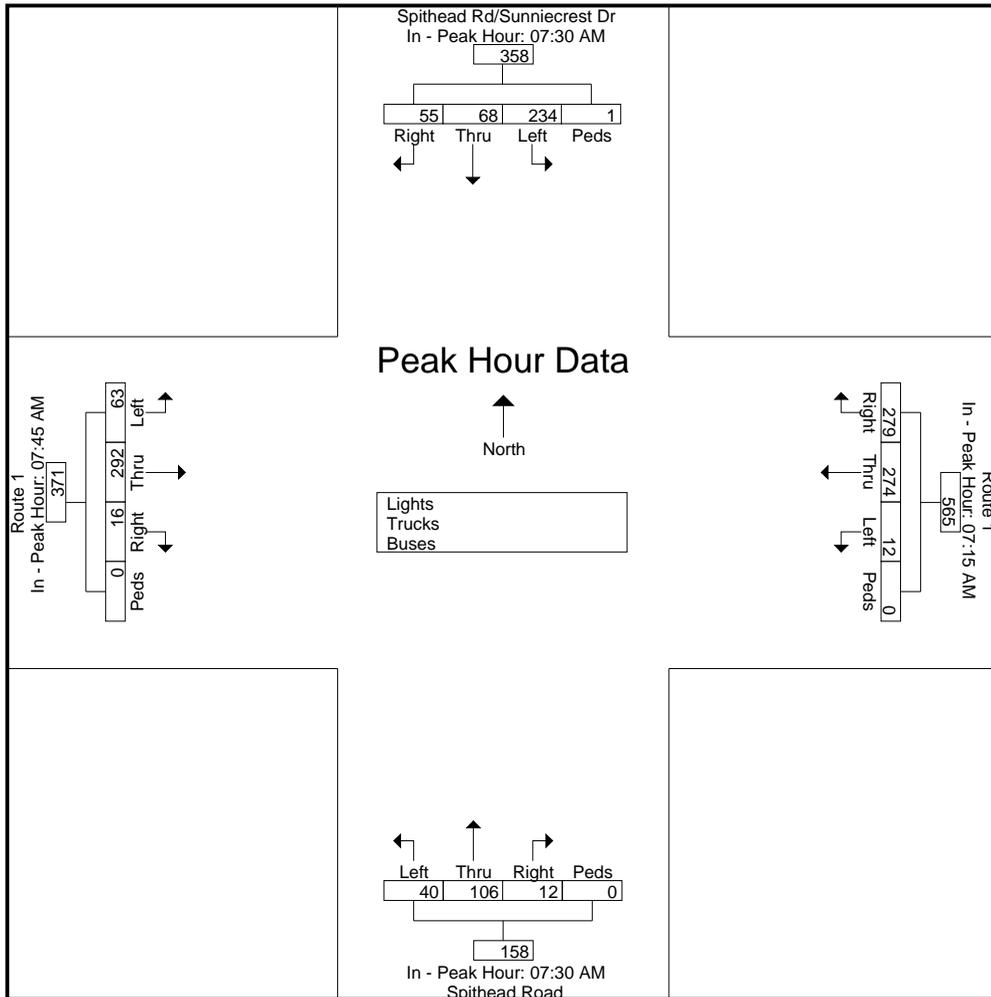
Kensington, Connecticut 06037
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File Name : 23539
Site Code : 23539
Start Date : 10/12/2022
Page No : 3

Start Time	Spithead Rd/Sunnicrest Dr From North					Route 1 From East					Spithead Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

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

	07:30 AM					07:15 AM					07:30 AM					07:45 AM				
+0 mins.	13	15	59	0	87	65	77	3	0	145	3	24	8	0	35	3	83	10	0	96
+15 mins.	13	16	80	0	109	86	72	3	0	161	3	19	5	0	27	1	62	16	0	79
+30 mins.	13	22	55	1	91	65	59	6	0	130	4	35	11	0	50	5	82	22	0	109
+45 mins.	16	15	40	0	71	63	66	0	0	129	2	28	16	0	46	7	65	15	0	87
Total Volume	55	68	234	1	358	279	274	12	0	565	12	106	40	0	158	16	292	63	0	371
% App. Total	15.4	19	65.4	0.3		49.4	48.5	2.1	0		7.6	67.1	25.3	0		4.3	78.7	17	0	
PHF	.859	.773	.731	.250	.821	.811	.890	.500	.000	.877	.750	.757	.625	.000	.790	.571	.880	.716	.000	.851



Connecticut Counts LLC

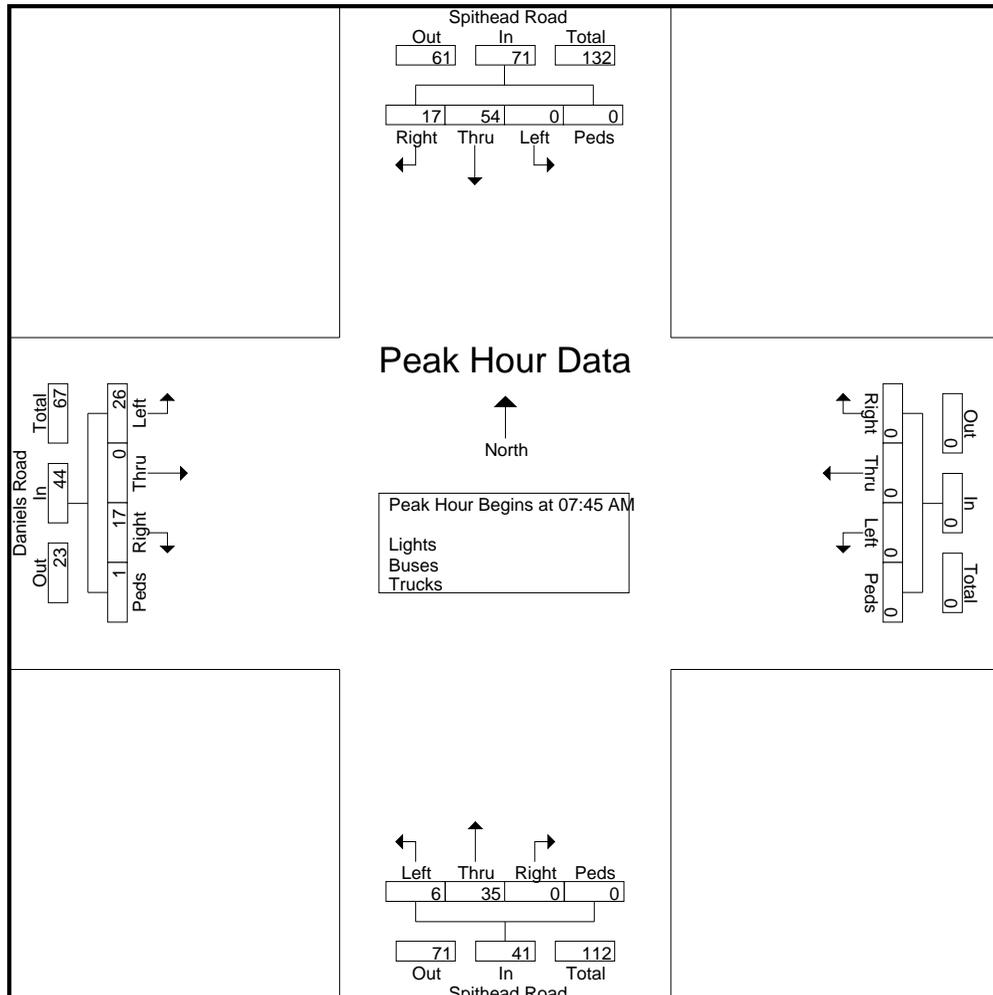
Kensington, Connecticut 06037
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File Name : 23533
Site Code : 23533
Start Date : 10/12/2022
Page No : 2

Start Time	Spithead Road From North					From East					Spithead Road From South					Daniels 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 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	7	11	0	0	18	0	0	0	0	0	0	9	1	0	10	1	0	5	0	6	34
08:00 AM	5	19	0	0	24	0	0	0	0	0	0	10	4	0	14	2	0	8	0	10	48
08:15 AM	3	14	0	0	17	0	0	0	0	0	0	10	0	0	10	5	0	4	1	10	37
08:30 AM	2	10	0	0	12	0	0	0	0	0	0	6	1	0	7	9	0	9	0	18	37
Total Volume	17	54	0	0	71	0	0	0	0	0	0	35	6	0	41	17	0	26	1	44	156
% App. Total	23.9	76.1	0	0		0	0	0	0		0	85.4	14.6	0		38.6	0	59.1	2.3		
PHF	.607	.711	.000	.000	.740	.000	.000	.000	.000	.000	.000	.875	.375	.000	.732	.472	.000	.722	.250	.611	.813



Connecticut Counts LLC

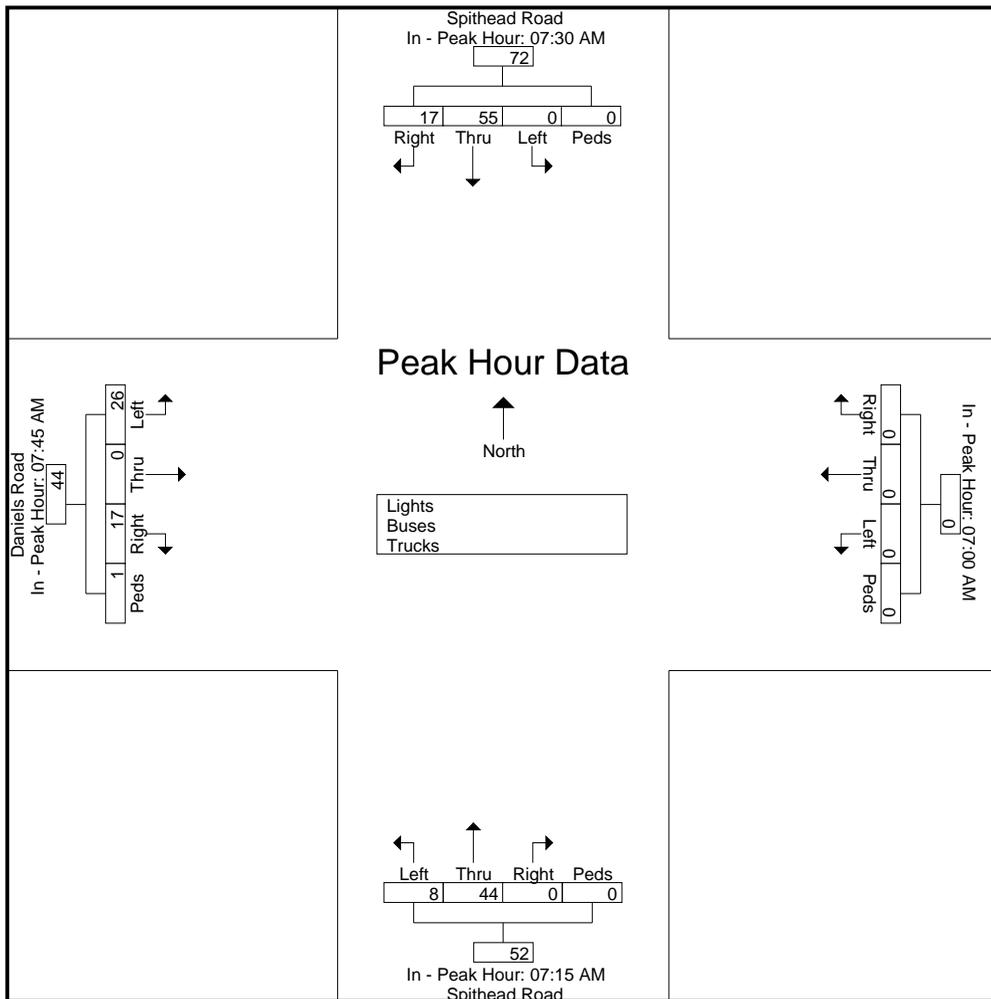
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File Name : 23533
Site Code : 23533
Start Date : 10/12/2022
Page No : 3

Start Time	Spithead Road From North					From East					Spithead Road From South					Daniels 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 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM					07:00 AM					07:15 AM					07:45 AM				
+0 mins.	2	11	0	0	13	0	0	0	0	0	0	12	3	0	15	1	0	5	0	6
+15 mins.	7	11	0	0	18	0	0	0	0	0	0	13	0	0	13	2	0	8	0	10
+30 mins.	5	19	0	0	24	0	0	0	0	0	0	9	1	0	10	5	0	4	1	10
+45 mins.	3	14	0	0	17	0	0	0	0	0	0	10	4	0	14	9	0	9	0	18
Total Volume	17	55	0	0	72	0	0	0	0	0	0	44	8	0	52	17	0	26	1	44
% App. Total	23.6	76.4	0	0		0	0	0	0		0	84.6	15.4	0		38.6	0	59.1	2.3	
PHF	.607	.724	.000	.000	.750	.000	.000	.000	.000	.000	.000	.846	.500	.000	.867	.472	.000	.722	.250	.611



Connecticut Counts LLC
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Spithead Road at Rope Ferry Road
 Waterford, Connecticut

File Name : 23531
 Site Code : 23531
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Rope Ferry Road From North					Private Drive From East					Rope Ferry Road From South					Spithead 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	6	30	2	0	38	0	0	0	0	0	0	46	11	0	57	14	0	17	0	31	126
07:15 AM	4	46	1	0	51	0	0	0	0	0	0	38	10	0	48	12	0	6	0	18	117
07:30 AM	2	32	1	0	35	0	0	0	0	0	3	46	8	0	57	12	0	8	0	20	112
07:45 AM	2	42	3	0	47	0	0	0	0	0	4	61	6	0	71	7	0	4	0	11	129
Total	14	150	7	0	171	0	0	0	0	0	7	191	35	0	233	45	0	35	0	80	484
08:00 AM	3	37	1	0	41	0	0	0	0	0	1	43	9	0	53	15	0	7	0	22	116
08:15 AM	1	38	0	0	39	0	0	0	0	0	0	44	6	0	50	10	0	10	0	20	109
08:30 AM	1	46	1	0	48	0	0	0	0	0	0	37	7	0	44	9	0	10	1	20	112
08:45 AM	2	46	0	0	48	0	0	0	0	0	0	48	6	0	54	6	0	3	0	9	111
Total	7	167	2	0	176	0	0	0	0	0	1	172	28	0	201	40	0	30	1	71	448
Grand Total	21	317	9	0	347	0	0	0	0	0	8	363	63	0	434	85	0	65	1	151	932
Apprch %	6.1	91.4	2.6	0		0	0	0	0		1.8	83.6	14.5	0		56.3	0	43	0.7		
Total %	2.3	34	1	0	37.2	0	0	0	0	0	0.9	38.9	6.8	0	46.6	9.1	0	7	0.1	16.2	
Lights	20	313	9	0	342	0	0	0	0	0	8	363	63	0	434	84	0	64	1	149	925
% Lights	95.2	98.7	100	0	98.6	0	0	0	0	0	100	100	100	0	100	98.8	0	98.5	100	98.7	99.2
Buses	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4
% Buses	4.8	0.6	0	0	0.9	0	0	0	0	0	0	0	0	0	0	0	0	1.5	0	0.7	0.4
Trucks	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3
% Trucks	0	0.6	0	0	0.6	0	0	0	0	0	0	0	0	0	0	1.2	0	0	0	0.7	0.3

Connecticut Counts LLC

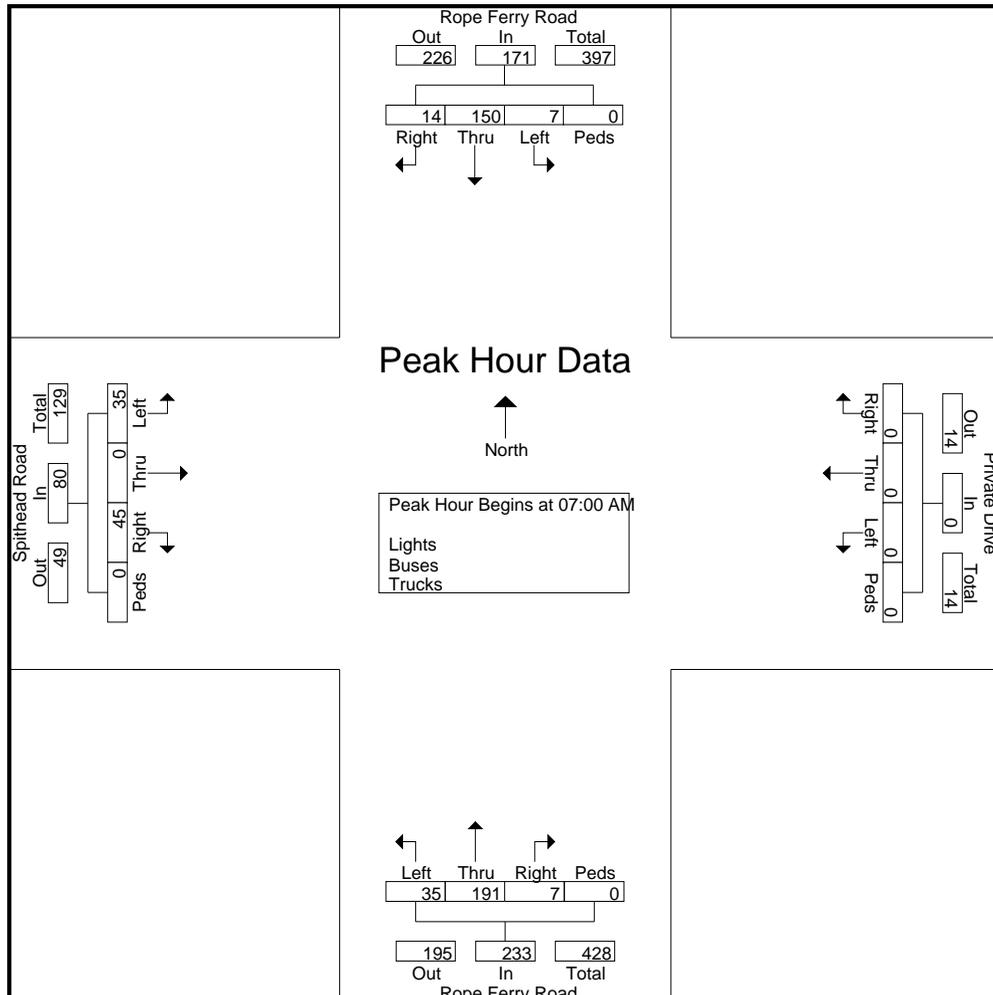
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23531
Site Code : 23531
Start Date : 10/12/2022
Page No : 2

Start Time	Rope Ferry Road From North					Private Drive From East					Rope Ferry Road From South					Spithead 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 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:00 AM

07:00 AM	6	30	2	0	38	0	0	0	0	0	0	46	11	0	57	14	0	17	0	31	126
07:15 AM	4	46	1	0	51	0	0	0	0	0	0	38	10	0	48	12	0	6	0	18	117
07:30 AM	2	32	1	0	35	0	0	0	0	0	3	46	8	0	57	12	0	8	0	20	112
07:45 AM	2	42	3	0	47	0	0	0	0	0	4	61	6	0	71	7	0	4	0	11	129
Total Volume	14	150	7	0	171	0	0	0	0	0	7	191	35	0	233	45	0	35	0	80	484
% App. Total	8.2	87.7	4.1	0		0	0	0	0		3	82	15	0		56.2	0	43.8	0		
PHF	.583	.815	.583	.000	.838	.000	.000	.000	.000	.000	.438	.783	.795	.000	.820	.804	.000	.515	.000	.645	.938



Connecticut Counts LLC

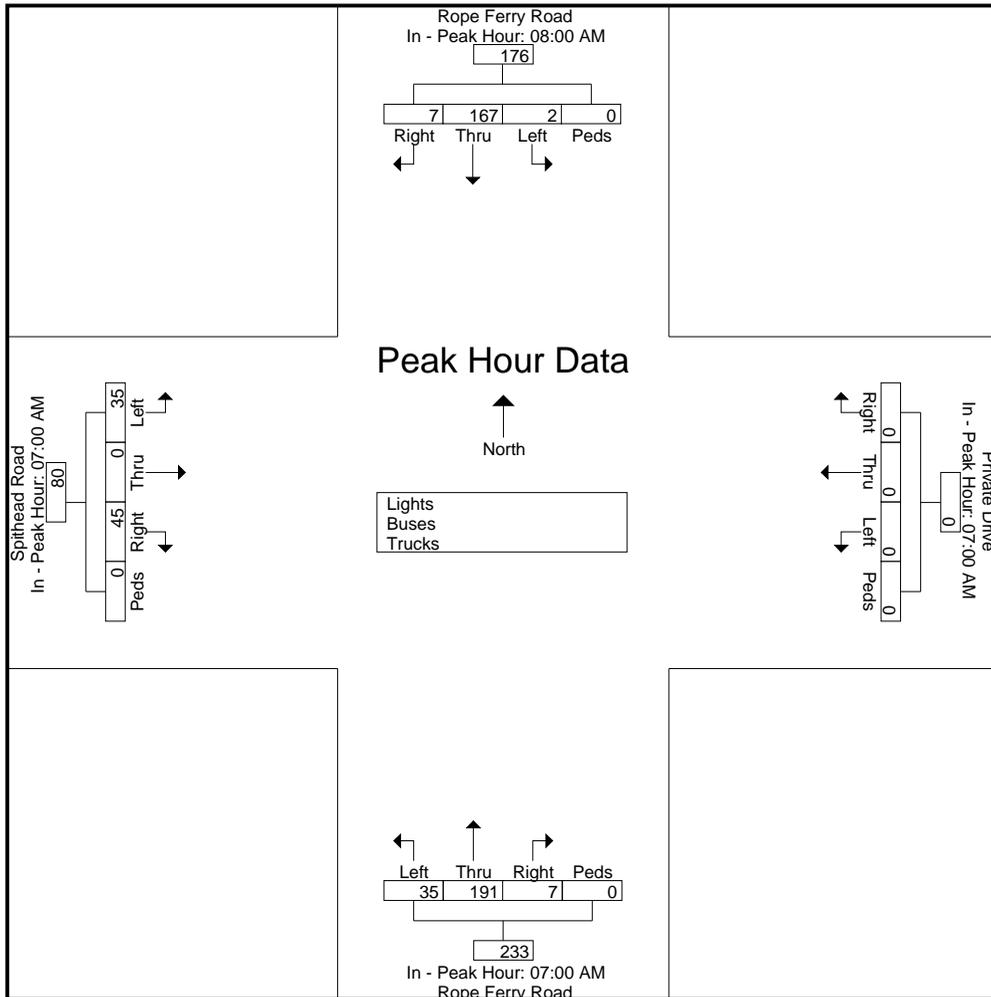
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23531
Site Code : 23531
Start Date : 10/12/2022
Page No : 3

Start Time	Rope Ferry Road From North					Private Drive From East					Rope Ferry Road From South					Spithead 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 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM					07:00 AM					07:00 AM					07:00 AM				
+0 mins.	3	37	1	0	41	0	0	0	0	0	0	46	11	0	57	14	0	17	0	31
+15 mins.	1	38	0	0	39	0	0	0	0	0	0	38	10	0	48	12	0	6	0	18
+30 mins.	1	46	1	0	48	0	0	0	0	0	3	46	8	0	57	12	0	8	0	20
+45 mins.	2	46	0	0	48	0	0	0	0	0	4	61	6	0	71	7	0	4	0	11
Total Volume	7	167	2	0	176	0	0	0	0	0	7	191	35	0	233	45	0	35	0	80
% App. Total	4	94.9	1.1	0		0	0	0	0		3	82	15	0		56.2	0	43.8	0	
PHF	.583	.908	.500	.000	.917	.000	.000	.000	.000	.000	.438	.783	.795	.000	.820	.804	.000	.515	.000	.645



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

Route 1 at Sunnicrest Dr
 Waterford, Connecticut

File Name : 23539
 Site Code : 23539
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Sunnicrest Dr

Start Time	Spithead Rd/Sunnicrest Dr From North					Route 1 From East					Spithead Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
*** BREAK ***																					
07:30 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	1	1	2	0	4	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	6
Total	2	1	2	0	5	1	0	0	0	1	0	0	0	0	0	0	0	2	0	2	8
*** BREAK ***																					
08:15 AM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	3
08:30 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
08:45 AM	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	4	0	1	0	5	1	0	0	0	1	0	1	0	0	1	0	0	1	0	1	8
Grand Total	6	1	3	0	10	2	0	0	0	2	0	1	0	0	1	0	0	3	0	3	16
Apprch %	60	10	30	0		100	0	0	0		0	100	0	0		0	0	100	0		
Total %	37.5	6.2	18.8	0	62.5	12.5	0	0	0	12.5	0	6.2	0	0	6.2	0	0	18.8	0	18.8	

Connecticut Counts LLC

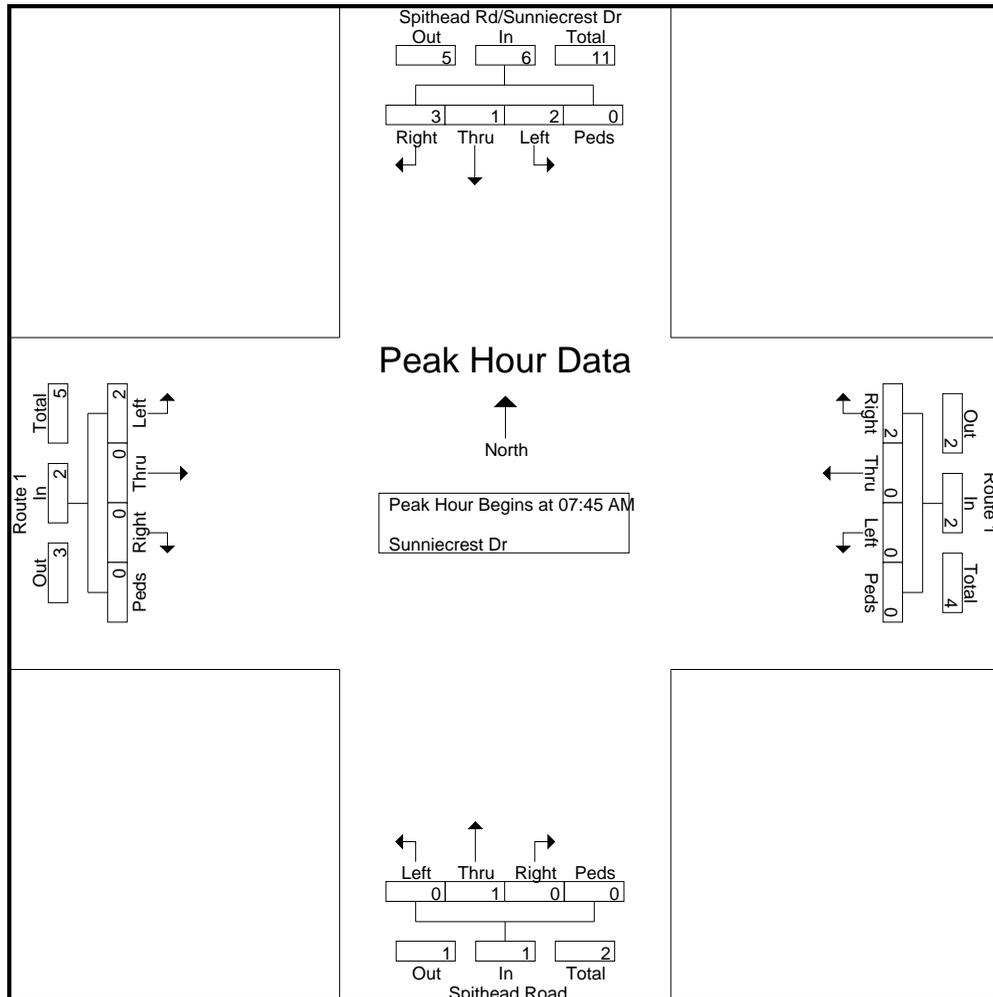
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23539
Site Code : 23539
Start Date : 10/12/2022
Page No : 2

Start Time	Spithead Rd/Sunnicrest Dr From North					Route 1 From East					Spithead Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

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

07:45 AM	1	1	2	0	4	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	6
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	3
08:30 AM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Total Volume	3	1	2	0	6	2	0	0	0	2	0	1	0	0	1	0	0	2	0	2	11
% App. Total	50	16.7	33.3	0		100	0	0	0		0	100	0	0		0	0	100	0		
PHF	.750	.250	.250	.000	.375	.500	.000	.000	.000	.500	.000	.250	.000	.000	.250	.000	.000	.500	.000	.500	.458



Connecticut Counts LLC

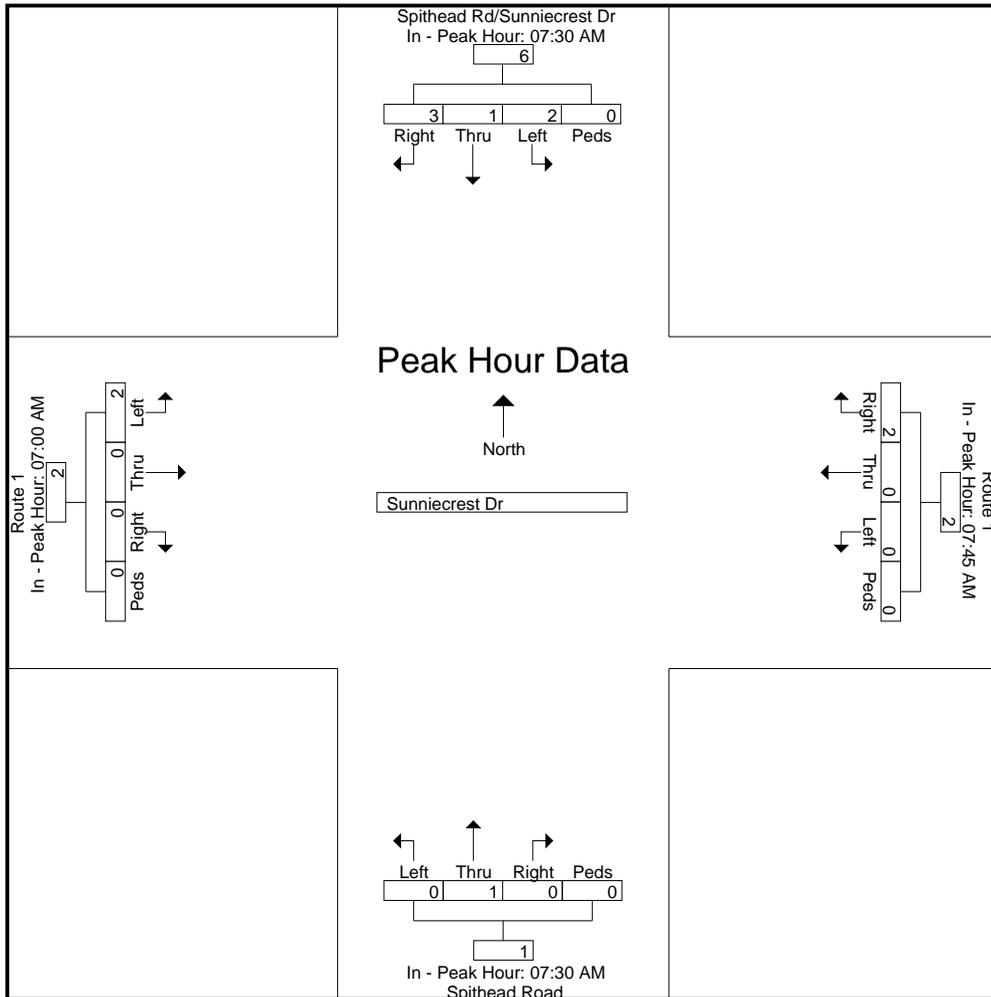
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23539
 Site Code : 23539
 Start Date : 10/12/2022
 Page No : 3

Start Time	Spithead Rd/Sunnicrest Dr From North					Route 1 From East					Spithead Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

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

	07:30 AM					07:45 AM					07:30 AM					07:00 AM				
+0 mins.	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1
+15 mins.	1	1	2	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	1	0	0	0	1	1	0	0	0	1	0	1	0	0	1	0	0	1	0	1
Total Volume	3	1	2	0	6	2	0	0	0	2	0	1	0	0	1	0	0	2	0	2
% App. Total	50	16.7	33.3	0		100	0	0	0		0	100	0	0		0	0	100	0	
PHF	.750	.250	.250	.000	.375	.500	.000	.000	.000	.500	.000	.250	.000	.000	.250	.000	.000	.500	.000	.500



Connecticut Counts LLC
Kensington, Connecticut 06037
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Niantic River Road at West Street
 Waterford, Connecticut

File Name : 23725
 Site Code : 23725
 Start Date : 11/3/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Niantic River Road From North					West Street From East					Niantic River 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	
07:00 AM	0	6	9	0	15	8	0	3	1	12	4	1	0	0	5	0	0	0	0	0	32
07:15 AM	0	5	22	2	29	10	0	8	0	18	3	5	0	0	8	0	0	0	0	0	55
07:30 AM	0	2	14	0	16	3	0	4	0	7	2	9	0	0	11	0	0	0	1	1	35
07:45 AM	0	4	12	1	17	9	0	6	1	16	9	3	0	0	12	0	0	0	1	1	46
Total	0	17	57	3	77	30	0	21	2	53	18	18	0	0	36	0	0	0	2	2	168
08:00 AM	0	2	13	0	15	11	0	6	0	17	7	4	0	0	11	0	0	0	0	0	43
08:15 AM	0	4	14	0	18	9	0	3	0	12	3	5	0	0	8	0	0	0	0	0	38
08:30 AM	0	2	15	0	17	18	0	11	0	29	5	4	0	0	9	0	0	0	0	0	55
08:45 AM	0	2	9	0	11	15	0	5	0	20	8	3	0	0	11	0	0	0	0	0	42
Total	0	10	51	0	61	53	0	25	0	78	23	16	0	0	39	0	0	0	0	0	178
Grand Total	0	27	108	3	138	83	0	46	2	131	41	34	0	0	75	0	0	0	2	2	346
Apprch %	0	19.6	78.3	2.2		63.4	0	35.1	1.5		54.7	45.3	0	0		0	0	0	100		
Total %	0	7.8	31.2	0.9	39.9	24	0	13.3	0.6	37.9	11.8	9.8	0	0	21.7	0	0	0	0.6	0.6	
Lights	0	25	108	3	136	83	0	45	2	130	40	32	0	0	72	0	0	0	2	2	340
% Lights	0	92.6	100	100	98.6	100	0	97.8	100	99.2	97.6	94.1	0	0	96	0	0	0	100	100	98.3
Buses	0	1	0	0	1	0	0	1	0	1	1	1	0	0	2	0	0	0	0	0	4
% Buses	0	3.7	0	0	0.7	0	0	2.2	0	0.8	2.4	2.9	0	0	2.7	0	0	0	0	0	1.2
Trucks	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Trucks	0	3.7	0	0	0.7	0	0	0	0	0	0	2.9	0	0	1.3	0	0	0	0	0	0.6

Connecticut Counts LLC

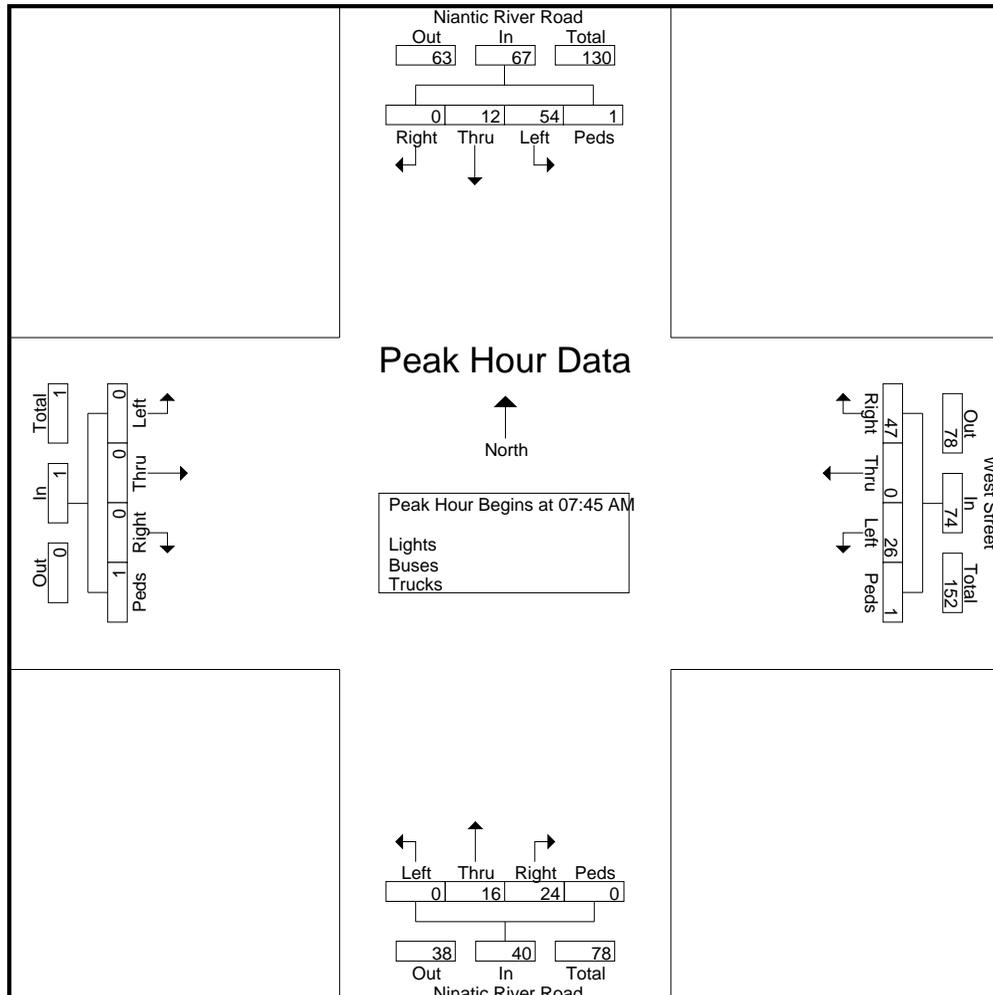
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23725
Site Code : 23725
Start Date : 11/3/2022
Page No : 2

Start Time	Niantic River Road From North					West Street From East					Niantic River 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 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:45 AM

07:45 AM	0	4	12	1	17	9	0	6	1	16	9	3	0	0	12	0	0	0	1	1	46
08:00 AM	0	2	13	0	15	11	0	6	0	17	7	4	0	0	11	0	0	0	0	0	43
08:15 AM	0	4	14	0	18	9	0	3	0	12	3	5	0	0	8	0	0	0	0	0	38
08:30 AM	0	2	15	0	17	18	0	11	0	29	5	4	0	0	9	0	0	0	0	0	55
Total Volume	0	12	54	1	67	47	0	26	1	74	24	16	0	0	40	0	0	0	1	1	182
% App. Total	0	17.9	80.6	1.5		63.5	0	35.1	1.4		60	40	0	0		0	0	0	100		
PHF	.000	.750	.900	.250	.931	.653	.000	.591	.250	.638	.667	.800	.000	.000	.833	.000	.000	.000	.250	.250	.827



Connecticut Counts LLC

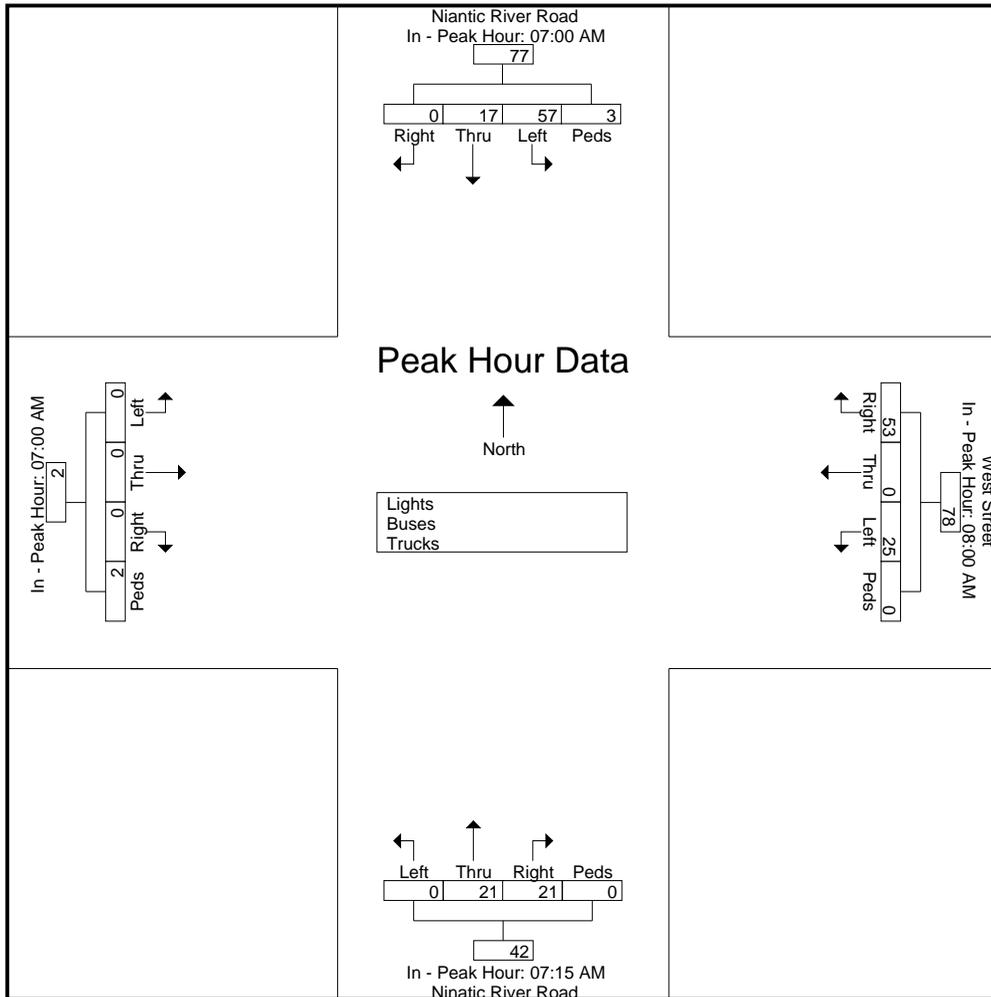
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23725
 Site Code : 23725
 Start Date : 11/3/2022
 Page No : 3

Start Time	Niantic River Road From North					West Street From East					Ninatic River 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 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:00 AM					08:00 AM					07:15 AM					07:00 AM				
+0 mins.	0	6	9	0	15	11	0	6	0	17	3	5	0	0	8	0	0	0	0	0
+15 mins.	0	5	22	2	29	9	0	3	0	12	2	9	0	0	11	0	0	0	0	0
+30 mins.	0	2	14	0	16	18	0	11	0	29	9	3	0	0	12	0	0	0	1	1
+45 mins.	0	4	12	1	17	15	0	5	0	20	7	4	0	0	11	0	0	0	1	1
Total Volume	0	17	57	3	77	53	0	25	0	78	21	21	0	0	42	0	0	0	2	2
% App. Total	0	22.1	74	3.9		67.9	0	32.1	0		50	50	0	0		0	0	0	100	
PHF	.000	.708	.648	.375	.664	.736	.000	.568	.000	.672	.583	.583	.000	.000	.875	.000	.000	.000	.500	.500



Connecticut Counts LLC

Kensington, Connecticut 06037
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Daniels Avenue at Shool Drives
Waterford, Connecticut

File Name : 23538
Site Code : 23538
Start Date : 10/12/2022
Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Private Drive From North					Daniels Avenue From East					School Drives From South					Daniels Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
02:00 PM	0	0	0	0	0	0	6	3	0	9	2	0	4	0	6	1	10	0	0	11	26
02:15 PM	0	0	0	0	0	0	11	2	0	13	5	0	4	0	9	3	7	0	0	10	32
02:30 PM	0	0	0	0	0	0	8	4	0	12	3	0	3	1	7	7	6	0	0	13	32
02:45 PM	0	0	0	0	0	0	7	2	0	9	3	0	3	0	6	4	11	0	0	15	30
Total	0	0	0	0	0	0	32	11	0	43	13	0	14	1	28	15	34	0	0	49	120
03:00 PM	0	0	0	0	0	0	6	2	0	8	2	0	0	0	2	0	9	0	0	9	19
03:15 PM	0	0	0	0	0	0	9	0	0	9	1	0	1	0	2	1	5	0	0	6	17
03:30 PM	0	0	0	0	0	0	7	0	0	7	0	0	0	0	0	0	8	0	0	8	15
03:45 PM	0	0	0	0	0	0	12	1	0	13	2	0	1	0	3	1	14	0	0	15	31
Total	0	0	0	0	0	0	34	3	0	37	5	0	2	0	7	2	36	0	0	38	82
04:00 PM	0	0	0	0	0	0	15	0	0	15	0	0	1	0	1	0	7	0	0	7	23
04:15 PM	0	0	0	0	0	0	12	0	0	12	0	0	0	0	0	0	8	0	0	8	20
04:30 PM	0	0	1	0	1	0	10	0	0	10	0	0	0	0	0	0	7	0	0	7	18
04:45 PM	0	0	0	0	0	0	15	0	0	16	0	0	0	0	0	1	5	0	0	6	22
Total	0	0	1	0	1	0	52	0	0	53	0	0	1	0	1	1	27	0	0	28	83
05:00 PM	1	0	0	0	1	0	8	0	0	8	0	0	0	0	0	0	9	0	0	9	18
05:15 PM	0	0	0	0	0	0	13	0	0	13	0	0	1	2	3	1	13	0	0	14	30
05:30 PM	0	0	0	0	0	1	11	0	0	12	0	0	0	0	0	0	11	0	0	11	23
05:45 PM	0	0	0	0	0	0	9	0	0	9	0	0	1	0	1	0	8	0	0	8	18
Total	1	0	0	0	1	1	41	0	0	42	0	0	2	2	4	1	41	0	0	42	89
Grand Total	1	0	1	0	2	2	159	14	0	175	18	0	19	3	40	19	138	0	0	157	374
Apprch %	50	0	50	0		1.1	90.9	8	0		45	0	47.5	7.5		12.1	87.9	0	0		
Total %	0.3	0	0.3	0	0.5	0.5	42.5	3.7	0	46.8	4.8	0	5.1	0.8	10.7	5.1	36.9	0	0	42	
Lights	1	0	1	0	2	2	156	12	0	170	16	0	18	3	37	19	138	0	0	157	366
% Lights	100	0	100	0	100	100	98.1	85.7	0	97.1	88.9	0	94.7	100	92.5	100	100	0	0	100	97.9
Buses	0	0	0	0	0	0	2	2	0	4	2	0	1	0	3	0	0	0	0	0	7
% Buses	0	0	0	0	0	0	1.3	14.3	0	2.3	11.1	0	5.3	0	7.5	0	0	0	0	0	1.9
Trucks	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% Trucks	0	0	0	0	0	0	0.6	0	0	0.6	0	0	0	0	0	0	0	0	0	0	0.3

Connecticut Counts LLC

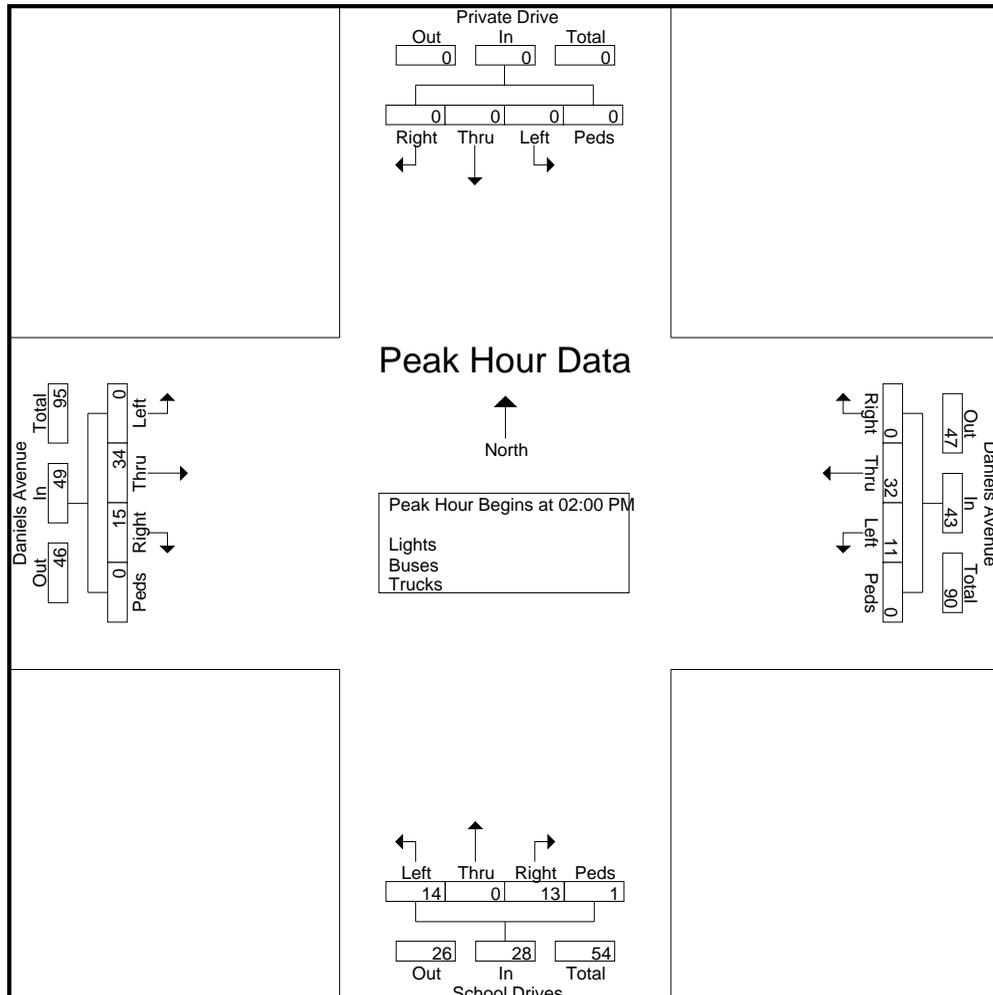
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23538
Site Code : 23538
Start Date : 10/12/2022
Page No : 2

Start Time	Private Drive From North					Daniels Avenue From East					School Drives From South					Daniels Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 02:00 PM

02:00 PM	0	0	0	0	0	0	6	3	0	9	2	0	4	0	6	1	10	0	0	11	26
02:15 PM	0	0	0	0	0	0	11	2	0	13	5	0	4	0	9	3	7	0	0	10	32
02:30 PM	0	0	0	0	0	0	8	4	0	12	3	0	3	1	7	7	6	0	0	13	32
02:45 PM	0	0	0	0	0	0	7	2	0	9	3	0	3	0	6	4	11	0	0	15	30
Total Volume	0	0	0	0	0	0	32	11	0	43	13	0	14	1	28	15	34	0	0	49	120
% App. Total	0	0	0	0	0	0	74.4	25.6	0	46.4	0	50	3.6	30.6	69.4	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.727	.688	.000	.827	.650	.000	.875	.250	.778	.536	.773	.000	.000	.817	.938



Connecticut Counts LLC

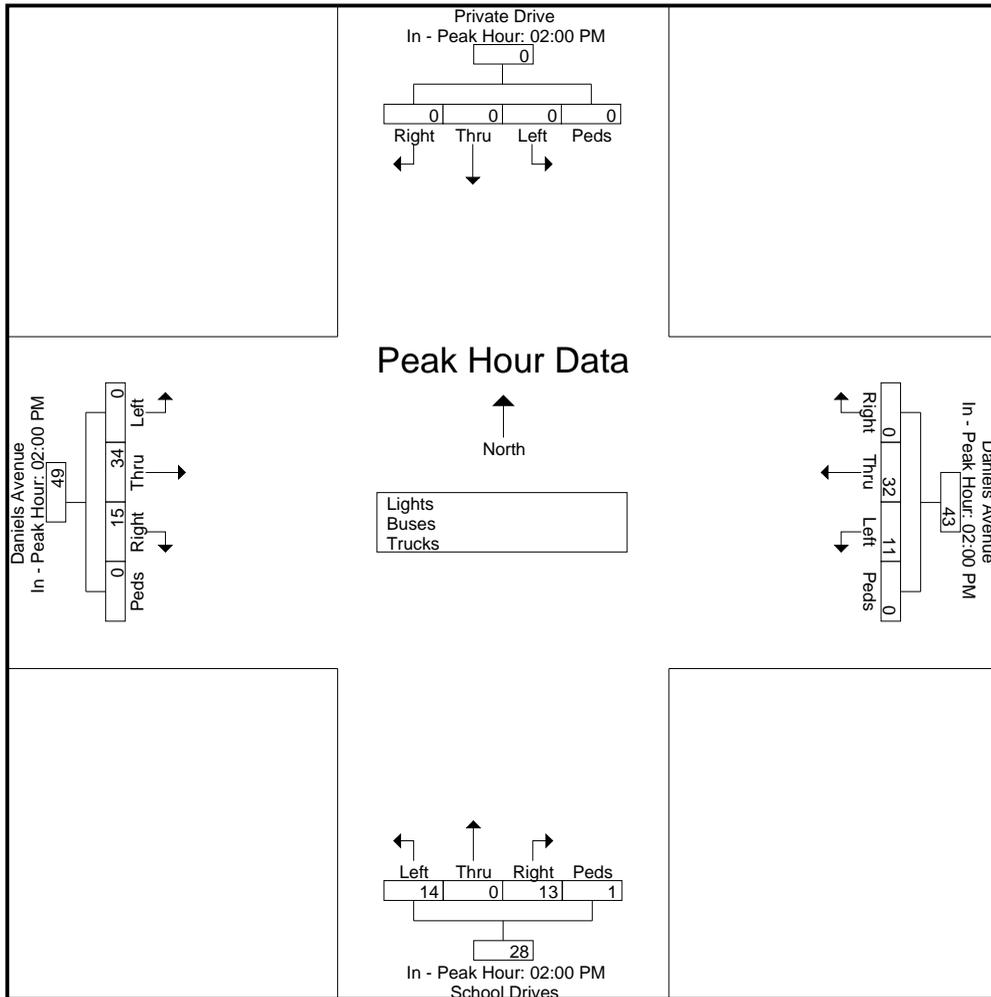
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23538
Site Code : 23538
Start Date : 10/12/2022
Page No : 3

Start Time	Private Drive From North					Daniels Avenue From East					School Drives From South					Daniels Avenue From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:00 PM					02:00 PM					02:00 PM					02:00 PM				
+0 mins.	0	0	0	0	0	0	6	3	0	9	2	0	4	0	6	1	10	0	0	11
+15 mins.	0	0	0	0	0	0	11	2	0	13	5	0	4	0	9	3	7	0	0	10
+30 mins.	0	0	0	0	0	0	8	4	0	12	3	0	3	1	7	7	6	0	0	13
+45 mins.	0	0	0	0	0	0	7	2	0	9	3	0	3	0	6	4	11	0	0	15
Total Volume	0	0	0	0	0	0	32	11	0	43	13	0	14	1	28	15	34	0	0	49
% App. Total	0	0	0	0	0	0	74.4	25.6	0		46.4	0	50	3.6		30.6	69.4	0	0	
PHF	.000	.000	.000	.000	.000	.000	.727	.688	.000	.827	.650	.000	.875	.250	.778	.536	.773	.000	.000	.817



Connecticut Counts LLC
Kensington, Connecticut 06037
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Maple Street at Existing Drive
Wethersfield, Connecticut

File Name : 23726
Site Code : 23717
Start Date : 11/3/2022
Page No : 1

Groups Printed- Lights - Trucks - Buses

Start Time	Niantic River Road From North					West Street From East					Niantic River 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	
02:00 PM	0	8	14	0	22	21	0	8	2	31	6	5	0	0	11	0	1	0	0	1	65
02:15 PM	0	6	20	0	26	28	0	7	0	35	12	3	0	0	15	0	0	0	0	0	76
02:30 PM	0	3	12	0	15	26	1	9	1	37	6	9	0	0	15	0	0	0	3	3	70
02:45 PM	0	7	15	0	22	45	0	5	0	50	14	7	0	0	21	0	0	0	0	0	93
Total	0	24	61	0	85	120	1	29	3	153	38	24	0	0	62	0	1	0	3	4	304
03:00 PM	0	2	21	0	23	22	0	7	2	31	14	5	0	0	19	0	0	0	0	0	73
03:15 PM	0	8	13	0	21	23	0	10	2	35	7	7	0	0	14	0	0	0	1	1	71
03:30 PM	0	8	16	1	25	26	0	11	1	38	6	4	0	0	10	0	0	0	0	0	73
03:45 PM	1	8	19	0	28	40	0	5	0	45	9	8	0	0	17	0	0	0	0	0	90
Total	1	26	69	1	97	111	0	33	5	149	36	24	0	0	60	0	0	0	1	1	307
Grand Total	1	50	130	1	182	231	1	62	8	302	74	48	0	0	122	0	1	0	4	5	611
Apprch %	0.5	27.5	71.4	0.5		76.5	0.3	20.5	2.6		60.7	39.3	0	0		0	20	0	80		
Total %	0.2	8.2	21.3	0.2	29.8	37.8	0.2	10.1	1.3	49.4	12.1	7.9	0	0	20	0	0.2	0	0.7	0.8	
Lights	1	49	130	1	181	230	1	60	8	299	73	47	0	0	120	0	1	0	4	5	605
% Lights	100	98	100	100	99.5	99.6	100	96.8	100	99	98.6	97.9	0	0	98.4	0	100	0	100	100	99
Trucks	0	1	0	0	1	1	0	1	0	2	1	1	0	0	2	0	0	0	0	0	5
% Trucks	0	2	0	0	0.5	0.4	0	1.6	0	0.7	1.4	2.1	0	0	1.6	0	0	0	0	0	0.8
Buses	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
% Buses	0	0	0	0	0	0	0	1.6	0	0.3	0	0	0	0	0	0	0	0	0	0	0.2

Connecticut Counts LLC

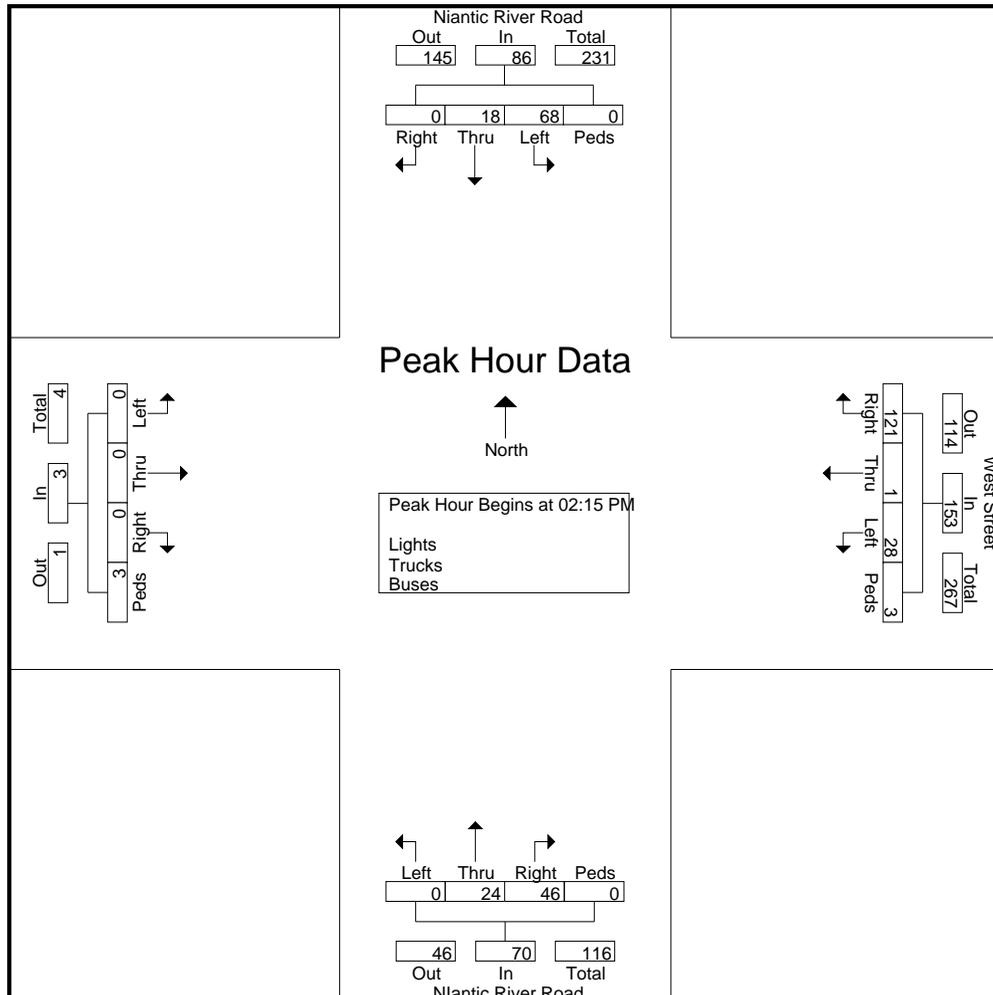
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23726
 Site Code : 23717
 Start Date : 11/3/2022
 Page No : 2

Start Time	Niantic River Road From North					West Street From East					Niantic River 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 02:00 PM to 03:45 PM - Peak 1 of 1
 Peak Hour for Entire Intersection Begins at 02:15 PM

02:15 PM	0	6	20	0	26	28	0	7	0	35	12	3	0	0	15	0	0	0	0	0	76
02:30 PM	0	3	12	0	15	26	1	9	1	37	6	9	0	0	15	0	0	0	3	3	70
02:45 PM	0	7	15	0	22	45	0	5	0	50	14	7	0	0	21	0	0	0	0	0	93
03:00 PM	0	2	21	0	23	22	0	7	2	31	14	5	0	0	19	0	0	0	0	0	73
Total Volume	0	18	68	0	86	121	1	28	3	153	46	24	0	0	70	0	0	0	3	3	312
% App. Total	0	20.9	79.1	0		79.1	0.7	18.3	2		65.7	34.3	0	0		0	0	0	100		
PHF	.000	.643	.810	.000	.827	.672	.250	.778	.375	.765	.821	.667	.000	.000	.833	.000	.000	.000	.250	.250	.839



Connecticut Counts LLC

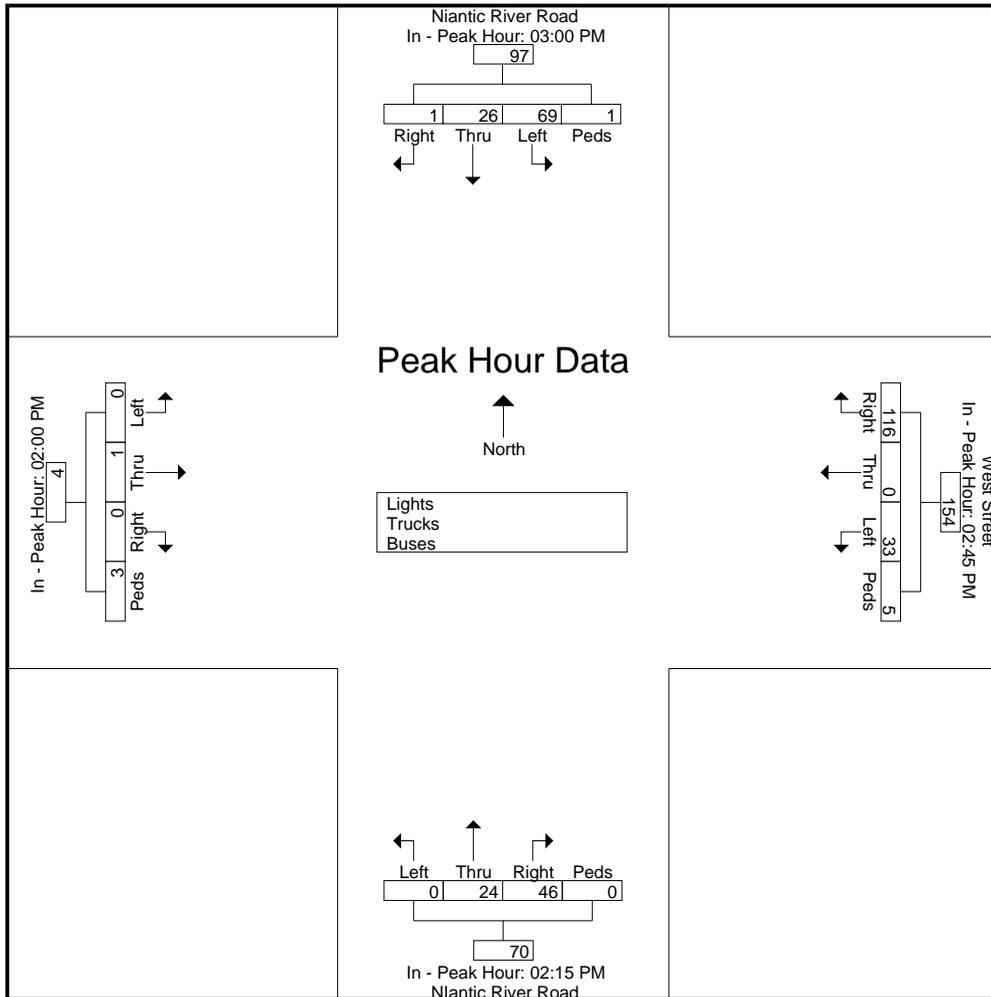
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23726
Site Code : 23717
Start Date : 11/3/2022
Page No : 3

Start Time	Niantic River Road From North					West Street From East					Niantic River 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 02:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM					02:45 PM					02:15 PM					02:00 PM				
+0 mins.	0	2	21	0	23	45	0	5	0	50	12	3	0	0	15	0	1	0	0	1
+15 mins.	0	8	13	0	21	22	0	7	2	31	6	9	0	0	15	0	0	0	0	0
+30 mins.	0	8	16	1	25	23	0	10	2	35	14	7	0	0	21	0	0	0	0	3
+45 mins.	1	8	19	0	28	26	0	11	1	38	14	5	0	0	19	0	0	0	0	0
Total Volume	1	26	69	1	97	116	0	33	5	154	46	24	0	0	70	0	1	0	3	4
% App. Total	1	26.8	71.1	1		75.3	0	21.4	3.2		65.7	34.3	0	0		0	25	0	75	
PHF	.250	.813	.821	.250	.866	.644	.000	.750	.625	.770	.821	.667	.000	.000	.833	.000	.250	.000	.250	.333



Connecticut Counts LLC
Kensington, Connecticut 06037
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Niantic River Road at Daniels Road
 Waterford, Connecticut

File Name : 23536
 Site Code : 23536
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Niantic River Road From North					Daniels Road From East					Niantic River 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	
02:00 PM	0	18	3	0	21	2	0	3	0	5	1	21	0	0	22	0	0	0	0	0	48
02:15 PM	0	18	2	0	20	5	0	4	0	9	3	23	0	0	26	0	0	0	0	0	55
02:30 PM	0	25	4	0	29	2	0	3	0	5	5	30	0	0	35	0	0	0	0	0	69
02:45 PM	0	19	2	0	21	2	0	3	0	5	6	25	0	0	31	0	0	0	0	0	57
Total	0	80	11	0	91	11	0	13	0	24	15	99	0	0	114	0	0	0	0	0	229
03:00 PM	0	22	3	0	25	4	0	6	3	13	2	38	0	0	40	0	0	0	0	0	78
03:15 PM	0	27	3	0	30	1	0	5	0	6	3	35	0	0	38	0	0	0	0	0	74
03:30 PM	0	28	3	0	31	4	0	3	1	8	2	36	0	0	38	0	0	0	0	0	77
03:45 PM	0	26	6	0	32	2	0	7	1	10	9	49	0	0	58	0	0	0	0	0	100
Total	0	103	15	0	118	11	0	21	5	37	16	158	0	0	174	0	0	0	0	0	329
04:00 PM	0	30	2	0	32	8	0	5	4	17	5	59	0	0	64	0	0	0	0	0	113
04:15 PM	0	30	3	0	33	3	0	6	0	9	3	53	0	0	56	0	0	0	0	0	98
04:30 PM	0	35	2	0	37	1	0	7	3	11	2	33	0	0	35	0	0	0	0	0	83
04:45 PM	0	31	2	0	33	3	0	8	2	13	3	33	0	0	36	0	0	0	0	0	82
Total	0	126	9	0	135	15	0	26	9	50	13	178	0	0	191	0	0	0	0	0	376
05:00 PM	0	35	6	0	41	5	0	1	3	9	4	39	0	0	43	0	0	0	0	0	93
05:15 PM	0	33	3	0	36	6	0	4	4	14	3	27	0	0	30	0	0	0	0	0	80
05:30 PM	0	27	2	0	29	6	0	5	2	13	7	21	0	0	28	0	0	0	0	0	70
05:45 PM	0	23	2	0	25	1	0	2	4	7	4	19	0	0	23	0	0	0	0	0	55
Total	0	118	13	0	131	18	0	12	13	43	18	106	0	0	124	0	0	0	0	0	298
Grand Total	0	427	48	0	475	55	0	72	27	154	62	541	0	0	603	0	0	0	0	0	1232
Apprch %	0	89.9	10.1	0		35.7	0	46.8	17.5		10.3	89.7	0	0		0	0	0	0		
Total %	0	34.7	3.9	0	38.6	4.5	0	5.8	2.2	12.5	5	43.9	0	0	48.9	0	0	0	0	0	
Lights	0	424	48	0	472	55	0	71	27	153	62	538	0	0	600	0	0	0	0	0	1225
% Lights	0	99.3	100	0	99.4	100	0	98.6	100	99.4	100	99.4	0	0	99.5	0	0	0	0	0	99.4
Buses	0	0	0	0	0	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	3
% Buses	0	0	0	0	0	0	0	1.4	0	0.6	0	0.4	0	0	0.3	0	0	0	0	0	0.2
Trucks	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	4
% Trucks	0	0.7	0	0	0.6	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0.3

Connecticut Counts LLC

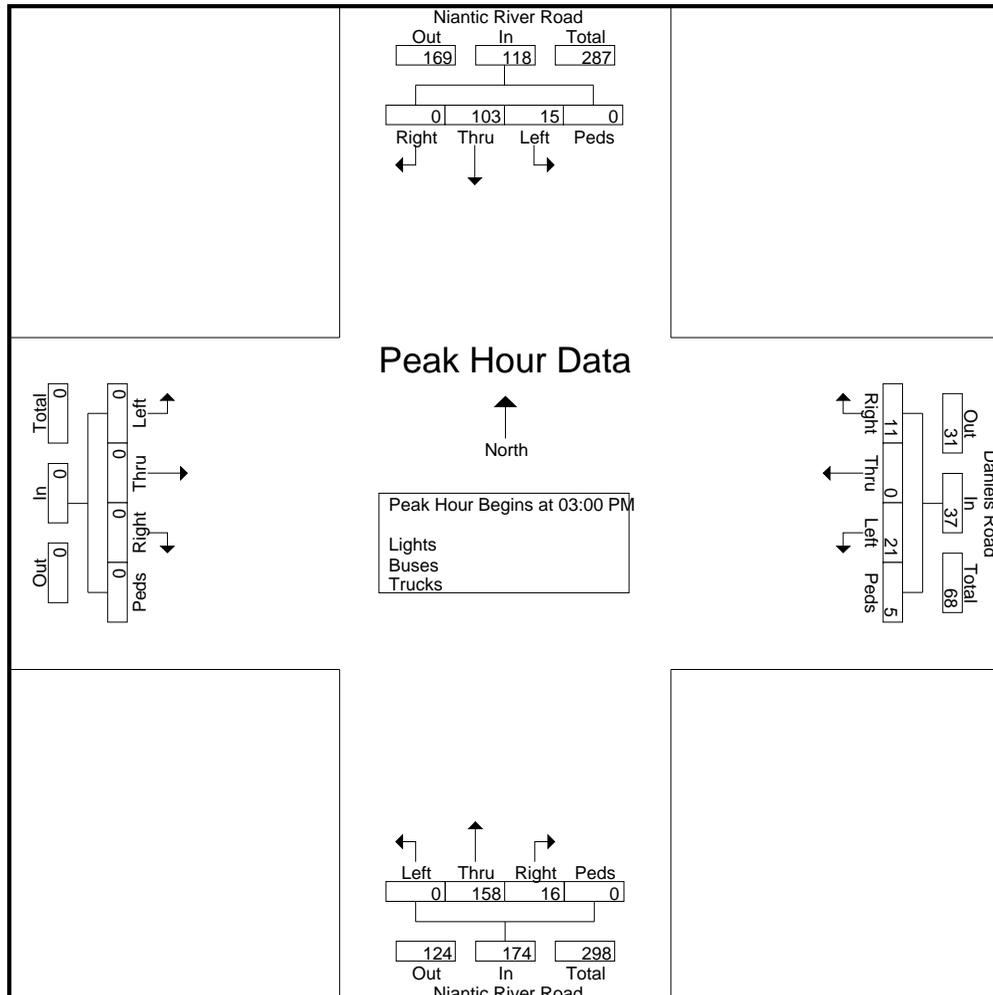
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23536
Site Code : 23536
Start Date : 10/12/2022
Page No : 2

Start Time	Niantic River Road From North					Daniels Road From East					Niantic River 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 02:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 03:00 PM

03:00 PM	0	22	3	0	25	4	0	6	3	13	2	38	0	0	40	0	0	0	0	0	78
03:15 PM	0	27	3	0	30	1	0	5	0	6	3	35	0	0	38	0	0	0	0	0	74
03:30 PM	0	28	3	0	31	4	0	3	1	8	2	36	0	0	38	0	0	0	0	0	77
03:45 PM	0	26	6	0	32	2	0	7	1	10	9	49	0	0	58	0	0	0	0	0	100
Total Volume	0	103	15	0	118	11	0	21	5	37	16	158	0	0	174	0	0	0	0	0	329
% App. Total	0	87.3	12.7	0		29.7	0	56.8	13.5		9.2	90.8	0	0		0	0	0	0		
PHF	.000	.920	.625	.000	.922	.688	.000	.750	.417	.712	.444	.806	.000	.000	.750	.000	.000	.000	.000	.000	.823



Connecticut Counts LLC

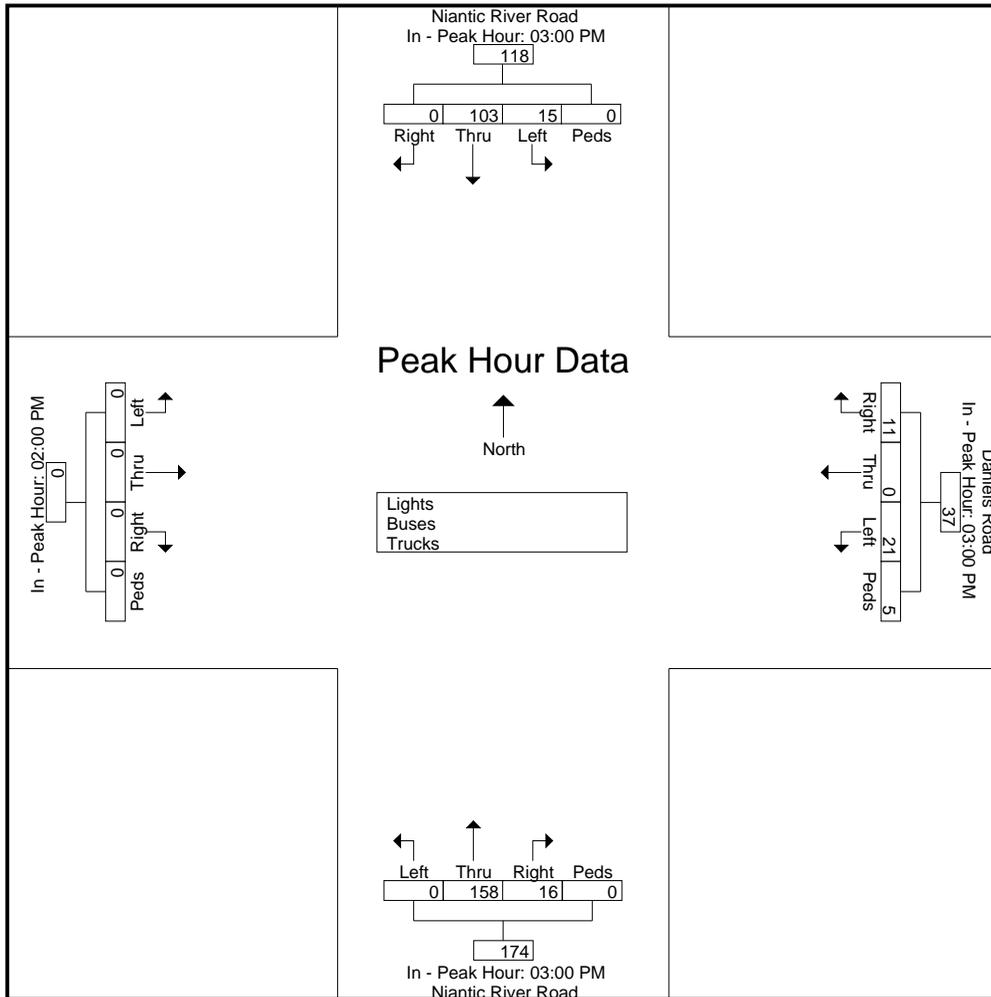
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23536
Site Code : 23536
Start Date : 10/12/2022
Page No : 3

Start Time	Niantic River Road From North					Daniels Road From East					Niantic River 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 02:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM					03:00 PM					03:00 PM					02:00 PM				
+0 mins.	0	22	3	0	25	4	0	6	3	13	2	38	0	0	40	0	0	0	0	0
+15 mins.	0	27	3	0	30	1	0	5	0	6	3	35	0	0	38	0	0	0	0	0
+30 mins.	0	28	3	0	31	4	0	3	1	8	2	36	0	0	38	0	0	0	0	0
+45 mins.	0	26	6	0	32	2	0	7	1	10	9	49	0	0	58	0	0	0	0	0
Total Volume	0	103	15	0	118	11	0	21	5	37	16	158	0	0	174	0	0	0	0	0
% App. Total	0	87.3	12.7	0		29.7	0	56.8	13.5		9.2	90.8	0	0		0	0	0	0	
PHF	.000	.920	.625	.000	.922	.688	.000	.750	.417	.712	.444	.806	.000	.000	.750	.000	.000	.000	.000	.000



Connecticut Counts LLC
Kensington, Connecticut 06037
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Rope Ferry Road at West Street
 Waterford, Connecticut

File Name : 23530
 Site Code : 23530
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	West Street From North					Rope Ferry Road From East					From South					Rope Ferry 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	
02:00 PM	8	1	5	0	14	9	10	1	0	20	0	0	0	0	0	0	19	11	0	30	64
02:15 PM	13	0	5	0	18	8	15	1	0	24	0	0	1	0	1	0	19	8	0	27	70
02:30 PM	10	0	4	0	14	11	20	0	0	31	0	0	0	0	0	0	24	13	0	37	82
02:45 PM	11	0	8	0	19	12	21	0	0	33	0	0	0	0	0	0	37	12	0	49	101
Total	42	1	22	0	65	40	66	2	0	108	0	0	1	0	1	0	99	44	0	143	317
03:00 PM	16	0	8	0	24	12	69	0	0	81	0	0	0	0	0	0	73	8	0	81	186
03:15 PM	26	0	6	0	32	11	77	0	0	88	0	0	0	0	0	0	70	14	0	84	204
03:30 PM	18	0	8	0	26	19	85	0	0	104	0	0	0	0	0	0	71	20	0	91	221
03:45 PM	24	0	9	1	34	12	81	0	0	93	0	0	0	0	0	0	68	17	0	85	212
Total	84	0	31	1	116	54	312	0	0	366	0	0	0	0	0	0	282	59	0	341	823
04:00 PM	21	0	12	2	35	43	123	0	0	166	0	0	0	0	0	0	69	24	0	93	294
04:15 PM	29	0	12	4	45	42	124	0	0	166	0	0	0	0	0	0	94	25	0	119	330
04:30 PM	20	0	15	0	35	16	122	0	0	138	0	0	0	0	0	0	95	22	0	117	290
04:45 PM	25	0	13	0	38	12	100	0	0	112	0	0	0	0	0	0	84	23	0	107	257
Total	95	0	52	6	153	113	469	0	0	582	0	0	0	0	0	0	342	94	0	436	1171
05:00 PM	24	0	19	2	45	18	92	0	0	110	0	0	0	0	0	0	86	24	0	110	265
05:15 PM	17	0	18	2	37	12	96	0	1	109	0	0	0	0	0	0	75	18	0	93	239
05:30 PM	22	0	15	0	37	14	78	0	0	92	0	0	0	0	0	0	66	18	0	84	213
05:45 PM	18	0	15	1	34	13	76	0	0	89	0	0	0	0	0	0	65	18	0	83	206
Total	81	0	67	5	153	57	342	0	1	400	0	0	0	0	0	0	292	78	0	370	923
Grand Total	302	1	172	12	487	264	1189	2	1	1456	0	0	1	0	1	0	1015	275	0	1290	3234
Apprch %	62	0.2	35.3	2.5		18.1	81.7	0.1	0.1		0	0	100	0		0	78.7	21.3	0		
Total %	9.3	0	5.3	0.4	15.1	8.2	36.8	0.1	0	45	0	0	0	0	0	0	31.4	8.5	0	39.9	
Lights	300	1	170	12	483	263	1187									1010					
% Lights	99.3	100	98.8	100	99.2	99.6	99.8	100	100	99.8	0	0	100	0	100	0	99.5	100	0	99.6	99.6
Buses	0	0	2	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
% Buses	0	0	1.2	0	0.4	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.1
Trucks	2	0	0	0	2	1	1	0	0	2	0	0	0	0	0	0	5	0	0	5	9
% Trucks	0.7	0	0	0	0.4	0.4	0.1	0	0	0.1	0	0	0	0	0	0	0.5	0	0	0.4	0.3

Connecticut Counts LLC

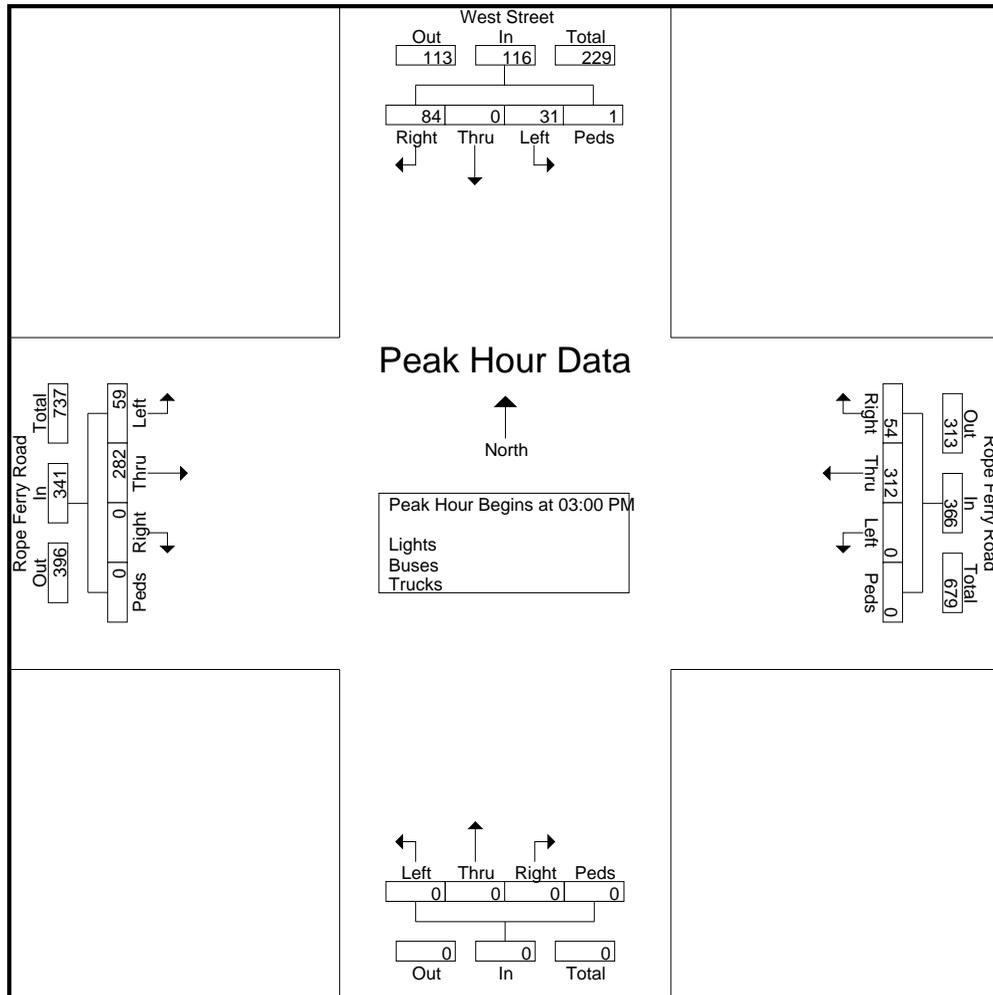
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23530
Site Code : 23530
Start Date : 10/12/2022
Page No : 2

Start Time	West Street From North					Rope Ferry Road From East					From South					Rope Ferry 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 02:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 03:00 PM

03:00 PM	16	0	8	0	24	12	69	0	0	81	0	0	0	0	0	0	73	8	0	81	186
03:15 PM	26	0	6	0	32	11	77	0	0	88	0	0	0	0	0	0	70	14	0	84	204
03:30 PM	18	0	8	0	26	19	85	0	0	104	0	0	0	0	0	0	71	20	0	91	221
03:45 PM	24	0	9	1	34	12	81	0	0	93	0	0	0	0	0	0	68	17	0	85	212
Total Volume	84	0	31	1	116	54	312	0	0	366	0	0	0	0	0	0	282	59	0	341	823
% App. Total	72.4	0	26.7	0.9		14.8	85.2	0	0		0	0	0	0		0	82.7	17.3	0		
PHF	.808	.000	.861	.250	.853	.711	.918	.000	.000	.880	.000	.000	.000	.000	.000	.000	.966	.738	.000	.937	.931



Connecticut Counts LLC

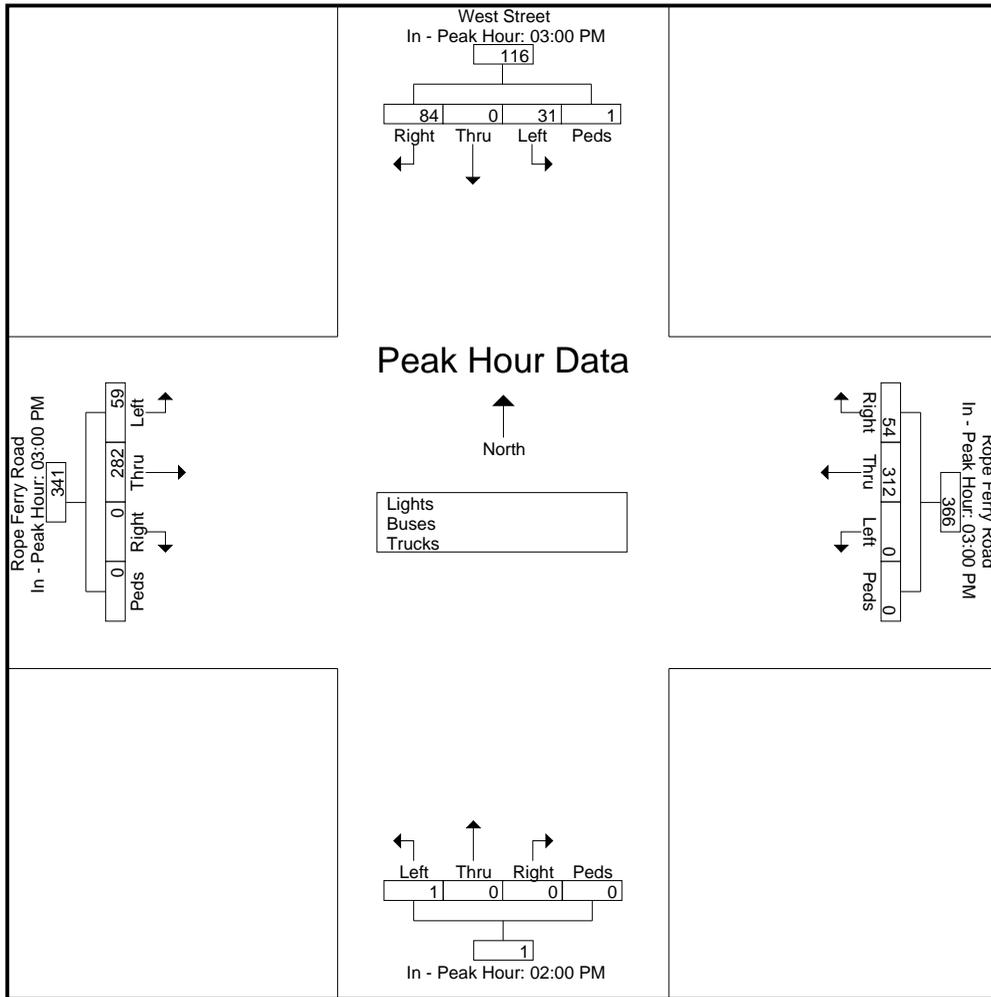
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23530
Site Code : 23530
Start Date : 10/12/2022
Page No : 3

Start Time	West Street From North					Rope Ferry Road From East					From South					Rope Ferry 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 02:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM					03:00 PM					02:00 PM					03:00 PM				
+0 mins.	16	0	8	0	24	12	69	0	0	81	0	0	0	0	0	0	73	8	0	81
+15 mins.	26	0	6	0	32	11	77	0	0	88	0	0	1	0	1	0	70	14	0	84
+30 mins.	18	0	8	0	26	19	85	0	0	104	0	0	0	0	0	0	71	20	0	91
+45 mins.	24	0	9	1	34	12	81	0	0	93	0	0	0	0	0	0	68	17	0	85
Total Volume	84	0	31	1	116	54	312	0	0	366	0	0	1	0	1	0	282	59	0	341
% App. Total	72.4	0	26.7	0.9		14.8	85.2	0	0		0	0	100	0		0	82.7	17.3	0	
PHF	.808	.000	.861	.250	.853	.711	.918	.000	.000	.880	.000	.000	.250	.000	.250	.000	.966	.738	.000	.937



Connecticut Counts LLC
Kensington, Connecticut 06037
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Route 1 at Niantic River Road
 Waterford, Connecticut

File Name : 23542
 Site Code : 23542
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	From North					Route 1 From East					Niantic River Road From South					Route 1 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	
02:00 PM	0	0	0	0	0	0	96	27	0	123	23	0	24	1	48	13	93	0	0	106	277
02:15 PM	0	0	0	0	0	0	80	15	0	95	16	0	20	0	36	13	62	0	0	75	206
02:30 PM	0	0	0	0	0	0	84	18	0	102	13	0	13	0	26	11	70	0	0	81	209
02:45 PM	0	0	0	0	0	0	103	15	0	118	13	0	22	0	35	15	71	0	0	86	239
Total	0	0	0	0	0	0	363	75	0	438	65	0	79	1	145	52	296	0	0	348	931
03:00 PM	0	0	0	0	0	0	103	17	0	120	23	0	27	0	50	18	98	0	0	116	286
03:15 PM	0	0	0	0	0	0	101	21	0	122	19	0	23	0	42	27	89	0	0	116	280
03:30 PM	0	0	0	0	0	1	100	25	0	126	13	0	31	0	44	23	92	0	0	115	285
03:45 PM	0	0	0	0	0	0	100	15	0	115	16	0	29	0	45	27	73	0	0	100	260
Total	0	0	0	0	0	1	404	78	0	483	71	0	110	0	181	95	352	0	0	447	1111
04:00 PM	0	0	0	0	0	0	112	21	0	133	26	0	39	0	65	27	93	0	0	120	318
04:15 PM	0	0	0	0	0	0	95	31	0	126	15	0	46	0	61	23	107	0	0	130	317
04:30 PM	0	0	0	0	0	0	121	25	0	146	10	0	25	0	35	17	110	0	0	127	308
04:45 PM	0	0	0	0	0	0	98	21	0	119	20	0	20	2	42	27	123	0	0	150	311
Total	0	0	0	0	0	0	426	98	0	524	71	0	130	2	203	94	433	0	0	527	1254
05:00 PM	0	0	0	0	0	0	83	22	0	105	18	0	28	0	46	30	96	0	0	126	277
05:15 PM	0	0	0	0	0	0	99	34	0	133	18	0	18	0	36	24	83	0	0	107	276
05:30 PM	0	0	0	0	0	0	65	27	0	92	26	0	11	0	37	24	91	0	0	115	244
05:45 PM	0	0	0	0	0	0	69	19	0	88	19	0	15	0	34	21	76	0	0	97	219
Total	0	0	0	0	0	0	316	102	0	418	81	0	72	0	153	99	346	0	0	445	1016
Grand Total	0	0	0	0	0	1	1509	353	0	1863	288	0	391	3	682	340	1427	0	0	1767	4312
Apprch %	0	0	0	0		0.1	81	18.9	0		42.2	0	57.3	0.4		19.2	80.8	0	0		
Total %	0	0	0	0	0	0	35	8.2	0	43.2	6.7	0	9.1	0.1	15.8	7.9	33.1	0	0	41	
Lights	0	0	0	0	0	1	1490									1411					
% Lights	0	0	0	0	0	100	98.7	99.2	0	98.8	99.3	0	98.7	100	99	99.1	98.9	0	0	98.9	98.9
Buses	0	0	0	0	0	0	6	0	0	6	1	0	2	0	3	2	7	0	0	9	18
% Buses	0	0	0	0	0	0	0.4	0	0	0.3	0.3	0	0.5	0	0.4	0.6	0.5	0	0	0.5	0.4
Trucks	0	0	0	0	0	0	13	3	0	16	1	0	3	0	4	1	9	0	0	10	30
% Trucks	0	0	0	0	0	0	0.9	0.8	0	0.9	0.3	0	0.8	0	0.6	0.3	0.6	0	0	0.6	0.7

Connecticut Counts LLC

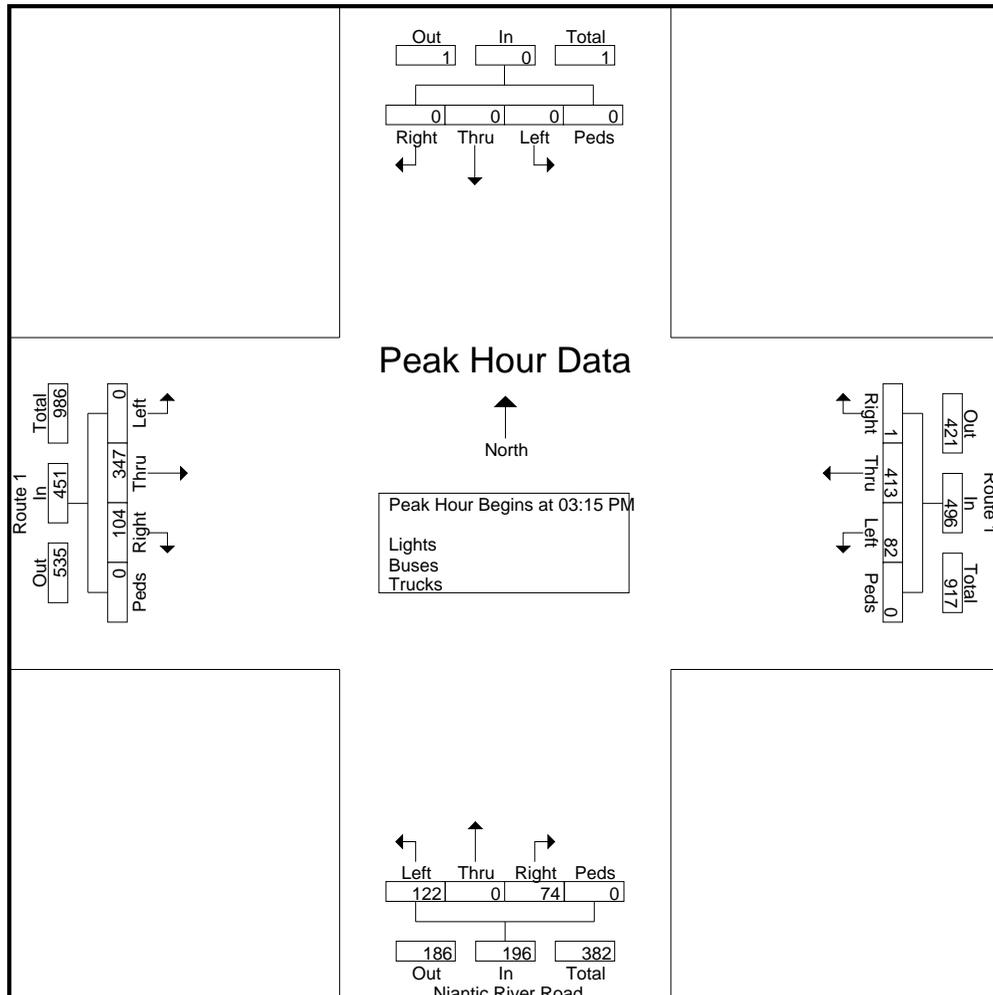
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23542
Site Code : 23542
Start Date : 10/12/2022
Page No : 2

Start Time	From North					Route 1 From East					Niantic River Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 02:00 PM to 04:00 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 03:15 PM

03:15 PM	0	0	0	0	0	0	101	21	0	122	19	0	23	0	42	27	89	0	0	116	280
03:30 PM	0	0	0	0	0	1	100	25	0	126	13	0	31	0	44	23	92	0	0	115	285
03:45 PM	0	0	0	0	0	0	100	15	0	115	16	0	29	0	45	27	73	0	0	100	260
04:00 PM	0	0	0	0	0	0	112	21	0	133	26	0	39	0	65	27	93	0	0	120	318
Total Volume	0	0	0	0	0	1	413	82	0	496	74	0	122	0	196	104	347	0	0	451	1143
% App. Total	0	0	0	0	0	0.2	83.3	16.5	0		37.8	0	62.2	0		23.1	76.9	0	0		
PHF	.000	.000	.000	.000	.000	.250	.922	.820	.000	.932	.712	.000	.782	.000	.754	.963	.933	.000	.000	.940	.899



Connecticut Counts LLC

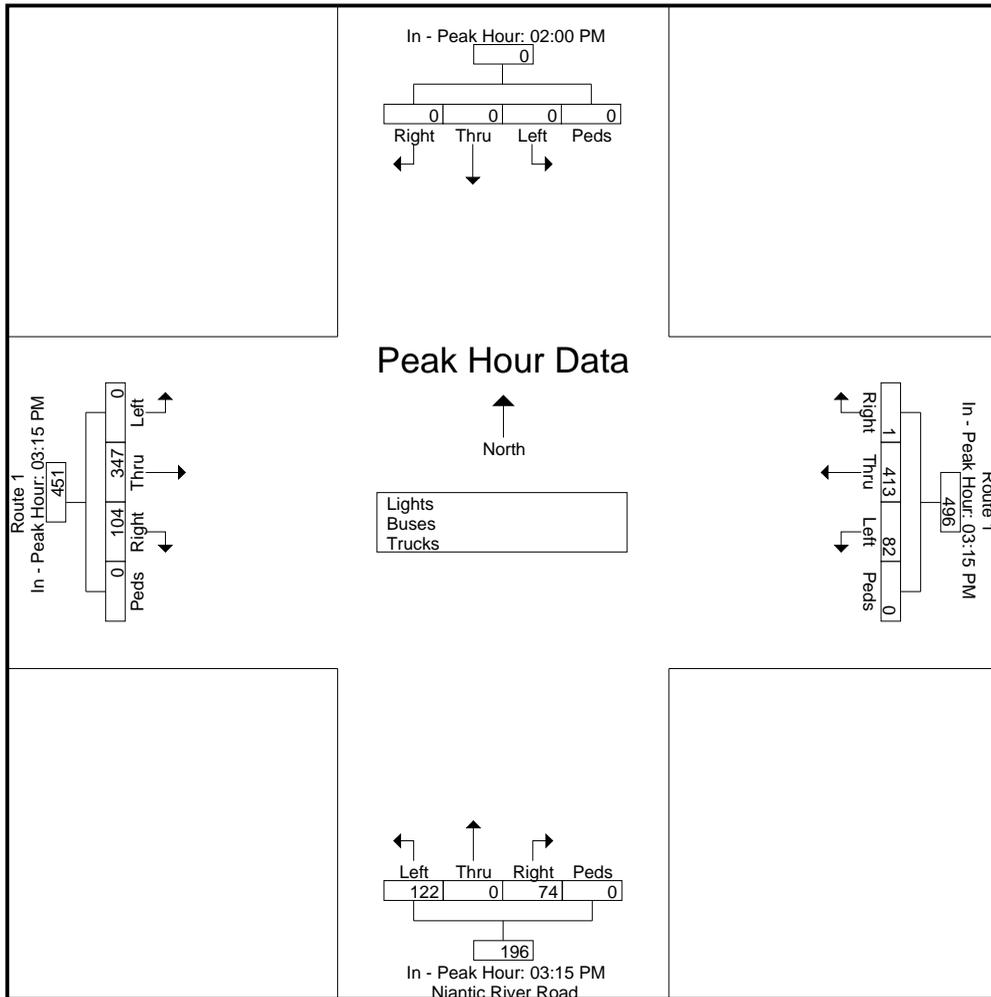
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23542
Site Code : 23542
Start Date : 10/12/2022
Page No : 3

Start Time	From North					Route 1 From East					Niantic River Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 02:00 PM to 04:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	02:00 PM					03:15 PM					03:15 PM					03:15 PM				
+0 mins.	0	0	0	0	0	0	101	21	0	122	19	0	23	0	42	27	89	0	0	116
+15 mins.	0	0	0	0	0	1	100	25	0	126	13	0	31	0	44	23	92	0	0	115
+30 mins.	0	0	0	0	0	0	100	15	0	115	16	0	29	0	45	27	73	0	0	100
+45 mins.	0	0	0	0	0	0	112	21	0	133	26	0	39	0	65	27	93	0	0	120
Total Volume	0	0	0	0	0	1	413	82	0	496	74	0	122	0	196	104	347	0	0	451
% App. Total	0	0	0	0	0	0.2	83.3	16.5	0		37.8	0	62.2	0		23.1	76.9	0	0	
PHF	.000	.000	.000	.000	.000	.250	.922	.820	.000	.932	.712	.000	.782	.000	.754	.963	.933	.000	.000	.940



Connecticut Counts LLC
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Route 1 at Spithead Road
 Waterford, Connecticut

File Name : 23540
 Site Code : 23540
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Lights - Trucks - Buses

Start Time	Spithead Road From North					Route 1 From East					Spithead Road From South					Route 1 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	
02:00 PM	17	18	58	0	93	63	73	3	0	139	3	32	3	0	38	5	64	19	0	88	358
02:15 PM	17	31	59	0	107	65	104	2	0	171	6	13	2	0	21	6	62	15	0	83	382
02:30 PM	18	31	48	0	97	66	87	3	0	156	3	35	9	0	47	7	60	9	0	76	376
02:45 PM	24	40	79	0	143	72	110	2	0	184	4	31	6	0	41	8	58	17	0	83	451
Total	76	120	244	0	440	266	374	10	0	650	16	111	20	0	147	26	244	60	0	330	1567
03:00 PM	12	23	55	0	90	75	81	4	0	160	0	24	6	0	30	9	70	21	0	100	380
03:15 PM	20	27	76	0	123	59	101	6	1	167	2	41	6	0	49	18	80	16	1	115	454
03:30 PM	19	47	73	0	139	68	113	8	0	189	5	28	6	0	39	6	87	15	0	108	475
03:45 PM	18	41	96	0	155	74	86	3	0	163	10	48	9	0	67	11	62	12	0	85	470
Total	69	138	300	0	507	276	381	21	1	679	17	141	27	0	185	44	299	64	1	408	1779
04:00 PM	16	42	61	0	119	99	95	4	0	198	2	65	8	0	75	9	81	20	0	110	502
04:15 PM	24	39	73	0	136	79	100	4	0	183	4	60	7	0	71	14	90	11	1	116	506
04:30 PM	23	33	86	0	142	71	107	3	0	181	4	56	0	0	60	10	92	20	0	122	505
04:45 PM	15	58	78	0	151	65	81	6	1	153	3	23	3	0	29	15	117	24	0	156	489
Total	78	172	298	0	548	314	383	17	1	715	13	204	18	0	235	48	380	75	1	504	2002
05:00 PM	19	37	83	0	139	55	75	9	1	140	4	28	13	0	45	7	77	16	0	100	424
05:15 PM	30	44	50	0	124	57	86	6	0	149	6	28	4	0	38	12	90	13	0	115	426
05:30 PM	16	36	63	0	115	53	83	5	0	141	3	23	6	0	32	12	98	16	0	126	414
05:45 PM	16	38	53	0	107	36	78	7	0	121	3	19	2	2	26	5	69	18	0	92	346
Total	81	155	249	0	485	201	322	27	1	551	16	98	25	2	141	36	334	63	0	433	1610
Grand Total	304	585	1091	0	1980	1057	1460	75	3	2595	62	554	90	2	708	154	1257	262	2	1675	6958
Apprch %	15.4	29.5	55.1	0		40.7	56.3	2.9	0.1		8.8	78.2	12.7	0.3		9.2	75	15.6	0.1		
Total %	4.4	8.4	15.7	0	28.5	15.2	21	1.1	0	37.3	0.9	8	1.3	0	10.2	2.2	18.1	3.8	0	24.1	
Lights	298	584	1084			1054	1460									1255					
% Lights	98	99.8	99.4	0	99.3	99.7	100	100	100	99.9	98.4	100	92.2	100	98.9	93.5	99.8	95.8	100	98.6	99.3
Trucks	6	1	6	0	13	3	0	0	0	3	1	0	7	0	8	9	2	11	0	22	46
% Trucks	2	0.2	0.5	0	0.7	0.3	0	0	0	0.1	1.6	0	7.8	0	1.1	5.8	0.2	4.2	0	1.3	0.7
Buses	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
% Buses	0	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0	0.1	0

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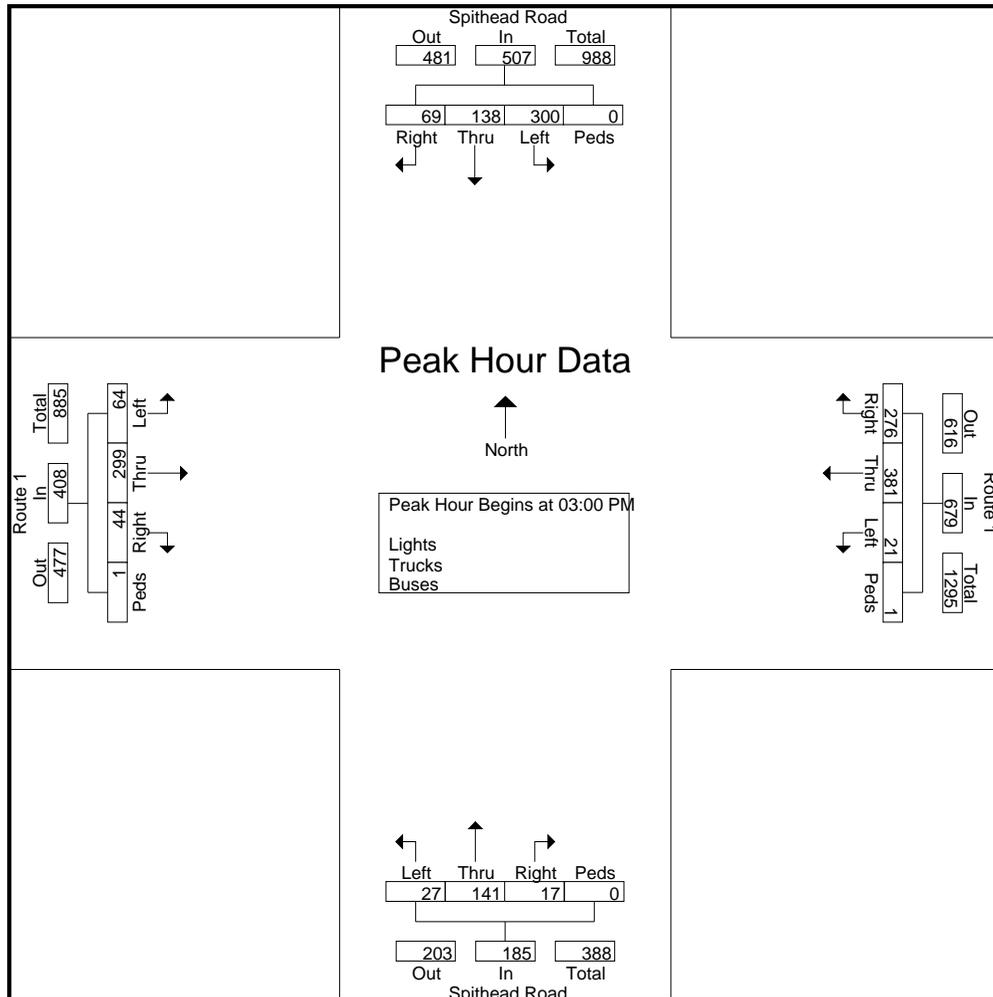
File Name : 23540
Site Code : 23540
Start Date : 10/12/2022
Page No : 2

Start Time	Spithead Road From North					Route 1 From East					Spithead Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 03:00 PM

03:00 PM	12	23	55	0	90	75	81	4	0	160	0	24	6	0	30	9	70	21	0	100	380
03:15 PM	20	27	76	0	123	59	101	6	1	167	2	41	6	0	49	18	80	16	1	115	454
03:30 PM	19	47	73	0	139	68	113	8	0	189	5	28	6	0	39	6	87	15	0	108	475
03:45 PM	18	41	96	0	155	74	86	3	0	163	10	48	9	0	67	11	62	12	0	85	470
Total Volume	69	138	300	0	507	276	381	21	1	679	17	141	27	0	185	44	299	64	1	408	1779
% App. Total	13.6	27.2	59.2	0		40.6	56.1	3.1	0.1		9.2	76.2	14.6	0		10.8	73.3	15.7	0.2		
PHF	.863	.734	.781	.000	.818	.920	.843	.656	.250	.898	.425	.734	.750	.000	.690	.611	.859	.762	.250	.887	.936



Connecticut Counts LLC

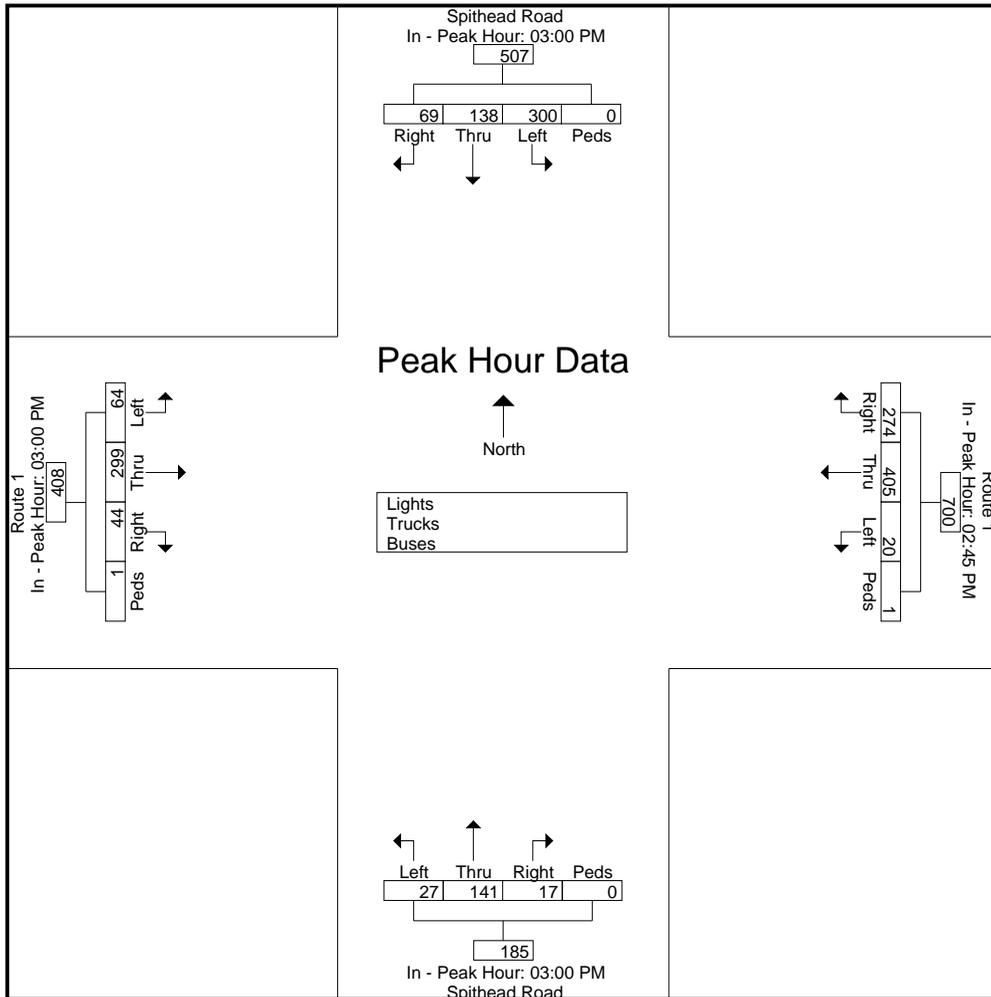
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23540
Site Code : 23540
Start Date : 10/12/2022
Page No : 3

Start Time	Spithead Road From North					Route 1 From East					Spithead Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM					02:45 PM					03:00 PM					03:00 PM				
+0 mins.	12	23	55	0	90	72	110	2	0	184	0	24	6	0	30	9	70	21	0	100
+15 mins.	20	27	76	0	123	75	81	4	0	160	2	41	6	0	49	18	80	16	1	115
+30 mins.	19	47	73	0	139	59	101	6	1	167	5	28	6	0	39	6	87	15	0	108
+45 mins.	18	41	96	0	155	68	113	8	0	189	10	48	9	0	67	11	62	12	0	85
Total Volume	69	138	300	0	507	274	405	20	1	700	17	141	27	0	185	44	299	64	1	408
% App. Total	13.6	27.2	59.2	0		39.1	57.9	2.9	0.1		9.2	76.2	14.6	0		10.8	73.3	15.7	0.2	
PHF	.863	.734	.781	.000	.818	.913	.896	.625	.250	.926	.425	.734	.750	.000	.690	.611	.859	.762	.250	.887



Connecticut Counts LLC
Kensington, Connecticut 06037
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Spithead Road at Daniels Road
 Waterford, Connecticut

File Name : 23534
 Site Code : 23534
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Spithead Road From North					From East					Spithead Road From South					Daniels 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	
02:00 PM	5	10	0	0	15	0	0	0	0	0	0	19	3	0	22	2	0	2	0	4	41
02:15 PM	7	20	0	0	27	0	0	0	0	0	0	17	7	0	24	3	0	8	0	11	62
02:30 PM	3	27	0	0	30	0	0	0	0	0	0	19	1	0	20	1	0	8	0	9	59
02:45 PM	6	21	1	0	28	0	0	0	0	0	0	19	3	0	22	3	0	5	0	8	58
Total	21	78	1	0	100	0	0	0	0	0	0	74	14	0	88	9	0	23	0	32	220
03:00 PM	9	17	0	0	26	0	0	0	0	0	0	28	4	0	32	4	0	7	0	11	69
03:15 PM	7	21	0	0	28	0	0	0	0	0	0	26	2	0	28	4	0	2	0	6	62
03:30 PM	8	25	0	0	33	0	0	0	0	0	0	33	3	0	36	5	0	2	0	7	76
03:45 PM	8	28	0	0	36	0	0	0	0	0	0	35	3	0	38	6	0	10	0	16	90
Total	32	91	0	0	123	0	0	0	0	0	0	122	12	0	134	19	0	21	0	40	297
04:00 PM	8	22	0	0	30	0	0	0	0	0	0	58	7	0	65	3	0	4	0	7	102
04:15 PM	9	21	0	0	30	0	0	0	0	0	0	53	5	0	58	3	0	7	0	10	98
04:30 PM	7	19	0	0	26	0	0	0	0	0	0	41	2	0	43	1	0	5	0	6	75
04:45 PM	12	43	0	0	55	0	0	0	0	0	0	19	3	0	22	0	0	5	0	5	82
Total	36	105	0	0	141	0	0	0	0	0	0	171	17	0	188	7	0	21	0	28	357
05:00 PM	4	40	0	0	44	0	0	0	0	0	0	27	5	0	32	7	0	3	0	10	86
05:15 PM	5	29	0	0	34	0	0	0	0	0	0	16	9	0	25	9	0	4	0	13	72
05:30 PM	8	24	0	0	32	0	0	0	0	0	0	12	4	0	16	3	0	7	0	10	58
05:45 PM	9	21	0	0	30	0	0	0	0	0	0	10	3	0	13	4	0	4	0	8	51
Total	26	114	0	0	140	0	0	0	0	0	0	65	21	0	86	23	0	18	0	41	267
Grand Total	115	388	1	0	504	0	0	0	0	0	0	432	64	0	496	58	0	83	0	141	1141
Apprch %	22.8	77	0.2	0		0	0	0	0		0	87.1	12.9	0		41.1	0	58.9	0		
Total %	10.1	34	0.1	0	44.2	0	0	0	0	0	0	37.9	5.6	0	43.5	5.1	0	7.3	0	12.4	
Lights	115	384	0	0	499	0	0	0	0	0	0	431	62	0	493	56	0	83	0	139	1131
% Lights	100	99	0	0	99	0	0	0	0	0	0	99.8	96.9	0	99.4	96.6	0	100	0	98.6	99.1
Buses	0	3	0	0	3	0	0	0	0	0	0	1	2	0	3	2	0	0	0	2	8
% Buses	0	0.8	0	0	0.6	0	0	0	0	0	0	0.2	3.1	0	0.6	3.4	0	0	0	1.4	0.7
Trucks	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% Trucks	0	0.3	100	0	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2

Connecticut Counts LLC

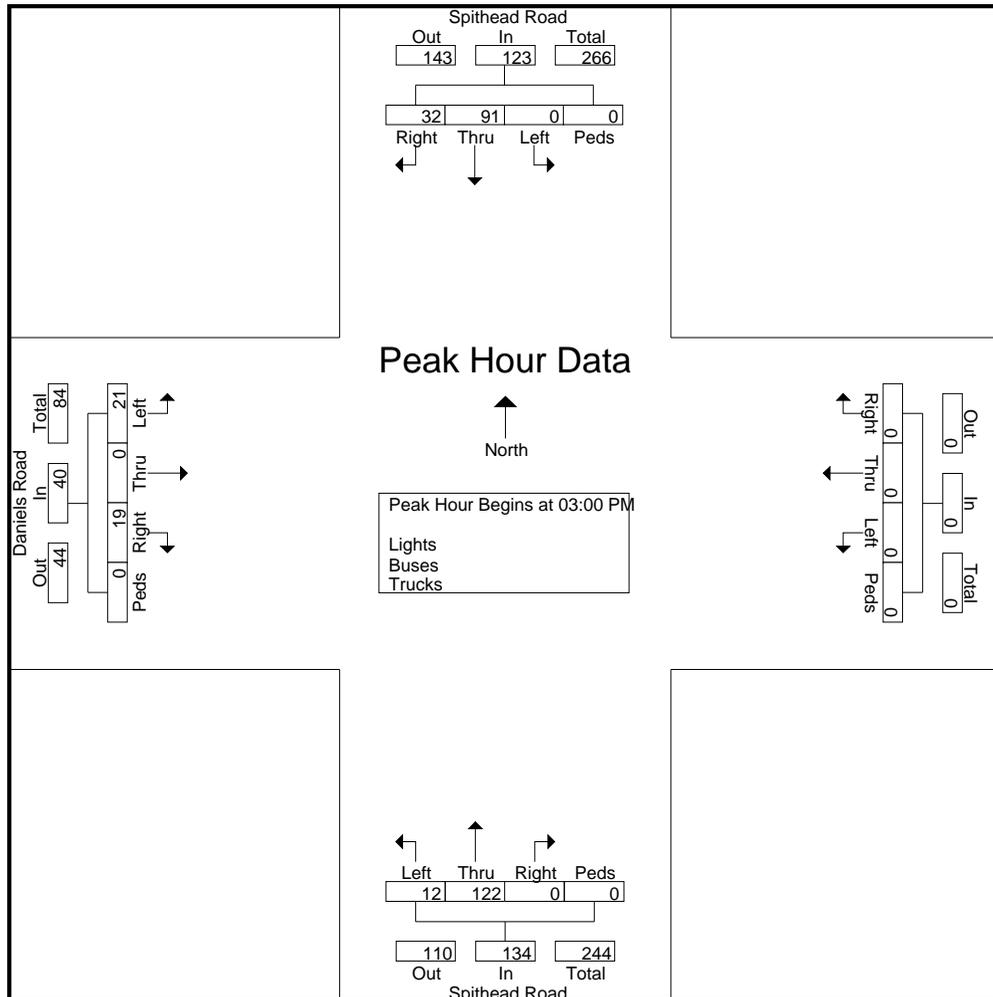
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23534
Site Code : 23534
Start Date : 10/12/2022
Page No : 2

Start Time	Spithead Road From North					From East					Spithead Road From South					Daniels 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 02:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 03:00 PM

03:00 PM	9	17	0	0	26	0	0	0	0	0	0	28	4	0	32	4	0	7	0	11	69
03:15 PM	7	21	0	0	28	0	0	0	0	0	0	26	2	0	28	4	0	2	0	6	62
03:30 PM	8	25	0	0	33	0	0	0	0	0	0	33	3	0	36	5	0	2	0	7	76
03:45 PM	8	28	0	0	36	0	0	0	0	0	0	35	3	0	38	6	0	10	0	16	90
Total Volume	32	91	0	0	123	0	0	0	0	0	0	122	12	0	134	19	0	21	0	40	297
% App. Total	26	74	0	0		0	0	0	0	0	0	91	9	0		47.5	0	52.5	0		
PHF	.889	.813	.000	.000	.854	.000	.000	.000	.000	.000	.000	.871	.750	.000	.882	.792	.000	.525	.000	.625	.825



Connecticut Counts LLC

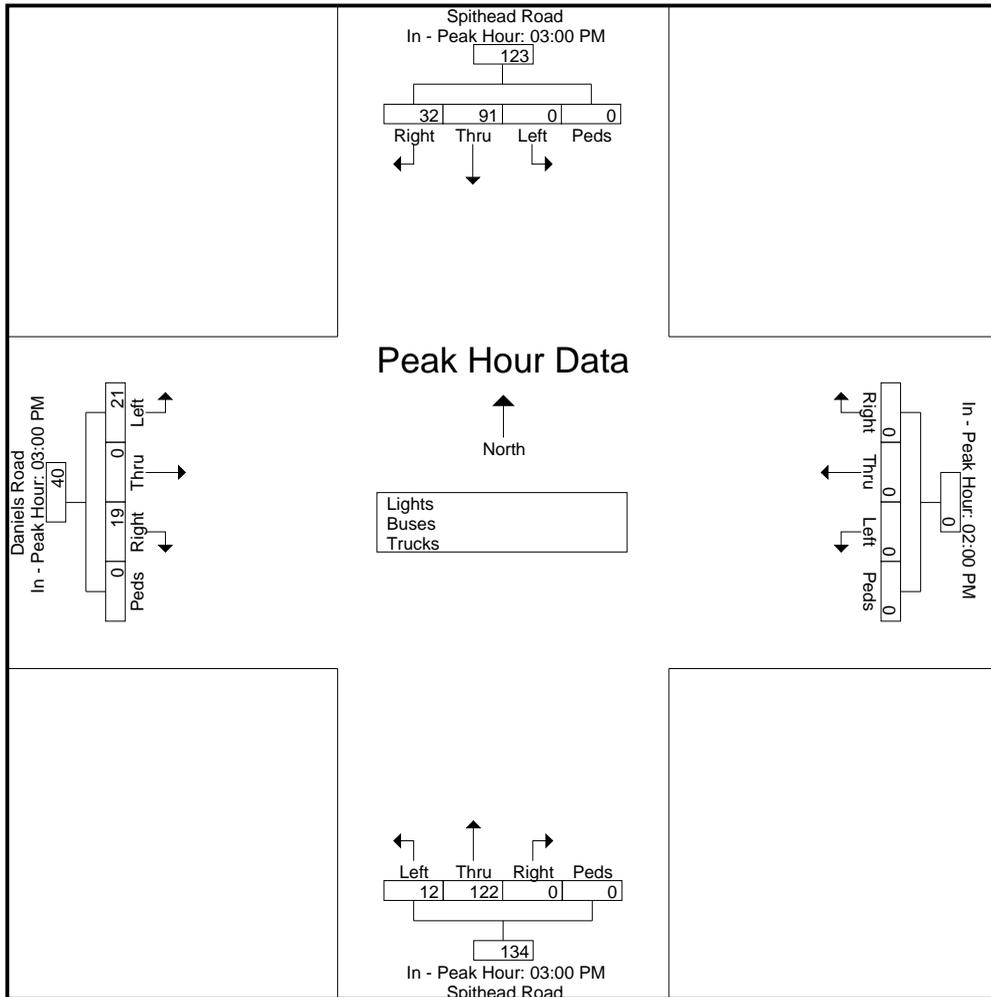
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23534
Site Code : 23534
Start Date : 10/12/2022
Page No : 3

Start Time	Spithead Road From North					From East					Spithead Road From South					Daniels 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 02:00 PM to 03:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:00 PM					02:00 PM					03:00 PM					03:00 PM				
+0 mins.	9	17	0	0	26	0	0	0	0	0	0	28	4	0	32	4	0	7	0	11
+15 mins.	7	21	0	0	28	0	0	0	0	0	0	26	2	0	28	4	0	2	0	6
+30 mins.	8	25	0	0	33	0	0	0	0	0	0	33	3	0	36	5	0	2	0	7
+45 mins.	8	28	0	0	36	0	0	0	0	0	0	35	3	0	38	6	0	10	0	16
Total Volume	32	91	0	0	123	0	0	0	0	0	0	122	12	0	134	19	0	21	0	40
% App. Total	26	74	0	0		0	0	0	0		0	91	9	0		47.5	0	52.5	0	
PHF	.889	.813	.000	.000	.854	.000	.000	.000	.000	.000	.000	.871	.750	.000	.882	.792	.000	.525	.000	.625



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

Spithead Road at Rope Ferry Road
 Waterford, Connecticut

File Name : 23532
 Site Code : 23532
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Lights - Buses - Trucks

Start Time	Rope Ferry Road From North					Private Drive From East					Rope Ferry Road From South					Spithead 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	
02:00 PM	5	64	0	0	69	0	0	0	0	0	0	66	19	0	85	5	0	4	0	9	163
02:15 PM	8	62	1	0	71	0	0	0	0	0	1	65	17	0	83	17	0	8	0	25	179
02:30 PM	5	59	0	0	64	0	0	0	0	0	0	58	16	0	74	16	0	4	0	20	158
02:45 PM	9	71	0	0	80	0	0	0	0	0	0	51	22	0	73	16	1	5	0	22	175
Total	27	256	1	0	284	0	0	0	0	0	1	240	74	0	315	54	1	21	0	76	675
03:00 PM	11	69	1	0	81	0	0	0	0	0	0	64	27	0	91	18	1	7	0	26	198
03:15 PM	4	56	1	0	61	0	0	0	0	0	1	68	22	0	91	15	2	8	0	25	177
03:30 PM	6	75	3	0	84	0	0	0	0	0	2	49	26	0	77	15	3	10	0	28	189
03:45 PM	7	82	18	0	107	0	0	0	0	0	10	68	32	0	110	18	6	9	0	33	250
Total	28	282	23	0	333	0	0	0	0	0	13	249	107	0	369	66	12	34	0	112	814
04:00 PM	10	73	1	0	84	0	0	0	0	0	1	63	53	0	117	18	0	3	3	24	225
04:15 PM	9	82	2	0	93	0	0	0	0	0	0	74	54	0	128	23	1	1	3	28	249
04:30 PM	6	80	3	0	89	0	0	0	2	2	4	79	35	0	118	18	1	3	2	24	233
04:45 PM	6	100	12	0	118	0	0	0	0	0	8	63	18	0	89	37	3	2	0	42	249
Total	31	335	18	0	384	0	0	0	2	2	13	279	160	0	452	96	5	9	8	118	956
05:00 PM	13	93	0	0	106	0	0	0	0	0	2	73	16	0	91	39	0	3	0	42	239
05:15 PM	10	90	1	0	101	0	0	0	0	0	0	68	17	0	85	30	0	14	0	44	230
05:30 PM	6	64	1	0	71	0	0	0	0	0	0	61	10	0	71	25	0	2	2	29	171
05:45 PM	6	68	0	0	74	0	0	0	0	0	0	60	7	0	67	17	0	8	1	26	167
Total	35	315	2	0	352	0	0	0	0	0	2	262	50	0	314	111	0	27	3	141	807
Grand Total	121	1188	44	0	1353	0	0	0	2	2	29	1030	391	0	1450	327	18	91	11	447	3252
Apprch %	8.9	87.8	3.3	0		0	0	0	100		2	71	27	0		73.2	4	20.4	2.5		
Total %	3.7	36.5	1.4	0	41.6	0	0	0	0.1	0.1	0.9	31.7	12	0	44.6	10.1	0.6	2.8	0.3	13.7	
Lights	116	1182										1020									
% Lights	95.9	99.5	100	0	99.2	0	0	0	100	100	96.6	99	99.5	0	99.1	100	100	97.8	100	99.6	99.2
Buses	4	3	0	0	7	0	0	0	0	0	0	5	0	0	5	0	0	2	0	2	14
% Buses	3.3	0.3	0	0	0.5	0	0	0	0	0	0	0.5	0	0	0.3	0	0	2.2	0	0.4	0.4
Trucks	1	3	0	0	4	0	0	0	0	0	1	5	2	0	8	0	0	0	0	0	12
% Trucks	0.8	0.3	0	0	0.3	0	0	0	0	0	3.4	0.5	0.5	0	0.6	0	0	0	0	0	0.4

Connecticut Counts LLC

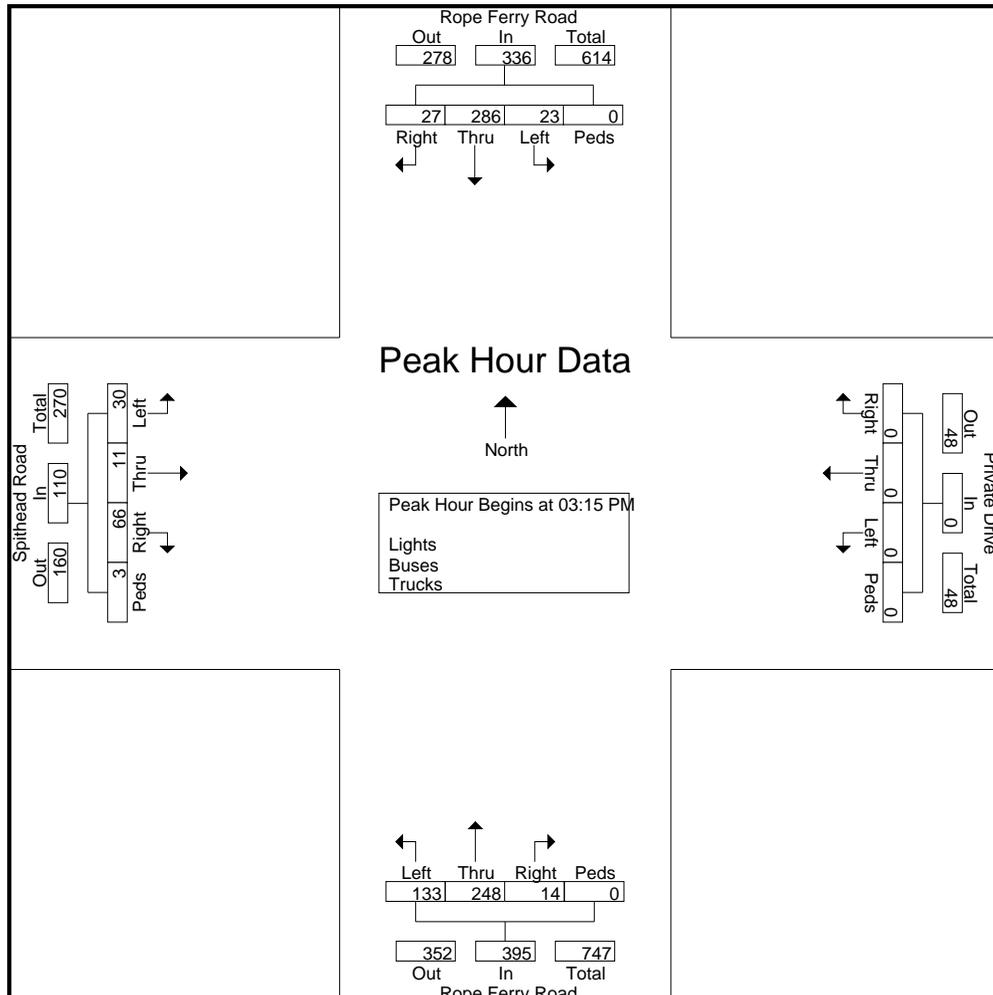
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23532
Site Code : 23532
Start Date : 10/12/2022
Page No : 2

Start Time	Rope Ferry Road From North					Private Drive From East					Rope Ferry Road From South					Spithead 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 02:00 PM to 04:00 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 03:15 PM

03:15 PM	4	56	1	0	61	0	0	0	0	0	1	68	22	0	91	15	2	8	0	25	177
03:30 PM	6	75	3	0	84	0	0	0	0	0	2	49	26	0	77	15	3	10	0	28	189
03:45 PM	7	82	18	0	107	0	0	0	0	0	10	68	32	0	110	18	6	9	0	33	250
04:00 PM	10	73	1	0	84	0	0	0	0	0	1	63	53	0	117	18	0	3	3	24	225
Total Volume	27	286	23	0	336	0	0	0	0	0	14	248	133	0	395	66	11	30	3	110	841
% App. Total	8	85.1	6.8	0		0	0	0	0		3.5	62.8	33.7	0		60	10	27.3	2.7		
PHF	.675	.872	.319	.000	.785	.000	.000	.000	.000	.000	.350	.912	.627	.000	.844	.917	.458	.750	.250	.833	.841



Connecticut Counts LLC

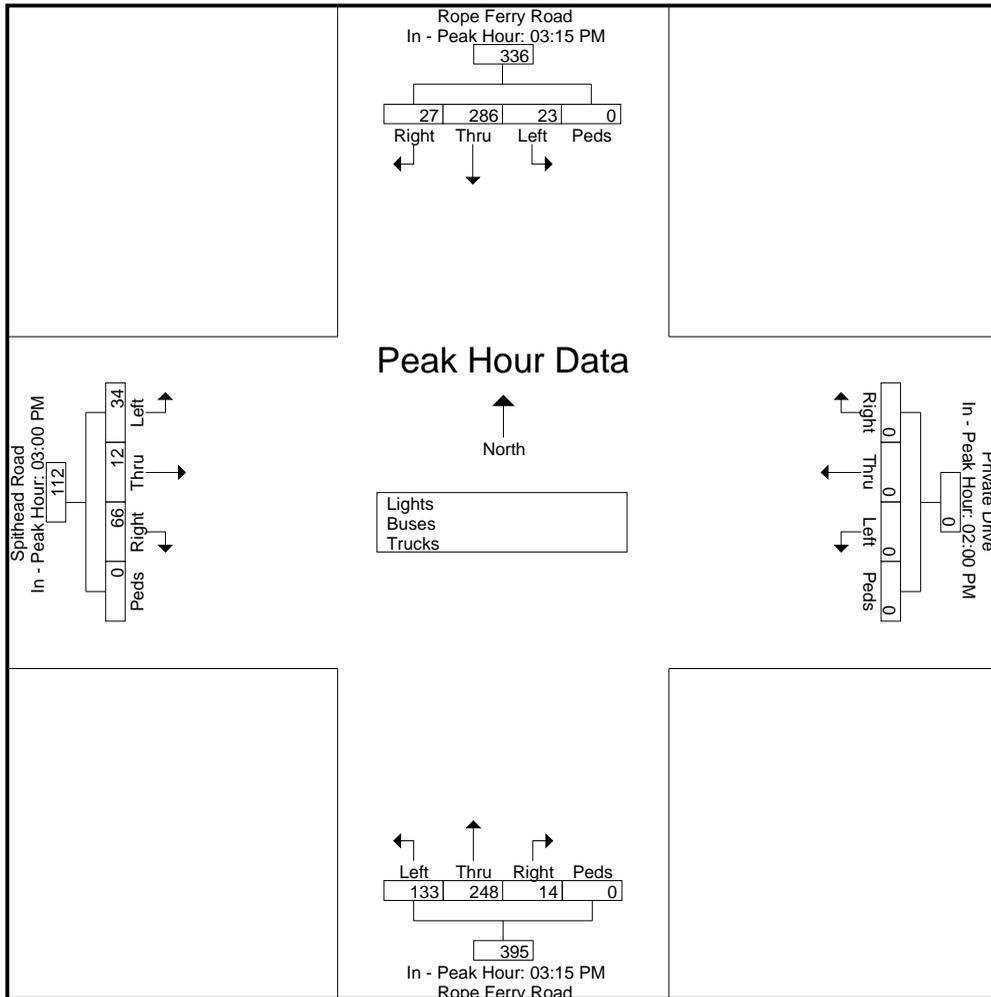
Kensington, Connecticut 06037
(860) 828-1693

File Name : 23532
Site Code : 23532
Start Date : 10/12/2022
Page No : 3

Start Time	Rope Ferry Road From North					Private Drive From East					Rope Ferry Road From South					Spithead 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 02:00 PM to 04:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	03:15 PM					02:00 PM					03:15 PM					03:00 PM				
+0 mins.	4	56	1	0	61	0	0	0	0	0	1	68	22	0	91	18	1	7	0	26
+15 mins.	6	75	3	0	84	0	0	0	0	0	2	49	26	0	77	15	2	8	0	25
+30 mins.	7	82	18	0	107	0	0	0	0	0	10	68	32	0	110	15	3	10	0	28
+45 mins.	10	73	1	0	84	0	0	0	0	0	1	63	53	0	117	18	6	9	0	33
Total Volume	27	286	23	0	336	0	0	0	0	0	14	248	133	0	395	66	12	34	0	112
% App. Total	8	85.1	6.8	0		0	0	0	0		3.5	62.8	33.7	0		58.9	10.7	30.4	0	
PHF	.675	.872	.319	.000	.785	.000	.000	.000	.000	.000	.350	.912	.627	.000	.844	.917	.500	.850	.000	.848



Connecticut Counts LLC
Kensington, Connecticut 06037
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Route 1 at Sunnycrest Dr
 Waterford, Connecticut

File Name : 23540
 Site Code : 23540
 Start Date : 10/12/2022
 Page No : 1

Groups Printed- Sunnycrest Dr

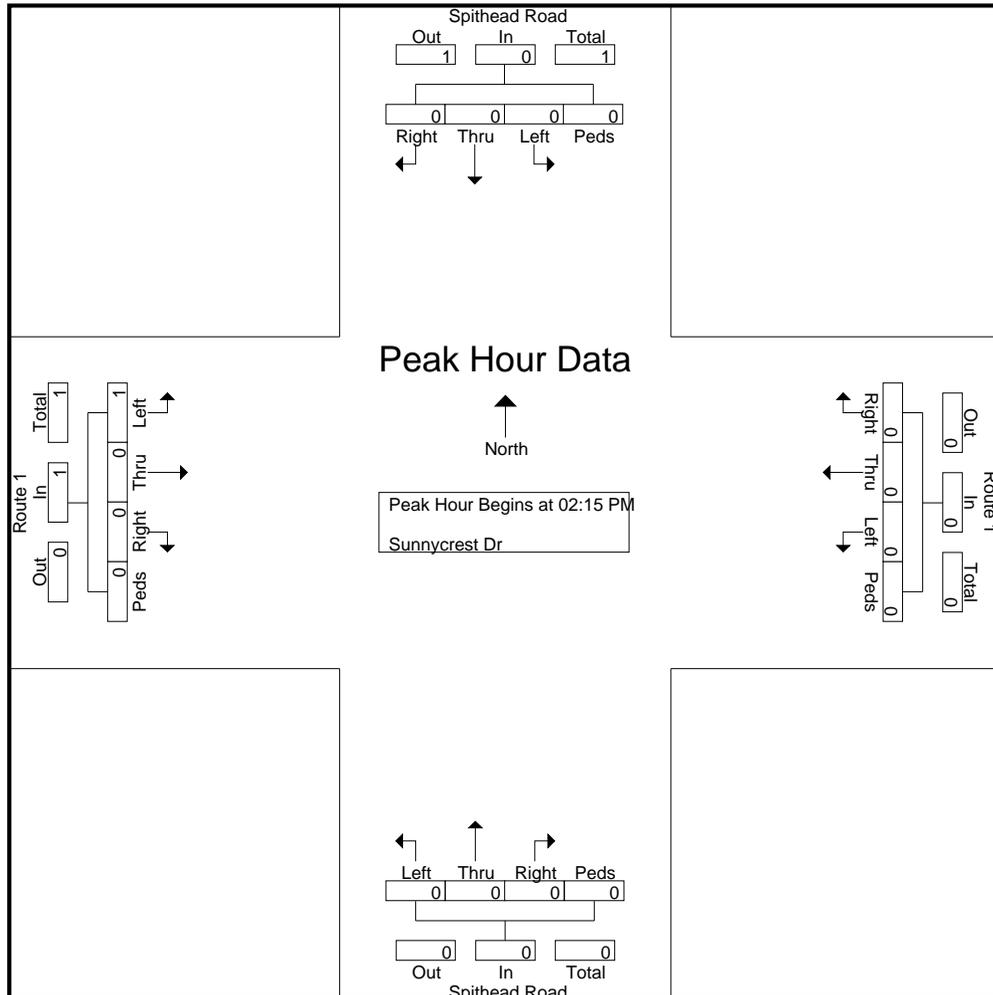
Start Time	Spithead Road From North					Route 1 From East					Spithead Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
*** BREAK ***																					
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
*** BREAK ***																					
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:00 PM	1	1	2	0	4	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	6
04:15 PM	1	0	1	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
*** BREAK ***																					
04:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	3	1	3	0	7	2	0	0	0	2	0	0	0	0	0	0	0	1	0	1	10
05:00 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
05:15 PM	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
05:30 PM	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
05:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	3
Total	3	0	3	0	6	1	0	0	0	1	0	0	0	0	0	0	0	4	0	4	11
Grand Total	6	1	6	0	13	3	0	0	0	3	0	0	0	0	0	0	0	6	0	6	22
Apprch %	46.2	7.7	46.2	0		100	0	0	0		0	0	0	0		0	0	100	0		
Total %	27.3	4.5	27.3	0	59.1	13.6	0	0	0	13.6	0	0	0	0	0	0	0	27.3	0	27.3	

Connecticut Counts LLC

Kensington, Connecticut 06037
(860) 828-1693

File Name : 23540
Site Code : 23540
Start Date : 10/12/2022
Page No : 2

Start Time	Spithead Road From North					Route 1 From East					Spithead Road From South					Route 1 From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:15 PM																					
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250



Appendix F

Crash Data Records

Uconn Crash Data
 LEARN Early Childhood School TIS
 Waterford, Connecticut
 January 1, 2022 - December 31, 2024

Date Of Crash	Time of Crash	Severity	No. of Vehicles	Number Of Non-Motorist	Intersecting Roadway	Collision Type	Weather	Light Condition	Road Surface Condition	Contributing Circumstances Roadway
01) Daniels Avenue at Site Driveway										
02) Daniels Avenue at Niantic River Road										
12/9/2023	16:33:00	Injury of any type (Serious, Minor, Possible)	2	0	NIANTIC RIVER RD	Angle	Clear	Dusk	Dry	None
10/28/2024	20:03:00	Injury of any type (Serious, Minor, Possible)	1	0	NIANTIC RIVER RD	Not Applicable	Clear	Dark-Lighted	Dry	None
03) Daniels Avenue at Spithead Road										
2/13/2022	6:57:00	Property Damage Only	1	0		Not Applicable	Snow	Daylight	Snow	Road Surface Condition (wet, icy, snow, slush, etc.)
5/27/2022	20:18:00	Injury of any type (Serious, Minor, Possible)	1	0		Not Applicable	Cloudy	Dusk	Wet	None
7/29/2023	16:13:00	Property Damage Only	1	0		Not Applicable	Clear	Daylight	Dry	None
04) Route 156 (Rope Ferry Road) at Spithead Road										
7/28/2022	16:30:00	Property Damage Only	2	0		Front to rear	Clear	Daylight	Dry	None
8/28/2022	20:57:00	Property Damage Only	2	0	SPITHEAD RD	Front to rear	Clear	Dark-Lighted	Dry	None
10/11/2024	14:55:00	Property Damage Only	2	0	SPITHEAD RD	Angle	Clear	Daylight	Dry	None
05) Route 156 (Rope Ferry Road) at West Street										
06) Niantic River at West Street										
07) Route 1 (Boston Post Road) at Niantic River Road										
1/30/2022	18:22:00	Injury of any type (Serious, Minor, Possible)	2	0		Sideswipe, opposite direction	Cloudy	Dark-Lighted	Slush	None
5/4/2022	21:03:00	Property Damage Only	2	0		Rear to side	Cloudy	Dark-Not Lighted	Dry	None
6/22/2022	13:57:00	Injury of any type (Serious, Minor, Possible)	2	0	NIANTIC RIVER RD	Angle	Cloudy	Daylight	Wet	None
7/17/2022	14:49:00	Injury of any type (Serious, Minor, Possible)	2	0		Sideswipe, same direction	Clear	Daylight	Dry	None
8/24/2022	12:56:00	Property Damage Only	3	0	NIANTIC RIVER RD	Front to rear	Clear	Daylight	Dry	None
12/31/2022	19:00:00	Property Damage Only	1	0	NIANTIC RIVER RD	Not Applicable	Rain	Dark-Lighted	Wet	Road Surface Condition (wet, icy, snow, slush, etc.)
1/24/2023	11:16:00	Property Damage Only	2	0		Front to rear	Clear	Daylight	Dry	None
5/17/2023	17:22:00	Injury of any type (Serious, Minor, Possible)	2	0	NIANTIC RIVER RD	Front to rear	Clear	Daylight	Dry	None
8/1/2023	11:48:00	Property Damage Only	2	0	NIANTIC RIVER RD	Sideswipe, opposite direction	Clear	Daylight	Dry	None
8/19/2023	20:56:00	Property Damage Only	2	0		Front to rear	Clear	Dark-Lighted	Dry	None
08) Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunnicrest Drive										
3/1/2022	11:44:00	Property Damage Only	1	0	1-N	Not Applicable	Clear	Daylight	Dry	None
4/28/2022	17:10:00	Property Damage Only	2	0		Front to rear	Clear	Daylight	Dry	None
6/17/2022	12:27:00	Property Damage Only	2	0	CROSS RD	Front to rear	Clear	Daylight	Dry	None
6/28/2022	15:45:00	Property Damage Only	2	0	CROSS RD	Front to rear	Clear	Daylight	Dry	None
8/16/2022	7:20:00	Property Damage Only	2	0		Front to rear	Clear	Daylight	Dry	None
9/23/2022	12:54:00	Property Damage Only	2	0		Sideswipe, same direction	Clear	Daylight	Dry	None
9/29/2022	12:02:00	Injury of any type (Serious, Minor, Possible)	3	0		Front to rear	Clear	Daylight	Dry	None
10/19/2022	10:44:00	Property Damage Only	3	0	CROSS RD	Front to rear	Cloudy	Daylight	Dry	None
10/4/2022	8:12:00	Property Damage Only	2	0		Angle	Rain	Daylight	Wet	None
10/29/2022	1:56:00	Property Damage Only	2	0		Front to front	Clear	Dark-Not Lighted	Dry	None
12/22/2022	13:43:00	Property Damage Only	2	0	CROSS RD	Angle	Cloudy	Daylight	Dry	None
1/3/2023	17:27:00	Property Damage Only	2	0		Angle	Clear	Dark-Not Lighted	Dry	None
5/1/2023	18:09:00	Property Damage Only	2	0		Sideswipe, same direction	Clear	Daylight	Dry	None
5/3/2023	16:15:00	Injury of any type (Serious, Minor, Possible)	2	0		Front to rear	Clear	Daylight	Dry	None
5/21/2023	12:00:00	Property Damage Only	2	0		Front to rear	Clear	Daylight	Dry	None
10/16/2023	16:22:00	Property Damage Only	2	0		Front to rear	Clear	Daylight	Dry	None
10/30/2023	17:20:00	Injury of any type (Serious, Minor, Possible)	2	0		Front to rear	Clear	Daylight	Dry	None
2/22/2024	9:02:00	Property Damage Only	2	0	SPITHEAD RD	Angle	Clear	Daylight	Dry	None
10/5/2024	10:55:00	Property Damage Only	2	0		Sideswipe, same direction	Clear	Daylight	Dry	None
10/6/2024	0:27:00	Property Damage Only	2	0		Angle	Clear	Dark-Lighted	Dry	None

CRASH DATA SUMMARY - January 2022 - December 2024
Daniels Avenue at Niantic River Road
WATERFORD, CONNECTICUT

Criteria

YEAR

2022	0
2023	1
2024	1
Total	2
Avg. No. of Crashes/ Year	0.67

CRASH TYPE

Angle	1
Guardrail Face	1
Total	2

SEVERITY

Injury - Possible	2
Total	2

CRASH DATA SUMMARY - January 2022 - December 2024
Daniels Avenue at Spithead Road
WATERFORD, CONNECTICUT

Criteria	
YEAR	
2022	2
2023	1
2024	0
Total	3
Avg. No. of Crashes/ Year	1.00
CRASH TYPE	
Embankment	1
Curb	1
Utility Pole/Light Support	1
Total	3
SEVERITY	
Property Damage Only	2
Injury - Minor	1
Total	3

CRASH DATA SUMMARY - January 2022 - December 2024
Route 156 (Rope Ferry Road) at Spithead Road
WATERFORD, CONNECTICUT

Criteria

YEAR

2022	2
2023	0
2024	1
Total	3
Avg. No. of Crashes/ Year	1.00

CRASH TYPE

Angle	1
Front to Rear	2
Total	3

SEVERITY

Property Damage Only	3
Total	3

CRASH DATA SUMMARY - January 2022 - December 2024
Route 1 (Boston Post Road) at Niantic River Road
WATERFORD, CONNECTICUT

Criteria	
YEAR	
2022	6
2023	4
2024	0
Total	10
Avg. No. of Crashes/ Year	3.33
CRASH TYPE	
Angle	1
Front to Rear	4
Rear to Side	1
Sideswipe, Opposite Direction	2
Sideswipe, Same Direction	1
Signal Pole	1
Total	10
SEVERITY	
Property Damage Only	6
Injury - Minor	2
Injury - Possible	2
Total	10

CRASH DATA SUMMARY - January 2022 - December 2024
Route 1 (Boston Post Road) at Spithead Road and Cross
WATERFORD, CONNECTICUT

Criteria	
YEAR	
2022	11
2023	6
2024	3
Total	20
Avg. No. of Crashes/ Year	6.67
CRASH TYPE	
Angle	5
Front to Front	1
Front to Rear	10
Sideswipe, Same Direction	3
Signal Pole	1
Total	20
SEVERITY	
Property Damage Only	17
Injury - Possible	3
Total	20

**REQUEST FOR SITE PLAN APPROVAL OF
PROPOSED SCHOOL FACILITY LOCATED AT
51 DANIELS AVENUE**

MAY 7, 2025

Kate Ericson
kericson@learn.k12.ct.us
Executive Director
LEARN
44 Hatchetts Hill Road
Old Lyme, CT 06371
Phone: 860 434 4800

Dean Gustafson, Soil Scientist
dgustafson@allpointstech.com
567 Vauxhall Street Extension – Suite 311
Waterford, CT 06385
Phone: 860 552 2033

Mark Vertucci PE, PTOE
mark.vertucci@fando.com
One Financial Plaza, 15th Floor
Hartford, CT 06103
Phone: (860) 783 4756

Katelyn Chapin AIA
kchapin@newmanarchitects.com
Newman Architects
265 Church Street, 15th Floor
New Haven, CT 06510
Phone:

Kathryn Gagnon PE, LEED AP
kgagnon@Langan.com
Long Wharf Maritime Center
555 Long Wharf Drive, 9th Floor
New Haven, CT 06511-6107
Phone: (203) 562 5771

Matthew Ranelli, Esq., LEED AP
mraneli@goodwin.com
Shipman & Goodwin LLP
265 Church Street, 12th Floor
New Haven, CT 06510
PHONE: (860) 251-5748

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MAY 7, 2025

1. Transmittal letter
2. Site Plan/Design Review Application Form
3. Plan Sheet CS100 showing proposed new lot lines, photo-reduced to 11" x 17"
4. Plan sheets CS101-102 showing site plan layout, photo reduced to 11" x 17"
5. Color Rendering of the Proposed Facility
6. Traffic Report (excerpt), prepared by Fuss & O'Neill, dated April 2025
7. Stormwater Management Report (excerpt), prepared by Langan, dated May 1, 2025
8. Environmental Assessment Report (excerpt), prepared by All-Points Technology Corp., dated May 1, 2025
9. Narrative Response to Pre-Application Review Comments from Town Professional Staff.
10. Notification letter to Waterford Utilities Commission/Water Company

SUBMITTED SEPARATELY

Application Fee

Full Size Plan Sets

Stormwater Management Report, prepared by Langan, dated May 1, 2025.

Traffic Report, prepared by Fuss & O'Neill, dated April 2025

Environmental Assessment Report, prepared by All-Points Technology Corp. dated May 1, 2025

TAB 1

Matt Ranelli
Phone: (203) 836-2805
MRanelli@goodwin.com

265 Church Street
Suite 1207
New Haven, CT 06510

May 7, 2024

Greg Massad, Chair and
Commission Members
Waterford Planning & Zoning Commission
15 Rope Ferry Road
Waterford, CT 06385

Jonathan Mullen
Planning Director
Mark Wujewicz
Planner
15 Rope Ferry Road
Waterford, CT 06385

Re: Request For Site Plan Approval of Proposed School Facility; 51 Daniels Avenue,
Waterford CT

Dear Chair Massad and Commission Members:

On behalf of our client, LEARN Regional Education Service Center (“LEARN”), we are pleased to submit to the Planning & Zoning Commission this application for site plan approval of a new school facility to replace the existing school facility (the former Southwest School) located at 51 Daniels Avenue in Waterford. The new public, magnet elementary school and daycare will improve the site with a modern facility that meets all modern standards, life safety codes, classroom design, energy efficiency, acoustic and ADA regulations. The school is an allowed use in the R-40 district by site plan approval and is consistent with the Town Plan of Conservation and Development for the site.

The Proposed Project and Statement of Use

LEARN is a Connecticut regional educational service center¹ that provides educational resources, programs and services to help meet the needs of the towns it serves, including Waterford. The Town of Waterford has agreed to sell a ±15.36-acre portion of the former Southwest School site at 51 Danial Avenue to LEARN for the purpose of constructing new school facility which is the subject of this application. The Town of Waterford will also retain a ±3.96-acre portion of the 51 Danials Avenue site to be merged with adjacent Town-owned open space land and in part for recreational use to construct two new pickleball courts – which are the

¹ Regional educational service centers were authorized by state statute starting in 1972 and based on voluntary partnerships with local towns and schools. LEARN serves Waterford and parts of other nearby towns.

subject of a separate site plan application filed simultaneously with this application and pending before the Commission. The areas to be sold to LEARN and the areas to be retained by the Town are shown on plan sheet CS100 (attached at Tab 3).

LEARN is proposing to replace the existing Southwest School building with a new combine magnet elementary school and daycare facility. The combined magnet elementary school and daycare will accommodate for a maximum of 574 students (with 526 students expected to occupy the magnet elementary school and 48 students to occupy the daycare center). The facility will serve Waterford residents as well as students from surrounding towns in accordance with LEARN's statutory authorization to provide public educational services to local towns and schools.

The new elementary school building be an upgrade over the existing building by meeting all the current building, life safety, efficiency and accessibility codes. In addition, the proposed plan includes replacing the existing conditions with a modern stormwater management system that satisfies Waterford's stormwater ordinances and the state guidance documents. The building is mostly located in the area of the existing school building and parking lot but expanded mostly to the rear of the lot to allow for the larger size structure and incorporation of courtyard like recreation areas. The proposed school design satisfies all setback, bulk and area standards and other provision of the Commission's regulations. The proposed school facility site plan layout is shown on plan sheets CS101 and CS102 (attached at Tab 4). The proposed single story design of the building and significant setback is compatible with the scale of the neighborhood and enhance the character of the community over the existing structure. A color rendering is provided at Tab 5 of these materials and additional elevations are provided in the plan sets.

Consistent with the Plan of Conservation and Development

The proposed plan is consistent with the Waterford Plan of Conservation and Development (POCD) (2012). The POCD future land use map (p. 81) identifies the site for future institutional and community use (as does the Regional POCD). The POCD implementation plan call for the site to be considered as a possible future school site and for recreation fields. The proposed plan satisfies both goals the first by selling a portion of the site to LEARN to develop a school and the second by the town retaining ownership of a portion of the site for increased open space recreation and adding two pickleball courts. In addition, the proposed plan advances several other goals contained in the POCD including preserving natural resources (p. 16), protecting water quality (p.17), increasing open space (p.25) and meeting community needs (p.67).

Traffic Report

LEARN retained a leading traffic engineer, Mark Vertucci PE, PTOE, of Fuss & O'Neill with statewide and local experience to evaluate the existing traffic conditions as well as the anticipated traffic generated by the school. Mr. Vertucci's traffic report is attached at Tab 6. To be conservative, the traffic report assumes that there is no traffic generated from the site under existing conditions even though the former Southwest School obviously generated traffic in a similar pattern as the proposed school. In addition, for purposes if the study the report assumed

that the elementary school and daycare pick up and drop off would peak at the same time notwithstanding the separate start times for each.

The traffic report determined the site access drive meets the recommended site line distances and the entrance has adequate capacity for queuing cars entering and exiting. The report also analyzed the nearby roadways and intersections and found sufficient capacity for the projected traffic volumes and acceptable levels of service. The report does make recommendations minor signal timing and optimization at the three signalized intersections included in the traffic study and recommends additional stop signs at the intersection of Daniels Avenue and Spithead Road. All of those recommendations are accepted by LEARN.

Stormwater Management

As detailed in the LEARN's stormwater report prepared by, Langan, (attached at Tab 7) the proposed stormwater management system is an improvement over existing conditions. The new system will provide better stormwater treatment and management that controls and reduces the peak runoff rate and total volume across all storm events up to and including the 100-year storm. The system satisfies the requirements contained in the Waterford Stormwater Ordinance and is consistent with the updated 2024 state Stormwater Quality Manual guidance document.

Wetlands

LEARN has filed a wetland application for a determination of no regulated activities or of non-regulated activities for the proposed school facility which is pending with the Conservation Commission. The proposed plan does not contain any direct wetland activities and no permanent disturbance in the 100-foot upland review area other than a small section of sidewalk located over 90 feet from the wetland boundary. LEARN's wetland expert, Dean Gustafson of All-Points Technology reviewed the plans, and concluded that the temporary disturbance and grading and sidewalk area will not adversely impact the wetlands. Mr. Gustafson's report is attached at Tab 8.

Conclusion

Based on the above, LEARN respectfully requests that the Commission grant site plan approval for the proposed school. We have included an application of \$660, if a different fee is due please let us know and we will pay it promptly. We look forward to the opportunity to present LEARN's application to you at the Commission next meeting. Thank you for consideration.

Sincerely,

Matthew Ranelli
Matthew Ranelli

Enclosures

TAB 2



Town of Waterford

Department of Planning and Development

www.waterfordct.org

Office Use Only

Date Submitted: _____

Processed By: _____

App. No.: _____

Total Fee: \$ _____

Electronic Submission

Waived: ____ Yes ____ No

PZC Form 1

Planning and Zoning Application

1. Type of Application(s), Use and Property Information *(check all that apply)*

- | | | |
|--|---|---|
| <input type="checkbox"/> Informal Staff Review | <input checked="" type="checkbox"/> Site Plan/Design Review | <input type="checkbox"/> Municipal Project (CGS§8-24) |
| <input type="checkbox"/> Special Permit/Design Review ¹ | <input type="checkbox"/> Subdivision /Resubdivision | <input type="checkbox"/> Lot line Adjustment |
| <input type="checkbox"/> Zoning Map Change | <input type="checkbox"/> Regulation Amendment(s) | <input type="checkbox"/> New District |
| <input type="checkbox"/> Multifamily Development | <input type="checkbox"/> Coastal Area Management ² | <input type="checkbox"/> Earth Excavation |
| <input type="checkbox"/> Flood Hazard Area | <input type="checkbox"/> Other: _____ | <input type="checkbox"/> Other: _____ |

Specify all uses and corresponding section for which this application applies³:

Use: Public School Section: 5.1.3

Use: _____ Section: _____

Use: _____ Section: _____

Name of proposed development/subdivision: _____ If subdivision how many lots?: _____

If applicable, are roadways proposed to be private, public or both:

- Private Public Both⁴

Parcel 1

Map/Block/Lot: 143 /1783 / /

Street No. & Name: 51 Daniels Avenue

Size SF/AC: 669,075 SF / 15.36 ac

Zoning District(s): R-40

Parcel 2

Map/Block/Lot: _____ / /

Street No. & Name: _____

Size SF/AC: _____ /

Zoning District(s): _____

¹ Include a completed list of property owners with Parcel ID, name, address and mailing address. It is the applicant's responsibility to distribute all notices certified return receipt. Evidence of mailing shall be submitted prior to the start of the hearing. Failure to do so will delay the opening of the hearing.

² Coastal Site Plan reviews under Coastal Area Management §25.4 must submit a completed PZC Form 2 in addition to this PZC Form 1.

³ The use listed must correspond to the exact use term noted within the zoning district as a permitted use allowed through site plan or special permit.

⁴ A plan must accompany the application clearly delineating the limits of public and private roads.

2. Applicant Information

Name: Katherine Ericson
 Title: Executive Director
 Company: LEARN
 Address: 44 Hatchetts Hill Rd.
 City/State: Old Lyme, CT
 Zip Code: 06371
 Telephone: 860.434.4800x1345 Fax: _____

Applicant's Authority to File Application⁵

- Legal Owner of Record
 Power of Attorney
 Contract to Purchase
 Other _____

Email: kericson@learn.k12.ct.us

3. Agent Information; if applicable

Name: Matt Ranelli
 Title: Partner
 Company: Shipman & Goodwin LLP
 Address: 265 Church Street, Suite 1207
 City/State: New Haven, CT
 Zip Code: 06510
 Telephone: 203-668-1519 Fax: _____

Specify Nature of Agent

- Attorney
 Civil Engineer
 Land Surveyor
 Design Professional; _____
 Other: _____

Bar/License/Reg. No.: _____

Email: MRanelli@goodwin.com

4. Property Owner(s) and Parcel(s) Information

Is owner co-applicant? Yes No

Note: If landowner is an LLC, Corporation, Trust or other legal entity, attach the names, addresses and title of each member or officer, including agent(s). If same as applicant list 'Same'.

Name: Hon. Robert Brule
 Title: First Selectman
 Company: Town of Waterford
 Address: 15 Rope Ferry Road
 City/State: Waterford, CT
 Zip Code: 06385
 Telephone: 860.442.0553
 Fax: _____
 Email: firstsel@waterfordct.org

Name: _____
 Title: _____
 Company: _____
 Address: _____
 City/State: _____
 Zip Code: _____
 Telephone: _____
 Fax: _____
 Email: _____

⁵ Applicant must submit evidence attesting to the authority to file application (i.e. deed, option for purchase, etc.)

5. Statement of Use

Attached a typed statement of use in conformance with the Zoning Regulations as described in Section 22.4.2. In addition include all hours and days of operation, size of buildings and number of stories, utilities servicing the parcel, variances received, number of employee and structures to be demolished.

6. Statement of Design Compatibility (Site Plans and Special Permits only)

Attach a statement describing how the building and site design is compatible with the neighborhood, character of Waterford and Zoning Regulations.

10. Consistency with Adopted Plan of Preservation, Conservation and Development (all applications)

Attach a statement attesting to how the proposed use, zone change, amendment or design is consistent with the most recent adopted Plan of Preservation, Conservation and Development (the Plan). Note relevant Plan section numbers and pages.

7. Natural and Cultural Resources

Yes	No		% of Property
<input type="checkbox"/>	<input checked="" type="checkbox"/>	a. Are inland wetlands present on site? Total SF/AC <u>625 SF</u> / <u>0.014 ac</u>	<u><0.5%</u>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	b. Are tidal wetlands present on site? Total SF/AC _____ / _____	_____
<input type="checkbox"/>	<input checked="" type="checkbox"/>	c. Are their known or suspected vernal pools on the property?	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	d. CT DEEP NDDDB: Are endangered, threatened or species of special concern suspected to be located on the property? <i>Applicant must attach an 8 1/2 x 11 map of the most current CT DEEP Natural Diversity Database with site clearly identified regardless of response provided. If you answered yes to item d., attach a letter from CT DEEP stating the name of the specie(s) that are suspected to be on the property. See Section 22 of the Zoning Regulations for additional information.</i>	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	e. Are floodplains or flood hazard areas on the property?	
		Identify: _____	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	f. Is the property located within a local, state or national historic district?	
		If yes identify district name: _____	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	g. Does the site possess any structures or sites listed on the local, state or national register of historic landmarks?	
		If yes, identify: _____	

8. Additional Information

Yes No

- a. Is any part of the site within 500' of the Town line? Which town: _____
- b. Will any egress or ingress for the property use streets within an adjoining municipality?
- c. Is any work proposed in wetlands or watercourses? Explain in Statement of Use
- d. Is any work proposed within 100 feet of a wetlands or watercourse? Explain in Statement of Use
- e. Is any work proposed within a floodplain or flood hazard area? Explain in Statement of Use
- f. Is public water available or proposed to the site? Identify: Public water service available
- g. Are public sanitary sewers available or proposed to the site? Identify: Sanitary sewer service available Telephone & Electric
- h. Is there a utility, drainage or other easement(s) on the site? Specify: distribution easements (see survey/CS100)
- i. Is open space proposed on the property?

How much open space is proposed (SF/AC)? _____ / _____ Percent of property(s) _____

Use and purpose of open space: _____

9. Previous Land Use Permits Associated with the Property(s)

Have previous permits been issued for the Property: Yes No (List singularly; attached additional pages if necessary)

<u>Date Issued</u>	<u>Issuing Agency</u>	<u>Approved Use/Activity</u>
2012	Conservation Commission	Regulated activities
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

9. Change of Zone, Regulation Amendment or New Zoning District, if applicable

Yes No

a. Is this application for a new zoning district and/or regulation not presently established within the Zoning Regulations? If a new zoning district, distinguish type of zone proposed:

Fixed Zone

Floating Zone

Overlay Zone

Identify proposed zone name: _____

For new regulations, list proposed section number(s) and titles(s):

i. _____

ii. _____

iii. _____

b. Is this application an amendment to an existing regulation? Attach proposed amendments, clearly noting any deletions, modifications or additions. List sections proposed to be modified:

i. _____

ii. _____

iii. _____

c. Is this application for a change to a district already established within the regulations? Identify:

Supporting materials:

For new zoning districts or a change in zone provide a legal description of the land involved in the zone district change including the following:

- Location map at 1"=1000'
- Accurate description and acreage of tract(s) to be changed with existing buildings and uses
- Show existing features including but not limited to contours at two-foot intervals, wetlands and watercourses, flood plains, all improvements and structures,
- All lots or parts of lots contained in an area within 500 feet in all directions of the zone change tract
- All lots shown in this area and within the zone change tract shall contain the name and address of owners as recorded in the Assessor's records and shall show the nature of use
- North point, and distance along road from nearest road intersection.
- Scale of map(s)

11. Bulk Zoning Requirements Table

Complete the following table, which must also be included on applicable drawings:

Zoning District(s): <u>R-40</u>		
Item	Required	Proposed
Minimum Lot Size	40,000 SF	669,075 SF
Frontage	100 SF	348 SF
Front Yard	50 SF	312 SF
Side Yard	25 SF	52 SF
Rear Yard	50 SF	464 SF
Building Line	N/A	364'
Building Coverage	20 %	12.99%
Parking ⁶	66 standard spaces	233 standard spaces & 7 ADA spaces
Landscaping	N/A	329,790 SF
Impermeable Coverage	N/A	300,520 SF

⁶ Attach method used to determine the number of parking spaces required.

13. Planning, Design and Engineering Team

Provide a list of all professionals responsible for the project. Additional pages attached, if necessary: Yes No

Discipline: Architecture Telephone: 475-441-7256
Name: Katelyn Chapin Fax: _____
Company: Newman Architects Email: kchapin@newmanarchitects.com
License(s)/ Accreditation No(s): Architect License(s)/ Accreditation No(s): Partner in Charge license would be used

Discipline: MEP Telephone: 860-681-2739
Name: Eric Gebrian Fax: _____
Company: CES Email: egebrian@ceseng.com
Licenses and/or Accreditation No(s): Mechanical Engineer License/ Accreditation No(s): Partner in Charge license would be used

Discipline: Civil & Hazmat Telephone: 203-784-3046
Name: Katy Gagnon Fax: _____
Company: Langan Email: kgagnon@langan.com
Licenses and/or Accreditation No(s): Civil Engineer License/ Accreditation No(s): Partner in Charge license would be used

Discipline: Environmental & Traffic Telephone: 806-707-9184
Name: Melissa Norback Fax: _____
Company: Fuss & O'Neill Email: Melissa.Norback@fando.com
Licenses and/or Accreditation No(s): Senior Hydrogeologist License/ Accreditation No(s): Partner in Charge license would be used

Discipline: Landscape Architect Telephone: 402-449-0858
Name: Anne Machian Fax: _____
Company: RDG Planning & Design Email: amachian@rdgusa.com
Licenses and/or Accreditation No(s): Landscape Architect License/ Accreditation No(s): Partner in Charge license would be used

14. Supporting Documentation

Itemize, including additional attachments, all information provided in support of the application. Titles, dates and sheet/map numbers shall correspond exactly with the corresponding information provided.

Additional pages attached, if necessary: Yes No

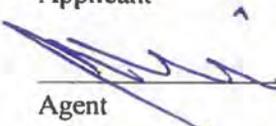
<u>Waterford P&Z Submission - Drawings</u>	<u>Wetland Report Dated May 1, 2025</u>
<u>Traffic Impact Study</u>	<u>Response to Town Professional Staff Comments</u>
<u>Stormwater Management Report</u>	
<u>General Application</u>	

15. For Informal Staff Review Use Only

Sec. 7-159b – Pre-application review of use of property. Notwithstanding any other provision of the general statutes, prior to the submission of an application for use of property under chapters 124, 126, 440 and 541 or any other provision of the general statutes authorizing an authority, commission, department or agency of a municipality to issue a permit or approval for use of such property, such authority, commission, department or agency or authorized agent thereof may separately, jointly, or in any combination, conduct a pre-application review of a proposed project with the applicant at the applicant's request. Such pre-application review and any results or information obtained from it may not be appealed under any provision of the general statutes, and shall not be binding on the applicant or any authority, commission, department, agency or other official having jurisdiction to review the proposed project.

I have read and understand the above provision of the Connecticut General Statutes and understand and agree that whatever discussion, comments and/or recommendations are made through this review are non-binding upon the parties.

Further, I acknowledge and agree that this pre-application review meeting is being conducted prior to and in anticipation of a formal application to the Waterford Planning and Zoning Commission or Conservation Commission to obtain feedback and response to the proposal or design, as it exists on this date, in the interest of preparing an application consistent with the Subdivision, Zoning or Wetlands regulations of the Town of Waterford as the case may be.

Signature	Printed Name	Date
<u>Katherine Ericson</u> Applicant	<u>Katherine Ericson</u>	<u>5/5/2025</u>
 Agent	<u>MATT RAWELLI</u>	<u>5/7/25</u>
<u>Land Owner</u>		
<u>PURCHASE & SALE AGREEMENT ON FILE AT TOWN HALL</u> Land Owner		

16. Technical Assistance Review Fee

In accordance with the Waterford Code of Ordinance Chapter 16.08, the Commission may require third party technical assistance review for the evaluation of applications associated with but not limited to site plans, special permits, zone change and regulation amendments and may collect payment for costs associated with the review. This includes but is not limited to civil engineering, architecture, legal assistance, traffic engineering and environmental protection.

17. Acknowledgements; All applications

Application Content

The undersigned hereby acknowledges that this application and statements submitted herewith are true to the best of my knowledge and approval of the application is contingent upon compliance with all requirements of said regulations.

Right of Entry and Inspection

The undersigned hereby authorizes the Waterford Planning and Zoning Commission or its agents, to enter the subject property for the purposes of inspection and enforcement for the said Zoning Regulations until receipt of final Certificate of Occupancy and Certificate of Zoning Compliance.

Electronic Data Accuracy and Transmission

If applicable, the undersigned hereby acknowledges that all electronic data submitted as part of this application is an accurate and true representation of all paper transmissions provided as part of this application and may be transmitted publically when requested and all applicable fees are paid in full by the requesting party.

Signature

Printed Name

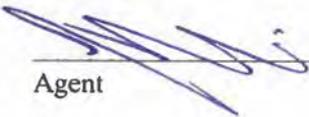
Date

Katherine Ericson

Katherine Ericson

5/5/2025

Applicant



MATT RAVELLI

5/7/25

Agent

Land Owner

Purchase & Sale Agreement ON FILE AT TOWN HALL

Land Owner

13. Planning, Design and Engineering Team

Provide a list of all professionals responsible for the project. Additional pages attached, if necessary: Yes No

Discipline: Architecture - Interiors Telephone: 402-449-0836
Name: Ed Buglewicz Fax: _____
Company: RDG Planning & Design Architects Email: ebuglewicz@rdgusa.com
License(s)/ Accreditation No(s): Architect License(s)/ Accreditation No(s): Will not be stamping drawings

Discipline: _____ Telephone: _____
Name: _____ Fax: _____
Company: _____ Email: _____
Licenses and/or Accreditation No(s): _____ License/ Accreditation No(s): _____

Discipline: _____ Telephone: _____
Name: _____ Fax: _____
Company: _____ Email: _____
Licenses and/or Accreditation No(s): _____ License/ Accreditation No(s): _____

Discipline: _____ Telephone: _____
Name: _____ Fax: _____
Company: _____ Email: _____
Licenses and/or Accreditation No(s): _____ License/ Accreditation No(s): _____

Discipline: _____ Telephone: _____
Name: _____ Fax: _____
Company: _____ Email: _____
Licenses and/or Accreditation No(s): _____ License/ Accreditation No(s): _____

May 5, 2025

LEARN Early Childhood School

51 Daniels Ave., Waterford, CT 06385

Newman Project #: 20240069

State Project #: 245-0090 MAG/N/PF

Waterford Planning & Zoning Submission: General Application

Item 5 Statement of Use

- A. The LEARN Early Childhood School is a magnet public school, grades Pre-K through second grade, and infant toddler center. The primary use of the building will be Type E - Education.
- B. Anticipated Visitors and Hours of Operation
 - a. Daily visitors
 - i. Pre-K- Grade 2 School
 - 1. Planned enrollment: 528
 - ii. Infant/Toddler Center
 - 1. Planned enrollment: 46
 - iii. Staff
 - 1. Anticipated staff: 125
 - b. Anticipated hours and days of operation
 - i. Pre-K- Grade 2 School
 - 1. School Year: tentatively: 9:15 am to 3:30 pm on weekdays
 - 2. Summer: No operations
 - ii. Infant/Toddler Center
 - 1. Year-round: tentatively: 7am to 5pm, weekdays
- C. Vehicular Traffic
 - a. Per the attached traffic report, the anticipated peak traffic is 550 vehicle trips on weekday mornings and 374 vehicle trips on weekday afternoons.
- D. Size of existing and proposed buildings
 - a. The proposed building is 87,640 SF. The school will be one story.
 - b. The size of the existing, to-be-demolished school and portable classroom total 41,946 SF.
- E. Utilities onsite
 - a. The parcel has access to Water, Sanitary, Electrical, and Telecom services.
- F. Structures to be demolished
 - a. The existing school constructed in 1958, a 1964 addition, and portable classrooms will be demolished.
- G. Additional information as requested on the General Application, item 8d: Is any work proposed within 100 feet of a wetlands or watercourse:
 - a. A small portion of the access drive around the site is within 100' of the offset wetland to the SE of the property, the pickleball development is within 100' of the wetland on the NE part of the site.

May 5, 2025

LEARN Early Childhood School

51 Daniels Ave., Waterford, CT 06385

Newman Project #: 20240069

State Project #: 245-0090 MAG/N/PF

Waterford Planning & Zoning Submission: General Application

Item 10 Consistency with Adapted Plan of Preservation, Conservation and Development

The site is indicated to be an Institutional use per the "Future Land Use Plan" (page 83) of the current Plan. The proposed public school will maintain the site as an institutional use and is therefore consistent with the Plan.

May 5, 2025

LEARN Early Childhood School

51 Daniels Ave., Waterford, CT 06385

Newman Project #: 20240069

State Project #: 245-0090 MAG/N/PF

Waterford Planning & Zoning Submission: General Application

Item 11 Bulk Zoning Requirements Table

ZONING CHART				
ZONE: LOW DENSITY RESIDENTIAL DISTRICT (R-40)				
LAND USE: PUBLIC SCHOOL				
PARCEL AREA: ±15.36 ACRES TOTAL BUILDING FOOTPRINT: ±86,900 SF				
CRITERIA	REQUIRED	EXISTING	PROPOSED	SECTION
LOT/BUILDING				
MIN. LOT AREA (SQ. FT.)	40,000	854,656	669,075	5.1
MIN. FRONTAGE (FT)	100	348	348	5.3
MIN. LOT WIDTH (FT)	125	568	409	5.3
FRONT YARD SETBACK (FT)	50	139	312	5.4.1
SIDE YARD SETBACK (FT)	25	125	52	5.4.2
REAR YARD SETBACK (FT)	50	712	464	5.4.3
MAX. BUILDING COVERAGE (%)	20	4.90%	12.99%	5.5
MAX. BUILDING HEIGHT (FT)	35	-	35	5.6
PARKING				
MIN. STANDARD SPACE DIMENSIONS (FT)	9 x 18	-	9 x 18	20.2c
MIN. NUMBER OF STANDARD SPACES	66 ^{1,2}	89	233	20.3a
MIN. NUMBER OF ACCESSIBLE SPACES	7 (2 VAN)	-	7 (6 VAN)	2010 ADA STANDARDS
MIN. NUMBER OF EV SPACES	4 ³	-	47	CT CLEAN AIR ACT

NOTES:

1. PUBLIC SCHOOL - 2 SPACES FOR EACH CLASSROOM PLUS 1 SPACE FOR EVERY 4 FIXED SEATS IN AUDITORIUMS, GYMNASIUMS OR OTHER PLACES OF PUBLIC ASSEMBLY
- KINDERGARTENS & CHILD CARE CENTERS - 2 SPACES FOR EACH CLASSROOM, BUT NOT LESS THAN 6 SPACES FOR ANY ONE BUILDING
2. PROPOSED SCHOOL INCLUDES 33 MAIN CLASSROOMS
3. PROVIDE LEVEL TWO EV CHARGERS IN AT LEAST 20% OF PARKING SPOTS

Natural Diversity Data Base Areas

WATERFORD, CT

December 2024

-  State and Federal Listed Species
-  Critical Habitat
-  Town Boundary

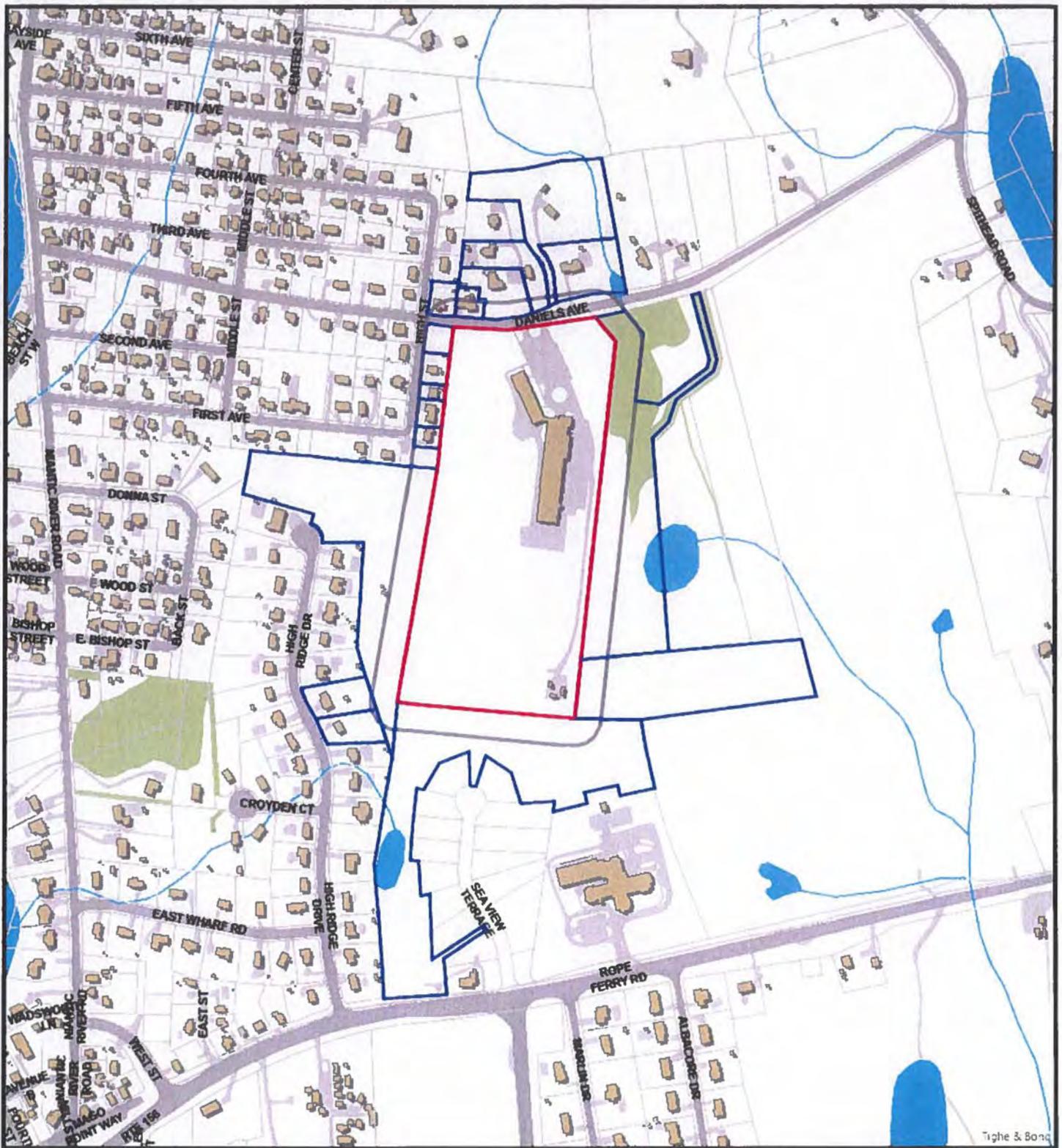
NOTE: This map shows known locations of State and Federal Listed Species and Critical Habitats. Information on listed species is collected and compiled by the Natural Diversity Data Base (NDDB) from a variety of data sources. Exact locations of species have been buffered to produce the generalized locations.

This map is intended for use as a preliminary screening tool for conducting a Natural Diversity Data Base Review Request. To use the map, locate the project boundaries and any additional affected areas if the project is within a hatched area there may be a potential conflict with a listed species. For more information, use DEEP ezFile <https://filings.deep.ct.gov/DEEPPortal/> to submit a Request for Natural Diversity Data Base State Listed Species Review or Site Assessment. More detailed instructions are provided along with the request form on our website. <https://portal.ct.gov/deep-nddbrequest>

Use the CTECO Interactive Map Viewers at <http://cteco.uconn.edu> to more precisely search for and locate a site and to view aerial imagery with NDDB Areas.

QUESTIONS: Department of Energy and Environmental Protection (DEEP)
79 Elm St, Hartford, CT 06106
email: deep.nddbrequest@ct.gov
Phone: (860) 424-3011





Tighe & Bond

100-Foot Abutters Map

5/6/2025 5:40:08 PM

Scale: 1"=500'

Scale is approximate

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.



Parcel ID	Owner	Mailing Address	Mailing City	Mailing State	Mailing Zip	Mailing Address
153200	APARICIO VIRGILIO M & CARLA	50 DANIELS AVE	WATERFORD	CT	06385	50 DANIELS AVENUE
305300	GUIDO MARK A & PAULA A	9 HIGH ST	WATERFORD	CT	06385	9 HIGH STREET
153100	HUGHES SEAN P + PEREIRA ALYSSA B	48 DANIELS AVENUE	WATERFORD	CT	06385	48 DANIELS AVENUE
153500	KELLERSTEDT ROY & CYNTHIA L	54 DANIELS AVE	WATERFORD	CT	06385	54 DANIELS AVENUE
305200	LATHROP TODD R & VICKIE L	7 HIGH ST	WATERFORD	CT	06385	7 HIGH STREET
153920	MAHEU SPENCER & KIRDZIK MELISSA	63 DANIELS AVE	WATERFORD	CT	06385	63 DANIELS AVENUE
153950	OPEN SPACE					65R DANIELS AVENUE
662299	OPEN SPACE & MACKENZIE FARM HOMEOWN	12 SEA VIEW TERRACE	WATERFORD	CT	06385	21 SEA VIEW TERRACE
154300	PARIS JASON	P O BOX 919	WATERFORD	CT	06385	52A DANIELS AVENUE
153400	PARIS JASON M	P O BOX 919	WATERFORD	CT	06385	52 DANIELS AVENUE
303100	PECK THOMAS O	19 HIGH RIDGE DR	WATERFORD	CT	06385	19 HIGH RIDGE DRIVE
153600	PERKINS BARBARA & MORANGE KELCEY	56 DANIELS AVENUE	WATERFORD	CT	06385	56 DANIELS AVENUE
305100	SAPIA MELISSA J & JOHN	5 HIGH STREET	WATERFORD	CT	06385	5 HIGH STREET
305700	SGANDURRA JAMES J	11 HIGH STREET	WATERFORD	CT	06385	15 HIGH STREET
305500	SGANDURRA JAMES J	11 HIGH STREET	WATERFORD	CT	06385	11 HIGH STREET
303300	VON ACHEN PATRICIA J	21 HIGH RIDGE DR	WATERFORD	CT	06385	21 HIGH RIDGE DRIVE
153300	WATERFORD TOWN OF	15 ROPE FERRY RD	WATERFORD	CT	06385	51 DANIELS AVENUE
304500	WATERFORD TOWN OF	15 ROPE FERRY DR	WATERFORD	CT	06385	33 HIGH RIDGE DRIVE

TAB 3

TAB 4

TAB 5

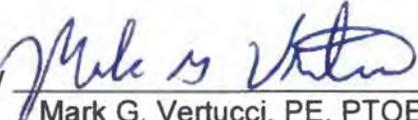
TAB 6

Traffic Impact Study
LEARN Early Childhood School
Waterford, Connecticut

April 2025

Town of Waterford Planning and Zoning Commission

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

Approved by  License No. 23761
Mark G. Vertucci, PE, PTOE

Prepared for:

Ms. Katelyn Chapin
Newman Architects, PC
265 Church Street 15th Floor
New Haven, CT 06510

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LEARN Early Childhood School
Waterford, Connecticut**

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Traffic Impact Study LEARN Early Childhood School Waterford, Connecticut

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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:

LEARN Regional Education Service Center

Site Acreage:

+/-16

Development Size/Type:

526 Student Charter Elementary School

48 Student Day Care Center

Parking:

233 total parking spaces (7 handicap parking spaces)

Applications:

Town of Waterford Planning and Zoning Commission

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

Build Year:

2026

Background Traffic Growth Factor:

0.7%

Traffic Counts:

Fuss & O'Neill -- October 12, 2022 (Turning Movement Counts)

Peak Hours Analyzed:

Weekday Morning Peak Hour -- 7:45 A.M. to 8:45 A.M.

Weekday Afternoon Peak Hour -- 3:00 P.M. to 4:00 P.M.

Expected Trip Generation:

Weekday Morning Peak Hour -- 590 trips (307 entering, 283 exiting)

Weekday Afternoon Peak Hour -- 414 trips (202 entering, 212 exiting)

Capacity Analysis:

Technique -- Highway Capacity Manual 6th Edition

Execution -- Synchro and SimTraffic Professional Software, Version 11.0

1 Introduction

LEARN Regional Education Service Center plans to demolish the existing 41,946 square foot school located at 51 Daniels Avenue in Waterford, Connecticut and replace it with a combined magnet elementary school and daycare. The combined magnet elementary school and daycare will consist of 574 students, with 526 students expected to occupy the magnet elementary school and 48 students to occupy the daycare center. The proposed development will consist of 233 total parking spaces, with 7 of those being ADA compliant spaces. The existing development is located on the south side of Daniels Avenue and is accessed via two one-way driveways, one entering and one exiting. Upon construction of the combined magnet elementary school and daycare development, full access to the site will be provided via Daniels Avenue across a single two-way site driveway. Internal connection between the developments will be provided as shown on the site location map, *Figure No. 1 of Appendix B*. The development is expected to be constructed in 2026.

Fuss & O'Neill has been retained to study the impact of the proposed development on traffic conditions throughout the adjacent roadway network. This report has been prepared to document the findings of the study and is being submitted to the Town of Waterford Planning and Zoning Commission in support of local permitting efforts. This report will also be submitted to the Office of the State Traffic Administration (OSTA) in support of an Administrative Decision Review.

2 Existing Condition

2.1 Site of Development

LEARN Regional Education Service Center intends to demolish the existing 41,946 square foot school located at 51 Daniels Avenue in Waterford, Connecticut and replace it with a combined magnet elementary school and daycare with a total of 574 students. It should be noted that the existing 41,946 square foot school located on the site was closed in June 2020. The existing parcel, currently zoned for Residential (R), is +/-19 acres in size of which +/- 16 acres will be transferred to LEARN and developed for school and daycare purposes. The site is bounded by residential land uses across all directions.

2.2 Adjacent Roadway Network

The adjacent roadway network consists of the following roadways:

- Route 1 (Boston Post Road)
- Route 156 (Rope Ferry Road)
- Daniels Avenue
- Niantic River Road
- Spithead Road
- Cross Road
- Sunnycrest Drive
- West Street

All adjacent roadways are classified by the Connecticut Department of Transportation as either arterial or major collector roads except Sunnycrest Drive.

Route 1 (Boston Post Road) is an east to west roadway under state jurisdiction that enters the study area at the western intersection of Sill Lane at Route 1 (Lyme Street) and Route 1 (Boston Post Road) and extends east 13.6 miles to the Waterford and New London town lines. Route 1 (Boston Post Road) provides access to commercial, residential, industrial, and business land uses in the vicinity of the site. In the vicinity of the site, Route 1 (Boston Post Road) is classified by the Connecticut Department of Transportation as a principal arterial that provides one 12-foot lane of travel in each direction at the study area intersections. The speed limit is 40 miles per hour (mph) on Route 1 (Boston Post Road) in the vicinity of the study area intersections. Sidewalks and crosswalks are available along Route 1 (Boston Post Road).

Route 156 (Rope Ferry Road) is an east to west roadway under state jurisdiction that enters the study area from the west at the East Lyme/Waterford town line and extends east 2.9 miles to its intersection with Route 1 (Boston Post Road) and Vivian Street. Route 156 (Rope Ferry Road) provides access to commercial, residential, industrial, and business land uses in the vicinity of the site. In the vicinity of the site, Route 156 (Rope Ferry Road) is classified by the Connecticut Department of Transportation as a minor arterial roadway that provides one 12-foot lane of travel in each direction. The speed limit is 35 miles per hour on Route 156 (Rope Ferry Road). Sidewalks and crosswalks are available along Route 156 (Rope Ferry Road).

Daniels Avenue is a two-lane undivided roadway that runs east to west under town jurisdiction and extends from the western intersection of Daniels Avenue at Niantic River Road east approximately 0.7 miles to the intersection of Daniels Avenue at Spithead Road. Daniels Avenue provides access to residential land uses. Daniels Avenue is classified by the Connecticut Department of Transportation as major collector roadway and has a posted speed limit of 25 miles per hour. Sidewalks and crosswalks are available along Daniels Avenue.

Niantic River Road is a two-lane undivided roadway that runs north to south under town jurisdiction that extends from the southern intersection of Niantic River Road at Rope Ferry Road north approximately 2.4 miles to the intersection of Niantic River Road at Route 1 (Boston Post Road). Niantic River Road provides access to commercial, residential, industrial and business land uses in the vicinity of the site. Niantic River Road is classified by the Connecticut Department of Transportation as a major collector roadway and has a posted speed limit of 30 miles per hour. Sidewalks and crosswalks are available along Niantic River Road.

Spithead Road is a two-lane undivided roadway that runs north to south under town jurisdiction that extends from the southern intersection of Spithead Road at Route 156 (Rope Ferry Road) north approximately 1.75 miles to the intersection of Spithead Road at Route 1 (Boston Post Road) and Cross Road. Spithead Road provides access to mostly residential land uses in the vicinity of the site. Spithead Road is classified by the Connecticut Department of Transportation as a major collector roadway. The speed limit on Spithead Road is 25 miles per hour south of its intersection with Daniels Avenue and 30 miles per hour north of its intersection with Daniels Avenue. Sidewalks and crosswalks are available along Spithead Road.

Cross Road is a two-lane undivided roadway that runs north to south under town jurisdiction that extends from the southern intersection of Cross Road at Spithead Road and Route 1 (Boston Post Road)/Sunnicrest Drive north approximately 2.2 miles to the intersection of Cross Road at Route 85 (Hartford Turnpike). Cross Road provides access to commercial, residential, industrial and business land uses. Cross Road is classified by the Connecticut Department of Transportation as a major collector roadway and has a posted speed limit of 30 miles per hour. Sidewalks are available along Cross Road.

Sunnicrest Drive is a two-lane undivided roadway that runs east to west under town jurisdiction that extends from the western intersection of Cross Road at Spithead Road and Route 1 (Boston Post Road)/Sunnicrest

Drive east approximately 750 feet its terminus at a cul-de-sac. Sunnecrest Drive provides access to residential land uses. Sunnecrest Drive is classified by the Connecticut Department of Transportation as a local roadway. The speed limit is not posted. Sidewalks and crosswalks are not available along Sunnecrest Drive.

West Street is a two-lane undivided connector roadway that runs east to west under town jurisdiction that extends from the western intersection of West Street at Niantic River Road east approximately 450 feet to the intersection of West Street at Route 156 (Rope Ferry Road). West Street provides access to primarily residential land uses and is classified by the Connecticut Department of Transportation as a major collector roadway. The speed limit is not posted. Sidewalks and crosswalks are available along West Street.

2.3 Study Area Intersections

The following study area intersections were reviewed:

- Daniels Avenue at Site Driveway
- Daniels Avenue at Niantic River Road
- Daniels Avenue at Spithead Road
- Route 156 (Rope Ferry Road) at Spithead Road
- Route 156 (Rope Ferry Road) at West Street
- Niantic River Road at West Street
- Route 1 (Boston Post Road) at Niantic River Road
- Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunnecrest Drive

Daniels Avenue at the Site Driveway is an unsignalized t-intersection that provides full movement access to the existing development with stop control along the northbound approach. The eastbound and westbound approaches of Daniels Avenue are uncontrolled. The eastbound approach of Daniels Avenue contains a shared through/right turn lane, and the westbound approach of Daniels Avenue contains a shared left/through lane into the site. The northbound approach of the existing Site Driveway will provide a combined left/right turn lane out of the development.

Daniels Avenue at Niantic River Road is an unsignalized t-intersection with Daniels Avenue providing the westbound approach while Niantic River Road provides the northbound/southbound approaches. Along the northbound approach of the intersection, Niantic River Road contains a shared through/right turn lane while the southbound approach of Niantic River Road contains a shared through/left turn lane. Along the stop-controlled westbound approach of the intersection, Daniels Avenue provides a shared left/right turn lane. A crosswalk is provided across the westbound approach, allowing people to cross Daniels Avenue.

Daniels Avenue at Spithead Road is an unsignalized t-intersection with Daniels Avenue providing the eastbound approach while Spithead Road provides the northbound/southbound approaches. Along the northbound approach of the intersection, Spithead Road contains a shared left/through lane while the southbound approach of Niantic River Road contains a shared through/right turn lane. Along the stop-controlled eastbound approach of the intersection, Daniels Avenue provides a shared left/right turn lane. A crosswalk is provided across the eastbound approach, allowing people to cross Daniels Avenue.

Route 156 (Rope Ferry Road) at Spithead Road is an unsignalized t-intersection with Spithead Road providing the southbound approach while Route 156 (Rope Ferry Road) provides the eastbound/westbound approaches. Along the eastbound approach of the intersection, Route 156 (Rope Ferry Road) provides a shared left/through

lane while the westbound approach of Route 156 (Rope Ferry Road) contains a shared through/right turn lane. Along the stop-controlled southbound approach of the intersection, Spithead Road provides a shared left/right turn lane. A crosswalk is provided across the southbound approach, allowing people to cross Spithead Road.

Route 156 (Rope Ferry Road) at West Street is a signalized t-intersection that is not part of a coordinated signal system along Route 156 (Rope Ferry Road). The intersection provides eastbound/westbound approaches on Route 156 (Rope Ferry Road) and a southbound approach on West Street. The eastbound approach of Route 156 (Rope Ferry Road) provides a dedicated left turn lane and through lane while the westbound approach of Route 156 (Rope Ferry Road) provides a dedicated right turn lane and a through lane. The southbound approach of West Street provides a shared left/right turn lane. A crosswalk is provided across the southbound approach, allowing people to cross West Street.

Niantic River Road at West Street is an unsignalized t-intersection with West Street providing the westbound approach while Niantic River Road provides the northbound/southbound approaches. Along the northbound approach of the intersection, Niantic River Road contains a shared through/right turn lane while the southbound approach of Niantic River Road contains a shared through/left turn lane. Along the stop-controlled westbound approach of the intersection, West Street provides a shared left/right turn lane. A crosswalk is provided across the westbound approach, allowing people to cross West Street.

Route 1 (Boston Post Road) at Niantic River Road is a signalized t-intersection that is not part of a coordinated signal system along Route 1 (Boston Post Road). The intersection provides eastbound/westbound approaches on Route 1 (Boston Post Road) and a northbound approach on Niantic River Road. The eastbound approach of Route 1 (Boston Post Road) provides a shared through/right turn lane while the westbound approach of Route 1 (Boston Post Road) provides a shared through/left turn lane. The northbound approach of Niantic River Road provides a shared left/right turn lane. A crosswalk is provided across the eastbound approach, allowing people to cross Route 1 (Boston Post Road).

Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive is a five-legged signalized intersection that is not part of a coordinated signal system along Route 1 (Boston Post Road). The intersection provides eastbound/westbound approaches on Route 1 (Boston Post Road), a northbound approach on Spithead Road, a southbound approach on Cross Road and a southwestbound approach on Sunniecrest Drive. The northbound approach of Spithead Road provides a shared left/through/right turn lane while the southbound approach of Cross Road provides a shared left/through/right turn lane. The eastbound approach of Route 1 (Boston Post Road) provides a dedicated left turn lane and a separate through/right turn while the westbound approach of Route 1 (Boston Post Road) provides a dedicated through/left turn lane and an exclusive right turn lane. The southwest approach on Sunniecrest Drive provides a shared left/through/right turn lane. A crosswalk is provided across the eastbound approach, allowing people to cross Route 1 (Boston Post Road).

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 school peak hours, the periods when commuter and/or school 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 Wednesday October 12th, 2022, at the eight intersections in the study area. The traffic count data collected indicates that the weekday morning peak hour of traffic is 7:45 A.M. to 8:45 A.M. and the weekday afternoon peak hour is 3:00 P.M. to 4:00 P.M. These peak hours were subsequently

analyzed for impacts. It is worth noting that should the proposed elementary magnet school hours occur outside of the adjacent roadway peak hours indicated by the traffic count data, the analysis conducted in this report would be considered conservative. Copies of the TMC traffic data have been included in *Appendix F* of this report.

3 Background Traffic Conditions

3.1 Growth Rate

Upon consultation with the Connecticut Department of Transportation (CTDOT) the 2022 existing traffic volumes were projected to the 2026 design year using a 0.7 percent per year peak hour growth factor to account for normal traffic growth in the study area. These grown volumes represent the projected Background traffic volumes as shown in *Figure No. 2 of Appendix B*.

3.2 Other Developments

Fuss & O'Neill contacted the Office of the State Traffic Administration (OSTA) and the Town of Waterford Planning and Zoning respective offices to identify any other pending or approved developments having site related traffic in the study area. Upon consultation, neither OSTA nor the Town of Waterford has knowledge of any plans for developments that would have site related traffic in the vicinity of the study area.

3.3 Planned Roadway Improvement Projects

Fuss & O'Neill contacted the Office of State Traffic Administration (OSTA) and the Town of Waterford Planning Department to identify any planned roadway improvement projects in the study area. Upon consultation, neither OSTA nor the Town of Waterford has knowledge of any roadway improvements within the study area.

4 Proposed Conditions

4.1 Development

LEARN Regional Education Service Center intends to demolish the existing 41,946 square foot school located at 51 Daniels Avenue in Waterford, Connecticut and replace it with a combined magnet elementary school and daycare. The combined magnet elementary school and daycare will consist of 574 students, with 526 students expected to occupy the magnet elementary school and 48 students to occupy the daycare center. The proposed development will consist of 233 total parking spaces, with 7 of those being ADA compliant spaces. The development is depicted on the site location map, *Figure No. 1 of Appendix B* and is expected to be constructed in 2026.

4.2 Site Access and Circulation

Access to the combined magnet elementary school and daycare will be provided at the reconstructed stop-controlled driveway located along Daniels Avenue. The site driveway will provide full access and dedicated left turn and right turn lanes along the northbound approach with stop control to access Daniels Avenue. Internal connection between the facilities will be provided as shown on the site location map, *Figure No. 1 of Appendix B*.

4.3 Trip Generation

The expected site generated traffic data was calculated using existing empirical data from the Institute of Transportation Engineers (ITE) publication Trip Generation, 11th edition, 2021. This publication is an industry-accepted resource for determining trip generation. Trip generation for the weekday morning and weekday afternoon peak hour was calculated using the ITE land use codes 536 "Charter Elementary School" and 565 "Day Care Center." As a conservative approach, no credit was taken for families that may have students dropping off or picking up in both the school and the daycare.

As previously noted, LEARN Regional Education Service Center intends to demolish the existing 41,946 square foot school and replace it with a combined magnet elementary school and daycare. The combined magnet elementary school and daycare will consist of 574 students, with 526 students expected to occupy the magnet elementary school and 48 students to occupy the daycare center.

Using the ITE land use code 520 "Elementary School," the previous 41,946 square foot school was estimated to generate a total of 281 vehicle trips (152 entering, 129 exiting) during the weekday morning peak hour and a total of 171 vehicle trips (79 entering, 92 exiting) during the weekday afternoon peak hour. It should be noted that the weekday afternoon peak hour used the generator calculations as published in *Trip Generation*, 11th Edition, 2021.

For a charter elementary school comprised of 526 students, a total of 550 vehicle trips (286 entering, 264 exiting) are anticipated during the weekday morning peak hour and a total of 374 vehicle trips (183 entering, 191 exiting) are anticipated during the weekday afternoon peak hour. As for a daycare center comprised of 48 students, a total of 40 vehicle trips (21 entering, 19 exiting) are anticipated during the weekday morning peak hour and a total of 40 vehicle trips (19 entering, 21 exiting) are anticipated during the weekday afternoon peak hour. Overall, the site will generate 590 total vehicle trips in the weekday morning peak hour (307 entering, 283 exiting) and 414 total vehicle trips in the weekday afternoon peak hour (202 entering, 212 exiting).

The proposed charter elementary school and day care center are therefore expected to result in a net increase of 309 trips during the weekday morning peak hour and 243 trips during the afternoon peak hour in comparison to the previous school use on the site. Thus, a significant portion of the proposed LEARN development site traffic will not be "new" to the study area intersections as these trips were already on the road network in the past when the previous elementary school was in operation.

It is important to note that the site generated traffic for the proposed daycare and school uses will only minimally overlap during the morning and afternoon peak periods. However, for the purposes of this analysis, traffic for the two uses was conservatively estimated to occur during the same school peak hours. It should also be noted that with the proposed charter elementary school year expected to operate from late August to middle of June, a significant reduction in site trips associated with the LEARN development is anticipated for the summer months across the network.

A summary of the ITE peak hour site trip generation for the proposed facility is shown in *Figure No. 4 of Appendix B* and also summarized in *Table 1 of Appendix A*.

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:

- 30% from the west on Route 1 (Boston Post Road)
- 20% from the north on Cross Road
- 5% from the east of Route 1 (Boston Post Road)
- 25% from the west of Route 156 (Rope Ferry Road)
- 15% from the east of Route 156 (Rope Ferry Road)
- 5% from the south of Niantic River Road

A regional arrival/departure distribution for the newly anticipated site generated traffic traveling to and from the project site is shown in *Figure No. 3 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. 4 of Appendix B*. These volumes were then added to the background volumes to yield the year 2026 peak hour Combined traffic volumes shown in *Figure No. 5 of Appendix B*.

5 Analyses

5.1 Crash Analysis

Crash data was gathered from CTDOT via the University of Connecticut Crash Data Repository for the following intersections and roadway segments:

- Daniels Avenue at Site Driveway
- Daniels Avenue at Niantic River Road
- Daniels Avenue at Spithead Road
- Route 156 (Rope Ferry Road) at Spithead Road
- Route 156 (Rope Ferry Road) at West Street
- Niantic River Road at West Street
- Route 1 (Boston Post Road) at Niantic River Road
- Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive

The records were gathered for the most recent three years of available data, 2022 through 2024. A summary of the crash data per intersection is provided in *Table 2 of Appendix A*. Copies of the crash data records have been provided in *Appendix F*.

The unsignalized intersection of Daniels Avenue at Site Driveway experienced no record of crash history within the most recent three years of crash data history from 2022 through 2024.

The unsignalized intersection of Daniels Avenue at Niantic River Road experienced an average of just under one crash per year. The intersection experienced one angle crash, and one crash classified as "not applicable" where

the driver drove through guardrail and into the Niantic River. Of the total crashes reported, the two resulted in possible injuries.

The unsignalized intersection of Daniels Avenue at Spithead Road experienced an average of one crash per year. The intersection experienced one crash where the driver drove into the embankment, one curb collision, and one that involved a utility pole collision. Of the total crashes reported, one resulted in minor injury while the remainder were property damage only collisions.

The unsignalized intersection of Route 156 (Rope Ferry Road) at Spithead Road experienced an average of one crash per year. The majority of these crashes (2) were front-to-rear collisions. Additionally, the intersection experienced one angle crash. Of the total crashes reported, all were property damage only collisions.

The signalized intersection of Route 156 (Rope Ferry Road) at West Street experienced no record of crash history within the most recent three years of crash data history from 2022 through 2024.

The unsignalized intersection of Niantic River Road at West Street experienced no record of crash history within the most recent three years of crash data history from 2022 through 2024.

The signalized intersection of Route 1 (Boston Post Road) at Niantic River Road experienced an average of just above three crashes per year. The majority of these crashes (4) were front-to-rear collisions. Additionally, the intersection experienced one angle crash, one rear-to-side collision, two opposite direction sideswipes, one same direction sideswipe and one collision classified as "not applicable" where the driver collided with the signal pole. Of the total crashes reported, two resulted in minor injury and two resulted in possible injury, while the remainder were property damage only collisions.

The signalized intersection of Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive experienced an average of just below seven crashes per year. The majority of these crashes (10) were front-to-rear collisions. Additionally, the intersection experienced five angle crashes, one front-to-rear collision, three same direction sideswipes and one collision classified as "not applicable" where a bus collided with a signal pole. Of the total crashes reported, three resulted in possible injury, while the remainder were property damage only collisions.

The type and frequency of crashes reported at the study area intersections is not considered abnormal for the traffic volumes and geometric characteristics of the study intersections along a signalized arterial corridor.

5.2 Intersection Sight Distance Analysis

Intersection sight distances were measured at the proposed site driveway location in accordance with criteria set forth in the 2023 CTDOT *Highway Design Manual*. The sight distance is measured from a point 15 feet back from the edge of the travel-way at a height of 3.5 feet, the standard height of a driver's eye.

Daniels Avenue has a posted speed limit of 25 miles per hour in both directions in the vicinity of the proposed development. A design speed of 30 miles per hour, five (5) miles per hour above the posted speed limit, was utilized for analysis.

For the design speed of 30 miles per hour on Daniels Avenue, 335 feet of intersection sight distance is required for a passenger car and 420 feet for a single unit box truck turning right or left onto a two-lane facility. Per coordination with the developer, the AASHTO S-BUS 40 was conservatively analyzed as the largest vehicle

movement for access to the site. Therefore, a single unit truck was analyzed for intersection sight distance purposes.

At the site driveway location on Daniels Avenue, the intersection sight distance looking right (east) offers 550 feet and looking left (west) offers 425 feet. Further sight distance is limited by the horizontal curvature in the road looking right (east), and vertical curvature in the road looking left (west). The site driveway location at Daniels Avenue is in substantially the same location as the existing school driveway and will exceed CTDOT sight distance criteria for the roadway design speed and provide safe egress for vehicles turning onto Daniels Avenue.

It should be noted that field observations revealed the intersection sight distances at the existing unsignalized Town maintained intersection of Daniels Avenue at Spithead Road appear to be impacted by the existing vertical and horizontal curvature of Spithead Road. Therefore, on the morning of April 16, 2025, Fuss & O'Neill measured intersection sight distances on the Daniels Avenue approach to Spithead Road in accordance with the same criteria mentioned above set forth in the 2003 CTDOT *Highway Design Manual*.

Spithead Road has a posted speed limit of 30 miles per hour in the southbound direction and a posted speed limit of 25 miles per hour in the northbound direction in the vicinity of the intersection. Therefore, design speeds of 30 and 35 miles per hour, respectively, were utilized for this analysis.

For the design speed of 30 miles per hour southbound on Spithead Road, the following intersection sight distances are required for a vehicle turning right onto Spithead Road:

- 335 feet of intersection sight distance for a passenger car
- 420 feet of intersection sight distance for a single-unity truck

For the design speed of 35 miles per hour northbound on Spithead Road, the following intersection sight distances are required for a vehicle turning left onto Spithead Road:

- 390 feet of intersection sight distance for a passenger car
- 490 feet of intersection sight distance for a single-unity truck

Approximately 230 feet of intersection sight distance is provided looking left from Daniels Avenue (north) which falls short of CTDOT requirements for a 30 mile per hour design speed due to existing vegetation, a berm, and the horizontal curvature of Spithead Road north of the intersection. Upon removal of the vegetation along the roadway, intersection sight distance can be improved slightly but it is still expected to fall below the threshold due to the horizontal curve constraints along the existing roadway. Looking right out of Daniels Avenue, there is approximately 330 feet of intersection sight distance provided looking south along Spithead Road which also falls short of CTDOT requirements for a 35 mile per hour design speed due to existing horizontal and vertical curve constraints.

Given these existing intersection constraints and noted concern for safe egress of the additional passenger cars and single unit trucks/busses being generated onto Spithead Road by the new school, we recommend that the intersection be converted to an all-way stop-controlled intersection by adding stop and stop ahead signs on both Spithead approaches that are in accordance with MUTCD distance guidelines.

5.3 Intersection Capacity Analysis

Capacity analyses for both signalized and unsignalized intersections were conducted using Synchro Professional Software, version 11.0.

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.

In discussing two-way stop controlled unsignalized intersection capacity analyses, LOS is used to provide a description of the delay and operational characteristics of the turns from the minor street (stop sign controlled) to the major street, and turns from the major street to the minor street. Through vehicles are not delayed by the minor street and do not experience delay, therefore they are not rated with a level of service.

Using the above referenced methodologies, weekday morning and weekday afternoon peak hour capacity analyses were conducted at the following signalized intersections:

- Route 156 (Rope Ferry Road) at West Street
- Route 1 (Boston Post Road) at Niantic River Road
- Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive

Weekday morning and weekday afternoon peak hour capacity analyses were also conducted at the following unsignalized intersections:

- Daniels Avenue at Site Driveway
- Daniels Avenue at Niantic River Road
- Daniels Avenue at Spithead Road
- Route 156 (Rope Ferry Road) at Spithead Road
- Niantic River Road at West Street

Tables No. 3 and 4 of Appendix A presents a summary of the levels of service at the unsignalized and signalized intersections, for both Background and Combined Conditions traffic volumes. Copies of the analysis worksheets can be found in Appendices C and D, for the weekday morning and weekday afternoon peak hours respectively.

The determination of the traffic impact from the proposed development is made through a comparison of the Background Conditions LOS (without the proposed development) versus the Combined Conditions LOS (with the proposed development).

The signalized intersection of Route 156 (Rope Ferry Road) at West Street operates at LOS A during the weekday morning and afternoon peak hours under 2026 background conditions. With the addition of the LEARN Early Childhood School development site traffic and minor signal timing adjustments, the signalized intersection of Route 156 (Rope Ferry Road) at West Street is expected to maintain these same LOS operations with minimal increases in v/c.

The signalized intersection of Route 1 (Boston Post Road) at Niantic River Road operates at LOS B during the weekday morning and afternoon peak hours under 2026 background conditions. With the addition of the LEARN Early Childhood School development site traffic and minor signal timing adjustments, the signalized intersection of Route 1 (Boston Post Road) at Niantic River Road is expected to maintain these same LOS operations with minimal increases in v/c.

The signalized intersection of Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive operates at LOS E during the weekday morning and afternoon peak hours under 2026 background conditions. With the addition of the LEARN Early Childhood School development site traffic and minor signal timing adjustments, the signalized intersection of Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive is expected to operate at LOS E during the weekday morning peak hour and LOS F during the weekday afternoon peak hour. However, under 2026 background conditions, the northbound and southbound approaches already operate at LOS F during both peak hours and the v/c ratio during the weekday afternoon peak hour is only 0.4 away from capacity. It should also be noted that the LEARN Early Childhood School development site traffic is less than 6% of the overall intersection volume during the weekday afternoon peak hour. The majority of the site traffic added to this intersection is on the southbound approach of Cross Street (approximately a 20% increase), however given the existing constraints and single lane arrangement along the southbound approach, it is understandable that any increase in traffic along this approach would degrade the LOS. It is also important to note that the increase in vehicle delays at this intersection during weekday afternoons will be confined to a portion of the afternoon school peak hour before and after dismissal.

At the unsignalized intersection of Daniels Avenue at Site Driveway the northbound approach of the site driveway is expected to operate acceptably at LOS D in during the morning peak hour and LOS B during the afternoon peak hour under 2026 combined conditions. As discussed previously, the site driveway will provide dedicated left turn and right turn lanes along the northbound approach with stop control to access Daniels Avenue. The westbound left turn of Daniels Avenue is expected to operate at LOS A during both peak hours under 2026 background and combined conditions.

At the unsignalized intersection of Daniels Avenue at Niantic River Road, the westbound approach of Daniels Avenue operates efficiently at LOS B or better during the weekday morning and weekday afternoon peak hours under 2026 background conditions and is expected to operate acceptably at LOS C during both peak hours with the addition of the LEARN Early Childhood School development site traffic. The southbound left turn of Niantic River Road operates efficiently at LOS A during all peak hours under 2026 background and 2026 combined conditions. There will be no significant reduction in LOS at this intersection as a result of the proposed development traffic.

At the existing unsignalized intersection of Daniels Avenue at Spithead Road the eastbound stop controlled approach of Daniels Avenue operates efficiently at LOS B or better during all peak hours under 2026 background and 2026 combined conditions. The northbound left turn from Spithead Road operates efficiently at LOS A during all peak hours under 2026 background and 2026 combined conditions. As a result of the sight line evaluation conducted at this intersection, implementation of all-way stop control is recommended as noted above in Section 5.2. Under all-way stop control, all three approaches will operate efficiently at LOS A during both the morning and afternoon peak hours in the combined conditions.

At the unsignalized intersection of Route 156 (Rope Ferry Road) at Spithead Road the southbound approach of Spithead Road operates efficiently at LOS B during the weekday morning peak hour and acceptably at LOS C during the weekday afternoon peak hour under 2026 background conditions. With the addition of the LEARN Early Childhood School development site traffic, the southbound approach of Spithead Road is expected to operate with similar LOS delays during the weekday morning and afternoon peak hours. The eastbound left turn of Route 156 (Rope Ferry Road) operates efficiently at LOS A during all peak hours under 2026 background and 2026 combined conditions. There will be no significant reduction in LOS at this intersection as a result of the proposed development traffic.

At the unsignalized intersection of Niantic River Road at West Street the westbound approach of West Street operates efficiently at LOS B or better during all peak hours under 2026 background and 2026 combined conditions. The southbound left turn of Niantic River Road operates efficiently at LOS A during all peak hours under 2026 background and 2026 combined conditions. There will be no significant reduction in LOS at this intersection as a result of the proposed development traffic.

5.4 Queue Analysis

Background and Combined 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. The queue lengths are provided in the Synchro capacity analysis worksheets, which are located in *Appendix C and D. Tables 5 and 6 of Appendix A* provide a summary of the queue lengths for the critical lanes at each intersection.

The majority of the approaches at the study are intersections that experience minimal queue length increases of four vehicle lengths or less upon the addition of the LEARN Early Childhood School site trips with the exception of the eastbound approach of Route 1 (Boston Post Road) at the intersection of Route 1 (Boston Post Road) at Niantic River Road during the weekday morning peak hour. The eastbound approach of Route 1 (Boston Post Road) is expected to experience a queue length increase of just under five vehicles or less. In addition, there are three approaches that experience queue length increases greater than four vehicle lengths at the intersection of Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive. For instance, the westbound through/left turn approach experiences an increase of just under five vehicles during the weekday morning peak hour and just under six vehicles during the weekday afternoon peak hour. However, this approach already exceeds its provided queue storage under background conditions and are not significantly impacted by the traffic generated from the proposed development. It is important to note that these queue increases are brief in nature and confined to a portion of the morning and afternoon school peak hours.

The northbound approach of the unsignalized intersection of Daniels Avenue at Site Driveway is also expected to experience a queue length increase of seven vehicles or less during the weekday morning peak hour upon the addition of the LEARN Early Childhood School site trips. However, this queue is anticipated to occur for

approximately 20 to 30 minutes during drop off and dismissal and can be adequately stored on site. This is common for school land uses as peak pick up and drop off times typically occur over a short time period just before the start of school and immediately after school dismissal.

The southbound approach of Cross Road during the weekday morning and weekday afternoon peak hours experiences an increase of just over four vehicles or less during the weekday morning peak hour and just under seven vehicles or less during the weekday afternoon peak hour. However, as stated previously, the existing single lane arrangement of Cross Road already creates significant queues along this approach. The northbound approach of Spithead Road during the weekday afternoon peak hour also experiences an increase of just over four vehicles or less during the weekday afternoon peak hour.

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 for a charter elementary school comprised of 526 students, a total of 550 vehicle trips (286 entering, 264 exiting) are anticipated during the weekday morning peak hour and a total of 374 vehicle trips (183 entering, 191 exiting) are anticipated during the weekday afternoon peak hour. As for a daycare center comprised of 48 students, a total of 40 vehicle trips (21 entering, 19 exiting) are anticipated during the weekday morning peak hour and a total of 40 vehicle trips (19 entering, 21 exiting) are anticipated during the weekday afternoon peak hour.

It is important to note that the trip generation projections in this study should be considered conservative as they assumed the daycare and school uses would peak during the same peak hours and they also did not take credit for parents dropping off children at both the school and daycare at the same time. In addition, no trip credit was taken for the previous school use that was in operation on the site and generated substantial traffic volume on the adjacent road network in the past.

The capacity analysis revealed that the majority of the intersections in the study area operate acceptably and will not sustain a significant decrease in LOS after inclusion of the site generated traffic. However, minor signal timings and optimization are recommended at the three signalized intersections within the study area and are located most remotely from the school. The site driveway is expected to operate at acceptable LOS during the school peak hours. Peak hour queueing on the driveway is expected to extend to 175 feet, however this queue is only anticipated to occur for approximately 20 to 30 minutes during drop off and dismissal and can be adequately stored on site. This is common for school land uses as peak pick up and drop off times typically occur over a short time period just before the start of school and immediately after school dismissal.

The addition of vehicular trips generated by the proposed development expansion will also result in temporary and minimal queue increases at several intersection approaches within the study area during a portion of the school peak hours. These queue increases are brief in nature and quickly dissipate following the morning and afternoon school peak hours.

Review of the most recent three years of available crash data provided by the University of Connecticut Crash Data Repository indicated that the number and type of collisions at the study intersection is not abnormal for the traffic volumes experienced. The increase in traffic expected at the study intersections is not anticipated to have detrimental impact to roadway safety.

Sight lines and intersection safety were reviewed at the site driveway location along Daniels Avenue. Field measurements revealed that sufficient intersection sight distance exists for vehicles looking right (east) and left (west) at the proposed site drive to allow for safe egress of vehicles attempting to turn right or left from the proposed driveway onto Daniels Avenue.

Sight lines and intersection safety were also reviewed at the existing, unsignalized Town maintained intersection of Daniels Avenue at Spithead Road given the horizontal and vertical curvature constraints that are present on Spithead Road in the vicinity of this intersection. Under the existing intersection geometry and existing traffic control (stop control on Daniels Avenue approach only), there have been no identifiable crash patterns and no abnormal crash frequencies observed at the intersection of Spithead Road and Daniel Avenue. As noted in the Crash Analysis, the intersection has averaged one crash per year over the latest three years of available data. However, while the intersection has been operating safely, the intersection sight distances from the Daniels Avenue approach to Spithead Road looking left from Daniels Avenue (north) and looking right from Daniels Avenue (south) falls short of CTDOT requirements as a result of the existing vegetation, horizontal and vertical curvature constraints noted above.

Given the existing intersection constraints and noted concern for safe egress of the additional passenger cars and single unit trucks/busses being generated onto Spithead Road by the new school, we recommend that the intersection be converted to an all-way stop-controlled intersection by adding stop and stop ahead signs on both Spithead approaches that are in accordance with MUTCD distance guidelines.

Based on the results of the foregoing analysis, the following off-site improvements are recommended:

1. Signal Timing and cycle length optimizations at the intersections of Route 156 (Rope Ferry Road) at West Street, Route 1 (Boston Post Road) at Niantic River Road, and Route 1 (Boston Post Road) at Spithead Road and Cross Road/Sunniecrest Drive
2. Implementation of all-way stop control at the intersection of Spithead Road at Daniels Avenue

Upon implementation of these off-site improvements, it is the professional opinion of Fuss & O'Neill, Inc. that the proposed development will not have a significant impact to traffic operations within the study area.

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GRAPHIC SCALE	

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NEWMAN ARCHITECTS, PC
 SITE LOCATION MAP
 LEARN EARLY CHILDHOOD SCHOOL TIS
 WATERFORD CONNECTICUT

PROJ. No. 20220883.A50
 DATE 03/20/2025
FIG. 1

TAB 7

01 May 2025

Gary Schneider
Town of Waterford
1000 Hartford Turnpike
Waterford, CT 06385

**RE: Stormwater Management Report
LEARN Early Childhood School
Waterford, Connecticut
Langan Project No.: 140310301**

Dear Mr. Schneider:

This report provides an analysis of the proposed peak runoff discharges and the engineering design for the proposed stormwater conveyance system at 51 Daniels Avenue.

PROJECT DESCRIPTION

Existing Conditions

The project site is located at 51 Daniels Avenue in Waterford, CT; see Figure 1. The existing overall parcel is approximately 19.32 acres. LEARN is acquiring 15.36 acres of the existing parcel to be utilized for a proposed elementary school. The remaining 3.96 acres will be retained by the Town of Waterford. The site is currently occupied by an existing school and includes impervious, grassy, and wooded areas. The parcel is located within the Niantic River subregional drainage basin. The parcel area does not contain any known locations of State and Federal Listed Species and Critical Habitats per the CT Natural Diversity Data Base Areas map of Waterford, CT dated December 2024. To the west, the project site is bordered by residential properties on High Street and High Ridge Drive, to the south by residential properties on Seaview Terrace and the Bayview Healthcare building, and to the east by residential properties and wooded areas. To the north, the project site is bordered by Daniels Avenue. The existing project site is currently a closed school building with associated impervious parking, drive aisles and pervious areas with the majority of stormwater running overland towards off-site wetlands to the west or Daniels Avenue.

Based upon a topographic survey titled "Lot Line Modification Survey" prepared by Benesch, dated March 28, 2024, the site grades generally slope downward from the eastern property line towards High Street and the off-site wetland to the west, with a small northeastern portion of the site sloping downward towards the northeast wetland. Elevations range from approximately 120 feet to about 80 feet.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Study of New London County, Connecticut map number 09011C0483J with an effective date of August 5, 2013, the proposed development is located within Zone X (Unshaded). Zone X (Unshaded) is considered a Low-Risk Area and described by FEMA as areas outside the 0.2-percent-annual-chance flood. No base flood elevations or base flood depths are shown within these zones; see Figure 2.

According to the USDA Natural Resources Conservation Service Web Soil Survey, the site's soil type varies throughout. The site is mostly classified as either Woodbridge fine sandy loam with a D hydrologic rating with slopes between 0% and 3%, Paxton and Montauk fine sandy loams with a C hydrologic rating with slopes between 3% and 8%, or Urban land with a D hydrologic rating. Additionally, small portions of the site are classified as Woodbridge fine sandy loam with a D hydrologic rating with slopes between 3% and 8%, Paxton and Montauk fine sandy loams with a C hydrologic rating with slopes between 3% and 8%, very stony, and Charlton-Chatfield complex with a B hydrologic rating with slopes between 0% and 15%, very rocky.

There is one off-site wetland located off the southwest corner of the site. No site work is proposed within the 100-foot upland review area of this wetland or within the 100-foot vernal pool envelope. Another off-site wetland is located off the southeastern corner of the site. A small section of sidewalk is proposed within the upland review area of this wetland, however, the sidewalk is downgradient of this wetland and no direct impacts are proposed. A small portion of a vernal is located on the parcel to be retained by the Town of Waterford. No permanent site features will be located within the 100-ft vernal pool envelope. No direct impacts are proposed.

Proposed Project

The proposed project consists of the construction of a ±87,500 square-foot footprint early childhood school. Additional improvements include new driveways, parking areas, stormwater and utility infrastructure, as well as hardscape and landscaped areas. A summary of the change in impervious is shown below.

Project Site Impervious Cover [SF]

Existing Conditions	Proposed Conditions	Net Increase
±162,430	±319,660	±157,230

The proposed stormwater system has been designed to maintain existing site hydrology to the maximum extent practicable. The majority of runoff from the new development will be collected in a traditional pipe and catchbasin network and conveyed to various stormwater management systems before discharging to either the southwestern property boundary or to the existing storm sewer system in Daniels Avenue. Water quality improvements include catchbasins with sumps, water quality unit, and underground and aboveground detention systems with outlet control structures. These water quality improvements have been designed to meet the minimum average annual pollutant load reduction targets for redevelopment sites per Table 4.3 of the 2024 CT *Stormwater Quality Manual*.

Details of the size and location of the stormwater network can be found on the Grading & Drainage Plans, detail sheets, and supporting calculations in the appendices of this report.

PEAK RUNOFF ANALYSIS (See Appendices A & B)

The stormwater management system is designed to control the rate runoff from the site's watersheds to be equal or less than existing conditions up to, and including, a 100-year design storm event.

The peak runoff discharges for the existing and proposed conditions were analyzed using Soil Conservation Service (SCS) methodology which outlines procedures for calculating peak rates of runoff resulting from precipitation events as well as procedures for developing runoff hydrographs. The entire site was included in the analysis; see Figures EXWS and PRWS. Values for area, curve number (CN), and a time of concentration were calculated for the existing and proposed conditions.

The curve number is a land sensitive coefficient that dictates the relationship between total rainfall depth and direct storm runoff. The soils within the watershed are divided into hydrologic soil groups (A, B, C, and D). The SCS classification system evaluates the runoff potential of a soil according to its infiltration and transmission rates. "A" soils have the lowest runoff potential, while "D" soils have the greatest runoff potential. Soils within the project area are predominantly Woodbridge fine sandy loam with a "D" hydrologic rating, Paxton and Montauk fine sandy loams with a "C" hydrologic rating, or Urban land with a "D" hydrologic rating.

The time of concentration (T_c) is defined as the time for runoff to travel from the hydraulically most distant point in the watershed to a point of interest. Values of time of concentration were determined for existing and proposed conditions based on land cover and slope of the flow path using methods outlined in TR-55.

For this study, a 24-hour NOAA D rainfall distribution was used to determine the peak flow rate to all points of discharge from the site. Precipitation data used for the various storm events is based on the "NOAA Atlas 14 Point Precipitation Frequency Estimates: CT" for the location as

shown in Graphic 1. A summary of all rainfall data utilized in the analysis for this site is provided below and a complete compilation of data provided by NOAA for this location is included in Appendix C.

Graphic 1. NOAA Rainfall Data Location Map



NOAA Precipitation Depth per Average Recurrence Interval [in]

Duration	2-Year	10-Year	25-Year	100-Year
24-hour	3.44	5.14	6.21	7.85

Existing Condition (See Appendix A)

The project area’s existing drainage conditions were analyzed as Watersheds 1, 2, and 3 (See Drawing EXWS).

Existing Watershed 1 is approximately 8.21 acres and consists mostly of grassy and wooded areas south of the existing school. Stormwater runoff from this watershed flows overland to the west and towards the off-site western wetland.

Existing Watershed 2 is approximately 5.53 acres and consists of the existing school parking area and grass areas west of the school. Stormwater runoff from this watershed flows overland to the northwest and towards the stormwater network within Daniels Avenue.

Existing Watershed 3 is approximately 2.56 acres and consists mostly of grassy and paved areas east of the existing school. Stormwater runoff from this watershed flows overland to the northeastern wetland.

Proposed Condition (See Appendix B)

In the proposed condition, the site hydrology has been designed to match existing conditions to the maximum extent possible, and all watershed design points remain the same.

Proposed Watershed 1 has been divided into two sub-watersheds: Proposed Watershed 1A and Proposed Watershed 1B. Proposed Watershed 1A is about 3.81 acres and consists of the southern parking lot and some landscape areas. Stormwater from these areas will be collected in a series of catch basins before being directed to a proposed underground infiltration system (System 1A). Discharge from this system will then be routed to an outfall located to the southwest. Proposed Watershed 1B is about 2.86 acres and consists of mostly grassy and some hardscaped areas. Stormwater from these areas will continue to flow west, overland, to the existing off-site wetland.

Proposed Watershed 2 has been divided into three sub-watersheds: Proposed Watershed 2A, Proposed Watershed 2B, and Proposed Watershed 2C. Proposed Watershed 2A is about 3.41 acres and consists mostly of roof tops, amenity and some landscape areas. Stormwater from these areas will be collected in roof drains and a series of yard drains before being directed to a proposed aboveground infiltration basin (System 2A). Discharge from this system will then be routed to the existing stormwater system in Daniels Avenue. Proposed Watershed 2B is about 3.19 acres and consists of the northern parking lot, site driveway, roof tops, amenity and some landscape areas. Stormwater from these areas will be collected in roof drains and a series of catch basins before being direct to a proposed underground infiltration basin (System 2B). Discharge from this system will then be routed to the existing stormwater system in Daniels Avenue. Proposed Watershed 2C is about 1.68 acres and consists of mostly grassy areas. Stormwater from these areas will continue to flow northwest, overland, to the existing stormwater system in Daniels Avenue.

Proposed Watershed 3 is about 1.35 acres and consists mostly of grassy and wooded areas. Stormwater from these areas will continue to flow northeast, overland, to the northeastern wetland.

Details of the sizes and locations of the stormwater collection systems can be found on drawings CG101 and CG102. On-site infiltration test was performed on April 16th, 2025, by Langan Engineering. Refer to Appendix F for test locations, results and test pit information. A 50% reduction was applied to the slowest test result for each system, see summary table below.

Detention System	Design Infiltration Rate
1A	2 in/hr
2A	0.25 in/hr
2B	2 in/hr

Site Discharge Peak Flow Comparison for WS-1 (CF)

Storm	Current	Proposed	Delta	% Reduction
2-Year	10.65	5.03	-5.62	-53%
10-Year	20.01	13.53	-6.48	-32%
25-Year	26.08	18.28	-7.80	-30%
100-Year	35.44	28.67	-6.77	-19%

Site Discharge Peak Flow Comparison for WS-2 (CF)

Storm	Current	Proposed	Delta	% Reduction
2-Year	10.97	4.78	-6.19	-56%
10-Year	18.68	10.58	-8.10	-43%
25-Year	23.53	17.35	-6.18	-26%
100-Year	30.92	24.24	-6.68	-22%

Site Discharge Peak Flow Comparison for WS-3 (CF)

Storm	Current	Proposed	Delta	% Reduction
2-Year	4.62	1.69	-2.93	-63%
10-Year	8.34	3.51	-4.83	-58%
25-Year	10.73	4.74	-5.99	-56%
100-Year	14.39	6.67	-7.72	-54%

Site Discharge Peak Flow Comparison for Total Site (CF)

Storm	Current	Proposed	Delta	% Reduction
2-Year	25.00	10.37	-14.51	-58%
10-Year	44.96	24.83	-19.81	-44%
25-Year	57.76	37.84	-19.46	-34%
100-Year	77.45	58.86	-17.89	-23%

As can be seen from the tables above, runoff from each watershed and the total site will be reduced for the storms up to, and including, the 100-year storm. Additionally, per the 2024 CT *Stormwater Quality Manual* requirements, runoff from each watershed that includes proposed site development will be reduced by 50% for the 2-year storm event.

STORMWATER CONVEYANCE SYSTEM (See Appendix D)

The stormwater conveyance system was sized using the Rational Method for the 10-year storm event. Values for area, runoff coefficient, C, and a time of concentration were calculated for each drainage area. The average runoff coefficient was calculated based upon the following cover types:

<u>Cover</u>	<u>C</u>
Grass/Pervious	0.3
Roof/Pavement/Impervious	0.9

Rainfall intensities were taken from the "NOAA Atlas 14 Point Precipitation Frequency Estimates: CT". Stormwater pipes were then sized based upon the Manning's Equation for full flow pipe capacity and solving for the hydraulic grade line. The computer program Hydraflow Storm Sewers 2011 by Intellisolve was used in the analysis.

The proposed storm sewer system has been analyzed using a starting HGL elevation equal to the outlet pipe's crown elevation. This mimics a tailwater elevation equal to the outlet pipe's diameter or a scenario where a proposed pipe is entering an existing pipe flow at full capacity.

STORMWATER QUALITY (See Appendix E)

The proposed stormwater management system has been designed to incorporate stormwater quality measures including catch basins with sumps, water quality units, underground and aboveground detention systems with outlet control structures. These measures will be implemented to increase water quality, maintain pre-development hydrology and minimize the passage of pollutants to the existing stormwater systems as compared to current conditions to the maximum extent achievable.

Standard 2 - Stormwater Runoff Quantity Control, was prioritized due to concerns about discharge upgradient of residential properties and the limited capacity of the existing storm sewer network in Daniels Avenue. Therefore, due to the site's presence of groundwater and low infiltration rates, the stormwater runoff volume retained on-site (as dead storage) does not meet the required retention volume (100% of the site's WQV). However, per the 2022 New England Stormwater Retrofit Manual performance curves for infiltration basin (HSG C & D), the retention volumes provided exceeds the required minimum average annual pollutant load reduction requirements for redevelopment sites listed in Table 4.3 of the CT Stormwater Quality Manual. The WQV is fully infiltrated for all design storms across the site, except for Pond 2A, where the

infiltration rate does not make it feasible due to poor infiltration rates. A summary of the retention volume (as dead storage) for each stormwater basin is summarized below (see Appendix E).

Detention System	2022 NE Stormwater Retrofit Minimum Retention Volume	Provided Retention Volume
1A	1,689 CF	1,809 CF
2A	3,576 CF	3,651 CF
2B	2,832 CF	2,891 CF

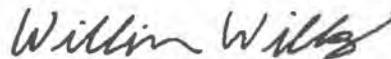
Each water quality unit has been sized to treat the water quality flow for 100% of the WQV. We will utilize Contech CDS hydrodynamic separators (water quality units) as pretreatment units, which are rated to provide 80% TSS removal. Additionally, per the New England Stormwater Retrofit Manual, the retention volume provided by pond 1A provides 80% TSS removal and ponds 2A and 2B provide 92% TSS removal.

CONCLUSION

The proposed stormwater management system has been designed in general accordance with the 2024 CTDEEP Stormwater Quality Manual, 2000 CTDOT Drainage Manual, and the Town of Waterford ordinances for stormwater management (Section 25.6). It has been designed to mimic existing site hydrology to the maximum extent practicable with no increase in the peak flow rates.

This Langan report confirms that the proposed stormwater management system, as designed, will effectively manage quality and quantity of stormwater runoff for the proposed development. Please refer to the Drawings for additional drainage information.

Sincerely,
Langan Engineering and Environmental Services, LLC



Bill Willsey, P.E.
Senior Staff Engineer



Kathryn Gagnon, P.E., LEED AP
Senior Project Manager

LIST OF FIGURES

Fig. 1	Location Map
Fig. 2	FEMA Flood Map
Fig. 3	NRCS Soil Map

LIST OF DRAWINGS

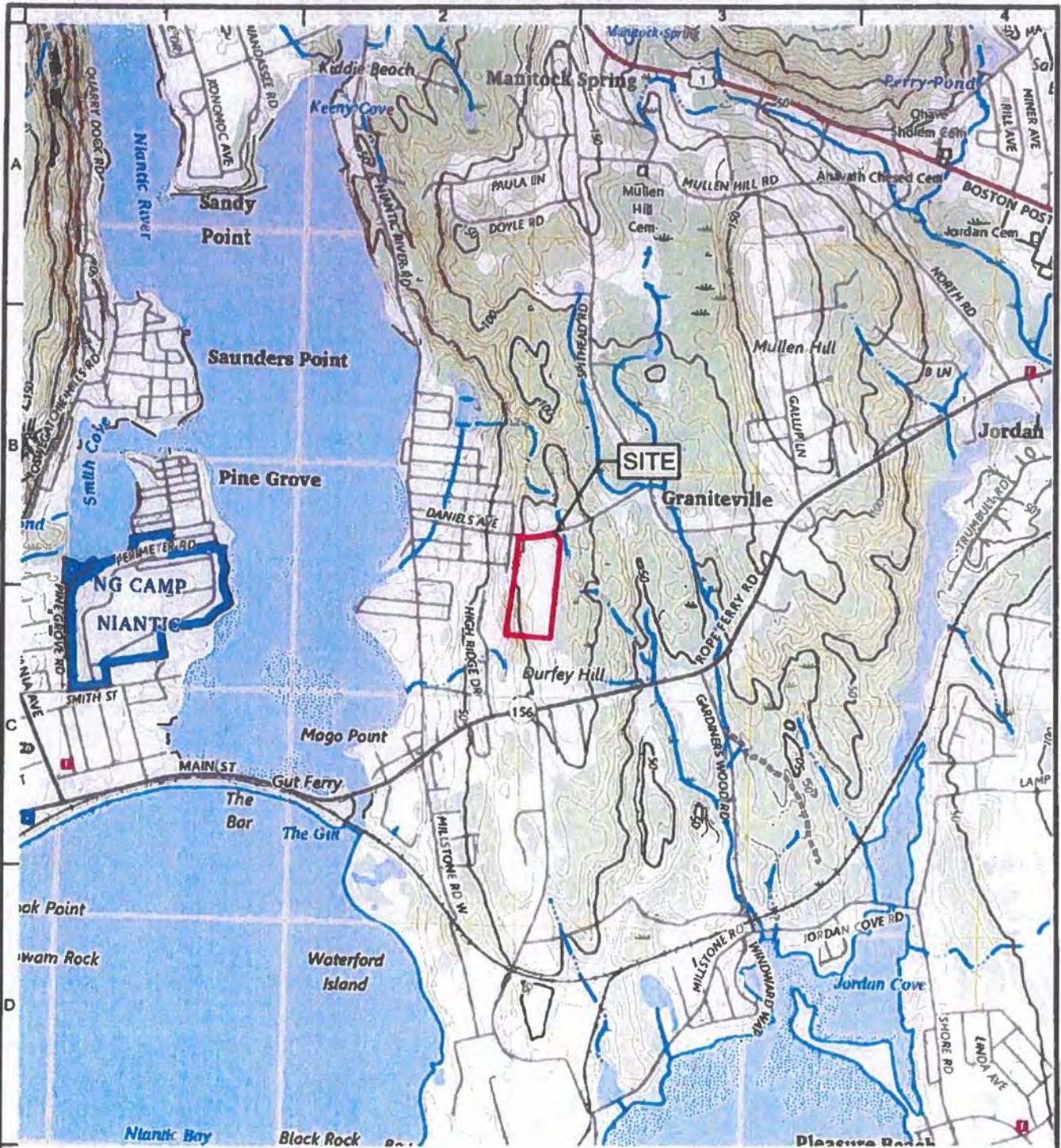
EXWS	Existing Watershed Map
PRWS	Proposed Watershed Map
DACB	Drainage Area Catchment Basin Map

REFERENCE DRAWINGS

CG100	Overall Grading & Drainage Plan
CG101	Grading & Drainage Plan I
CG102	Grading & Drainage Plan II
CE100	Overall Soil Erosion & Sediment Control Plan
CE101	Soil Erosion & Sediment Control Plan I
CE102	Soil Erosion & Sediment Control Plan II

LIST OF APPENDICES

Appendix A	Existing Stormwater Discharge Calculations
Appendix B	Proposed Stormwater Discharge Calculations
Appendix C	NOAA Rainfall Data
Appendix D	Stormwater Collection System Calculations
Appendix E	Supporting Calculations
Appendix F	Test Pit & Infiltration Logs
Appendix G	Stormwater Management System Operation and Maintenance Plan



Legend

Approximate Site Boundary



NOTES
 1 BASEMAP ADAPTED FROM UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5-MINUTE SERIES TOPOGRAPHICAL MAPS NIAN TIC, CONNECTICUT, QUADRANGLE DATED 2024

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Langan Engineering & Environmental Services Inc.
 Langan Engineering, Environmental Surveying
 Landscape Architecture and Geology D P C
 Langan International LLC

Collectively known as Langan

Project
LEARN SCHOOL
 51 DANIELS AVENUE
 WATERFORD CONNECTICUT

Figure Title
SITE LOCATION MAP

Project No
 140310301
 Date
 3/18/2025
 Scale
 1"=2,000'
 Drawn By
 MG
 Submission Date

Figure No
 1

TAB 8



WETLAND ASSESSMENT

May 1, 2025

Katy Gagnon, Senior Project Manager
Langan Engineering and Environmental Services
Long Wharf Maritime Center
555 Long Wharf Drive
New Haven, CT 06511

Re: LEARN - Early Childhood School
51 Daniels Avenue, Waterford, Connecticut
APT Job No: CT3611350

Dear Ms. Gagnon,

All-Points Technology Corporation, P.C. ("APT") understands that LEARN - Early Childhood School is acquiring ± 15.36 acres of a ± 19.32 -acre parcel at 51 Daniels Avenue in Waterford, Connecticut to be utilized for a proposed elementary school which will include demolition of the existing buildings, reconfiguration to existing drive aisles and parking areas, along with upgrades to the stormwater infrastructure (the "Project"). This wetland and vernal pool assessment report supplements other materials submitted under separate cover by others as part of the Waterford Conservation Commission ("WCC") Application for Permit ("Application"). The remaining ± 3.96 acres will be retained by the Town of Waterford for development of pickleball courts and a parking area, details of which will be submitted under a separate application. This document provides an assessment of three (3) wetlands and an embedded vernal pool proximate to the Project, which includes a description of the functions and values of the wetlands and vernal pool, a discussion of the Project's proposed activities located in the upland review area and nearby, and an analysis of potential resource impacts associated with the proposed regulated activities. The findings of this report are based on inspections performed of the Project area and nearby wetland/vernal pool resource on September 24, 2024 and April 12, 2025 and review of project site plans prepared by Langan Engineering, dated May 1, 2025 for the Application.

The Project area consists of a ± 19.32 -acre area on the south side of Daniels Avenue currently developed with a school building, associated impervious parking, drive aisles and pervious areas within the north eastern half of the rectangular-shaped parcel. A telecommunications tower facility is also located in the southeastern corner of the property and partially within the upland review area of Wetland 2 as discussed below. Remaining undeveloped portions of the property consist of an athletic field, open grassy and wooded/scrub-shrub areas. Wetlands were identified in proximity to the property along the northeastern, southeastern and southwestern boundaries. Within the northeastern wetland complex, Wetland 1, in proximity to Daniels Avenue, vernal pool habitat was identified and confirmed during the spring 2025 breeding season. Stormwater runoff from the school building and parking areas generally run overland to the west and toward Daniels Avenue to the north and not toward Wetland 1.

Wetland and Vernal Pool Resources

Matthew Gustafson and Emily Perko, Connecticut registered Soil Scientists with APT, performed a wetland inspection of the subject property on September 24, 2024 to identify and delineate wetland resources located on and proximate to the subject property. The wetland delineation methodology was performed in accordance with the Connecticut Inland Wetlands and Watercourses Act. A copy of the Wetland Inspection report, dated October 18, 2024, is enclosed along with representative photographs of the wetland features.

Three distinct wetland areas were identified on or immediately adjacent to the subject property located along the northeastern property boundary (identified as Wetland 1), off property along the southeastern boundary (Wetland 2) and off property near the southwestern boundary (Wetland 3). The 100-foot upland review area for all three delineated wetlands encroach into the subject property. Imbedded within Wetland 1, obligate vernal pool species breeding was also confirmed during a follow-up investigation performed on April 12, 2025. The limits of inundation associated with the vernal pool habitat were surveyed during the spring 2025 inspection. Although potential vernal pool habitat was identified in Wetland 2 during the October 18, 2024 wetland investigation, no vernal pool habitat was identified during the spring 2025 vernal pool inspection as those suspect areas were either found dry or had less than 2 inches of inundation and no evidence of any amphibian breeding. A detailed description of three wetland and one vernal pool resources identified is provided below.

Wetland Descriptions

Wetland 1 is located in the northeastern portion of the subject property, primarily located on the adjacent parcel, consisting of a forested complex dominated by red maple and black gum, with co-dominant of swamp white oak. The understory contains sweet pepperbush and highbush blueberry with multiflora rose along the delineated wetland boundary. The complex is characterized by seasonally saturated edges with a distinct slope break separation to the abutting upland forest to the west that is located on the property. A relatively large depressional area located entirely off the subject property is present within the interior of the wetland generally devoid of vegetation and presents indicators that a foot or more of inundation is present during peak flooding periods. Indicators include buttressed roots and moss trim lines. This depressional area was re-evaluated during the April 12, 2025 inspection to verify vernal pool breeding activity, during which time two (2) vernal pool indicator species spotted salamander (*Ambystoma maculatum*) and wood frog (*Lithobates sylvaticus*) were observed breeding within the flooded extents. Two distinct pockets of breeding within the central and southern portions of the flooded areas were observed with water depths ranging from 1.5 to 3 feet.

Wetland 2 is located off the southeast corner of the subject property on the adjacent parcel. Similar to Wetland 1, saturated edges border interior seasonally flooded areas, although much shallower than Wetland 1. Portions of the complex have experienced varying degrees of historic alteration with a stonewall intersecting the system resulting in altering of the drainage within the southern limits of the identified wetland and a dominance of multiflora rose and green briar present. The overstory was dominated by red maple with inclusions of black gum. The southern and central wetland extents are characterized by a broad transitional area consisting of a shallow slope break.

Wetland 3 is located off the southwest corner of the subject property on the adjacent property. This wetland feature is located at the base of a hillslope within a depressional area with a distinct slope break and rocky poorly drained soils. This isolated feature is dominated by red maple with spicebush and highbush blueberry within the understory. Small areas of shallow seasonal flooding were observed within the depression, which were confirmed to not support vernal pool breeding habitat due to their shallow flooding and short-duration hydroperiod.

Soil Classification

Soil survey information obtained from the Natural Resources Conservation Service ("NRCS") did not identify wetland soil types either within or proximate to the Project area. However, wetlands were encountered during the wetland investigation along the eastern property boundary and off-Property to the west. Based on available information collected during the wetland investigation the mapped wetland soil associated with the wetlands are predominately Ridgebury, Leicester and Whitman soils. Upland soils were examined along the wetland boundary and more distant upland areas during the site investigation. Those soils dominated by the Udorthents-Urban land complex within existing developed areas associated with the vacant school, Paxton and Montauck fine sandy loam in the western half of the property and Woodbridge fine sandy loam in the undeveloped southeastern portion. Detailed descriptions of wetland and upland soil types are provided below.

Wetland Soils:

Ridgebury, Leicester and Whitman (Soil Unit 3) soils consist of very deep, poorly to very drained soils formed in coarse-loamy or lodgement till. They are nearly level or gently sloping soils in depressions, drainageways, and low-lying positions on hills. A perched water table, or excess seepage water, is at or near the surface much of the year.

Upland Soils:

Paxton and Montauck fine sandy loam (Soil Unit 84) consist of well drained loamy soils formed in lodgement till landscapes. They are very deep to the underlying bedrock with a moderate depth to a densic contact. They are nearly level to steep soils on hills, drumlins and till plains.

Woodbridge fine sandy loam (Soil Unit 45) is a moderately well drained loam soil formed in lodgement till. They are very deep to bedrock and moderately deep to a densic contact. They are nearly level to moderately steep soils with slopes ranging from 0 to 25 percent on hills, drumlins, till plains, and ground moraines.

Udorthents-Urban Land Complex (Soil Unit 306) is a miscellaneous land type consisting mostly of disturbed soils (cutting, filling & grading) such that the original soil profile can no longer be discerned, buildings, paved roads and parking lots.

Wetland Evaluation

There are many methods of evaluating wetlands, all incorporating different parameters to assess these resources. This study uses methodology recommended by the Corps, *The Highway Methodology Workbook Supplement, Wetland Functions and Values: A Descriptive Approach* issued by the Corps, dated September 1999. This evaluation provides a qualitative approach in which wetland functions can be considered Principal, Secondary, or unlikely to be provided at a significant level. Functions and values can be Principal if they are an important physical component of a wetland ecosystem (function only), and/or are considered of special value to society, from a local, regional, and/or national perspective. The Corps recommends that wetland values and functions be determined through "best professional judgment" based on a qualitative description of the physical attributes of wetlands and the functions and values exhibited.

The basis for APT's determination of this qualitative approach relies on over 35 years of field experience and extensive knowledge of other scientific methods used for wetland evaluation purposes.

These functions and values can be grouped into four basic categories as follows:

Biological Functions

Fish and Shellfish Habitat — This function considers the effectiveness of seasonal or permanent waterbodies associated with the wetland in question for fish and shellfish habitat.

Wildlife Habitat — This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge.

Production Export (Nutrient) — This function relates to the effectiveness of the wetland to produce food or usable products for humans or other living organisms.

Hydrologic Functions

Floodflow Alteration (Storage & Desynchronization) — This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events.

Groundwater Recharge/Discharge — This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. Recharge should relate to the potential for the wetland to contribute water to an aquifer. Discharge should relate to the potential for the wetland to serve as an area where groundwater can be discharged to the surface.

Water Quality Functions

Sediment/Toxicant/Pathogen Retention — This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens.

Nutrient Removal/Retention/Transformation — This function relates to the effectiveness of the wetland to prevent adverse effects of excess nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries.

Sediment/Shoreline Stabilization — This function relates to the effectiveness of a wetland to stabilize streambanks and shorelines against erosion.

Societal Values

Recreation (Consumptive and Non-Consumptive) — This value considers the effectiveness of the wetland and associated watercourses to provide recreational opportunities such as canoeing, boating, fishing, hunting, and other active or passive recreational activities. Consumptive activities consume or diminish the plants, animals, or other resources that are intrinsic to the wetland, whereas non-consumptive activities do not.

Educational/Scientific Value — This value considers the effectiveness of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.

Uniqueness/Heritage — This value relates to the effectiveness of the wetland or its associated waterbodies to produce certain special values. Special values may include such things as archaeological sites, unusual aesthetic quality, historical events, or unique plants, animals, or geologic features.

Visual Quality/Aesthetics — This value relates to the visual and aesthetic qualities of the wetland.

Threatened or Endangered Species Habitat — This value relates to the effectiveness of the wetland or associated waterbodies to support threatened, endangered or special concern species.

The degree to which a wetland provides each of these functions is determined by one or more of the following factors: landscape position, substrate, hydrology, vegetation, history of disturbance, and size. Each wetland may provide one or more of the listed functions at Principal levels.

The determining factors that affect the level of function provided by a wetland can often be broken into two categories. The effectiveness of a wetland to provide a specified function is generally dependent on factors within the wetland whereas the opportunity to provide a function is often influenced by the wetland's position in the landscape and adjacent land uses. For example, a depressed wetland with a restricted outlet may be considered highly effective in trapping sediment due to the long residence time of runoff water passing through the system. If this wetland is located in gently sloping woodland, however, there is no significant source of sediment in the runoff therefore the wetland is considered to have a small opportunity of providing this function.

Biological Functions:

The ecological integrity of all three Wetlands have been compromised due to proximity to developed areas, historic alteration of Wetland 2 and the relatively small size of Wetland 3. From a comparative perspective, Wetland 1 has the highest ecological quality: however, fragmented upland habitat buffering this wetland from the existing on-site development, Daniels Avenue to the north and residential properties to the east has diminished some of the wetland's biological functions. As a result, wildlife utilization would largely be used by generalists and species habituated to the high level of human activity that exists both on the subject property and in the surrounding area. Wetland 1 maintains sufficient hydrology to support vernal pool breeding habitat throughout the complex but does not maintain permanent inundation to support finfish habitat. Although the ecological integrity of these wetlands has been compromised, wildlife habitat function is supported within Wetland 1 at a Principal level due in part to the vernal pool habitat but not at a significant capacity in Wetlands 2 and 3.

All three wetlands consist of a common vegetative class of palustrine forest cover type with shrub and herbaceous understory. However, there is not a large diversity of wetland cover types so there is a limited potential to produce food for several different types of wildlife that require diverse or specific wetland habitats beyond the forest habitat that is present. Therefore, these wetlands were assessed as supporting the production export (nutrient) function at a Secondary level based on the fruit bearing shrubs observed in the three resource areas.

Hydrologic Functions:

Wetlands 1, 2 and 3 do not border on a perennial watercourse with an active floodplain, and floodflow alteration is only supported at a Secondary level within Wetland 1 due to the potential for this system to support flood storage from stormwater runoff since it essentially functions as a confined basin. This function is not supported within Wetlands 2 or 3 due to the small size of these features.

All three wetlands receive groundwater discharges from hillside seepage providing the potential for both water discharge and recharge to the local groundwater. Wetland 1 was

assessed as supporting the groundwater discharge/recharge function at a Principal level due to its larger size while Wetlands 2 and 3 support this function at a Secondary level due to their relatively small size.

Water Quality:

The developed surrounding environment provides an opportunity for all three wetlands to support sediment/toxicant/pathogen retention and nutrient removal/retention/transformation functions. Wetland 1 receives stormwater from the subject property through sheet flow. Based on the resource size and location of Wetland 1 there is a potential to support these water quality functions in a Secondary level. Due to the relatively small sizes of Wetlands 2 and 3 there is limited potential to support this function in any significant capacity.

None of the wetlands have the potential for sediment/shoreline stabilization since they do not border on a perennial stream or open water body that would generate high flow velocities during storm events or from wave action.

Societal Values:

Wetland 1, consisting of a forested wetland type that supports vernal pool habitat is easily accessible by the public, and is associated with a school, supports an opportunity for various societal values. However, due to a lack of hunting or fishing opportunities, this wetland supports recreation value at a Secondary level. This wetland supports educational/scientific value at a Principal level due to the ease of access, proximity to a unique wetland habitat with breeding by vernal pool species, and future use of the property as a public school. In addition, this wetland supports visual/aesthetics value at a Secondary level due to the proximity of development and obstructive intervening vegetation from any publicly viewable areas. The uniqueness/heritage value of this wetland is diminished by the lack of: archaeological sites; unusual aesthetic quality; historical events; or unique plants, animals, or geologic features. As such, Wetland 1 does not support the uniqueness/heritage value at a Principle or Secondary level. Due to their small size and lack of unique characteristics, Wetlands 2 and 3 do not support any of these functions and values in a significant capacity.

Urban wetland quality values are supported by Wetland 1 at a Secondary level, since this wetland is generally surrounded by development but does support some habitat for wildlife particularly for vernal pool species. Wetlands 2 and 3 do not support this value in a significant capacity due to their small size and lack of diverse habitat.

Threatened or Endangered Species Habitat:

No State-listed Threatened, Endangered or Special Concern species are known to utilize the subject property, or its wetlands based on available mapping (December 2024) from the Connecticut Department of Energy & Environmental Protection ("DEEP") Natural Diversity Data Base ("NDDB"). The nearest NDDB buffer area is located ± 0.18 mile to the northeast in nearby Millstone Brook riparian corridor. As such, consultation with DEEP NDDB is not required for this project. Due to the relatively small forest patch size, limited size of these wetland resources through development on the subject property and abutting properties, the potential wildlife habitat value for rare species would be limited and is not considered to be supported at either a Principle or Secondary level.

Proposed Activities

The following section summarizes development activities. The WCC regulates activities in wetland and watercourses and upland areas within 100 feet of wetlands and watercourses, known as an upland review area ("URA") that are likely to impact wetlands and watercourses and not otherwise deemed as-of-right or non-regulated activities.

The proposed redevelopment will avoid direct wetland impacts. As previously discussed, Wetland 1 is located mainly off the subject property with the vernal pool habitat located off site and Wetlands 2 and 3 are entirely located off the property. However, due to the proximity of all wetlands to the subject property, the 100-foot URA encroaches on to the property. The proposed redevelopment will avoid encroachment into most of the URA with one exception. A small ± 200 SF portion of the proposed perimeter sidewalk that will surround the entire LEARN school will just encroach into the URA of Wetland 2 with associated grading and limit of disturbance encompassing an additional ± 800 SF of the URA; total activity in the URA is $\pm 1,000$ SF. This relatively small area of regulated activity in the URA is currently comprised of maintained lawn associated with the nearby athletic field. In addition, a gravel access road that provides access to the telecommunications facility (approved by this Commission in 2012) is located between the proposed sidewalk and Wetland 2. Additionally, the redevelopment project avoids any encroachment into areas within 100 feet of the vernal pool in Wetland 1. As a result, the proposed redevelopment will not impact the vernal pool habitat or intercept migratory corridors or forested habitat used by the identified vernal pool species.

The project has been designed to avoid direct stormwater discharges to wetland resource areas while maintaining existing drainage patterns and hydrology inputs to the wetland areas to the maximum extent practicable. The proposed stormwater management system incorporates a variety of stormwater quality measures including catch basins with sumps, ADS Stormtech Isolator Rows, hydrodynamic separators, and belowground and aboveground infiltration basins. These treatment measures will properly control peak runoff rates, retain all of the project's post-development retention volume, and provide proper renovation of the water quality volume, resulting in a significant improvement over the current stormwater management system to the benefit of the receiving wetlands. The proposed stormwater management system substantially achieves the stormwater volume, rate, and average annual pollutant load reduction requirements as per the recommendations of the 2024 *Connecticut Stormwater Quality Manual*.

Wetland and Vernal Pool Impact Analysis

The fundamental concept of wetland and vernal pool impact analysis is based on the precept that wetland and vernal pool impacts should first be avoided where possible. Secondly, if practicable alternatives do not exist to avoid wetland impacts, then impacts should be minimized. Thirdly, mitigation should be considered for unavoidable wetland impacts, with consideration given to the loss of wetland functions and values that are important to the local region.

As previously discussed, the LEARN - Early Childhood School redevelopment will avoid any direct impact to wetlands or vernal pool resources.

Areas of proposed activity within Wetland 2's 100-foot URA, which total $\pm 1,000$ SF, are proposed to occur within an existing maintained open field associated with the nearby athletic field that is routinely mowed. Impacted and degraded areas currently exist in closer proximity to Wetland 2 associated with the telecommunications facility and gravel access drive. Upland review areas can serve a number of important functions that support wetlands and watercourses including water quality protection (erosion control and sediment, nutrient, biological and toxics removal), hydrologic event modification

and wildlife habitat. However, considering the existing developed and disturbed nature of this particular upland review area, such functions are not being supported in a significant capacity.

Construction and operation of the school would not result in direct physical impact to Vernal Pool 1 or impact within 100 feet of the vernal pool edge. It is widely documented that vernal pool dependent amphibians are not solely reliant upon the actual vernal pool, which is limited to use for breeding and egg/larval development, and require surrounding upland forest habitat for most of their adult lives. Intact forest represents the highest value, or optimal, habitat within the VPE and adjacent areas to support breeding opportunities for the various obligate vernal pool indicator species that rely on forested habitat (e.g., wood frog and spotted salamander). The US Army Corps of Engineers New England District's *Vernal Pool Best Management Practices* ("BMPs") also establish the concept of "directional corridors" (identified herein as "Migratory Corridors"). Identification of Migratory Corridors allow a project to evaluate potential impacts to optimal pool-breeding amphibian habitat that focuses on conserving the most essential habitats which link breeding pools, forested wetlands, and forested uplands. These interrelated habitats form essential migratory corridors at a landscape scale level. The location of Migratory Corridors is established through an evaluation of both wetland and terrestrial habitat structure qualities (e.g., vegetative cover types, width of vegetated buffer, soil surface moisture, thickness of duff layer, abundance of cover objects, etc.) that determines the locations of "Suitable Non-Breeding Habitat" and "Non-Habitat" in proximity to the vernal pool. Non-habitat areas such as developed areas, maintained lawn, and large expanses of impervious surface do not support Migratory Corridors due to the lack of sufficient vegetative conditions which are often associated with higher levels of predation and high level of human activity that can result in direct mortality. For the subject property which is dominated by the existing school development and includes the school building, relatively large areas of paved parking and access, and regularly maintained athletic fields and lawn, represents a large area of Non-Habitat located west of Vernal Pool 1. This large area of Non-Habitat provides no vegetative cover for migratory wood frogs or salamanders, which would expose these amphibians to desiccation and high levels of predation. This existing development separates the vernal pool habitat from other forested areas thereby eliminating a potential Migratory Corridor to the west.

Migratory Corridors occur in areas that link vernal pools and Suitable Non-Breeding Habitat, which consists of (both forested wetland and upland habitats). The principal Migratory Corridors associated with Vernal Pool 1 are located to the south and east of the resource area linking adjacent and somewhat continuous upland and wetland forested habitats. Although residential properties are located proximate to these Migratory Corridors, there is significantly less landscape-level anthropogenic changes when compared to the expansive school development, that still maintains a relatively large forested habitat block to accommodate these Migratory Corridors. The proposed redevelopment does not intercept this Migratory Corridor.

There is the potential for short term wetland impacts during construction due to the proximity of wetland resources and proposed site work associated with grading and vegetation removal activities. The potential for these short-term impacts is mitigated with the implementation and maintenance of a comprehensive soil erosion and sediment control plan, as detailed on the separately attached project site plans that were developed in accordance with *2024 Connecticut Guidelines For Soil Erosion and Sediment Control*. The installation of silt fence and employment of additional erosion control Best Management Practices ("BMPs") would function as an effective isolation barrier for possible migrating herpetofauna from encountering construction. Additionally, a Wetland and Vernal Pool Protection Plan will include contractor education and awareness signage of the nearby sensitive wetland resources, including the vernal pool habitat and associated herpetofauna (i.e., wood frog, salamanders, turtles, snakes, etc.) that could be encountered.

Wetland and Vernal Pool Protection Plan

As a result of the proposed development's location in the vicinity of wetlands and vernal pool, the following protection plan is provided to avoid unintentional impact to wetland and vernal pool habitats and associated herpetofauna during construction activities. Complete details of the recommended wetland and vernal pool are enclosed with a summary provided below. Upon permit approval, this protection plan will be incorporated into the construction drawings to ensure the Contractor is fully aware of the project's environmentally sensitive setting and the required protection measures.

A wetland scientist from APT experienced in compliance monitoring of construction activities will serve as the Environmental Monitor for this project to ensure that the following BMPs are implemented properly. The proposed wetland and vernal pool protection program consists of several components including: periodic inspection and maintenance of erosion controls and isolation structures; education of all contractors and sub-contractors prior to initiation of work on the site; protective measures; wildlife sweeps to remove any wildlife from work areas; and reporting.

APT recommends establishing a wetland and vernal pool protection program consisting of contractor awareness training prior to initiation of construction activities. The contractor training session would stress the sensitive nature of the project, what species might be encountered and what to do if they are present. In addition, the wetland protection program would include an initial inspection of the silt fence erosion and sedimentation controls that will serve double duty as a restrictive barrier to possible species dispersal into the construction site from the nearby wetland and vernal pool. Provided the wetland protection program is properly implemented during construction, it is APT's opinion that potential short-term impacts to nearby wetland and vernal pool resources would not occur.

Mitigation

Since the proposed addition and renovation activities will not directly impact wetland resources and are limited to activities within the existing developed/disturbed upland review area, no mitigation is considered necessary. APT will perform contractor education training at a pre-construction meeting to review the environmentally sensitive nature of the project area, where wetland and vernal pool resources are located and the need to ensure protection of those resources during construction through implementation and maintenance of the soil erosion and sediment control plan. APT will also posting notice signs to highlight the environmentally sensitive nature of the subject property to maintain diligence by the contractor throughout the construction project duration.

Summary and Conclusion

The LEARN - Early Childhood School redevelopment project will not directly impact wetland or vernal pool resources. In addition, activities proposed in the 100-foot URA will be limited to existing developed and disturbed areas and only encompass a relatively small $\pm 1,000$ SF area. A comprehensive suite of erosion and sedimentation control measures in addition to a Wetland and Vernal Pool Protection Plan will be implemented during construction to prevent direct and indirect impacts to nearby wetland and vernal pool resources during construction.

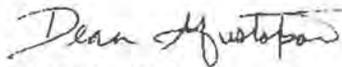
Considering the proposed development activities avoid any direct wetland and vernal pool impact, work is limited to the outer URA within an existing degraded and maintained area, and extensive protection measures will be employed during construction activities, it is our professional opinion that no likely adverse impact to wetland and vernal pool resources would result.

Based on the findings of this assessment, we respectfully request that the Town of Waterford Conservation Commission serving as the Inland Wetlands Agency find this project and the various conservation and mitigation measures are adequately protective of the interests contained in the Town of Waterford Inland Wetlands and Watercourses Regulations and issue a wetland permit approving the proposed regulated activity.

If you have any questions regarding the above-referenced information, please feel free to contact me by telephone at (860) 552-2033 or at dgustafson@allpointstech.com.

Sincerely,

All-Points Technology Corporation, P.C.



Dean Gustafson
Professional Soil Scientist
Senior Wetland Scientist

Enclosures

Wetland Inspection Report



WETLAND INSPECTION

October 18, 2024

APT Project No.: CT3611350

Prepared For: Langan Engineering and Environmental Services
Long Wharf Maritime Center
555 Long Wharf Drive, New Haven, CT 06511

Site Address: 51 Daniels Avenue, Waterford, Connecticut

Date of Investigation: 9/25/2024

Field Conditions: **Weather:** cloudy, mid 60's
Soil Moisture: dry to moist

Wetland/Watercourse Delineation Methodology¹:

- Connecticut Inland Wetlands and Watercourses
- Connecticut Tidal Wetlands
- U.S. Army Corps of Engineers

Municipal Upland Review Area: Wetlands: 100 feet **Watercourses:** 100 feet

The wetlands inspection was performed by²:

A handwritten signature in black ink, appearing to read "Matthew Gustafson".

Matthew Gustafson, Registered Soil Scientist

Enclosures: Wetland Delineation Field Forms & Wetland Inspection Map

This report is provided as a brief summary of findings from APT's wetland investigation of the referenced Study Area that consists of proposed development activities and areas generally within 200 feet.³ If applicable, APT is available to provide a more comprehensive wetland impact analysis upon receipt of site plans depicting the proposed development activities and surveyed location of identified wetland and watercourse resources.

¹ Wetlands and watercourses were delineated in accordance with applicable local, state and federal statutes, regulations and guidance.

² All established wetlands boundary lines are subject to change until officially adopted by local, state, or federal regulatory agencies.

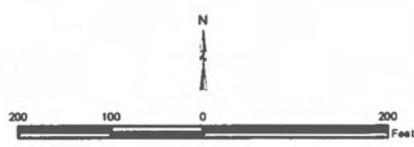
³ APT has relied upon the accuracy of information provided by Langan Engineering and Environmental Services regarding the location and limits of the Study Area for the purposes of identifying wetlands and watercourses.



Legend

- Site
- Wetland Flag
- 100' Upland Review Area
- Delineated Wetland Boundary
- Approximate Wetland Area
- Approximate Parcel Boundary

Map Notes:
 Base Map Source: 2019 CT Aerial Imagery (CTECO)
 Map Scale: 1 inch = 200 feet
 Map Date: September 2024



Wetland Inspection Map

51 Daniels Avenue
Waterford, Connecticut



TAB 9

**LEARN Response to Town Professional Staff Comments
New School – 51 Daniels Avenue**

LEARN appreciates the opportunity to benefit from the Town of Waterford's pre-application review process. LEARN submitted draft plans to the Town professional staff on March 27, 2024. We received consolidated comments from the Waterford staff on April 9, 2025 regarding LEARN's Preliminary Application for its proposed new school project and pickleball courts to be located at 51 Daniels Avenue. The respective staff comments are below followed by LEARN's narrative response to each comment and references to the updated plans and reports as needed.

For ease of review, the Town professional staff comments are in *italics* and the Learn responses are in **bold**.

A.

<i>Department</i>	<i>Date</i>
<i>Traffic</i>	<i>4/8/25</i>

I. *Chief of Police Balestracci*

I. *As far as my concerns, several schools in Waterford have poor entrance/exit, parking and traffic flow designs. The following schools have significant challenges which create congestion on local roads, the requirement for daily police or school staff management and safety concerns: Clark Lane Middle School, The Friendship School, Great Neck Elementary School and Quaker Hill Elementary School. When built, it was more common for students to ride school buses. In today's environment, students are commonly dropped-off and picked-up by family in personal cars. This change in behavior has amplified challenges already created by school entrances and exits being placed too close together on heavily travelled roads and general parking being within the bus and parent travel areas for drop-off and pick-up. As family members arrive at varied times to try and get ahead of traffic delays, the challenges are compounded.*

In review of the draft Friendship School design, I find the school bus queue area to be too short in length, too close to Daniels Avenue, too close to the main roadway into the rear lot and positioned to transition students on and off the bus in an area which requires them to cross a travel lane for parking. This creates potential concerns for traffic backing up as the buses turn into the area designated as the bus drop-off area, which could in-turn back up traffic onto Daniels Avenue and prevent other vehicles from continuing towards the rear of the school.

At the rear of the school, where it is designated parent drop-off, it requires traffic to cross the line of cars waiting in line to drop-off or pick-up. Although there would be markings on the pavement to prevent blocking of that intersection, our experience shows many drivers fail to follow these markings and police and/or staff management is required daily to prevent gridlock, again compounding delays and safety concerns.

I also looked at the design in terms of school safety. Although I am not an architect, I find the overall design challenging. The layout creates a significant number of entry/exit points to manage, controlled access points to the school at extreme opposite ends which reduces staff and school safety monitors from one focus point to two, and outdoor recreational areas confined between the building and a fence which makes emergency egress limited in worst case scenarios.

RESPONSE: The school bus drop-off and pick-up area as well as the parent drop off areas

were planned to accommodate the anticipated trip generation for the two components of the site (1) an Infant/Toddler Center and (2) a Pre-K – Grade 2 elementary school. As part of its design process LEARN's design team drew on industry standards, its experience with other school projects as well as LEARN own experience with the Friendship School. As the owner and operator of the future school, LEARN is fully incented to design for and provide the best site access and circulation possible on the site. LEARN values the Police Chief comments and has expanded the bus drop-off and pick-up queuing area to accommodate 11 school buses. The expanded area is shown on plan sheet CS102. The expanded queuing can now accommodate queuing storage for 11 school buses and 87-105 cars and 11 school buses. LEARN does not anticipate the need for all of these spaces, taking a conservative approach, they provide an adequate storage to handle high volume events.

LEARN can also manage traffic volumes by controlling start and finish time for various programs. Currently, the infant/toddler program is anticipated to operate from 7 am to 5 pm, Monday-Friday, year-round. Because the infant/toddler program requires parents to bring the children into the school, parents will park their vehicles in the designated infant/toddler drop-off stalls and walk the infants and toddlers to the main (north) entrance for this program. After checking in at the administration deck, the parents will walk the child to his or her classroom. The infant/toddler drop-off should be completed prior to the start time for the elementary school program. The elementary school is anticipated to operate from 9:15 – 3:30 on weekdays, following the school year calendar. Students will arrive via bus (at the north lot) or by parent drop off (at the south lot).

Bus Queuing

The Bus drop-off and queuing area has been expanded and reconfigured based on the Police Chief's comments to hold nine buses for loading/unloading at the same time and two reserve spaces for buses waiting to load or unload. With this new property, LEARN will be transitioning to a hub busing strategy with the support of buses from Waterford and New London. The bus drop-off zone has been reconfigured and relocated to accommodate 9 buses concurrently loading/unloading. The bus drop off island has been removed, allowing students to exit directly to a sidewalk with no need to cross traffic of any kind to ensure student and faculty safety. The north parking lot area also includes ADA parking and van drop off consistent with the spaces required by law.

Parent Drop-Off Area

Based on LEARN's experience with other regional school facilities, LEARN anticipates a significant portion of students will use the bus service. However, LEARN also recognizes, as noted in the comments, that frequently parents elect to drive their children to school. LEARN has designed the school to provide parent drop-off and pick-up in the rear (south) parking lots to provide large queuing storage areas and avoid conflict with the buses. As noted, the In total, the revised design can accommodate queuing of 85 -105 cars. LEARN does not anticipate queues of that length but the site can safely accommodate them. As design professionals, we anticipate that parents will observe the crossings at the marked intersection along with the support of signage that instruct drivers to not block the intersection. LEARN intends to communicate the traffic flow pattern in advance of the first day of school through its school orientation materials and presentations. If the rules are not

followed, LEARN will assign a staff member and/or consult with the police to best monitor the intersection to avoid any potential bottleneck concerns. In addition, staff members will be stationed at the south entry to assist in getting students out of and into their car to ensure an orderly process.

School Design

The school is placed on the rectangular site to optimize the site's natural features while organizing the program into wings that support the culture around grade level teams. The Infant/Toddler entry is staffed by a separate administrative team from the elementary school. The staff at the front desk will control entry into that portion of the building. The main north entry of the school is located adjacent to the main administrative suite. The staff at this desk will have visual and electronic surveillance of the entry drive and all entry points. Any visitor at the school will need to enter the building at the north entrance.

The south entrance is predominately used at the beginning and end of the day to accommodate parent drop off/pick up. Similar to the system currently in place at the Friendship School, parents drop off/pick up their student in the designated area. A member of the LEARN team will greet each child at the vehicle. Parents do not get out of the car. Once the LEARN staff member has a small group of children, they will swipe their keycard to gain access into the south vestibule. Signage will be posted that directs visitors to the north entry. In the event a visitor does not follow the signage, there is an intercom at the south entrance and the administrative staff will direct the visitor to the north entry. No visitors will be granted access into the south entrance of the school.

The building shape creates courtyard environments that are ideal for early learners to safely and securely play outdoors. The playgrounds and outdoor learning environments to the west open to the landscape for the youngest learners in Pre-K through Kindergarten classrooms. The grade 1 and 2 playground opens to the east. All outdoor play areas are protected with a 6' fence that includes a secure gate that can accommodate the egress capacity.

- 2. One additional area that should be mentioned in this project is the intersection of Daniels Avenue and Spithead Road. This T-shaped intersection is currently controlled with one Stop sign on Daniels Ave. The line of site from Daniels Ave. to Spithead Road, specifically if looking north, is very limited. With an increase in vehicles and several school buses likely to use that section of road, I strongly suggest improvements to the off-road grading at that intersection or the request for a three-way Stop sign controlled intersection to the Local Traffic Authority. Current traffic levels do not call for changes, however with the school being constructed, I do believe action is required here.*

RESPONSE: Based on the comment above, Intersection sight distances were measured at the intersection of Daniels Avenue at Spithead Road in accordance with criteria set forth in the 2003 CTDOT Highway Design Manual on the morning of April 16th, 2024, by Fuss & O'Neill. Intersection sight distance is measured from a point 15 feet back from the edge of travel-way at a height of 3.5 feet, the standard height of a driver's eye.

Spithead Road has a posted speed limit of 30 miles per hour in the southbound direction and

a posted speed limit of 25 miles per hour in the northbound direction in the vicinity of the intersection. Therefore, a design speed of 30 and 35 miles per hour was utilized for analysis.

For the design speed of 30 miles per hour on Spithead Road, the following intersection sight distances are required as it pertains to their respective vehicle turning right onto a two-lane facility:

- 335 feet of intersection sight distance for a passenger car
- 420 feet of intersection sight distance for a single-unity truck

For the design speed of 35 miles per hour on Spithead Road, the following intersection sight distances are required as it pertains to their respective vehicle turning left onto a two-lane facility

- 390 feet of intersection sight distance for a passenger car
- 490 feet of intersection sight distance for a single-unity truck

Under the existing intersection geometry and existing traffic control (stop control on Daniels Avenue approach only), there have been no identifiable crash patterns and no abnormal crash frequencies observed at the intersection of Spithead Road and Daniel Avenue. As noted in the Traffic Impact Study, the intersection has averaged one crash per year over the latest three years of available data. While the intersection has been operating safely, representatives of Fuss & O'Neill measured intersection sight distances from the Daniels Avenue approach to Spithead Road in accordance with criteria set forth in the 2003 CTDOT Highway Design Manual on the morning of April 16th, 2024.

Approximately 230 feet of intersection sight distance is provided looking left from Daniels Avenue (north) which falls short of CTDOT requirements for a 35 mile per hour design speed due to existing vegetation, a berm, and the horizontal curvature of Spithead Road north of the intersection. Upon removal of the vegetation along the roadway, intersection sight distance can be improved slightly but it is still expected to fall below the threshold due to the horizontal curve constraints along the existing roadway. Looking right out of Daniels Avenue, there is approximately 330 feet of intersection sight distance provided looking south along Spithead Road which also falls short of CTDOT requirements for a 30 mile per hour design speed due to existing horizontal and vertical curve constraints.

Given these constraints and noted concern of the local traffic authority above for safe egress of both passenger cars and single unit trucks/busses onto Spithead Road, we recommend that the intersection be converted to an all-way stop-controlled intersection by adding stop and stop ahead signs on both Spithead approaches that are in accordance with MUTCD distance guidelines.

II. Officer Devine - Traffic Officer

1. *Parking Lot for Bus Drop-Off and Pickup:*

a. *Length for Buses:*

- i. *The proposed bus parking lot may not be long enough to accommodate the buses without backing up into the roadway. If buses back up, they could obstruct traffic, causing potential traffic jams, delays, and safety concerns for vehicles trying to access the school or the surrounding area. Currently eleven (11) busses and two (2) vans are utilized for pickup and drop off.*

RESPONSE: See response #1 above. The site plan has been revised to expand the bus drop-off area to allow for active loading/unloading for up to 9 full-size school buses. An additional 2 parking spaces for buses have been provided within the bus loop should overflow parking be required. The intent is that loading/unloading would only occur along the curb. The maximum number of buses that should serve the site is anticipated to be 11.

b. *Parking Spots on the Right Side of the Bus Drop-Off/Pickup Canopy:*

- i. *The placement of parking spots on the right side of the bus drop-off and pickup canopy could create a potential problem if any vehicles are in that portion of the parking lot when busses are stopped. The vehicles would not be able to exit the lot when the busses are stopped with the red flashing lights and stop signs active. Vehicles located in this lot may not be able to see the flashing red lights or stop signs for the busses, since they would be traveling parallel to the busses on the right side of the busses, opposite side of the stop signs. Exiting vehicles would have to cross in front of busses, which would be a violation if the bus had its red lights and stop signs active. Vehicles attempting to pull in to this lot could also cause additional traffic backing busses up since they would be utilizing the same entrance and exit. This may block the flow of buses, leading to potential safety hazards for children and delays in pick-up and drop-off.*

RESPONSE: See response #1 above. Bus queueing, parking and circulation in the north lot has been revised extensively to address the comment in part by providing a fully separate queuing lane for the buses. See CS102 for an updated site plan.

c. *Bus Drop Off/Pickup Canopy Location:*

- i. *The dropping off or picking up children, in the bus area drop off and pickup area, leaves where children need to cross a travel lane in the parking lot to reach or exit the school. This could lead to pedestrians walking through vehicle traffic, increasing the likelihood of accidents or near misses. The safety of students and adults crossing the lot should be a significant consideration in the design. The location also lead to the possibility of having traffic on both sides of the canopied island, which is a safety concern with groups of young children exiting or entering busses on this island.*

RESPONSE: See response #1 above. Bus queueing, parking and circulation in the north lot has been revised extensively to allow students to disembark from the buses directly onto the sidewalk and enter the school with the need to cross any traffic. See CS102 for an updated site plan.

2. *Flow of Traffic for Drop-Off and Pickup:*

a. *Traffic Loop Design:*

- i. *The current design calls for vehicles to drive to the back of the building, follow a loop, and then cross the queue of vehicles, from which they came, in the drop off/pick up line before heading back out to the exit. This could cause significant traffic congestion, especially during peak hours when the drop-off and pick-up lines are long.*

RESPONSE: See response #1. The site has been designed to provide queuing space for about 100 cars on site and 11 buses. LEARN does not anticipate queues of that length but the site can safely accommodate them. As design professionals, we anticipate that parents will observe the crossings at the marked intersection along with the support of signage that instruct drivers to not block the intersection. LEARN intends to communicate the traffic flow pattern in advance of the first day of school through its school orientation materials and presentations. If the rules are not followed, LEARN will assign a staff member and/or consult with the police to best monitor the intersection to avoid any potential bottleneck concerns. In addition, staff members will be stationed at the south entry to assist in getting students out of and into their car to ensure an orderly process.

b. *Impact on Teachers and Staff:*

- i. *If teachers or staff members need to park in the rear lot, they may be caught in the same traffic line as parents dropping off or picking up students. This could further exacerbate congestion, causing delays for both teachers and parents. If teachers are trying to park during busy drop-off and pick-up times, it could create additional backups, especially if staff parking spaces are located in a high-traffic area.*

RESPONSE: Staff is required to arrive prior to the school day and ahead of drop-off. Staff will be trained and scheduled to arrive ahead of drop off hours and will naturally leave after pick-up hours. Staff will also be able to access the parking area by taking a right at the stop sign prior to reaching the queuing lanes.

III. Recommendations:

1. *Bus Parking Length:*

It may be necessary to adjust the bus parking lot length or design to ensure that buses do not back up into the roadway. Consideration should also be given to the width of lanes to allow for smoother flow of traffic.

RESPONSE: The bus parking length has been increased and the area redesigned to que and load or unload nine buses simultaneously and widened in areas to provide reserve space for two additional buses within the bus loop should overflow parking be required. The intent is that loading/unloading would only occur along the curb. The maximum number of buses that should serve the site is anticipated to be 11.

2. *Re-evaluate the Bus Drop Off Location to avoid dropping children off on an island that could potentially have traffic on either side. Dropping off as close as possible to an entrance would be preferred, and avoiding having groups of youth crossing at marked and unmarked crossing areas in the parking lot.*

RESPONSE: See response #1. The site plan has been revised to eliminate the drop-off island and instead provide drop-off directly to the sidewalk for all buses without the need to cross any travel way.

3. *Re-evaluating the Car Loop Design: Redesigning the drop-off/pick-up loop to prevent vehicles from crossing the bus area and creating better separation between buses and cars could reduce congestion and enhance safety. A one way loop around the school could ease the flow of traffic, allowing two way traffic at the front entrance into the front parking lot area and pickle ball court.*

RESPONSE: See response directly above. All vehicle crossing between the buses and cars has been eliminated. See CS102 for an updated site plan.

B.

<i>Department</i>	<i>Date</i>
<i>Environmental Planner</i>	<i>4/9/25</i>

1. *Recommend test holes be conducted in areas proposed for subsurface detention. Field percolation rate verifications for subsurface units and proposed bio-swale / bio-retention area.*

RESPONSE: Test pits and percolation tests were performed on 4/16/25 and results have been provided in Appendix F of the Stormwater Management Report submitted with the revised application materials. Based on the percolation test data the stormwater system as designed will achieve peak flow rate reduction of greater than 50 percent for the two-year storm in each of the three watersheds on site and for the site as a whole as recommended in the 2024 CT Stormwater Manual. Additionally, the proposed system will improve over existing conditions by providing significant reductions in peak flow rates for all storm events up to and including the 100-year storm.

2. *Soil hydrologic class D, soil infiltration not anticipated, so units basically detention*

RESPONSE: Test pits and percolation tests were performed in the areas of the proposed detention systems. The design is based on the test results, as detailed in the Stormwater Management Report. To be conservative, a 50 percent reduction was applied to the slowest percolation test results.

3. *What measures are proposed for water quality treatment and pre-treatment?*

RESPONSE: Proposed stormwater quality measures to improve the site include water quality units, catch basins with sumps, above and below-ground infiltration systems. The system will increase the stormwater quality.

4. *Any consideration of breaking up IA into smaller discharge or treatment points such as rain gardens before discharging towards municipal system? LID implementation?*

RESPONSE: The design has been optimized to address stormwater management needs while providing sufficient programming space for the school in light of the decreased acreage that LEARN is acquiring and to minimize disturbance to the extent possible.

5. *Plans will require design specifications/details for the bioswale construction. Recommend designing this a wet bioretention design to maximize pollutant renovation before discharge to municipal stormwater system. The receiving coastal water (Niantic River) is listed by the State as impaired for bacteria & nitrogen loading.*

RESPONSE: The western stormwater management area has been redesigned based on field data, investigation and the confirmation of the proposed property line. It is not designed as a wet basin due to it's proximity to the school. It primarily receives roof water. Detail of the basin is shown on CG503 and a description of the stormwater quality measures proposed is included as a section in the Stormwater Management Report.

6. *Detail should indicate elevations, typical cross-section, substrate material type and depth, seed mixture/planting plan, temporary erosion control measures proposed until vegetative cover is established.*

RESPONSE: The plans have been updated to include additional details regarding measures to install and stabilize the substrate materials. Details have been provided in the CG and CE series of plans and details as well as the construction sequence on CS003.

7. *Staff recommends examination of existing soil saturation in the area of the proposed swale as it will potentially affect available storage depth and duration of retention for water quality renovation.*

RESPONSE: As noted, percolation testing was performed and the design has been adjusted based on testing results.

8. *Concern with proposed new outlet at SW end of site from sub-surface detention chambers. Provide calculated peak flows and volumes for 2, 10, & 25-year storms and address measures to reduce concentrated flows down-gradient. From drainage report appendix printouts, discharge at this outlet for the 10 and 25-year storm events is 12 cfs and 16 cfs. Outlet controls needed. Receiving hillside is primarily a groundwater discharge zone with limited ability to absorb surface flows for a large part of the year. Recommend incorporating a level spreader to diffuse flows at this outlet.*

RESPONSE: Overflow discharge from the southern underground detention system has been rerouted to direct water away from the southern/southeastern property line. Additional outlet protection has been detailed, including a scour hole and level spreader.

9. *An Impact assessment from this discharge on the downslope shallow stormwater swale, located along rear property lines of homes on High Ridge Road, and its conveyance capacity may be required to assure no off-site residential impacts. Existing swale conveyance flows north along*

the rear property line of homes on High Ridge Road, then directly west between two homes (and in-ground pools) into a manhole. It receives stormwater run-off from the (2) treatment basins at the southern abutting Sea View Terrace subdivision.

RESPONSE: Overflow discharge from the southern underground detention system has been rerouted to direct water away from the southern/southeastern property line. Additional outlet protection has been detailed, including a scour hole and level spreader.

- 10. Application will need a stormwater management / maintenance plan and a narrative as to how the design meets the requirements of Section 25.6 of the Zoning Regulations and meets the definition of "Maximum Extent Achievable" for LID implementation and water quality renovation per the State Stormwater Quality Manual.*

RESPONSE: A Stormwater Management System Operation and Maintenance Plan has been provided as Appendix G of the Stormwater Report.

- 11. A letter report regarding the on-site and adjacent wetland / vernal pool resource and potential project impacts to the wetland is recommended to accompany the application.*

RESPONSE: A Wetland Assessment Report from LEARN's expert, Dean Gustafson of All-Points has been provided under separate cover. The Report concludes that there are no proposed direct wetland or vernal pool activities and that the minor activities in the far ends of the upland review area will not adversely impact the wetlands or vernal pool. The Report makes some recommendations including vegetative enhancements in the upland review area all of which are accepted.

- 12. Site plans should include a construction sequencing narrative identifying major site work phases, temporary construction stormwater control measures, time estimate for application of permanent seeding to stabilize competed phases and reduce extent of overall land disturbance, and when the stormwater treatment measures are to be completed and connected to the site drainage system.*

RESPONSE: Phasing and Construction sequencing are provided, see CS003.

- 13. Temporary sediment traps may be necessary to reduce sedimentation impacts to down-gradient properties and the proposed permanent bio-swale. If proposed include size and typical detail in plan set.*

RESPONSE: The use of temporary sediment traps is contractor means and methods. The Contractor will be required to conform with the CT DEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction. If they feel they need temporary sediment traps to satisfy the requirements, they should be provided.

- 14. Clarify Soil Erosion Control Note #15.*

RESPONSE: The note has been revised to read: The contractor shall correct any omissions, errors, or field operations immediately and in accordance with the guidelines for soil erosion and sediment control.

15. Clarify if rain gardens are proposed as noted on the narrative sheet.

RESPONSE: Based on the considerations discussed above regarding the test pit and percolation test results and the need for school programming space as compounded by the area of the existing site being retained by the Town, rain gardens, although generally supported, have not been proposed.

16. If the pickle ball courts are remaining as part of the overall project site plan application, the limits of disturbance and extent of site grading and construction activity for this amenity must be shown on the overall site plan sheets and the grading and S&E control plan sheets. This is located within the upland review area of an inland wetland that is partially on the subject property and is an off-site vernal pool breeding area.

RESPONSE: The pickleball court design has been submitted as a separate application package because the pickleball courts will be located on the portion of the site to be retained by the Town and will be owned and operated by the Town. A separate wetland assessment has been provided as a part of the pickleball court application. LEARN's expert, Dean Gustafson of All-Points evaluated the proposed pickleball courts and concluded that there are no proposed direct wetland or vernal pool activities and that the minor activities in the far ends of the upland review area will not adversely impact the wetlands or vernal pool. The Report makes some recommendations including vegetative enhancements in the upland review area all of which are accepted by LEARN.

17. As noted, the site work will require registration for a CT DEEP General Permit for Construction Stormwater discharge.

RESPONSE: Acknowledged. The project will be registered to the CT DEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction prior to the start of construction.

C.	<u>Department</u>	<u>Date</u>
	Planner	4/11/25

1. Provide Boundary Plan prepared by a licensed surveyor.

RESPONSE: See the boundary plan prepared by LEARN's surveyor at sheets SV.01, SV.02, and SV.03 which have been added to the set.

2. Provide Natural Diversity Database Review documentation.

RESPONSE: The Natural Diversity Database Review documentation is included in the Wetland

Assessment Report filed with the application. The NDDDB review revealed no threatened, endangered or special concern speciation in the project location.

3. *Provide reasoning and support documentation relating to the number of parking spaces proposed for the project.*

RESPONSE: LEARN is a museum themed elementary magnet school. Between the infant/toddler program and elementary school, LEARN anticipates 125 teachers and staff on a day-to-day basis. The additional parking spots can accommodate Infant/Toddler drop offs that require a vehicle to park and the child is dropped off inside the classroom as well as daily visitors who will park in the north lot. The plan calls for 233 parking spaces.

To confirm the adequacy of the parking, the number of parking spaces proposed for the project was crosschecked with guidance provided in the ITE Parking Generation Manual, 6th edition, 2023. This manual is a nationwide industry-accepted resource for determining parking generation. Following review of land use code 536 (Charter Elementary School), the manual reports an average peak parking demand of 0.18 parking spaces per student during the weekdays. This equates to 95 parking spaces attributable to a 526-student charter elementary school. Additionally, parking spaces attributable to land use code 565 (Day Care Center) were calculated and the manual reports an average peak parking demand of 0.25 parking spaces per student during the weekdays. This equates to 12 parking spaces attributable to a 48-student day care center.

The ITE Parking Generation Manual indicates the proposed development will require a total of 107 parking spaces. The proposed development is designed to provide 243 parking spaces, which is in excess of what is necessary based on the ITE Parking Generation Manual during the peak parking demand. The excess parking spaces were established based on neighboring school experience as it relates to faculty and special event needs.

4. *Monument sign shall be no closer than 10 feet to the property line.*

RESPONSE: Reference updated site plans to reflect the revised location of the monument sign. Sign is more than 10' from property line, dimension has been added to Site Plan II, CS102.

5. *Angled parking spaces of 60 degree shall have a minimum access drive width of 18'.*

RESPONSE: Site Plan II has been updated to address this comment. See plan sheet CS102.

6. *Drainage infrastructure proposed in the Northwest corner of the property accommodating the storm water detention swale occurs within the parcel to be retained by the Town. Will there be a drainage easement or consider relocating the work onto School property?*

RESPONSE: Grading and drainage has been updated based on the confirmed proposed

property line. The swale will not cross onto the town retained parcel. Please see plan sheet CG102.

7. *Provide screening for RTU's.*

RESPONSE: Reference updated roof plan to reflect the revised location of the screening at the roof top units so they will not be visible from the public right of way.

8. *Clarify whether the LOS and Queue Length Summaries for Daniels Avenue at Site Driveway need to include a Daniels Avenue Eastbound Right Turn into the site driveway, which may be impacted given the shortened entrance drive length prior to busses entering the drop-off queue. Are the anticipated number of busses that will be queuing for drop off and pick up taken into account in these calculations and models?*

RESPONSE: The capacity analysis for the unsignalized driveway of Daniels Avenue at Site Driveway was conducted using Synchro Professional Software, version 11.0 which analyzes aspects such as level of service (LOS), 95th percentile design queue lengths, and delay at intersections within the study network. Factors like these were what we used to determine any necessary offsite improvements across the network. Based on these reports provided in the Appendices of the Traffic Impact Study, an eastbound right turn lane was not deemed necessary when analyzing the capacity or queue length analyses. The eastbound and westbound approaches did not deteriorate below a LOS A with the additional site traffic added to the network and did not have any significant queuing increases either. Therefore, construction of an eastbound right turn operational lane into the property was not proposed and we do not recommend the addition of an additional operational lane on Daniels Avenue solely based on the possibility of a queue spillback due to internal site congestion issues.

With respect to the ingress of the site driveway, it is noted that the Synchro analysis does take into consideration any internal congestion within the development (i.e. bus drop off/pick up conflicts or internal queuing). However, in response to the staff comments above as they relate to internal site congestion, the location of the bus drop-off/pick up location has been shifted and adequate queue space has been provided for the maximum number of busses expected on site at any given time. In addition, as noted above, LEARN will communicate the traffic flow pattern in advance of the first day of school and have approximately 15 staff members stationed at the south entry to assist in getting students out of and into their car. Should any on-site concerns occur, LEARN will assign a staff member to monitor site operations to avoid any potential bottleneck concerns.

D. <u>Department</u>	<u>Date</u>
Public Works	4/11/25

1. *General Comments:*

1. *Before work begins on the project, a site access permit is required from DPW.*

RESPONSE: Acknowledged. LEARN will request a site access permit from DPW prior to the start of work.

2. *Any work that is performed within the Towns ROW, an excavation permit is required from DPW.*

RESPONSE: Acknowledged. LEARN will request a site access permit from DPW prior to the start of work.

3. *Any work within the roadway would require repair per the towns street use regulations*

RESPONSE: Acknowledged.

4. *The Drainage discharge at the rear of the site at FES 123. (Point Discharge) Down gradient of this is a swale that takes runoff from Sea View Terrace. Any way to keep the drainage on site/Slow it down on site? (LID, sed Basins? Infiltration Basin) So not to impact the other properties.*

RESPONSE: Overflow discharge from the southern underground detention system has been rerouted to direct water away from the southern/southeastern property line.

5. *At the north end of site tying into the towns' drainage system (multiple locations) Can the existing system accommodate the additional drainage into the system?*

RESPONSE: Peak flow to Daniels Avenue has been reduced by at least 20% in the proposed condition, through the 100-year storm, as detailed in the Stormwater Management Report.

6. *With school time drop offs and pickups will there be any backups onto the town road? The drop off area could get backed up and the over flow would probably end up on Daniels Ave. Could become a safety issue.*

RESPONSE: See response #1. The site has been redesigned to expand queuing capacity and improve drop-off areas to prevent overflow and back up onto the public road. The site now provides queuing space for approximately 100 cars on site and 11 buses. A queuing diagram has been provided as part of this application submission.

II. All comments refer to plan CS-102

1. *Sidewalk to the right (east) of the driveway, the walk should be a concrete ADA ramp and 5' sidewalk.*

RESPONSE: The plan has been updated to provide be a concrete ADA ramp and 5' sidewalk.

2. *To the east of the driveway is a painted crosswalk. If required, ADA ramps shall be constructed, if not, the painted crosswalk and signage shall be removed.*

RESPONSE: Site Plan II, CS102, has been updated.

3. *Replace or infill Daniels Ave traffic markings that at affected by the new driveway entrance.*

RESPONSE: Site Plan II, CS102, has been updated.

4. *To the west of the driveway, the curbing shall be concrete to match the existing curbing. Carry the replacement past the existing asphalt sidewalk from the site.*

RESPONSE: The plan has been updated to satisfy this comment.

5. *Remove the existing asphalt sidewalk from the site that is within the right of way west of the driveway.*

RESPONSE: Site Plan II, CS102, has been updated.

6. *Far west of the driveway is a concrete sidewalk that is to intersect with the existing asphalt sidewalk. Not clear how that intersection will be constructed.*

RESPONSE: Site Plan II, CS102, has been updated.

III. Comments refer to plan CG-102

1. *Shows 2-15 inch HOPE pipes being tied into existing street 15 inch drainage pipe.*
 - a. *Statement from the engineer that the existing street system will accommodate the discharge into our system.*
 - b. *If so, Both discharges will need a clear water permit from the Town.*

RESPONSE: Peak flow to Daniels Avenue has been reduced by at least 20% in the proposed condition, through the 100-year storm, as detailed in the Stormwater Management Report. Any required permits will be obtained.

2. *The far west drainage system will need an easement from the Town.*

RESPONSE: Grading and drainage has been updated based on the confirmed proposed property line and will not cross the parcel boundary onto the land retained by the Town. Please see plan sheet CG102.

<u>E.</u>	<u>Department</u>	<u>Date</u>
	Utility Commission	4/14/25

- 1. Please use Waterford Utility Commission sewer and water details, no details were included in this submission.*

RESPONSE: Waterford Utility Commission sewer and water details have been added to the plans.

- 2. Please provide the reasoning surrounding the proposed installation of a new manhole rather than either utilizing an existing lateral (the existing building was connected through the rear of the parcel) or coring an existing manhole present on Daniels Ave.
 - a. If the intent is to set a new manhole, please provide a detail for the connection along with a narrative describing the intended process for making said connection.**

RESPONSE: The design team has limited information on the existing lateral and based on the proposed design, a new lateral to the road is the preferred solution. We are proposing a doghouse manhole connection which should have limited to no impact to the existing system while being installed.

- 3. Information regarding intended grease interceptor should be provided via detail and information regarding sizing selection should be provided.*

RESPONSE: Detail information regarding intended grease interceptor has been added to the plan set (see sheet CU503).

- 4. All water and sewer within property line should adhere to plumbing code, including required minimum cover.*

RESPONSE: Acknowledged.

- 5. No information regarding proposed onsite manholes, nor the proposed manhole in the right of way are provided: top of frame, inverts, slope and material type are required on a plan and profile sheet.*

RESPONSE: Utility Plans have been updated (see plan sheets CU100, CU101 and CU102).

6. *Please identify / callout fire and domestic water services individually including material type and size. There is a 12" water line on Daniels Ave – as a point of reference.*

RESPONSE: The plans have been updated to include the requested information.

7. *The proposed domestic water service appears to exceed 150' from the street line to the point where the line enters the building. A meter pit is required if the length of piping exceeds 150'.*

RESPONSE: The plans have been updated as requested including the addition of a meter pit.

8. *The fire loop has two hydrants off of the line and the fire service goes into the back of the building, are the proposed hydrants intended to be private, if so a maintenance agreement may be required.*

RESPONSE: The hydrants will be private – we will coordinate a maintenance agreement if required.

9. *Please update notes to reflect that the building(s) will not remain open during construction and there is no force main connection or flows to be maintained.*

RESPONSE: The existing building will be demolished the summer of 2025 and therefore there will not be only remaining structures on site during the construction of the new school. The plan notes have been updated accordingly.

TAB 10

SHIPMAN

Matt Ranelli
Phone: (203) 836-2805
MRanelli@goodwin.com

265 Church Street
Suite 1207
New Haven, CT 06510

May 2, 2025

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Jill Stevens
Director of Utilities
Waterford Utility Commission
15 Rope Ferry Road
Waterford, CT 06385

Re: Notice Pursuant To Conn. Gen. Stat. §§ 8-3i And 22a-42f Of Application For Determination Of No Regulated Activities Or, In The Alternative, Approval Of Regulated Activities Associated With A Proposed New School Facility At 51 Daniels Avenue, Waterford, Connecticut

Dear Director Stevens:

Pursuant to Conn. Gen. Stat. §§ 8-3i and 22a-42f, we are writing to inform you of an application filed on behalf of our client LEARN Regional Educational Service Center to construct a new school facility on property located at 51 Daniels Avenue in Waterford, Connecticut. The application was filed with the appropriate Waterford land use agencies and is available at the Waterford Town Hall, 15 Rope Ferry Rd, Waterford, CT 06385.

If you have any questions regarding this application or would like a courtesy copy, please contact me at (860) 251-5748.

Sincerely,

Matthew Ranelli
Matthew Ranelli

GMR:mm

From: [Marc Balestracci](#)
To: [Mark Wujewicz](#)
Subject: LEARN School On Daniels Ave.
Date: Wednesday, July 9, 2025 1:11:41 PM

Good afternoon Mark,

Thank you for speaking with me earlier today in reference to the potential LEARN Magnet School proposed for the old Southwest Elementary School property on Daniels Ave. in town. LEARN representatives and the project architects have been in discussions and meetings with the police department in regards to the traffic pattern, parking lot and overall safety and security for the project since we first received design plans from your office. The police department requested a few changes to the original traffic pattern/parking lot plan and LEARN has been very accommodating in our requests. I do believe your office has received a revised traffic pattern/parking lot plan from LEARN as a result of our meetings and requests, to which our concerns have been satisfied by the adjustments.

Should you need me for any meetings and or additional information, please feel free to contact me at any time.

Thank you,

Marc Balestracci
Chief of Police
Waterford Police Department
41 Avery Lane, Waterford, Connecticut
860-442-9451 Ext. 2282



CONFIDENTIALITY NOTICE: This electronic message may contain information that is confidential and/or legally privileged. It is intended only for the use of the individual(s) and entity named as recipients in the message. If you are not an intended recipient of the message, please notify the sender immediately and delete the material from any computer. Do not deliver, distribute, or copy this message, and do not disclose its contents or take action in reliance on the information it contains. Thank you.

FIFTEEN ROPE FERRY ROAD



WATERFORD, CT 06385-2886

Date: June 17, 2025

To: Waterford Planning & Zoning Commission

RE: Report of Conservation Commission Action:
Inland Wetland Permit #C-25-06 – 51 Daniels Avenue

Commissioners,

The Waterford Conservation Commission granted inland wetland permit #C-25-06 for regulated inland wetland activities associated with the construction of a new school facility on land located at 51 Daniels Avenue, Waterford, CT. The permit was granted with conditions on June 12, 2025. A copy of the permit is attached.

Authorized regulated activities include:

- Construction of an 87,500 sq. ft. school facility with associated access driveway and parking areas upland of inland wetland resources.
- Disturbance of 1,000 sq. ft. of upland review area for construction of a sidewalk west of the off-site wetland area #2.
- Discharge of treated stormwater run-off to inland wetlands and watercourses.

The activities are shown on site plans entitled; “LEARN – Early Childhood School, 51 Daniels Avenue, Waterford, Connecticut” dated 05/01/2025, prepared by Langan Engineering & Environmental Services, Inc.

A condition of permit approval requires the final plan set to incorporate the revised plan sheets CG101, CG102 and CE101 as presented to the Conservation Commission on 5/22/2025. These plan changes reflect the relocation of the southwest stormwater discharge outlet to reduce the potential for soil erosion and sediment impacts to the off-site receiving wetland area, and revised grading at the spillway outlet for the stormwater basin.

Respectfully;

Maureen FitzGerald
Environmental Planner

Attachment:

cc: Waterford Conservation Commission

FIFTEEN ROPE FERRY ROAD
WATERFORD, CT 06385-2886



PHONE: 860-442-0553
www.waterfordct.org

**NOT VALID
UNTIL SIGNED**

TOWN OF WATERFORD
Inland Wetlands & Watercourses Permit #C-25-06
51 Daniels Avenue, Waterford, CT

The Waterford Conservation Commission, in their capacity as the Town's Inland Wetland Agency, hereby authorizes the applicant to conduct regulated activities in designated areas located at 51 Daniels Avenue, Waterford, CT, which are subject to jurisdiction in accordance with CT General Statutes, Section 22a-36 through 22a-45, inclusive, as amended, and the Waterford Inland Wetlands and Watercourses regulations.

This permit is a grant of approval to conduct the following regulated activities:

- Construction of an 87,500 sq. ft. school facility with associated access driveway and parking areas upland of inland wetland resources.
- Disturbance of 1,000 sq. ft. of upland review area for construction of a sidewalk west of the off-site wetland area #2.
- Discharge of treated stormwater run-off from the developed site upgradient of the off-site wetland area #3.

These regulated activities are associated with the construction of a new regional school facility on 15.36 acres of land located at 51 Daniels Avenue, Waterford, Connecticut. The proposed activities are detailed on site plans entitled; "LEARN - Early Childhood School, 51 Daniels Avenue, Waterford, Connecticut" dated 05/01/2025, prepared by Langan Engineering & Environmental Services, Inc.

The Conservation Commission authorizes the regulated activity with the following conditions of approval to minimize impacts associated with the proposed regulated activity and protect the inland wetlands and watercourses:

SPECIAL CONDITIONS:

1. The final plan set shall incorporate the revised plan sheets CG101, CG102 and CE101 as presented to the Conservation Commission on 5/22/2025.
2. The approved limits of clearing and disturbance shall be marked in the field and approved by the Commission's agent prior to the start of site work.
3. The vernal pool protection plan shall be implemented as detailed in the wetland assessment report prepared by All-Points Technology Corporation submitted with the application. Reports documenting completion of contractor awareness training and inspection of wildlife restrictive barriers shall be submitted to the Commission's agent at the start of construction.

4. At all times during site construction, temporary diversion swales and sediment traps shall be installed and maintained to control construction run-off and prevent sediment discharge to wetlands.
5. Prior to issuance of a certificate of permit compliance, an as-built plan and written inspection report from the design engineer shall be submitted to the Commission's agent to document that the stormwater detention / treatment components and outfalls were constructed in accordance with the approved plans.
6. An operation and maintenance plan that identifies the frequency and type of inspection and maintenance actions required for each element of the stormwater treatment system shall be prepared by the project engineer and submitted to the Commission's agent. The plan shall be kept on-site and the stormwater system shall be maintained in accordance with the plan.

STANDARD CONDITIONS:

1. The Conservation Commission's agent shall be notified at least 48 hours prior to commencement of any regulated activity.
2. Final stabilization of disturbed soil areas, including all temporary and permanent soil disturbances, shall be stabilized with the application of loam, seed and appropriate erosion control measures.
3. At all times during site work and until soil areas are stabilized, the applicant shall install and maintain erosion and sediment control measures such as fabric filter fence, staked hay bales or other measures deemed necessary by the Commission's agent to prevent erosion and sedimentation impacts to wetlands and watercourses.
4. Erosion control and soil stabilization measures shall comply with the approved plans and the guidelines as established in the Connecticut Guidelines for Soil Erosion and Sediment Control, 2002, CTDEEP Bulletin 34.
5. Upon direction of the Commission's agent, erosion and sediment control measures shall be removed by the applicant following stabilization of the site.

All work and all regulated activities conducted pursuant to this authorization shall be consistent with the terms and conditions of this permit. Any structures, excavation, deposition of fill, obstructions of flow, encroachments or other regulated activities not specifically identified and authorized herein shall constitute a violation of this permit and may result in permit modification, suspension or revocation.

In the event that any additional wetland or watercourse regulated activities are required as a result of other agency permitting to support the proposed activity, the Waterford Conservation Commission reserves the right to reconsider the proposed regulated activity and may require modifications to minimize the impact to wetland resources.

**DEPARTMENT OF PLANNING AND DEVELOPMENT**

MEMORANDUM

TO: Planning and Zoning Commission

FROM: Mark Wujtewicz, Planner

DATE: July 22, 2025

TITLE: Staff Report: Project LEARN
Proposed School Facility
51 Daniels Avenue
Site Plan
Application PL-25-8

EXECUTIVE SUMMARY

The project as proposed is to construct a single story 87,500 square foot footprint public, magnet elementary school and daycare facility located at 51 Daniels Avenue. The project as proposed will accommodate a maximum of 574 students, with 526 students occupying the magnet elementary school and 48 for the daycare. The property is the site of the Town of Waterford's former Southwest public elementary school. The Planning and Zoning Commission (Commission) had previously approved a CT General Statute (CGS) 8-24 application (PZ2010-029) on July 26, 2010 to lease a portion of the Southwest School Building to Project LEARN for use as a dual language middle school. Subsequent to the approval of PZ2010-029 the Commission approved a CT General Statute (CGS) 8-24 application (PL-23-8) for the sale of a portion of the property to Project LEARN. This portion contains approximately 15.36 acres and is the subject of this site plan application. The remaining land of approximately 4 acres is retained by the Town of Waterford. An existing cellular tower is located on the parcel of land to be retained by the Town of Waterford.

The applicant is proposing to demolish the existing school building and construct a new school facility building. Site improvements associated with the building include access driveway, grading, stormwater management and landscaping.

The application has been reviewed and approved by the Waterford Conservation Commission through the issuance of Inland Wetland Permit #C-25-06. A copy of the Conservation Commission Action has been submitted into the record.

BACKGROUND

Pertinent Regulations

CGS 8-3(g)

Section 5 – Low Density Residential (R-40)

Section 5.1.3 – Public or private parks and playgrounds, subject to the approval of a site plan under the provisions of Section 22 of these regulations

Section 22 – Site Plans

Section 22b – Design Review of Site and Building Requirements

This application was received by the Commission on May 13, 2025.

The required action date for this application is July 17, 2025.

An extension for Commission action on the application to July 22, 2025 was granted by the applicant on July 14, 2025.

DISCUSSION

In order for the Commission to approve a site plan it must find that the plan is consistent with the Town of Waterford Zoning Regulations. The Commission must act on the plan initially submitted for review and can find that the site plan is either compliant with the Zoning Regulations or it may approve the plan with modifications that are required to be implemented on the plan prior to filing on the land records.

Activity associated with the construction of the proposed facility will impact approximately 1,000 square feet of the upland review area for the construction of a sidewalk. Discharge from the treated stormwater runoff upgradient of the offsite wetland area #3. As a result, an application for Inland Wetland Permit #C-25-06 was submitted to the Waterford Conservation Commission. Inland Wetland Permit #C-25-06 was approved with conditions by the Conservation Commission to conduct authorized regulated activities associated with the construction and operation of the regional school facility. In accordance with CGS §8-3(g) a report of the Conservation Commission action was submitted into the record.

The applicant submitted a Stormwater Management Report into the record. Due to the complexity of the Stormwater Design and the potential of offsite impacts, the Commission determined that a third party peer review of the proposed stormwater system and report submitted by the applicant be conducted in accordance with Town of Waterford Ordinance 16.08.050(B). A copy of the Stormwater Management Report and the site plan was provided to the Town of Waterford's "On- Call" engineering firm SLR. After a review of the documents and plans, SLR provided a peer report on June 26, 2025, which was forwarded to the applicant on June 30, 2025. The applicant reviewed the report and provided revised plans and responses on July 15, 2025. On July 16, 2025, the applicants revised plans and responses were forwarded to SLR for confirmation as to whether the responses adequately address the items in the peer report. At the time of the drafting of this Staff Report, SLR's review of the responses from the applicant

has not been received. The Commission may consider in its action, a condition of approval that the final plans and stormwater drainage reports adequately address any of the items identified in the peer report prior to filing the final plans on the land records.

The Traffic Impact Study and internal vehicle circulation plan was reviewed by the Town's traffic authority and found to adequately address traffic and vehicle circulation patterns.

RECOMMENDED ACTION

Based on the information provided, staff recommends the Planning and Zoning Commission find that:

Findings:

1. The application is for a use subject to a Site Plan approval, pursuant to Section 5.1.3 of the Waterford Zoning Regulations.
2. The application meets the criteria for site plan approval, pursuant to Section 22 of the Waterford Zoning Regulations, subject to modifications and conditions listed.
3. The Waterford Conservation Commission issued Inland Wetland Permit# C-25-06 for regulated inland wetland activities.
4. The Waterford Conservation Commission issued a report of its action on application #C-25-06 in accordance with CGS §8.3(g).
5. This application has been reviewed by the Town of Waterford Design Review Board in accordance with Section 22b of the Waterford Zoning Regulations and which Board submits a positive report to the Planning and Zoning Commission.

and that the Commission approve the proposal with the following modifications and conditions:

1. Any of the outstanding items referenced in the Peer Review- Site Plan and Stormwater Management report provided by SLR dated June 25, 2025 be adequately addressed prior to filing the final plans on the land records.
2. All conditions of approval for Inland Wetland Permit #C-25-06 shall be incorporated into this decision as if fully set forth herein.

Proposed Motion

To approve with modifications and conditions, the Site Plan for the Project LEARN proposed school facility application #PL-25-8 located at 51 Daniels Avenue, with modifications and conditions 1 & 2 and to adopt the findings 1 thru 5 of the staff report dated July 22, 2025.