



Eastern Connecticut Corridor Rail and Transit Feasibility Study (ECRTS)

Appendix A: Existing Conditions Report

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Table of Contents

1.	Introduction	1
1.1	Overview and Municipalities	2
1.2	Regional Context	3
2.	Demographics	4
2.1	Population and Population Density	5
2.2	Age.....	7
2.3	Race and Ethnicity	8
2.4	Income	9
2.5	Poverty.....	10
2.6	Environmental Justice Communities	10
3.	Employment	12
3.1	Employment Density	13
3.2	Labor Force Participation	14
3.3	Industry Mix	16
4.	Existing Rail Service	17
4.1	Historical Background.....	18
4.2	Passenger Rail Service	18
4.2.1	Northeast Corridor Infrastructure	18
4.2.2	Service and Ridership	18
4.3	Freight Rail Service	19
5.	Existing Transit Service	19
5.1	Local Bus and Demand Response Service.....	19
5.1.1	Ridership.....	24
5.2	Intercity Bus	26
5.3	Casino Line Runs.....	27
5.3.1	Mohegan Sun	27
5.3.2	Foxwoods	29
5.4	Ridesharing and Van/Carpool	29
5.5	Ferry Services	30
5.6	Other Transit Services.....	34
6.	Travel Patterns	35
6.1	Modal Split.....	35
6.2	Commuting Patterns.....	37
6.3	Origin-Destination Analysis.....	38

7. Parking43

7.1 Park & Ride Lots 43

7.2 Station Parking 44

7.2.1 New London Union Station 44

7.2.2 Mystic Train Station 46

7.2.3 Westerly Train Station..... 47

7.3 Municipal Parking..... 49

7.3.1 Norwich Center 49

7.3.2 Downtown Groton..... 50

7.3.3 Pfizer & Electric Boat 50

7.3.4 SUBASE New London 51

7.3.5 Mohegan Sun Casino 52

8. Environmental Conditions53

8.1 Wetlands 53

8.2 Flood Zones 54

8.3 Land Use 55

8.3.1 Thames River Corridor 55

8.3.2 Groton Secondary/Spur 56

8.3.3 SLE Extension 56

8.4 Recreational and Protected Lands..... 56

8.4.1 Thames River Corridor 56

8.4.2 Groton Secondary/Spur 56

8.4.3 SLE Extension 56

8.5 Historic Resources 57

Exhibit A: Activity Center Analysis

Exhibit B: Environmental Map Series

Tables

Table 2-1. Population Change..... 6

Table 2-2. Population and Population Density 6

Table 3-1. Job Density by Community..... 13

Table 3-2. Top 5 Industries of Employment in Region (2002 and 2019) 17

Table 5-1. Local Bus Service Characteristics 19

Table 5-2. Major Destinations Transit Connections 23

Table 5-3. 2017-2019 Ridership by System 24

Table 5-4. Mohegan Sun Line Run Operations 27

Table 5-5. FIFD Annual trends 2017-2021 33

Table 5-6. ECTC Transportation Programs 34

Table 5-7. Senior Transportation Services 34

Table 6-1. Means of Transportation to Work 36

Table 6-2. Activity Center Average Daily Traffic Volumes..... 39

Table 6-3. Activity Center Travel Times 41

Table 6-4. Weekday/Weekend Commute Center Change in Average Daily Traffic Volumes..... 42

Table 7-1. Park & Ride Lots within Study Area 44

Table 7-2. New London Public Parking..... 45

Table 7-3. Mystic Public Parking 46

Table 7-4. Westerly Public Parking..... 48

Figures

Figure 1-1. Study Area Regional Context..... 1

Figure 1-2. Study Overview Map 2

Figure 1-3. Study Community Map..... 3

Figure 2-1. Study Area Context Map..... 4

Figure 2-2. Population by Municipality 5

Figure 2-3. Study Area Population Density Map 7

Figure 2-4. Age Distribution Region Compared to State 8

Figure 2-5. Median Age by Town 8

Figure 2-6. Racial Composition..... 9

Figure 2-7. Median Household Income by Town..... 9

Figure 2-8. Poverty Levels 10

Figure 2-9. Study Area Communities with Distressed Municipality Designation Since 2010..... 11

Figure 2-10. Environmental Justice Demographic Vulnerability Index 11

Figure 3-1. Annual Average Jobs (1990-2022)..... 12

Figure 3-2. Employment Density Map 14

Figure 3-3. Historic Unemployment Rate Norwich-New London-Westerly LMA 15

Figure 3-4. Unemployment by Town (2021)..... 15

Figure 3-5. Average Wage (2019) 16

Figure 5-1. Map of Transit in the Region..... 21

Figure 5-2. Transit Frequency and Span..... 22

Figure 5-3. New London Smart Ride Pickup and Drop-Off Density 25

Figure 5-4. Stonington HOP Pickup and Drop-off Density..... 26

Figure 5-5. Mohegan Sun Greyhound Ridership..... 27

Figure 5-6. Mohegan Sun Line Runs Ridership and Trips Operated Source: Mohegan Sun 28

Figure 5-7. Mohegan Sun Line Run Ridership Map..... 28

Figure 5-8. Vanpools in the Study Area..... 30

Figure 5-9. New London Ferry and Intermodal Map 31

Figure 5-10. Ferry Map..... 32

Figure 5-11. FIFD Monthly Ridership 2019-2021..... 33

Figure 6-1. Regional Employment Destinations 37

Figure 6-2. Study Area Commute Flows..... 38

Figure 6-3. Top Origin Traffic Volumes for Each Activity Center 40

Figure 6-4. Average Daily Commute Center Traffic by Origin Location..... 41

Figure 6-5. Commute Center Weekday & Weekend Average Daily Traffic..... 42

Figure 7-1. Locations of Park & Ride Lots..... 43

Figure 7-2. New London Train Station Parking 45

Figure 7-3. Mystic Train Station Parking..... 46

Figure 7-4. Mystic On-Street Parking 47

Figure 7-5. Westerly Train Station Parking 48

Figure 7-6 Norwich Center Parking..... 49

Figure 7-7. Downtown Groton Parking Areas..... 50

Figure 7-8. Downtown Groton On-Street Parking 51

Figure 7-9. Pfizer & Electric Boat Parking..... 52

Figure 8-1. Wetlands Mapping Example (for a complete dataset see Exhibit B)..... 53

Figure 8-2. FEMA Flood Mapping Example (for complete data set see Exhibit B) 55

1. Introduction

The Connecticut Legislature has directed the Connecticut Department of Transportation (CTDOT) to conduct a feasibility study for expanding passenger rail service and ground transportation options in southeast Connecticut¹ via the Eastern Connecticut Corridor Rail and Transit Feasibility Study (ECRTS). ECRTS is investigating the feasibility of and market for the following transportation improvements (Figure 1-1):

- Extending the Shore Line East rail line to the State of Rhode Island
- Establishing a new passenger rail service from the City of New London to the City of Norwich
- Establishing a new passenger train station in the Town of Groton and the Borough of Stonington
- Extending other ground transportation systems in the eastern region of the state and providing improved connectivity between such systems and rail lines

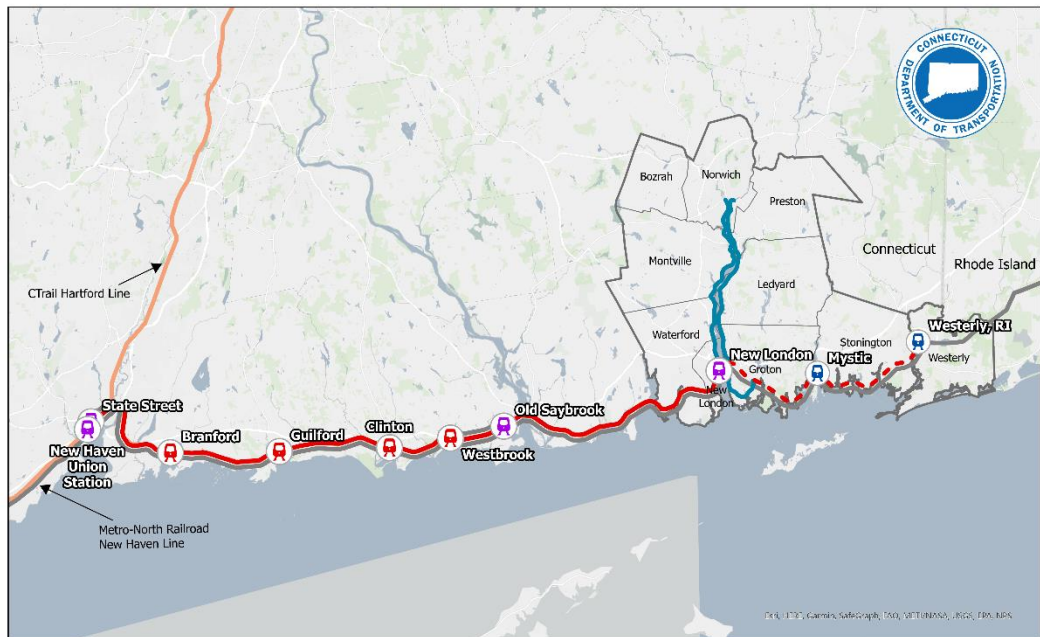
Figure 1-1. Study Area Regional Context

Eastern Connecticut
Corridor Rail & Transit
Feasibility Study
Existing Service & Study Area

Legend

- Existing Shore Line East Station Only
- Existing Shore Line East/Amtrak Station
- Existing Amtrak Station Only
- Existing Shore Line East Rail Line
- Potential Shore Line East Extension
- Possible Conversion to Passenger Rail
- Northeast Corridor (Amtrak)
- Metro-North Rail New Haven Line, CTrail Hartford Line
- Study Area
- Study Area Town

0 2.5 5 7.5 10 Miles



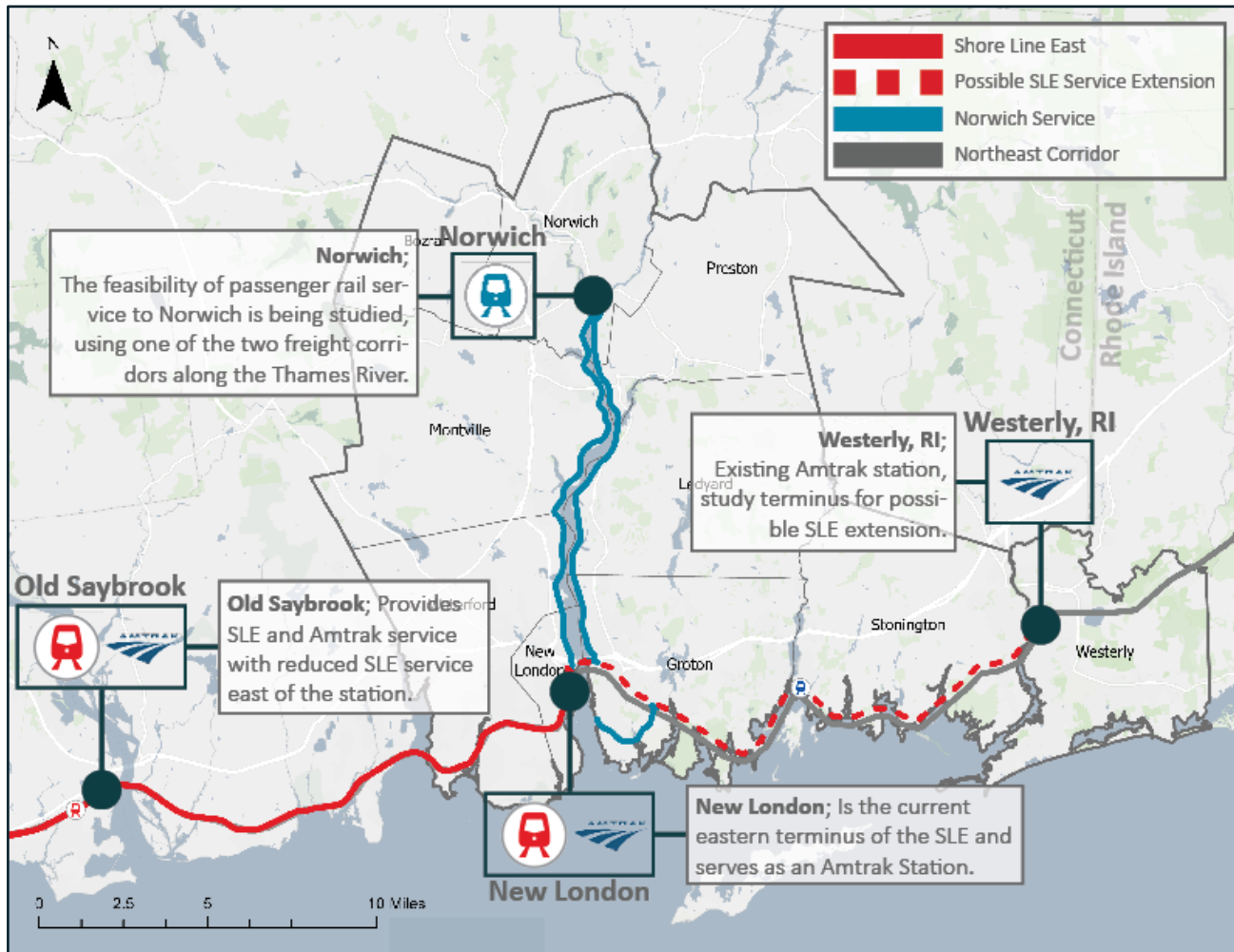
A feasibility study is the first step in evaluating the viability of service in a corridor. This feasibility study will consider existing and future market and environmental conditions, equity and environmental justice issues, preliminary engineering considerations, ridership levels, service operations, equipment needs and system requirements, and preliminary costs and revenue forecasts within the ECRTS study area. As a result of the findings of these investigations, more detailed studies may follow.

The purpose of this Existing Conditions Report is to identify current demographic and socioeconomic conditions, as well as transportation services and infrastructure within the study area. Additionally, an environmental survey in the Study area is presented in the last chapter, with additional travel pattern analysis presented in Exhibit A. The corridors and communities examined in this report include those along both sides of the Thames River from New London to Norwich and shoreline communities from New London, Connecticut to Westerly, Rhode Island.

¹ [Substitute House Bill No. 6484, Public Act 21-175, Section 20](#)

Information within this report will serve as a basis for the analysis of current and future needs affecting mobility within this study area. Using the data summarized in this report, the study team will perform corridor-level analyses that evaluate the potential benefits of rail/transit improvements that address current and future demand in the study corridors.

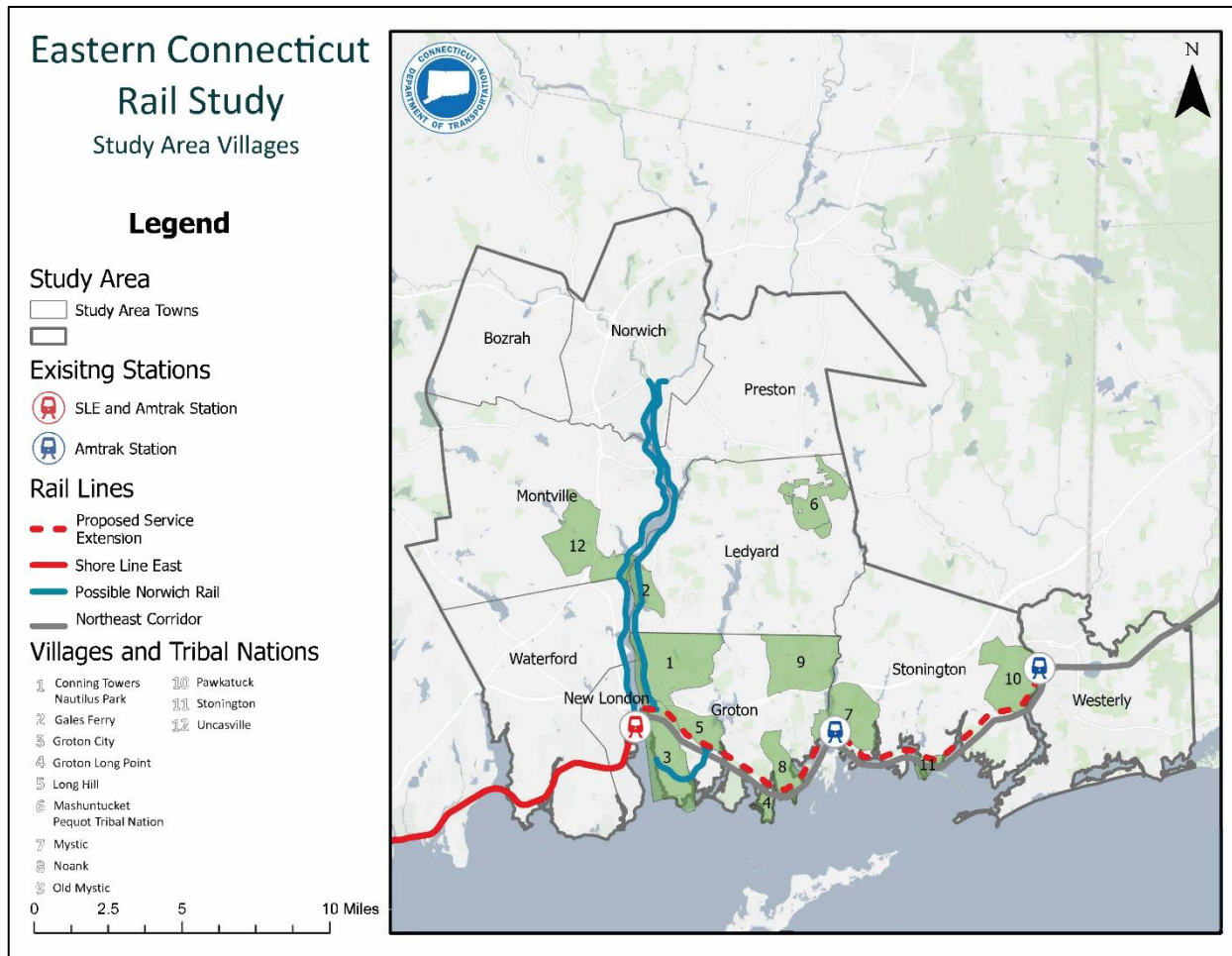
Figure 1-2. Study Overview Map



1.1 Overview and Municipalities

For the purposes of the ECRTS, the study area is defined as the ten municipalities through which the potential rail service passes. This includes Bozrah, Groton, Ledyard, Montville, New London, Norwich, Preston, Stonington, and Waterford, Connecticut, plus Westerly, Rhode Island. Figure 1-3 shows an overview of the cities and towns in the study area as well as the many villages and boroughs.

Figure 1-3. Study Community Map



1.2 Regional Context

The study area is situated in the southeast corner of Connecticut, bordered by Rhode Island to the east and Long Island Sound to the south. Southeast Connecticut is a region characterized by a diverse landscape of built out urban areas, small village centers, dense forests, sandy coastlines, and ties to the defense industry. The region is home to four colleges and universities, the US Coast Guard Academy, a naval submarine base, the second and third largest casinos in the United States, and major employers like General Dynamics Electric Boat and Pfizer.

The Northeast Corridor (NEC) is a rail line that extends east to west connecting Boston to New York via Rhode Island and Connecticut. In 1990, CTDOT established the Shore Line East (SLE) passenger rail service along the NEC from New Haven to Old Saybrook to supplement Amtrak service and serve commuters of southeastern Connecticut. Service was expanded to New London in 1996. While Amtrak service continues eastbound beyond New London, it only stops in Mystic and Westerly. By automobile, the study area is approximately an hour from Providence and New Haven, 50 minutes from Hartford, two hours from Boston, and two and a half hours from New York.

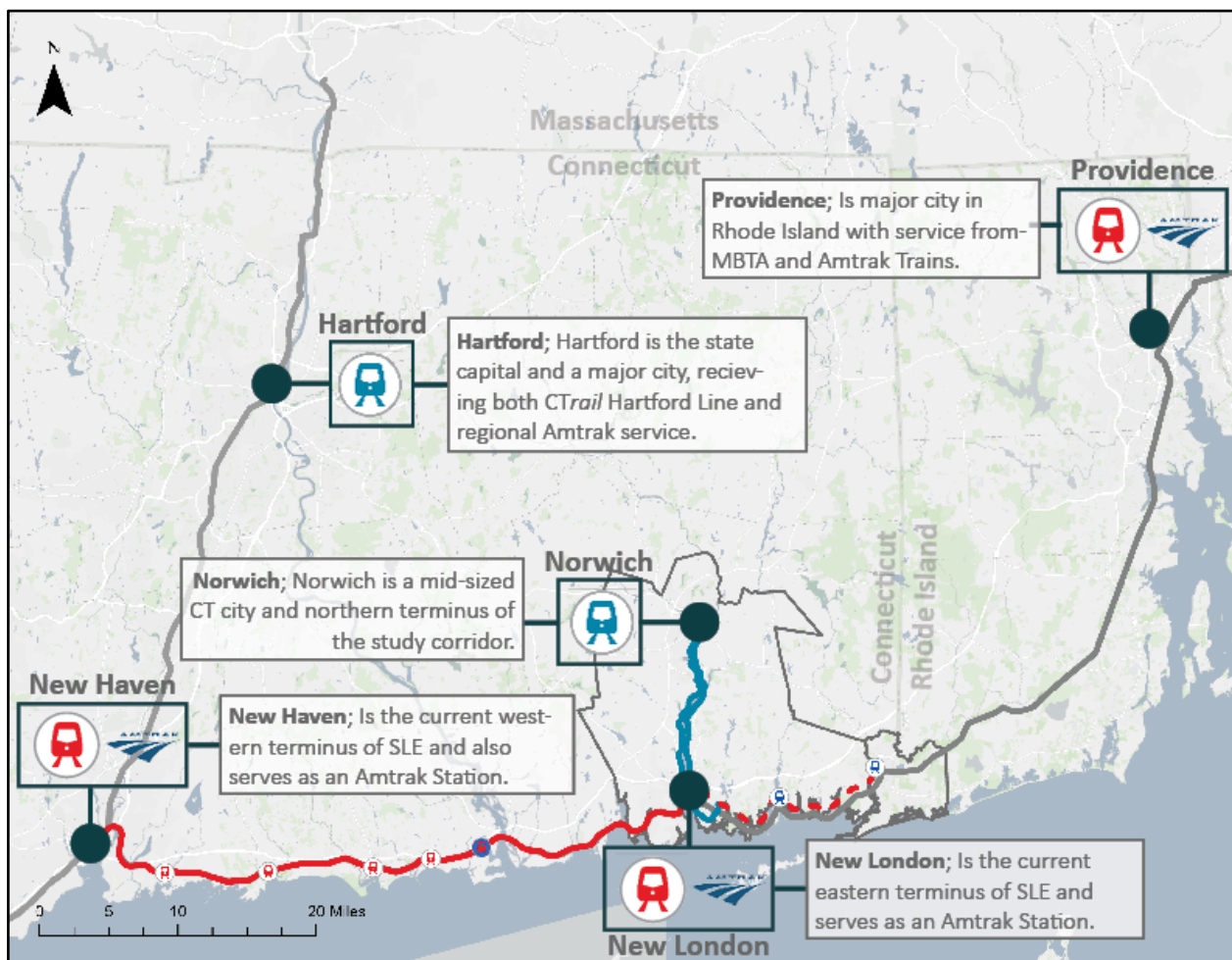
2. Demographics

This chapter presents an analysis of the demographic characteristics of the towns in the study area. The following demographic measures are included in the analysis as they impact transit demand in the region and ensure that CTDOT meets agency goals and federal regulations in serving disadvantaged communities:

- Population Density
- Age
- Race/Ethnicity
- Income and Poverty
- Environmental Justice Communities

There are stark contrasts between communities in the study area in terms of demographic characteristics. Overall, the cities in the study area are more racially diverse than the rest of the communities in the region and tend to be much younger. There is also an uneven distribution of wealth across the region, with New London having half the median household income of the three wealthiest towns in the region.

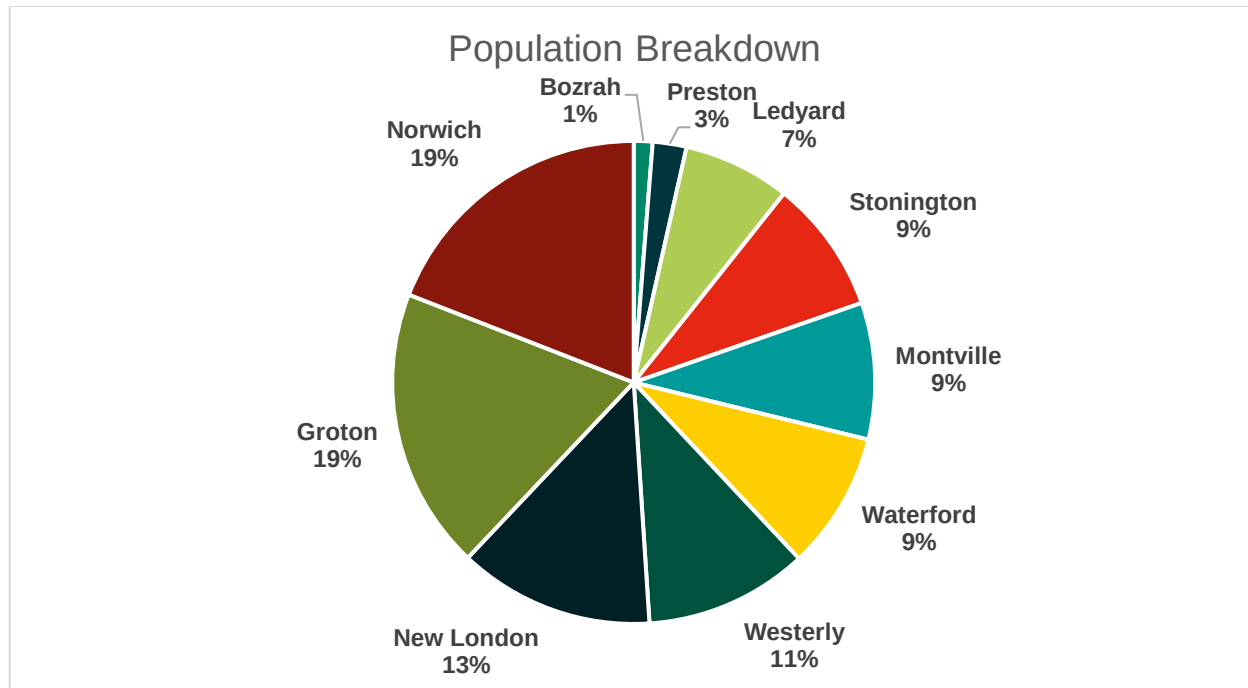
Figure 2-1. Study Area Context Map



2.1 Population and Population Density

The study area contains a mix of urban, suburban, and rural communities, which range in population from 2,589 to 39,260 residents. Of the 205,817 residents residing in the study area, just over half live in Norwich, Groton, and New London (Figure 2-2). The least populous towns are Bozrah and Preston. Between 2010 and 2019, population declined within the study area declined by 5,235 residents, a decline of 2.5 percent (Table 2-1). The population decline was experienced by all communities, with Montville having the greatest decline of 3.8 percent. On the whole, the State of Connecticut's population change was stagnant, with an overall increase of just 977 residents.

Figure 2-2. Population by Municipality



Source: US Census Bureau 2019 American Community Study

Table 2-1. Population Change

Town	2010 Population	2019 Population	Change	Percent Change
Bozrah	2,627	2,589	-38	-1.4%
Preston	4,726	4,657	-69	-1.5%
Ledyard	15,051	14,761	-290	-1.9%
Stonington	18,545	18,445	-100	-0.5%
Montville	19,571	18,835	-736	-3.8%
Waterford	19,517	18,935	-582	-3.0%
Westerly	22,787	22,544	-243	-1.1%
New London	27,620	26,966	-654	-2.4%
Groton	40,115	38,825	-1,290	-3.2%
Norwich	40,493	39,260	-1,233	-3.0%
Region	211,052	205,817	-5,235	-2.5%
State	3,574,097	3,575,074	977	0.0%

Source: US Census Bureau 2019 American Community Survey, 2010 Decennial Census

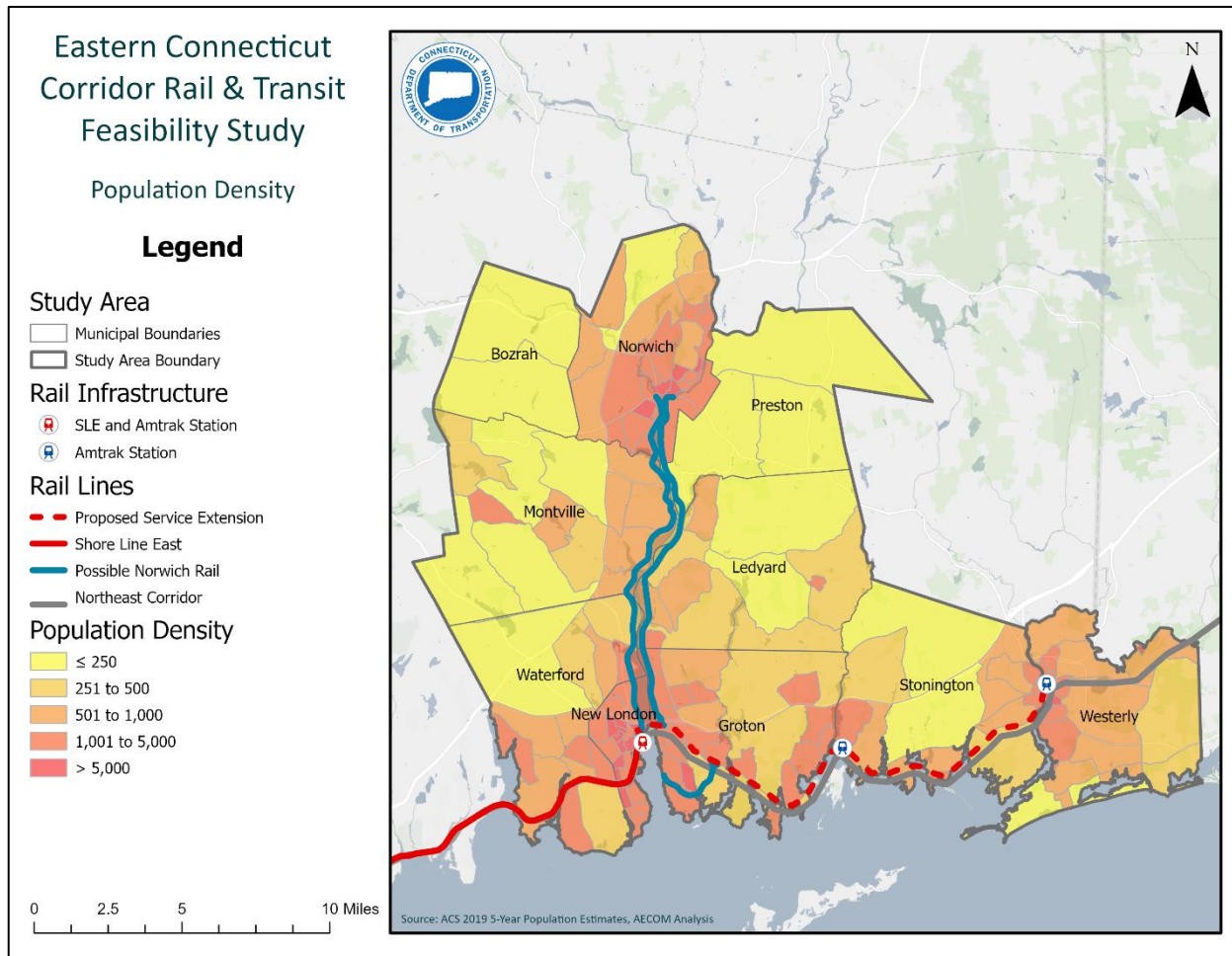
Overall, the study area, with an average density of 693 people per square mile, has a population density that is slightly less than that of Connecticut (Table 2-2). Of the ten municipalities in the study area, density ranges greatly from 4,798 people per square mile in New London to 130 in Bozrah. US Census Bureau block group population data shows that the densest areas are in downtown Norwich, New London, eastern Groton along the Thames River shore, Mystic, and Pawcatuck/Westerly downtown (Figure 2-3). In general areas along the coast and the Thames River have higher densities than inland communities, with the exception of a pocket in Montville (a residential development near Oakdale Elementary School) and Ledyard (a residential development near the Gallup Hill School).

Table 2-2. Population and Population Density

Town	2019 Population	Land Area (sqm)	Population Density
Bozrah	2,589	19.96	130
Groton	38,825	31.03	1,251
Ledyard	14,761	38.22	386
Montville	18,835	41.95	449
New London	26,966	5.61	4,798
Norwich	39,260	28.06	1,399
Preston	4,657	30.82	151
Stonington	18,445	38.66	477
Waterford	18,935	32.77	578
Westerly	22,544	30.1	749
Region	205,817	297.18	693
State	3,575,074	4842.36	738

Source: US Census Bureau 2019 American Community Survey

Figure 2-3. Study Area Population Density Map



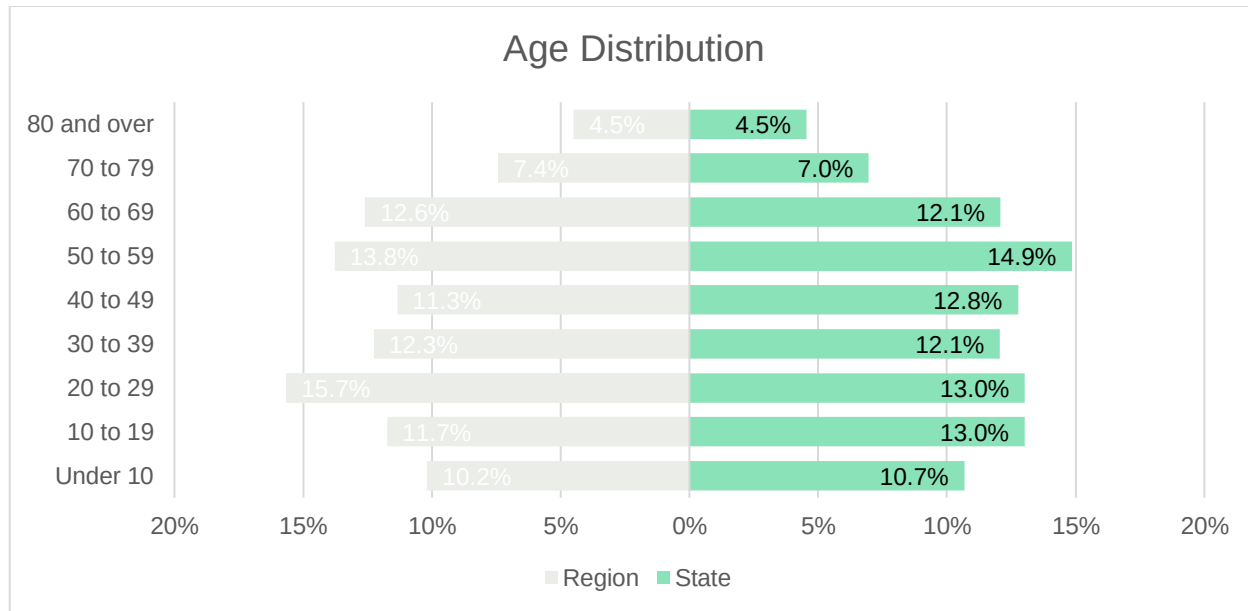
Source: US Census Bureau 2019 American Community Survey

2.2 Age

The age distribution in the study area is generally similar to that of the rest of the state, except there is a greater percentage of individuals aged 20 to 29 (Figure 2-4). This is likely because of the institutions of higher education and naval submarine base located in the study area. The overall median age in the study area is slightly less than the state average of 41 (Figure 2-5). The denser, more populous, urban areas of New London, Groton, and Norwich have lower median ages than the more rural and suburban communities. The Southeastern Connecticut Council of Governments (SCCOG) Plan of Conservation and Development² (POCD) attributes this to not only the higher education and military institutions located in these three urban communities but the presence of recent immigrants in cities (who tend to be young adults), and historical trends for baby boomers, many of whom have reached retirement and moved into rural and suburban communities in the 1970's and 80's to start families.

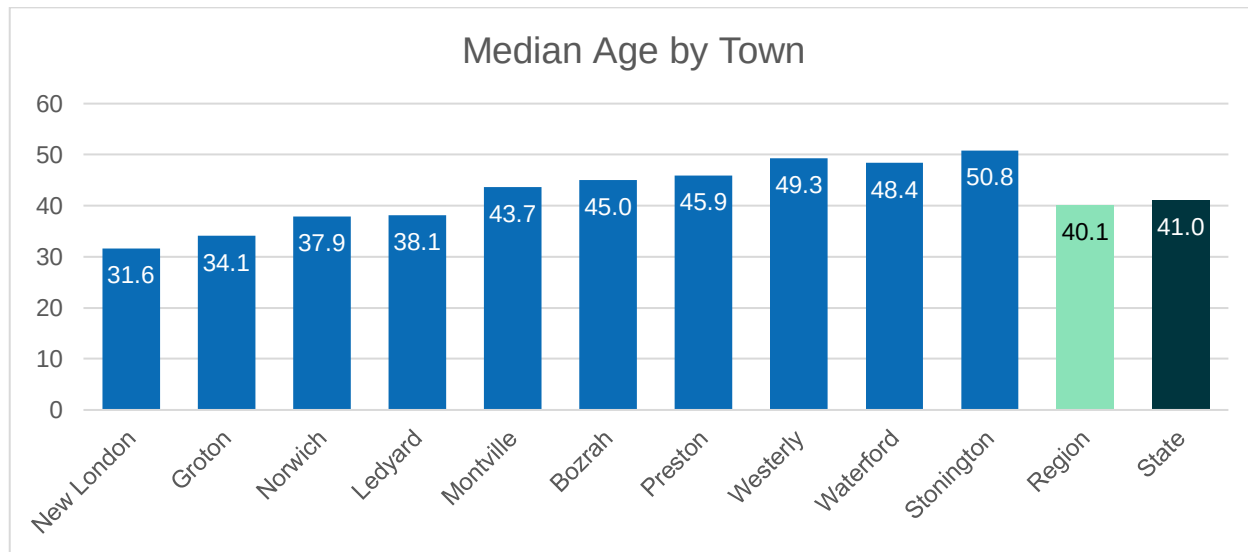
² Regional Plan of Conservation and Development – SCCOG. (2017). Retrieved June 17, 2022, from Seccog.org website: <http://seccog.org/reg-plan>

Figure 2-4. Age Distribution Region Compared to State



Source: US Census Bureau 2019 American Community Survey

Figure 2-5. Median Age by Town

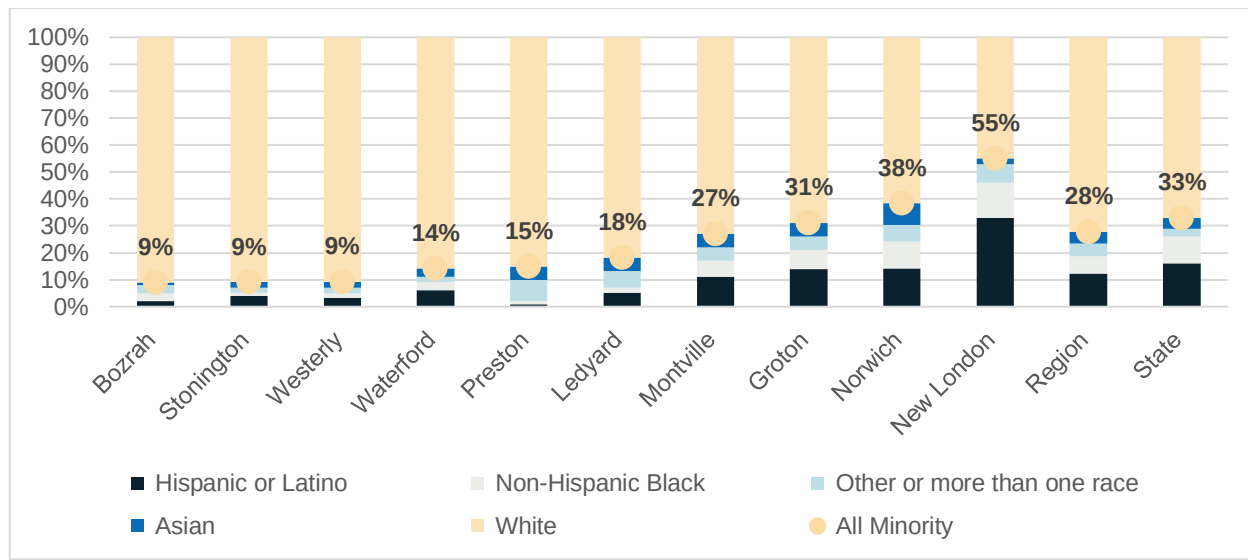


Source: US Census Bureau 2019 American Community Survey

2.3 Race and Ethnicity

Overall, the region is less diverse than the state overall; Norwich and New London are the only municipalities more ethnically diverse than the State of Connecticut (Figure 2-6). Montville and Groton have a similar ethnic mix to that of the region, while communities such as Bozrah, Stonington and Westerly are overwhelmingly white. New London has both the greatest percentage (33) and overall number (8,899) of Hispanic and Latino individuals. It also has the greatest percentage (13) non-Hispanic black individuals, but Norwich has an overall greater number at 3,926. Norwich has the greatest percentage (eight) and number (3,141) of individuals of Asian descent. Preston has the greatest percentage of “other”, which comprises over half of the minority population in the community. This is not surprising given that “other” includes Native Americans and Preston is home to the Mashantucket Pequot Tribe.

Figure 2-6. Racial Composition

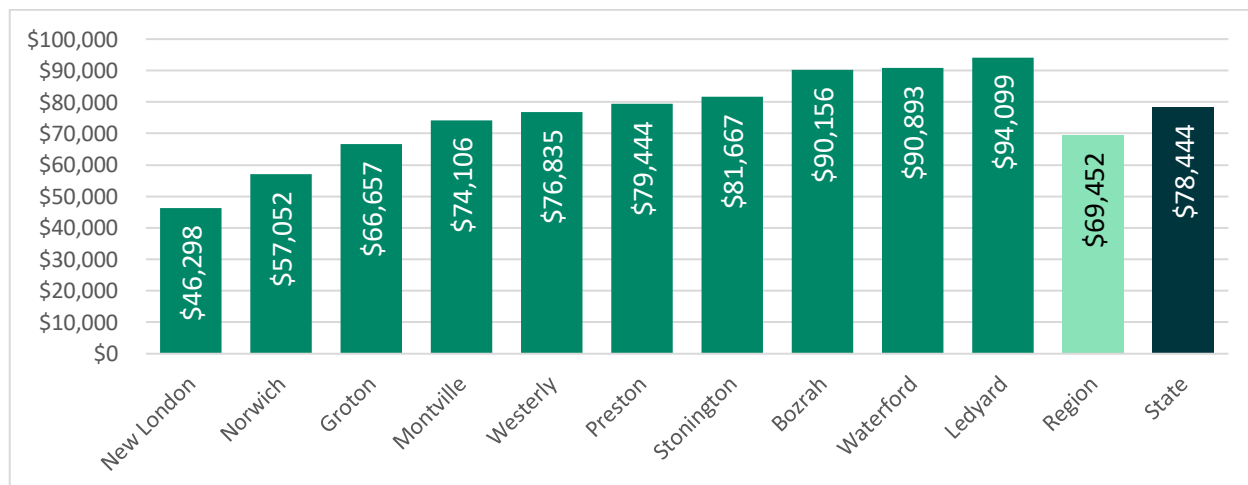


Source: US Census Bureau 2019 American Community Survey

2.4 Income

The median household income in the study area is \$9,000 lower than the state average, even though 70 percent of the communities have an average household income that is greater than the region's average and half are greater than the state average (Figure 2-7). This is because the three most populous and dense towns (New London, Norwich, and Groton) have the lowest income levels. Median household income varies greatly within the study area with Ledyard having twice that of New London. New London has the 5th lowest median household income among all municipalities statewide.

Figure 2-7. Median Household Income by Town

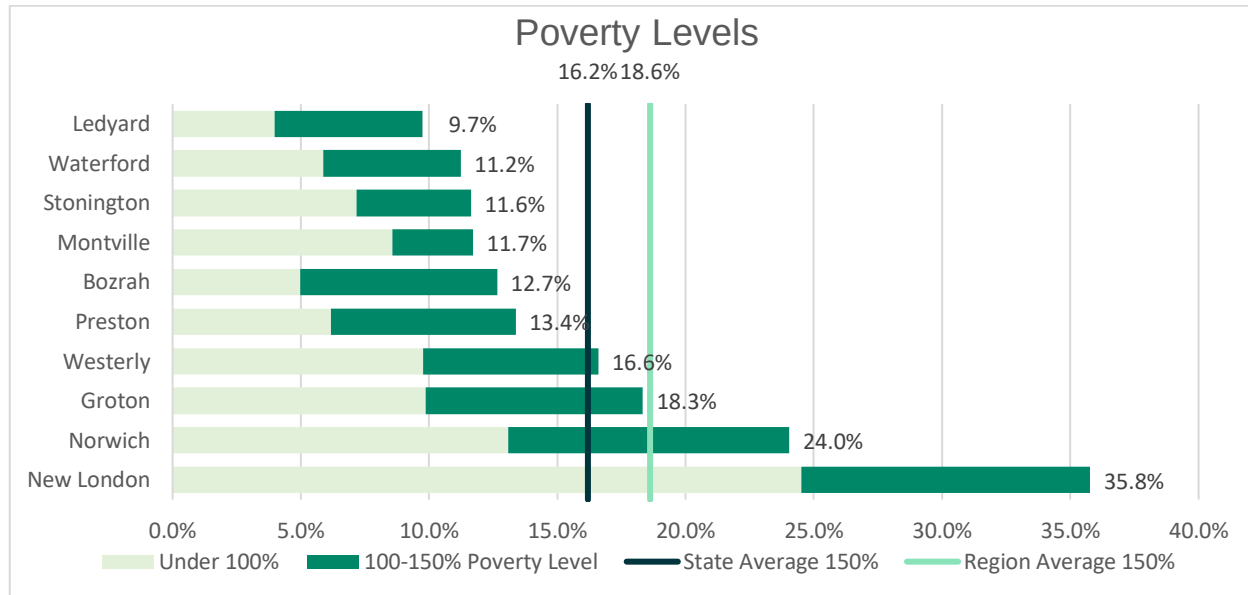


Source: US Census Bureau 2019 American Community 5-Year Survey

2.5 Poverty

The level of poverty (defined as 150 percent below the poverty line) in the region is slightly greater than the state average of 16.2 percent (Figure 2-8). It varies greatly among communities from one out of ten individuals in Ledyard to one-third of individuals in New London. The four urban communities of New London, Norwich, Groton, and Westerly all have poverty levels above the Connecticut state average.

Figure 2-8. Poverty Levels



Source: US Census Bureau 2019 American Community Survey

2.6 Environmental Justice Communities

Since 2010, the Connecticut Department of Economic and Community Development (DECD) has been using US Census, Department of Labor, and Department of Education data to designate communities as “Distressed Municipalities” that have high unemployment and poverty rates, low or declining job growth, an aging housing stock, low educational attainment rates, and low per capita incomes³. All communities are ranked based on a composite score of the aforementioned elements, and the top 25 towns with the highest scores are designated as distressed municipalities. Since the list has been published, five out of the ten communities in the study area have been on the list at one point in time, including New London, which has consistently been on the list. While Norwich has only consistently been on the list since 2015, as of the 2021 scoring, it was ranked as the 2nd most distressed municipality in Connecticut; New London was number four, Montville number 10, and Groton number 19.

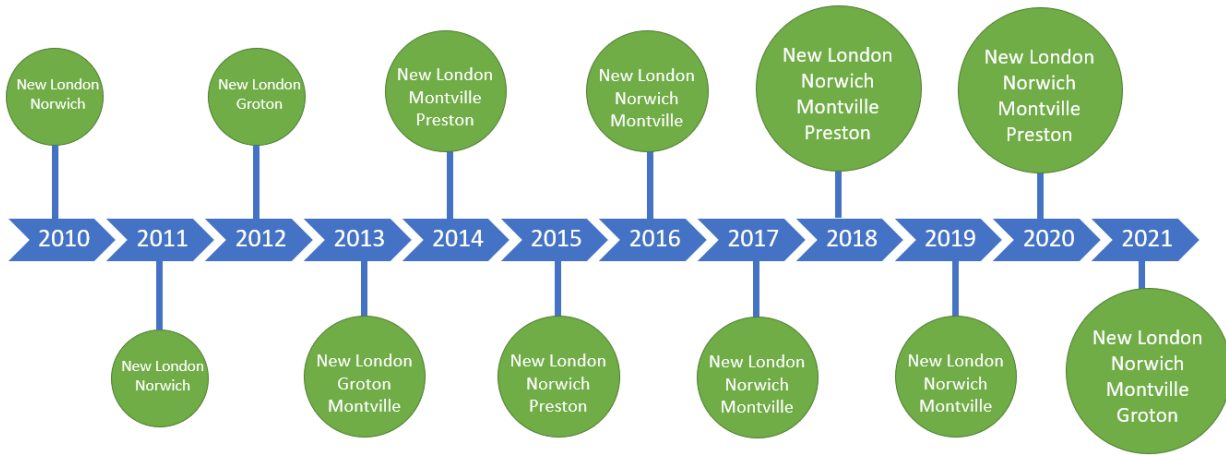
The Environmental Protection Agency (EPA) has developed an Environmental Justice (EJ) screening tool called EJScreen⁴. The tool uses a combination of demographic and environmental indicators to calculate EJ areas (Census block groups) that are vulnerable to change. Demographic indicators were mapped to understand where EJ communities exist within the study area. The areas with higher percentages EJ communities are clustered in

³ Distressed Municipalities. (2021). Retrieved June 17, 2022, from CT.gov - Connecticut's Official State Website: https://portal.ct.gov/DECD/Content/About_DECD/Research-and-Publications/02_Review_Publications/Distressed-Municipalities

EJScreen: Environmental Justice Screening and Mapping Tool | US EPA. (2014, September 3). Retrieved June 17, 2022, from US EPA website: <https://www.epa.gov/ejscreen>

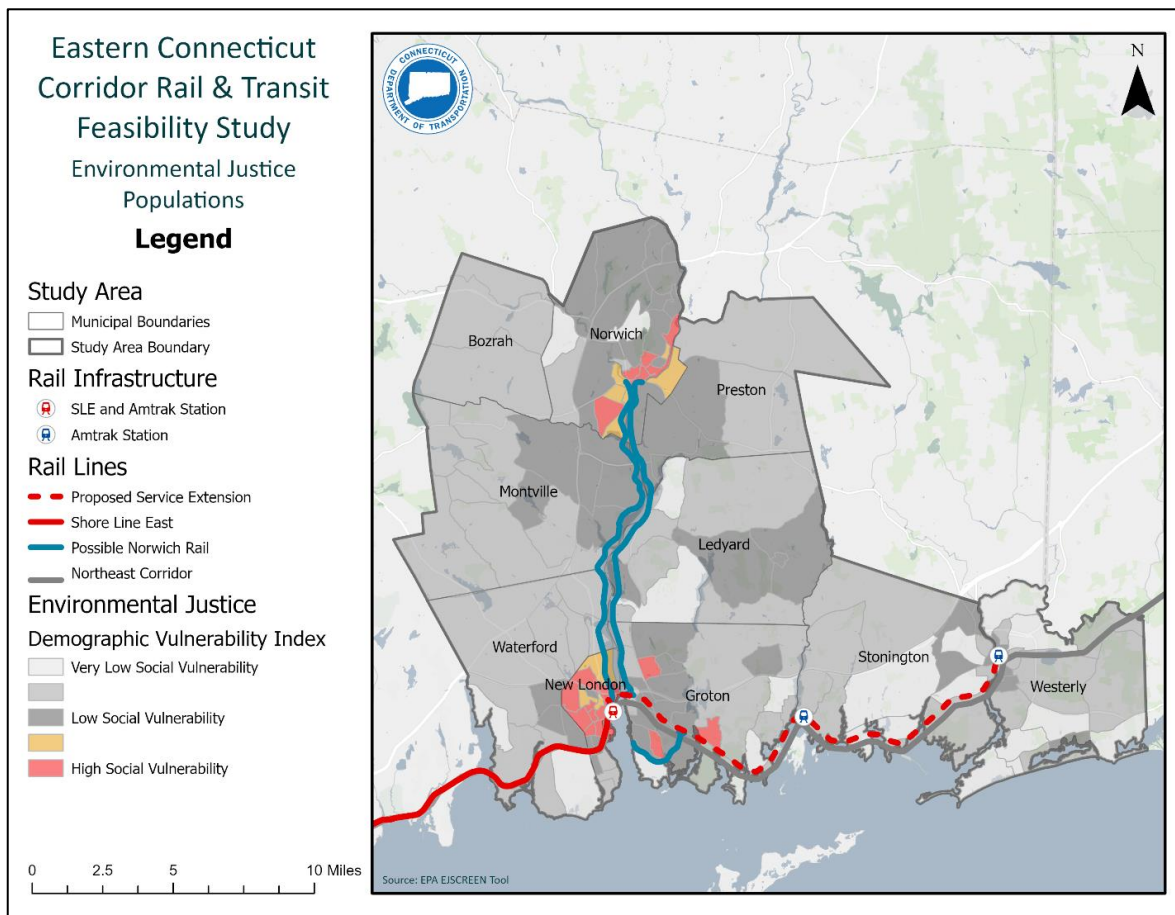
the northern part of New London, downtown Norwich, the Poquonnock, Conning Towers-Nautilus Park, and Branford Manor Apartments area of Groton (Figure 12).

Figure 2-9. Study Area Communities with Distressed Municipality Designation Since 2010



Source: Connecticut Department of Economic and Community Development

Figure 2-10. Environmental Justice Demographic Vulnerability Index



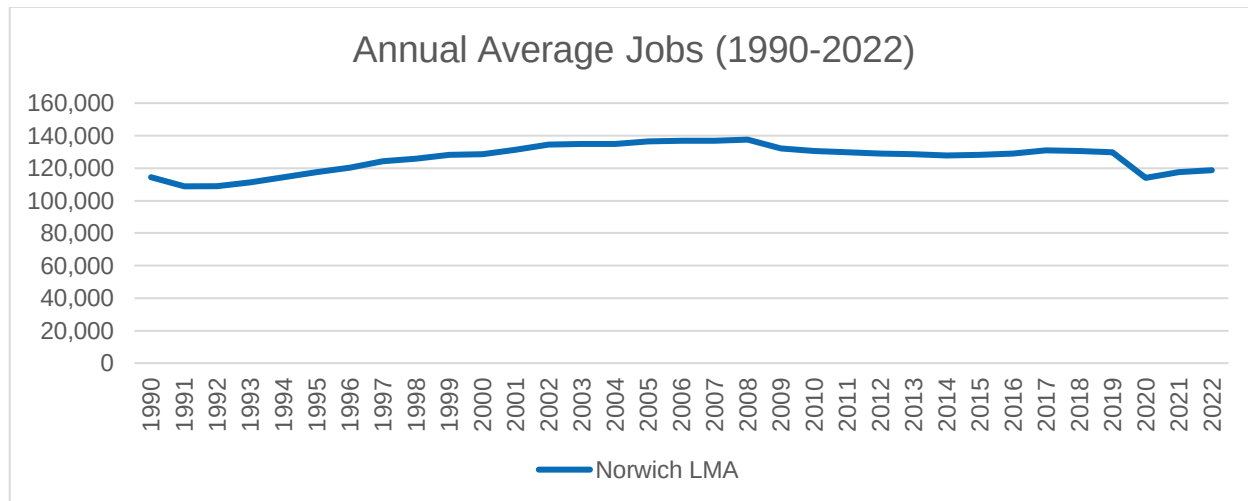
3. Employment

The data in this section was collected from the Connecticut Department of Labor (CTDOL) and the US Census Bureau. The Census data presented was collected at a town level while the CTDOL data has largely been collected under the ‘Norwich-New London-Westerly CT-RI’ Labor Market Area (LMA); much of their data is not available at the town level. In addition to the study area towns, the LMA extends to Lyme/Old Lyme in the west and Canterbury in the north.

Overall, the labor market in the region has not changed much in the past two decades in terms of industry mix, with most residents working in the service industry or manufacturing. The resort casinos, Mohegan Sun and Foxwoods, are the largest employers in the region along with General Dynamics Electric Boat and the Naval Submarine Base.

The number of jobs in the region has declined over the last decade and a half, peaking in 2008 and never recovering from the Great Recession (Figure 3-1). In 2019, prior to the sharp, COVID pandemic-induced decline in 2020, the number of jobs had dropped 5.7% since the 2008 peak, while jobs in the state overall declined only 0.7 percent. To explain this, the 2017 Comprehensive Economic Development Strategy (CEDS) that was conducted for the Southeastern Connecticut Economic Development District points to the more than 12,000 jobs in the region’s gaming industry that were lost between 2008 and 2015. The CEDS explains that the industry has not only been impacted by the overall economic malaise but also competition due to the expansion of the gaming industry across New England and the Northeast. The region’s job market has also been hit harder by the COVID-pandemic than the state’s, with unemployment rising 3.4 percent between 2019 and 2021, compared to 2.2 percent in the state overall, likely due in part to the region’s reliance on the service industry. In the near-term, General Dynamics Electric Boat is bringing new jobs to the region; they are expected to hire more than 3,000 workers in 2022 alone to meet the needs of new military contracts.

Figure 3-1. Annual Average Jobs (1990-2022)



Source: CT Department of Labor

⁵ McGirl, S. (2022, January 24). Electric Boat Needs to Hire Thousands in 2022. Retrieved June 17, 2022, from NBC Connecticut website: <https://www.nbcconnecticut.com/news/local/electric-boat-needs-to-hire-thousands-in-2022/2698451/>

3.1 Employment Density

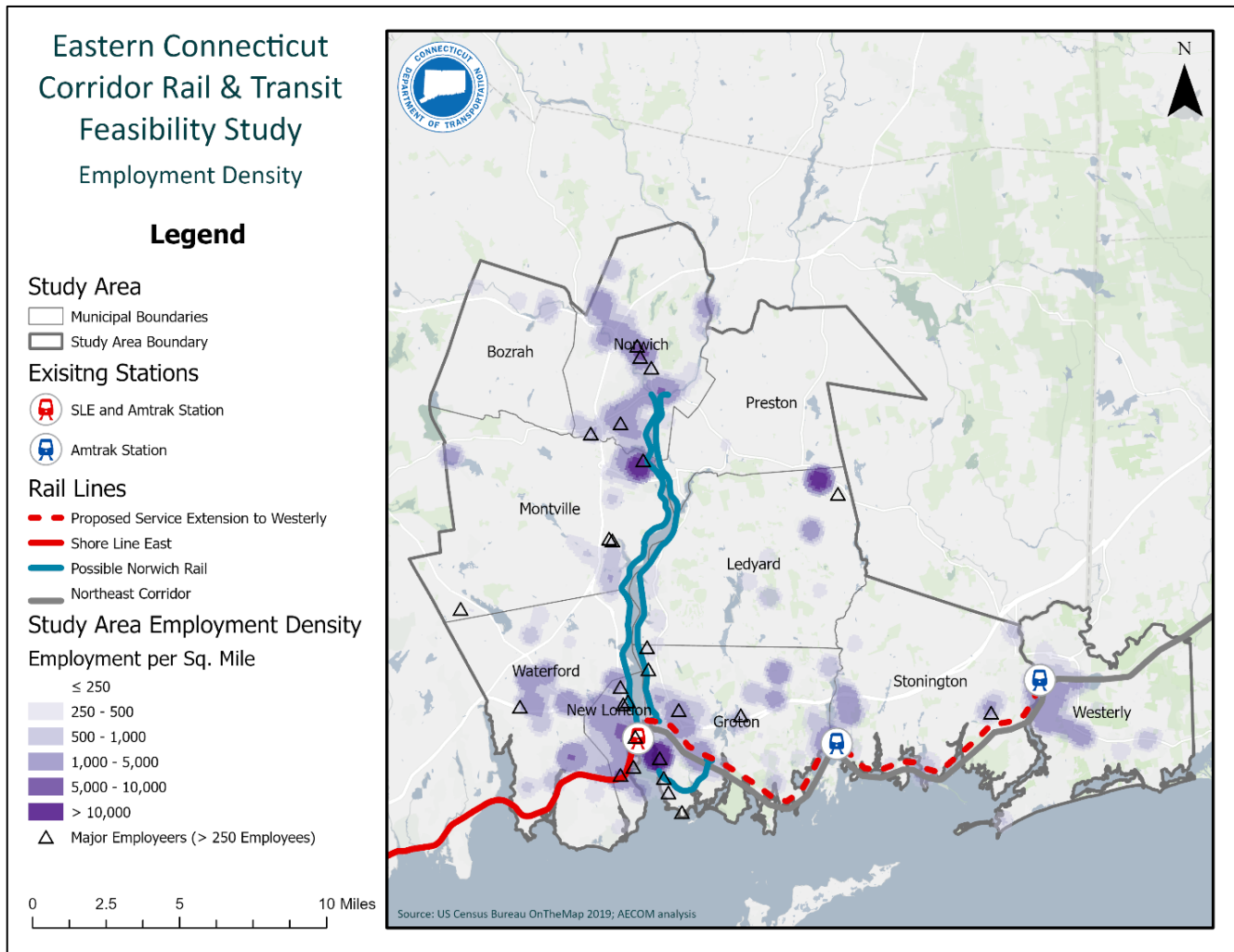
The study area, with an average job density of 364 jobs per square mile, has an employment density that is greater than Connecticut as a whole (Table 3-1). The greatest number of jobs is in Groton, but the employment density is greatest in New London, which is 2.7 times greater than the second densest community. Employment data shows that the areas with the greatest density correspond to Foxwoods Resort Casino, Mohegan Sun, and Electric Boat. Other dense areas for employment include downtown Norwich, Mystic, downtown Westerly, northern New London, the Route 1 corridor in Groton, Routes 82 and 32 in Norwich, and various shopping plazas in Waterford (Table 3-1). Many of the areas with higher density correspond to one or more of the thirty top employers (250 or more employees) in the area.

Table 3-1. Job Density by Community

Town	2019 Jobs	Land Area (sqm)	Job Density
Bozrah	1,224	19.96	61
Groton	28,174	31.03	908
Ledyard	9,551	38.22	250
Montville	12,007	41.95	286
New London	13,894	5.61	2,477
Norwich	16,686	28.06	595
Preston	675	30.82	22
Stonington	6,819	38.66	176
Waterford	10,115	32.77	309
Westerly	8,995	30.1	299
Region	108,140	297.18	364
State	1,643,166	4842.36	339

Source: US Census Bureau Longitudinal Employer-Household Dynamics (LEHD) Dataset

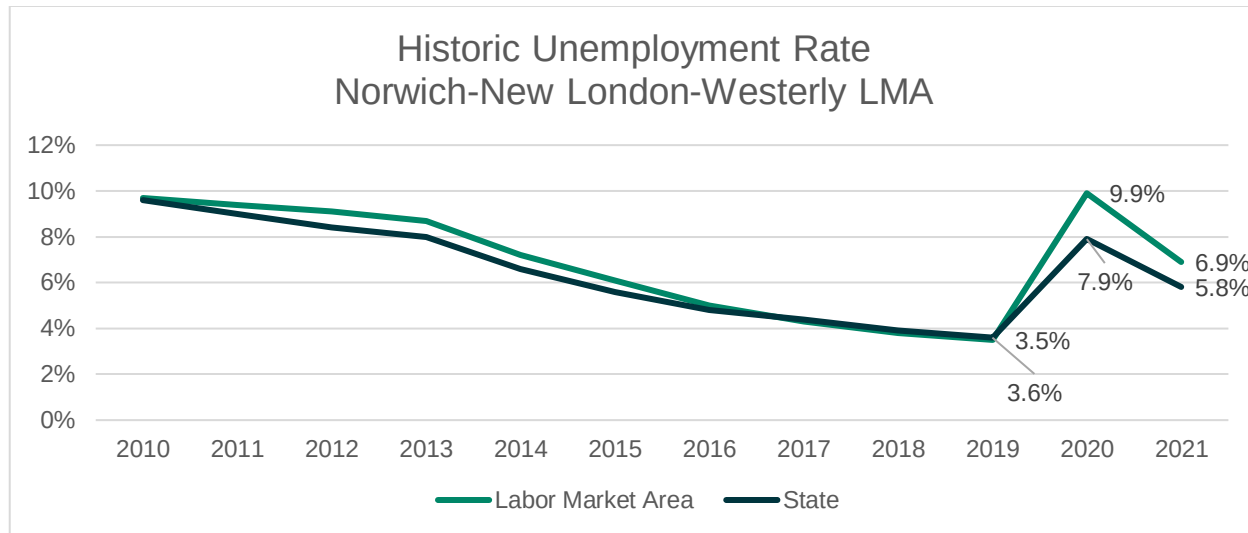
Figure 3-2. Employment Density Map



3.2 Labor Force Participation

The unemployment rate in the Norwich-New London-Westerly LMA has largely mirrored that of the state for the last decade; they were both hit hard by the Great Recession, with the unemployment rates for both nearly hitting 10 percent in 2010 but falling in the decade that followed (Figure 3-3). In 2019, the unemployment rates for the region and state were 3.5 and 3.6 percent, respectively. Both saw significant jumps in unemployment in 2020, due to the COVID pandemic, with the region experiencing a nearly 6.5 percent increase in unemployment (almost 2 percent more than the state), likely due to the large number of jobs in the service industry. In 2021, the year that followed the onset of the pandemic, there were substantial drops in both unemployment rates. The unemployment rate continues to fall in the region with the CTDOL reporting an average unemployment rate of 5.6 percent in the first two months of 2022.

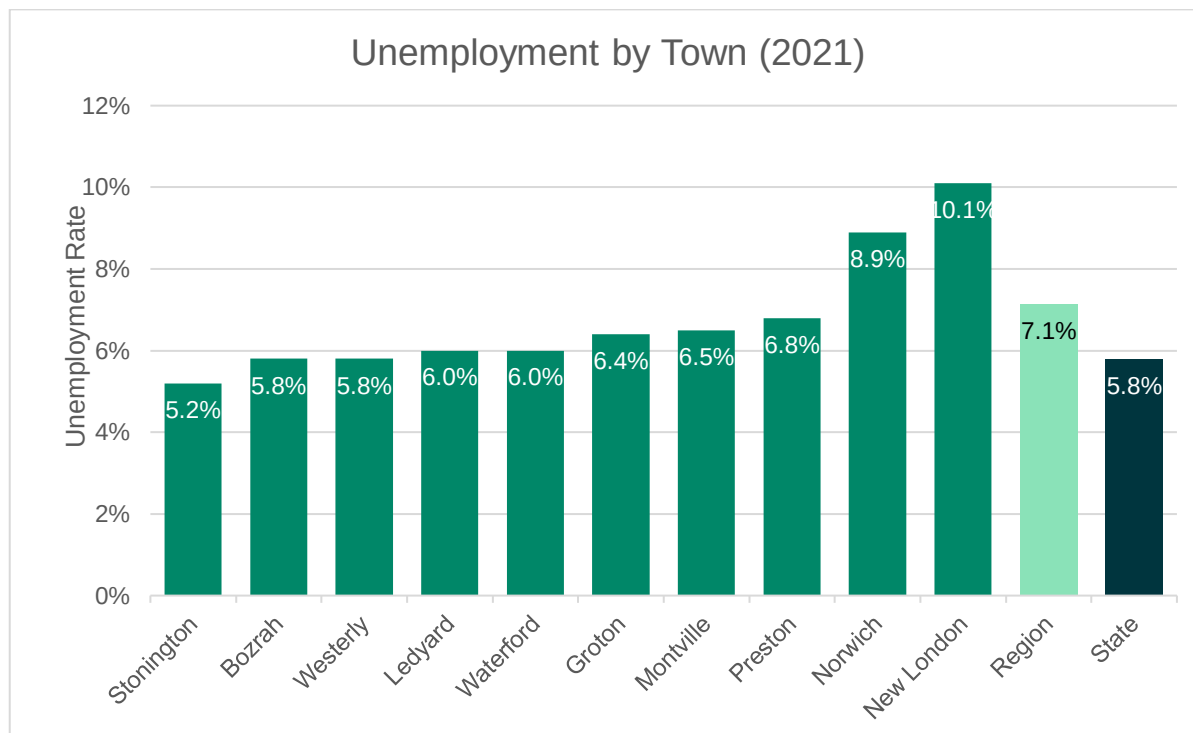
Figure 3-3. Historic Unemployment Rate Norwich-New London-Westerly LMA



Source: CT Department of Labor

With the exception of Groton, the urban areas in the region had higher unemployment rates in 2021, with Norwich and New London exceeding the regional average by 1.8 and 3 percent, respectively (Figure 3-4). This is likely because Groton has several large defense employers, which were less likely to be impacted by the pandemic. Most of the towns in the region have unemployment rates very close to the state's 5.8 percent unemployment rate, however, the average unemployment rate for the region is higher than that of the state.

Figure 3-4. Unemployment by Town (2021)

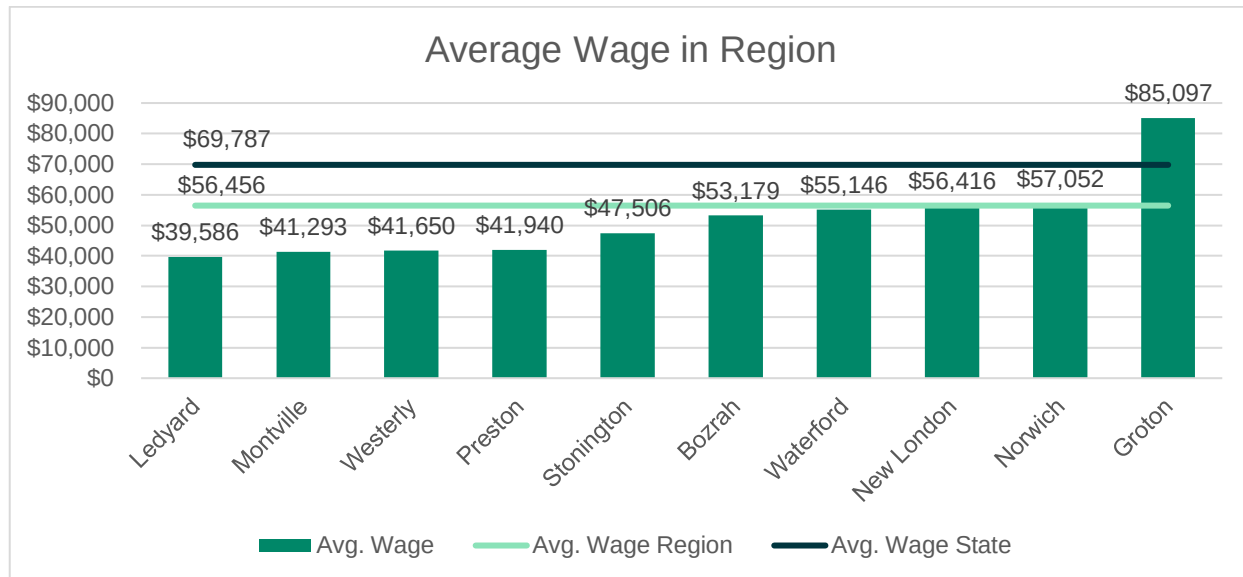


Source: CT Department of Labor

The study team looked at average annual wage data from 2019 rather than 2020 to account for any abnormalities that may have arisen from the COVID pandemic. The wages reported are for jobs located in the towns, not the

wages of town residents. Jobs in the towns of Groton had a significantly higher average wage than the rest of the towns in the region in 2019 (Figure 3-5). Groton is home to Pfizer’s offices in the region where over 1,000 people work in higher paying professional, scientific, and technical services jobs. One of Electric Boat’s two facilities in the region is also located in Groton and employs people in well-paying manufacturing and engineering jobs. The lowest average wages in the region were in Ledyard and Montville, where Foxwoods and Mohegan Sun and their thousands of hospitality sector jobs are located.

Figure 3-5. Average Wage (2019)



Sources: CT Department of Labor, RI Department of Labor

3.3 Industry Mix

The methodologies used by the Bureau of Labor Statistics (BLS) and the US Census Bureau for classifying jobs by industry complicated the study team’s analysis of industry mix for the region. With the goal of informing a market analysis on transit demand in the study area, the project team relied on the Census rather than the CTDOL/BLS for industry-level jobs data because the latter classifies all casino jobs as “Local Government” jobs. Given the disruptions in the labor market (particularly in the service industry) that have occurred over the last few years due to the COVID pandemic, the study team decided to use 2019 industry data. The earliest Census data that were available for the region and could be compared with the latest data was from 2002.

The top industries of employment in the region have not changed significantly since 2002. The most popular industry of employment in the region in 2019 was accommodation and food service, reflecting the presence of two of largest casinos in the United States in the region (Table 3-2). In 2002, the most popular industry was arts, entertainment and recreation (19,583 jobs or 17.5% of the workforce), these were also likely casino jobs as there has been no significant change in large employers in this industry in the last decade throughout the region. Manufacturing, which includes submarine construction and production of submarine components, made up the second largest element of workforce with nearly 19,000 employees—this industry has also remained relatively flat over the last two decades, with 18,159 jobs reported in 2002. However, the manufacturing industry is

anticipated to grow rapidly in the next decade, with General Dynamics Electric Boat hiring thousands of new employees in 2022 alone⁶.

Table 3-2. Top 5 Industries of Employment in Region (2002 and 2019)

Industry	2019		2002	
	Total Jobs	% of Total Jobs in Region	Total Jobs	% of Total Jobs in Region
Accommodation and Food Service or Arts, Entertainment, and Recreation*	24,747	23.0%	28,186	25.2%
Manufacturing	18,657	17.3%	18,159	16.2%
Health Care and Social Assistance	16,049	14.9%	14,189	13.4%
Retail Trade	11,478	10.7%	12,589	11.2%
Educational Services	9,006	8.4%	7,216	6.4%

*These industries were combined for analysis because while data showed there was a significant shift in the number of jobs in each industry over the last two decades, the job market in the region for these industries has not changed significantly.

Source: 2019 LEHD

4. Existing Rail Service

This chapter details the current rail services within the municipalities of Bozrah, Groton, Ledyard, Montville, New London, Norwich, Preston, Stonington, Waterbury, and Westerly. This assessment includes historical background and current passenger rail service, Shore Line East (SLE) and Amtrak.

All railroad lines have a level of capacity, frequently expressed as trains per hour (TPH), for a given route. It establishes the volume of trains that can be accommodated over the course of a day and can be a key determinant in establishing a route's ability to serve a given market. A line's capacity is affected by the number of tracks available, the presence of passing points (two or more tracks, sidings, station tracks), the presence/absence of movable bridges, the type of train control system, maximum and average speeds over sections, speed differentials between service types, the number of stations in a section, and the presence of major freight facilities. These factors and details for the Northeast Corridor (NEC) from New London to Westerly, the Thames River Corridors (east and west alignments) and the Groton Secondary will be summarized in this section.

⁶ McGirl, S. (2022, January 24). Electric Boat Needs to Hire Thousands in 2022. Retrieved June 17, 2022.

<https://www.nbcconnecticut.com/news/local/electric-boat-needs-to-hire-thousands-in-2022/2698451/>.

4.1 Historical Background

Despite its small size, Connecticut featured numerous railroads by the mid-19th century. The Palmer Line, built in 1849 under the New London, Willimantic, and Springfield Railroad (part of the Central Vermont Railway) was succeeded by the New England Central Railroad in 1995, controlled by Genesee & Wyoming Inc. (GWI) as of 2012. The Norwich Branch, built in 1840 as part of the Norwich & Worcester Line (changed to Providence and Worcester Railroad in 1845), was taken over by New Haven Railroad in 1898 and became independent in 1973. Shoreline, built in 1858 under the New Haven, New London, and Stonington Railroad (Stonington to Groton) connected New London via the Thames River Bridge in 1889. The Providence and Stonington Railroad created a segment from Stonington to Providence in 1837.

The Railroad Passenger Service Act (1970) established that Amtrak would run intercity service on the Northeast Corridor (NEC), and in the mid-1980s, CTDOT began looking at providing commuter rail service along Amtrak's NEC between New Haven and New London as a means of reducing highway congestion on the I-95 corridor. In May 1990, the new Shore Line East (SLE) commuter rail service began between New Haven and Old Saybrook, operating only during peak hours, a service that was extended to New London in 1996.

4.2 Passenger Rail Service

The region's rail service includes 16 regional Amtrak trains daily at New London Union Station and 8 Amtrak trains at Mystic Station as well as 23 SLE trains daily at New London Union Station. New London Union Station offers easy connections between Amtrak, CTrail Shore Line East commuter rail, intercity and local buses, and ferries, and connects to Foxwoods Casino Resort in Ledyard on an Amtrak Thruway bus from New London. The tracks in this segment along the Northeast Corridor are owned by Amtrak. Along the New Haven Line (NHL), which runs from New Haven, Connecticut to New York City, CTDOT owns the right-of-way (ROW) and stations in Connecticut, and the operators on the Line include Metropolitan Transportation Authority (MTA) Metro-North Railroad (MNR) and Amtrak.

4.2.1 Northeast Corridor Infrastructure

The NEC is a two-track system between New London, CT and Westerly, RI—the limits of the study area. Tracks are electrified with a 27.5kv AC constant tension catenary system with independent catenary support poles. Each track is equipped with a bidirectional, multi-code cab-signal signal system optimized to support high speed service and not dense commuter operations. All tracks are equipped with Amtrak's Advanced Civil Speed Enforcement System (ACSES) for complete PTC compliance. Due to the many curves present, this section is among the slowest in the entire Boston to Washington corridor, with a maximum speed of 90mph.

New London has two low-level platforms that contain two very short high-level platforms, one on each track. Sharp curvature through the station precludes full-length ADA-compliant platforms, causing extended dwell times for stopping trains. At New London, a third track branches off and connects with GWI's line to Norwich on the west side of the Thames River. A rudimentary station platform allows passenger access to Track 6 and is used by terminating SLE trains. The NEC crosses the Thames River on a movable bridge 1.3 miles east of the New London Station, where the junction to GWI's east side line to Norwich begins in Groton. Additionally, a third running track also begins at this location.

4.2.2 Service and Ridership

In 2021, Amtrak restored service to 80% of pre-pandemic levels to meet the needs of customers⁷. It is important to note that year-end ridership on Amtrak's Northeast Regional trains was 67% of pre-pandemic levels and Acela

⁷ <http://nec-commission.com/app/uploads/2022/03/NEC-Annual-Report-FY21.pdf>

ridership only recovered to 45% of pre-pandemic levels. SLE ridership had only recovered to approximately 17.5% of pre-pandemic levels in January 2022⁸.

Along the 70-mile segment of Connecticut shoreline between New Haven and the Rhode Island State Line, Amtrak operates 38 trains (19 daily round trips). These trains run to north to Providence and Boston, and south to New York City and beyond, providing Acela Express and Regional service approximately hourly in peak and bi-hourly in off-peak periods. The segment is primarily 2-tracks with passing sidings near Guilford, Old Saybrook, and Groton. Amtrak also operates the SLE commuter rail service.

4.3 Freight Rail Service

The West and East Thames River Corridors and the Groton Secondary (Old Road/Spur) host limited freight operations (1-2 trains per day) that meet market demand and do not operate on fixed schedules. GWI's New England Central Railroad (NECR) has provided the main freight route from New London to Canada since the 19th century. The former Norwich Branch of the Providence and Worcester Line, purchased by GWI in 2016, was an important north/south route to Worcester for freight. GWI still operates daily freight trains on the line serving industries in the region, including several large quarries. The Groton Secondary, originally constructed as New Haven Railroad's Main Line, led to a ferry terminal to carry passengers and cargo to New London. The ferry terminal facilities are now the site of Electric Boat ship building operations, a major employer in the region.

5. Existing Transit Service

This chapter details the current transit and ridesharing services operating within the municipalities of Bozrah, Groton, Ledyard, Montville, New London, Norwich, Preston, Stonington, Waterbury, and Westerly. This assessment includes local bus service, demand response, inter-city bus, regularly scheduled charter, ridesharing and van/carpool, and ferry service.

5.1 Local Bus and Demand Response Service

Southeast Area Transit District (SEAT) is the primary operator for fixed route and demand response services within the study area communities located in Connecticut. Rhode Island Public Transit Authority (RIPTA) provides service in Westerly, Rhode Island. Neighboring transit providers Windham Regional Transit District (WRTD) and 9 Town Transit provide limited service to the study area communities. Lastly, the Mashantucket Pequot Tribal Transportation (MPTT) operates a community route connecting the reservation to the Foxwoods Resort Casino. Collectively these five systems operate 14 fixed routes, two deviated fixed routes, 2 express/commuter routes, and four demand response services (Table 5-1). A map showing all routes/services can be found in Figure 5-1.

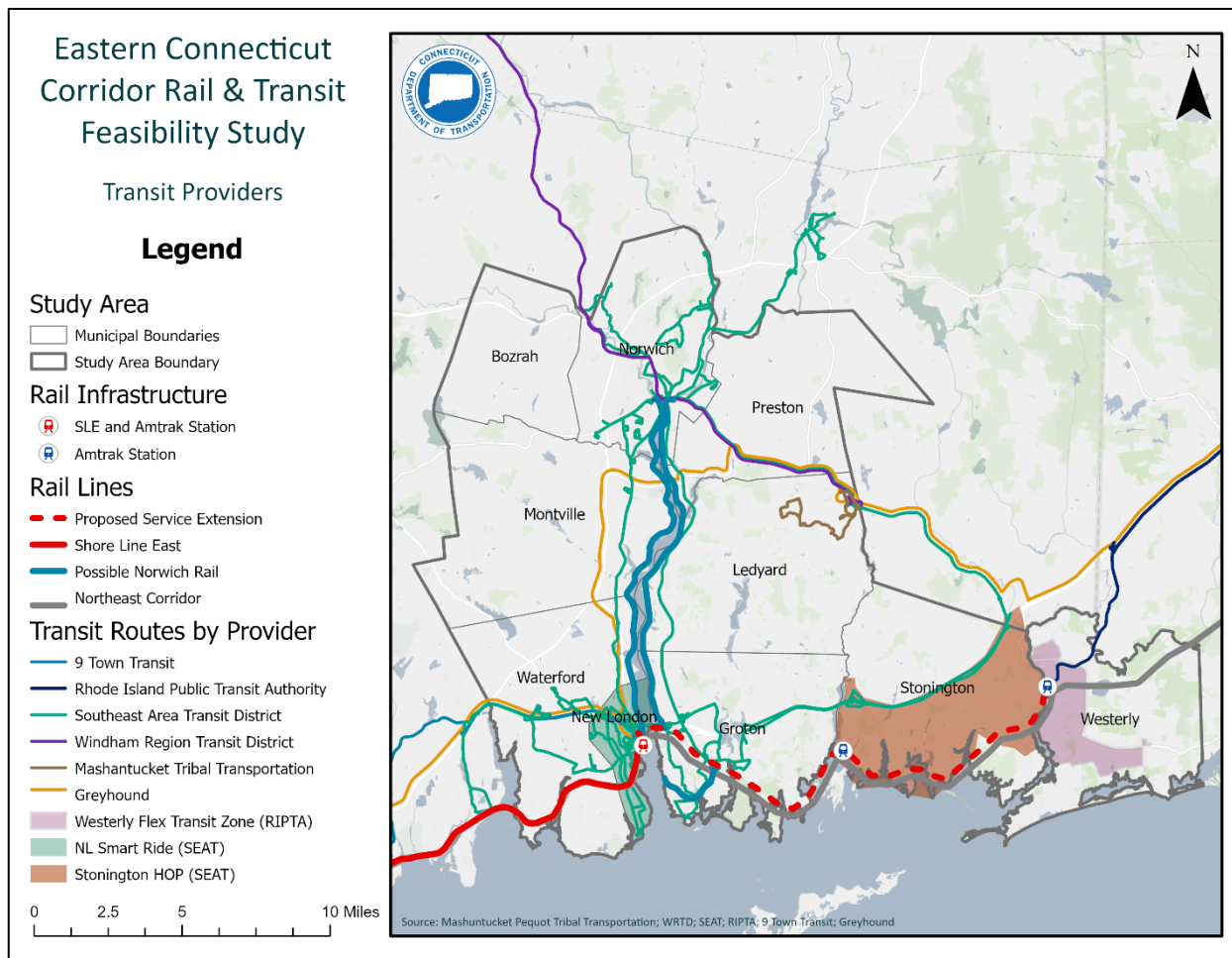
Table 5-1. Local Bus Service Characteristics

Route	Mode	Days Operated	Description
SEAT			
Route 1	Fixed Route	Mon-Sat	Norwich to New London via Route 32 & Montville
Route 2	Fixed Route	Mon-Sat	Norwich to New London via Route 12 & Groton
Route 3	Fixed Route	Mon-Fri	New London to Niantic & Crossroads Wal-Mart
Route 4	Fixed Route	Mon-Sat	Norwich Transit Center to Occum/Taftville

⁸ <https://www.ctinsider.com/hartford/article/CT-train-riders-are-slow-to-return-to-Shore-Line-17251558.php>

Route	Mode	Days Operated	Description
Route 5	Fixed Route	Mon-Sat	Norwich Transit Center to Norwich Business Park via Backus Hospital
Route 6	Fixed Route	Mon-Sat	Norwich Transit Center to Norwich Wal-Mart via Marcus Plaza
Route 7	Fixed Route	Mon-Sat	Norwich Transit Center to Hamilton Av, Mohegan Sun & Uncas-on-Thames
Route 9	Fixed Route	Mon-Sat	Norwich Transit Center to Lisbon Landing via Route 12
Route 11	Fixed Route	Mon-Sat	Groton Local Service
Route 12	Fixed Route	Mon-Sat	New London to Crystal Mall & New London Shopping Center
Route 13	Fixed Route	Mon-Sat	New London to Lawrence + Memorial Hospital & Ocean Beach
Route 14	Fixed Route	Mon-Sat	New London to NL Mall, Waterford Commons, Crystal Mall & NL Shopping Center
Route 15	Fixed Route	Mon-Sat	New London to Mitchell College, Waterford Commons, & Crystal Mall
Route 108	Fixed Route	Mon-Sat	New London Union Station to Foxwoods via Groton & Olde Mistick Village
Route 982	Fixed Route	Mon-Sat	Norwich Transit Center to Foxwoods via SR 2.
New London Smart Ride	Demand Response	Mon-Sat	Microtransit service in the City of New London open to all users. Trips must begin and end in New London
Stonington HOP	Demand Response	Mon-Fri	Microtransit service in the town of Stonington open to all users. Trips must begin and end in Stonington
SEAT Connect	Demand Response	Mon-Sat	ADA Complementary service within ¼ mile of a SEAT fixed Route
WRTD			
Route 991	Commuter Route	Mon-Sun	Willimantic – Norwich – Foxwoods via Rt 32
9 Town Transit			
Route 643	Deviated fixed Route	Mon-Fri	Old Saybrook – East & Old Lyme – New London via Rt 1
Mashantucket Pequot Tribal Transportation (MPTT)			
Community Route	Fixed Route	Mon-Fri	MPTN reservation to Foxwoods Resort Casino, connects to SEAT Route 108 at Great Cedar Hotel
RIPTA			
95x	Express Route	Mon-Fri	Express bus between Westerly and Providence via I-95 and Park & Rides along the way
301	Deviated Fixed Route	Friday	Service from Westerly to the Richmond Stop and Shop via Route 91
Westerly Flex	Demand Response	Mon-Fri	Demand response service within Westerly

Figure 5-1. Map of Transit in the Region

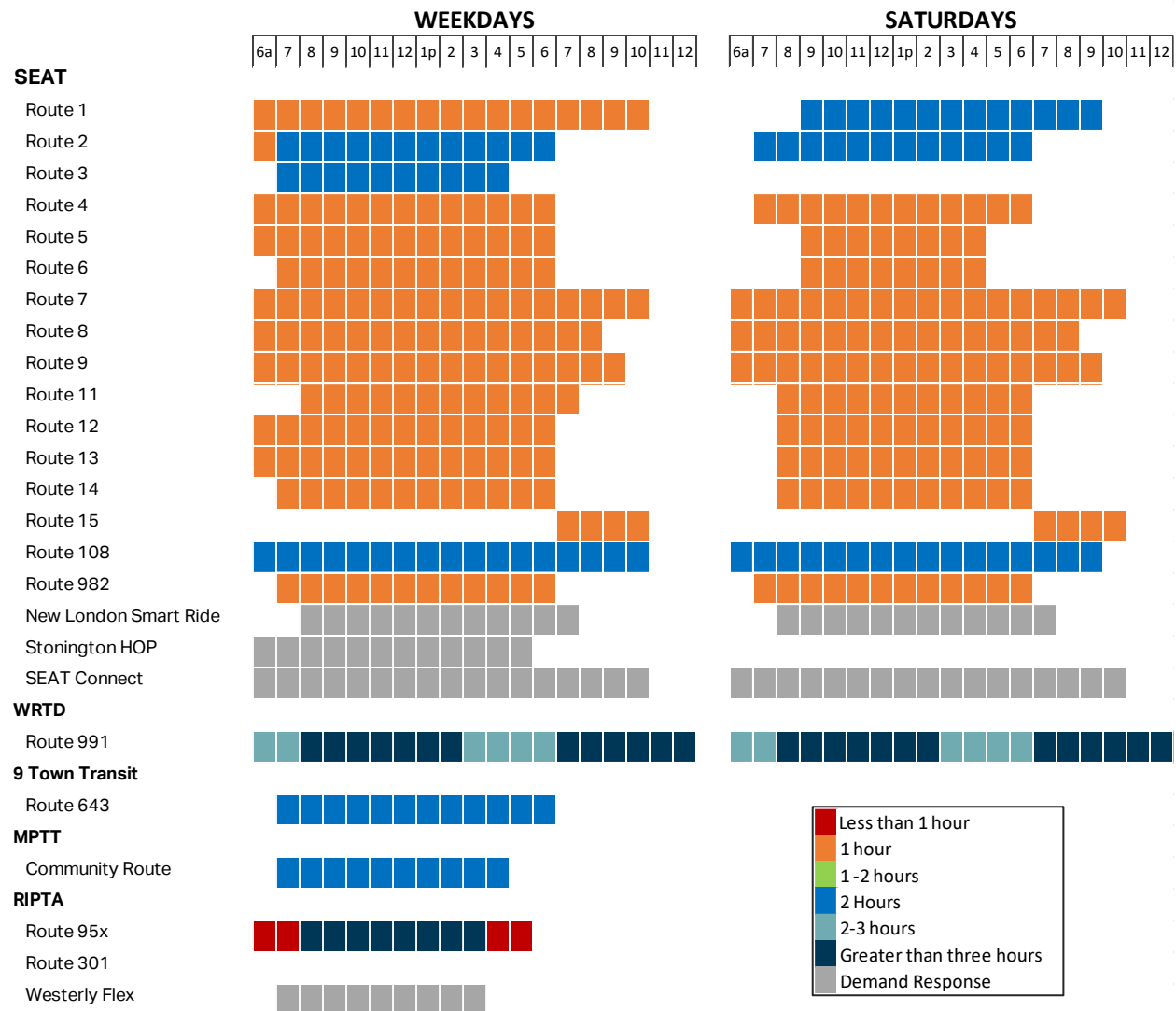


SEAT generally operates at a frequency of every 60 minutes on weekdays from 6 AM to 7 PM with late-night service to 11 PM on five routes (Figure 5-2). On Saturdays, all routes/services operate except Route 3 and Stonington HOP (on-demand microtransit) service. Saturday service starts later on most routes at 8 AM, but evening service is largely the same, and most routes retain the same frequency of service. No Sunday service is operated by SEAT. SEAT Connect is the ADA complementary paratransit available at the same times and locations as SEAT fixed routes. Service is only available to pre-approved customers; all trips must begin and end within $\frac{3}{4}$ mile of a SEAT fixed route and must be requested at least a day in advance. Stonington HOP and New London Smart Ride are demand response microtransit services open to the public. Each service has a designated zone and customers can request a ride via a mobile app as long as the trip begins and ends within the same zone. Trips can be reserved in advance or scheduled for an immediate pickup. The service is operated using SEAT vehicles and powered by Spare Labs, a scheduling technology platform that allows for same day curb-to-curb microtransit trips.

WTRD's Route 991 operates seven days a week, with six trips daily and late-night service, with the last trip northbound departing Foxwoods Resort Casino at 12:10 AM. The route is classified as a commuter route, and as such is not required to provide complementary ADA paratransit service. The 9 Town Transit Route 643 operates on weekdays only, with six trips daily. It will deviate up to $\frac{3}{4}$ a mile off the route to pick up or drop off any passenger, as long as the request is made 24 hours in advance. RIPTA service in Westerly is limited to weekdays only. The 95X operates during peak hours only with service designed to bring individuals to Providence in the morning and back in the afternoon. The Route 301 is a deviated fixed route that operates on Fridays only with two trips from Westerly to Hope Valley and one trip in the reverse direction. Westerly Flex is a point deviation

demand response service that provides service within a seven square mile zone focused downtown, but also serves a limited number of scheduled timepoints, including the Stedman Center and Salt Pond Plaza, which facilitates transfers to Flex 203, Route 14, and Route 66. All trips that do not begin or end at one of the scheduled timepoints must be reserved 24 hours in advance. Mashantucket Pequot Tribal Transportation operates the community route around the reservation and to the Foxwoods Resort Casino approximately every two hours from 7:50 AM to 3:50 PM. Passengers can transfer from the MPTT service to SEAT Route 108 at the Great Cedar Hotel.

Figure 5-2. Transit Frequency and Span



In Norwich, the Norwich Transportation Center, located on Hollyhock Island in downtown Norwich, is a hub with eight SEAT routes and the WRTD Route 991 serving this location. SEAT routes pulse out of the Norwich Transportation Center, which aids with transfers. All routes arrive between 0:50 and 0:55 of the hour and depart on the hour. The WRTD Route 991 timing does not align with SEAT routes to facilitate transfers at the Norwich Transportation Center for the pulse. In New London seven SEAT routes and the 9 Town Transit Route 643 converge at New London Union Station. As with the Norwich Transportation Center, service out of New London Union Station operates using a pulse with SEAT routes arriving at 0:55 of the hour and departing on the hour. Timing of the 9 Town Transit Route 643 is coordinated to allow for transfers, arriving at Union Station at 0:50 of the hour and departing on the hour.

There are two routes that connect the Norwich Transportation Center with New London Union Station. SEAT Route 1 runs along Route 32 on the west side of the Thames River, and SEAT Route 2 travels along Route 12 on the east side of the river. Both routes arrive and depart New London and Norwich at the same time. There is no bus service that runs parallel to the Northeast Corridor connecting New London to Westerly. Bus service does not cross state borders; SEAT does not enter Rhode Island and RIPTA does not enter Connecticut. Table 5-2 outlines bus and demand response service that is available to major destinations in the study area communities.

Table 5-2. Major Destinations Transit Connections

Major Destinations	Transit Connections
Norwich Train Station	On the east side of the Thames River, SEAT Routes 7 and 982 stop on Main St, just outside of the old train station. Both routes serve the Norwich Transportation Center. Route 7 also serves Mohegan Sun and the 982 serves Foxwoods.
Groton Center	Served by Route 11 with service on North/Mitchell St in the southbound direction only. Route 11 is a loop route providing local service to various locations within Groton. It does not serve New London Station or Norwich Transportation Center.
Electric Boat	No bus routes operate along Eastern Point Road where Electric Boat is located. The closest stop is at the corner of Benham Road and Rainville Avenue, 1,500 feet from Electric Boat. This stop is served by Route 11 in the southbound direction only. Route 11 is a loop route providing local service to various locations within Groton. It does not serve New London Station or Norwich Transportation Center.
Pfizer	Route 11 stops just outside the entrance to the Pfizer parking lot on Shennecossett Road. Route 11 is a loop route providing local service to various locations within Groton. It does not serve New London Station or Norwich Transportation Center.
Mystic Train Station	Stonington HOP on-demand microtransit service
Groton Sub Base	Route 2 serves the Route 12 corridor that is the eastern border of the naval submarine base. SEAT has limited designated bus stops along Route 12, but does operate as a flag stop system, so a bus can be flagged down. No service operates on the base.
Mohegan Sun	SEAT Routes 1 and 7 serve Mohegan Sun, with a stop along Sandy Desert Road. From that stop, the closest entrance is through the Indian Summer Garage, approximately a quarter mile away. Route 1 connects the hubs in Norwich and New London, serving the casino in both directions. Route 7 provides service between Hamilton Avenue in Norwich and Mohegan Sun via the Norwich Transportation Center.
Foxwoods	Foxwoods is served by SEAT, WRTD and MPTT. All routes serve the Great Cedar Hotel bus stop. SEAT Route 982 connects the casino to the Norwich Transportation Center with direct limited stop service via Route 2. SEAT Route 108 connects New London Union Station to the casino. This route also doubles as the Amtrak Thruway Connecting Bus Service. WRTD Route 991 is a commuter route from Windham to the casino via the Norwich Transportation Center. MPTT has a community shuttle from the tribal reservation to various locations at the casino.
Westerly Train Station	RIPTA Westerly Flex, 95x and 301 all serve the train station

5.1.1 Ridership

5.1.1.1 System-level Ridership Patterns

Historic ridership trends to get an idea of system magnitude are shown in Table 5-3. Ridership across all systems was on a downward trajectory before the COVID pandemic. RIPTA by far operates the most service and serves the most passengers in the region, but they operate statewide. SEAT had been averaging around a million passengers a year prior to the pandemic.

Table 5-3. 2017-2019 Ridership by System

System	2017	2018	2019
SEAT	1,009,229	958,277	965,658
WRTD	204,565	178,580	164,879
9 Town	99,997	86,993	87,617
MPTT	387,627	306,756	282,135
RIPTA	16,602,919	16,718,409	16,431,596

Source: National Transit Database

5.1.1.2 Demand Response Service Ridership Patterns

Ridership data for the New London Smart Ride and the Stonington HOP from June 2022 were analyzed by origin and destination to address ridership patterns in each of the zones and determine where key destinations may exist (Figure 5-3 and Figure 5-4). For the New London Smart Ride, frequent origin/destinations include downtown New London in the vicinity of Bank Street, Shaw Street, and Ocean Avenue, the New London Mall, and the Sunrise Northeast Group Home. Frequent origins/destinations for the Stonington HOP include the downtowns of Mystic and Westerly, the Mystic Aquarium, and Brookside Lane in Westerly.

Figure 5-3. New London Smart Ride Pickup and Drop-Off Density

Eastern Connecticut
Corridor Rail & Transit
Feasibility Study

New London Smart Ride
Demand Response Mapping

- Legend
- Existing Stations
- SLE and Amtrak Station
- Rail Lines
- Proposed Service Extension
- Shore Line East
- Proposed Norwich Rail
- Passenger Rail
- New London Smart Ride
- Demand Response Zone
- Pickup and Drop-Off Density
- Sparse
- Dense

0 0.5 1 2 Miles

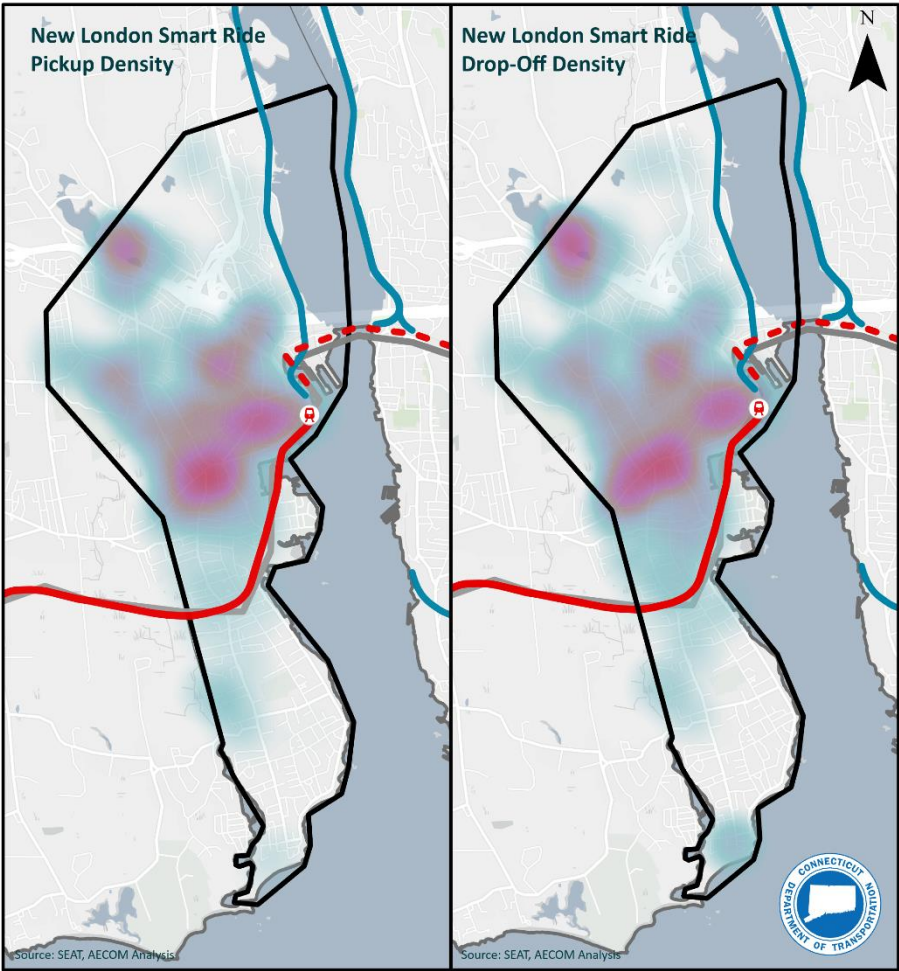


Figure 5-4. Stonington HOP Pickup and Drop-off Density

Eastern Connecticut
Corridor Rail & Transit
Feasibility Study
Stonington HOP
Demand Response Mapping

Legend

Existing Stations

Amtrak Station

Rail Lines

Proposed Service Extension

Shore Line East

Proposed Norwich Rail

Passenger Rail

Stonington HOP

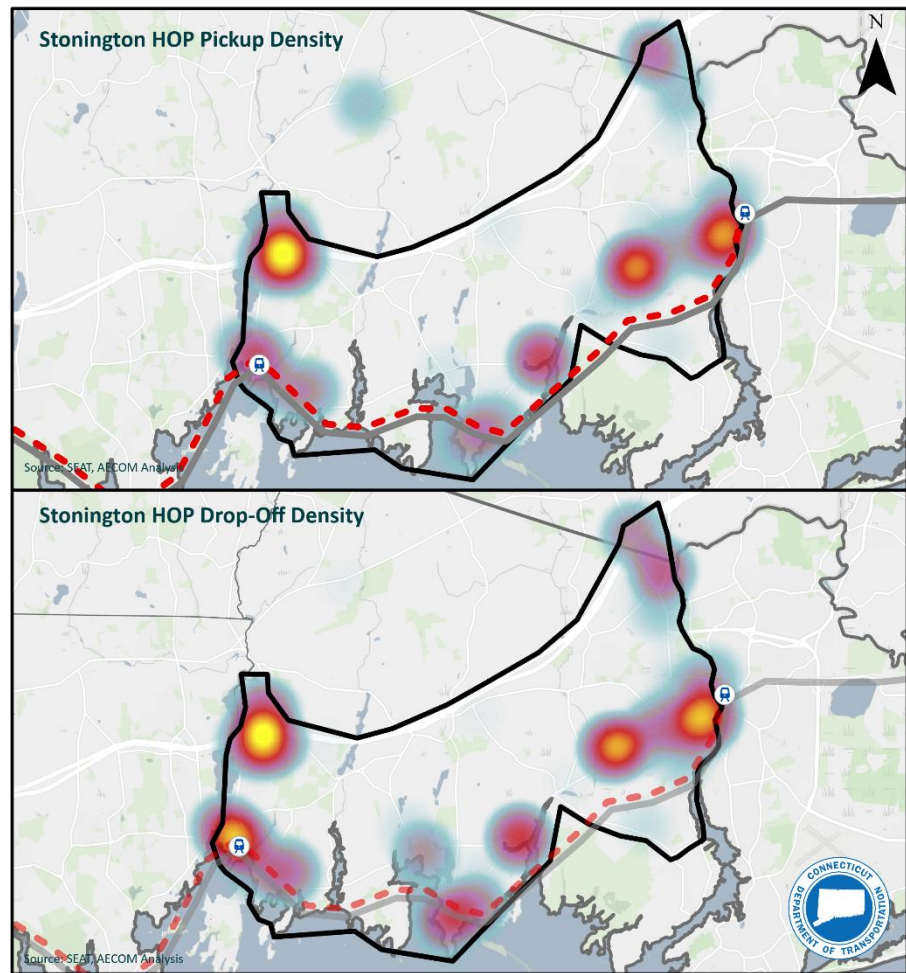
Demand Response Zone

Pickup and Drop-Off Density

Sparse

Dense

0 1 2 4 Miles

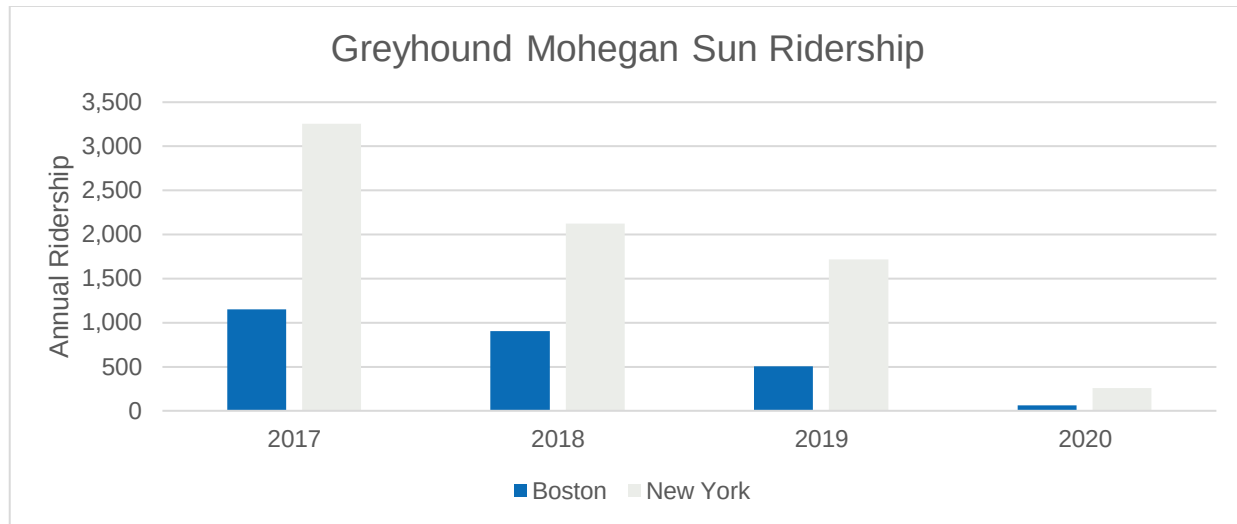


5.2 Intercity Bus

Greyhound operates intercity bus service in the study area. Service connects New York to Boston, with one trip daily in each direction, stopping at New London Union Station. One-way fares range from \$16 to \$28 depending on the date and distance traveled. Service northbound operates Friday to Tuesday, departing New London for Boston at 1:40 PM. Southbound service to New York departs at 7:35 PM and runs Thursday to Monday. Prior to the pandemic, there were four roundtrips daily on the route, plus an additional round trip from Providence to New York City, which stopped at both casinos. The Providence to New York route via the casinos was discontinued in 2019 due to low ridership.

Ridership from New York to Mohegan Sun was much greater than that from Boston. In 2019 there were 4,409 one-way passenger trips to the casino, or twelve daily. Ridership data in Figure 5-5 represents trips with the end destination as Mohegan Sun and it can be assumed that the total number of passenger trips would be doubled if round-trip data was included.

Figure 5-5. Mohegan Sun Greyhound Ridership



Source: Mohegan Sun Line Run Ridership

Prior to July 23, 2017, Peter Pan provided service to Foxwoods with three round trips daily. Route 6A went from Boston to Foxwoods, 6B from Concord, NH to Foxwoods, and 17A from Amherst, MA to Foxwoods with a stop in Enfield, CT.

5.3 Casino Line Runs

Both casinos operate line runs, which are regularly scheduled charter services from various locations throughout the northeast.

5.3.1 Mohegan Sun

Mohegan Sun contracts with several carriers to operate their “Asian Bus Line” and “Domestic Line Runs” for regularly scheduled service from destinations throughout New England, New York, and New Jersey. The number of operators and cities served have been declining since 2017 (Table 5-4). On March 16, 2020, service was ceased due to the pandemic and did not resume until the summer of 2021. The Asian Bus Line remains suspended indefinitely, and the Domestic Line Runs operates at the discretion of the carrier. However, many are concerned with potentially low ridership and have opted to not resume the service, but instead organize charter service once a month if demand warrants.

Table 5-4. Mohegan Sun Line Run Operations

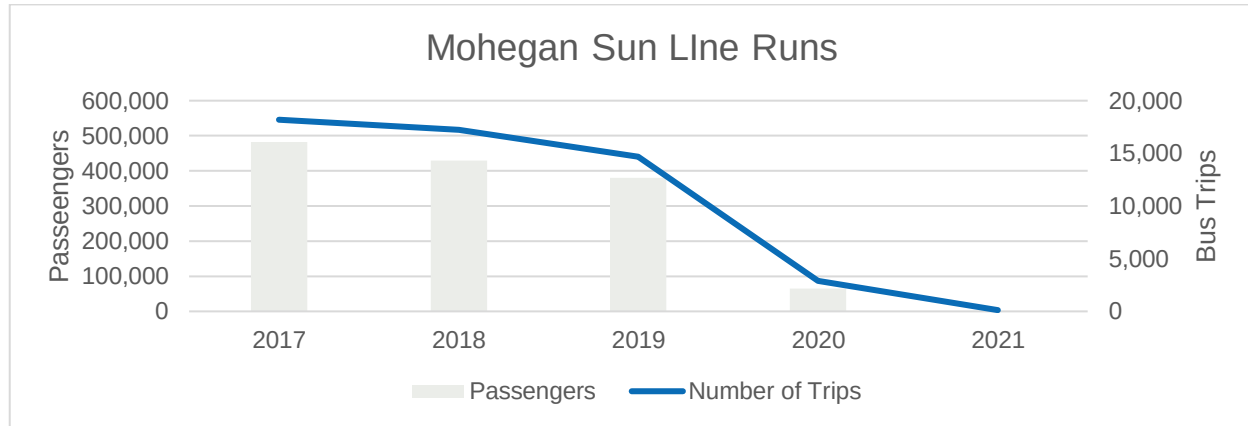
Year	Number of Operators	Cities with Service
2017	31	45
2018	30	37
2019	24	34
2020	20	31
2021	2	2

Source: Mohegan Sun

Since 2017, service has been provided from 48 different communities. While there are clusters of trips from in and around New York City and Boston, the I-91 corridor and Hudson River Valley were other areas with substantial

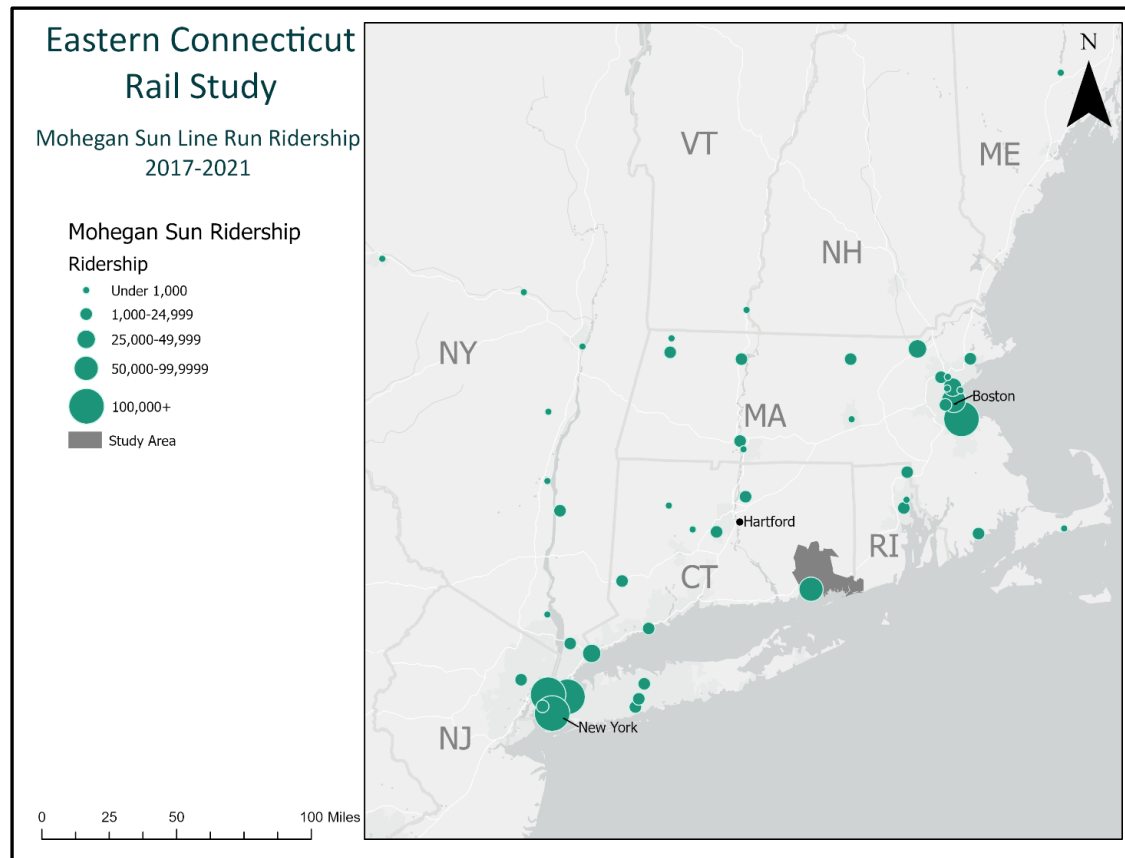
trip generation. As with the decline in the number of operators and the cities with service, there has been a decline in passengers and the number of trips provided (Figure 5-6). In 2017, there were 481,659 passengers; by 2019, this number declined by 21 percent, which parallels the decline in the number of trips provided. Three of the top five locations for both ridership and trips provided were in or around New York City: Flushing, Manhattan, and Brooklyn (Figure 5-7). Before the pandemic, these cities, along with Boston, Malden, Lowell, and Quincy, MA, and Danbury and New London, CT averaged more than one trip per day on the line runs. While New York City communities had a higher number of trips than those from the Boston area, the Boston communities averaged a slightly higher number of passengers pre trip.

Figure 5-6. Mohegan Sun Line Runs Ridership and Trips Operated Source: Mohegan Sun



Source: Mohegan Sun

Figure 5-7. Mohegan Sun Line Run Ridership Map



Source: Mohegan Sun

New London trips originate at Union Station and are operated by Dattco. In 2017, there were 1,152 trips provided (3.2 per day) and 21,757 passenger trips, which averaged to 18.9 passengers per trip. Ridership and the total number of trips declined from 2017 to 2019, but still averaged 18 passengers per trip. Service was averaging 17 passengers per trip when it was halted in 2020 due to the pandemic. In 2021, when line run service was restored, only two began operating, including the service from New London dubbed the “Ferry Shuttle”.

Fares vary based on the operator and location but range from \$25 to \$45 with an average of \$34 for the Domestic Line Runs. The Asian Line Runs have a set fare of \$13. Line Run fares are round trip (except for Greyhound, which is 1-way only and part of a regularly scheduled route), and many offer additional incentives such as meal/retail credit or a free slot play coupon. Even without the incentives, Line Run fares are significantly less expensive than Amtrak, which averages \$106 roundtrip from Boston and \$160 from New York City. MNR to SLE from New York to New London is \$67 in the peak and \$55.50 in the off-peak for roundtrip tickets.

5.3.2 Foxwoods

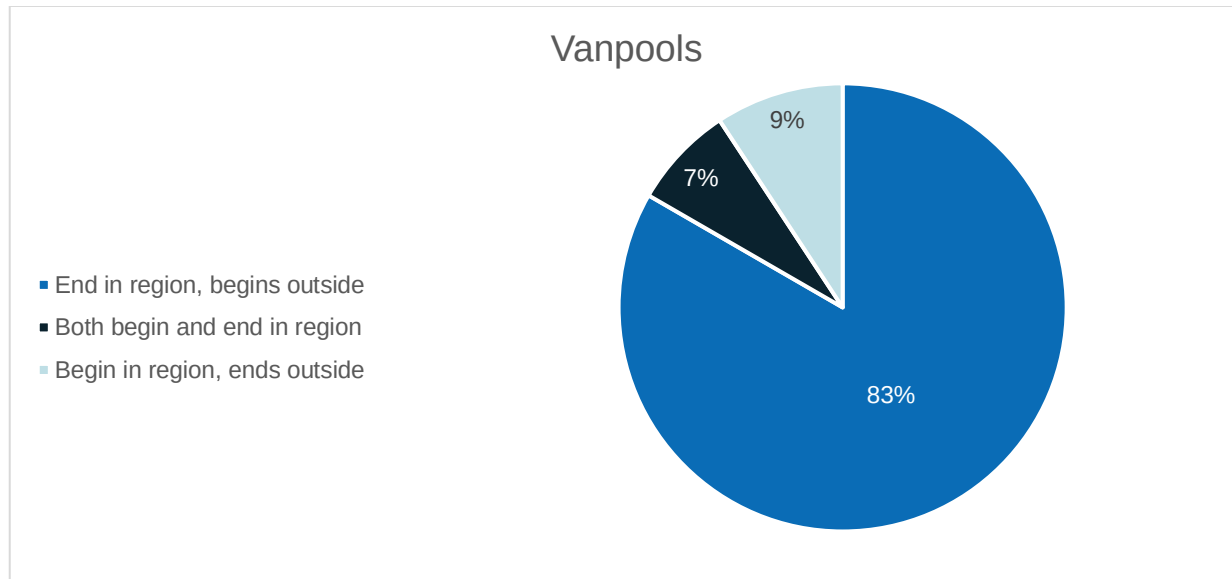
Foxwoods is currently accepting non-package charter bus reservations on a limited basis for groups.

5.4 Ridesharing and Van/Carpool

There are 54 active vanpools in the study communities. Among the active vanpools, there are 368 users, and on average the vehicles are 62 percent full. Vehicle capacity (including the driver) ranges in size from 7 to 15 passengers. Vanpools in Connecticut are overseen by **CTrides** through a partnership with Enterprise Commute. Enterprise provides and maintains the vehicles, manages the commuter accounts, and collects the necessary data need to report to the National Transit Database (NTD), required when using funds from the Federal Transit Administration (FTA).

Overwhelmingly, the majority (83 percent) of vanpools operating in the region are bringing individuals from outside of the corridor communities into the area to work (Figure 5-8). The greatest percentage of vanpools (42 percent) are coming from the north, along the I-395 corridor, followed by the northeast along the I-95 in Rhode Island at 33 percent, and the Route 9 and 2 corridors to the northwest at 18 percent. Very few are coming from I-95 to the west (four percent) and the southern Rhode Island Shore (two percent). The top destination for vanpools is Electric Boat; 27 of the 45 vanpools have a destination to the Eastern Point Road Groton location, two to the Kings Highway Groton location, and six to the New London location. The next top destination is eight to the Groton-New London Airport. One vanpool travels to the US Coast Guard Academy in New London and one to the Naval Base in Groton.

Figure 5-8. Vanpools in the Study Area



Nine percent of the vanpools originate in the study communities, but the destination is outside of the region. Three originate in Groton, one in Preston and one in Waterford. The Waterford vanpool travels to the Veterans Affairs (VA) Hospital in West Haven and the other four head east to Rhode Island. Two of the Rhode Island-bound vanpools head to the Naval Undersea Warfare Center in Newport and the other two to Quonset Point in North Kingstown. Only four vanpools begin and end in the study area, and all have a final destination at Electric Boat on Eastern Point Road. Two begin in Westerly and two in Norwich.

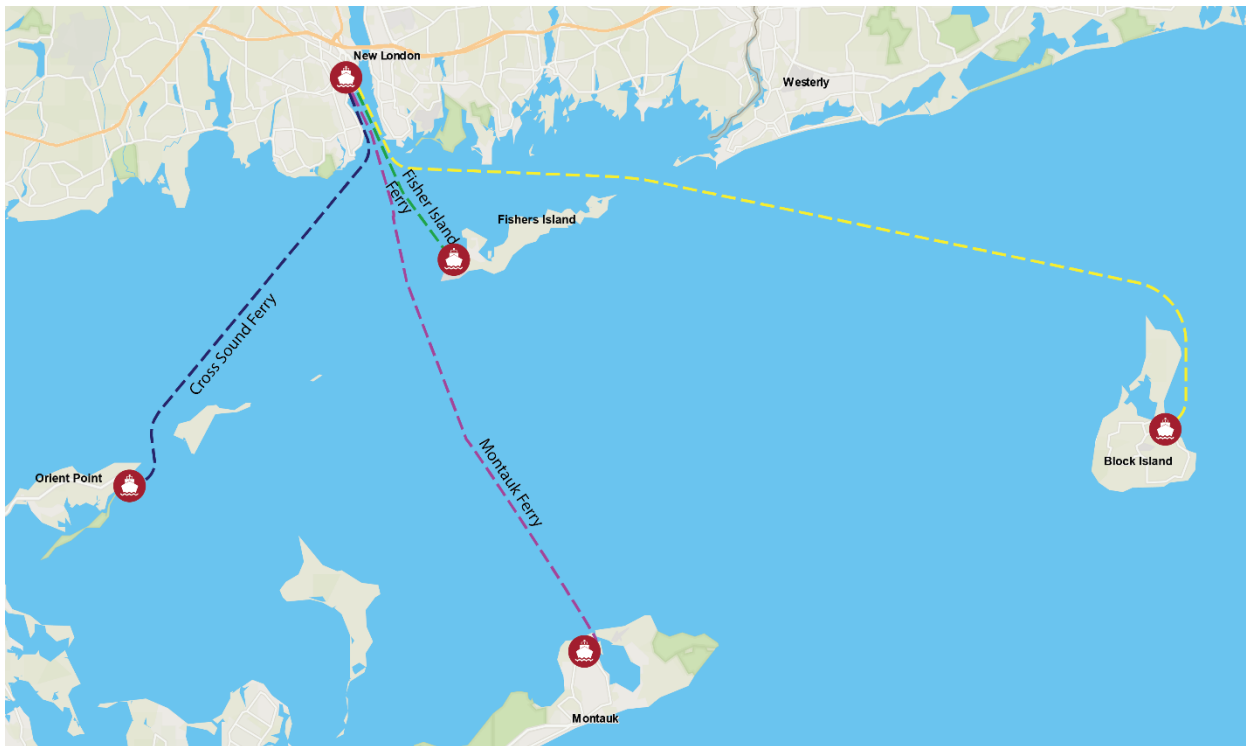
5.5 Ferry Services

Ferry service is operated out of the New London Terminal, adjacent to New London Union Station, to Fishers Island, Block Island, and Montauk and Orient Point on Long Island (Figure 5-9). Additionally, there is a seasonal water taxi between New London and Groton. Figure 5-9 depicts the location of each ferry dock, in relation to the rail station and SEAT bus service. There are plans to improve the Cross Sound Ferry site with a new passenger terminal and safe pedestrian access over the Amtrak rail lines.

Figure 5-9. New London Ferry and Intermodal Map



Figure 5-10. Ferry Map



The Fisher Island Ferry District (FIFD) operates three vessels between New London and Fishers Island, providing fast ferry services, freight transport, and auto transport. The fast ferry operates from July through August (Sundays through Fridays) with two round trips on Tuesdays and Wednesdays, three on Monday, Thursday, and Sunday, and six on Fridays. A one-way trip takes 25 minutes and can hold up to 18 passengers. Fares vary from \$21 to \$32 based on the time of day. The auto ferry operates year-round with two vessels that can carry between 24 and 34 vehicles and 210 to 246 passengers. The number of trips per day varies based on the season but ranges from four round trips in the winter to as many as nine during the peak on Fridays in the summer. A roundtrip adult full fare is \$27 and \$66 for a vehicle. Freight is transported using the auto ferries on designated freight trips Wednesdays and Sundays. Rates vary based on the freight dimensions, weight, and type.

July and August are the busiest months for FIFD, which is not surprising given the tourism and second home nature of Fisher Island (Figure 5-11). Prior to the COVID-19 pandemic, FIFD carried 115,000 to 120,000 passengers, 30,000 to 32,000 vehicles, 5,000 commercial vehicles, performed roughly 1,850 trips, and carried an average of 65 passengers per trip annually. As with public transit systems nationwide, FIFD saw a sharp drop in ridership in April of 2020 and an overall decrease in ridership of 24 percent from 2019 to 2020. Ridership began to rebound in 2021 and has returned to 82 percent of pre-pandemic levels. Monthly trends for 2021 returned to that of pre-pandemic levels but with less of a peak in the summer, indicating less tourism. While ridership and the number of roundtrips are still at 80-85 percent pre-pandemic levels, the number of vehicles carried has returned to pre-pandemic levels. Interestingly the number of ferry trips decreased in 2020 by 20 percent, but there was a dramatic increase in packages/freight carried. FedEx packages carried increased by 75 percent and UPS by 29 percent.

Figure 5-11. FIFD Monthly Ridership 2019-2021

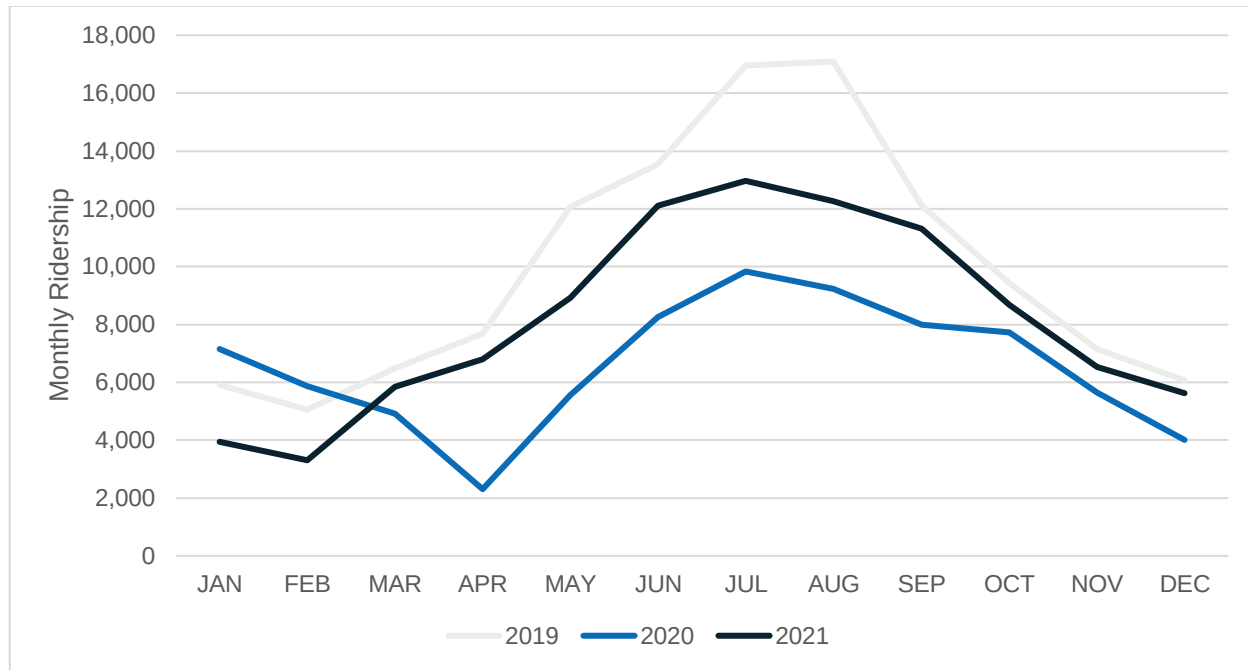


Table 5-5. FIFD Annual trends 2017-2021

Year	Passengers	Vehicles	Commercial Vehicles	Round Trips	Passengers per trip
2017	115,410	30,923	5,189	1,840	63
2018	119,686	31,281	5,127	1,813	66
2019	119,303	32,061	4,635	1,884	63
2020	78,511	27,196	4,063	1,471	53
2021	98,251	31,630	4,461	1,626	60

Cross Sound Ferry operates both the Block Island Express Ferry and the Cross Sound Ferry. The Block Island Express Ferry is a seasonal service from New London to Block Island operating late May through mid-October. There are three to six trips daily, and it varies by day type and month, with more service in the summer months. A one-way trip takes an hour and thirty minutes, and the adult fare is \$31.25. The ferry cannot accommodate vehicles but can transport bicycles and carts/wagons for a fee. The Cross Sound Ferry operates annually from New London to Orient Point, Long Island (LI). The fleet of eight vessels can carry passengers, passenger vehicles, trucks, recreational vehicles (RVs) and commercial vehicles. The high-speed passenger ferry operates a few days per month in June, August, September, and October. The traditional vehicle ferry operates 10 to 20 trips daily, and it varies by day type and month, with more service in the summer months and during holiday periods. A one-way trip takes an hour and 20 minutes, and adult fare is \$20 on the traditional auto ferry. The high-speed ferry takes 40 minutes and one-way fare is \$23. In addition to ferry service, pre-pandemic, Cross Sound Ferry also marketed Ferry to Casino services. Parking for both ferries is limited in New London at the terminal and is \$10 per day. On-site parking is available for free in Orient Point on a first-come, first served basis. There is no parking at the terminal on Block Island.

Viking Fleet operates a seasonal fast ferry between New London and Montauk, LI from late May through mid-September on Thursdays to Mondays. There is one trip daily, and the one-way adult fare is \$50. The trip takes approximately 75 minutes. The ferry cannot accommodate vehicles but can transport bicycles for a fee.

5.6 Other Transit Services

The Eastern Connecticut Transportation Consortium (ECTC) was formed in 1992 as a public and private partnership to address the problem of regional coordination of paratransit. Today ECTC is a clearinghouse for information on transportation services in the region and both a provider and broker of transportation services. They are subcontracted by SEAT to operate the ADA complementary paratransit service, coordinate the region's Job Access Reverse Commute Program, provide senior van services in several communities, and have developed several partnerships to lower transportation costs and reduce gaps in service throughout eastern Connecticut. Other transportation programs offered by ECTC include the New London County dial-a-ride for medical transportation, a taxi travel voucher program, and programs targeted towards veterans and low-income individuals (Table 5-6).

Table 5-6. ECTC Transportation Programs

Program	What	Where	Who
New London County Dial-A-Ride Medical Transportation	Medical trips in New London County	Bozrah, Groton, Ledyard, New London, and Waterford	Seniors 60+ and disabled
Eastern Connecticut Travel Voucher Program	Taxi voucher for ½ fare. Any trip purpose except grades K through 12 school transportation	All of eastern CT	disabled
Focus on Vets	Trips to VA hospitals	All of eastern CT	Veterans
Rides for jobs	Employment related activities	All of eastern CT	Low income

Many of the communities in the study area have transportation programs for elderly residents, and some extend to the disabled. While some are operated by senior centers such as in Norwich with specific trip destinations or types each day, others such as the Pawcatuck Neighborhood Center (PNC), provide regional service to several communities. All of the senior dial-a-ride programs in the study area communities are free and have wheelchair lift-equipped vehicles (Table 5-7).

Table 5-7. Senior Transportation Services

Community	Senior Transportation
Bozrah	Service operated by ECTC for seniors 60+ only from 8:30 AM to 4:30 PM on Fridays. Trip must be to a nutrition site, for shopping or a medical appointment.
Groton	Service operated by the Senior Center for seniors 55+.

Community Senior Transportation

Ledyard	Service operated by the Senior Center. Trips available to the senior center, medical appointments on M/Tu/Th within town and to Groton, Norwich, New London, and Waterford.
Montville	Service operated by the Senior Center. Trips available to the senior center daily, shopping locations on designated days to New London, Waterford, and Norwich. The senior center also has a Med RIDE program for any medical related trips.
New London	Service operated by the Senior Center from 8:40 AM to 3 PM on weekdays. Trips available to the senior center daily, medical appointments (in and out of town) and shopping (each day of the week has a specific destination).
Norwich	Service operated by the Senior Center from 8:30 to 3 PM on weekdays. Trips available to the senior center, medical appointments (in and out of town) and shopping (each day of the week has a specific destination in Norwich). Disabled non-seniors can take medical trips only. Norwich coordinates with Montville to jointly provide a Med RIDE program.
Preston	Service operated by Preston Senior Affairs for weekly shopping trips and routine medical appointments within a 25-mile radius
Stonington	PNC Senior Transportation Program
Waterford	Service operated by the Senior Center for seniors 60+. Trips can be for any purpose but there are designated days for certain trip types. Trips can be in-town, to East Lyme, Niantic or New London.
Westerly	PNC Senior Transportation Program

6. Travel Patterns

This section looks at regional travel patterns into and out of the study area, and across the larger region.

6.1 Modal Split

Modal split refers to the type of transportation option (car, bus, etc.) that one uses to travel. Statewide, the majority of people (77 percent) commute to a worksite via a single-occupant vehicle (SOV). The study area slightly exceeds the statewide rate, being approximately 3.5 percent higher (80.5 percent). Regional transit use (1.9 percent) is below the statewide rate (4.4 percent), and this applies to all local communities, with the exception of New London (5.2 percent). There are a variety of explanations for this pattern, including the dispersal of regional employment centers and general transit-prohibitive development patterns (low-density housing, etc.). This built environment layout also explains why New London has walk-commute rates above the local and statewide rates. Finally, the rates of remote work are scattered. The collective region has a lower remote-work rate (4.8 percent) than the statewide rate (7.4 percent), but it also has communities like Preston (9 percent) and Stonington (10.4 percent) with remote-workers in excess of the statewide average rate. Modal split for each study area community is shown in Table 6-1.

Table 6-1. Means of Transportation to Work

Geography	16+ Workers	SOV	SOV %	Carpool	Carpool %	Public Transit	Public Transit %	Walk	Walk %	Other	Other %	Remote	Remote %
Bozrah	1,237	1,026	82.9%	122	9.9%	7	0.6%	23	1.9%	10	0.8%	49	4.0%
Groton	18,208	14,381	79.0%	1,404	7.7%	297	1.6%	643	3.5%	409	2.2%	1,074	5.9%
Ledyard	7,487	6,451	86.2%	477	6.4%	132	1.8%	0	0.0%	93	1.2%	334	4.5%
Montville	9,157	7,646	83.5%	1,080	11.8%	18	0.2%	49	0.5%	135	1.5%	229	2.5%
New London	11,272	8,519	75.6%	1,257	11.2%	591	5.2%	453	4.0%	181	1.6%	271	2.4%
Norwich	19,160	15,036	78.5%	2,760	14.4%	427	2.2%	188	1.0%	187	1.0%	562	2.9%
Preston	2,432	2,022	83.1%	156	6.4%	0	0.0%	0	0.0%	35	1.4%	219	9.0%
Stonington	9,760	7,722	79.1%	580	5.9%	173	1.8%	159	1.6%	108	1.1%	1,018	10.4%
Waterford	9,737	8,433	86.6%	600	6.2%	34	0.3%	61	0.6%	125	1.3%	484	5.0%
Westerly	12,326	9,893	80.3%	949	7.7%	255	2.1%	363	2.9%	222	1.8%	644	5.2%
Region	100,776	81,129	80.5%	9,385	9.3%	1,934	1.9%	1,939	1.9%	1,505	1.5%	4,884	4.8%
Connecticut	1,752,957	1,350,093	77.0%	137,708	7.9%	76,317	4.4%	36,846	2.1%	21,931	1.3%	130,062	7.4%

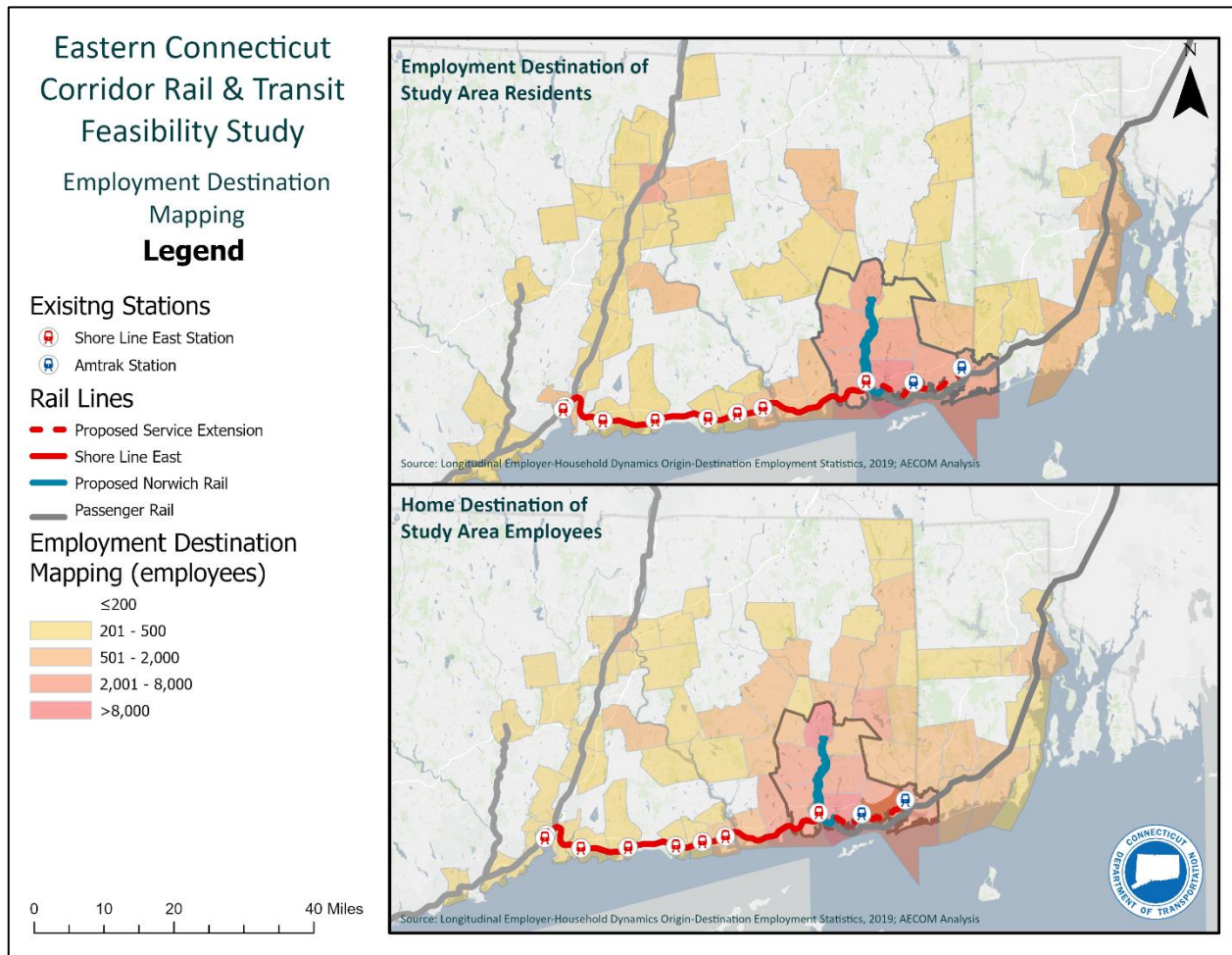
Source: 2020 ACS 5 Year - B08141 MEANS OF TRANSPORTATION TO WORK BY VEHICLES AVAILABLE

6.2 Commuting Patterns

Eastern Connecticut residents largely commute to worksites within the study area and near the region's major highways such as I-395 and I-95 (Figure 6-1). The majority of study area residents (approximately 61 percent) also work within the region and the largest study area employment centers are in communities along the Thames River, such as Norwich and Groton. Outside of the study area, many residents commute to job centers in New Haven, greater Hartford and coastal Rhode Island, towards Providence.

Study area employers draw from an employment pool that is slightly different. The residential locations of study area employees are largely concentrated in eastern Connecticut, along the entire I-395 corridor in Connecticut. Additionally, many study area employees live in coastal and inland Rhode Island along the Route 6 and I-95 corridors. Additionally, there is a smaller number of people commuting from further distances, such as the I-91 corridor in central Connecticut. This implies that employers generate larger volumes of local/adjacent regional travel.

Figure 6-1. Regional Employment Destinations

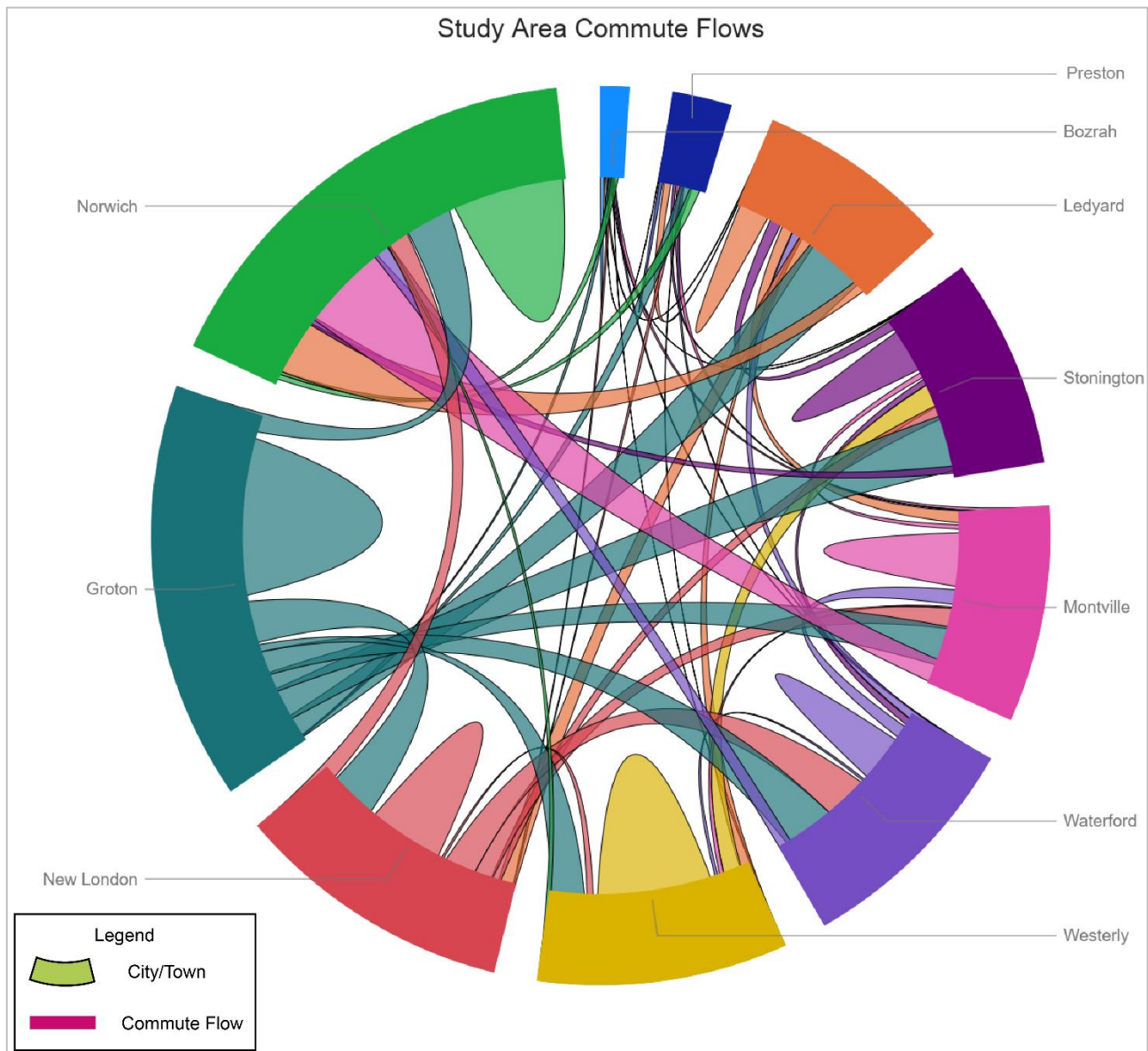


Source: Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics, 2019

Local commute flows follow the regional pattern with Ledyard, Groton, and Norwich employers drawing the most study area residents. Figure 6-2 depicts the volumes of commuters traveling between study area municipalities,

as the bar increases in size, the number of commuters increase. The chord diagram shows commute flow in each direction, and by volume.

Figure 6-2. Study Area Commute Flows



Source: Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics, 2019

6.3 Origin-Destination Analysis

The study area contains several notable traffic generators including entertainment centers like Mohegan Sun and Foxwoods Resort Casino; employment destinations like General Dynamics Electric Boat and Pfizer; and central business districts like Mystic Village, New London Center, and Norwich Center. These places draw approximately 64,000 average daily trips from locations in central and eastern Connecticut, as well as western Rhode Island. The top three traffic-generating destinations are Mohegan Sun, Westerly, and Foxwoods (Table 6-2). Mohegan Sun leads all destinations with more than 11,000 daily trips. There are a variety of explanations for this including the

casino's mixture of employees and patrons traveling to the site daily. These volumes include all modes of transportation.

Table 6-2. Activity Center Average Daily Traffic Volumes

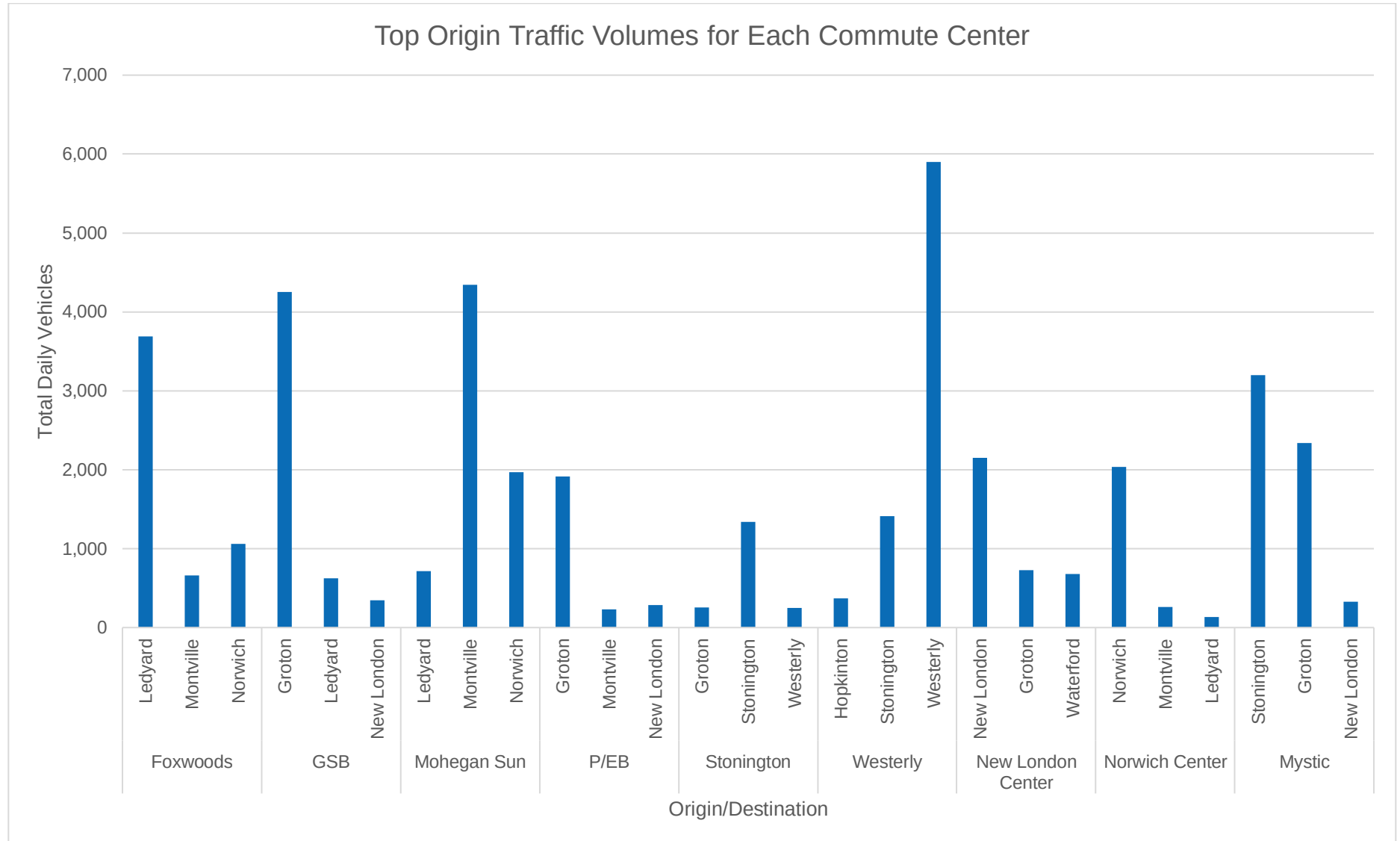
Activity Center Name	Average Daily Traffic Volume	% Total
Foxwoods	9,836	15.3%
Groton Submarine Base	7,284	11.3%
Mohegan Sun	11,141	17.3%
Mystic	8,716	13.6%
New London Center	6,209	9.7%
Norwich Center	3,748	5.8%
Pfizer and Electric Boat	5,052	7.9%
Stonington	2,516	3.9%
Westerly	9,788	15.2%
Total	64,290	

Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021, combined destinations

These different commute centers largely draw the most employees locally with the following communities producing the most origin traffic for each destination (Figure 6-3):

- Ledyard, Norwich and Montville produce the largest volume of average daily Foxwoods traffic;
- Groton, Ledyard, and New London produce the largest volume of average daily Groton Submarine Base traffic;
- Montville, Norwich, and Ledyard produce the largest volume of average daily Mystic traffic;
- New London produces the largest volume of average daily New London traffic;
- Groton, New London, and Montville produce the largest volume of average daily Pfizer and Electric Boat traffic;
- Most Stonington traffic originates within the municipality, Groton and Westerly also produce the largest volumes; and
- Most Westerly traffic also originates within the municipality, Stonington and Hopkinton, RI also produce the largest volumes.

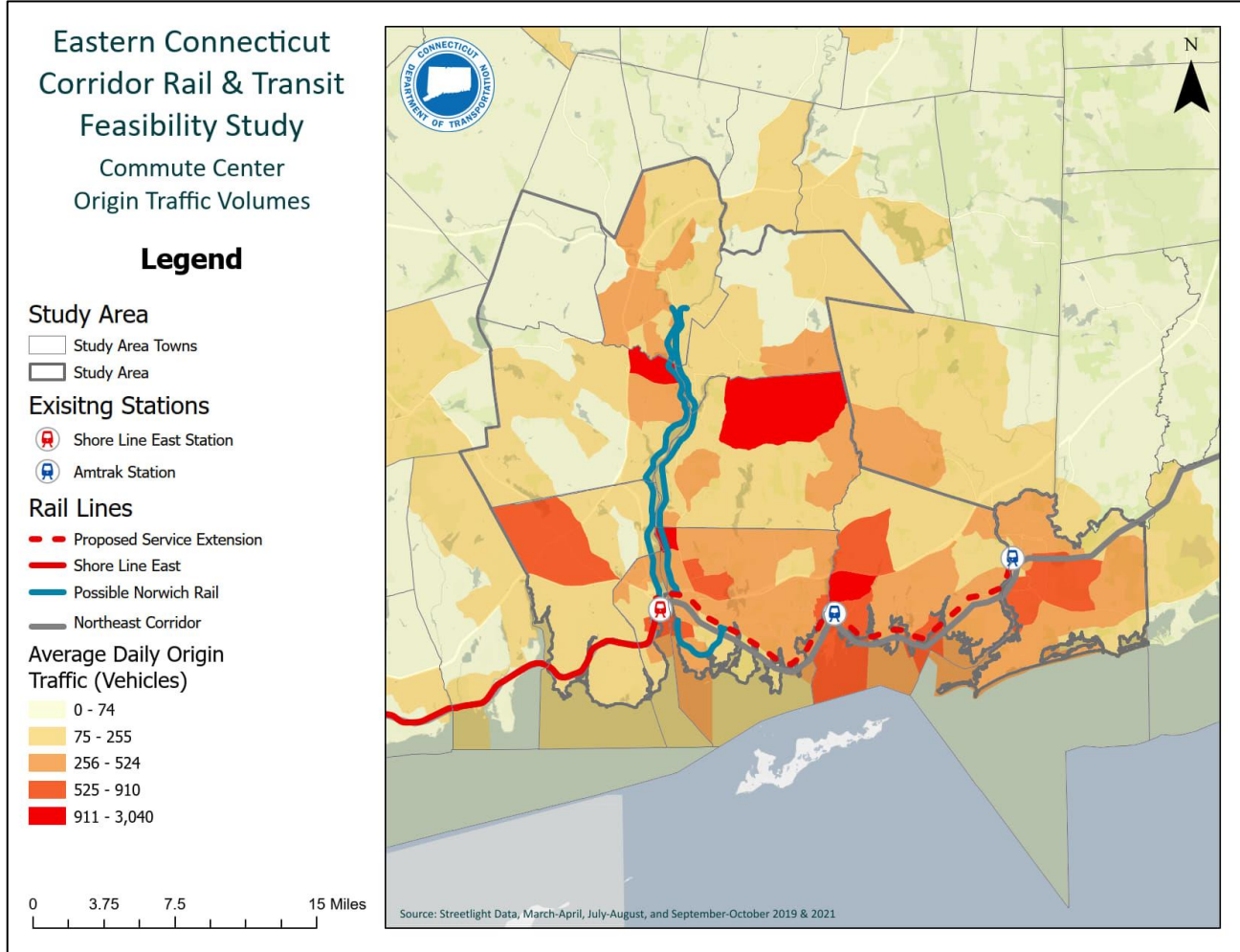
Figure 6-3. Top Origin Traffic Volumes for Each Activity Center



Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021

Traffic is spread throughout the region, with larger volumes of trip origins occurring near or within the study area (Figure 6-4). While activity center traffic originates in many locations, Stonington and Groton are two locations that produce the highest levels of activity center traffic, particularly from the Mystic Village area.

Figure 6-4. Average Daily Commute Center Traffic by Origin Location



Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021

Travel times reflect this localized traffic pattern as average activity center travel times are largely within approximately 26 minutes of a destination, with the number being slightly lower for a weekday (Table 6-3).

Table 6-3. Activity Center Travel Times

Day Type	Average Travel Time in Minutes (Unweighted)	Average Travel Time in Minutes (Weighted by Total Trips)
All Days	48	27
Weekdays	39	25
Weekend	39	27

Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021

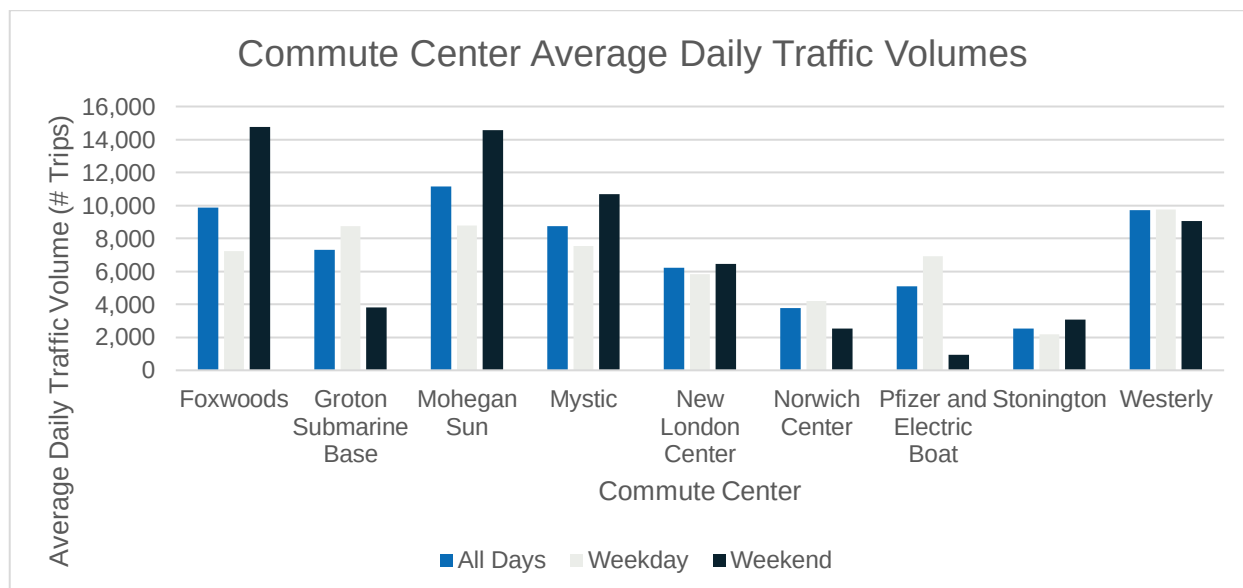
Weekday and weekend travel patterns vary in all activity centers in different ways. Weekend traffic largely increases at entertainment destinations like the two casinos and decreases at employment destinations such as Pfizer, Electric Boat, and the Groton Submarine Base (Table 6-4). Foxwoods traffic has the largest percentage differential between weekday and weekend traffic, with an approximate 105 percent increase in weekend traffic as compared to weekday traffic. On the other end of the spectrum, traffic volumes at Pfizer/Electric Boat and the Groton Submarine base decrease by approximately 86 and 56 percent, respectively between weekdays and weekends. This can be explained by the primarily traditional Monday – Friday work week at these locations.

Table 6-4. Weekday/Weekend Commute Center Change in Average Daily Traffic Volumes

Destination	All Days	Weekday	Weekend	Weekday/ Weekend % Differential
Foxwoods	9,836	7,205	14,771	105.0%
Groton Submarine Base	7,284	8,712	3,827	-56.1%
Mohegan Sun	11,141	8,759	14,555	66.2%
Mystic	8,716	7,495	10,687	42.6%
New London Center	6,209	5,794	6,439	11.1%
Norwich Center	3,748	4,179	2,529	-39.5%
Pfizer and Electric Boat	5,052	6,874	945	-86.3%
Stonington	2,516	2,172	3,061	40.9%
Westerly	9,788	9,804	9,111	-7.1%
Total	64,290	60,994	65,925	8.1%

Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021

Figure 6-5. Commute Center Weekday & Weekend Average Daily Traffic



Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021

7. Parking

This chapter reviews available public and private parking within key study area locations. These locations include existing Amtrak stations in New London, Mystic, and Westerly, as well as select downtown and point of interest locales.

7.1 Park & Ride Lots

Park & ride lots enable commuters to transfer from single- or low-occupancy vehicles to higher-occupancy modes of transportation, such as bus, rail, or carpool. There are 11 park & ride lots within the study area. Of these, seven offer connections to bus or rail, including Norwich, Preston, Stonington, Waterford, and Westerly. Westerly is the only park & ride location in the study area offering rail and express bus services. The other lots listed above offer local bus connections only, while the remainder of the park & ride lots do not offer any connections to rail or bus services. Figure 7-1 shows map of the study area park & ride lots. Table 7-1 details the capacity, occupancy, and available services of study area park & ride lots.

Figure 7-1. Locations of Park & Ride Lots



Table 7-1. Park & Ride Lots within Study Area

Lot	Location	Total Spaces	Disabled Spaces	Average Occupancy	Bus or Rail Connection	Amenities			
						Paved	Lighted	Shelter	EV Charge
A	Bozrah	27	2	43%	None	✓	✓	✗	✗
B	Groton	46	3	100%	None	✓	✓	✗	✗
C	Norwich	83	4	50%	Local	✓	✓	✗	✗
D	Norwich	186	6	39%	Local	✓	✓	✗	✗
E	Norwich	158	6	23%	Local	✓	✓	✗	✗
F	Preston	71	2	13%	Local	✓	✓	✗	✗
G	Stonington	44	0	2%	None	✓	✗	✗	✗
H	Stonington	39	2	50%	None	✓	✓	✗	✗
I	Stonington	297	8	21%	Local	✓	✓	✓	✗
J	Waterford	59	3	34%	Local	✓	✓	✗	✗
K	Westerly	38	2	N/A	Express, Local, Rail	✓	✓	✓	✗

7.2 Station Parking

The section below reviews available parking within a ½ mile of study area train stations. Public parking near train stations in the study area varies from plentiful to meager, with prices ranging from free to \$15/day.

7.2.1 New London Union Station

There are four off-street parking areas available to the public within a ½ mile of the New London Union Station, illustrated in Figure 7-2. These lots total approximately 1,800 off-street parking spaces. Each of these parking areas was reviewed during the 2017 New London Downtown Transportation and Parking Study⁹. The study found that these lots reached a peak occupancy of 75% on summer Saturdays (2017), however, both the Water Street Garage and Julian/Mariner Square Lot reached near capacity during the study period. The 2014 SCCOG Parking Supply Study - Downtown New London found peak capacity in October to be at 62%. An overview of each parking area is below, and capacity, operator, cost, and restriction information can be found in Table 7-2.

⁹ New London Downtown Transportation and Parking Study. (2017). Retrieved on June 17, 2022 from NewLondonCT.org: http://newlondonct.org/filestorage/7495/7518/7577/7579/2017_Transportation_Sudy_index.pdf

- Water Street Garage is a 24-hour public access garage, typically used by Union Station patrons, ferry riders, and Electric Boat employees. Electric Boat leases nearly half of the parking spaces in the Water Street Garage and provides shuttle service for employees from the garage. The garage also sells monthly parking permits for nearby offices.
- Julian/Mariner Square Lot offers public access on weekends and holidays, including Friday evenings. This lot is primarily used by ferry passengers on weekends and is only available to local office employees during the work week.
- O'Neill – Tilley Municipal Lot is available to the public from 6 AM to 6 PM Monday through Friday only. A small number of spaces are reserved for parking permit users.
- Governor Winthrop Garage is a daily use garage operated by Cornish Parking Garage. Parking is mostly used by the general public, with some ferry passenger use, and parking for the Interdistrict School for Arts and Communication (ISAAC).

Figure 7-2. New London Train Station Parking



Table 7-2. New London Public Parking

Location	Total Spaces	Operator	Cost	Restrictions
Water Street Garage	910	New London Parking Authority	First Hour: \$2.00 Daily Max: \$15.00	No Overnight Parking
Julian/Mariner Square Lot	185	New London Parking Authority	Demand Pricing Daily Rate: \$10.00+	Public Use on Weekends Only
O'Neill – Tilley Municipal Lot	201	New London Parking Authority	First Hour: \$1.00 Daily Max: \$8.00	2 Hour Minimum, 6 AM-6 PM Weekdays Only
Gov. Winthrop Garage	496	Cornish Parking Garage	Daily Rate: \$10.00	None

According to the 2014 Parking Supply Study performed by SCCOG, on-street parking totals 525 spaces, though the New London Parking Authority reports that the number of spaces is now higher due to non-striped street parking availability. Stakeholders of the 2017 Transportation and Parking study expressed concerns about traffic generation from drivers cruising for on-street parking. On-street parking in New London is generally free with 2-hour or less time limits.

7.2.2 Mystic Train Station

The Mystic Train Station parking lot is the only long-term, public-use parking area within a ½ mile radius of the station. There are multiple private parking areas within the radius that have been found to be underutilized by the 2021 Downtown Mystic Parking Study¹⁰; however, these lots are not currently available for public use. Parking at the Mystic Train Station is free and includes same-day and overnight parking. Figure 7-3 illustrates public and private parking areas near Mystic Train Station.

There is no on-street parking immediately adjacent to the Mystic Train Station, however, many streets within the ½ mile radius allow on-street parking. The streets closest to the Train Station are mostly residential and appear to be used primarily for resident parking. Additional on-street parking is available in downtown Mystic. Figure 7-3 illustrates on-street parking inventoried by the 2021 Downtown Mystic Parking Study.

Figure 7-3. Mystic Train Station Parking

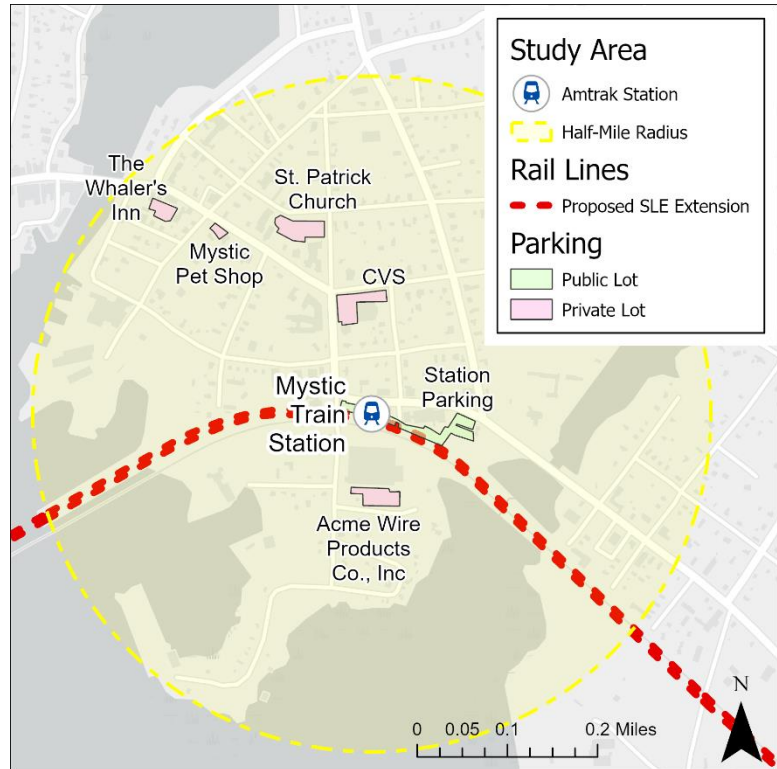


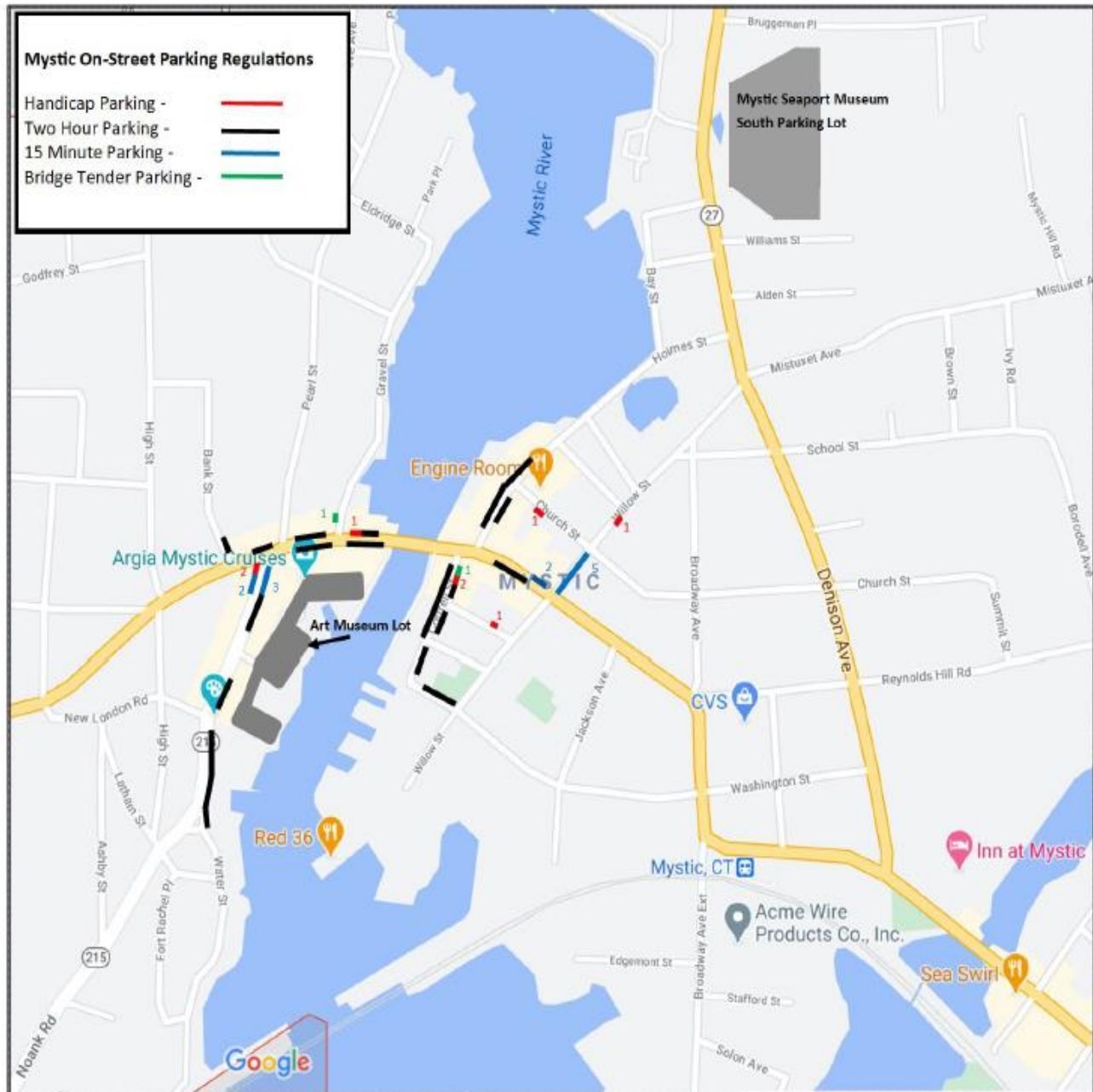
Table 7-3. Mystic Public Parking

Location	Total Spaces	Operator	Restrictions
Mystic Train Station	63	Amtrak	None
Acme Wire Products	47	N/A	No Public Parking
CVS	52	N/A	No Public Parking
St. Patrick Church	69	N/A	No Public Parking
Mystic Pet Shop	13	N/A	No Public Parking
The Whaler's Inn	36	N/A	No Public Parking

Source: Downtown Mystic Parking Study, 2021

¹⁰ Downtown Mystic Parking Study. (2021). Retrieved on June 17, 2022 from Groton-Ct.gov: https://cms9files.revize.com/grotonct/document_center/Departments/Planning%20&%20development/Mystic%20Parking%20Study/FINAL%20REPORT_52821.pdf

Figure 7-4. Mystic On-Street Parking



Source: 2021 Downtown Mystic Parking Study

7.2.3 Westerly Train Station

There are four publicly accessible parking areas within ½ mile of the Westerly Train Station, all located on the Westerly, RI side of the Pawcatuck River. The Westerly Train Station Lot offers both short-term and overnight parking for free. The High Street Station Lot is located near the Westerly Post Office and Westerly Library. This lot, along with an additional lot and a garage owned by Washington Trust Company, are typically used by patrons and employees of the Downtown Historic District.

There is an abundance of on-street parking in the vicinity of the Westerly Train Station, however, there is a 3-hour time limit for on-street parking which is not feasible for station guests.

Figure 7-5. Westerly Train Station Parking

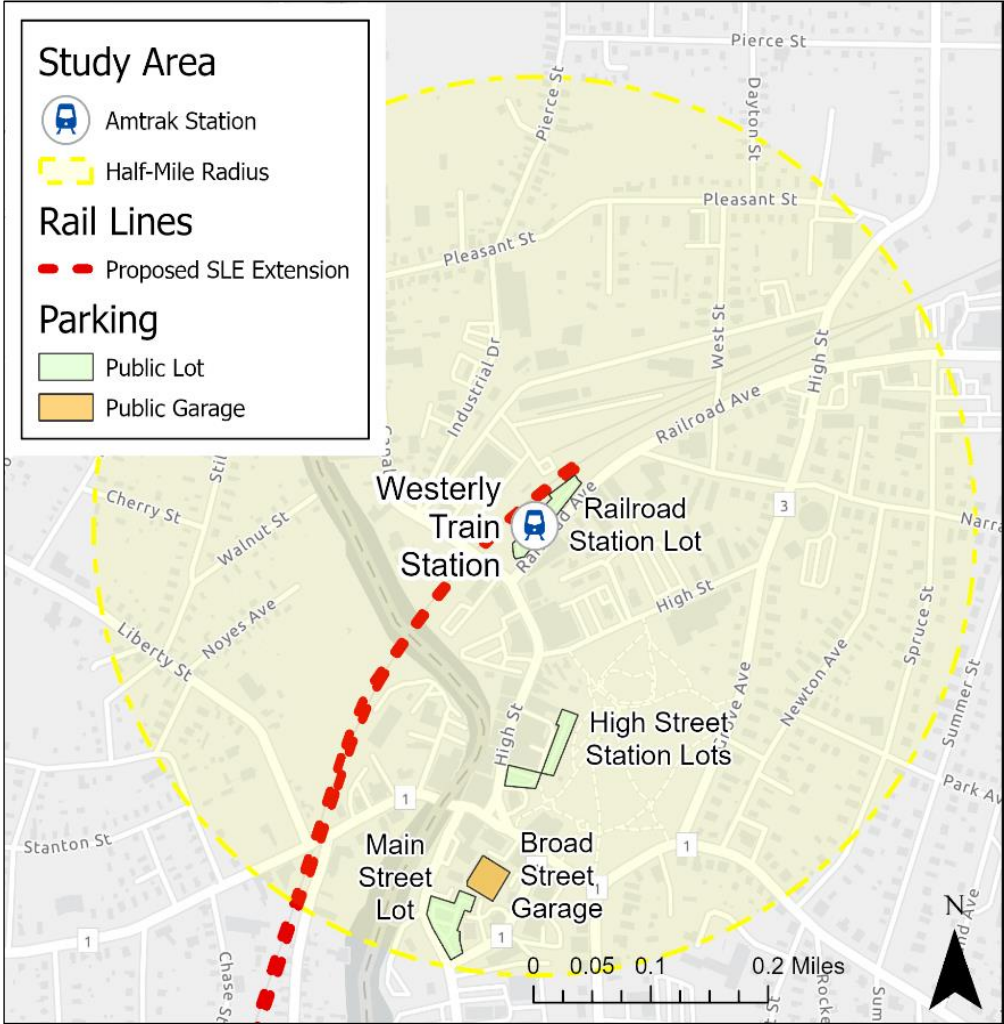


Table 7-4. Westerly Public Parking

Location	Total Spaces	Operator	Cost	Restrictions
Train Station Lot	32	Amtrak	Free	None
High Street Station Lot	87	---	---	---
Broad Street Garage	---	Washington Trust Company	---	---
Main Street Lot	---	Washington Trust Company	---	---

--- No data available.

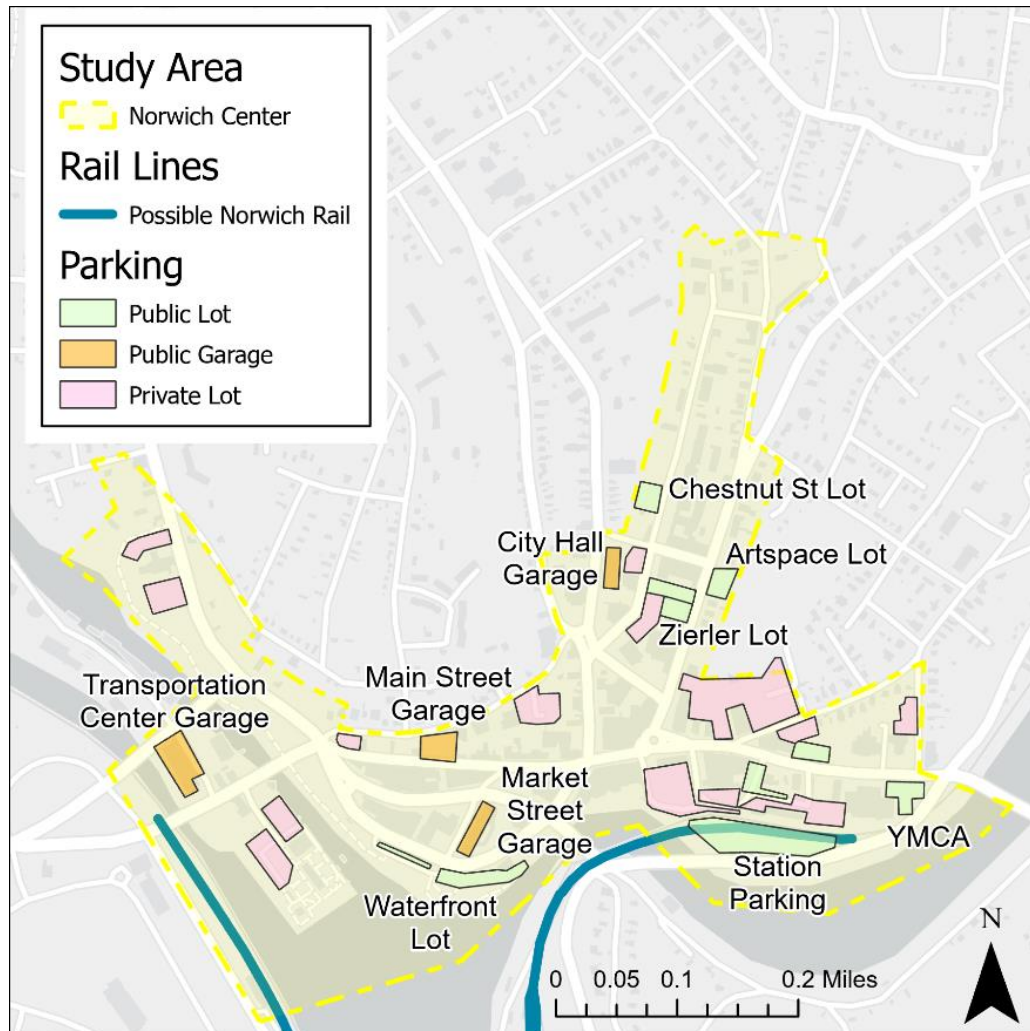
7.3 Municipal Parking

The following section reviews municipal parking in key study area locations, including Downtown Norwich and Groton, the Naval Submarine Base, and Mohegan Sun Casino.

7.3.1 Norwich Center

Norwich Center offers a variety of on-street parking, lots, and garages for public use. The Historic Downtown Norwich Parking Report indicates that there are over 3,000 parking spaces in this area, with nearly 2,000 free public spaces. Nearly 350 free on-street parking spaces are available throughout downtown with a limit of two hours per day. Free two-hour max/day parking is available at the Main Street Garage, while the YMCA and Waterfront lots are free during business hours (7 AM to 4 PM). There are over 600 free off-street parking spaces without time limits. The City offers monthly parking rates for daily users at a cost of \$38/month (lots) or \$48/month (garages). In addition, the EZ Park Pass is \$5/day for daily off-street parking users. There is no overnight parking in the City of Norwich's lots or garages.

Figure 7-6 Norwich Center Parking

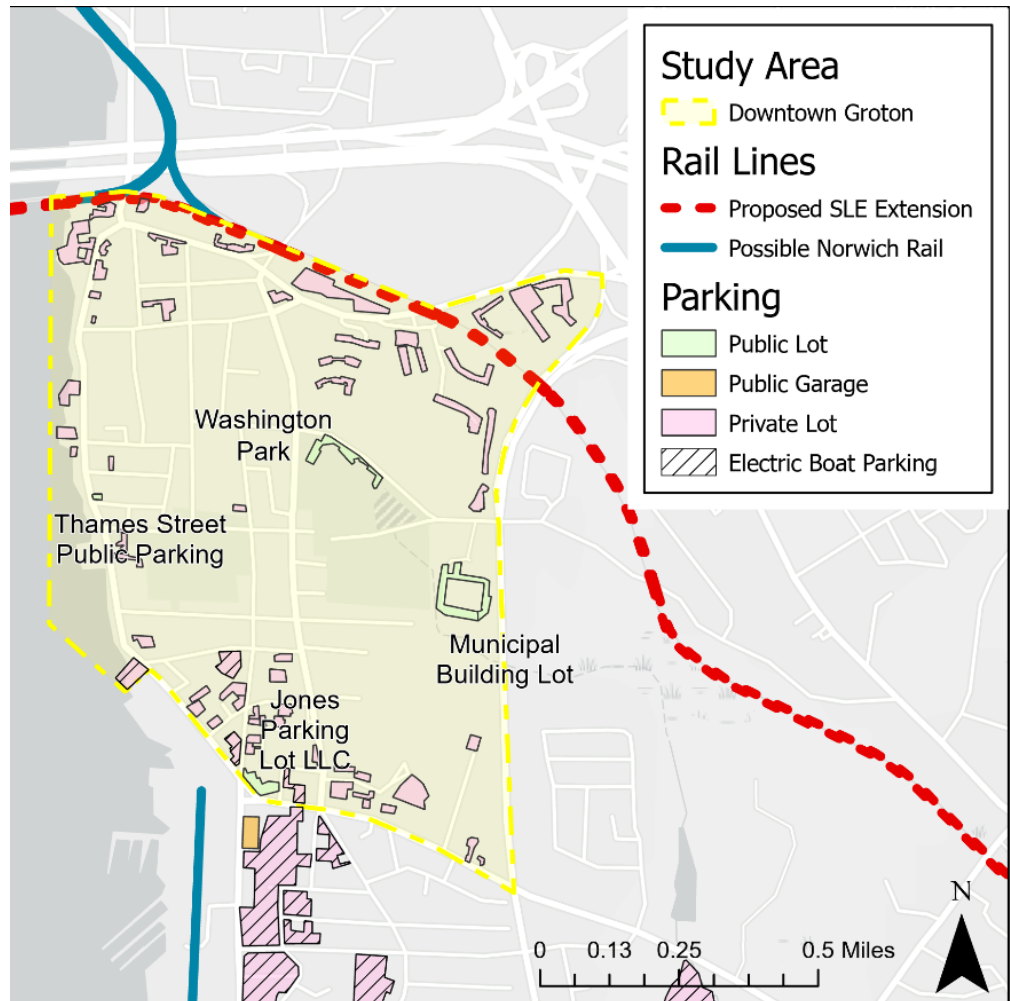


7.3.2 Downtown Groton

The 2020 City of Groton Parking Management Plan¹¹ states that there are more than 6,000 parking spaces in downtown Groton. Of these spaces, 4,227 are off-street parking and less than 10% (404) of those spaces are publicly accessible. The other 3,873 off-street parking spaces are private or restricted access, as indicated in Figure 7-7. Many of the private parking areas offer monthly parking for local employees, including those of Electric Boat, however, these lots are not officially affiliated and as such, are not indicated as Electric Boat parking on the map.

There are nearly 1,900 total on-street parking spaces in downtown Groton, according to the Parking Management Plan referenced above. The residential parking permit program accounts for 579 spaces, and the remaining 1,300 spaces are public on-street parking spaces. The report indicated that most of the on-street parking is located in residential areas and sees relatively low usage during peak hours (see Figure 7-8). In 2019, the SUBASE New London Joint Land Use Study¹² identified public demand for on-street parking on Bridge Street to the northeast of downtown Groton, which does not currently have on-street parking.

Figure 7-7. Downtown Groton Parking Areas



7.3.3 Pfizer & Electric Boat

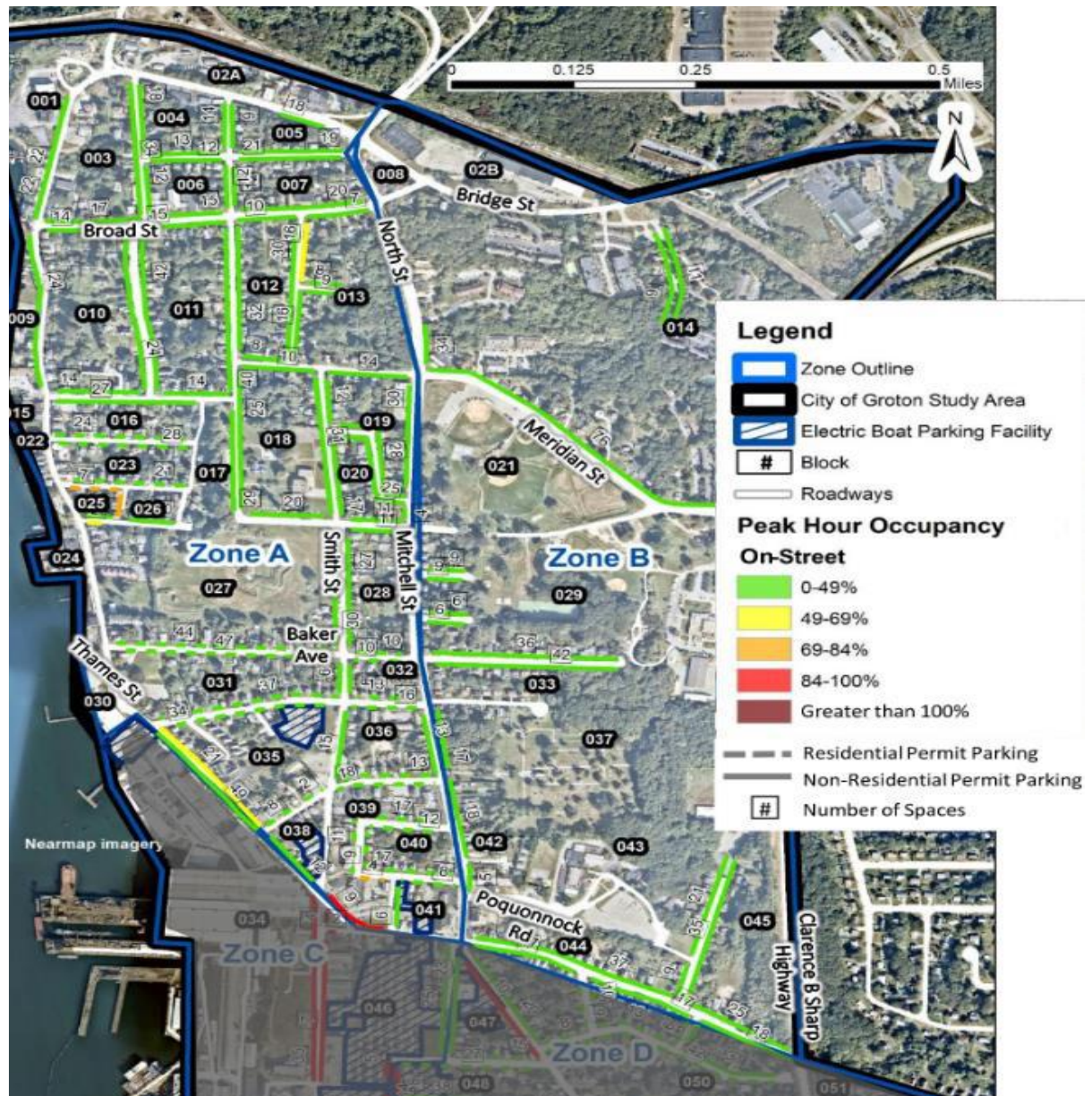
According to the Groton Parking Management Plan, Electric Boat (EB) owns or operates over 4,750 nearby parking spaces across 13 parking areas. In addition, Electric Boat employees are known to park in locations not affiliated with EB, such as on-street parking, a nearby public garage, and other off-street private parking facilities. Electric Boat provides shuttle service to their remote parking facilities to encourage usage. The company also encourages alternative modes of travel, such as van- and carpools, but does not currently incentivize these methods with preferred parking, bonuses, or parking cash-outs. Such incentives, as recommended by the SUBASE

¹¹ City of Groton Parking Plan. (2018). Retrieved June 17, 2022, from Cityofgrotonparkingplan.com website: <https://www.cityofgrotonparkingplan.com/>

¹² SUBASE New London Joint Land Use Study. (2017). Retrieved June 17, 2022 from SECCOG.org website: http://seccog.org/wp-content/uploads/2018/05/SNL_JLUS_Final_2017-12-01_sm.pdf

New London Joint Land Use Study (JLUS), would help offset future parking space deficits created by projections of 2,500 additional employees at EB. The 2020 Groton Parking Management Plan anticipates a deficit of over 1,700 parking spaces based on these projections. The JLUS also recommends consideration of a parking garage in place of the existing lot at the intersection of Eastern Point Road, Chester Road, and Mumford Avenue, which would

Figure 7-8. Downtown Groton On-Street Parking



contribute an additional 400 spaces to the current parking inventory. Pfizer owns/operates another 2,350 parking spaces in southern Groton. There are over 1,700 spaces in the main location's parking lot. The remaining spaces are located across 6 satellite locations.

7.3.4 SUBASE New London

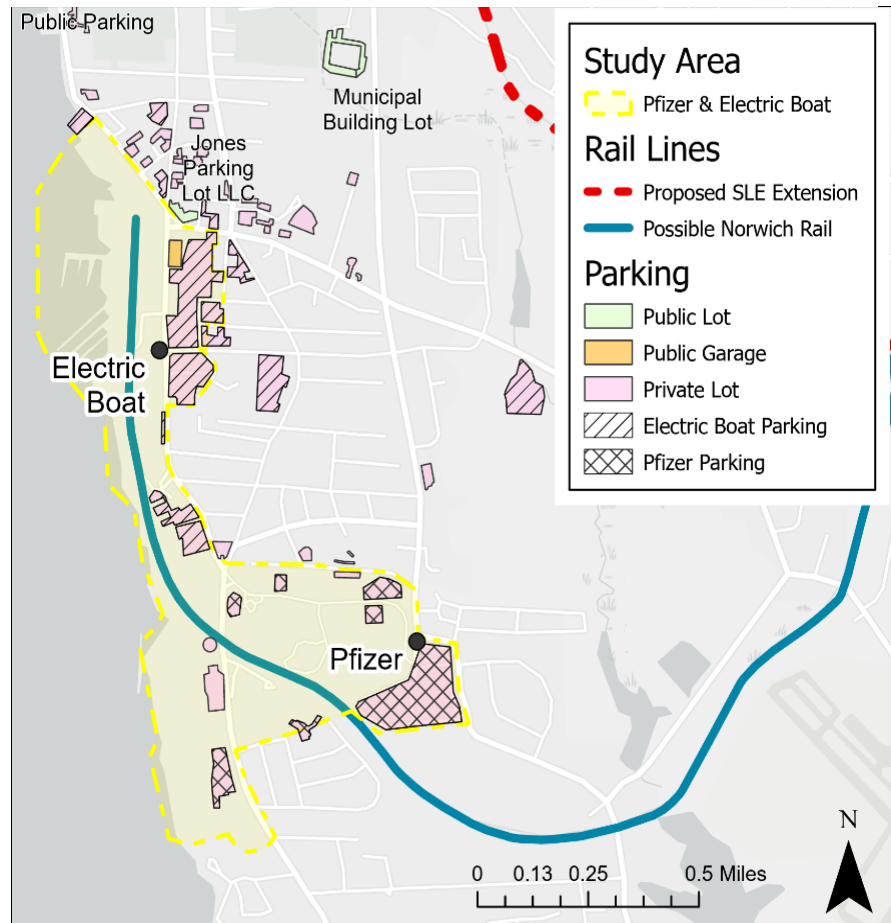
There is no public parking in the vicinity of the entrances to the New London SUBASE. The main entrance to the south of the base has a small temporary parking area for guests to request a base pass prior to entering the gate. There is no long-term parking available at this location. The northern gate, located in a residential area, does not have any off-base public parking available either. The SUBASE New London Joint Land Use Study reports that participation in employer incentives for transit programs is "very low, likely due to the fact that free employee parking is provided on-base" despite participant eligibility for nearly \$300 per month incentives for bus or vanpool travel. The JLUS recommends creation of a bus stop in close proximity to the main gate and an on-base

shuttle service to enable users to reach their destinations which are currently accessible only by privately owned vehicle.

7.3.5 Mohegan Sun Casino

Mohegan Sun offers over 13,000 guest parking spaces, according to their official website. The casino offers 3 on-site garages and one on-site lot, as well as one off-site garage and lot for guest parking. An additional off-site lot is designated for recreational vehicle (RV) parking and requires an RV permit. The Winter Garage, Indian Summer Garage, and Riverview Garage provide access to the Casino of the Earth. The Riverview Garage also connects to the Casino of the Sky and offers reserved parking and valet services. Mohegan Sun has complimentary EV charging stations in Riverview Garage and Indian Summer Garage. In addition, valet attendants will connect chargers to EVs upon request.

Figure 7-9. Pfizer & Electric Boat Parking



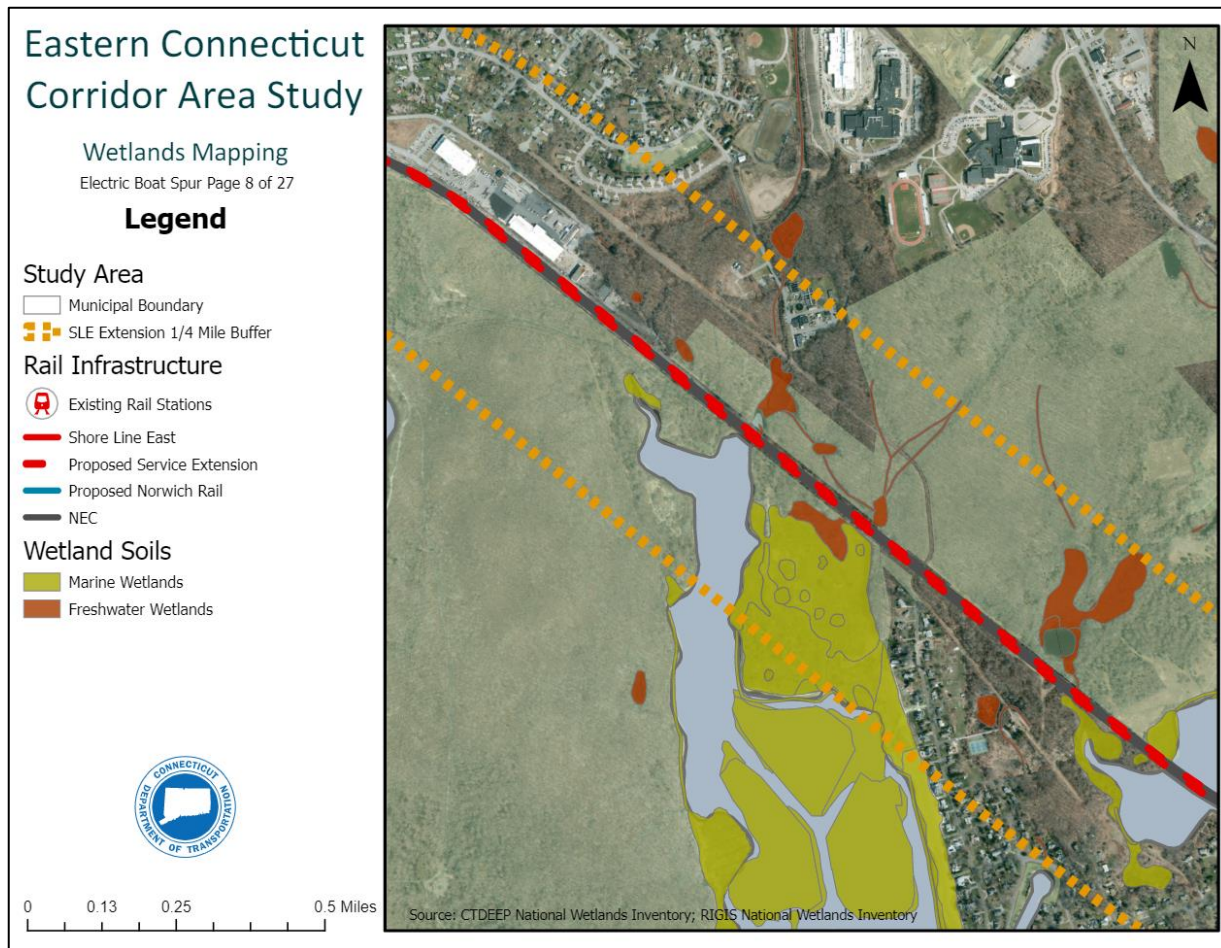
8. Environmental Conditions

Environmental conditions within the study area were reviewed in order to assess possible constraints or concerns with the possible development of passenger rail service to Norwich and/or the expansion of Shore Line East (SLE) service to Westerly, Rhode Island. A 1/4-mile buffer around track infrastructure was used for this assessment and includes the freight alignments on either side of the Thames River between New London and Norwich (owned and operated by GWI), the Northeast Corridor (NEC) alignment (owned and operated by Amtrak), and the freight Spur between the NEC and General Dynamics Electric Boat. Detailed environmental maps for the lengths of the corridors can be found in Exhibit B by corridor: Northeast Corridor (New London – Westerly), Thames River Corridors (East and West sides, New London – Norwich), and Groton Secondary/Spur (Town and City of Groton).

8.1 Wetlands

The project study area includes both freshwater wetland soils and marine wetlands soils. The majority of the wetlands within the study area are present along the existing Northeast Corridor for the possible SLE service extension. Due to the existing level of track infrastructure and current service operating on the line, there is little concern for additional impacts to wetlands from an expansion of SLE service east to Westerly. While there are fewer identified wetlands along the two rail alignments to Norwich it is likely that track, signal and other work within either alignment would affect or occur within close proximity to wetland soils. The potential impacts to wetlands along either alignment would likely be limited and mitigable.

Figure 8-1. Wetlands Mapping Example (for a complete dataset see Exhibit B)

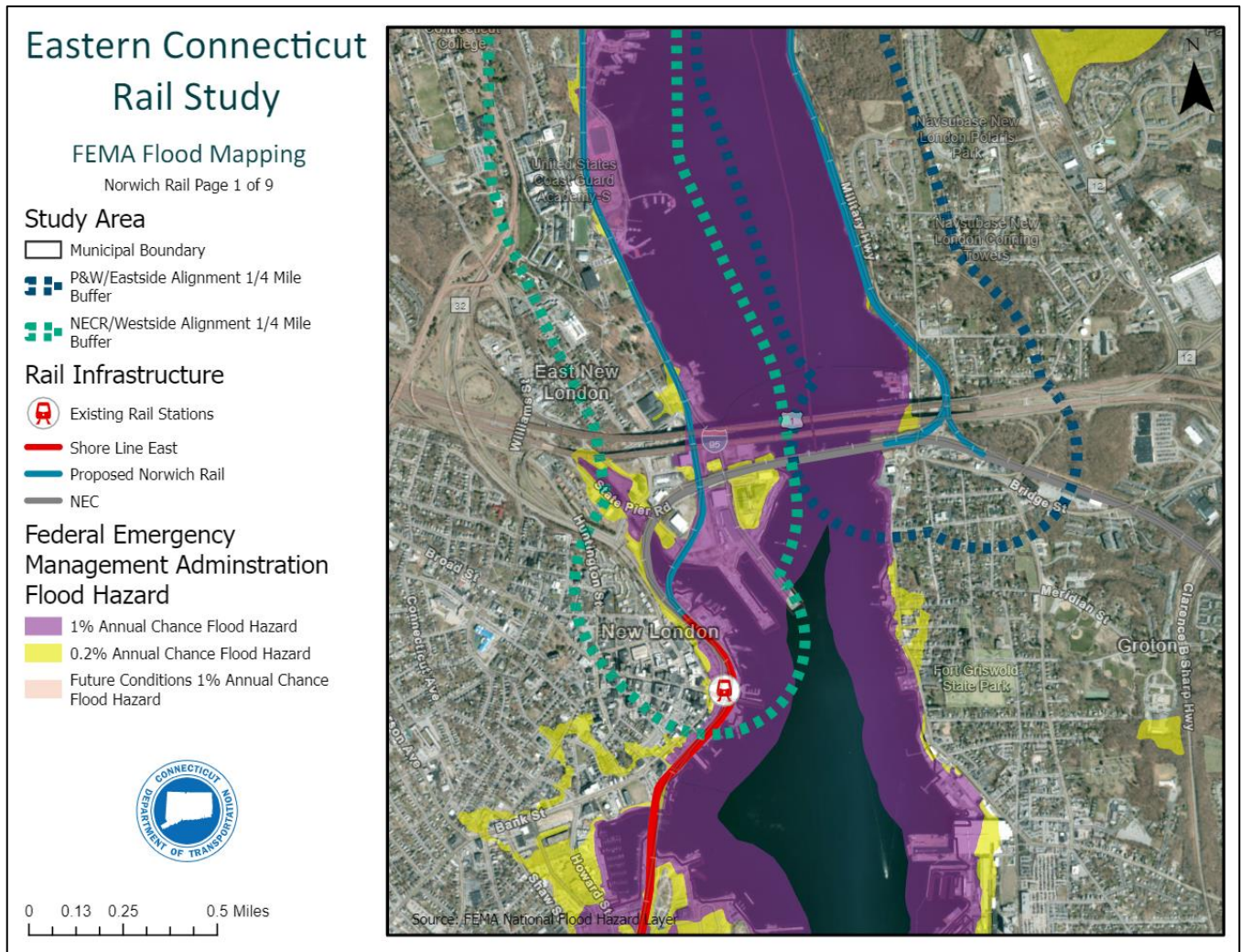


8.2 Flood Zones

Shore Line East and the proposed rail connection to Norwich are in close proximity to both Long Island Sound and the Thames River. Portions of the rail alignment are vulnerable to one percent annual flood hazard (also known as 100-year flood zone) and 0.2 percent annual flood hazard (also known as 500-year flood zones) events. The presence of these flood zones will be an ongoing challenge for the Thames River alignments and for SLE expansion along the NEC. Existing floods zones will likely expand with projected sea level rise in the 2050 and 2100 time horizons. If passenger service between New London and Norwich is established, strategic raising of the rail alignment may be a viable alternative to mitigate its flood risk.

Thames River Corridor — West A majority of the existing alignment is within or proximal to the .2% or 1% annual flood hazard areas. Mapping indicates that in many instances the rail ROW is along the edge (+/- 50ft) of the flood hazard zones. North of Mohegan Sun the rail alignment is impacted.	Thames River Corridor — East A substantial portion of the existing alignment is within or proximal to the .2% or 1% annual flood hazard areas.
Groton Secondary/Spur The first 1.2 miles of the Spur is fully within .2% or 1% annual flood hazard area. The remaining portion of the alignment that would be used for a potential rail service is not within .2% or 1% annual flood hazard areas. West of Eastern Point Road, portions if the alignment are proximal to .2% or 1% annual flood hazard areas.	SLE Extension along the Northeast Corridor A substantial portion of the existing alignment is within or proximal to the .2% or 1% annual flood hazard areas. Many locations between the Electric Boat, Pfizer, and points east are well within the .2% or 1% annual flood hazard areas, which may make any flood events more impactful.

Figure 8-2. FEMA Flood Mapping Example (for complete data set see Exhibit B)



8.3 Land Use

The land use for the three study corridors is diverse and varies greatly within each. The proposed rail alternatives (Thames River Corridor, Groton Secondary/Spur, and SLE Extension) traverse dense urban areas with commercial and industrial uses, lower density residential neighborhoods, small villages with a mix of uses, as well as open space/preserved lands. The following subsections provide an overview by alternative on key land uses or parcels within each specific study area.

8.3.1 Thames River Corridor

The Thames River Corridor includes two options with an alignment proposed on either the east or west side of the Thames River between New London and Norwich. In the New London area there is a mix of dense residential, mixed-use structures, commercial and industrial uses including the Port of New London. Norwich, though smaller in overall population and scale, includes denser residential and commercial uses in close proximity to the east and west alignments.

North of New London the density of development generally decreases and is generally centered on residential land uses. There are several exceptions to this development pattern including:

- **West Alignment:** The US Coast Guard Academy (institutional); Riverhead Building Supply¹³ (commercial); NRG Montville (utility); and Mohegan Sun (commercial).
- **East Alignment:** The Groton Sub Base (institutional); AmSty/Dow Chemical site¹⁴ (industrial); Gales Ferry School, Juliet Long School and Ledyard Middle School (institutional); and Norwich State Hospital¹⁵ (institutional).

8.3.2 Groton Secondary/Spur

The Groton Secondary/Spur is within the Town and City of Groton. Land uses within the quarter mile study area vary along the alignment and include residential, industrial, commercial and recreational uses. This specifically includes the Shennecossett Golf Course (recreational); Branford Manor Apartments (residential); Pfizer (industrial/ technology); and General Dynamic Electric Boat (industrial/ technology).

8.3.3 SLE Extension

The possible SLE Extension alignment follows the NEC between New London, CT and Westerly, RI. The land uses along this alignment vary greatly. As noted previously, there is a mix of dense residential, mixed-use structures, commercial and industrial uses, including the Port of New London. In Westerly, RI, adjacent land uses to the station area include commercial, higher density residential, railroad adjacent, and recreational.

8.4 Recreational and Protected Lands

The study area contains protected lands that are owned/managed by various local, state, federal and private entities. These properties are managed for both active and passive recreation and often include sensitive ecosystems. The addition of new rail service in any of the corridors within the study area has the potential to impact protected lands and their users that are closest to the rail corridors.

8.4.1 Thames River Corridor

Along the Thames River east and west alignments between New London and Norwich, there are parcels of protected land that are held as municipal open space, land trust, state land, as well as private open space within the quarter mile buffer on each side of the river. There are more protected parcels within the quarter mile buffer of the eastern alignment than the western alignment.

8.4.2 Groton Secondary/Spur

For Groton Secondary/Spur there is limited protected land within the quarter mile rail station buffer, however the rail alignment does pass through a golf course.

8.4.3 SLE Extension

Along the NEC segment between New London and Westerly, there are 69 protected parcels within the quarter mile rail alignment buffer, including Bluff Point State Park and Barn Island Wildlife Management Area. Despite

¹³ Riverhead Building Supply is highlighted because it receives direct freight rail shipments.

¹⁴ This facility is highlighted because it receives direct freight rail shipments.

¹⁵ This site closed in October 1996 and remains abandoned to this day. In the context potential new passenger rail the sites proximity to the alignment presents a significant TOD opportunity.

the proximity of protected lands to the alignment, there would likely be limited to no additional impact from an extension of SLE service to the existing/future service densities operated along the line.

8.5 Historic Resources

There are National Register of Historic Places properties and historic districts within the ¼-mile study area for the Thames River and possible SLE extension corridors. Historic districts and properties are concentrated in New London and Norwich. There are no historic districts or properties within the ¼-mile study area for the Groton Secondary/Spur. The following are a list of notable historic districts and properties within the ¼-mile study area:

Thames River Corridor – West	Thames River Corridor – East
Downtown New London Historic District New London Union Station Hodge Square Historic District Thames Shipyard Downtown Norwich Historic District Carroll Building	Groton Bank Historic District USS Nautilus Gales Ferry Historic District Norwich Hospital District American Thermos Bottle Company Laurel Hill Historic District Downtown Norwich Historic District
SLE Extension Along the Northeast Corridor	
Downtown New London Historic District New London Union Station Noank Historic District Mystic River Historic District Mystic Bridge Historic District Stonington Borough Stonington Highschool William Clark Company Thread Mill Pawcatuck River Railroad Bridge Westerly Railroad Station	



Eastern Connecticut Corridor Rail and Transit Feasibility Study (ECRTS)

Appendix A: Existing Conditions Report, Exhibit A

November 2023

Prepared by

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AECOM

Table of Contents

A.	Travel Patterns by Community	2
A.1.	Foxwoods	2
A.2.	Mohegan Sun	4
A.3.	Groton Submarine Base	6
A.4.	Pfizer and Electric Boat	8
A.5.	Stonington.....	10
A.6.	Westerly.....	12
A.7.	New London Center.....	14
A.8.	Norwich Center	16
A.9.	Mystic	18

Tables

Table A-1 Average Daily Origin Traffic by Community - Foxwoods	2
Table A-2 Average Daily Origin Traffic by Community – Mohegan Sun	4
Table A-3 Average Daily Origin Traffic by Community – Groton Submarine Base	6
Table A-4 Average Daily Origin Traffic by Community – Pfizer and Electric Boat	8
Table A-5 Average Daily Origin Traffic by Community – Stonington	10
Table A-6 Average Daily Origin Traffic by Community – Westerly	12
Table A-7 Average Daily Origin Traffic by Community – New London	14
Table A-8 Average Daily Origin Traffic by Community – Norwich Center.....	16
Table A-9 Average Daily Origin Traffic by Community – Mystic.....	18

Figures

Figure A-1 Foxwoods Activity Center Origin Traffic Volumes	3
Figure A-2 Mohegan Sun Activity Center Origin Traffic Volumes	5
Figure A-3 Groton Submarine Base Activity Center Origin Traffic Volumes.....	7
Figure A-4 Pfizer and Electric Boat Activity Center Origin Traffic Volumes	9
Figure A-5 Stonington Activity Center Origin Traffic Volumes.....	11
Figure A-6 Westerly Activity Center.....	13
Figure A-7 New London Center Activity Center Origin Traffic Volumes.....	15
Figure A-8 Norwich Origin Traffic Volumes	17
Figure A-9 Mystic Activity Center Origin Traffic Volumes	19

A. Travel Patterns by Community

Southeastern Connecticut residents largely commute to worksites within the study area and near the region's major highways such as I-395, I-95, and I-91. The majority of study area residents (approximately 61 percent) also work within the region and the largest study area employment centers are in communities along the Thames River, such as Norwich and Groton. Outside of the study area, many residents commute to job centers in New Haven, greater Hartford, and coastal Rhode Island, towards Providence.

The project includes several notable commute centers (really activity centers because traffic includes commuting and recreational/visitor traffic) including Foxwoods, Groton Submarine Base, Mystic, Pfizer and Electric Boat, Westerly, and Stonington. These centers largely draw commuters from within the study area and its neighboring communities. This technical memo contains a summary of each activity center and the sources of daily traffic.

A.1. Foxwoods

A regional hub for employment and entertainment, Foxwoods draws daily traffic from a variety of communities, with Ledyard, Norwich and Montville producing the highest (48 percent combined) volumes of daily Foxwoods-bound traffic (Table A-1 and Figure A-1). Foxwoods is located within the Mashantucket Pequot reservation and town of Ledyard, indicating that most Foxwoods trips occur locally (33 percent). This noted, data indicates that people regularly travel from places further away, including Windsor Locks and New Haven, locations nearly 60 miles from Foxwoods.

Table A-1 Average Daily Origin Traffic by Community - Foxwoods

Municipality	Average Daily Origin Traffic	Percentage of Total Activity Center Traffic
Ledyard	3,688	33.1%
Norwich	1,059	9.5%
Montville	658	5.9%
Groton	610	5.5%
North Stonington	454	4.1%
Preston	427	3.8%
Stonington	426	3.8%
New London	319	2.9%
Westerly	311	2.8%
All Other Municipalities	3,183	28.6%
Total	11,135	

Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021, Foxwoods-only destination

Figure A-1 Foxwoods Activity Center Origin Traffic Volumes

Eastern Connecticut Corridor Rail & Transit Feasibility Study Foxwoods Commute Center Origin Traffic Volumes

Legend

Study Area

Study Area

Existing Stations

Shore Line East Station

Amtrak Station

Rail Lines

Proposed Service Extension

Shore Line East

Possible Norwich Rail

Northeast Corridor

Connecticut & Rhode Island Towns

Average Daily Origin Traffic

0 - 9

10 - 37

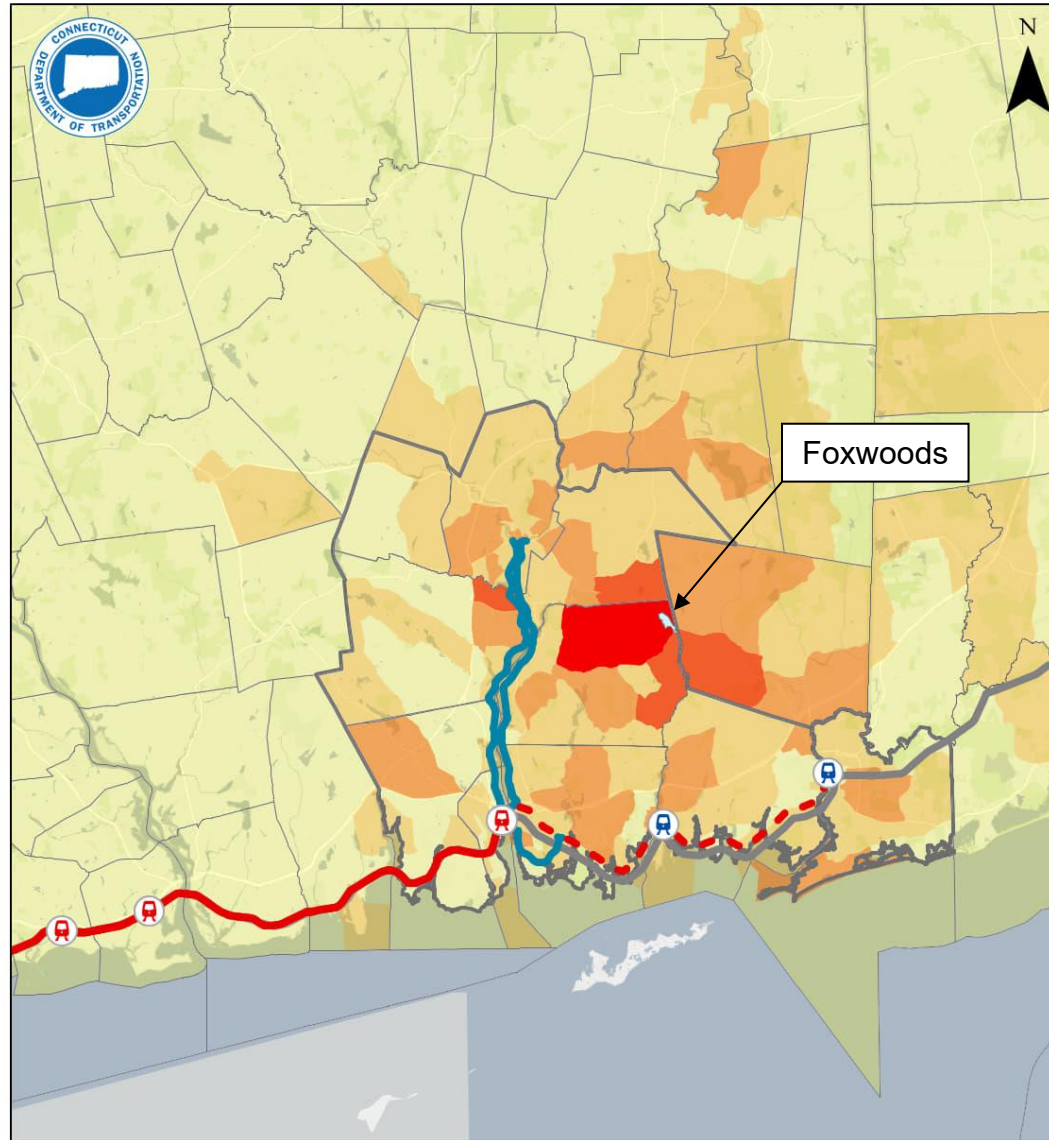
38 - 146

147 - 445

446 - 3,280

Foxwoods Commute
Center

0 3.75 7.5 15 Miles



Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021, Foxwoods-only destination

A.2. Mohegan Sun

In ways nearly identical to Foxwoods, Mohegan Sun is a commute center for a variety of people, including many service-industry jobs. Mohegan Sun traffic originates throughout the region, with Montville, Norwich, and Ledyard producing the largest volume of average daily Mohegan Sun-bound traffic (Table A-2 and Figure A-2). These three communities are responsible for 52% of all traffic ending in Mohegan Sun. While most travel takes place within the region, Mohegan Sun draws regular travelers from places across Connecticut, including Beacon Falls and East Granby, two locations approximately 73 miles away.

Table A-2 Average Daily Origin Traffic by Community – Mohegan Sun

Municipality	Average Daily Origin Traffic	Percentage of Total Activity Center Traffic
Montville	4,342	32.6%
Norwich	1,971	14.8%
Ledyard	715	5.4%
Groton	585	4.4%
New London	513	3.9%
Waterford	436	3.3%
East Lyme	254	1.9%
Stonington	192	1.4%
Griswold	185	1.4%
All Other Municipalities	4,127	31.0%
Total	13,320	

Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021, Mohegan Sun-only destination

¹ Like Foxwoods, Mohegan Sun is on a Native American reservation (Mohegan Reservation). The reservation is within the Town of Montville.

Figure A-2 Mohegan Sun Activity Center Origin Traffic Volumes

Eastern Connecticut Corridor Rail & Transit Feasibility Study Mohegan Sun Commuter Center Origin Traffic Volumes **Legend**

Study Area

Study Area

Existing Stations

Shore Line East Station

Amtrak Station

Rail Lines

Proposed Service Extension

Shore Line East

Possible Norwich Rail

Northeast Corridor

Connecticut & Rhode Island Towns

Average Daily Origin Traffic

0 - 16

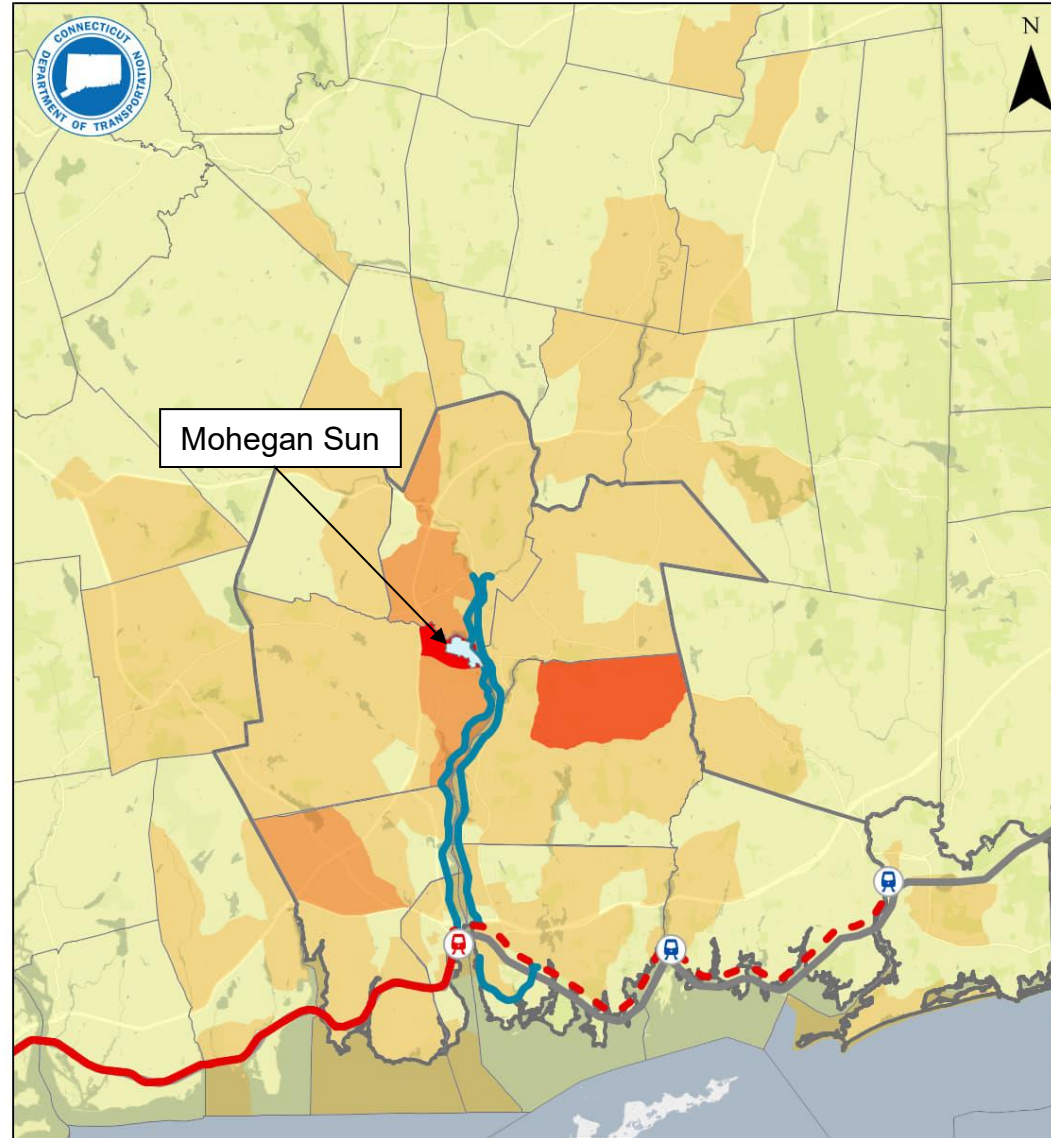
17 - 77

78 - 250

251 - 473

474 - 3,413

0 3.75 7.5 15 Miles



Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021, GSB-only destination

A.3. Groton Submarine Base

The Groton Submarine Base (GSB) is a large employer in Groton, CT. The base generates many trips largely consisting of work and defense related activities. The adjacent Nautilus Museum is open to the public and draws visitors to the activity center as well. Like Foxwoods, Groton draws many people from the study area and the largest volume of GSB-destination traffic (78%) comes from Groton, Ledyard, and New London (Table A-3 and Figure A-3). Groton is the municipality with the most origin trips ending at the GSB, contributing 64 percent of all daily trips. In ways similar to Foxwoods, the commute center regularly draws people from across Connecticut, including places like Windsor and New Britain, locations approximately 55 miles away.

Table A-3 Average Daily Origin Traffic by Community – Groton Submarine Base

Municipality	Average Daily Origin Traffic	Percentage of Total Activity Center Traffic
Groton	4,254	64.3%
Ledyard	626	9.5%
New London	343	5.2%
Waterford	271	4.1%
Norwich	226	3.4%
Montville	201	3.0%
Stonington	174	2.6%
East Lyme	98	1.5%
Westerly	45	0.7%
All Other Municipalities	382	5.8%
Total	6,620	

Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021, GSB-only destination

Figure A-3 Groton Submarine Base Activity Center Origin Traffic Volumes

Eastern Connecticut Corridor Rail & Transit Feasibility Study

Groton Submarine Base
Commute Center
Origin Traffic Volumes

Legend

Study Area

 Study Area

Existing Stations

 Shore Line East Station

 Amtrak Station

Rail Lines

 Proposed Service Extension

 Shore Line East

 Possible Norwich Rail

 Northeast Corridor

 Connecticut & Rhode Island Towns

Average Daily Origin Traffic

 0 - 12

 13 - 50

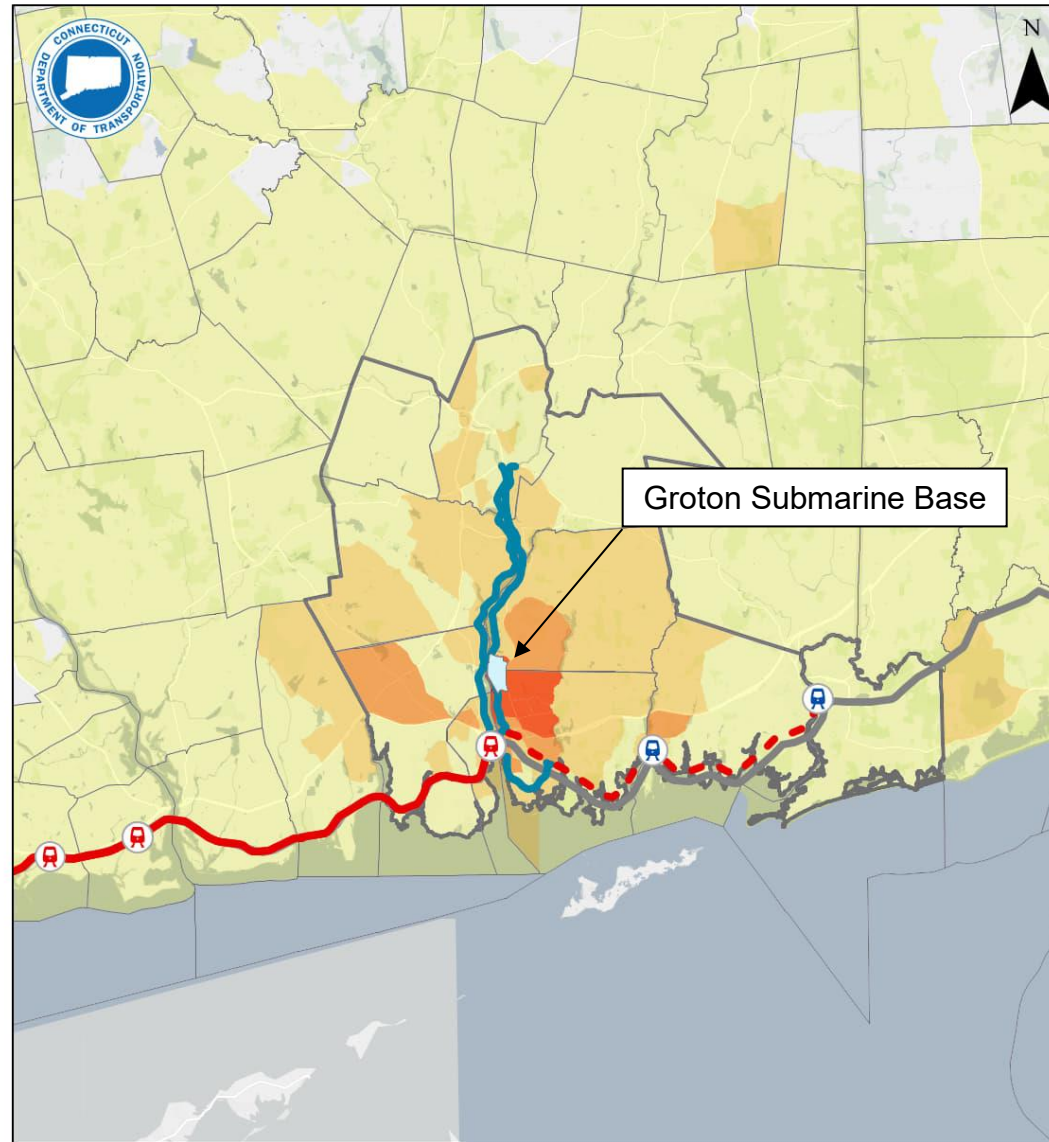
 51 - 148

 149 - 397

 398 - 2,078

 Groton Submarine Base
Commute Center

0 3.75 7.5 15 Miles



Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021, GSB-only destination

A.4. Pfizer and Electric Boat

Pfizer and Electric Boat are two of eastern Connecticut's largest employers and they draw people primarily from the study area and communities around it. The communities producing the most Pfizer/Electric Boat-bound traffic are Groton, New London, and Montville (Table A-4 and Figure A-4). Groton produces the majority (42.9 percent) of traffic and together these communities account for approximately 54 percent of all traffic. This noted, the region also draws regular traffic from locations more than 50 miles away, including places like Ellington and West Hartford.

Table A-4 Average Daily Origin Traffic by Community – Pfizer and Electric Boat

Municipality	Average Daily Origin Traffic	Percentage of Total Activity Center Traffic
Groton	1,917	42.9%
New London	283	6.3%
Montville	232	5.2%
Waterford	201	4.5%
Ledyard	200	4.5%
Norwich	197	4.4%
Stonington	184	4.1%
East Lyme	175	3.9%
Westerly	123	2.8%
All Other Municipalities	957	21.4%
Total	4,469	

Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021, Pfizer and Electric Boat-only destination

Figure A-4 Pfizer and Electric Boat Activity Center Origin Traffic Volumes

Eastern Connecticut Corridor Rail & Transit Feasibility Study

Pfizer and Electric Boat
Commute Center
Origin Traffic Volumes

Legend

Study Area

Study Area

Existing Stations

Shore Line East Station

Amtrak Station

Rail Lines

Proposed Service Extension

Shore Line East

Possible Norwich Rail

Northeast Corridor

Connecticut & Rhode Island Towns

Average Daily Origin Traffic

0 - 5

6 - 20

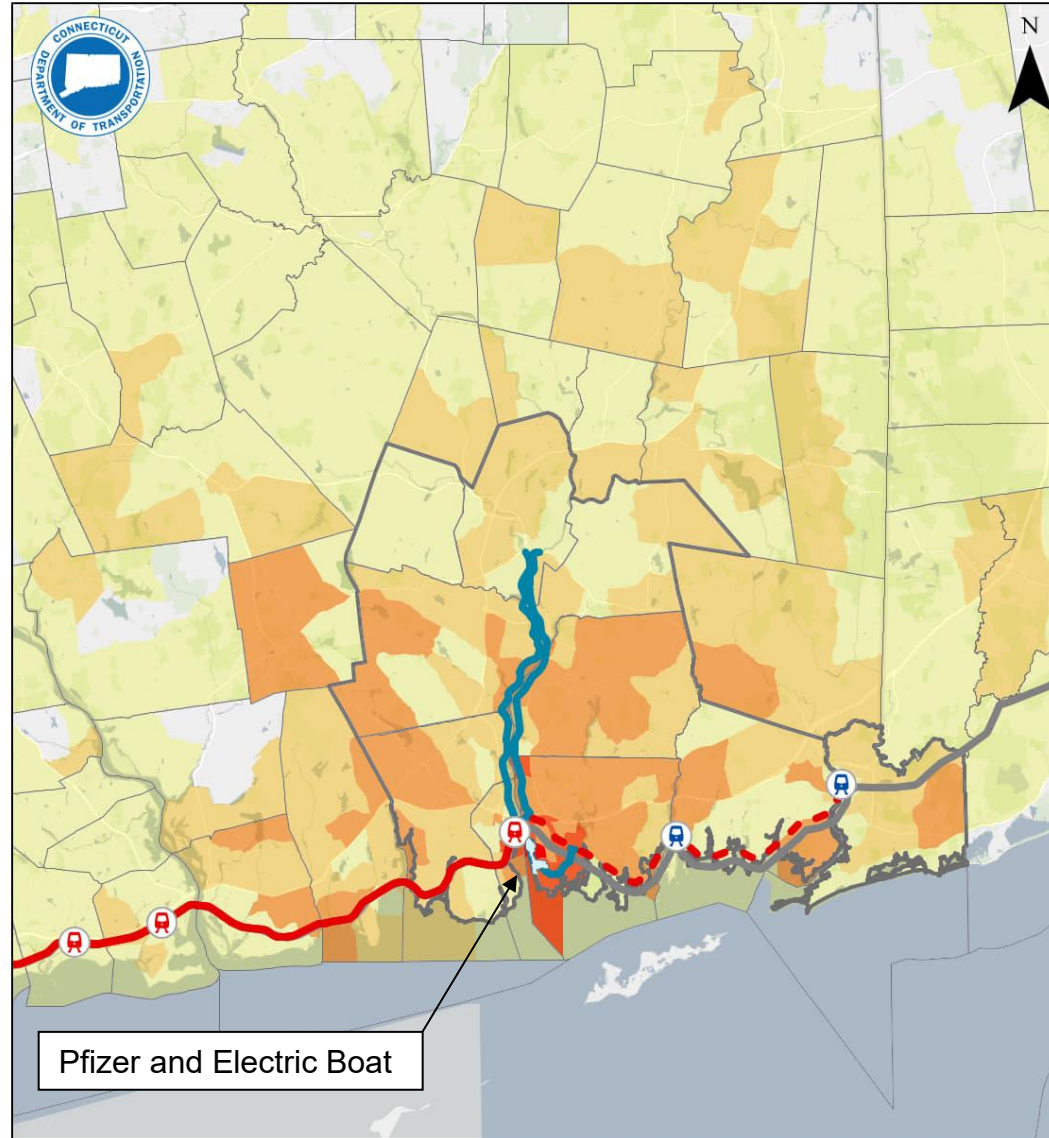
21 - 53

54 - 134

135 - 671

Pfizer and Electric Boat

0 3.75 7.5 15 Miles



Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021, Pfizer and Electric Boat-only destination

A.5. Stonington

Stonington has a downtown core that includes several entertainment destinations that bring both patrons and staff. Most Stonington traffic (approximately 62 percent) originates within the municipality (Table A-5 and Figure A-6). Additionally, Groton and Westerly also produce the largest volumes of traffic and once combined, these three communities are responsible for 85 percent of all Stonington-based traffic. While traffic is mainly local, there are some who regularly travel from places as far as South Windsor, an approximate-65 mile journey.

Table A-5 Average Daily Origin Traffic by Community – Stonington

Municipality	Average Daily Origin Traffic	Percentage of Total Activity Center Traffic
Stonington	1,339	61.9%
Groton	257	11.9%
Westerly	246	11.4%
North Stonington	59	2.7%
Ledyard	40	1.8%
New London	38	1.8%
Waterford	36	1.7%
Montville	28	1.3%
East Lyme	27	1.2%
All Other Municipalities	93	4.3%
Total	2,163	

Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021, Stonington-only destination

Figure A-5 Stonington Activity Center Origin Traffic Volumes

Eastern Connecticut Corridor Rail & Transit Feasibility Study Stonington Commute Center Origin Traffic Volumes

Legend

Study Area

Study Area

Existing Stations

Shore Line East Station

Amtrak Station

Rail Lines

Proposed Service Extension

Shore Line East

Possible Norwich Rail

Northeast Corridor

Connecticut & Rhode Island Towns

Average Daily Origin Traffic

0 - 2

3 - 38

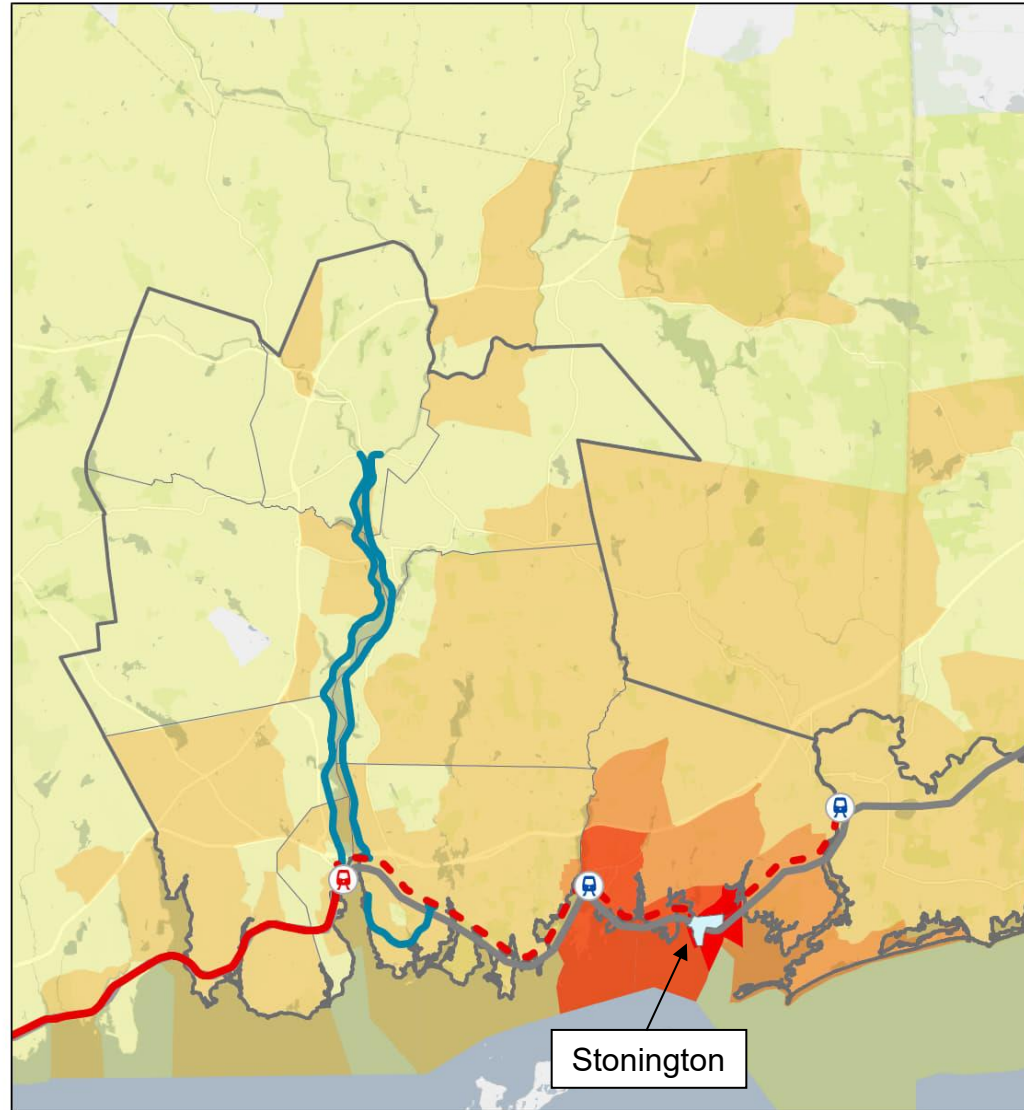
39 - 80

81 - 160

161 - 332

Stonington Commute
Center

0 3.75 7.5 15 Miles



Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021, Stonington-only destination

A.6. Westerly

Like other activity centers in the study area, Westerly contains a mix of entertainment and employment draws. Unlike the other activity centers, Westerly draws a larger percentage of traffic from communities in Rhode Island including Charlestown and Hopkinton (Table A-6 and Figure A-6). This noted, most Westerly traffic also originates within the municipality (62 percent), with neighboring Stonington contributing 14 percent of all Westerly traffic. Though traffic is overwhelmingly local, some Westerly-bound people travel more than 60 miles regularly.

Table A-6 Average Daily Origin Traffic by Community – Westerly

Municipality	Average Daily Origin Traffic	Percentage of Total Activity Center Traffic
Westerly	5,903	62.4%
Stonington	1,413	14.9%
Hopkinton	371	3.9%
Charlestown	286	3.0%
Groton	249	2.6%
North Stonington	216	2.3%
South Kingston	179	1.9%
Richmond	134	1.4%
Ledyard	97	1.0%
All Other Municipalities	605	6.4%
Total	9,453	

Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021 Westerly-only destination

Figure A-6 Westerly Activity Center

Eastern Connecticut Corridor Rail & Transit Feasibility Study

Westerly Commute Center
Origin Traffic Volumes

Legend

Study Area

Study Area

Existing Stations

Shore Line East Station

Amtrak Station

Rail Lines

Proposed Service Extension

Shore Line East

Possible Norwich Rail

Northeast Corridor

Connecticut & Rhode Island Towns

Average Daily Origin Traffic

0 - 22

23 - 101

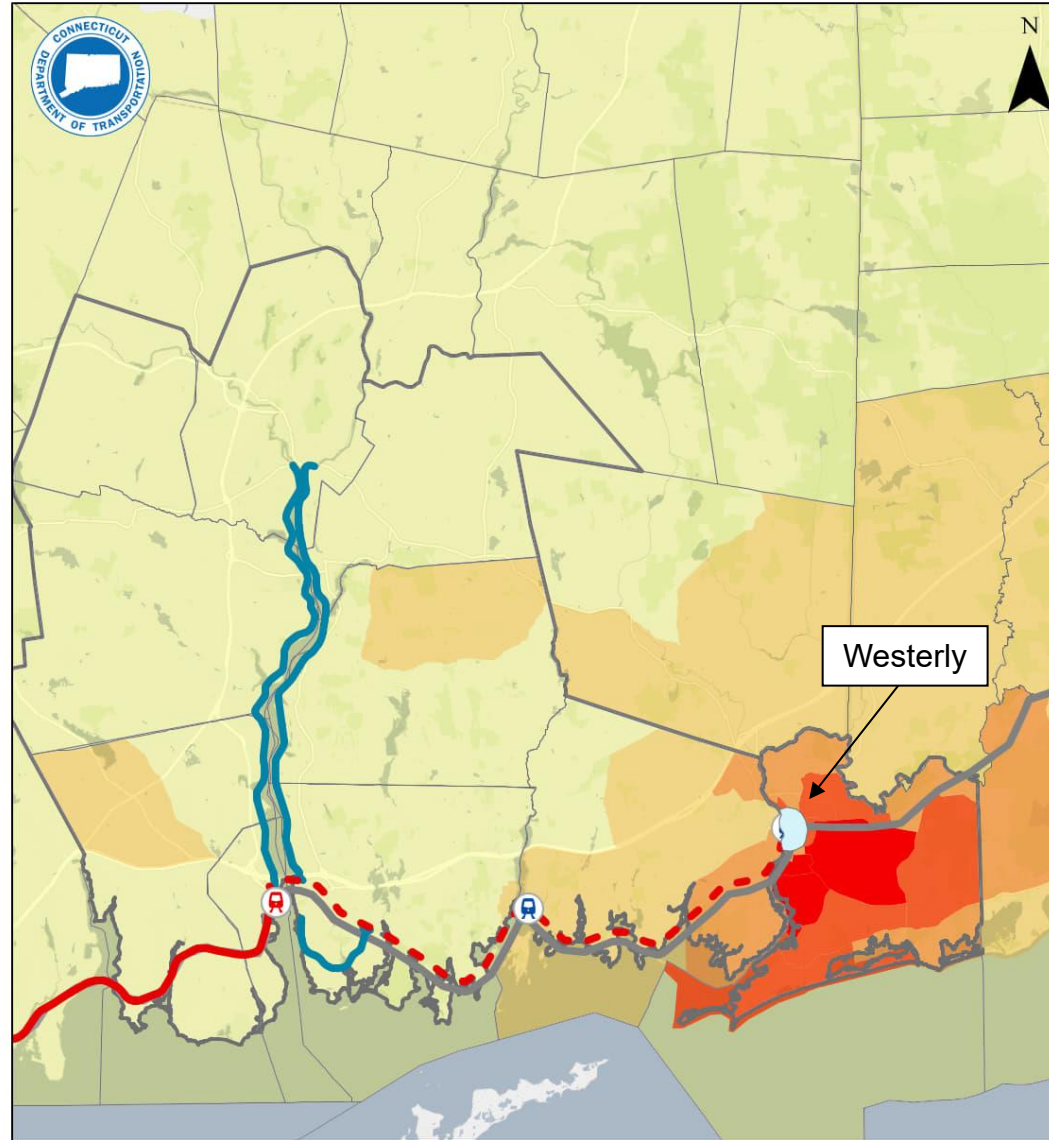
102 - 251

252 - 421

422 - 790

Westerly Commute
Center

0 3.75 7.5 15 Miles



Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021 Westerly-only destination

A.7. New London Center

New London Center is a major regional destination as it is the largest city within the study area. In ways similar to other centers, most trips ending in New London start in New London. Groton and Waterford also produce large amounts of New London-bound traffic, with all three combining to account for 65 percent of daily traffic. Though traffic mostly comes from places in the study area, New London regularly draws people from communities more than 50 miles away (e.g. East Hartford).

Table A-7 Average Daily Origin Traffic by Community – New London

Municipality	Average Daily Origin Traffic	Percentage of Total Activity Center Traffic
New London	2,153	39.6%
Groton	726	13.3%
Waterford	680	12.5%
Montville	322	5.9%
Norwich	232	4.3%
Stonington	232	4.3%
East Lyme	228	4.2%
Ledyard	194	3.6%
Old Saybrook	51	0.9%
All Other Municipalities	621	11.4%
Total	5,439	

Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021 New London center-only destination

Figure A-7 New London Center Activity Center Origin Traffic Volumes

Eastern Connecticut Corridor Rail & Transit Feasibility Study

New London Center
Commute Center
Origin Traffic Volumes

Legend

Study Area

 Study Area

Existing Stations

 Shore Line East Station

 Amtrak Station

Rail Lines

 Proposed Service Extension

 Shore Line East

 Possible Norwich Rail

 Northeast Corridor

 Connecticut & Rhode Island Towns

Average Daily Origin Traffic

 0 - 7

 8 - 28

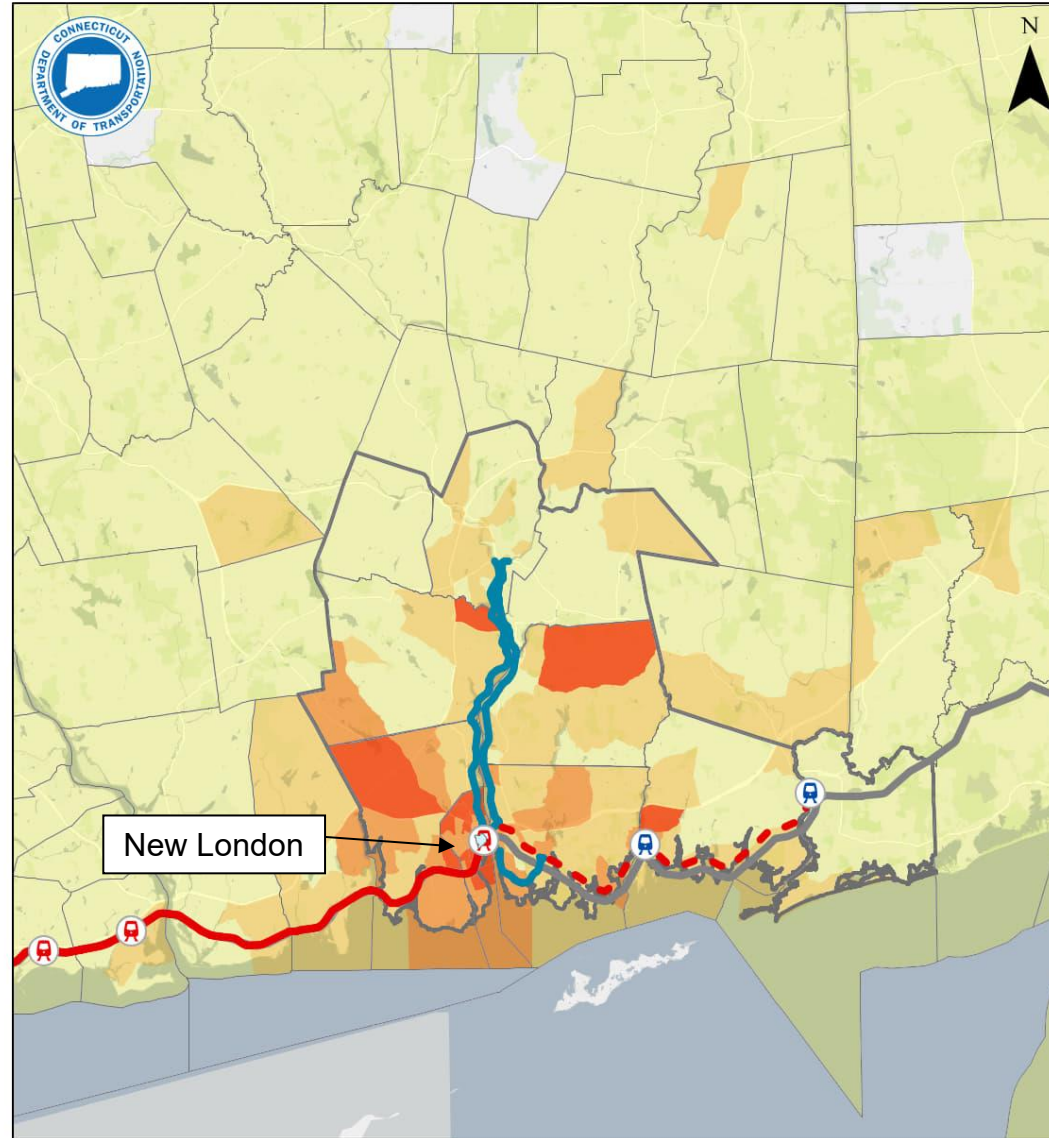
 29 - 78

 79 - 228

 229 - 417

 New London Center
Commute Center

0 3.75 7.5 15 Miles



Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021 New London Center-only destination

A.8. Norwich Center

Norwich Center includes a downtown core with a blend of employment and leisure destinations. Most trips ending in Norwich begin in the study area. The majority of people traveling to Norwich (69 percent) starting in Norwich. Montville and Ledyard produce large amounts of New London-bound traffic. Though traffic mostly comes from areas in the study area, Norwich regularly draws people from communities more than 50 miles away (Windsor Locks).

Table A-8 Average Daily Origin Traffic by Community – Norwich Center

Municipality	Average Daily Origin Traffic	Percentage of Total Activity Center Traffic
Norwich	2,033	57.4%
Montville	261	7.4%
Ledyard	133	3.8%
Groton	127	3.6%
New London	117	3.3%
Lisbon	101	2.8%
Griswold	88	2.5%
Waterford	77	2.2%
Preston	70	2.0%
All Other Municipalities	537	15.2%
Total	3,544	

Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021 New London center-only destination

Figure A-8 Norwich Origin Traffic Volumes

Eastern Connecticut Corridor Rail & Transit Feasibility Study

Norwich Center Origin Traffic Volumes

Legend

Study Area

 Study Area

Existing Stations

 Shore Line East Station

 Amtrak Station

Rail Lines

 Proposed Service Extension

 Shore Line East

 Possible Norwich Rail

 Northeast Corridor

 Connecticut & Rhode Island Towns

Average Daily Origin Traffic

 0 - 5

 6 - 24

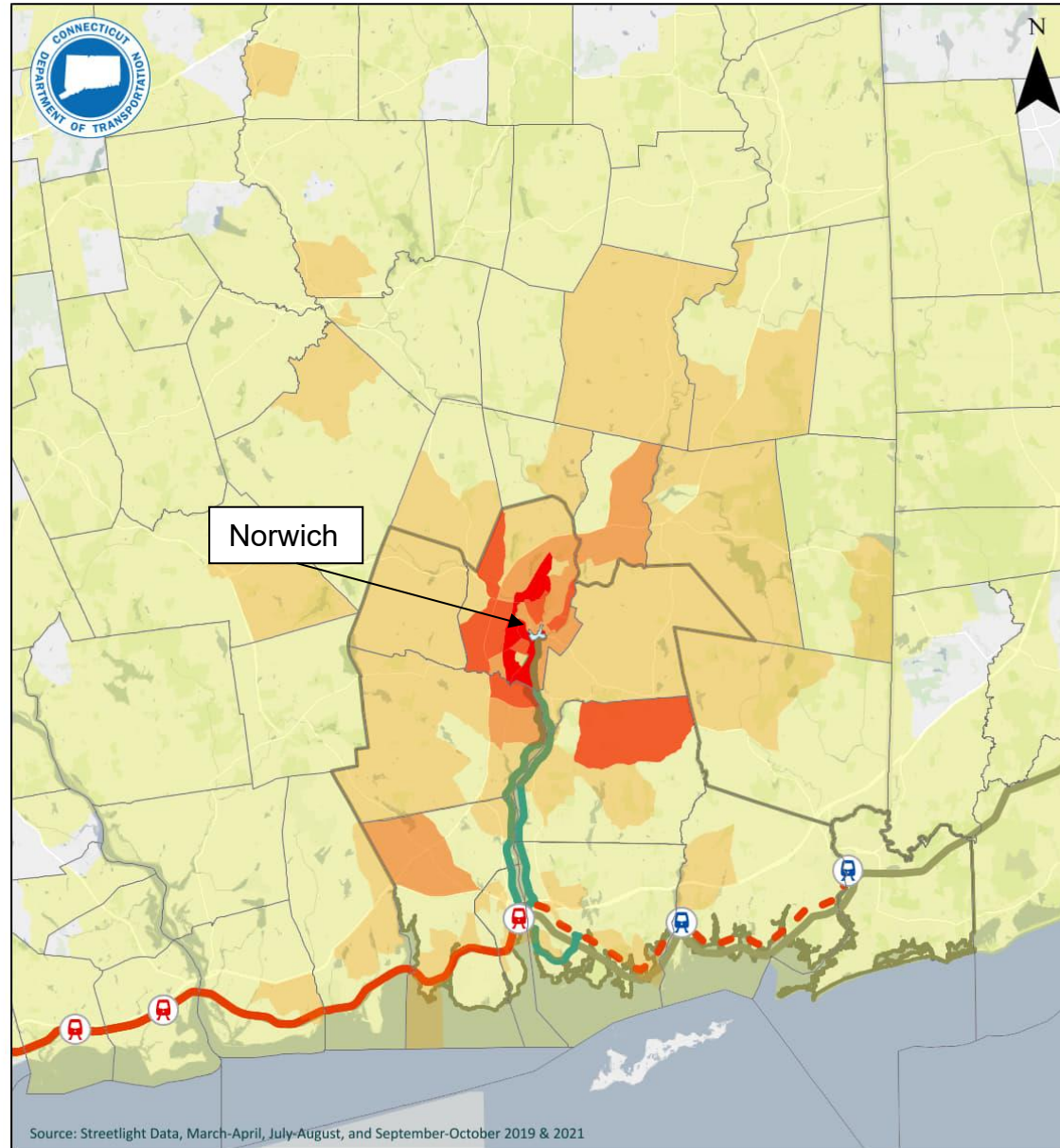
 25 - 58

 59 - 99

 100 - 177

 Norwich Center

0 3.75 7.5 15 Miles



A.9. Mystic

Mystic is a village located within Groton and Stonington. It includes a downtown core with a blend of employment and leisure destinations. Most trips ending in Mystic begin in the study area, with the majority beginning within Stonington and Groton (76.5 percent). Though traffic mostly is localized, Mystic regularly draws people from communities more than 66 miles away (Farmington).

Table A-9 Average Daily Origin Traffic by Community – Mystic

Municipality	Average Daily Origin Traffic	Percentage of Total Activity Center Traffic
Stonington	3,198	44.2%
Groton	2,337	32.3%
New London	328	4.5%
Waterford	315	4.4%
Westerly	299	4.1%
Ledyard	272	3.8%
East Lyme	163	2.3%
North Stonington	117	1.6%
Norwich	103	1.4%
All Other Municipalities	102	1.4%
Total	7,234	

Source: Streetlight Data, March-April, July-August, and September-October 2019 & 2021 New London center-only destination

Figure A-9 Mystic Activity Center Origin Traffic Volumes

Eastern Connecticut Corridor Rail & Transit Feasibility Study

Mystic Commute Center Origin Traffic Volumes **Legend**

Study Area

Study Area

Existing Stations

Shore Line East Station

Amtrak Station

Rail Lines

Proposed Service Extension

Shore Line East

Possible Norwich Rail

Northeast Corridor

Connecticut & Rhode Island Towns

Legend

Average Daily Origin Traffic

0 - 20

21 - 87

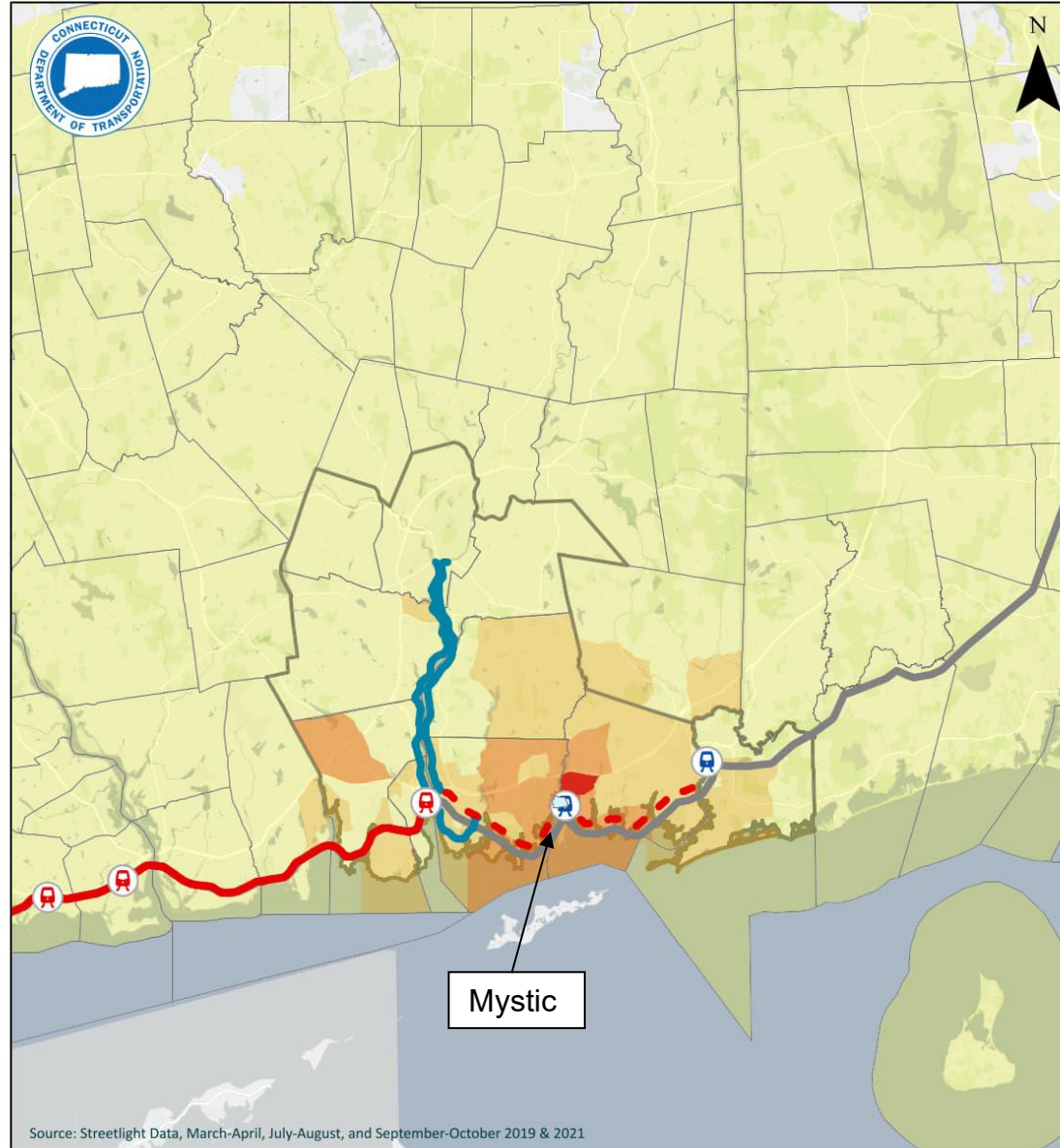
88 - 319

320 - 618

619 - 1,263

Mystic Commute Center

0 3.75 7.5 15 Miles





Eastern Connecticut Corridor Rail and Transit Feasibility Study (ECRTS)

Appendix A: Existing Conditions Report, Exhibit B

November 2023

Prepared by

AECOM Technical Services, Inc.
WSP USA, Inc.
STV Group, Inc.
Freeman Companies, LLC
Goman + York Property Advisors, LLC

AECOM

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 1 of 27

Legend

Study Area

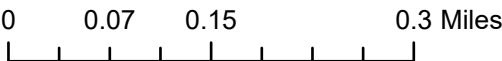
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 2 of 27

Legend

Study Area

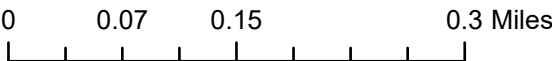
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 3 of 27

Legend

Study Area

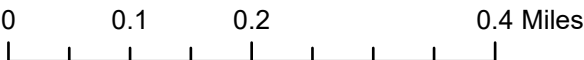
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 4 of 27

Legend

Study Area

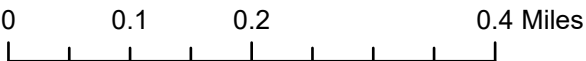
- Municipal Boundary
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Rail Infrastructure

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- Proposed Norwich Rail
- NEC

Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 5 of 27

Legend

Study Area

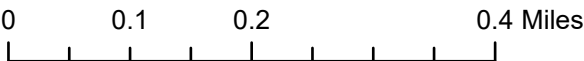
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Rail Infrastructure

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- NEC

Wetland Soils

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- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 6 of 27

Legend

Study Area

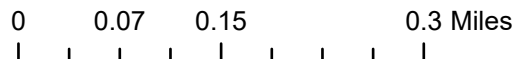
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Rail Infrastructure

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Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 7 of 27

Legend

Study Area

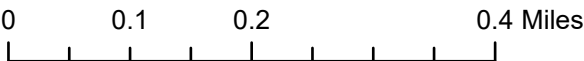
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Rail Infrastructure

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- Shore Line East
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- Proposed Norwich Rail
- NEC

Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 8 of 27

Legend

Study Area

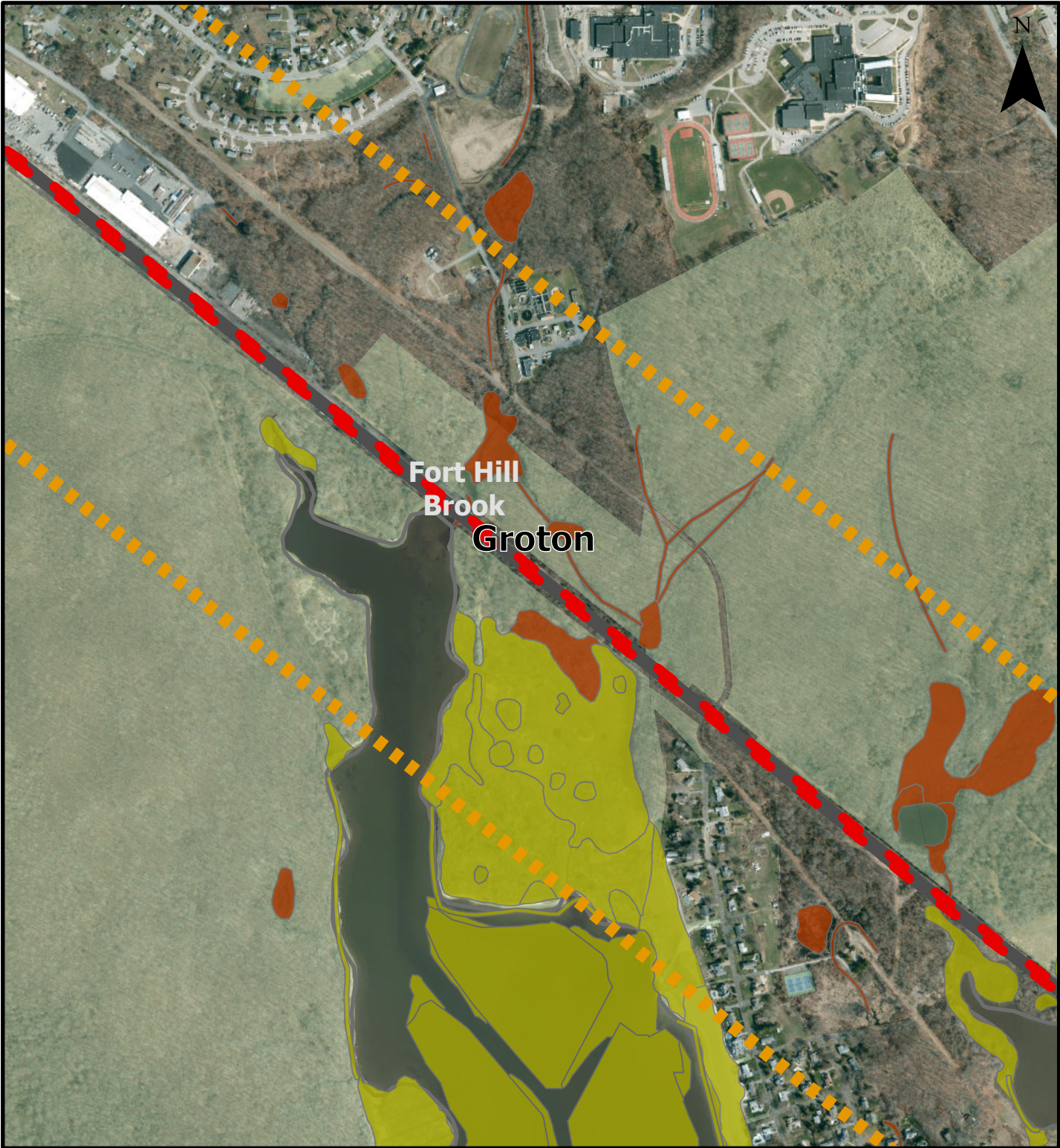
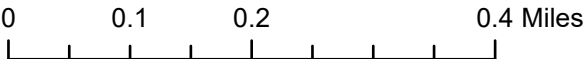
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Rail Infrastructure

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- Proposed Norwich Rail
- NEC

Wetland Soils

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- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 9 of 27

Legend

Study Area

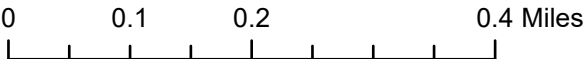
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Rail Infrastructure

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Wetland Soils

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- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 10 of 27

Legend

Study Area

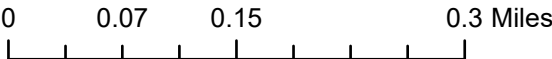
- Municipal Boundary
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Rail Infrastructure

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Wetland Soils

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- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 11 of 27

Legend

Study Area

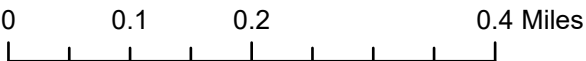
- Municipal Boundary
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Rail Infrastructure

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- NEC

Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 12 of 27

Legend

Study Area

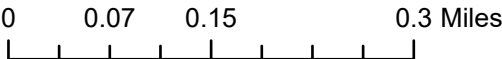
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
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- Proposed Norwich Rail
- NEC

Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 13 of 27

Legend

Study Area

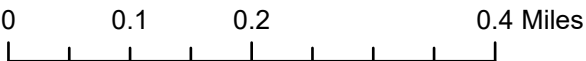
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Rail Infrastructure

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Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 14 of 27

Legend

Study Area

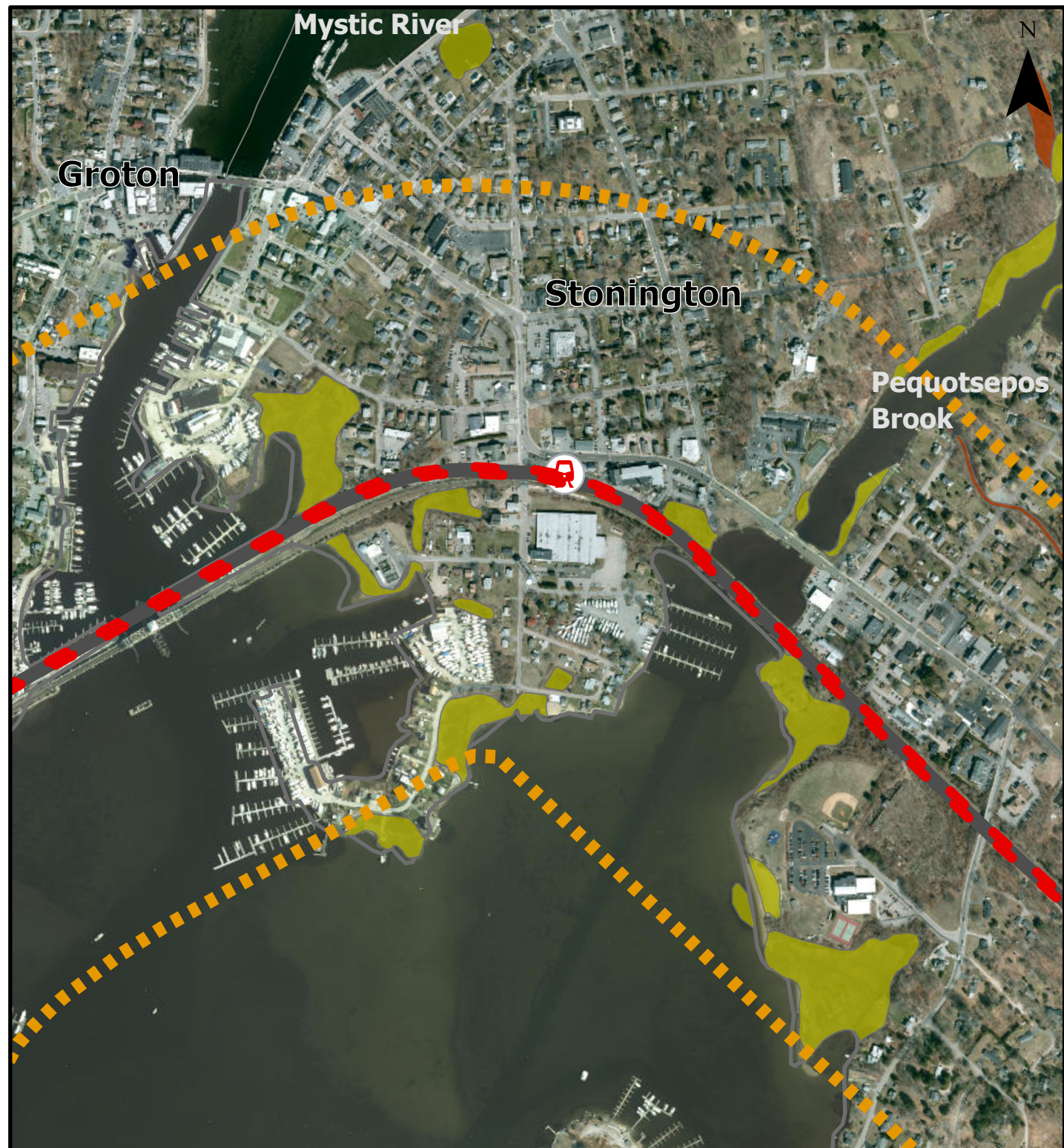
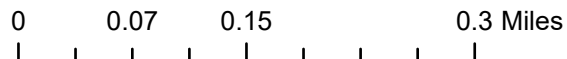
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

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-  NEC

Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 15 of 27

Legend

Study Area

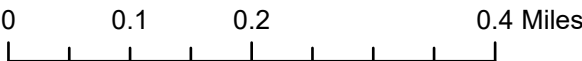
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Rail Infrastructure

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Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 16 of 27

Legend

Study Area

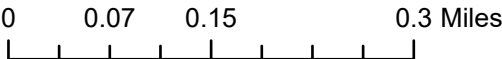
- Municipal Boundary
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Rail Infrastructure

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- NEC

Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 17 of 27

Legend

Study Area

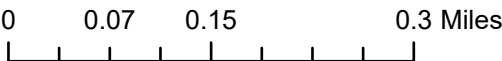
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Rail Infrastructure

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Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 18 of 27

Legend

Study Area

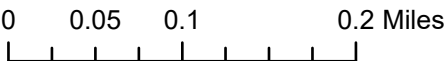
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

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- NEC

Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 19 of 27

Legend

Study Area

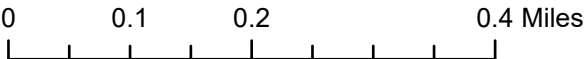
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

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- NEC

Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 20 of 27

Legend

Study Area

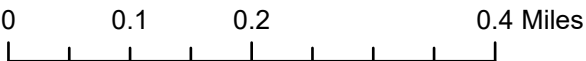
- Municipal Boundary
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Rail Infrastructure

- Existing Rail Stations
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- NEC

Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 21 of 27

Legend

Study Area

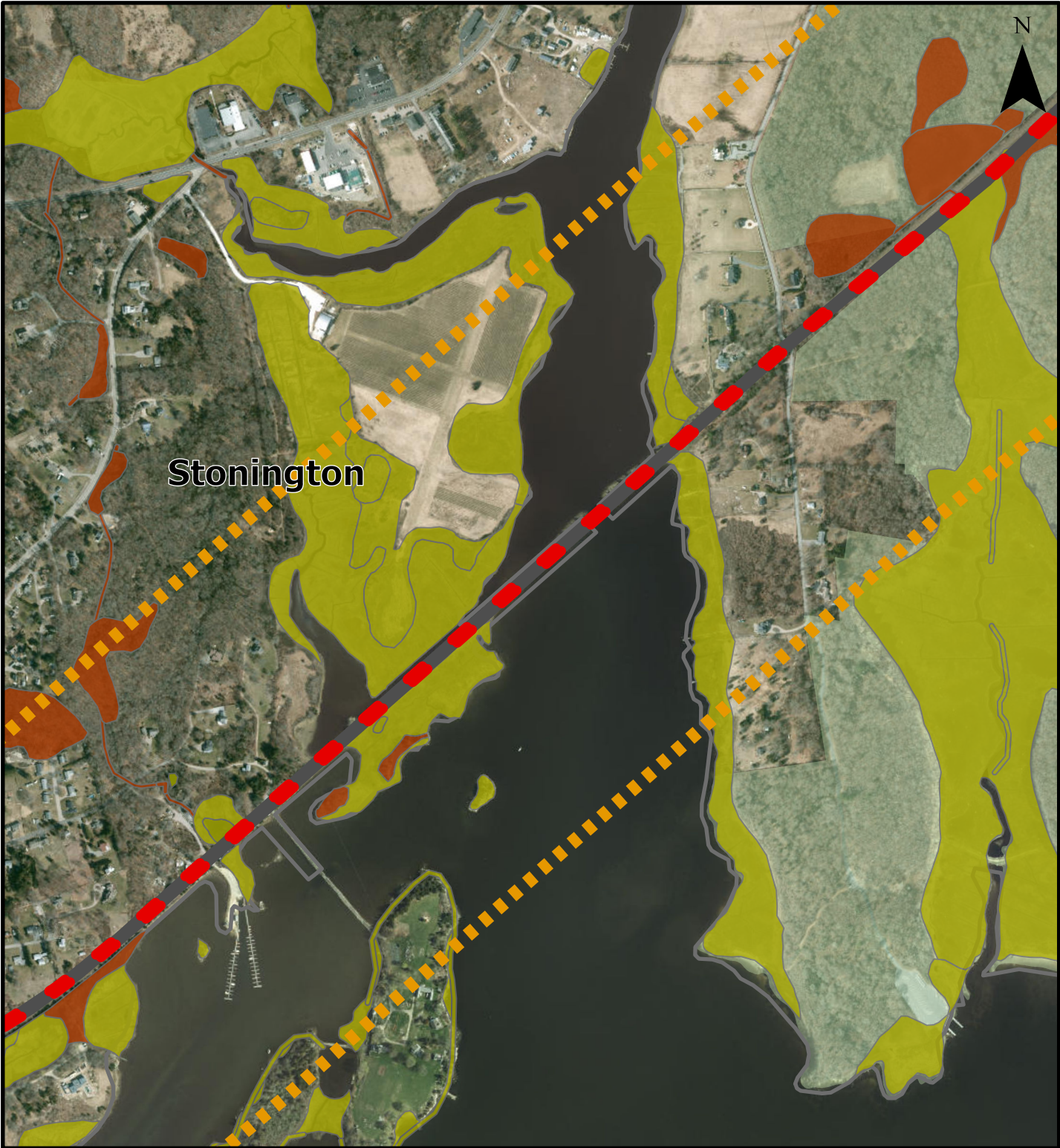
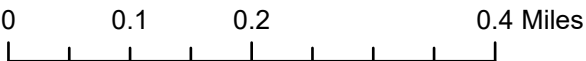
- Municipal Boundary
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Rail Infrastructure

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Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 22 of 27

Legend

Study Area

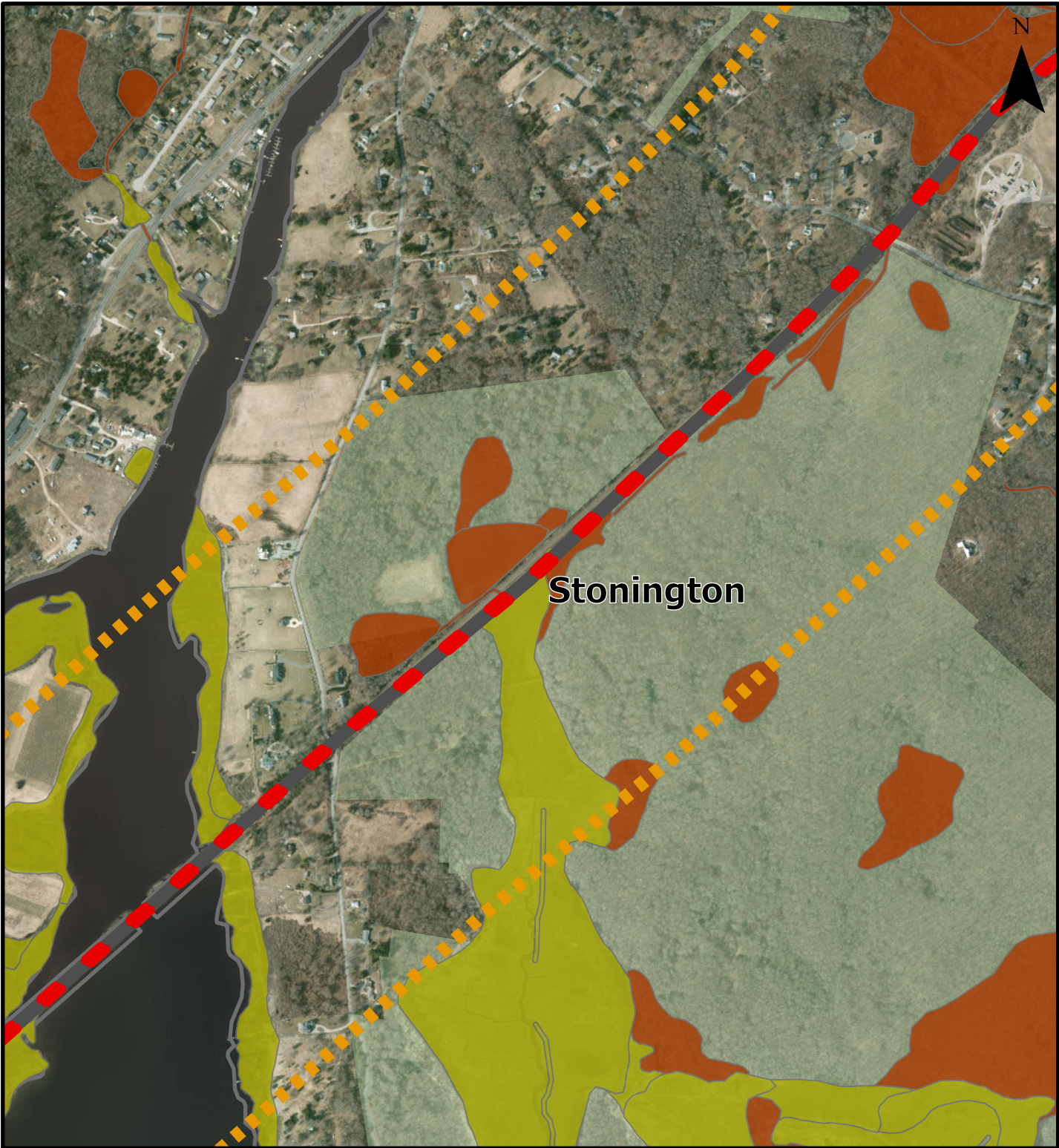
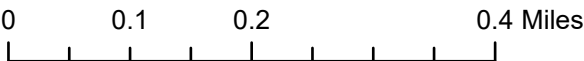
- Municipal Boundary
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Rail Infrastructure

- Existing Rail Stations
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- NEC

Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 23 of 27

Legend

Study Area

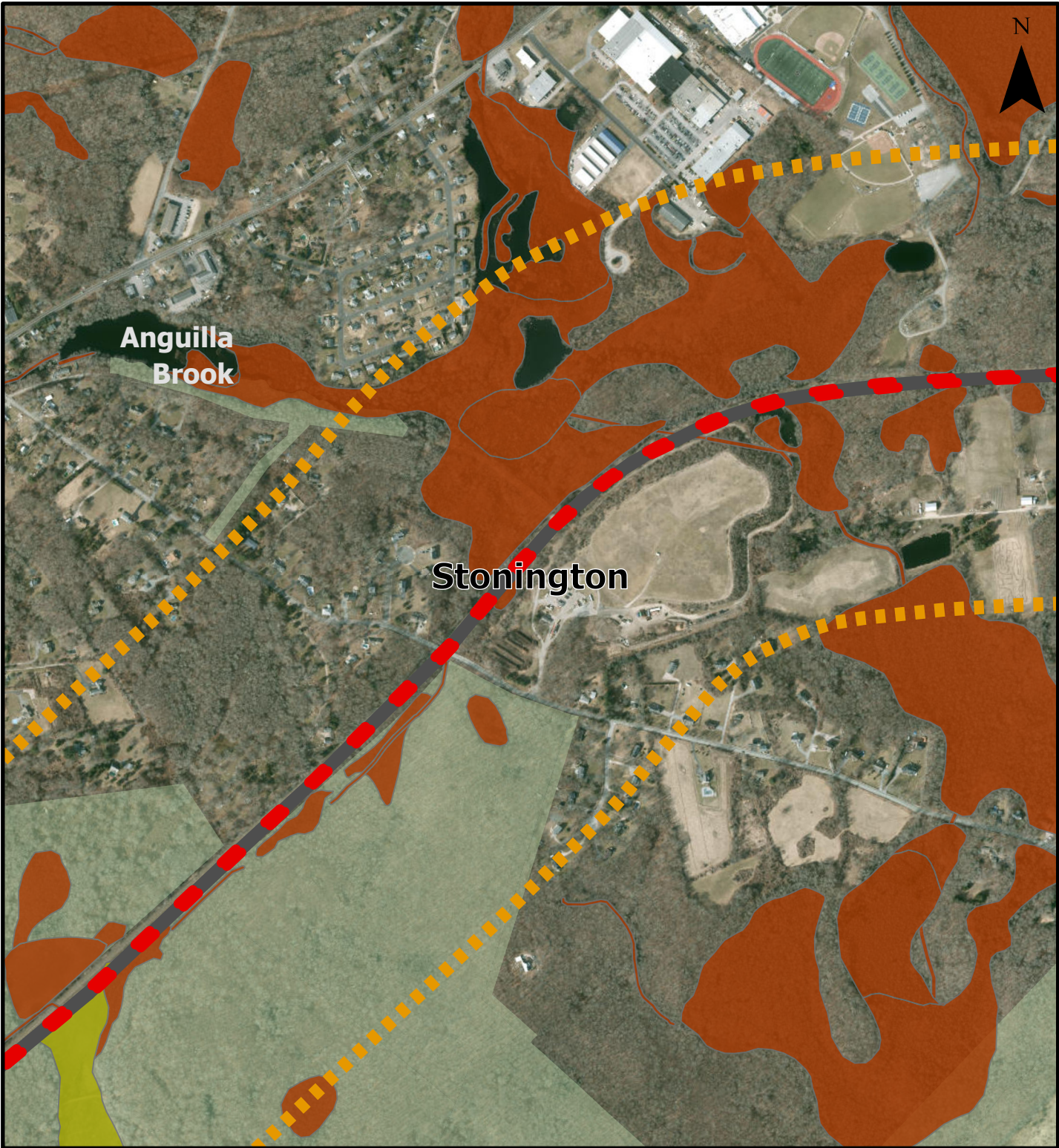
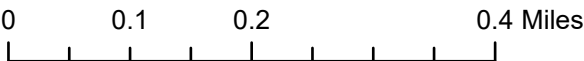
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Rail Infrastructure

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- NEC

Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 24 of 27

Legend

Study Area

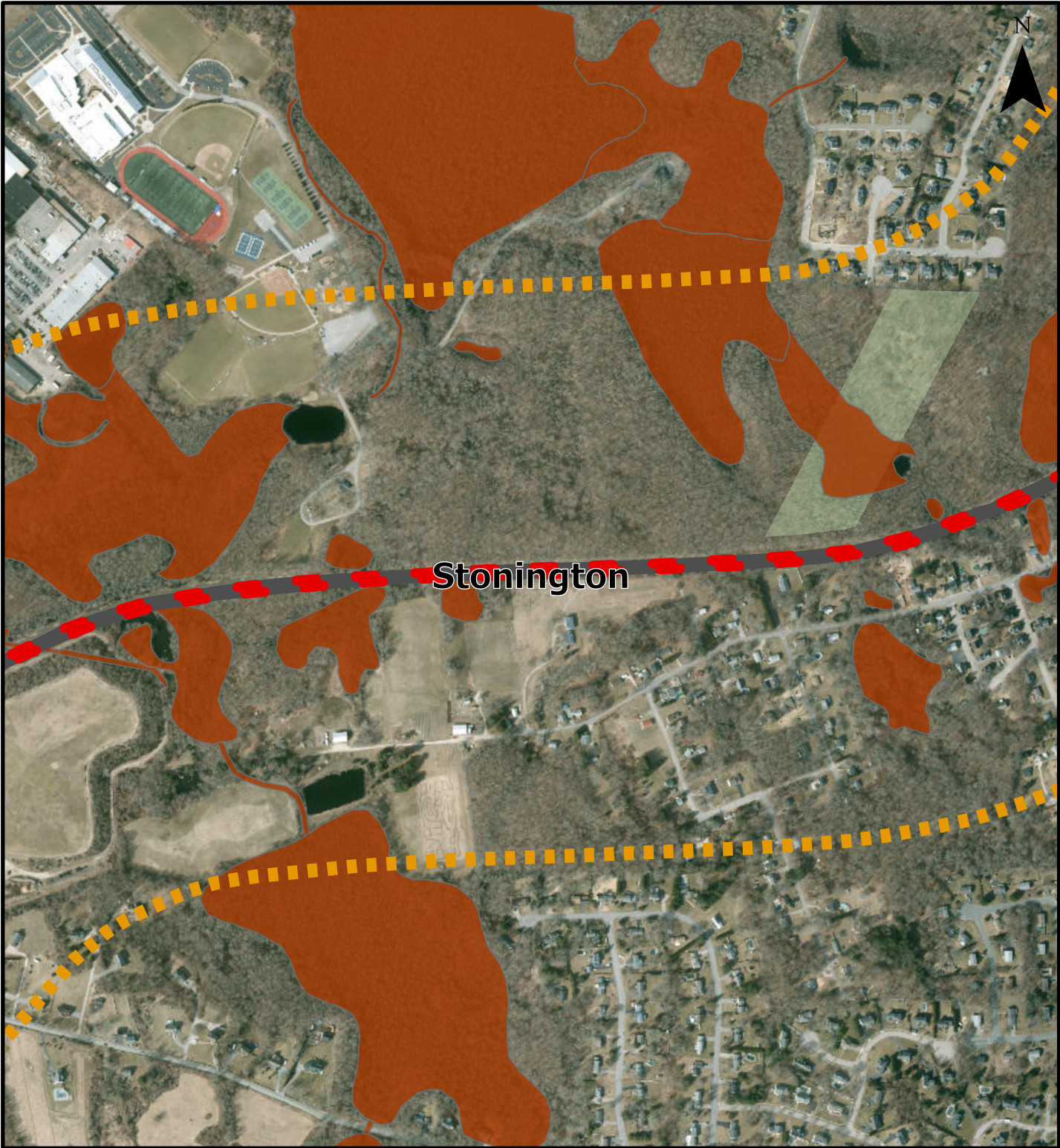
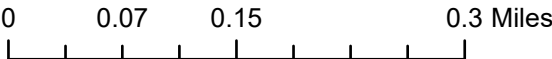
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Rail Infrastructure

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Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 25 of 27

Legend

Study Area

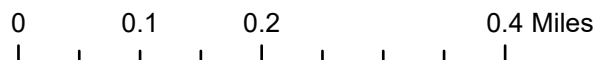
-  Municipal Boundary
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Rail Infrastructure

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-  NEC

Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 26 of 27

Legend

Study Area

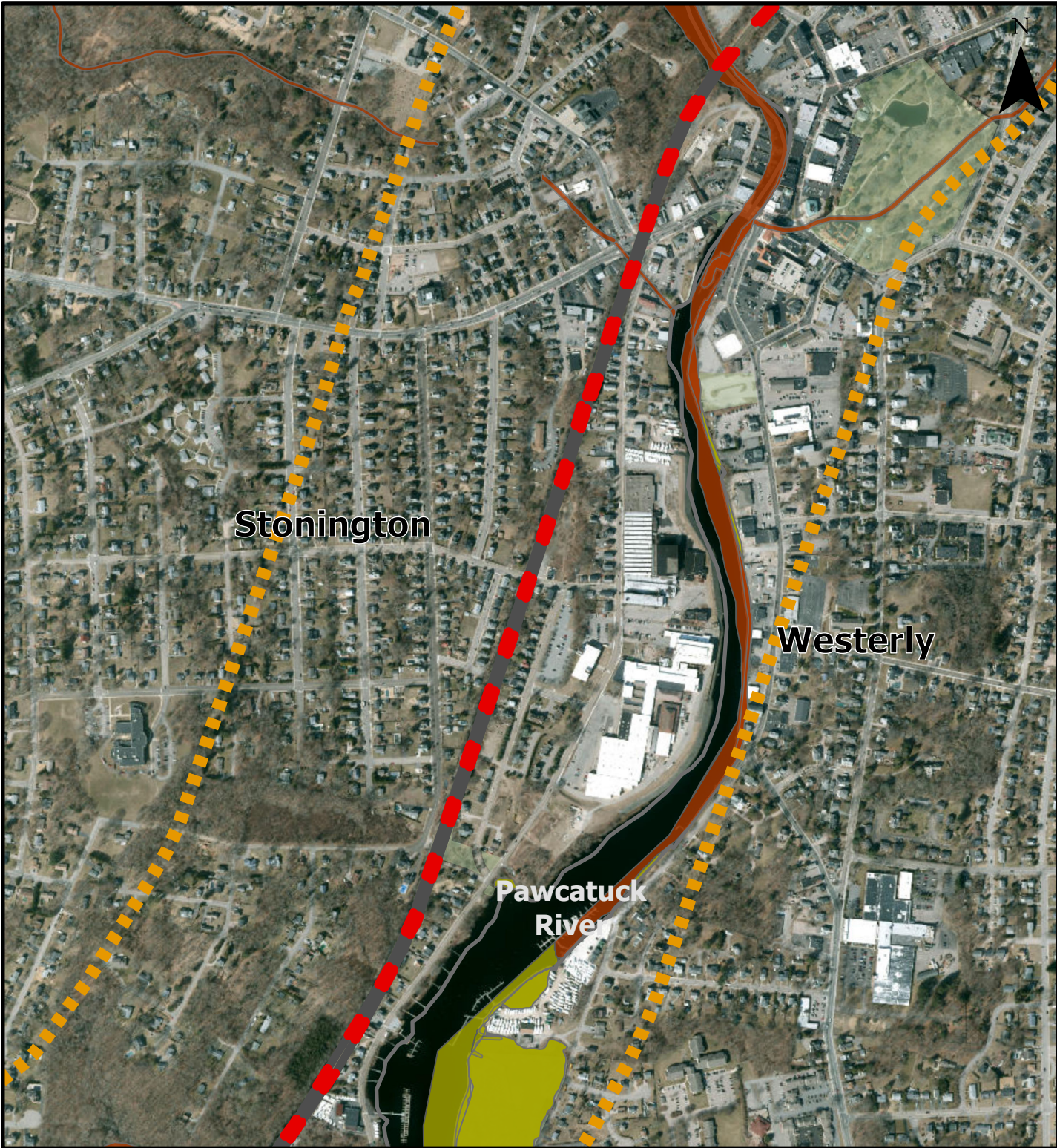
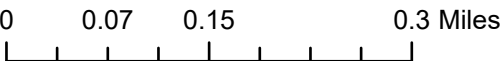
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Rail Infrastructure

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Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

SLE Extension Page 27 of 27

Legend

Study Area

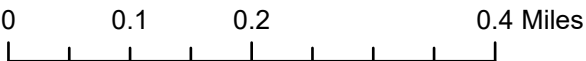
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Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Sources: CTDEEP National Wetlands Inventory; RIGIS National Wetlands Inventory

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 1 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

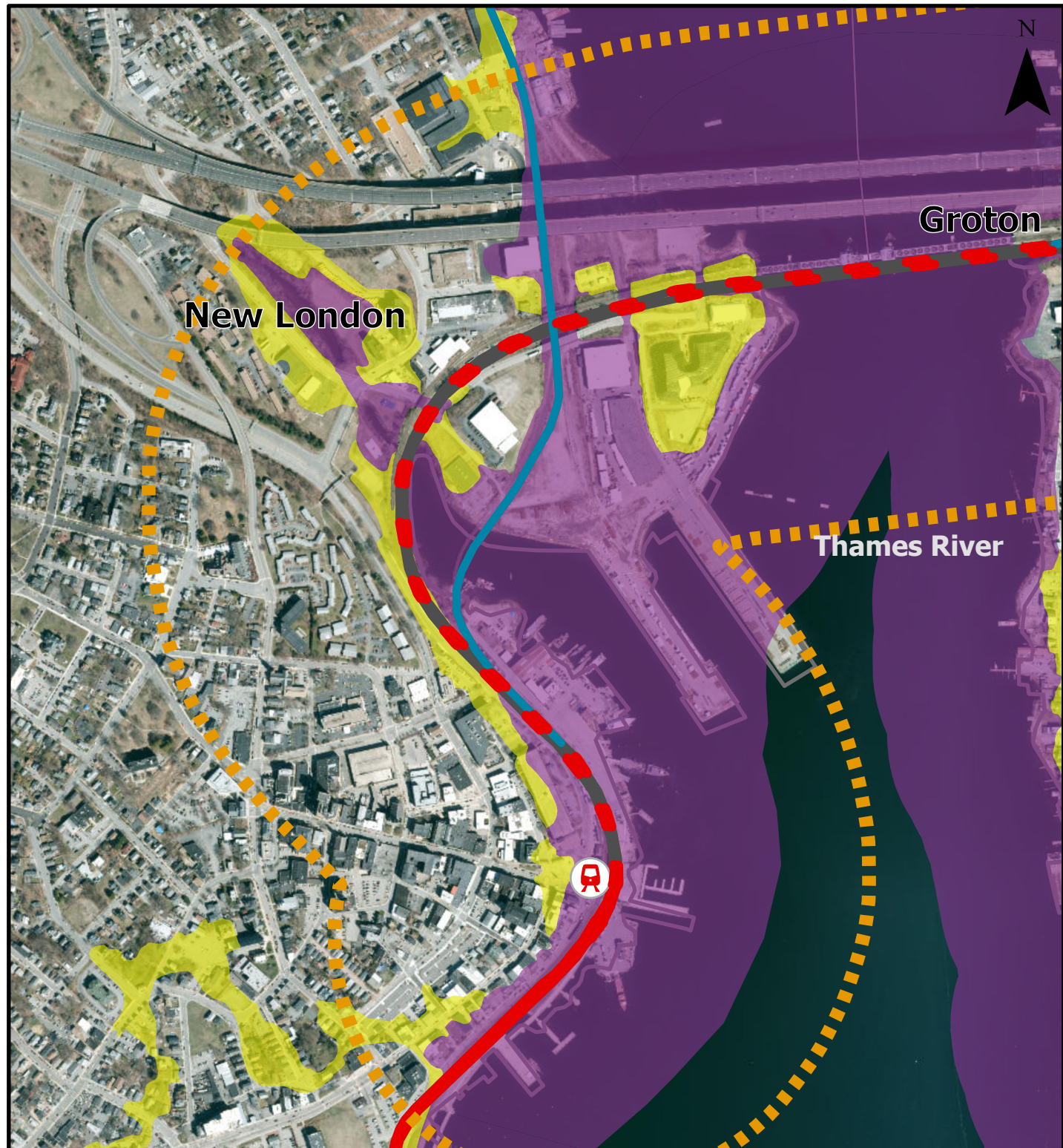
-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



0 0.07 0.15 0.3 Miles



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 2 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

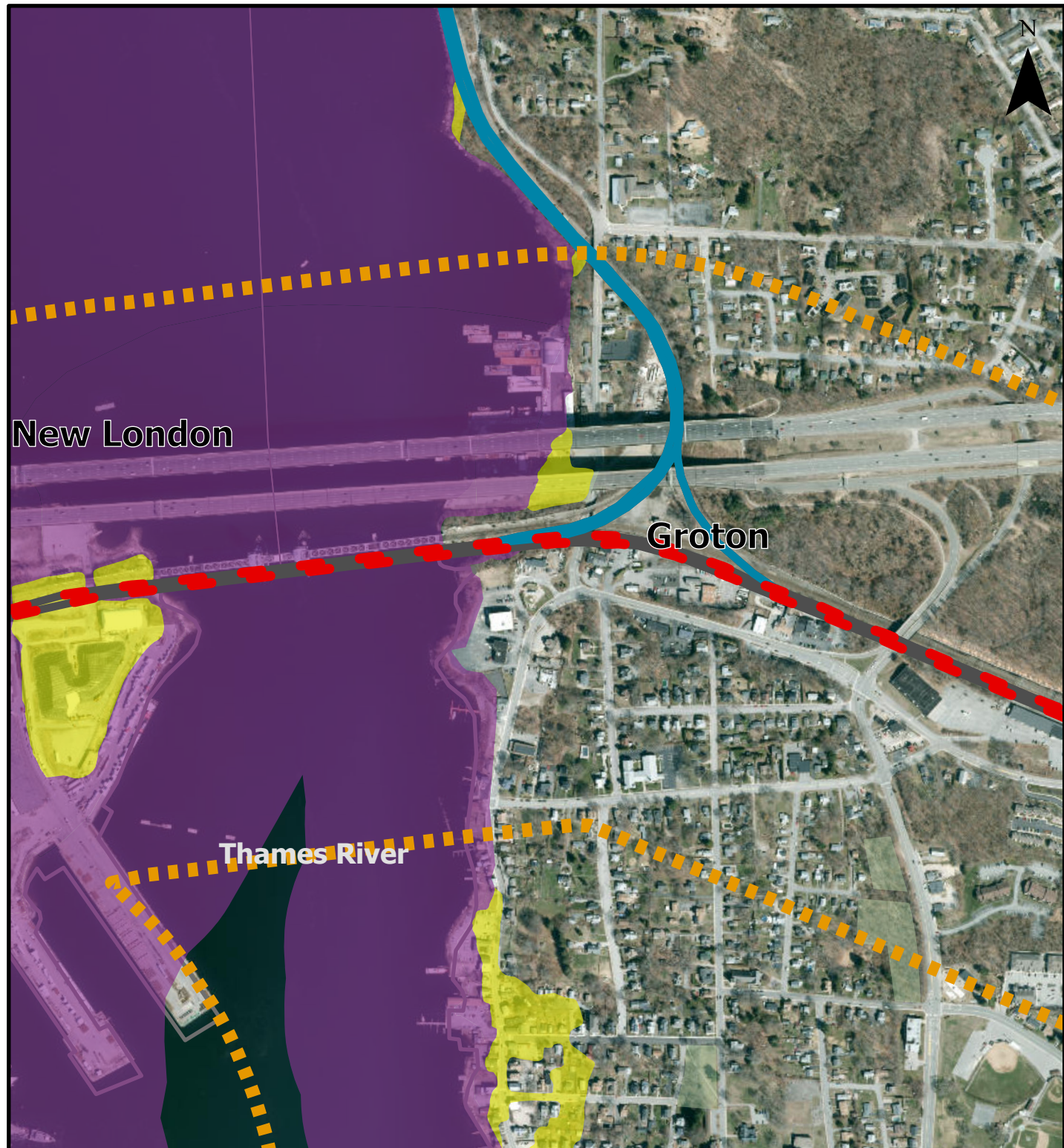
-  Existing Rail Stations
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Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



0 0.07 0.15 0.3 Miles



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 3 of 27

Legend

Study Area

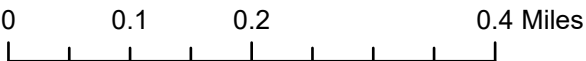
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Rail Infrastructure

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Federal Emergency Managment Administration Flood Hazard

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- Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 4 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

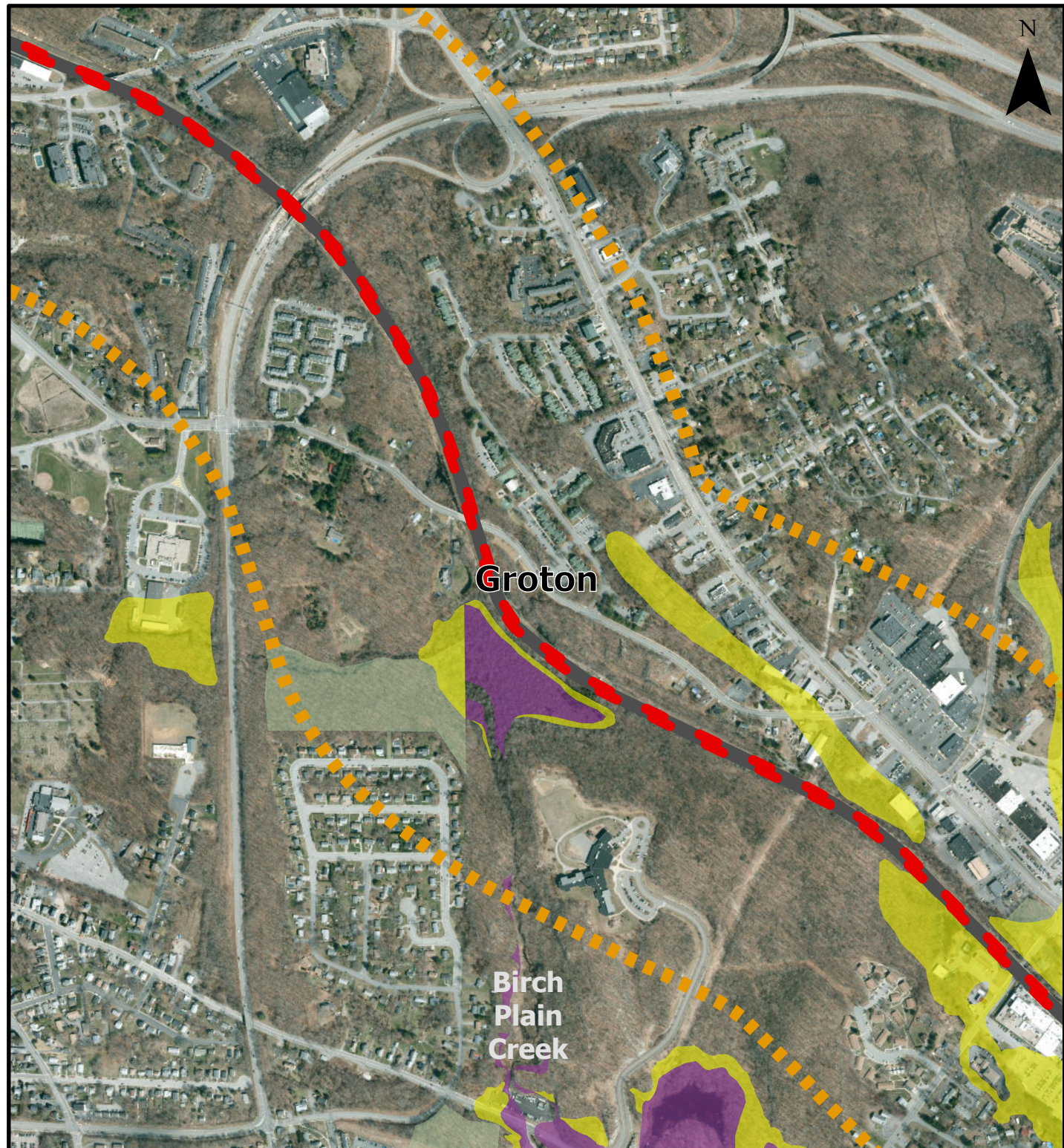
-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



0 0.1 0.2 0.4 Miles



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 5 of 27

Legend

Study Area

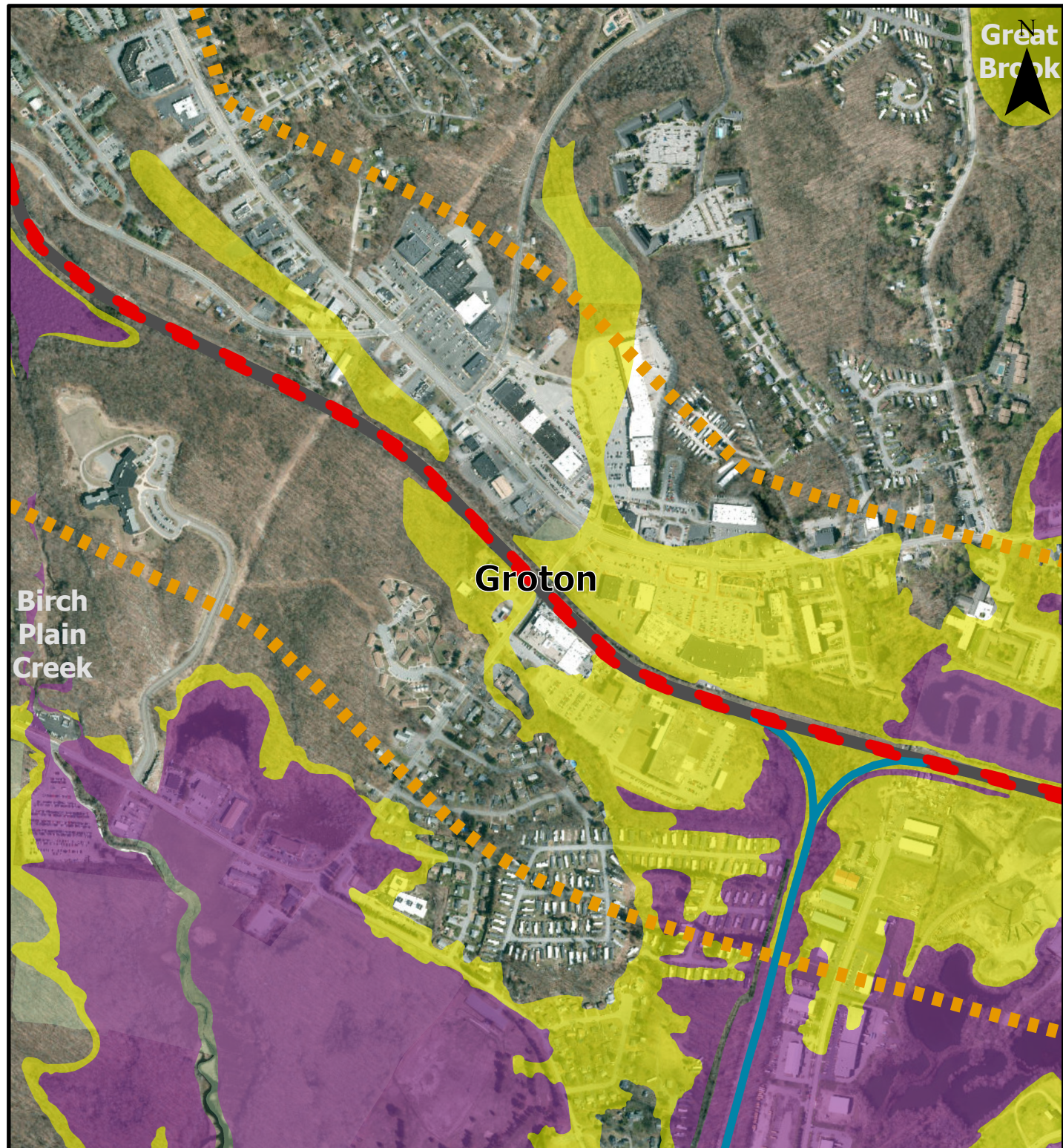
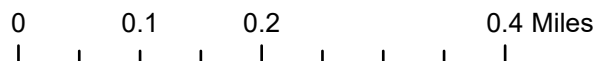
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 6 of 27

Legend

Study Area

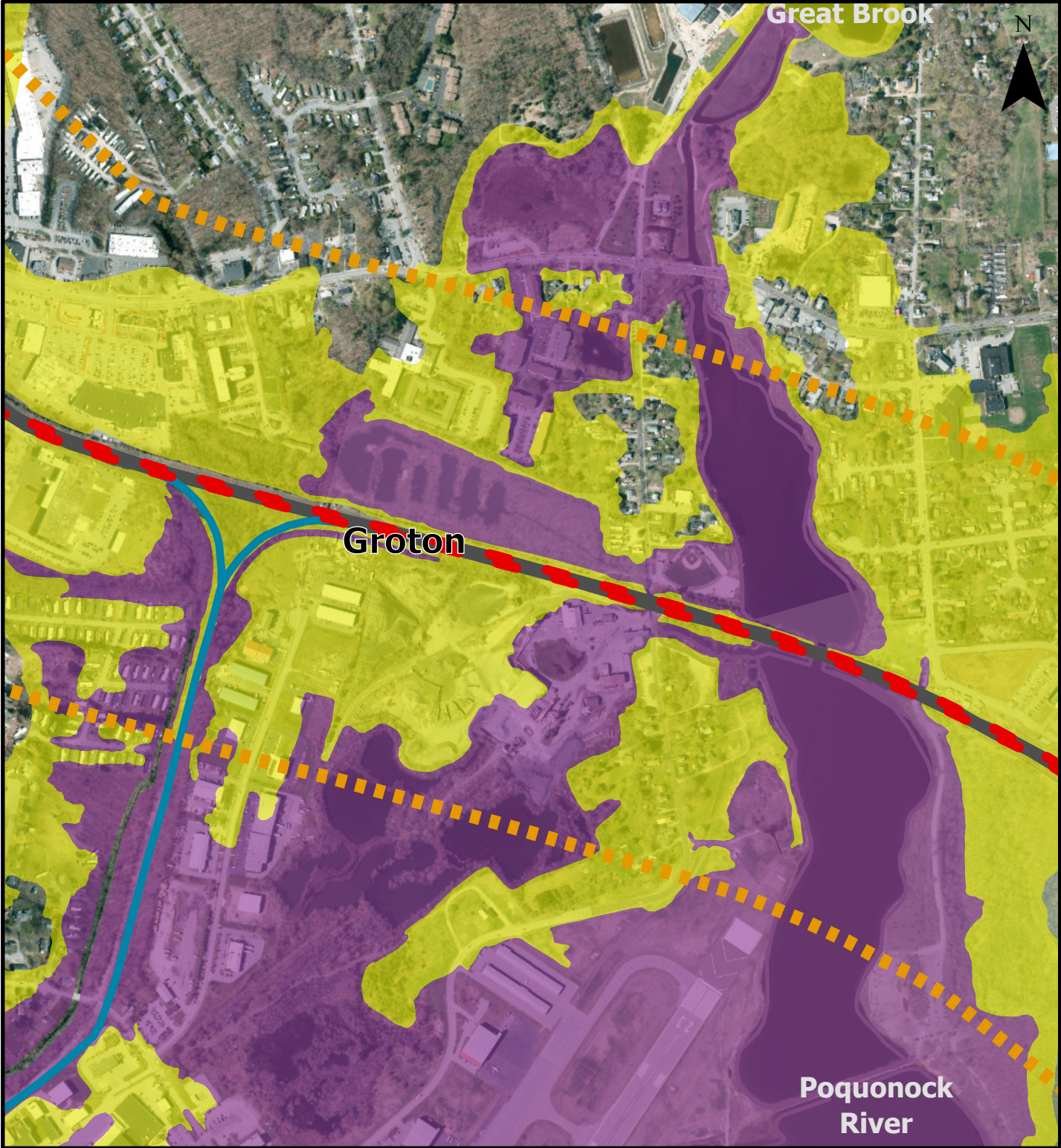
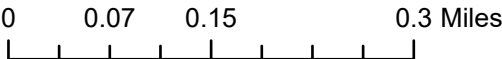
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Federal Emergency Managment Administration Flood Hazard

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance
Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 7 of 27

Legend

Study Area

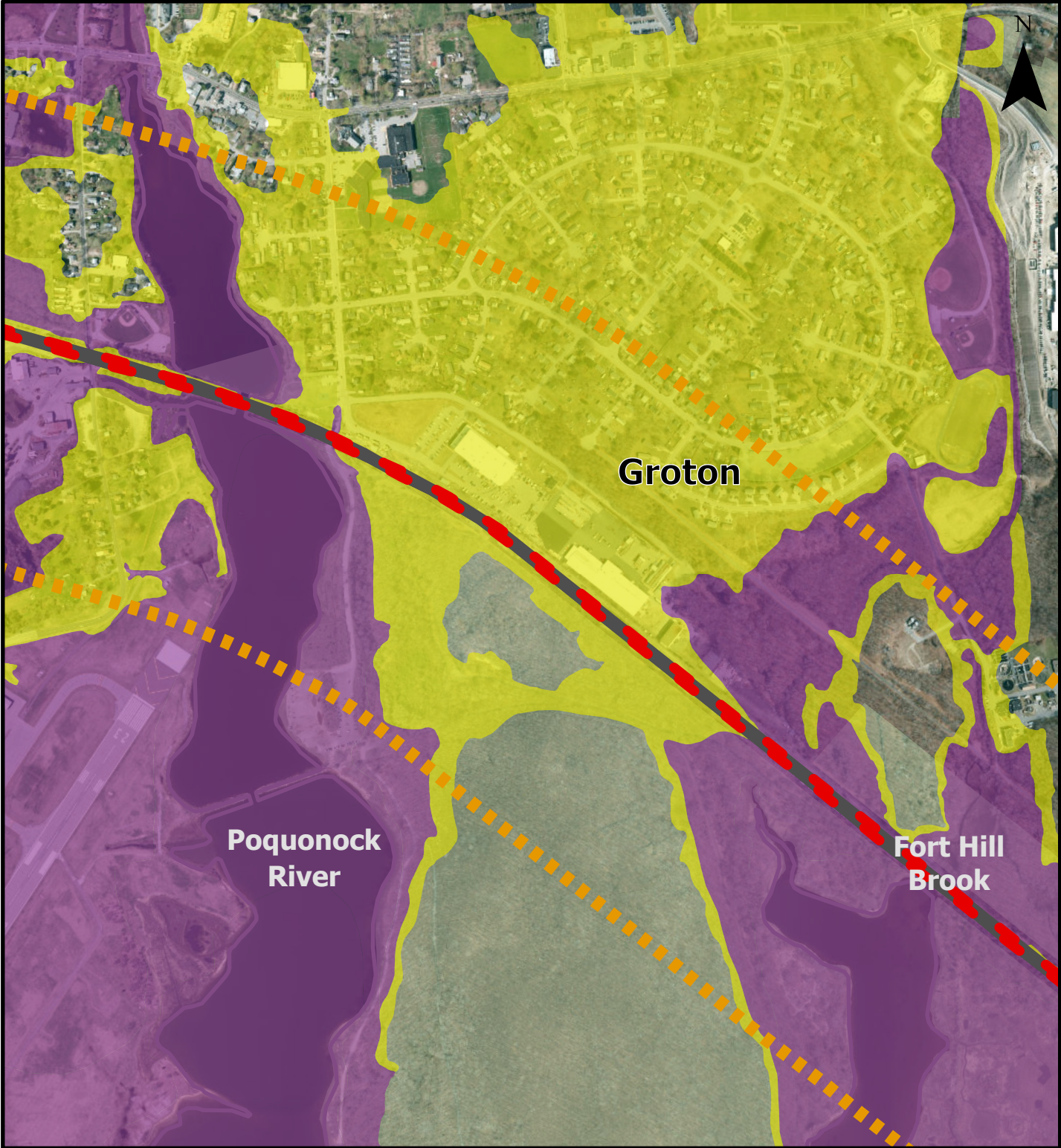
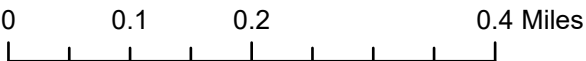
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Federal Emergency Managment Administration Flood Hazard

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 8 of 27

Legend

Study Area

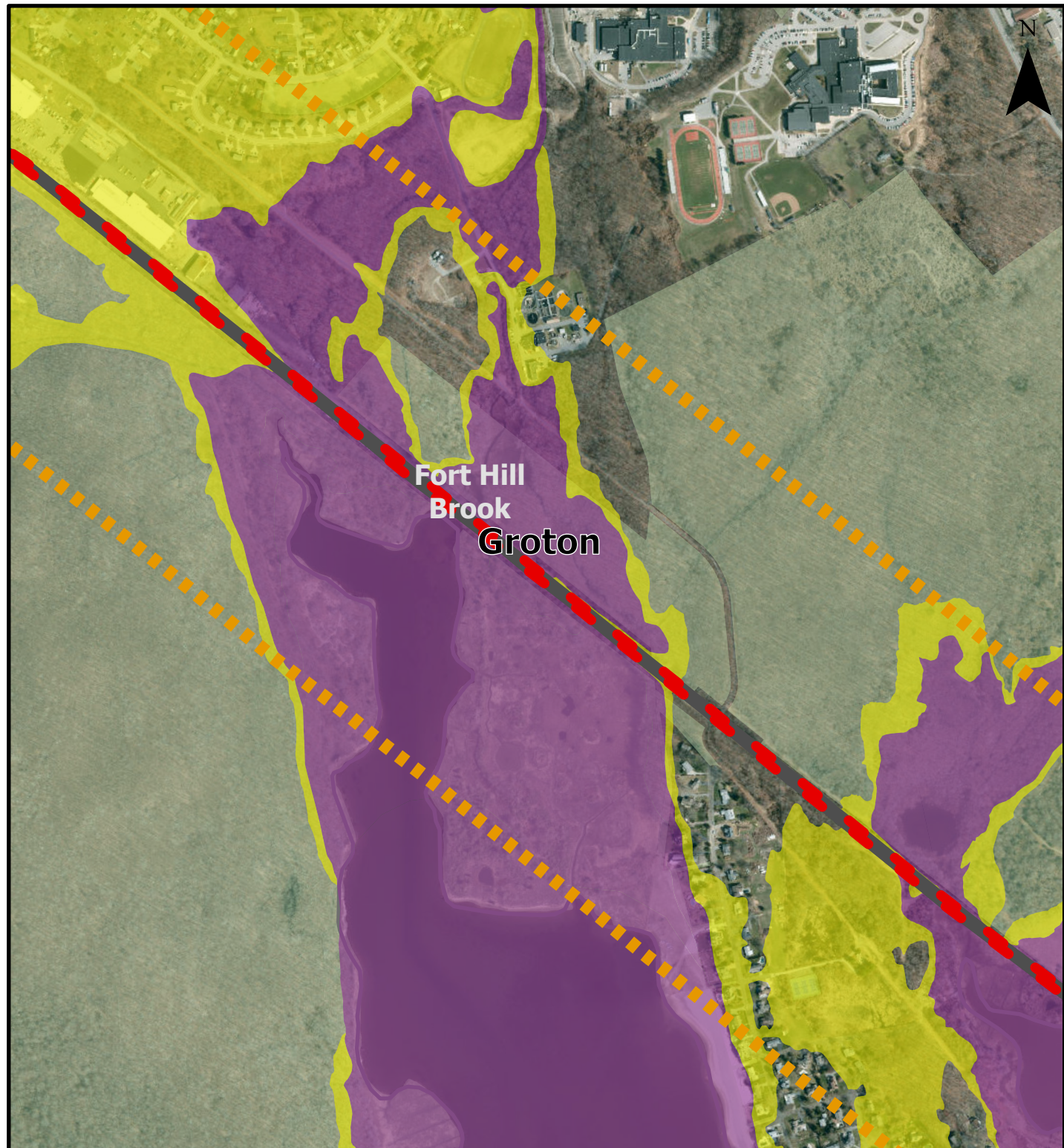
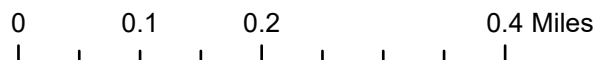
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Managment Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 9 of 27

Legend

Study Area

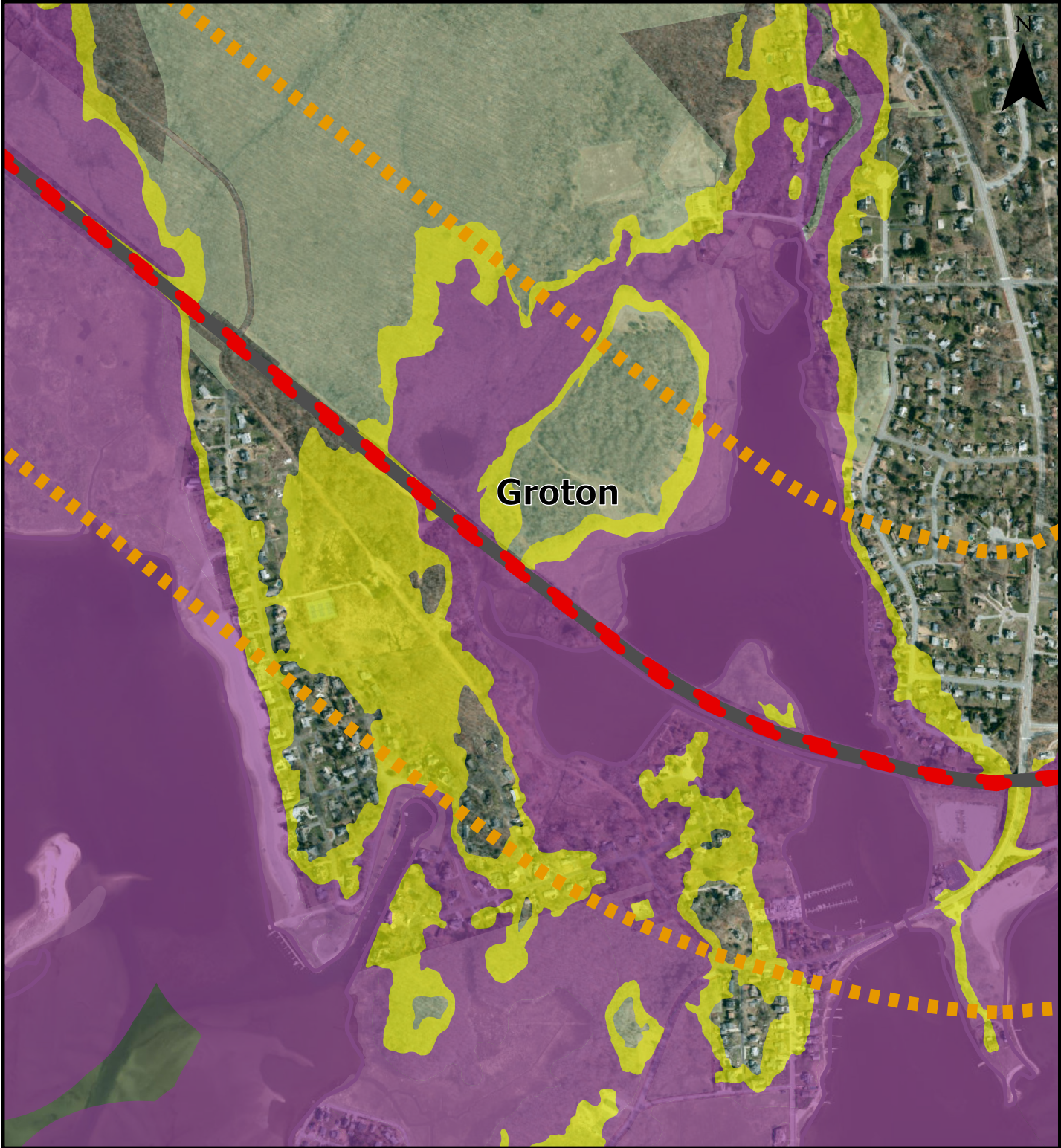
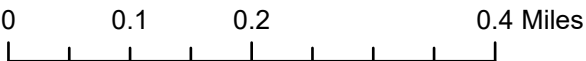
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Federal Emergency Managment Administration Flood Hazard

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 10 of 27

Legend

Study Area

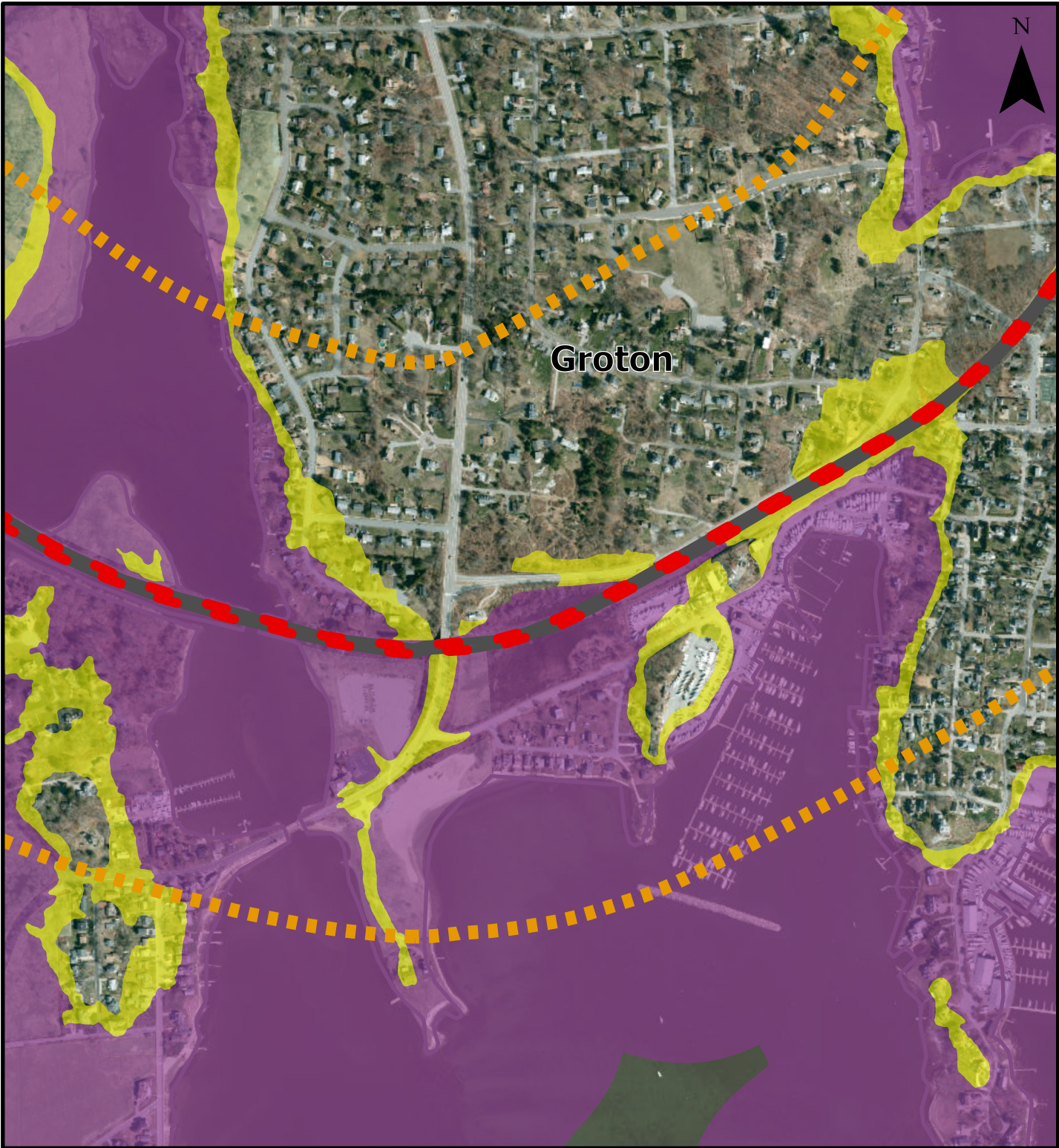
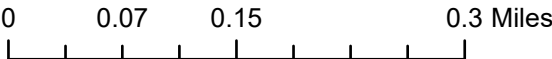
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Federal Emergency Managment Administration Flood Hazard

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 11 of 27

Legend

Study Area

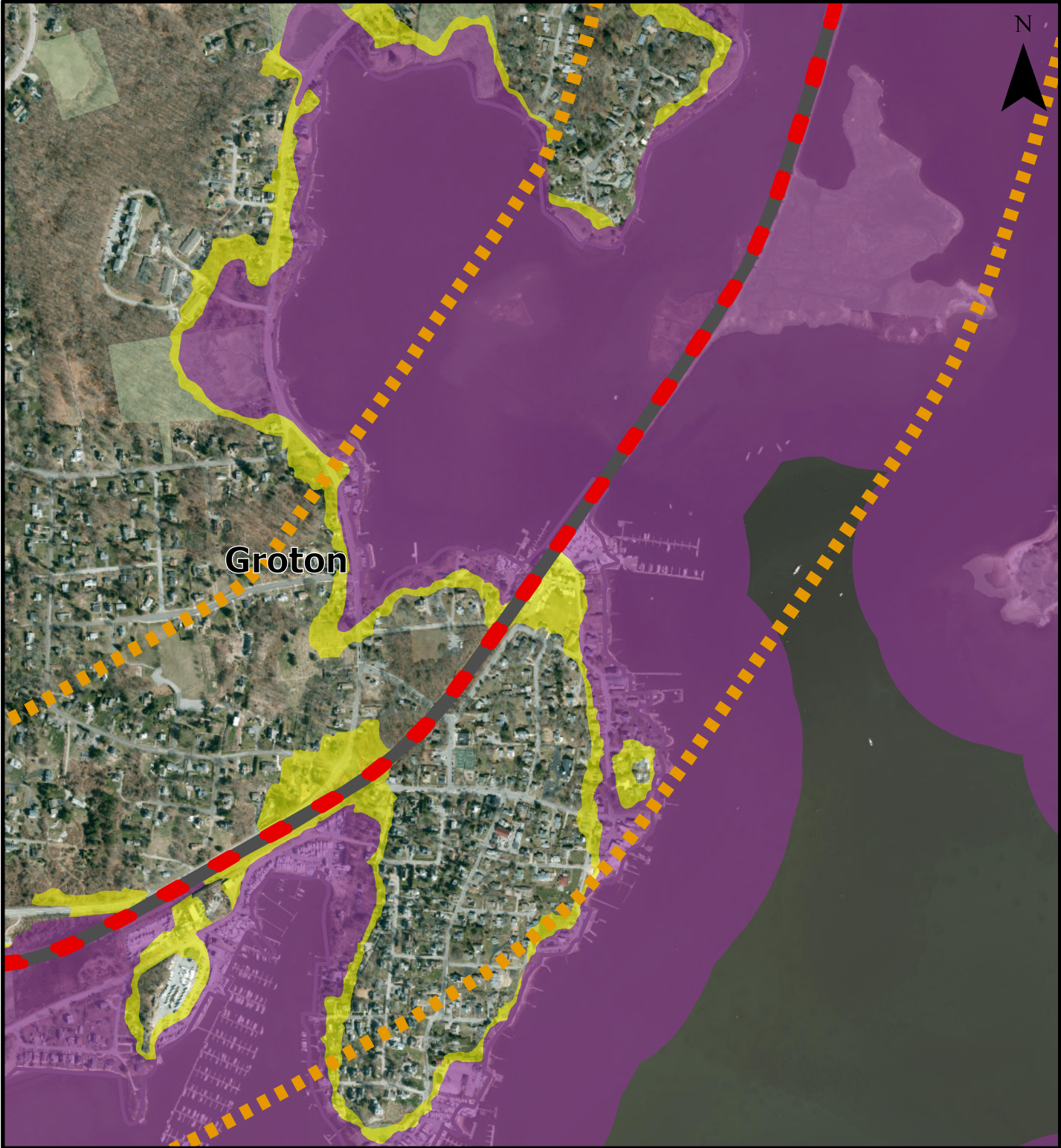
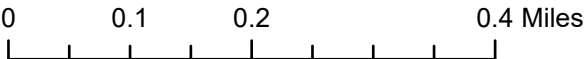
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Federal Emergency Managment Administration Flood Hazard

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 12 of 27

Legend

Study Area

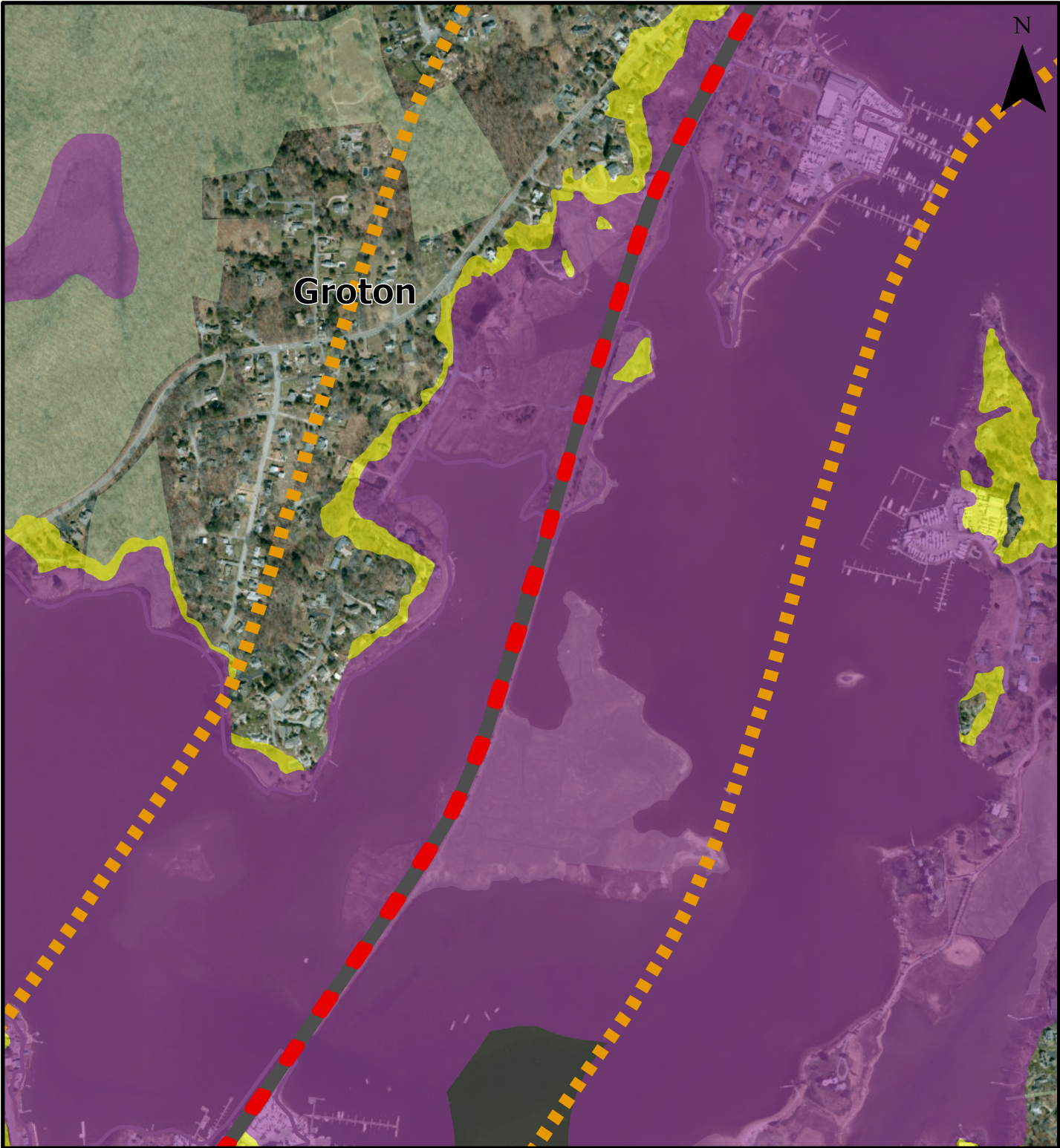
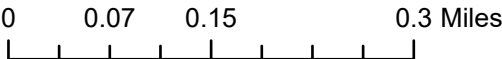
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Federal Emergency Managment Administration Flood Hazard

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 13 of 27

Legend

Study Area

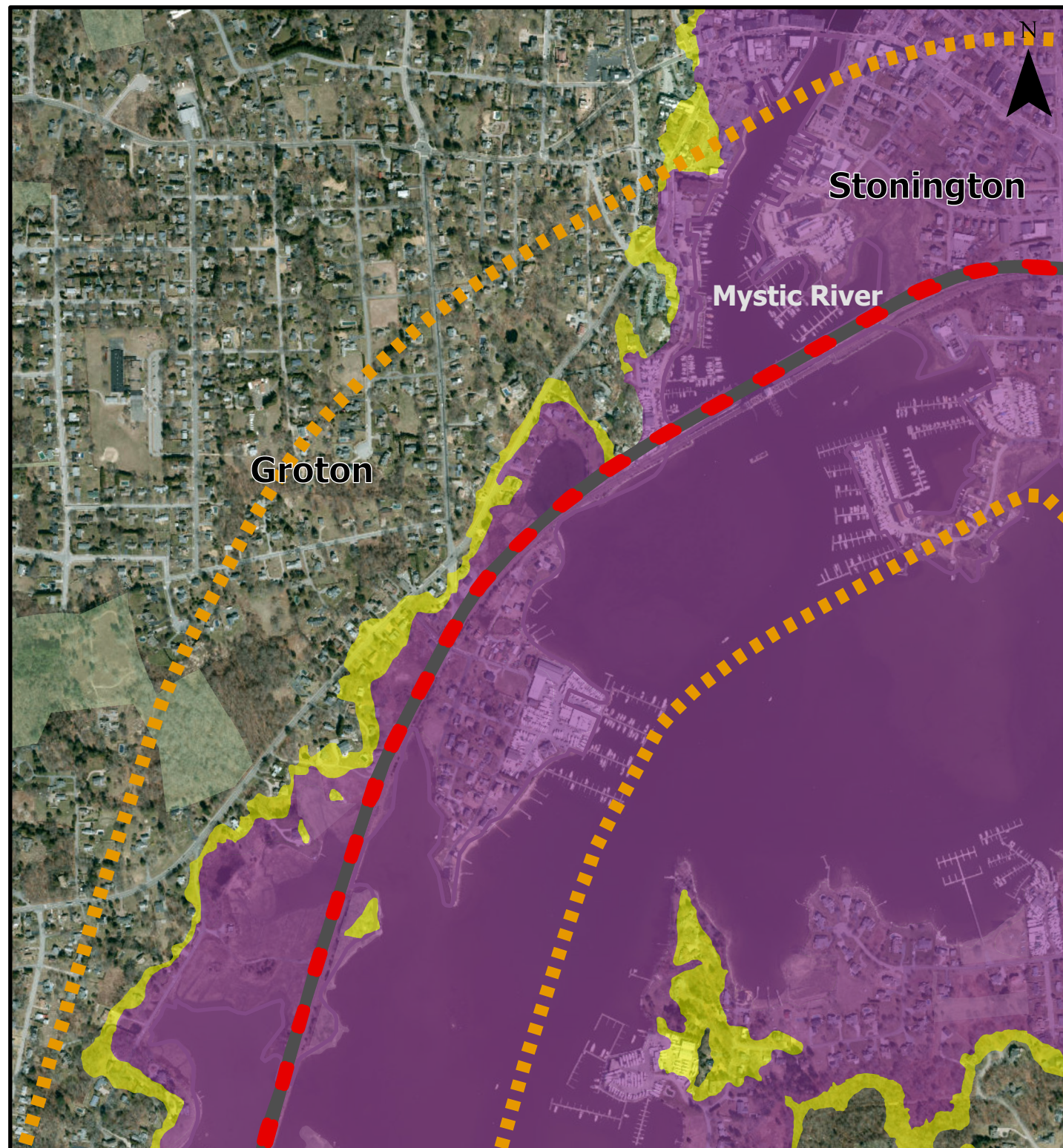
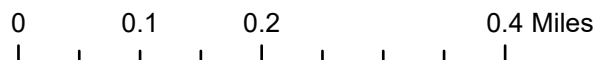
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 14 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

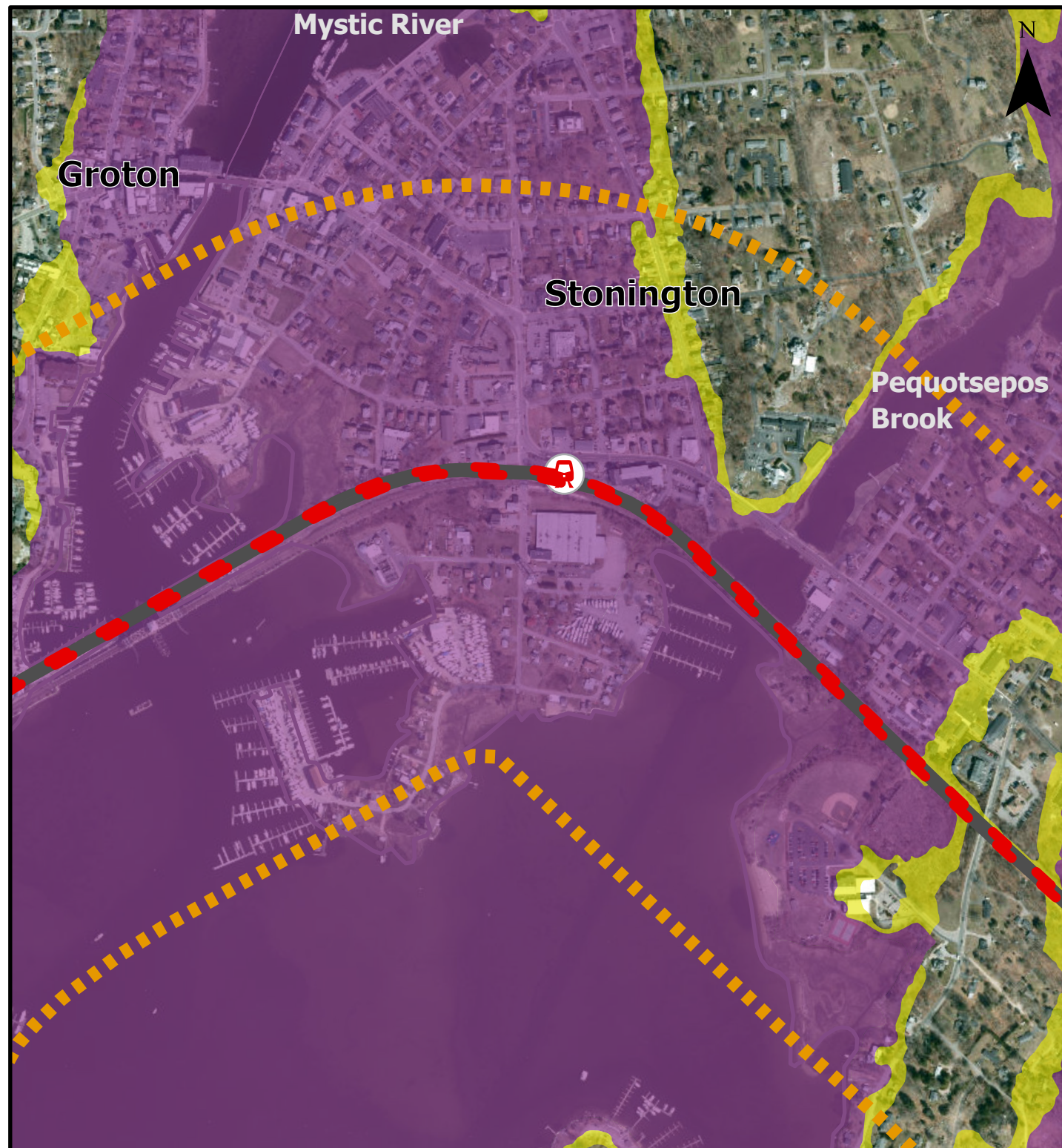
-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



0 0.07 0.15 0.3 Miles



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 15 of 27

Legend

Study Area

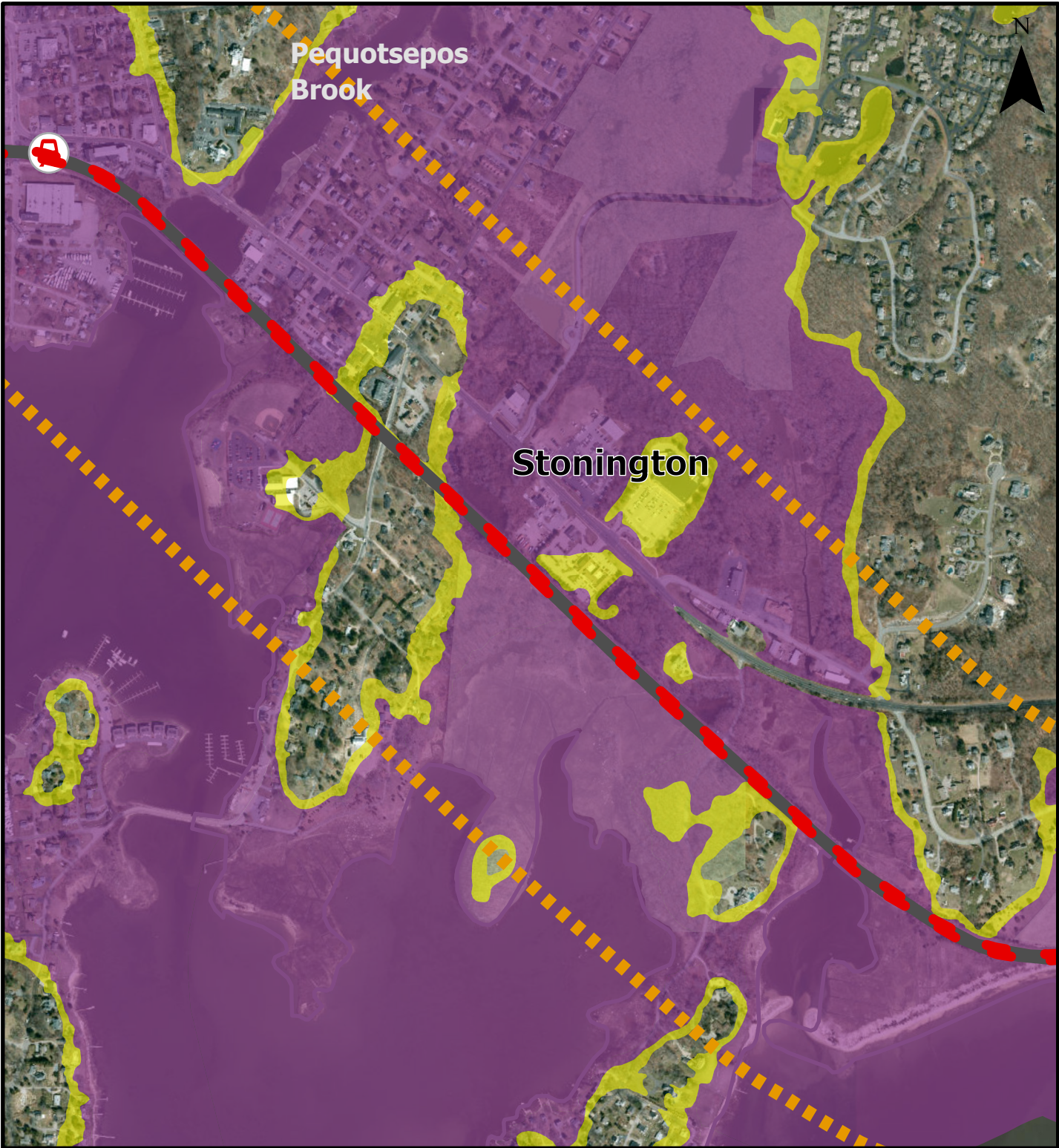
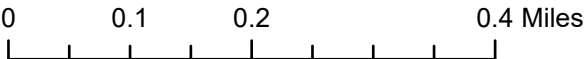
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Federal Emergency Managment Administration Flood Hazard

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 16 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

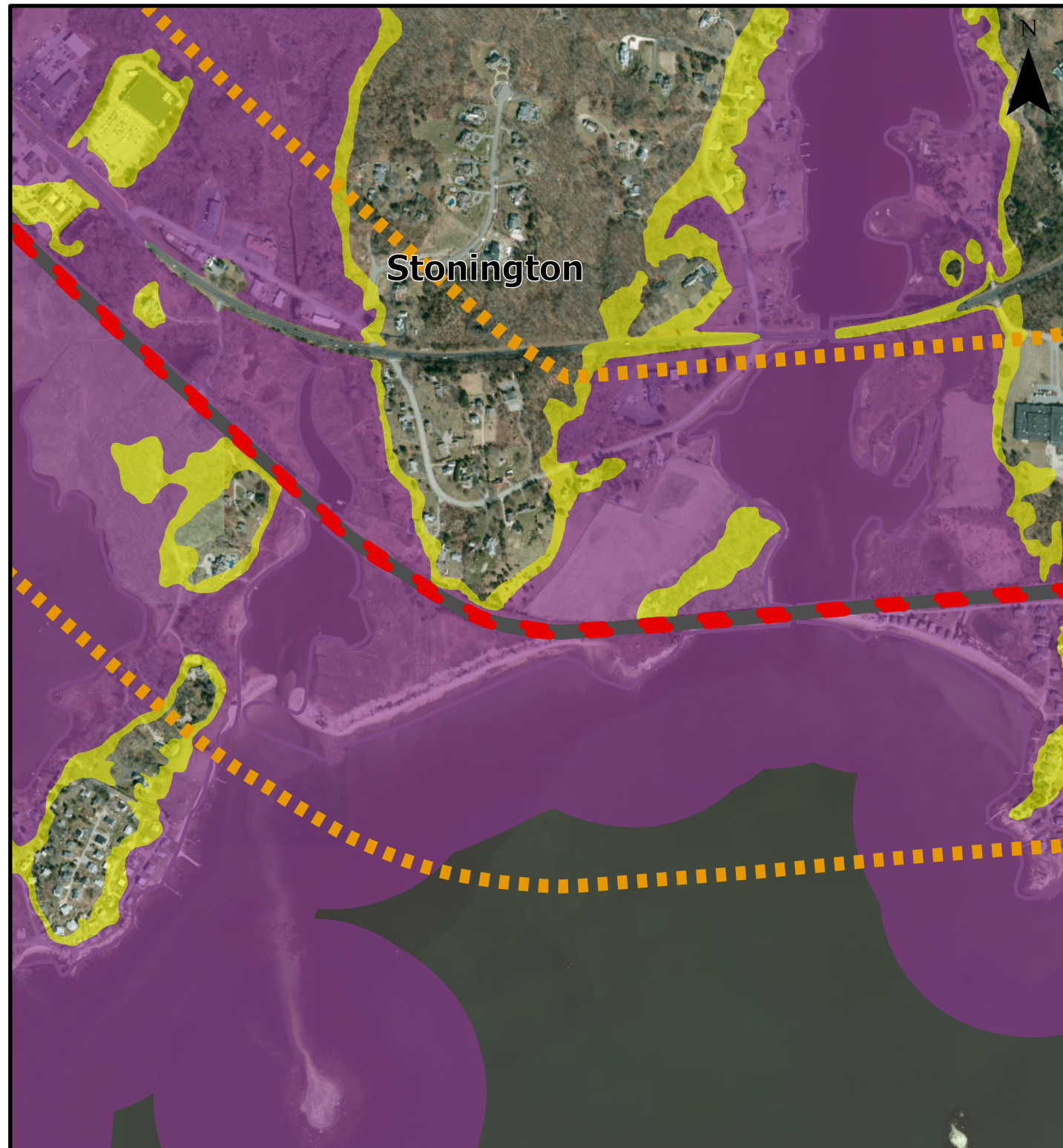
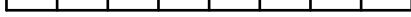
-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



0 0.07 0.15 0.3 Miles



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 17 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

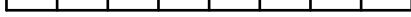
-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



0 0.07 0.15 0.3 Miles

A horizontal scale bar with four segments, corresponding to the distances 0, 0.07, 0.15, and 0.3 miles.

Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 18 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

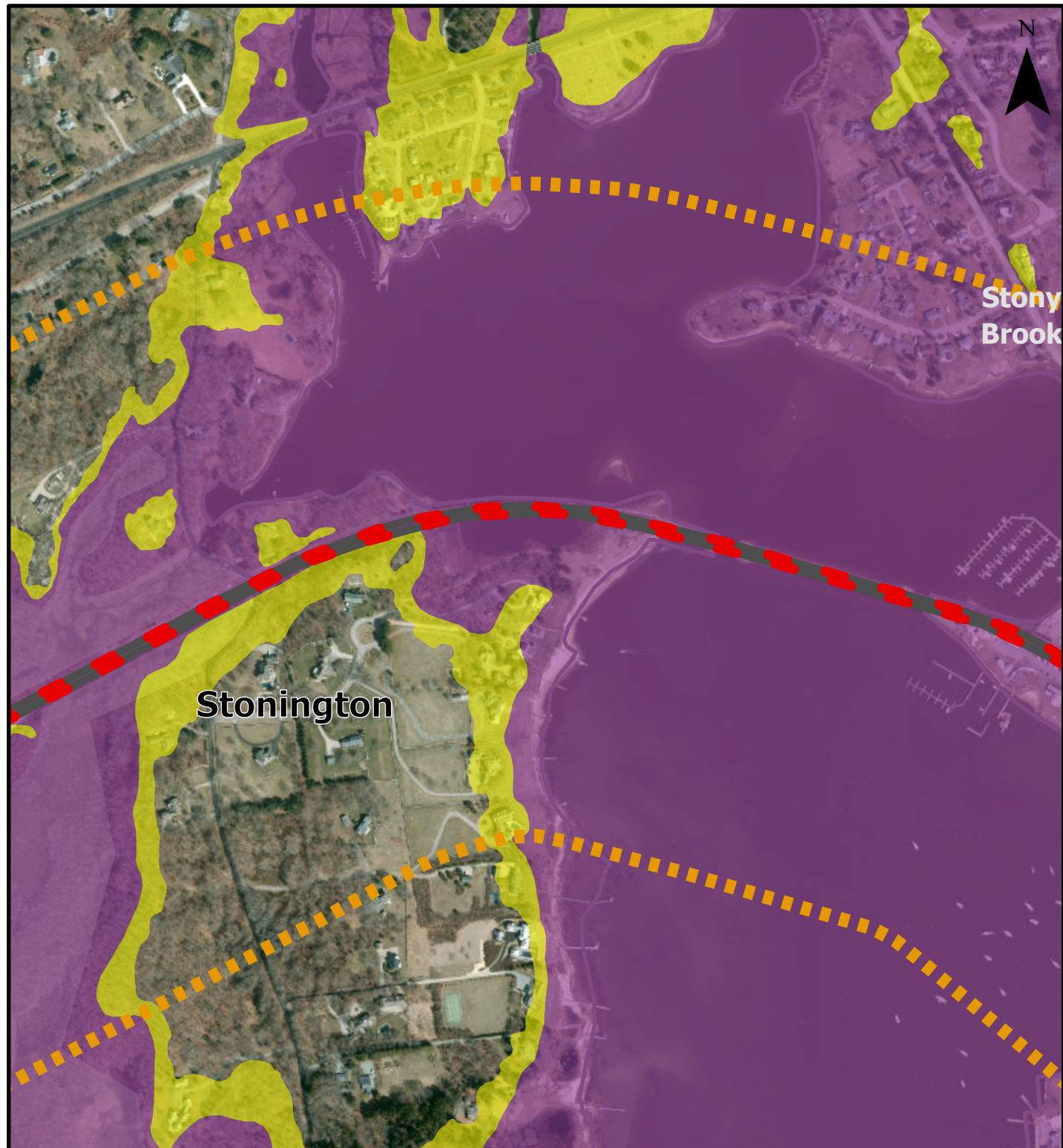
-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



0 0.05 0.1 0.2 Miles



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 19 of 27

Legend

Study Area

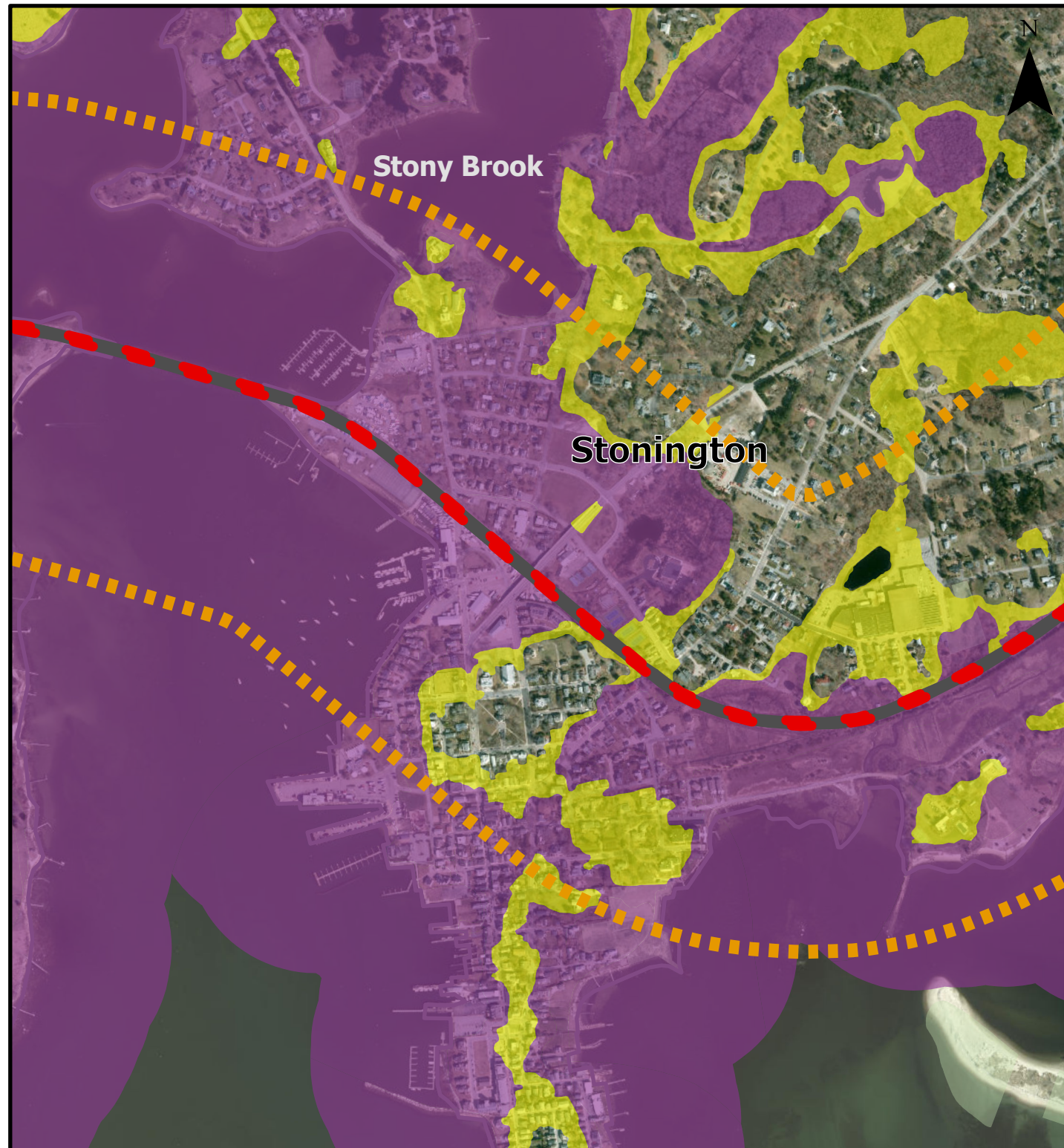
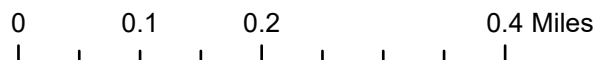
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 20 of 27

Legend

Study Area

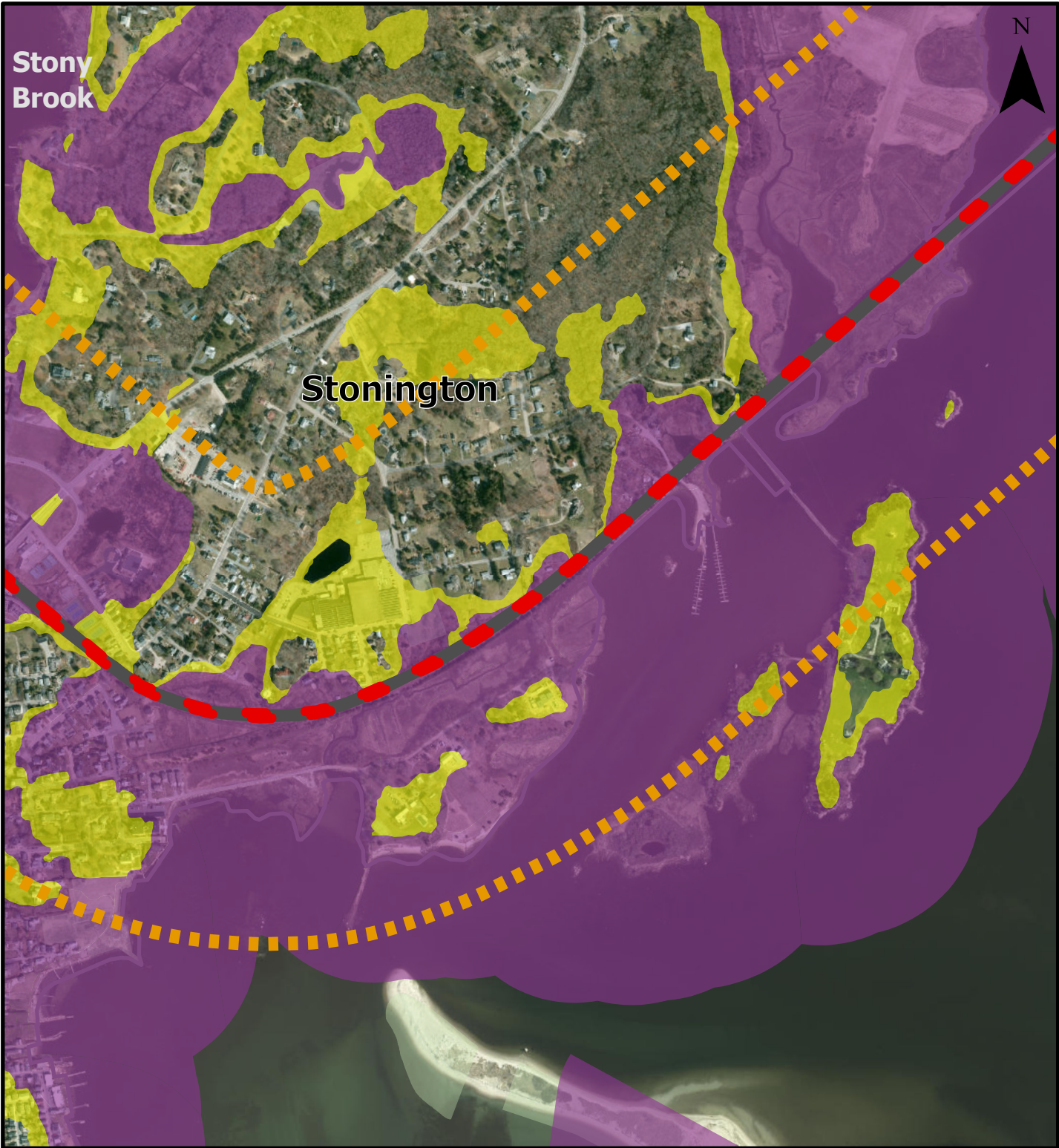
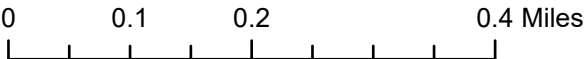
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Managment Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 21 of 27

Legend

Study Area

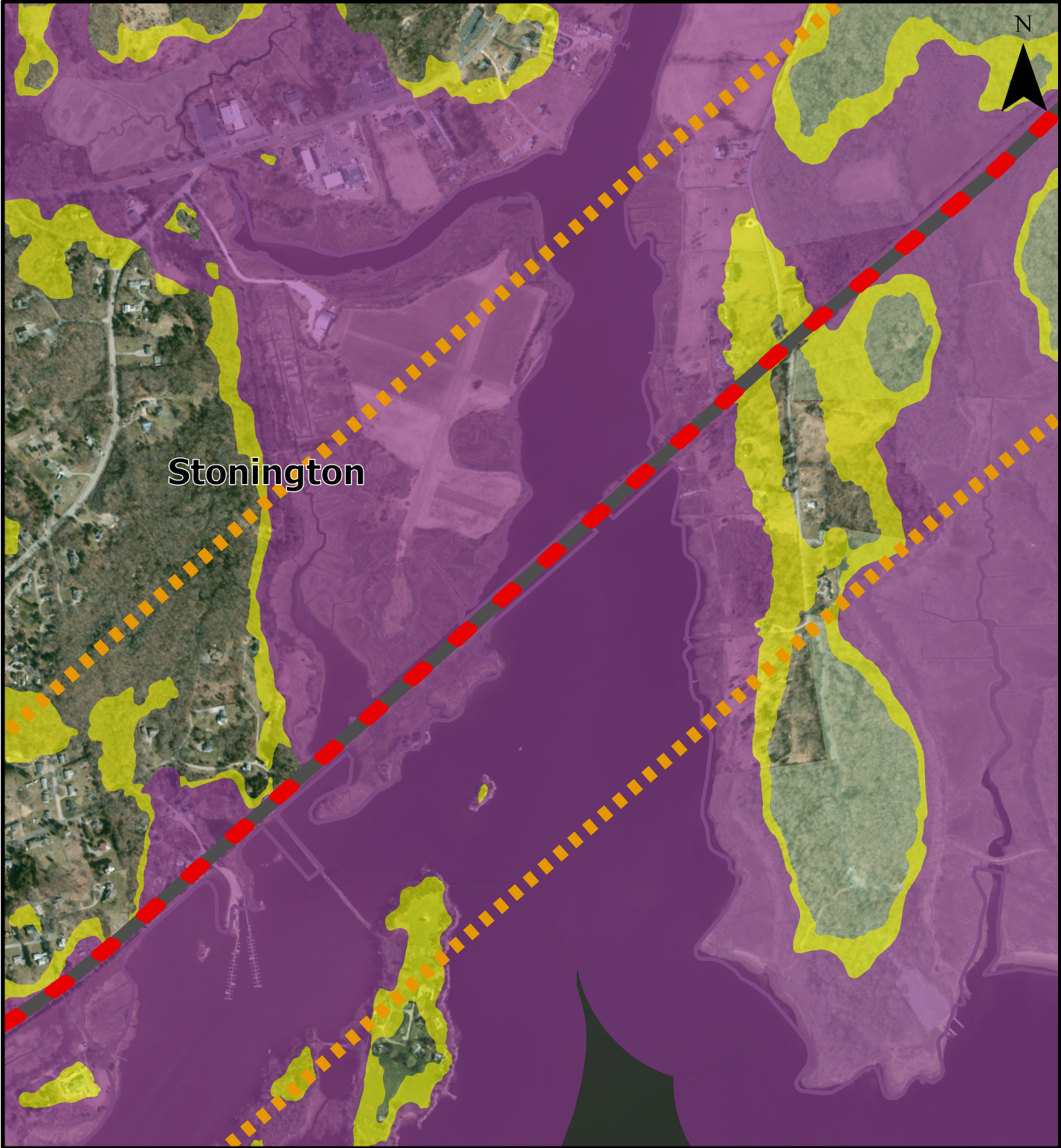
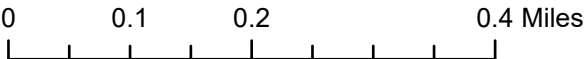
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Federal Emergency Managment Administration Flood Hazard

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance
Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 22 of 27

Legend

Study Area

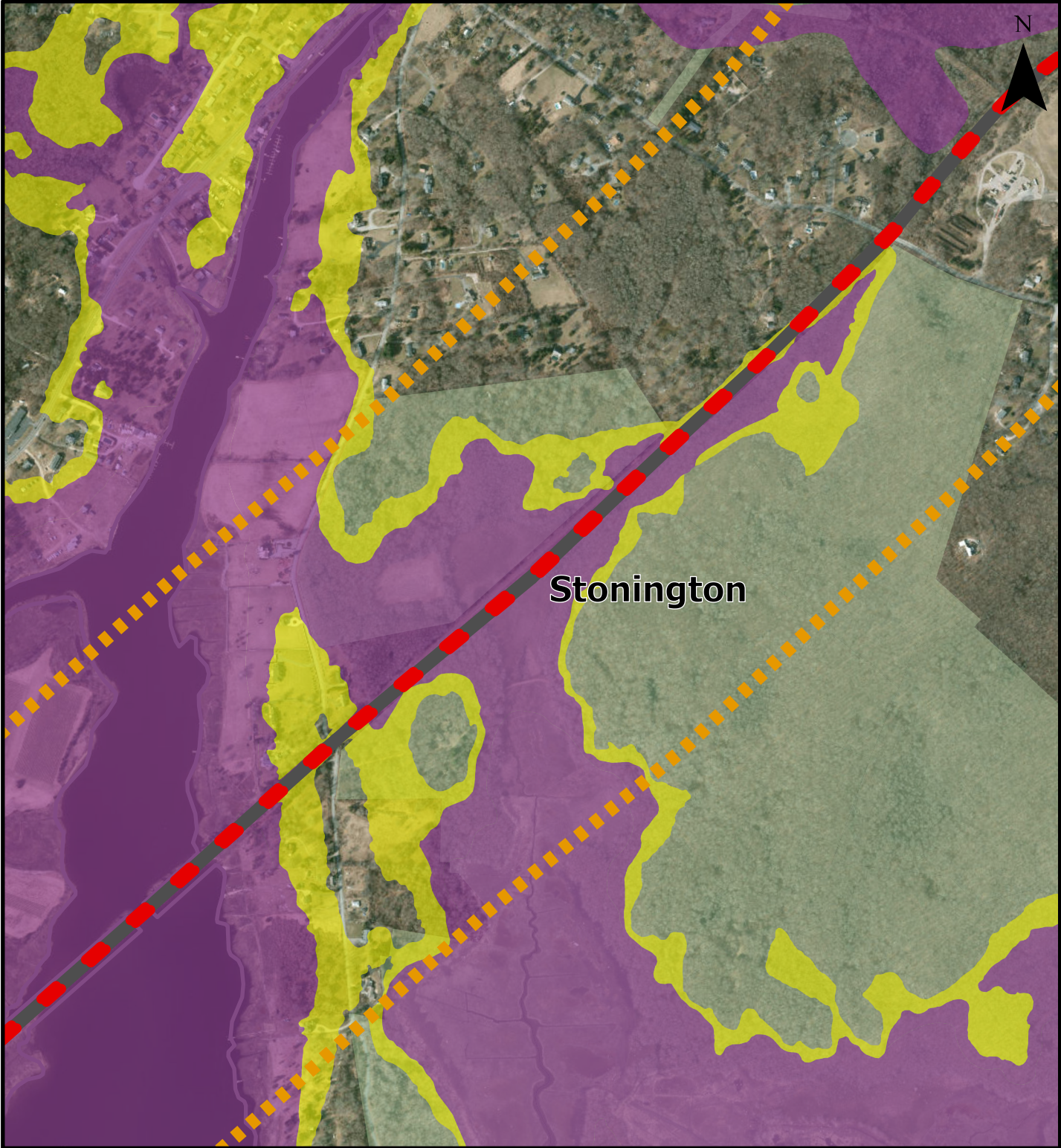
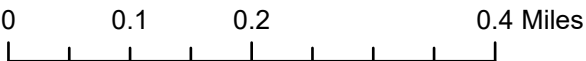
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Federal Emergency Managment Administration Flood Hazard

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 23 of 27

Legend

Study Area

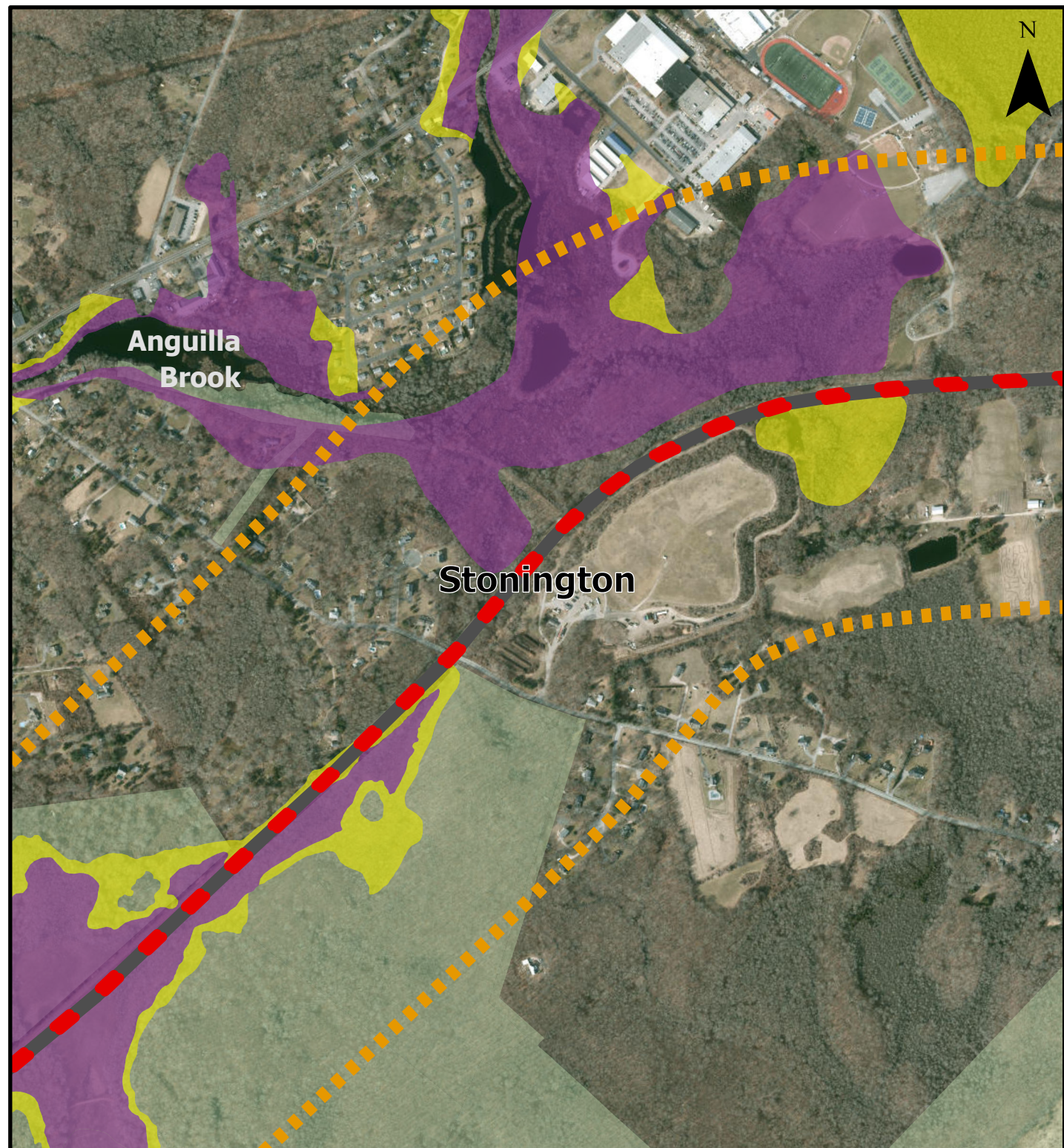
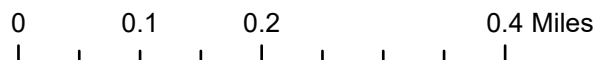
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Managment Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 24 of 27

Legend

Study Area

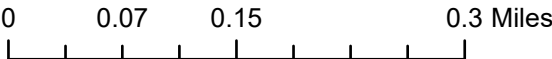
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Federal Emergency Managment Administration Flood Hazard

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 25 of 27

Legend

Study Area

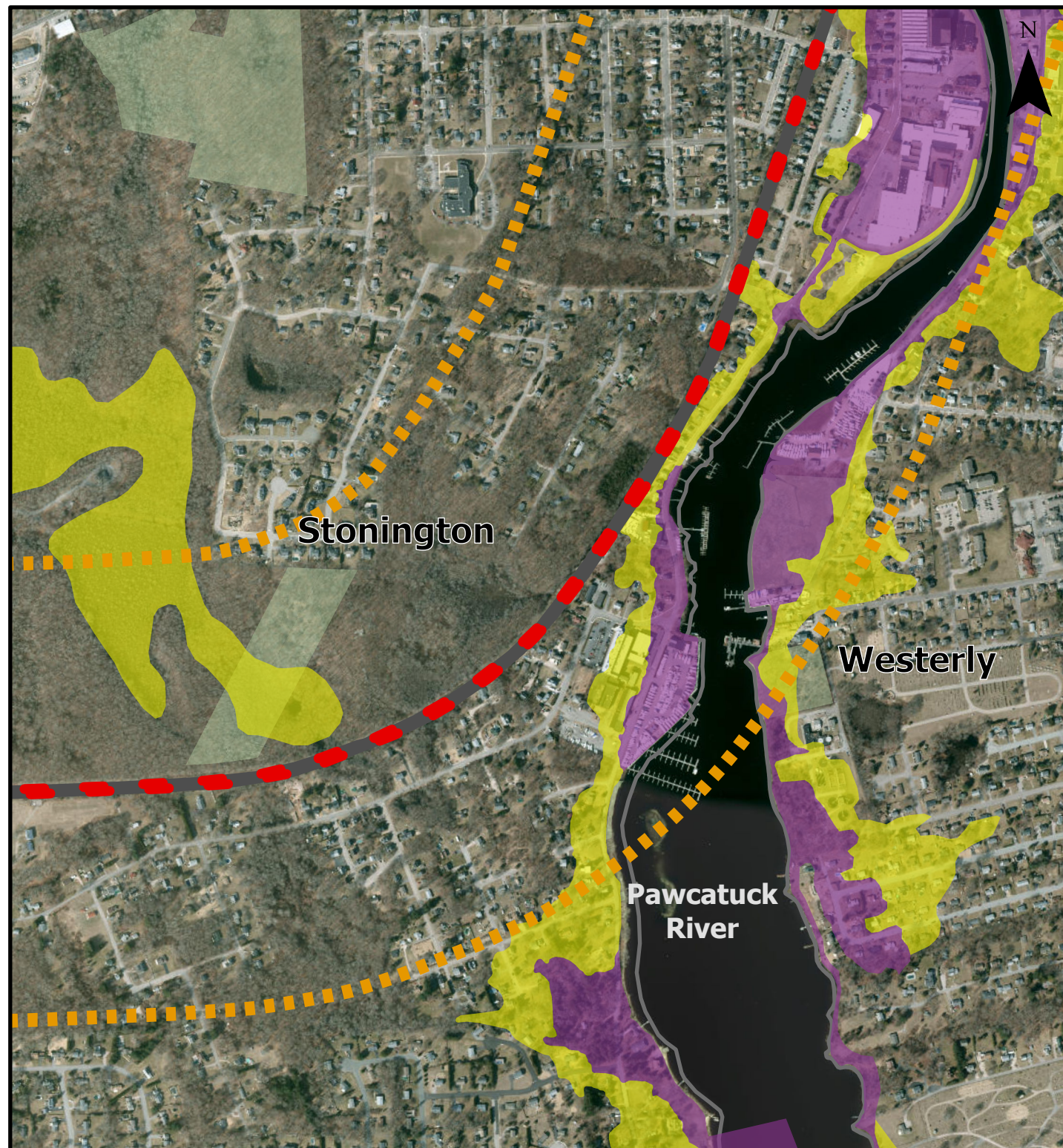
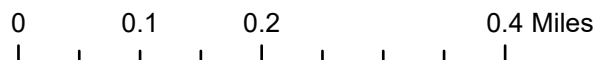
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 26 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

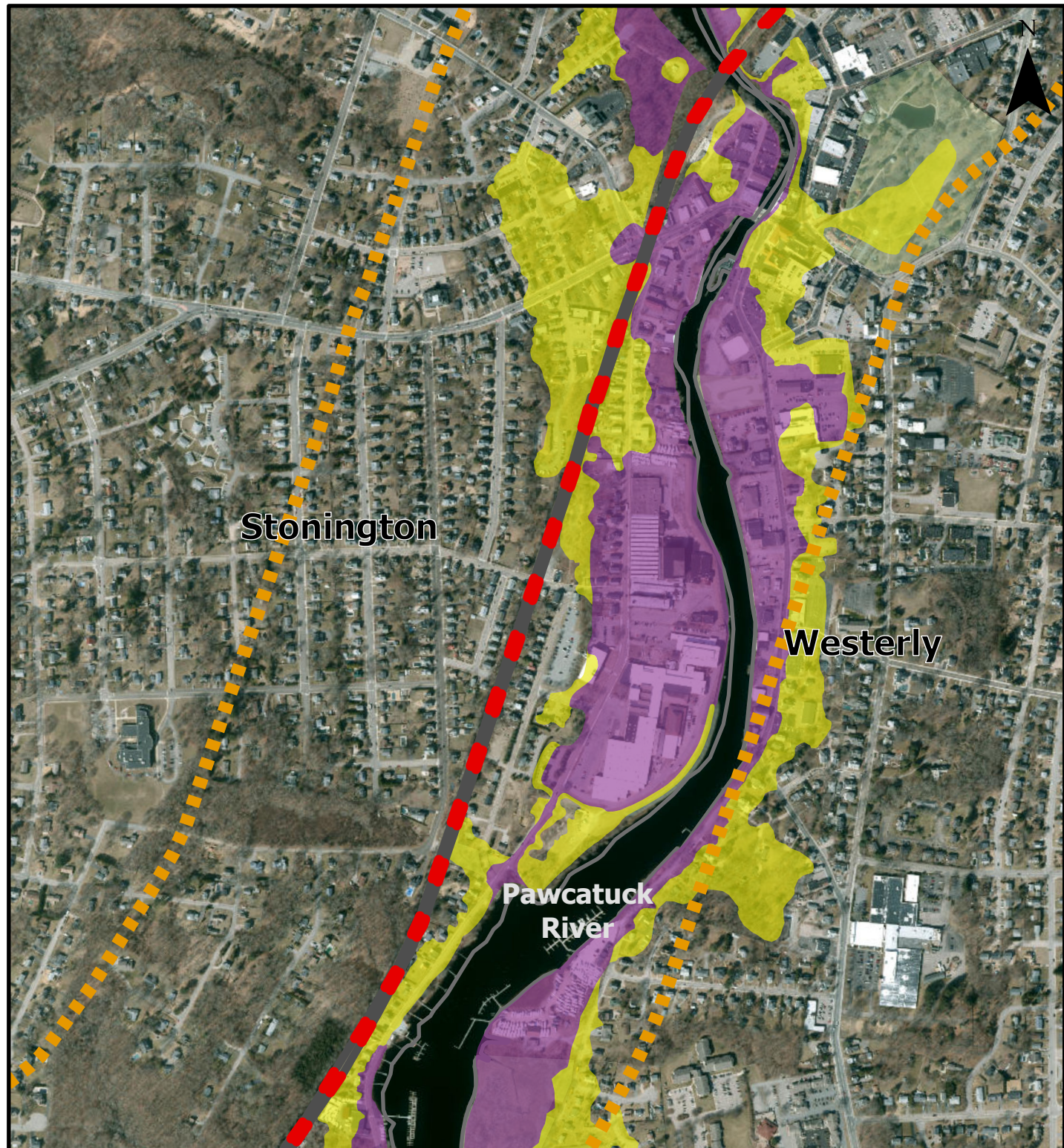
-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



0 0.07 0.15 0.3 Miles



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

SLE Extension Page 27 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

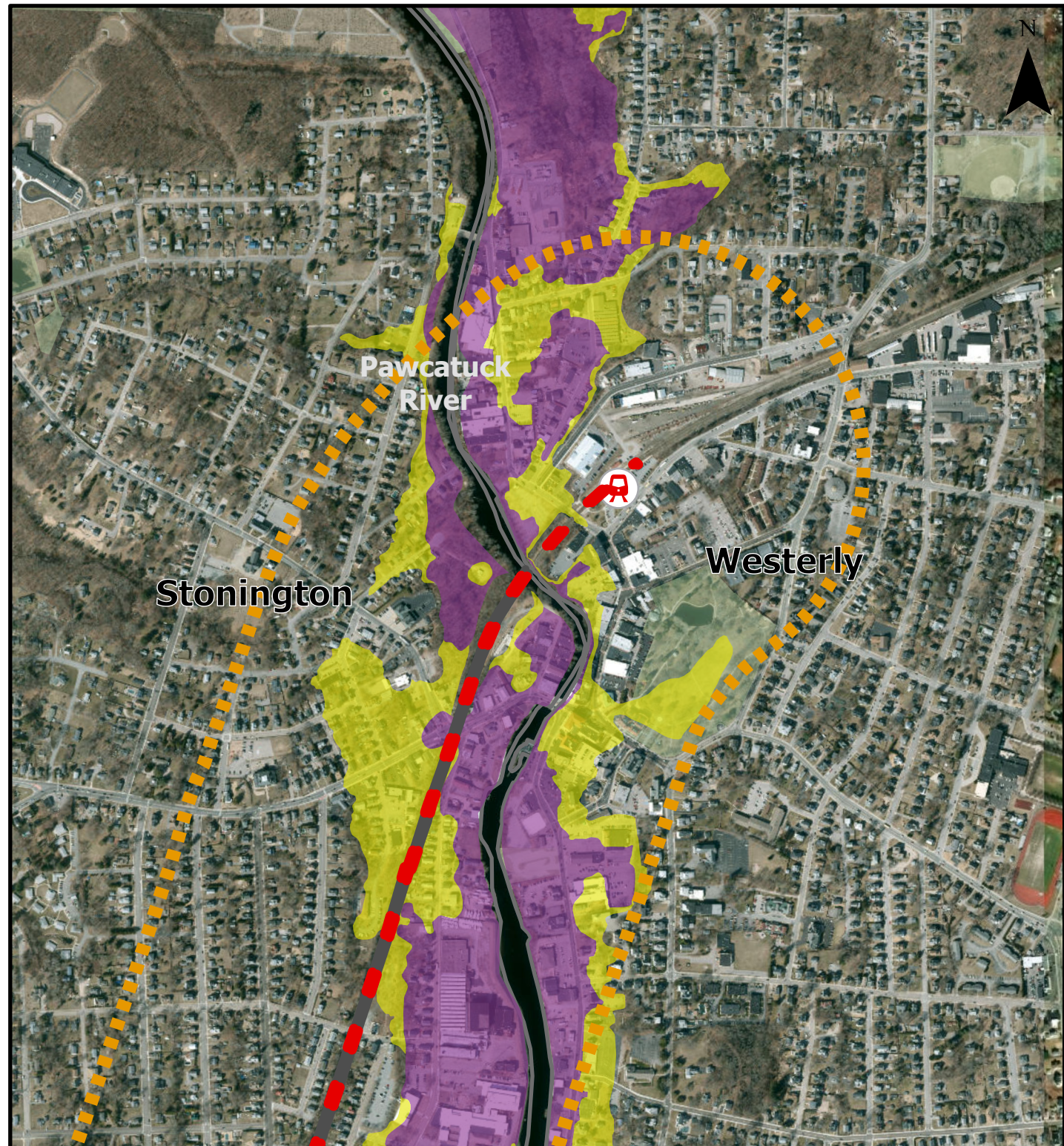
-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard
-  Future Conditions 1% Annual Chance Flood Hazard



0 0.1 0.2 0.4 Miles



Sources: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 1 of 27

Legend

Study Area

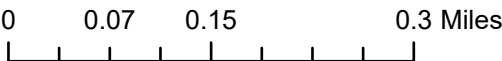
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 2 of 27

Legend

Study Area

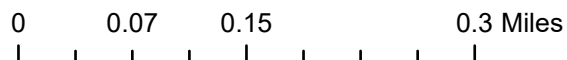
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 3 of 27

Legend

Study Area

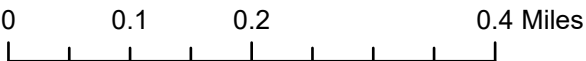
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 4 of 27

Legend

Study Area

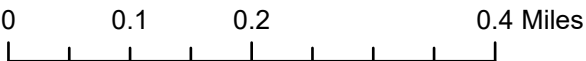
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 5 of 27

Legend

Study Area

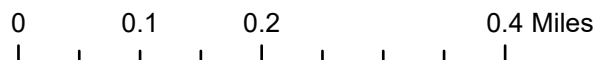
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 6 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



0 0.07 0.15 0.3 Miles



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 7 of 27

Legend

Study Area

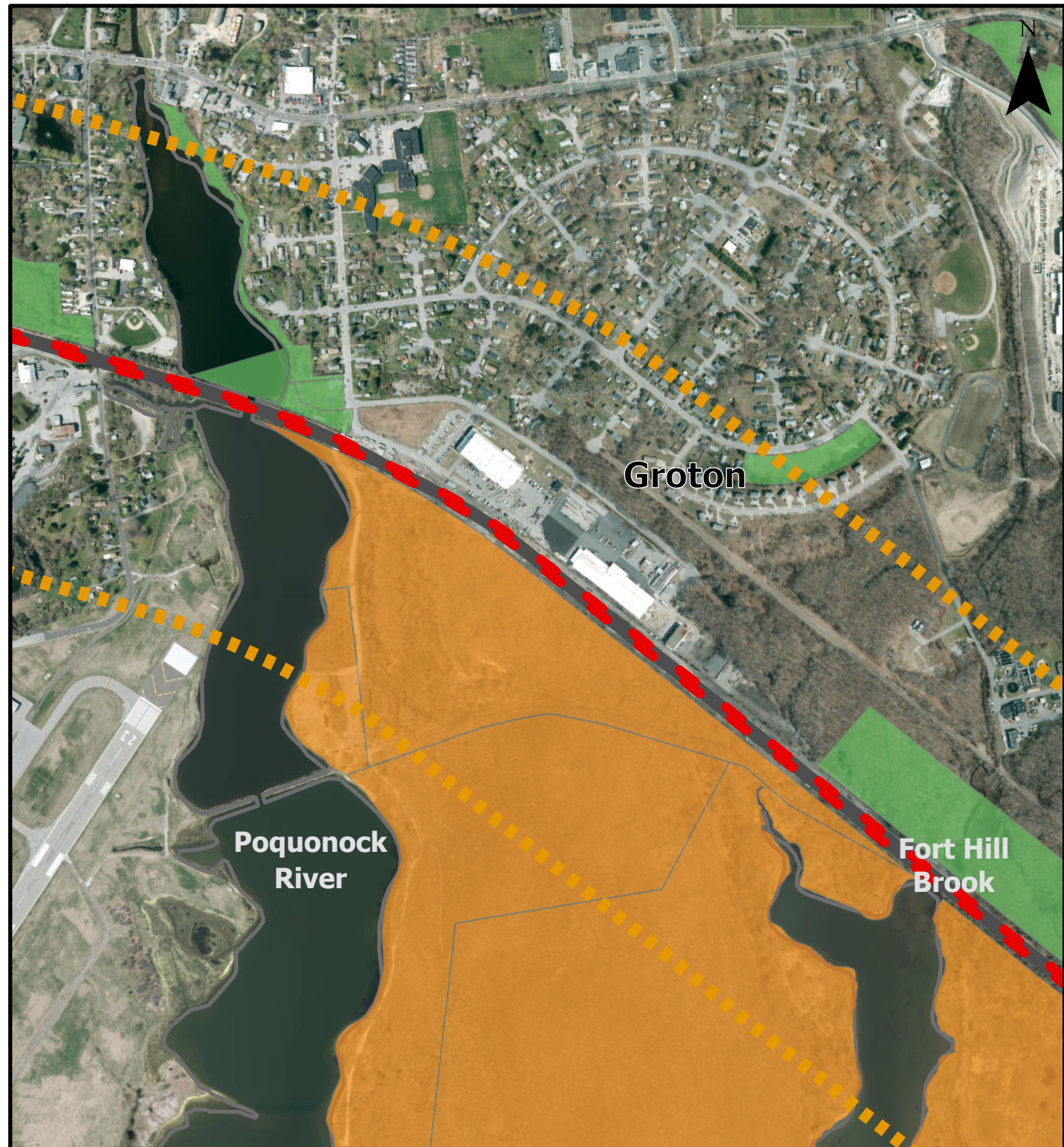
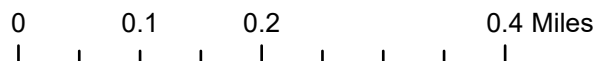
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 8 of 27

Legend

Study Area

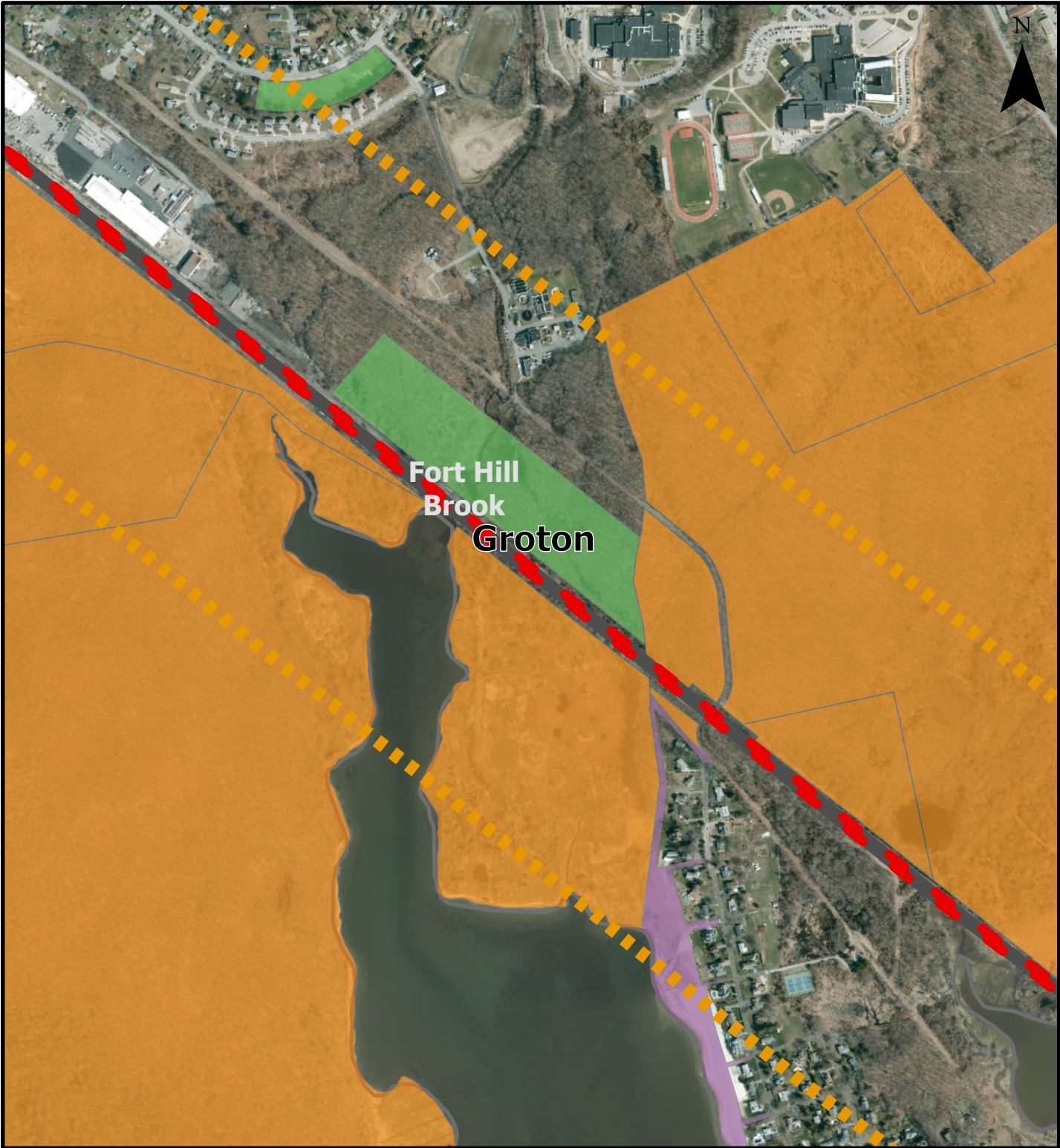
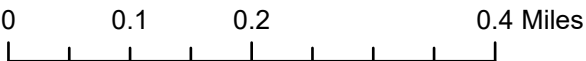
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 9 of 27

Legend

Study Area

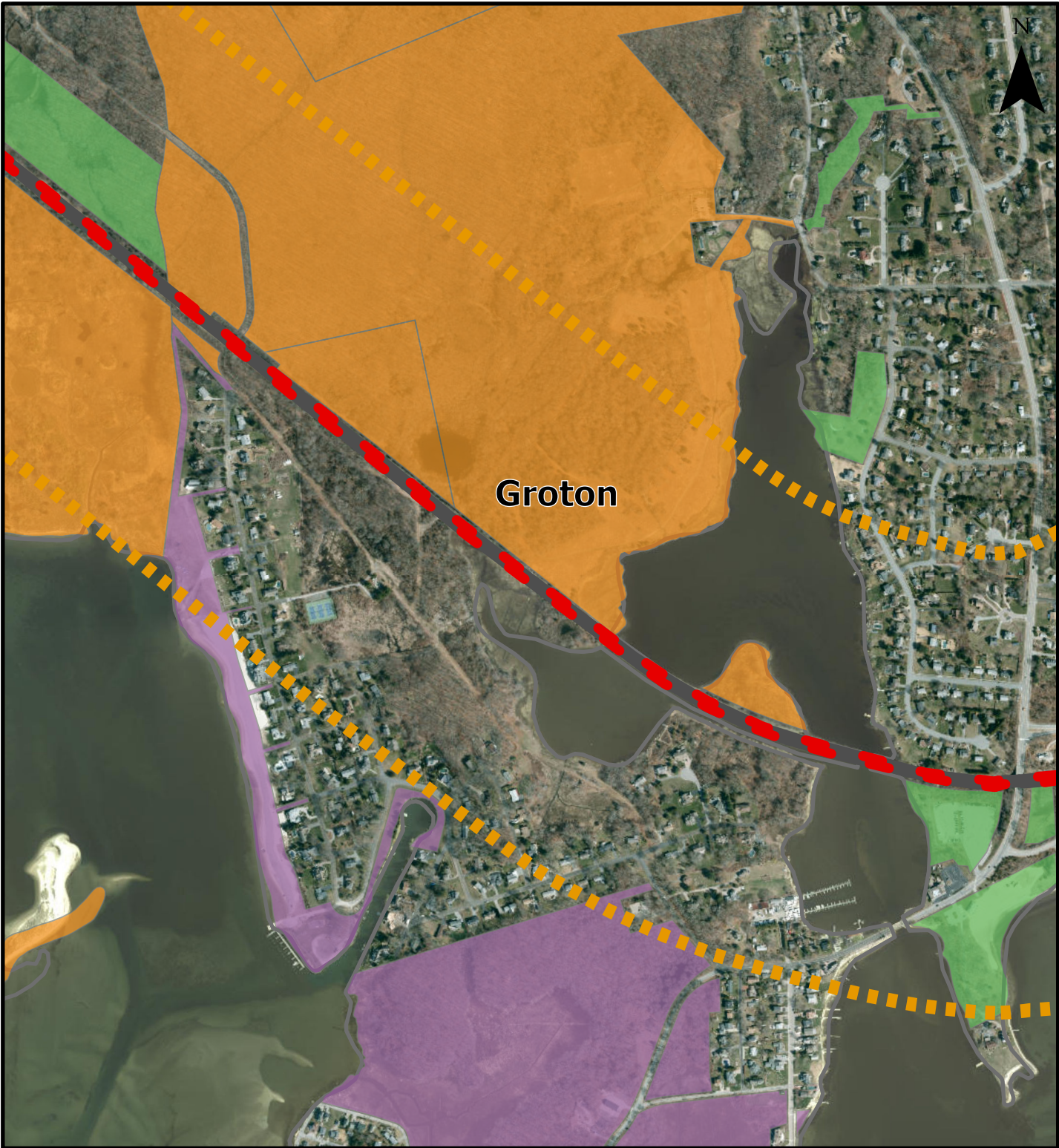
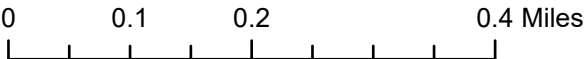
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 10 of 27

Legend

Study Area

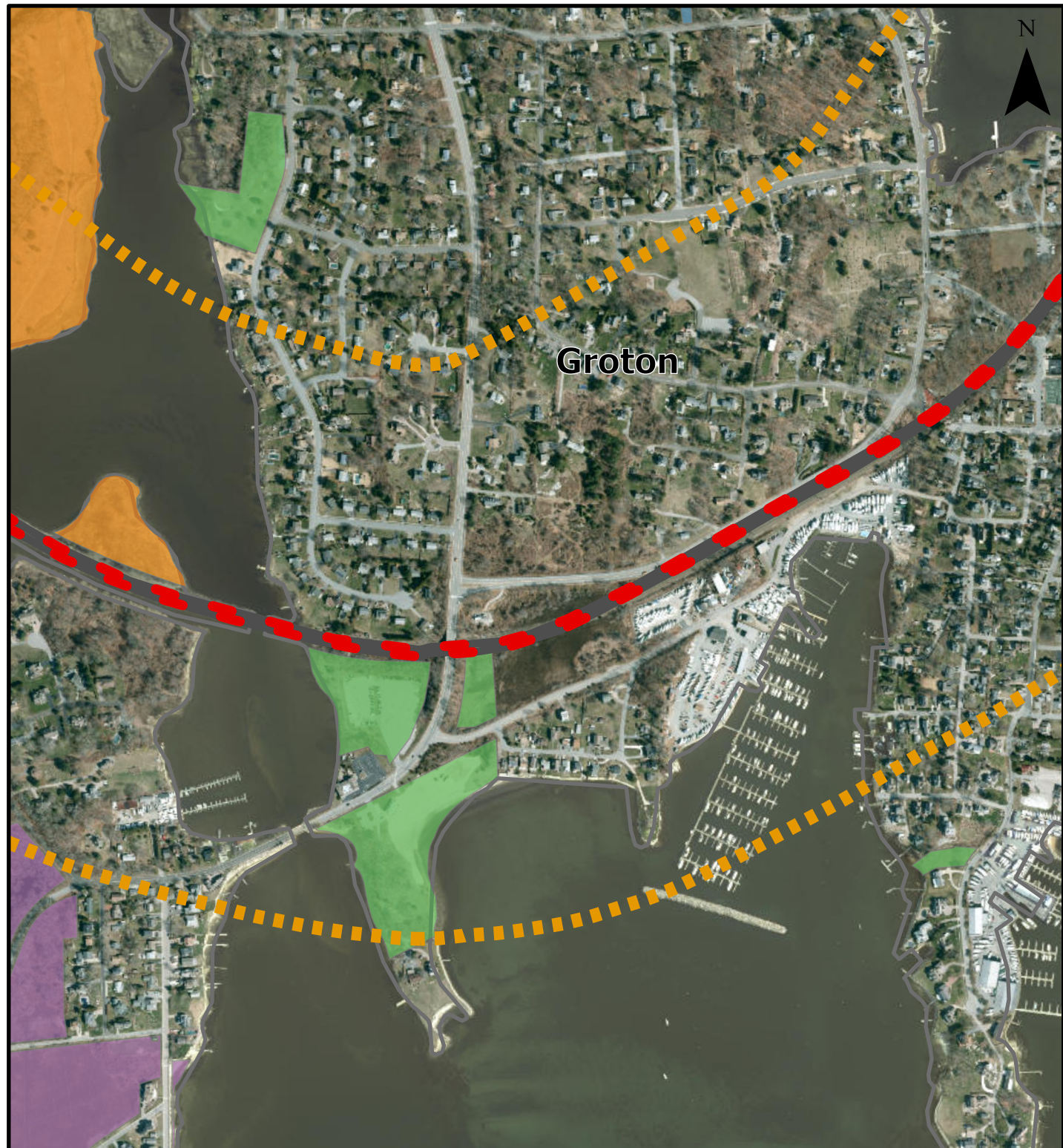
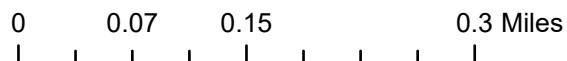
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 11 of 27

Legend

Study Area

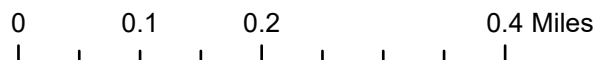
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 12 of 27

Legend

Study Area

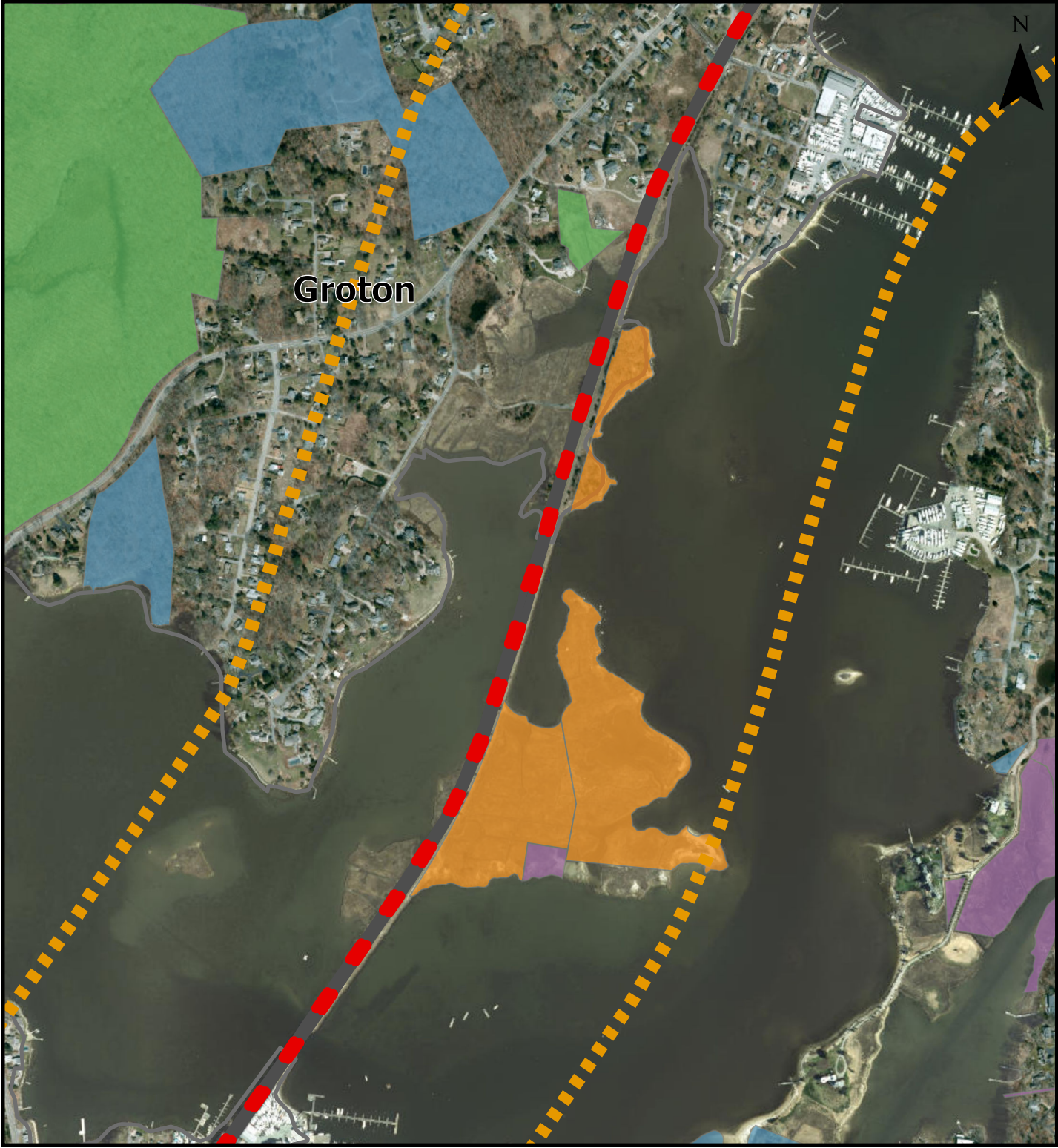
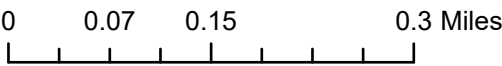
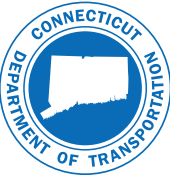
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 13 of 27

Legend

Study Area

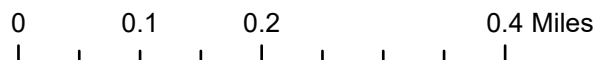
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 14 of 27

Legend

Study Area

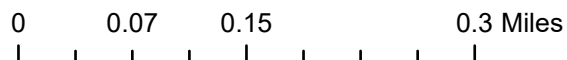
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 15 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



0 0.1 0.2 0.4 Miles



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 16 of 27

Legend

Study Area

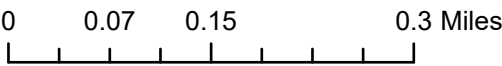
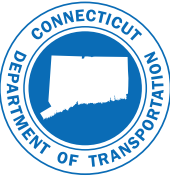
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 17 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



0 0.07 0.15 0.3 Miles

A horizontal scale bar with tick marks corresponding to the distances 0, 0.07, 0.15, and 0.3 miles.

Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 18 of 27

Legend

Study Area

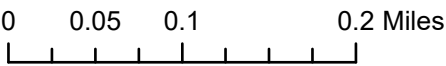
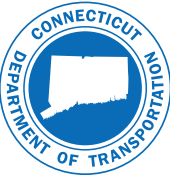
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 19 of 27

Legend

Study Area

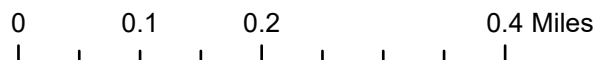
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 20 of 27

Legend

Study Area

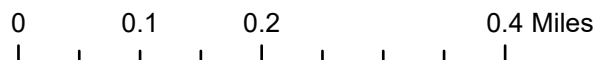
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 21 of 27

Legend

Study Area

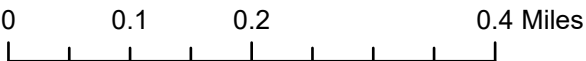
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 22 of 27

Legend

Study Area

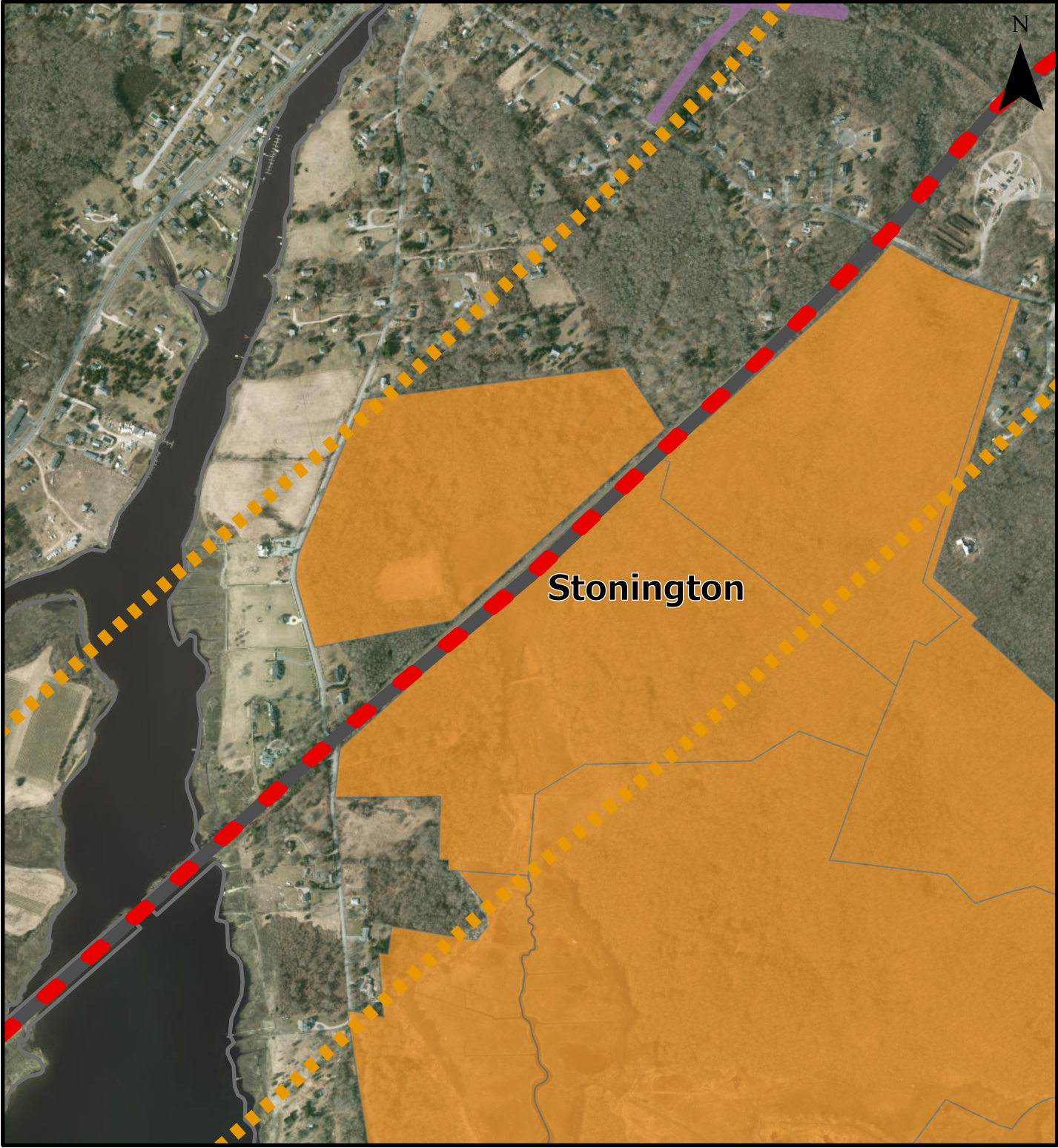
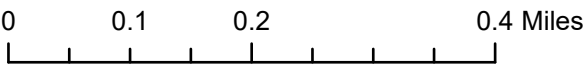
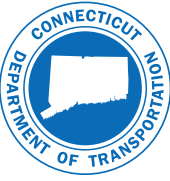
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 23 of 27

Legend

Study Area

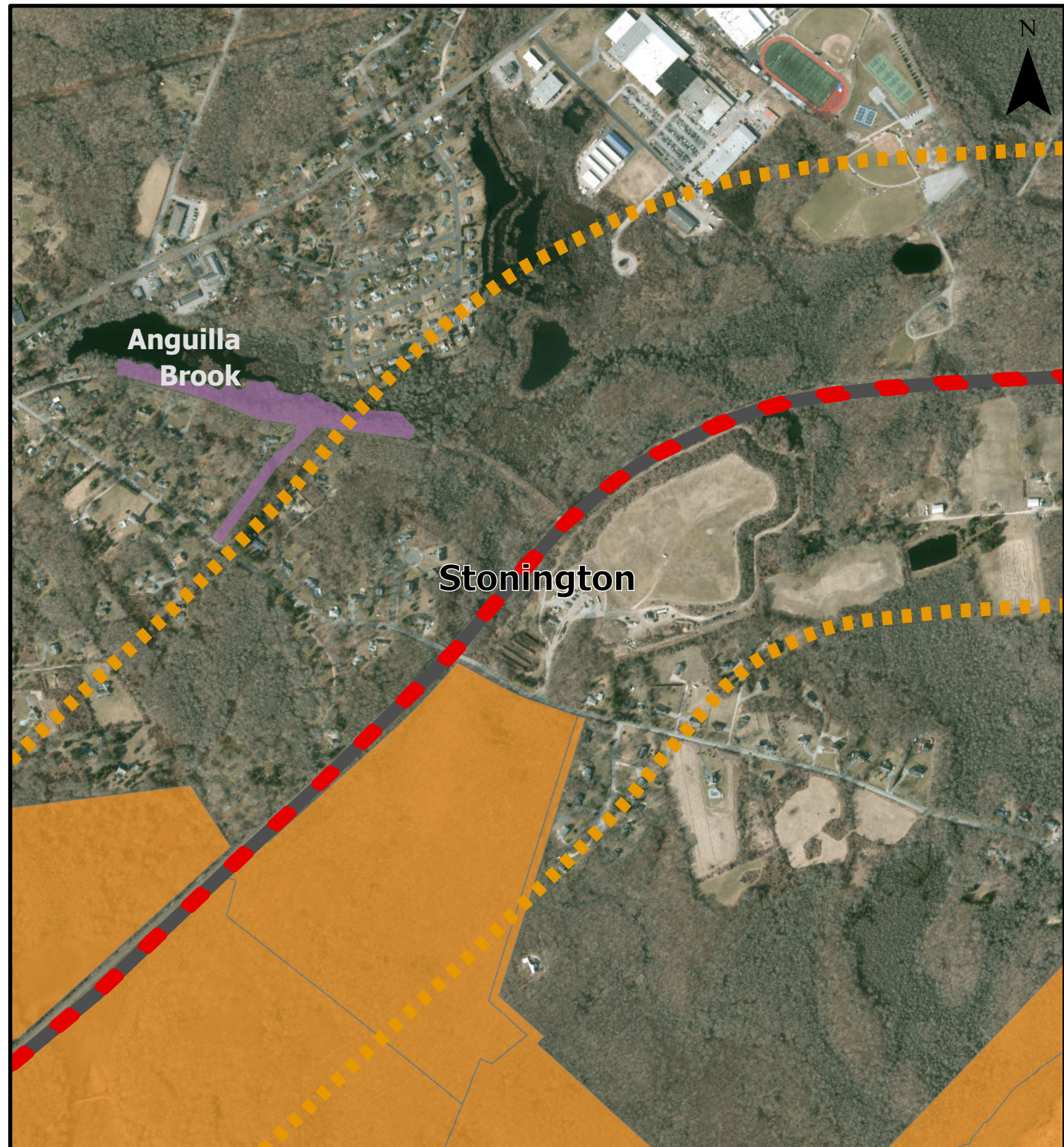
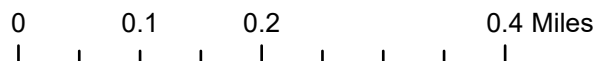
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 24 of 27

Legend

Study Area

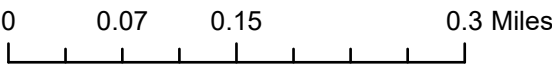
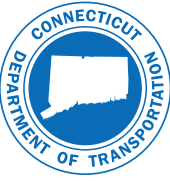
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 25 of 27

Legend

Study Area

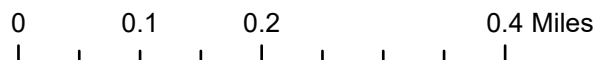
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and
Protected Lands

SLE Extension Page 26 of 27

Legend

Study Area

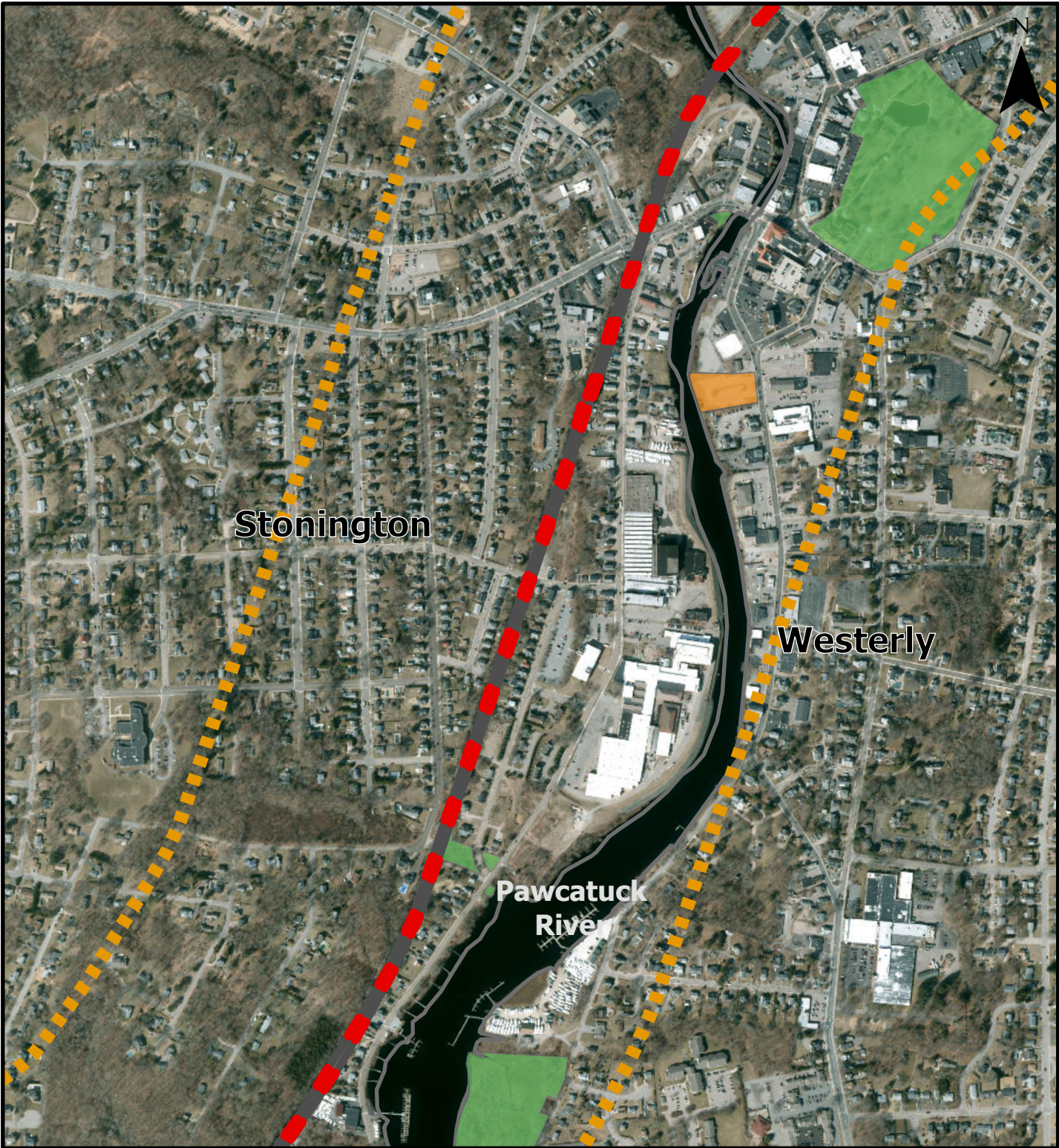
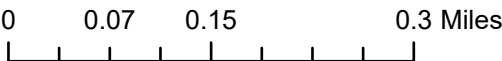
- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

SLE Extension Page 27 of 27

Legend

Study Area

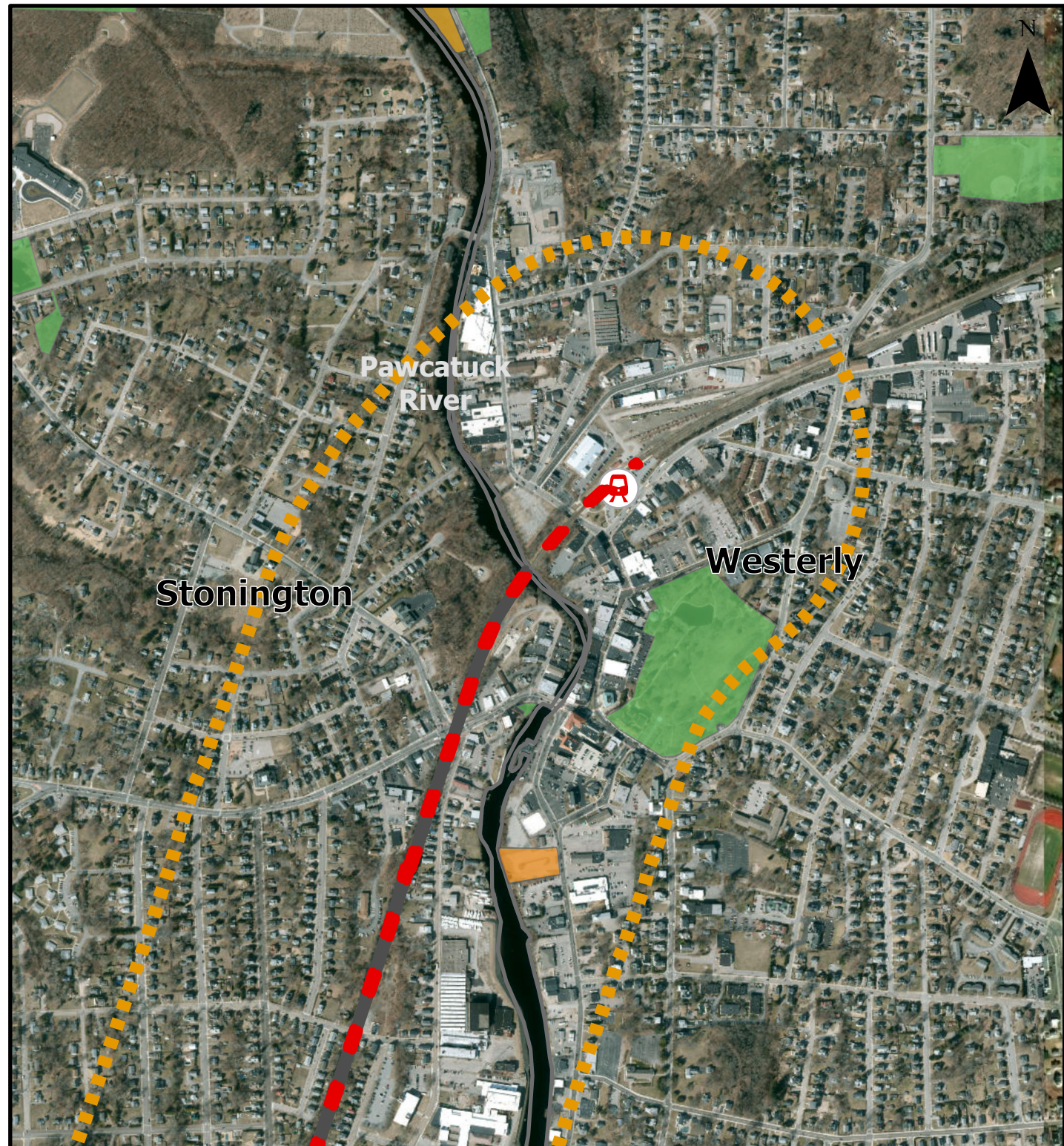
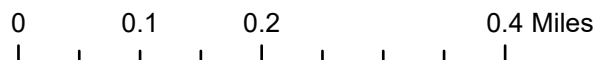
-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Sources: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 1 of 27

Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC
-  Historic_Sites
-  Historic_Districts
-  RI Site of Historic Significance



0 0.07 0.15 0.3 Miles



Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 2 of 27

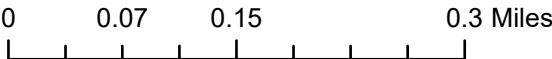
Legend

Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC
- Historic_Sites
- Historic_Districts
- RI Site of Historic Significance



Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 3 of 27

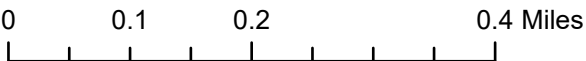
Legend

Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC
- Historic_Sites
- Historic_Districts
- RI Site of Historic Significance



Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 4 of 27

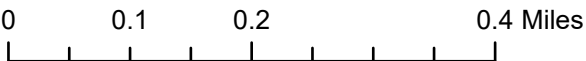
Legend

Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC
- Historic_Sites
- Historic_Districts
- RI Site of Historic Significance



Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 5 of 27

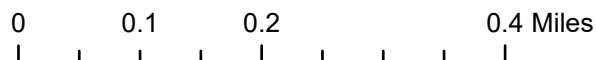
Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC
-  Historic_Sites
-  Historic_Districts
-  RI Site of Historic Significance



Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 6 of 27

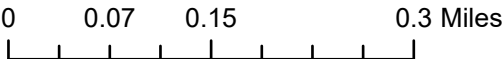
Legend

Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC
- Historic_Sites
- Historic_Districts
- RI Site of Historic Significance



Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 7 of 27

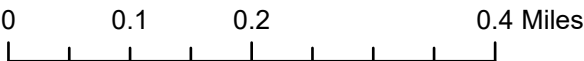
Legend

Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC
- Historic_Sites
- Historic_Districts
- RI Site of Historic Significance



Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 8 of 27

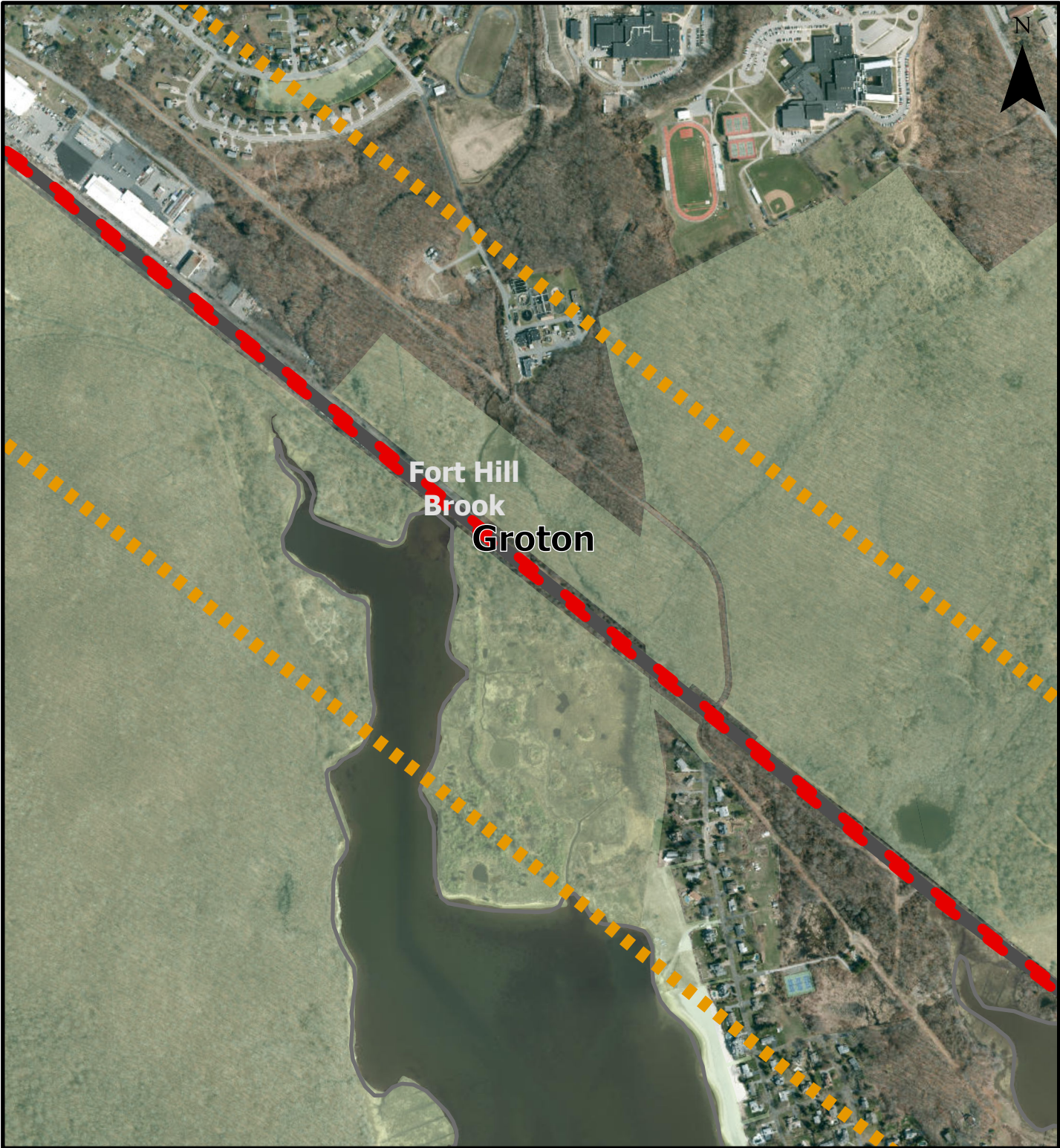
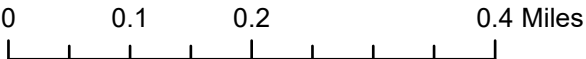
Legend

Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC
- Historic_Sites
- Historic_Districts
- RI Site of Historic Significance



Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 9 of 27

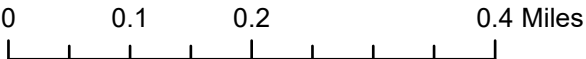
Legend

Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

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- Proposed Norwich Rail
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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 10 of 27

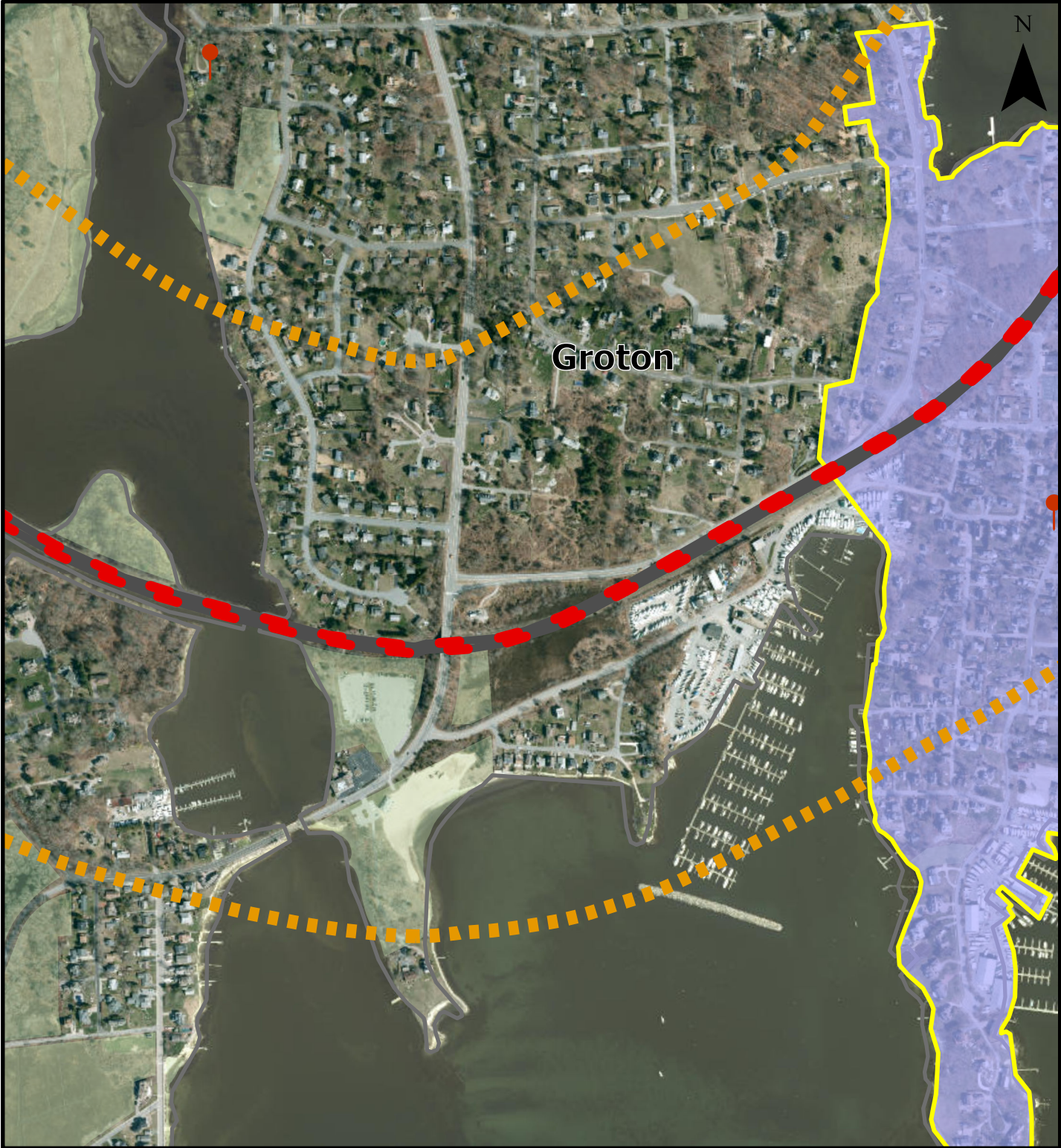
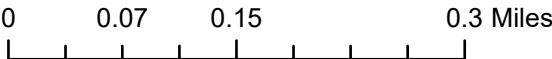
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Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC
- Historic_Sites
- Historic_Districts
- RI Site of Historic Significance



Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 11 of 27

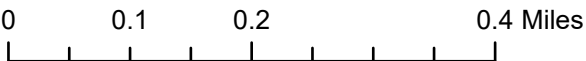
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Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC
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- Historic_Districts
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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 12 of 27

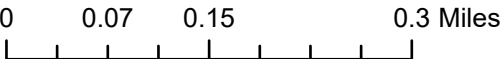
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Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC
- Historic_Sites
- Historic_Districts
- RI Site of Historic Significance



Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 13 of 27

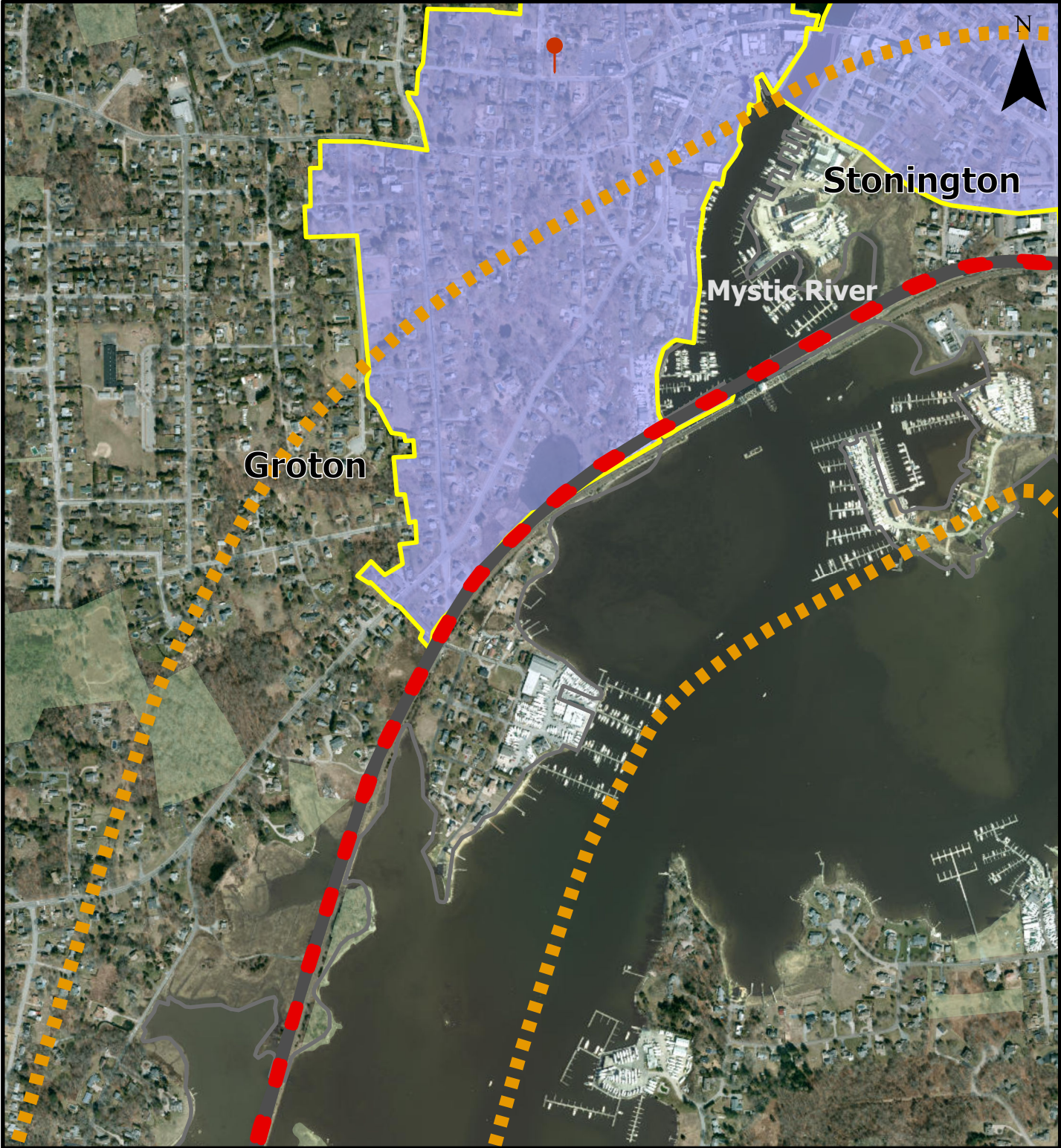
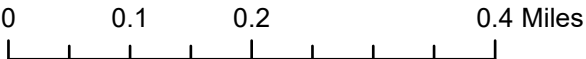
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Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 14 of 27

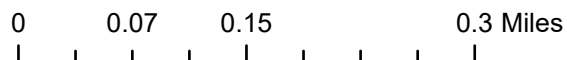
Legend

Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 15 of 27

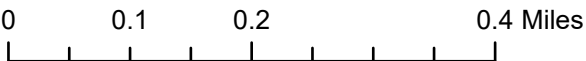
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Study Area

- Municipal Boundary
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Rail Infrastructure

- Existing Rail Stations
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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 16 of 27

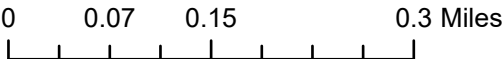
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Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 17 of 27

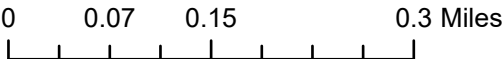
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Study Area

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- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 18 of 27

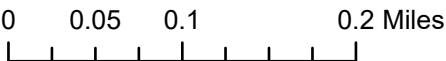
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Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
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- Historic_Districts
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Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 19 of 27

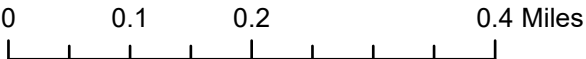
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Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 20 of 27

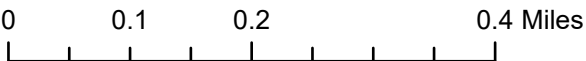
Legend

Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
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- Proposed Service Extension
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- Historic_Districts
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Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 21 of 27

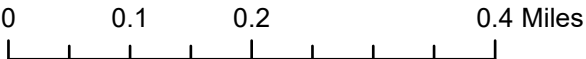
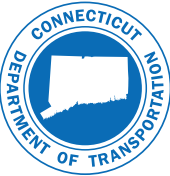
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Study Area

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- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 22 of 27

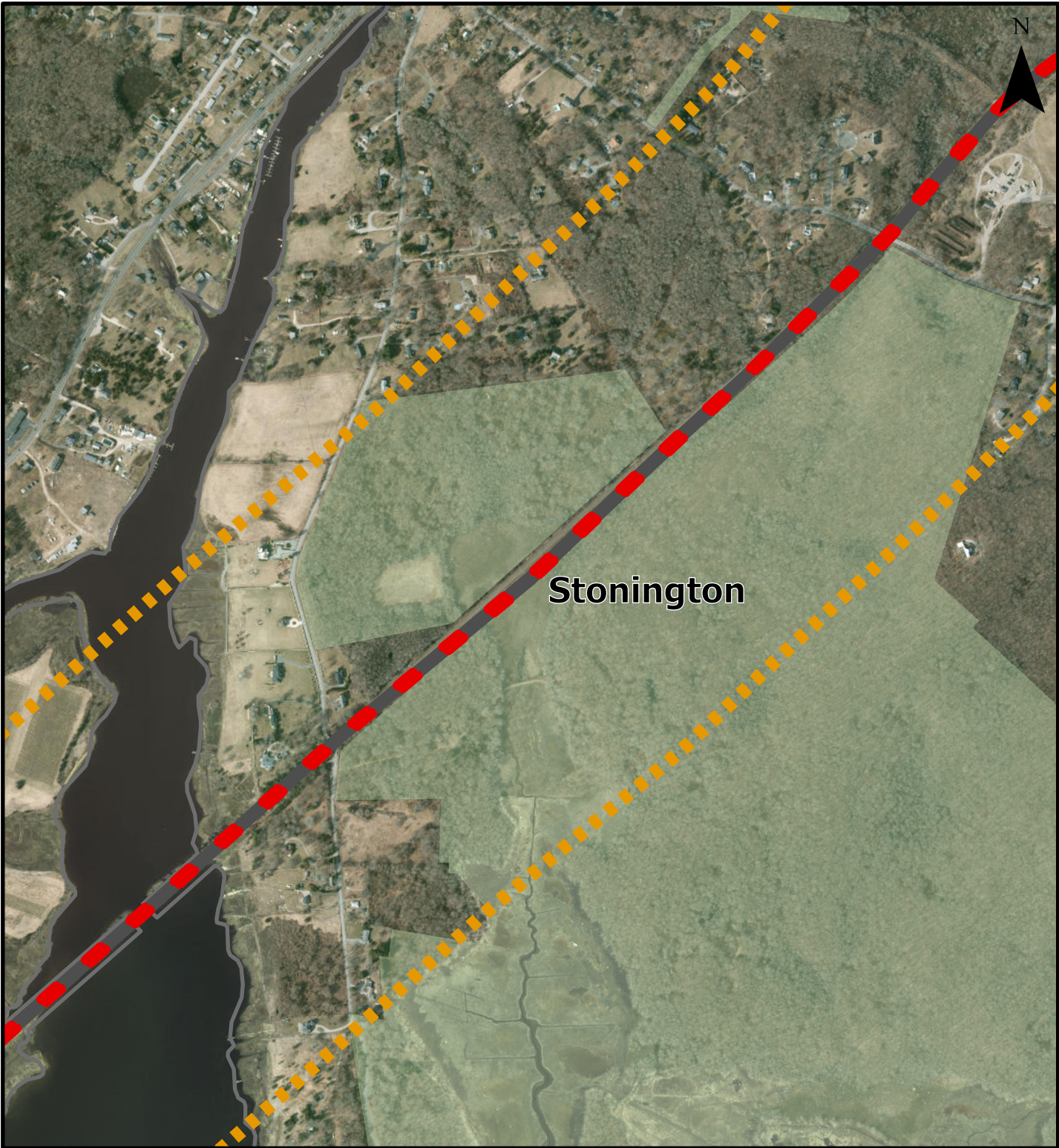
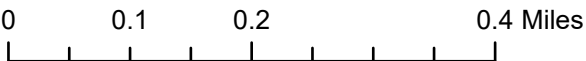
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Study Area

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- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 23 of 27

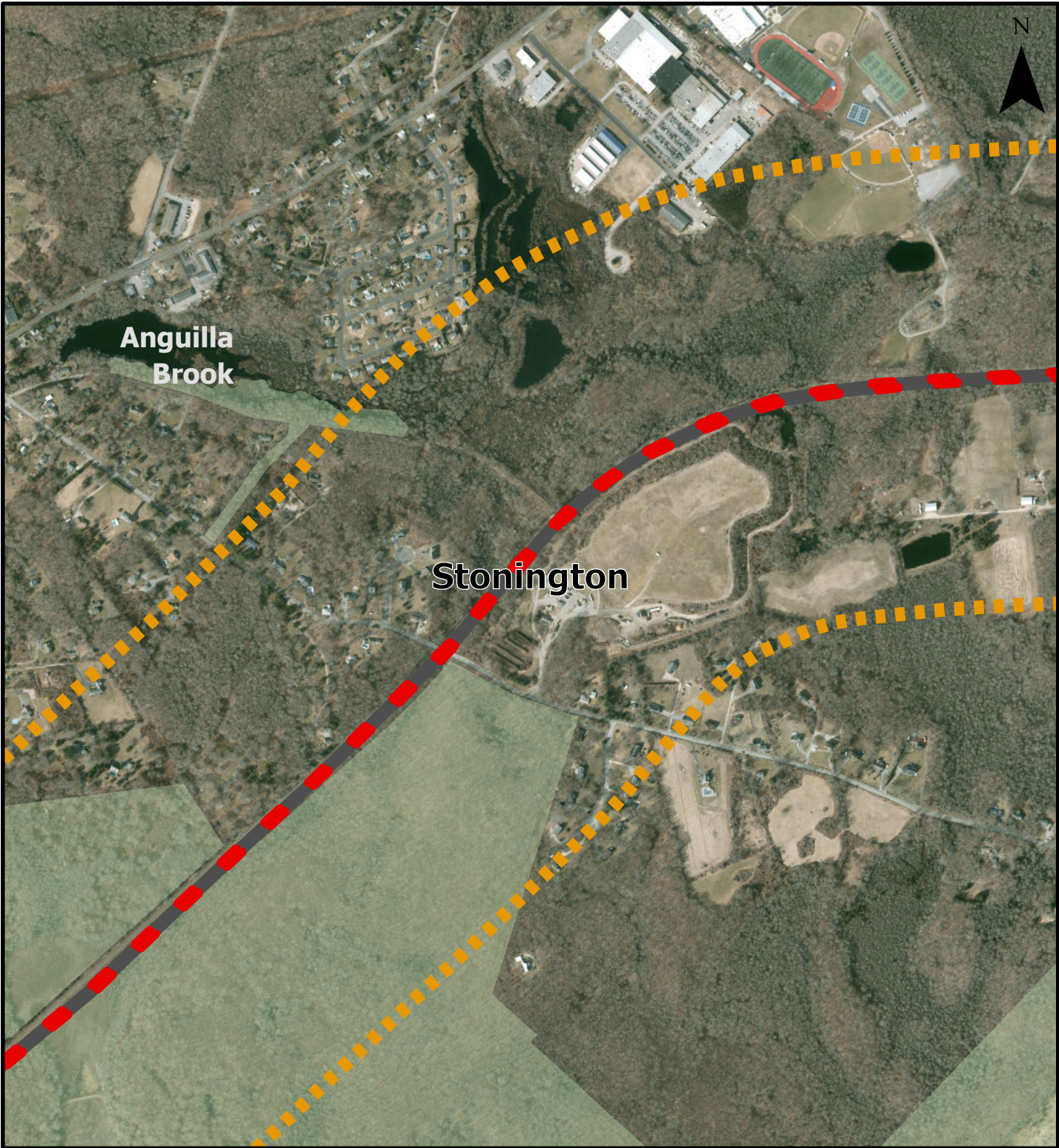
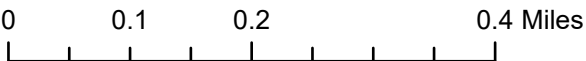
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Rail Infrastructure

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Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 24 of 27

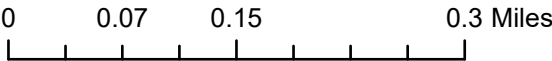
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Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 25 of 27

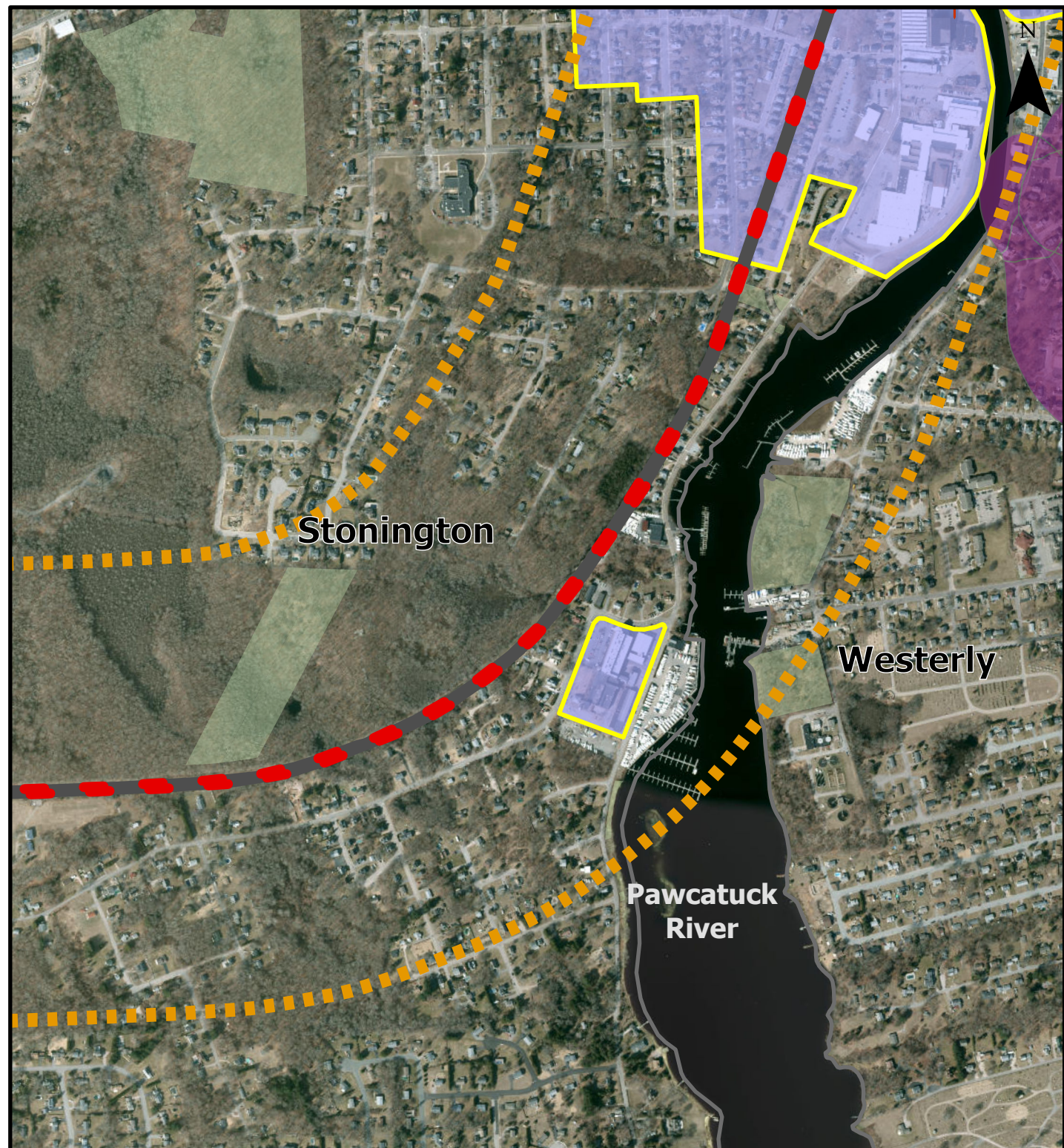
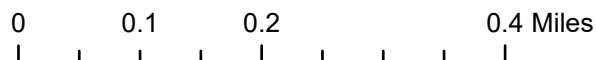
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Study Area

-  Municipal Boundary
-  SLE Extension 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC
-  Historic_Sites
-  Historic_Districts
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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 26 of 27

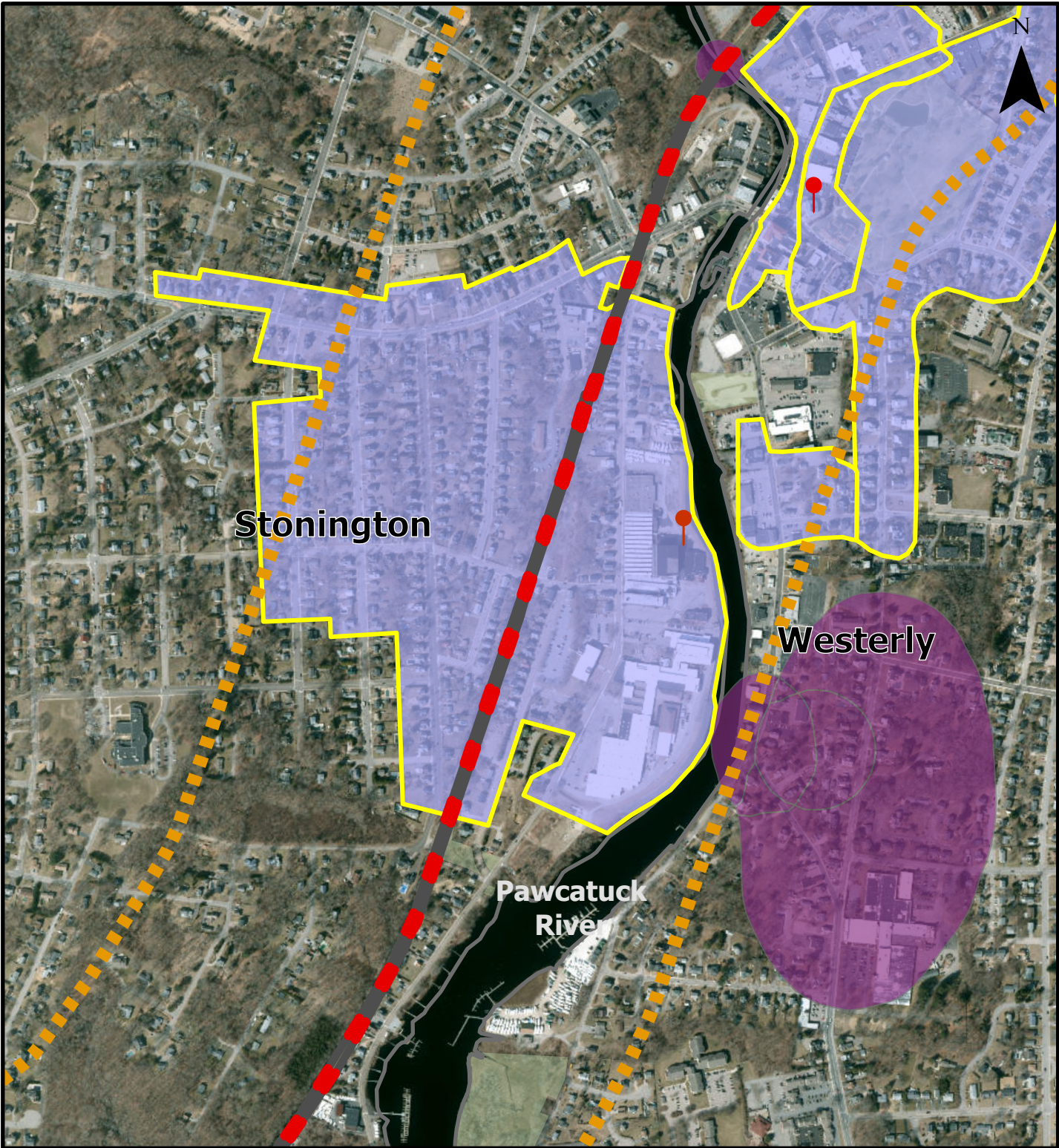
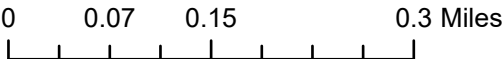
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Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

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- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Corridor Area Study

Historic Resources

SLE Extension Page 27 of 27

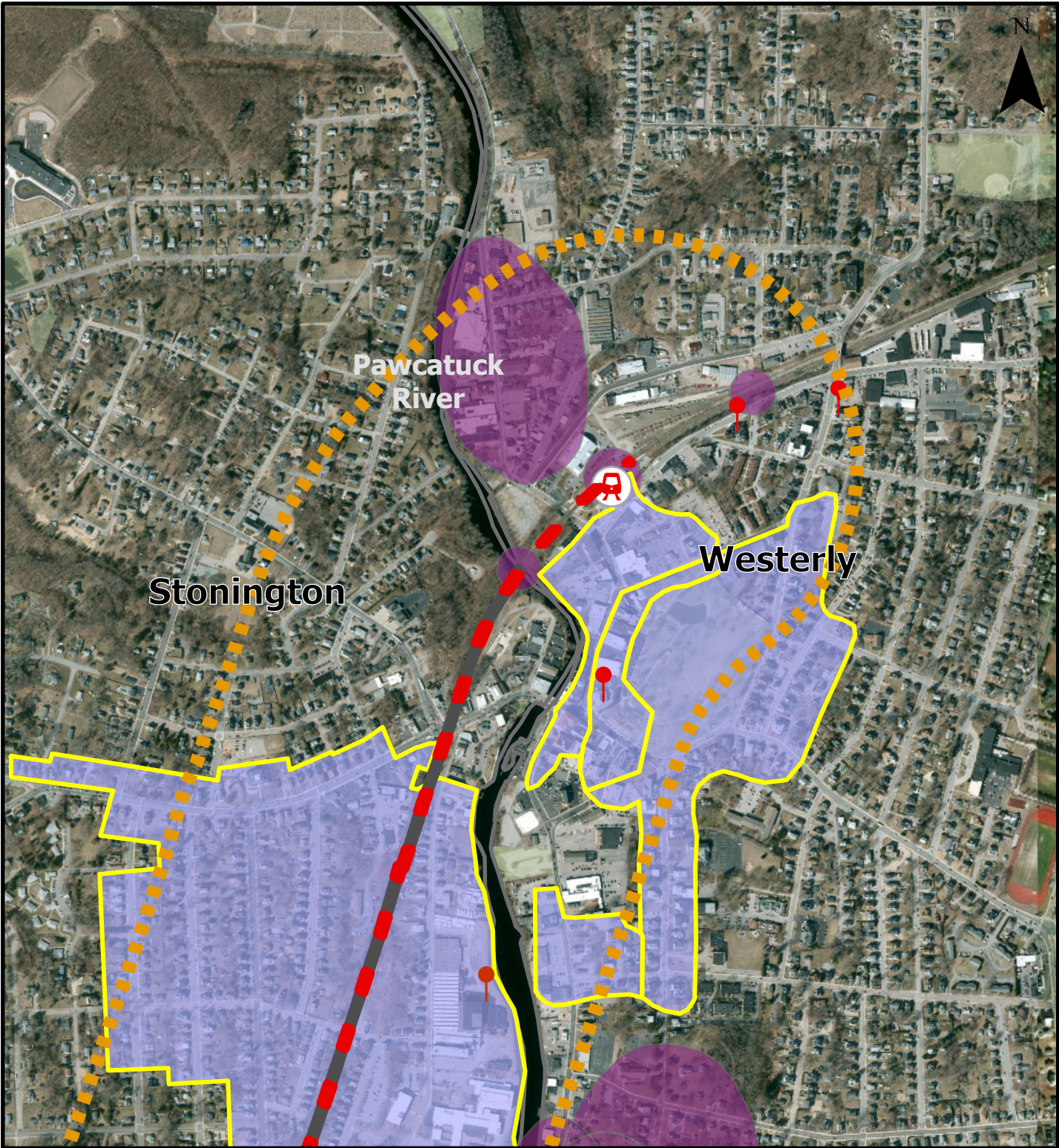
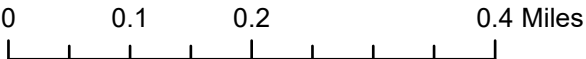
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Study Area

- Municipal Boundary
- SLE Extension 1/4 Mile Buffer

Rail Infrastructure

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- Shore Line East
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Sources: National Register of Historic Places; Rhode Island Division of Planning; University of Rhode Island Environmental Data Center

Eastern Connecticut Rail Study

Wetlands Mapping

Norwich Rail Page 1 of 9

Study Area

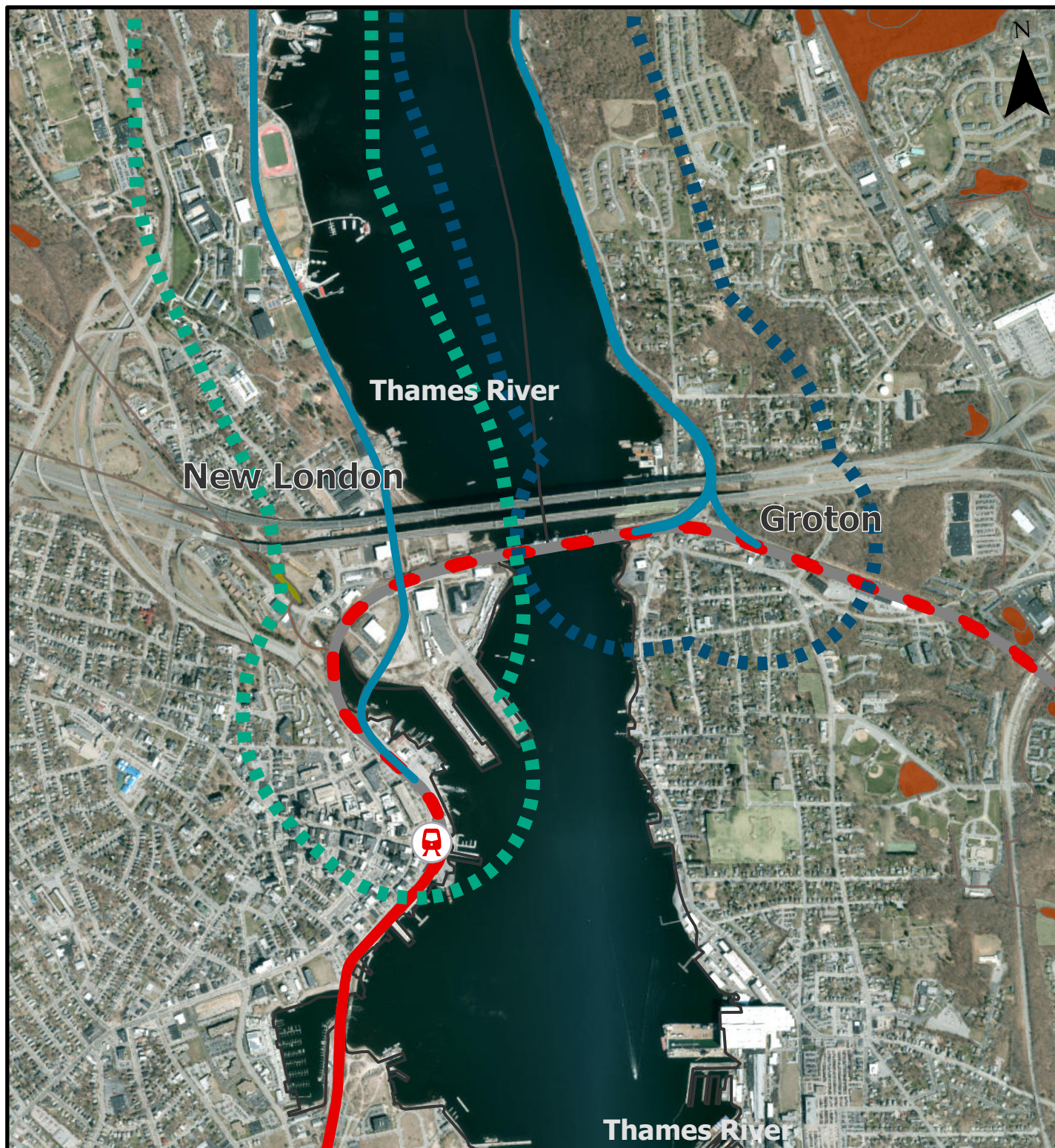
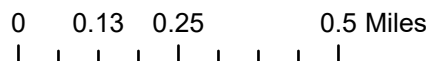
-  Municipal Boundary
-  P&W/Eastside Alignment 1/4 Mile Buffer
-  NECR/Westside Alignment 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



Source: CTDEEP National Wetlands Inventory

Eastern Connecticut Rail Study

Wetlands Mapping

Norwich Rail Page 2 of 9

Study Area

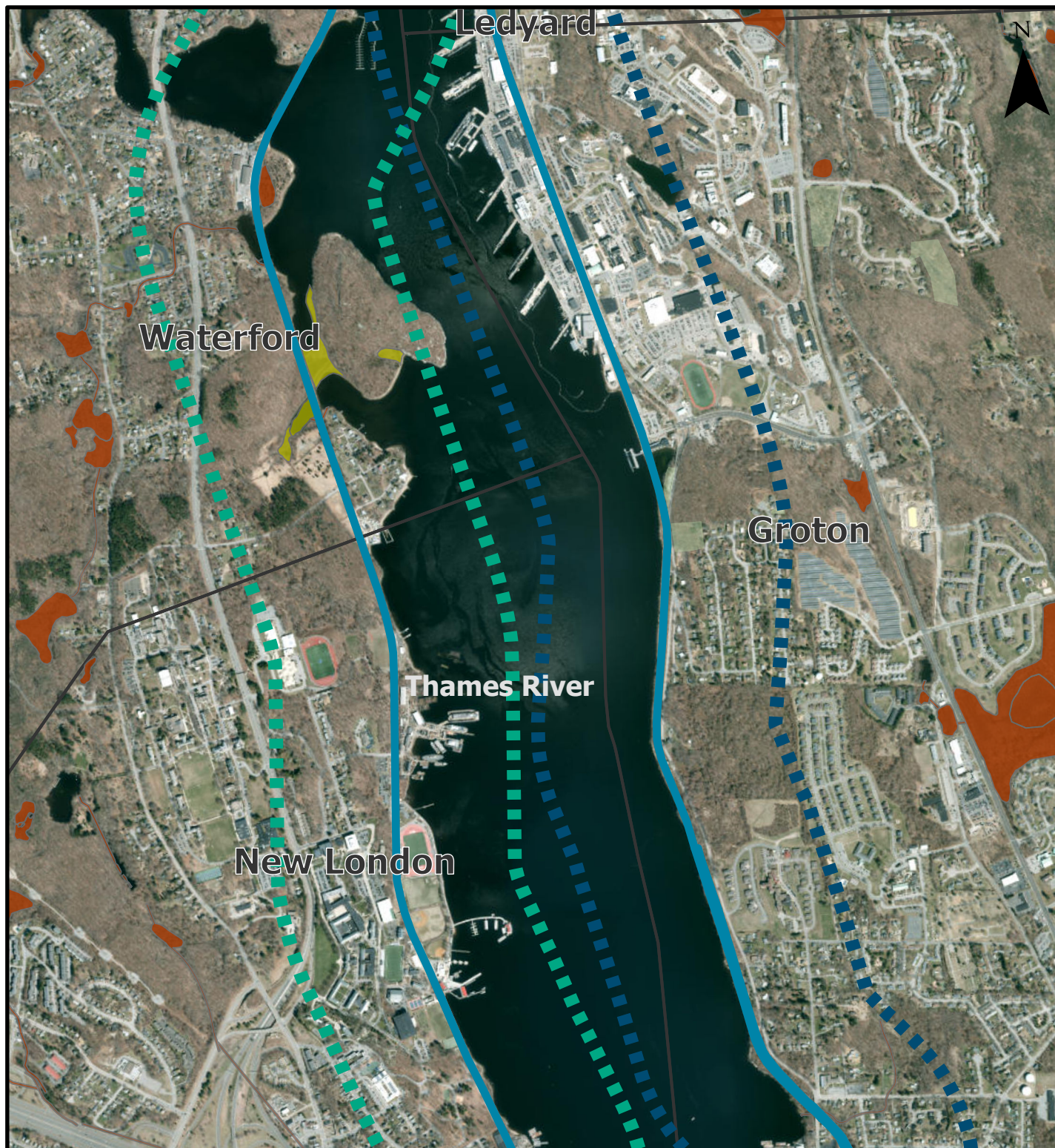
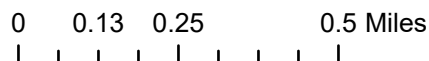
-  Municipal Boundary
-  P&W/Eastside Alignment 1/4 Mile Buffer
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Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



Source: CTDEEP National Wetlands Inventory

Eastern Connecticut Rail Study

Wetlands Mapping

Norwich Rail Page 3 of 9

Study Area

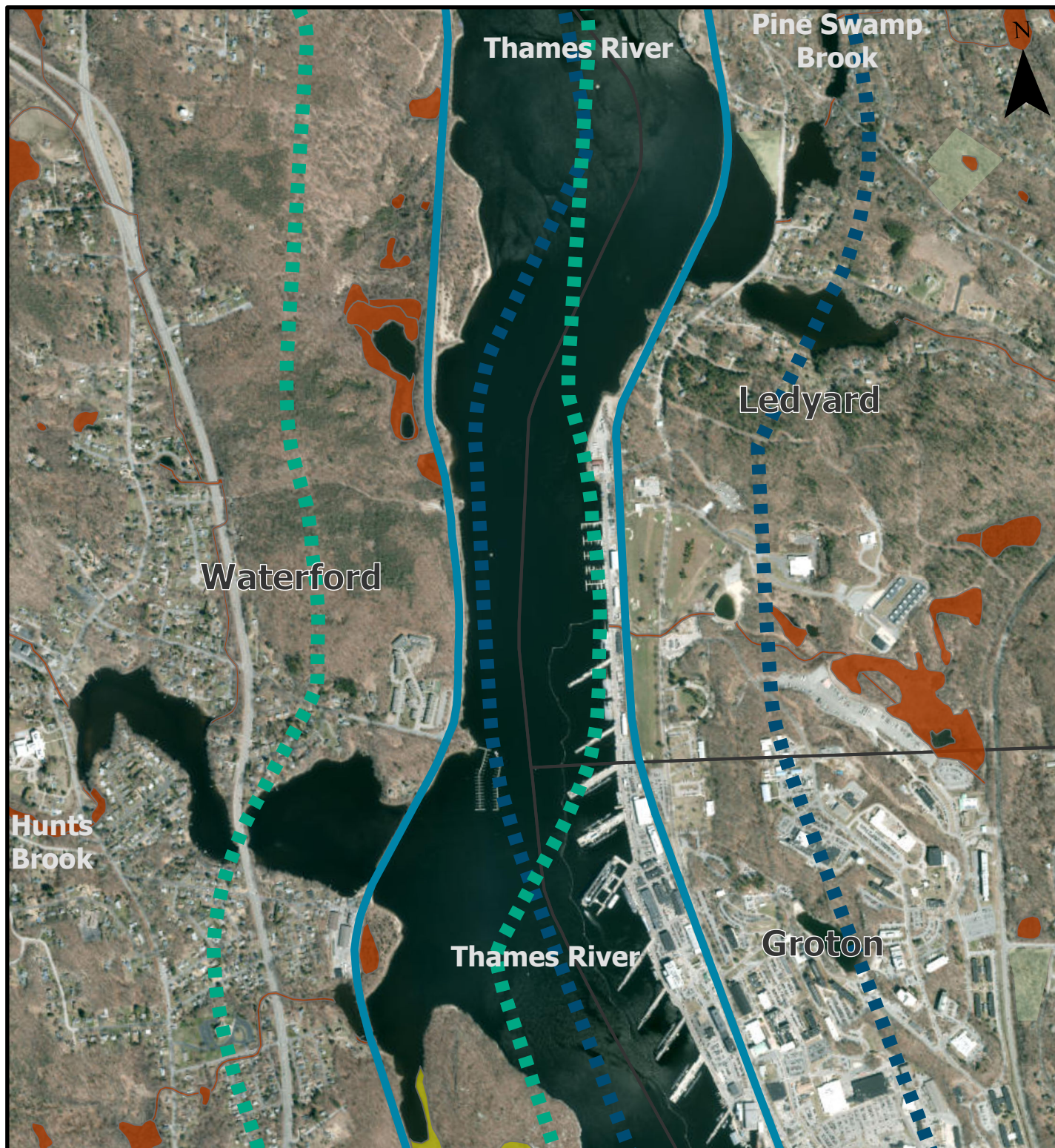
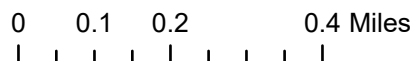
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Rail Infrastructure

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-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



Source: CTDEEP National Wetlands Inventory

Eastern Connecticut Rail Study

Wetlands Mapping

Norwich Rail Page 4 of 9

Study Area

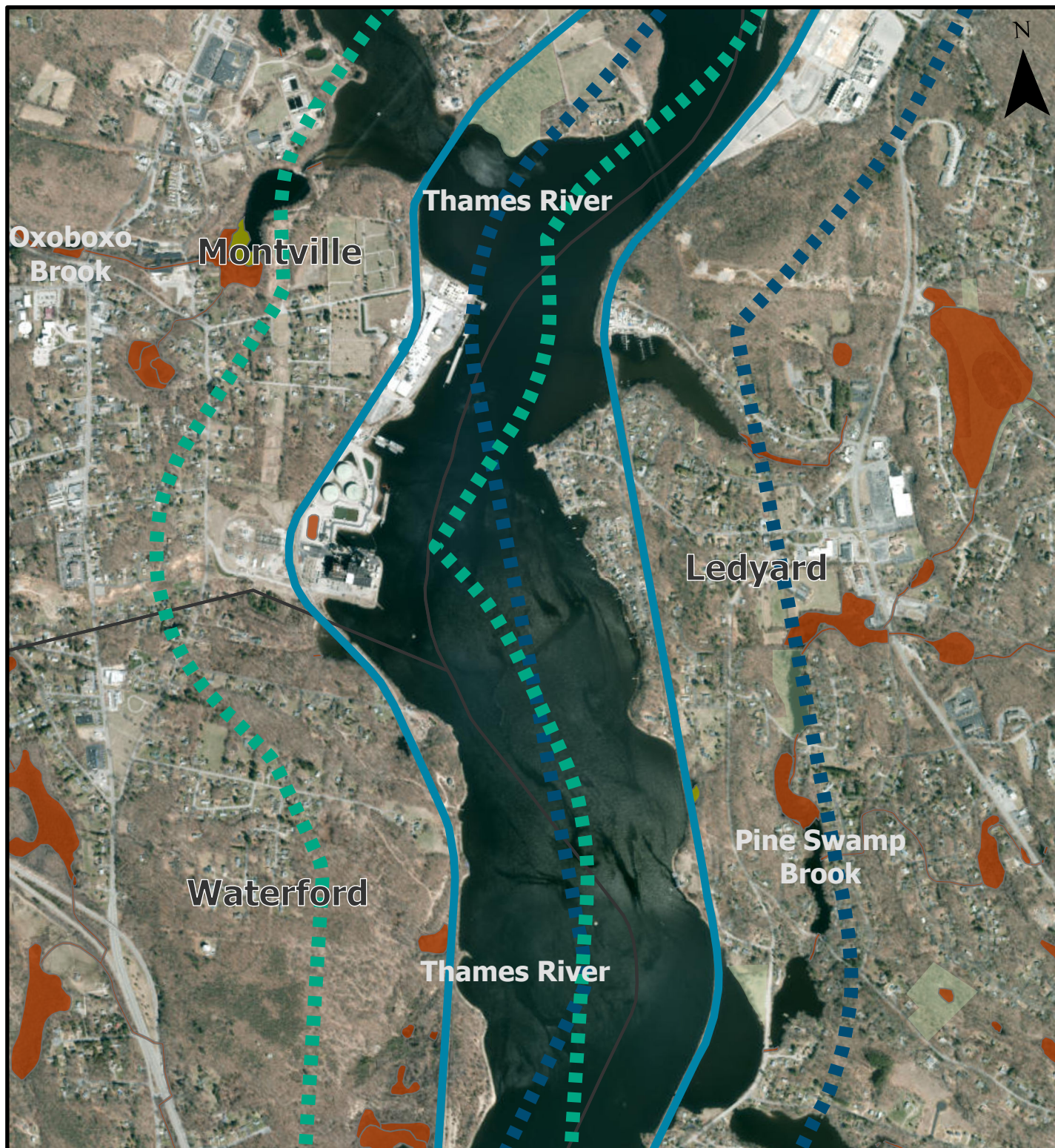
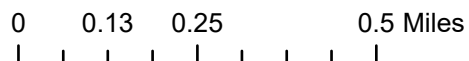
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Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



Source: CTDEEP National Wetlands Inventory

Eastern Connecticut Rail Study

Wetlands Mapping

Norwich Rail Page 5 of 9

Study Area

-  Municipal Boundary
-  P&W/Eastside Alignment 1/4 Mile Buffer
-  NECR/Westside Alignment 1/4 Mile Buffer

Rail Infrastructure

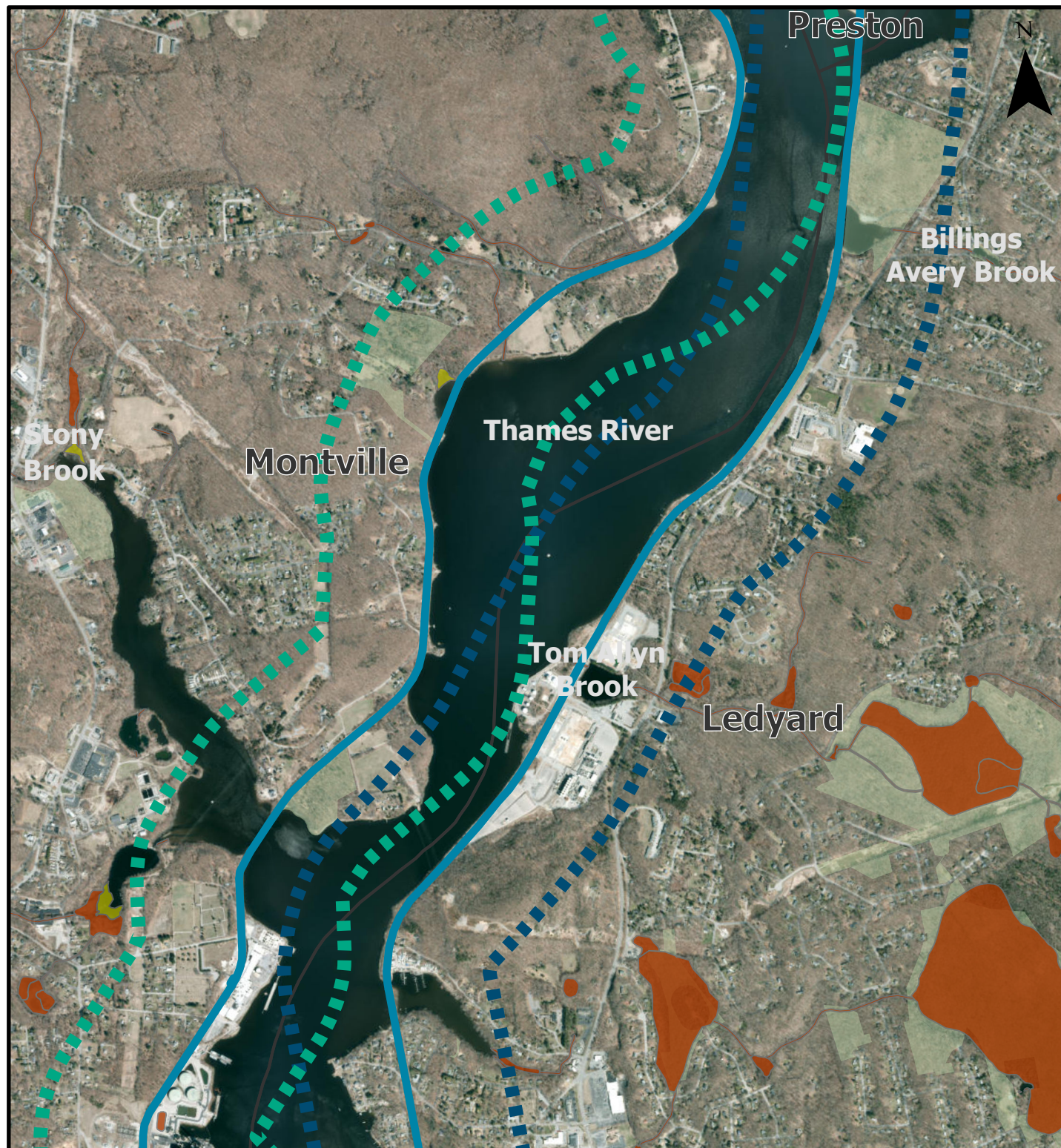
-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



0 0.15 0.3 0.6 Miles

A horizontal scale bar with four segments, corresponding to the distances 0, 0.15, 0.3, and 0.6 miles.

Source: CTDEEP National Wetlands Inventory

Eastern Connecticut Rail Study

Wetlands Mapping

Norwich Rail Page 6 of 9

Study Area

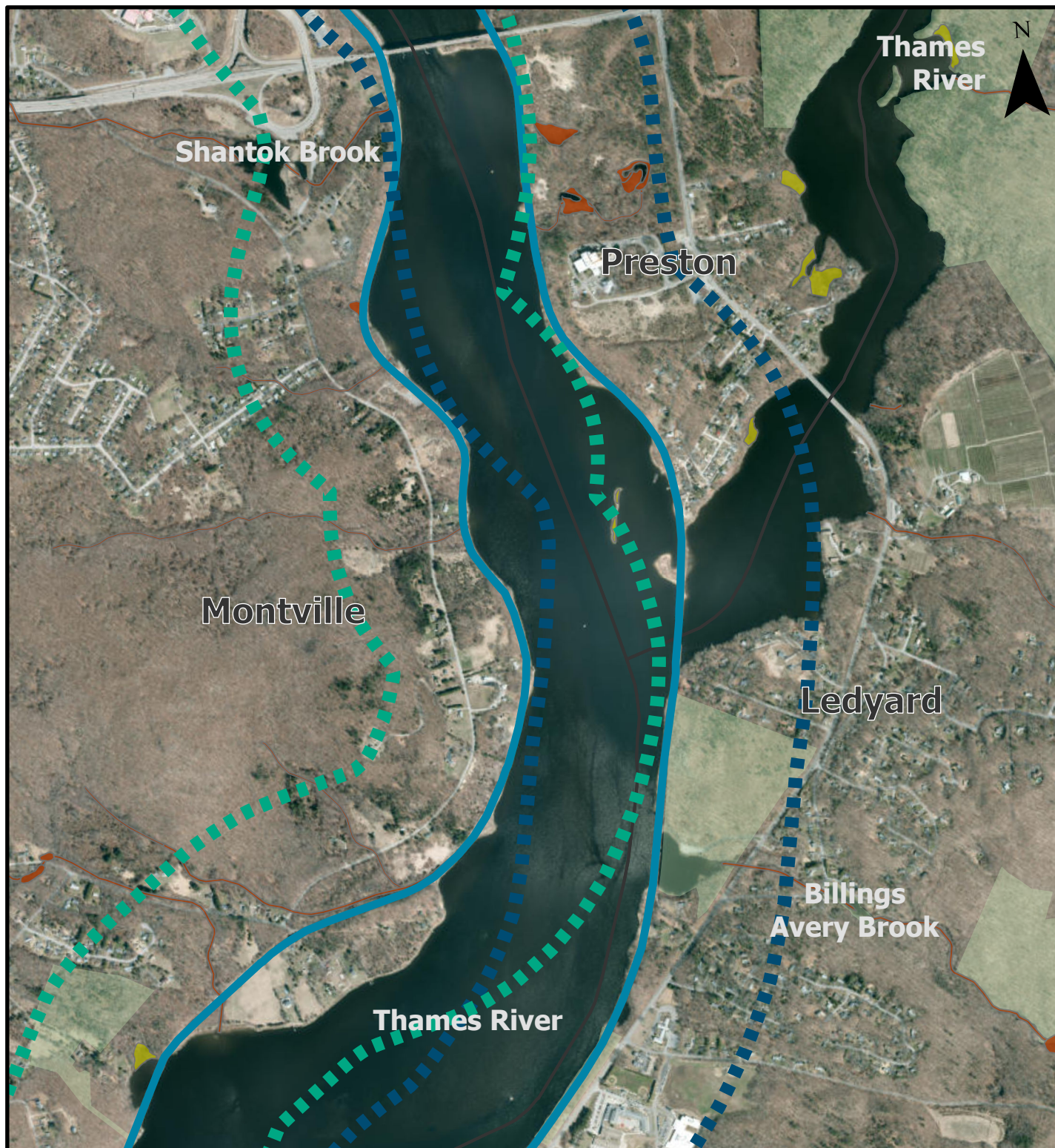
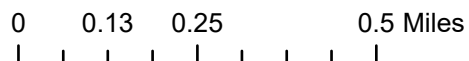
-  Municipal Boundary
-  P&W/Eastside Alignment 1/4 Mile Buffer
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Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



Source: CTDEEP National Wetlands Inventory

Eastern Connecticut Rail Study

Wetlands Mapping

Norwich Rail Page 7 of 9

Study Area

-  Municipal Boundary
-  P&W/Eastside Alignment 1/4 Mile Buffer
-  NECR/Westside Alignment 1/4 Mile Buffer

Rail Infrastructure

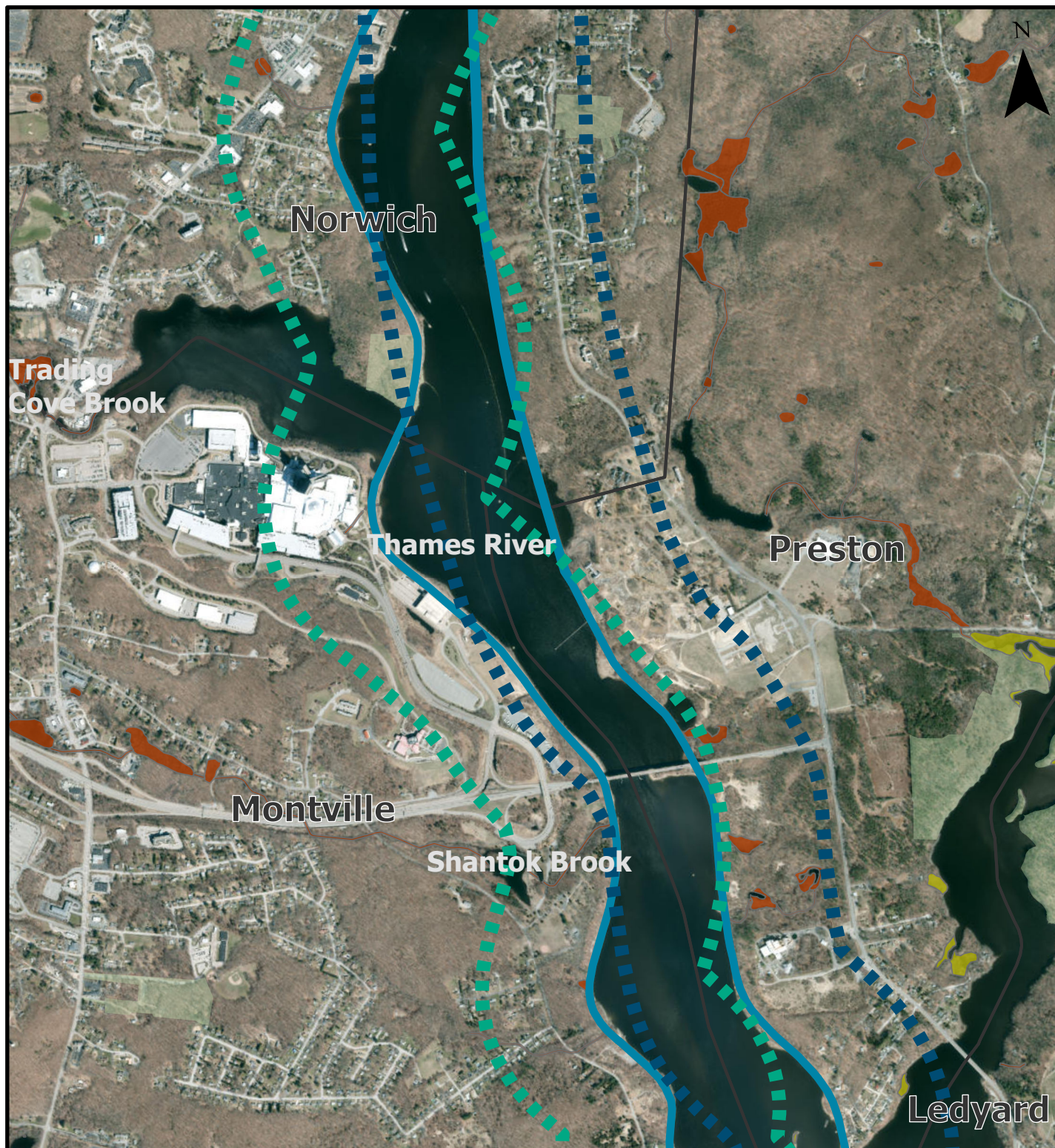
-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



0 0.15 0.3 0.6 Miles



Source: CTDEEP National Wetlands Inventory

Eastern Connecticut Rail Study

Wetlands Mapping

Norwich Rail Page 8 of 9

Study Area

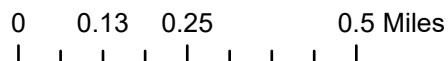
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Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



Source: CTDEEP National Wetlands Inventory

Eastern Connecticut Rail Study

Wetlands Mapping

Norwich Rail Page 9 of 9

Study Area

-  Municipal Boundary
-  P&W/Eastside Alignment 1/4 Mile Buffer
-  NECR/Westside Alignment 1/4 Mile Buffer

Rail Infrastructure

-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Wetland Soils

-  Marine Wetlands
-  Freshwater Wetlands



0 0.13 0.25 0.5 Miles



Source: CTDEEP National Wetlands Inventory

Eastern Connecticut Rail Study

FEMA Flood Mapping

Norwich Rail Page 1 of 9

Study Area

-  Municipal Boundary
-  P&W/Eastside Alignment 1/4 Mile Buffer
-  NECR/Westside Alignment 1/4 Mile Buffer

Rail Infrastructure

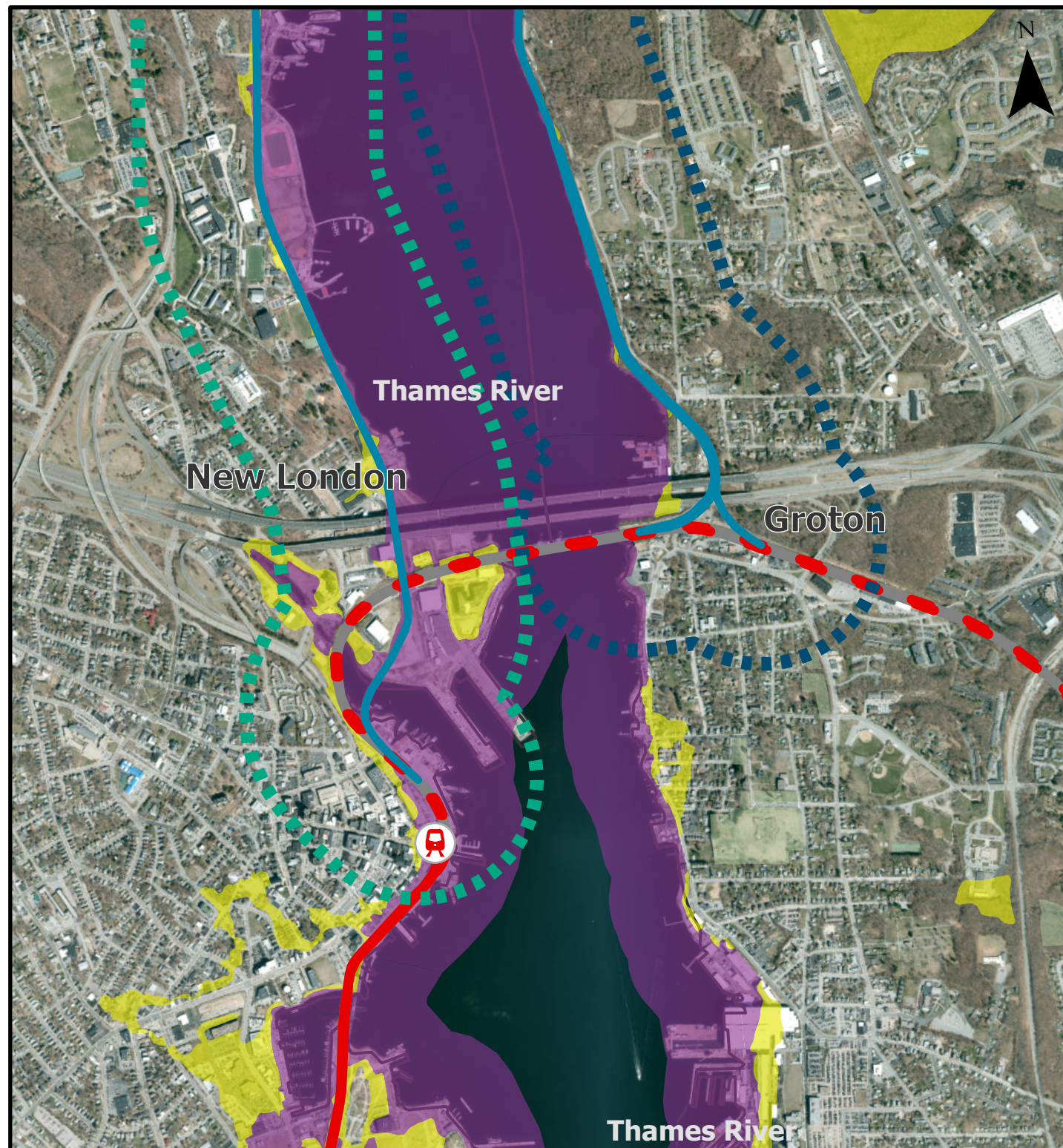
-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard



0 0.13 0.25 0.5 Miles



Source: FEMA National Flood Hazard Layer

Eastern Connecticut Rail Study

FEMA Flood Mapping

Norwich Rail Page 2 of 9

Study Area

-  Municipal Boundary
-  P&W/Eastside Alignment 1/4 Mile Buffer
-  NECR/Westside Alignment 1/4 Mile Buffer

Rail Infrastructure

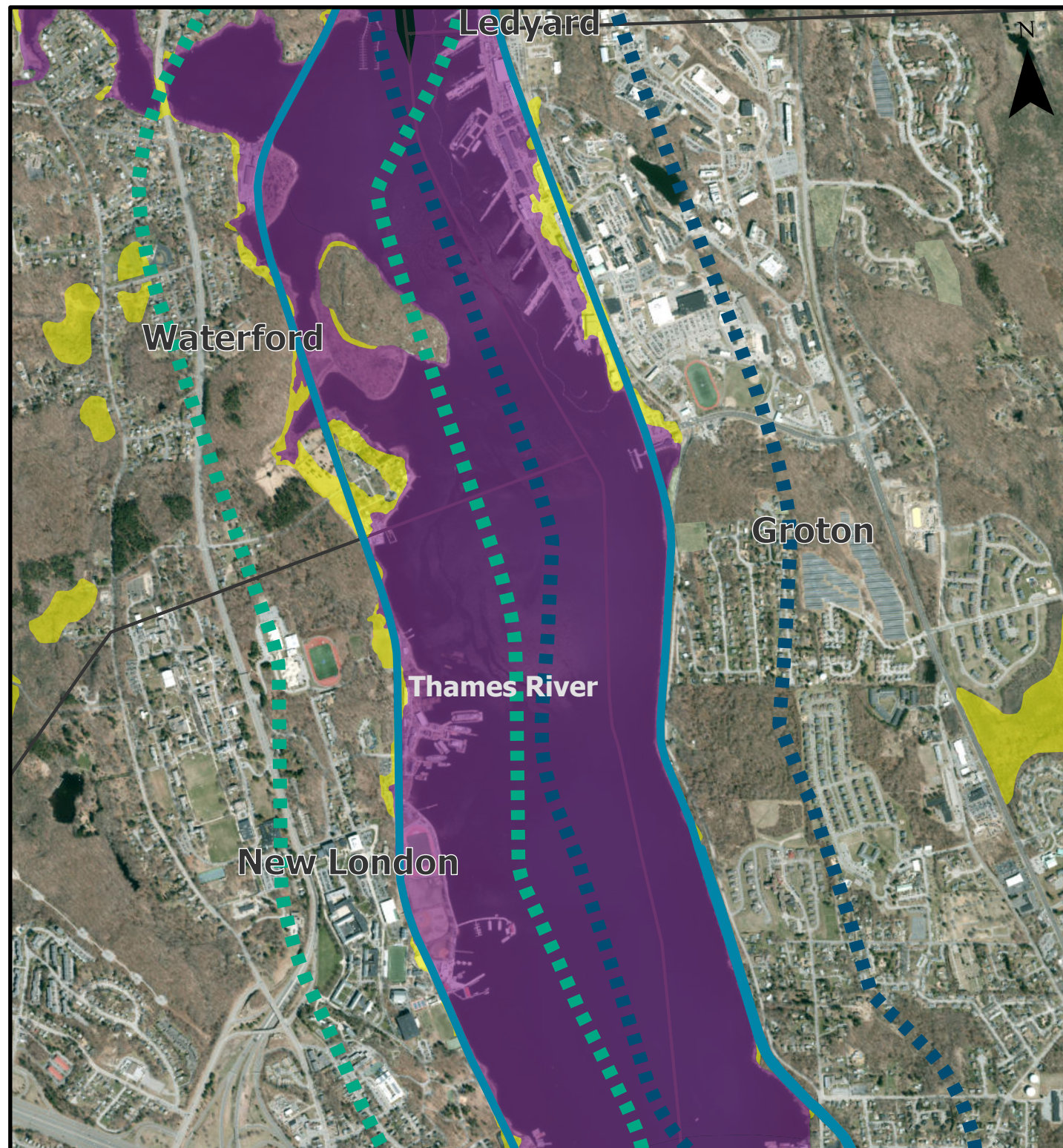
-  Existing Rail Stations
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Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard



0 0.13 0.25 0.5 Miles



Source: FEMA National Flood Hazard Layer

Eastern Connecticut Rail Study

FEMA Flood Mapping

Norwich Rail Page 3 of 9

Study Area

-  Municipal Boundary
-  P&W/Eastside Alignment 1/4 Mile Buffer
-  NECR/Westside Alignment 1/4 Mile Buffer

Rail Infrastructure

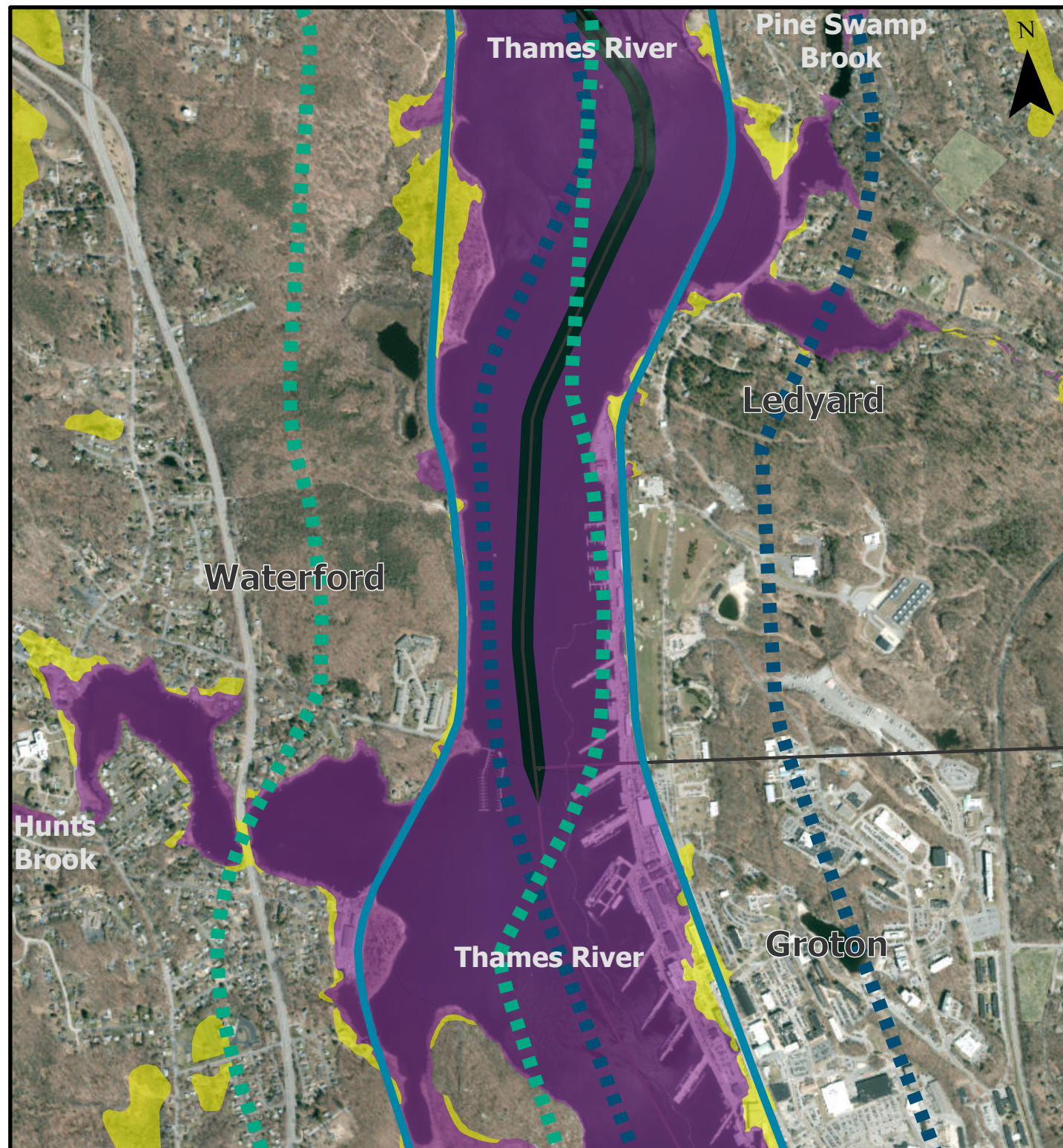
-  Existing Rail Stations
-  Shore Line East
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-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard



0 0.1 0.2 0.4 Miles



Source: FEMA National Flood Hazard Layer

Eastern Connecticut Rail Study

FEMA Flood Mapping

Norwich Rail Page 4 of 9

Study Area

-  Municipal Boundary
-  P&W/Eastside Alignment 1/4 Mile Buffer
-  NECR/Westside Alignment 1/4 Mile Buffer

Rail Infrastructure

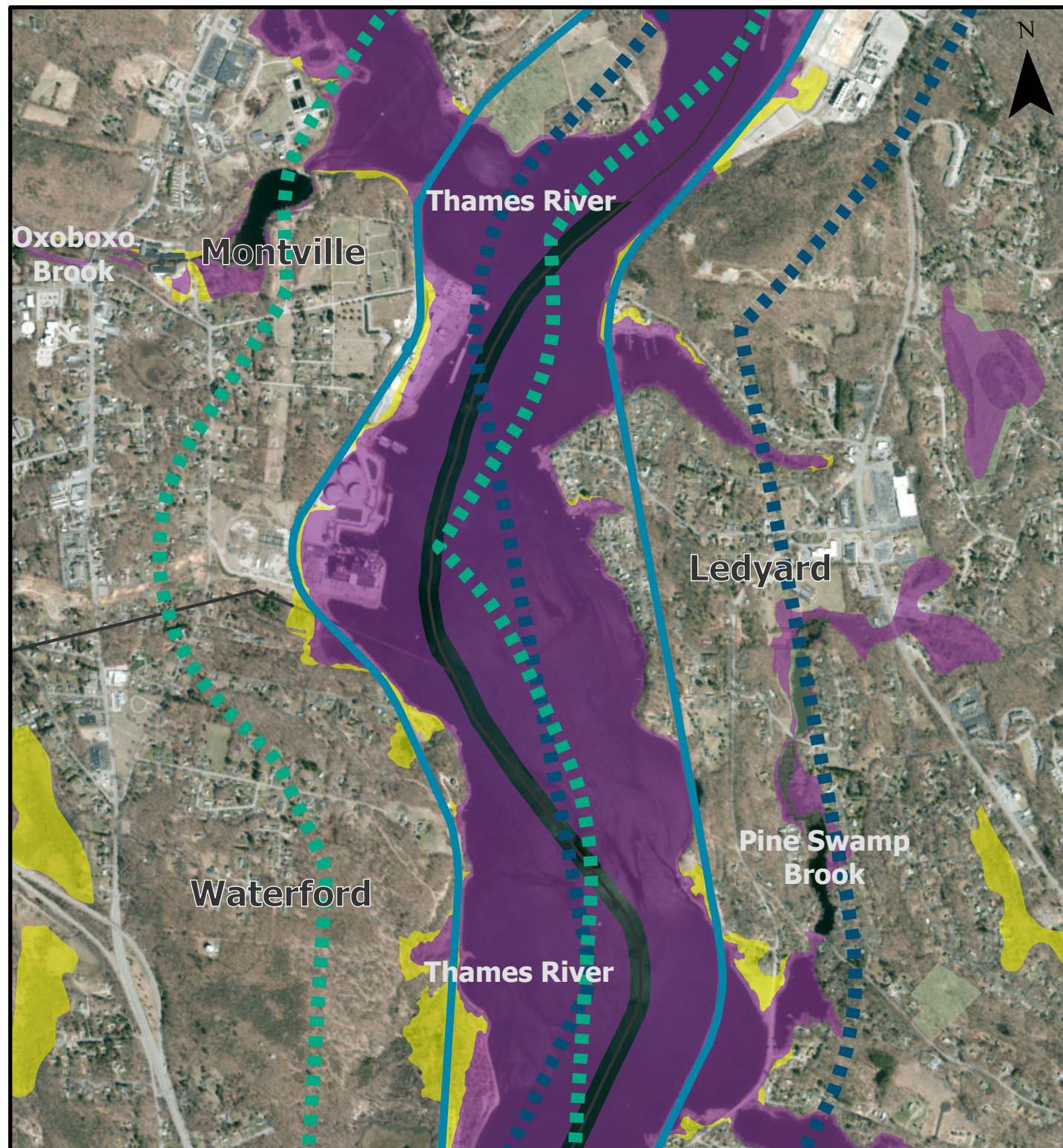
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Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard



0 0.13 0.25 0.5 Miles



Source: FEMA National Flood Hazard Layer

Eastern Connecticut Rail Study

FEMA Flood Mapping

Norwich Rail Page 5 of 9

Study Area

-  Municipal Boundary
-  P&W/Eastside Alignment 1/4 Mile Buffer
-  NECR/Westside Alignment 1/4 Mile Buffer

Rail Infrastructure

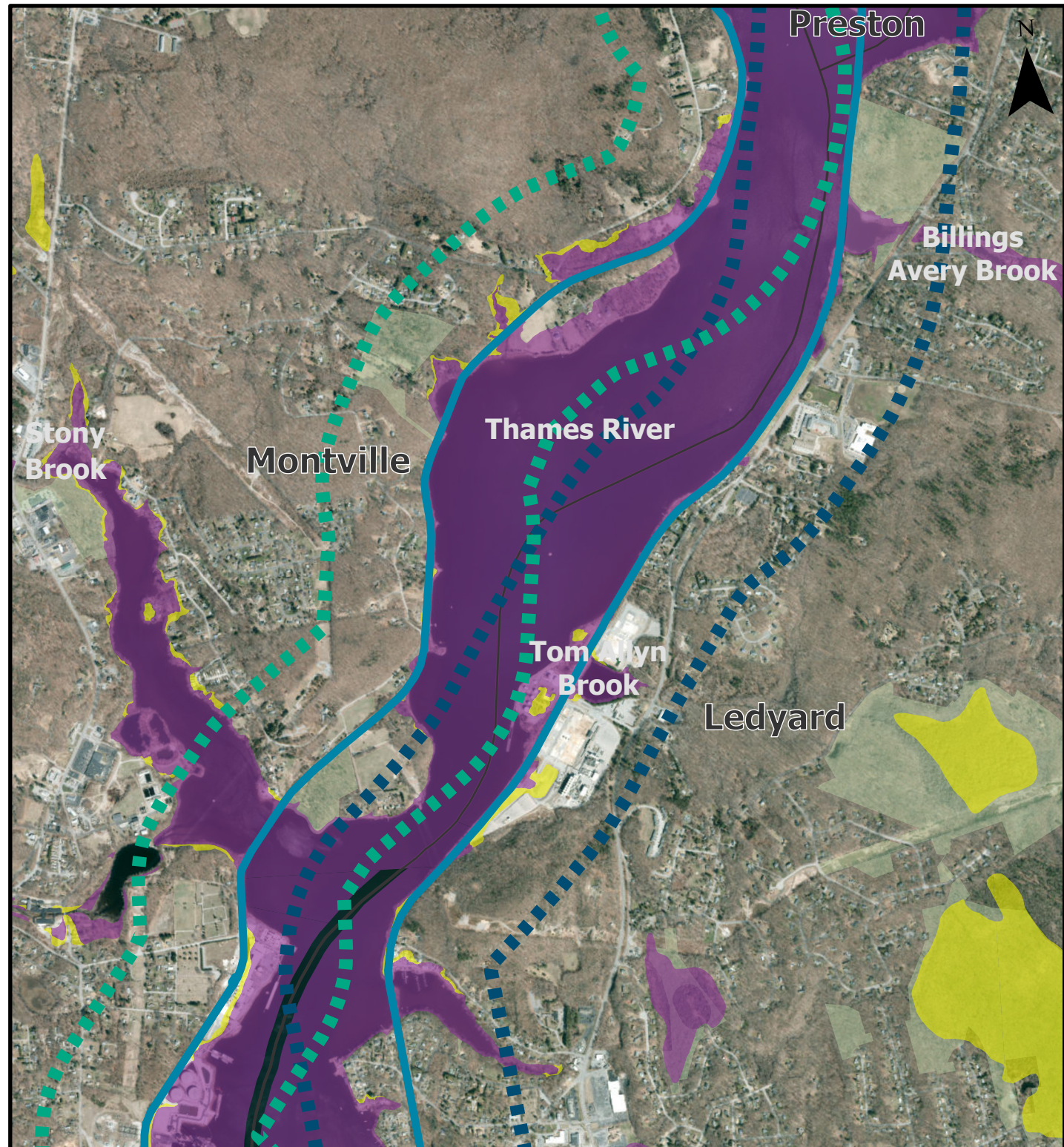
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0 0.15 0.3 0.6 Miles



Source: FEMA National Flood Hazard Layer

Eastern Connecticut Rail Study

FEMA Flood Mapping

Norwich Rail Page 6 of 9

Study Area

-  Municipal Boundary
-  P&W/Eastside Alignment 1/4 Mile Buffer
-  NECR/Westside Alignment 1/4 Mile Buffer

Rail Infrastructure

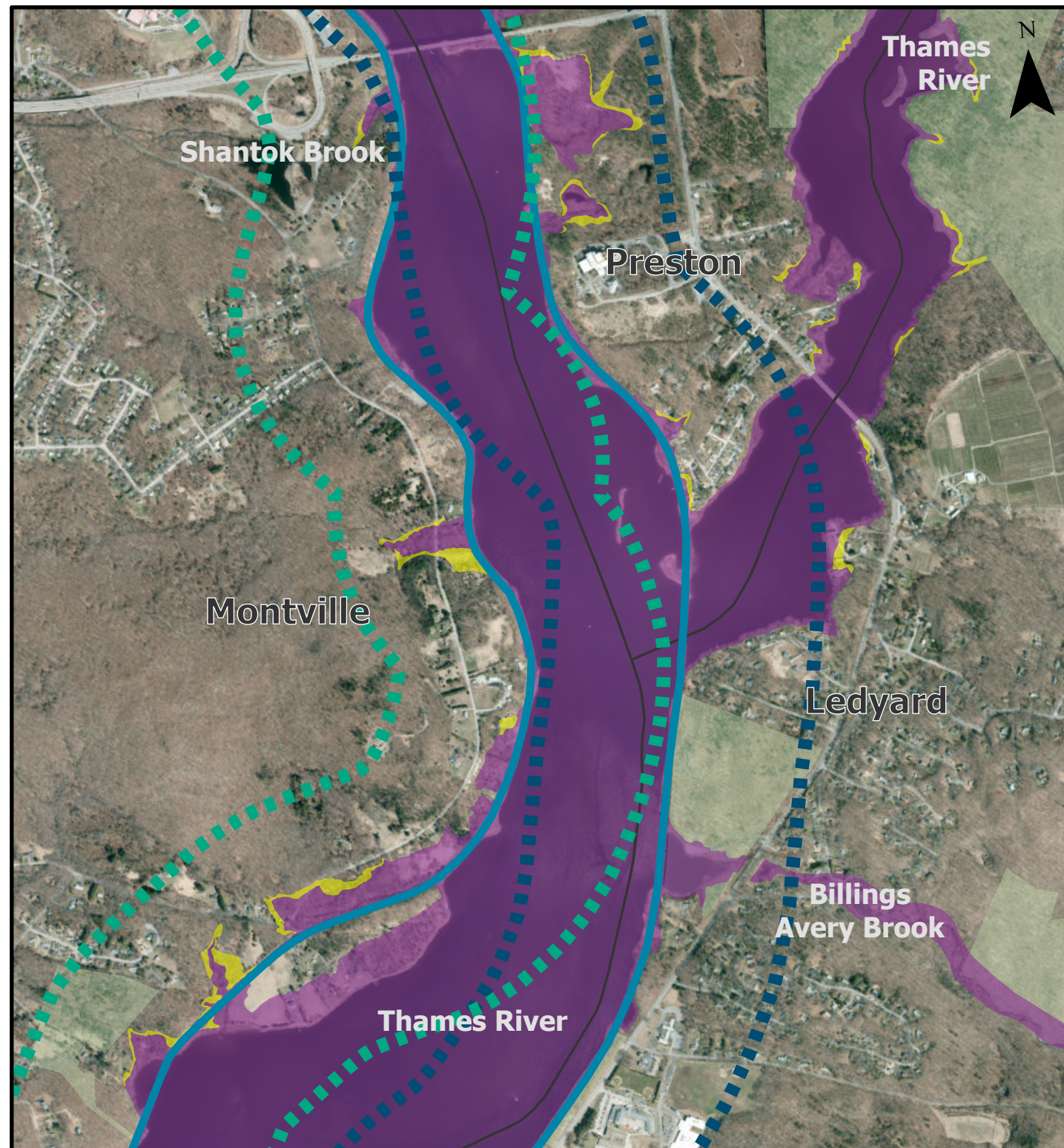
-  Existing Rail Stations
-  Shore Line East
-  Proposed Service Extension
-  Proposed Norwich Rail
-  NEC

Federal Emergency Management Administration Flood Hazard

-  1% Annual Chance Flood Hazard
-  0.2% Annual Chance Flood Hazard



0 0.13 0.25 0.5 Miles



Source: FEMA National Flood Hazard Layer

Eastern Connecticut Rail Study

FEMA Flood Mapping

Norwich Rail Page 7 of 9

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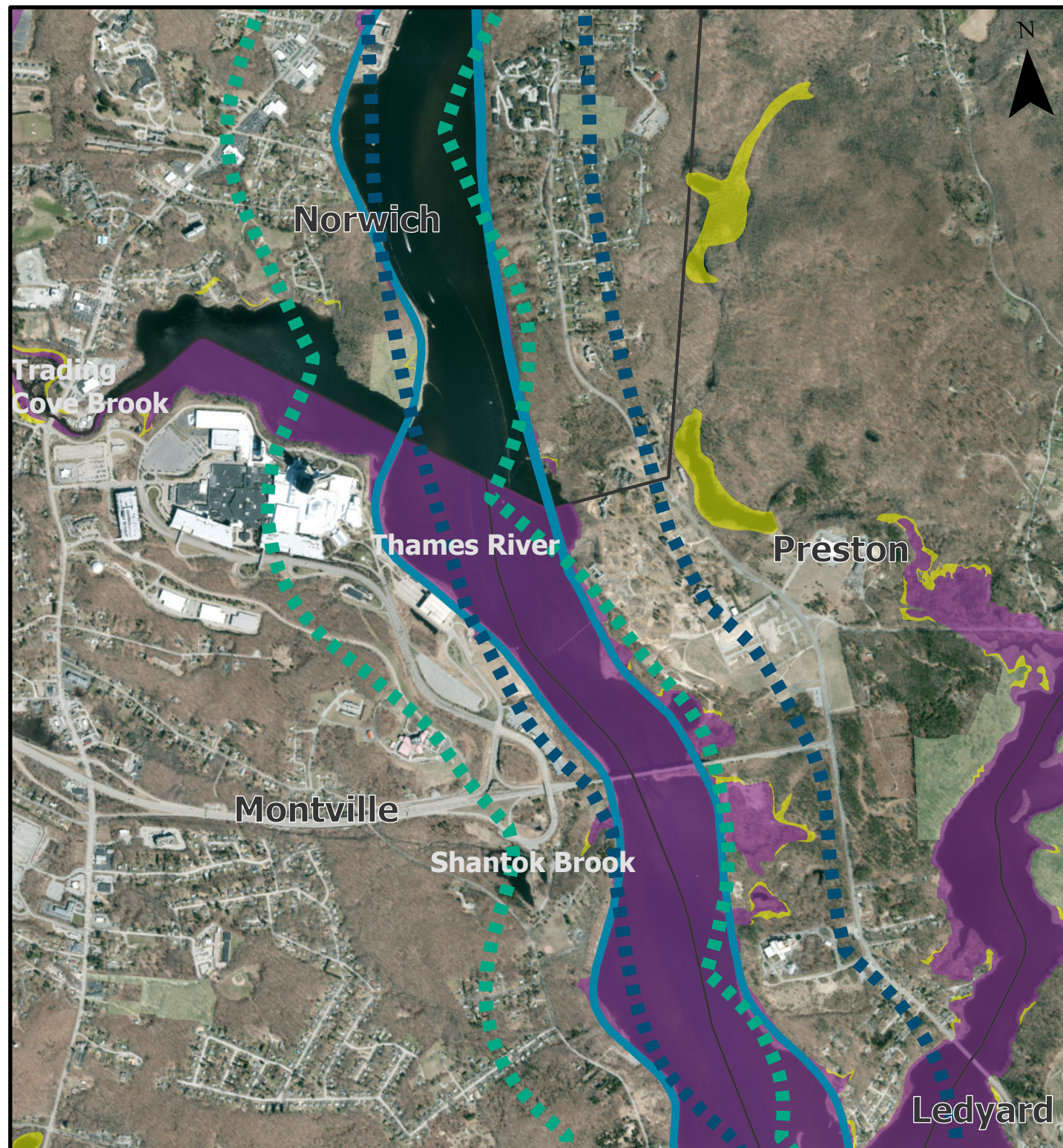
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Eastern Connecticut Rail Study

FEMA Flood Mapping

Norwich Rail Page 8 of 9

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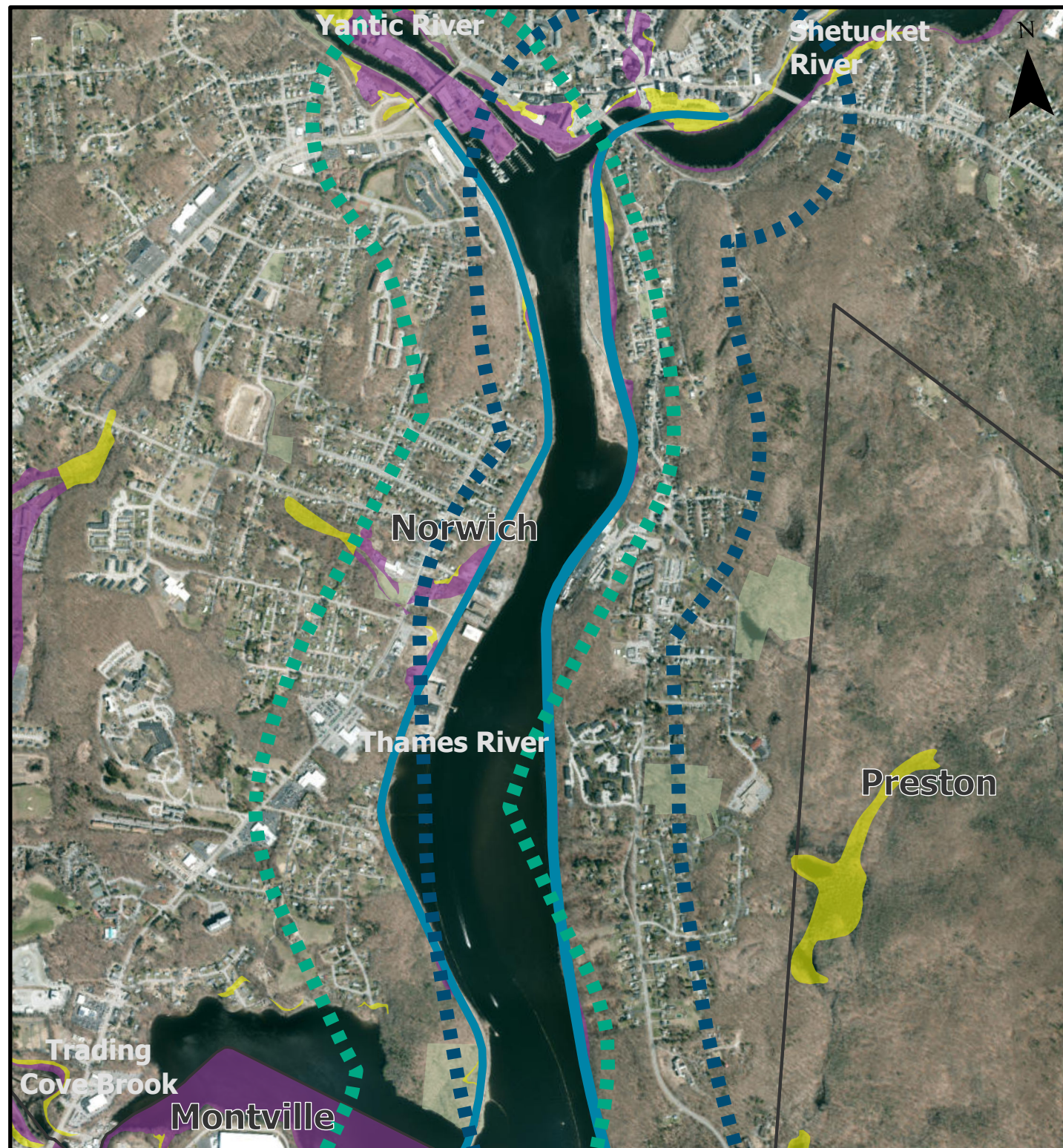
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Eastern Connecticut Rail Study

FEMA Flood Mapping

Norwich Rail Page 9 of 9

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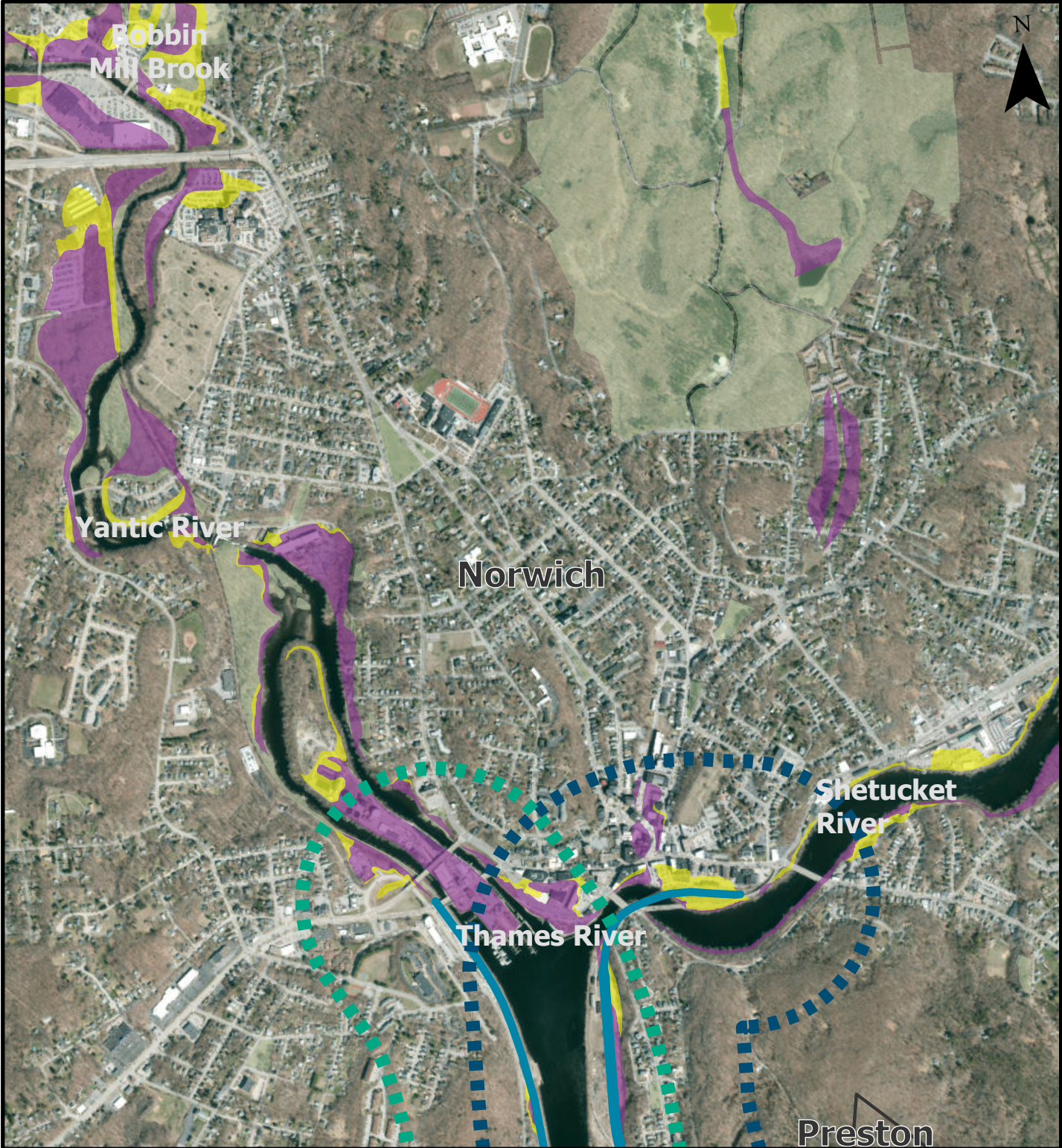
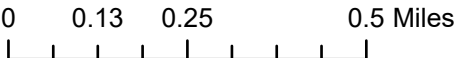
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Source: FEMA National Flood Hazard Layer

Eastern Connecticut Rail Study

Recreational and Protected Lands

Norwich Rail Page 1 of 9

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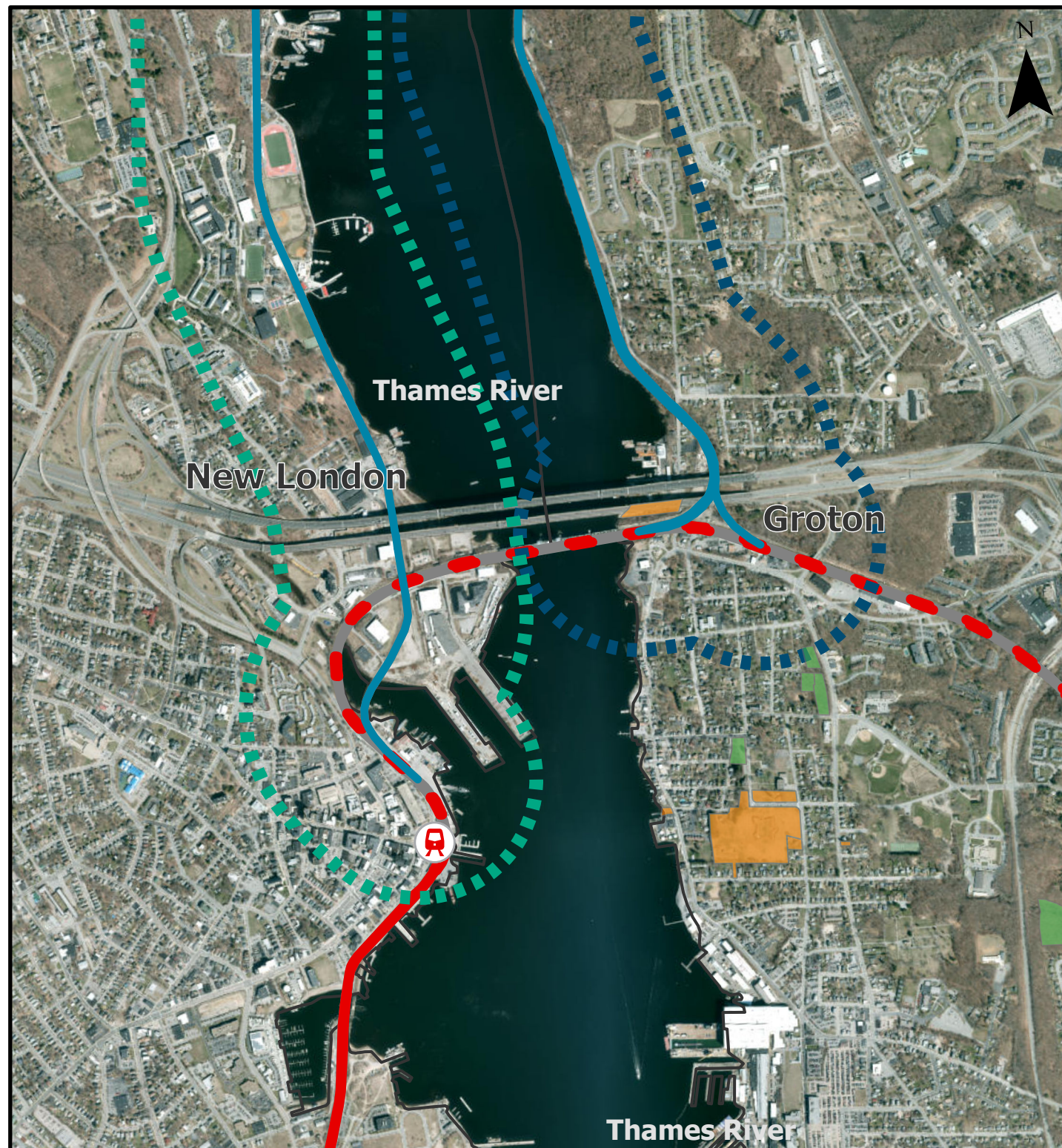
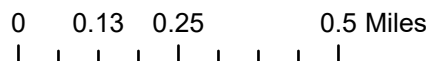
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Rail Infrastructure

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-  NEC

Protected Open Space

-  Federal Land
-  Land Trust Land
-  Municipal Open Space
-  Private Open Space
-  State
-  Utility Company Land



Source: CTDEEP Protected Open Space

Eastern Connecticut Rail Study

Recreational and Protected Lands

Norwich Rail Page 2 of 9

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Eastern Connecticut Rail Study

Recreational and Protected Lands

Norwich Rail Page 3 of 9

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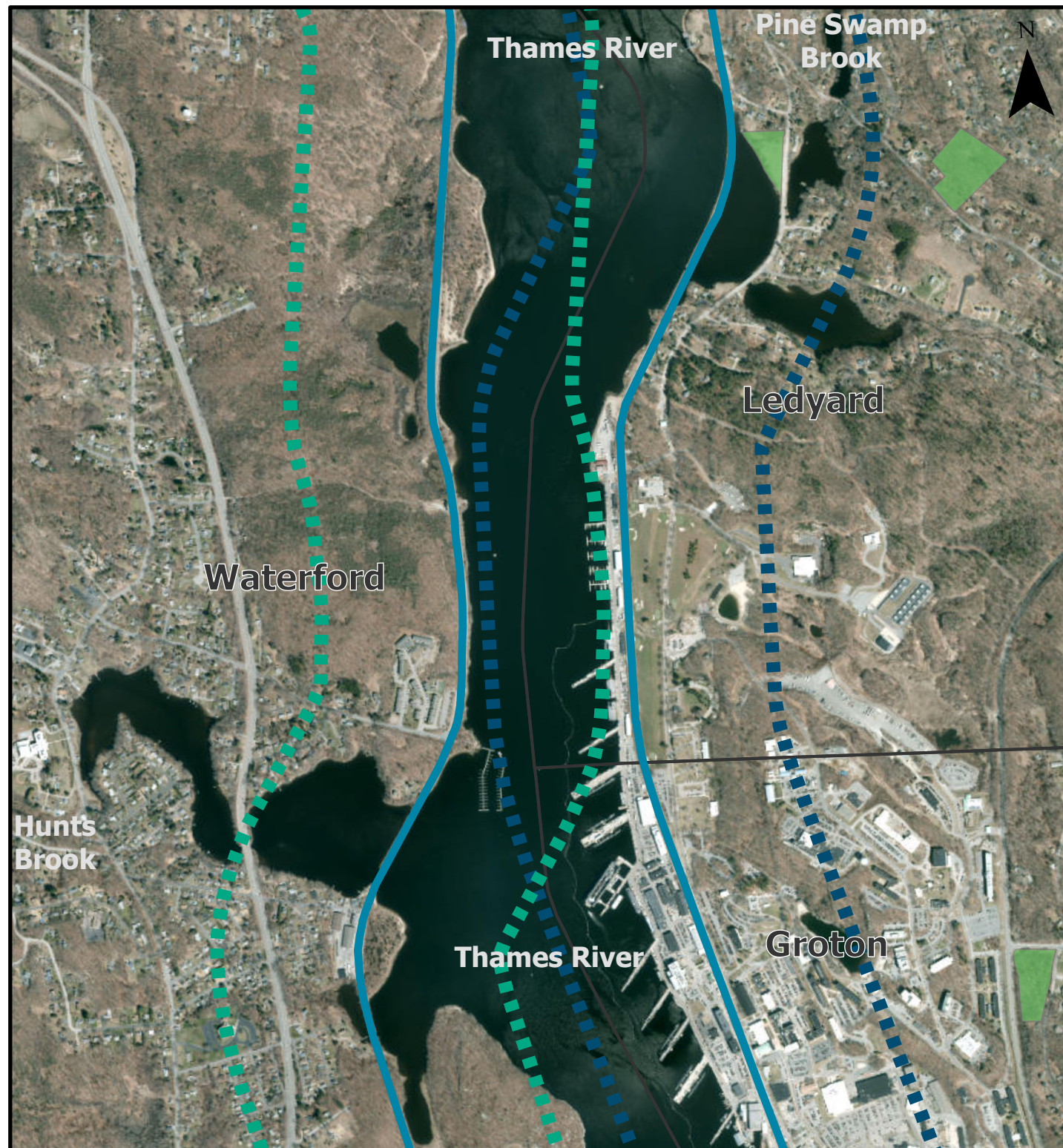
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-  Utility Company Land



0 0.1 0.2 0.4 Miles

A horizontal scale bar with tick marks at 0, 0.1, 0.2, and 0.4 miles.

Source: CTDEEP Protected Open Space

Eastern Connecticut Rail Study

Recreational and Protected Lands

Norwich Rail Page 4 of 9

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0 0.13 0.25 0.5 Miles

A horizontal scale bar with vertical tick marks at 0, 0.13, 0.25, and 0.5 miles.

Source: CTDEEP Protected Open Space

Eastern Connecticut Rail Study

Recreational and Protected Lands

Norwich Rail Page 5 of 9

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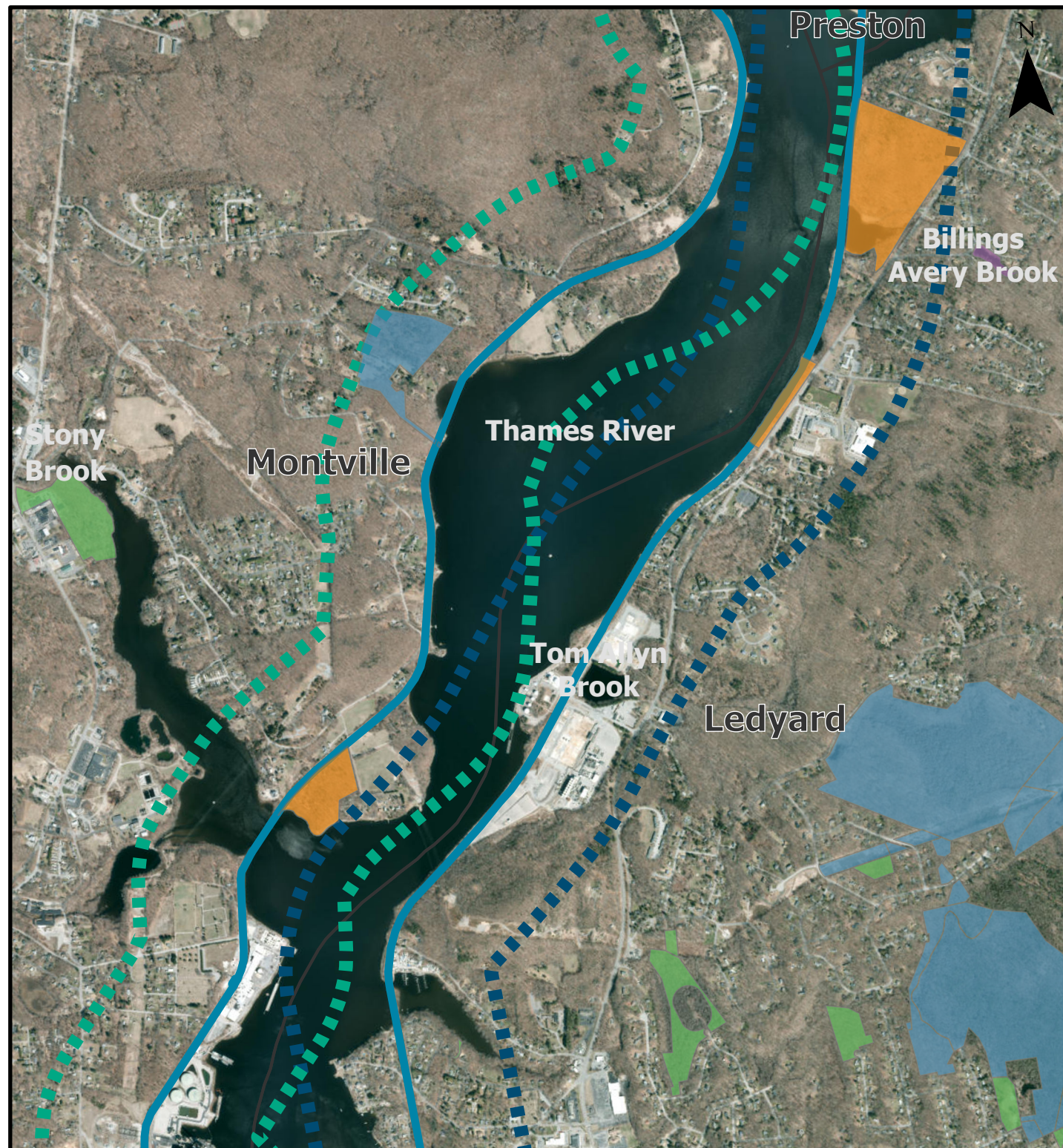
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0 0.15 0.3 0.6 Miles



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Eastern Connecticut Rail Study

Recreational and Protected Lands

Norwich Rail Page 6 of 9

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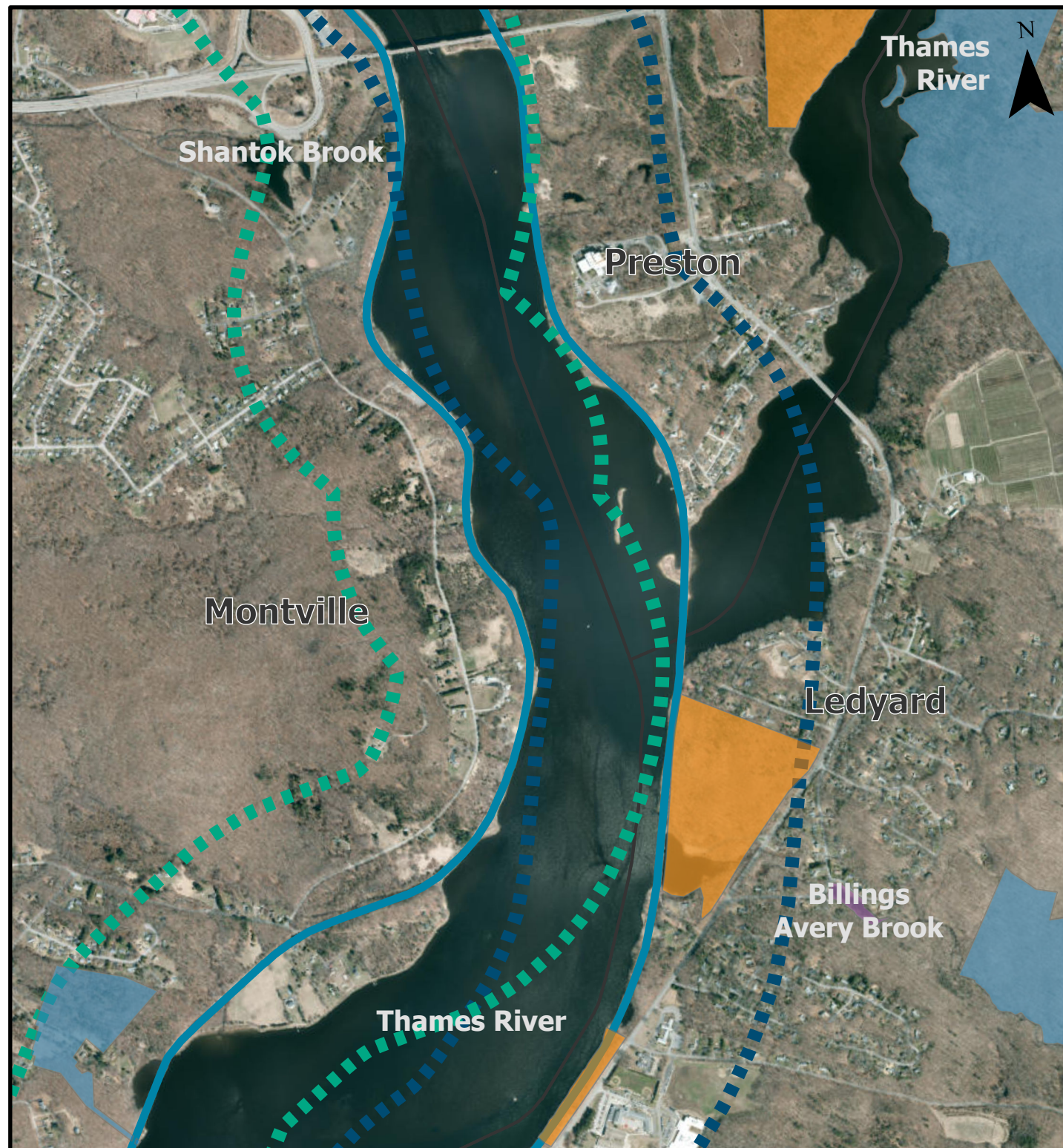
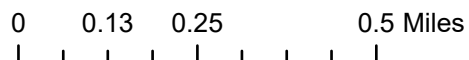
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Eastern Connecticut Rail Study

Recreational and Protected Lands

Norwich Rail Page 7 of 9

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Eastern Connecticut Rail Study

Recreational and Protected Lands

Norwich Rail Page 8 of 9

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Eastern Connecticut Rail Study

Recreational and Protected Lands

Norwich Rail Page 9 of 9

Study Area

 Municipal Boundary

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Rail Infrastructure

 Existing Rail Stations

 Shore Line East

 Proposed Service Extension

 Proposed Norwich Rail

 NEC

Protected Open Space

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0 0.13 0.25 0.5 Miles



Source: CTDEEP Protected Open Space

Eastern Connecticut Rail Study

Historic Resources

Norwich Rail Page 1 of 9

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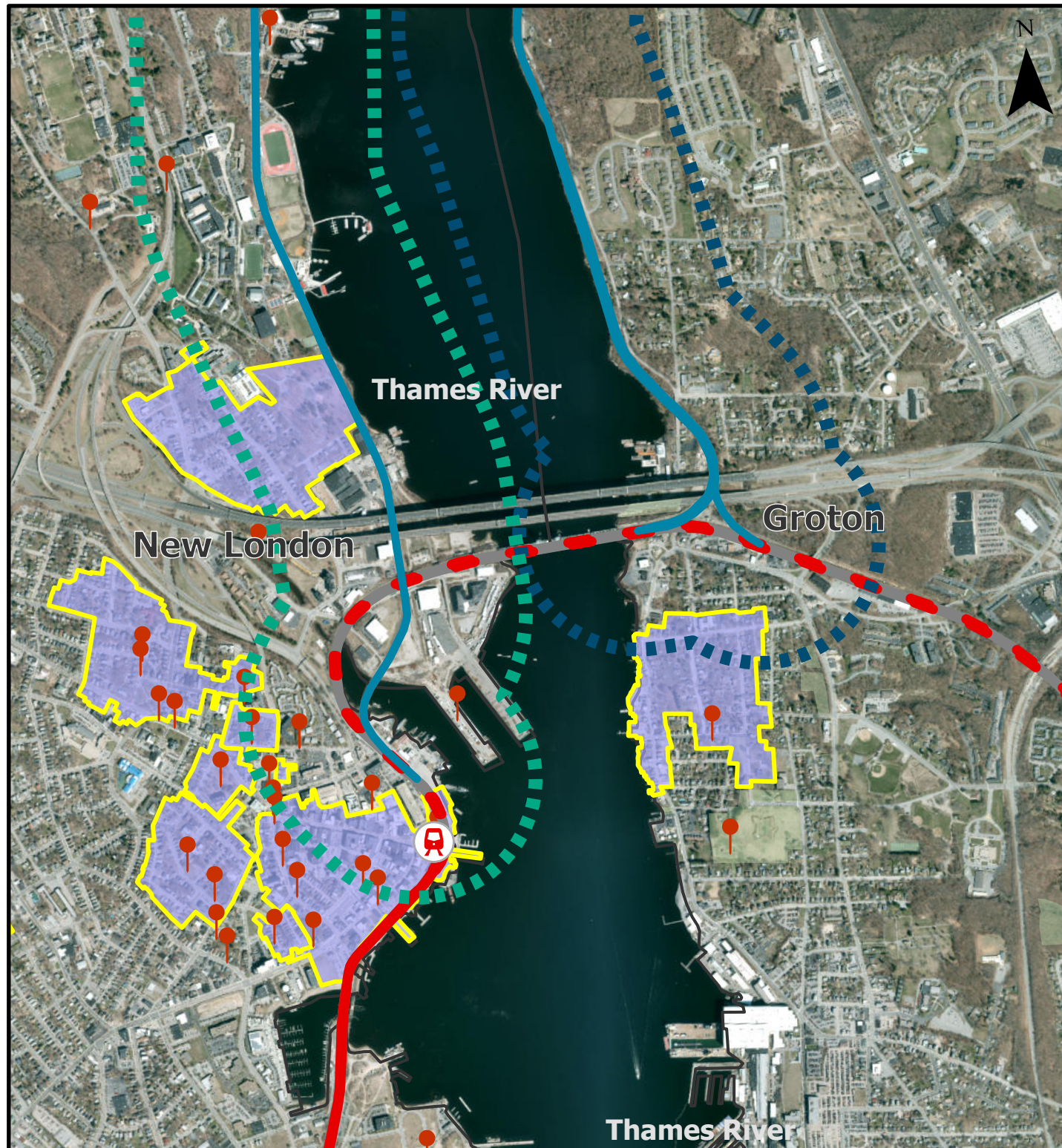
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Historic Resources

-  NRHP Properties
-  NRHP Historic Districts



0 0.13 0.25 0.5 Miles



Source: National Register of Historic Places

Eastern Connecticut Rail Study

Historic Resources

Norwich Rail Page 2 of 9

Study Area

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Eastern Connecticut Rail Study

Historic Resources

Norwich Rail Page 3 of 9

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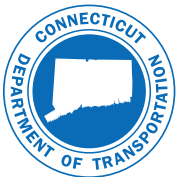
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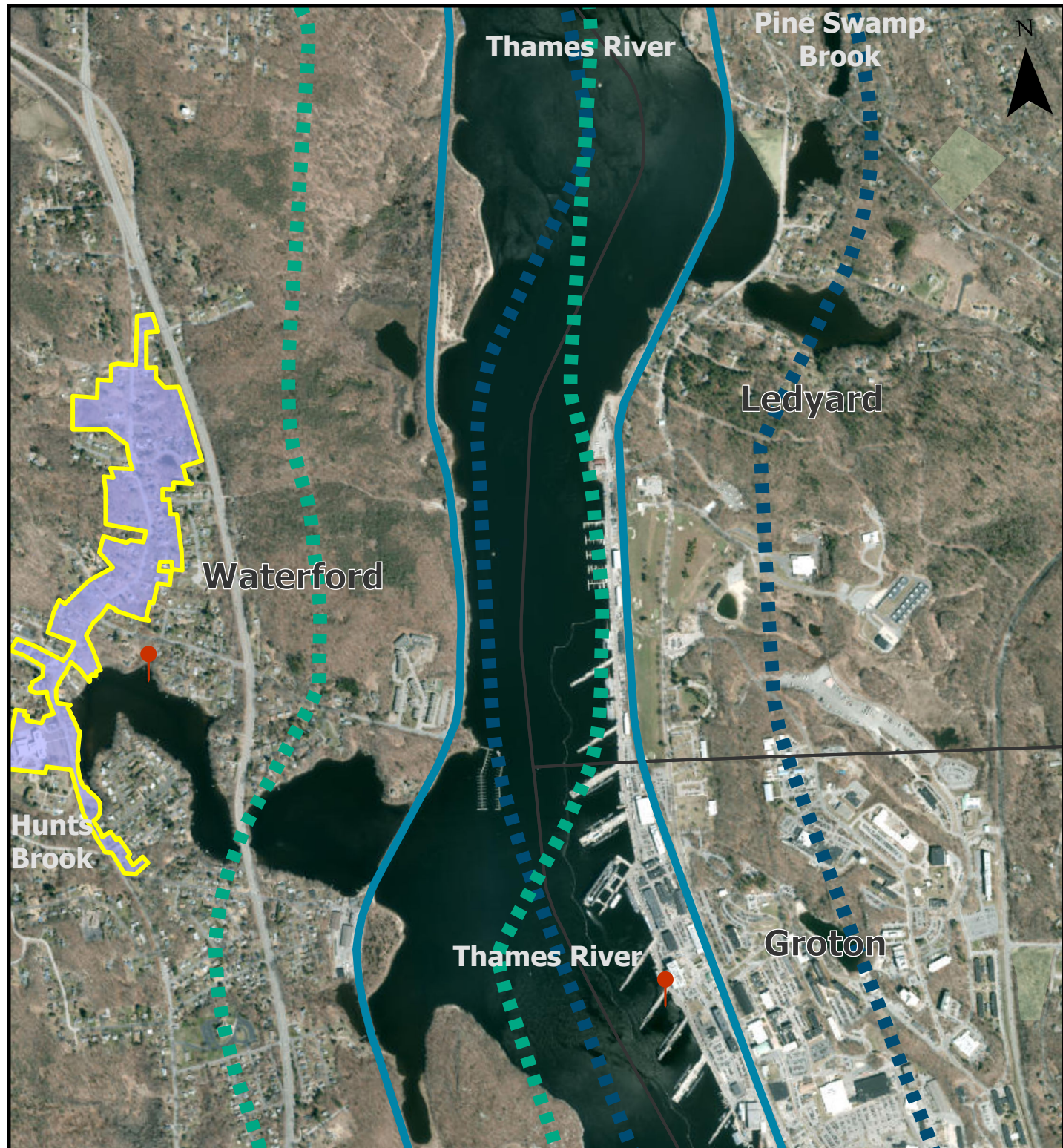
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0 0.1 0.2 0.4 Miles



Source: National Register of Historic Places

Eastern Connecticut Rail Study

Historic Resources

Norwich Rail Page 4 of 9

Study Area

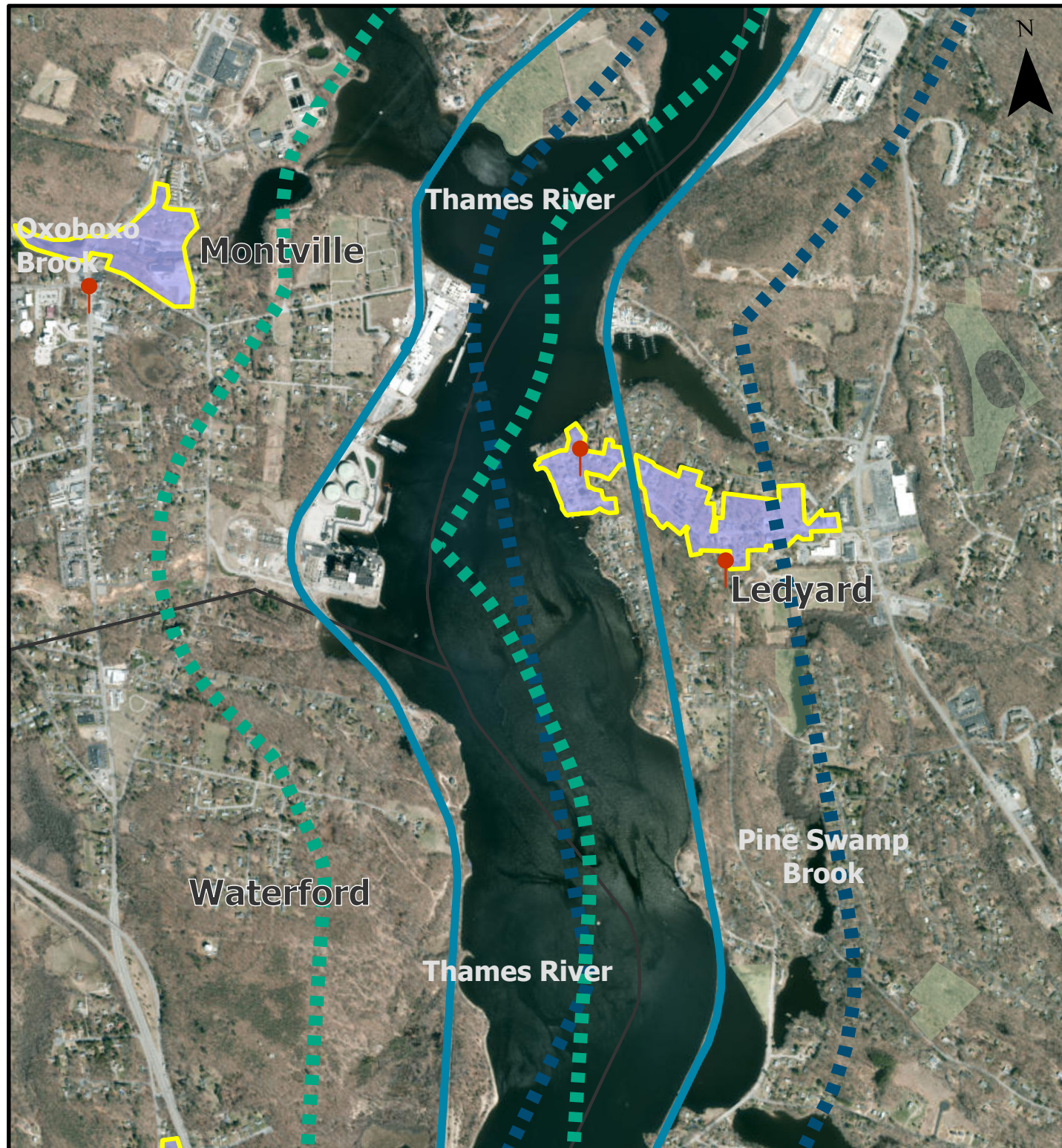
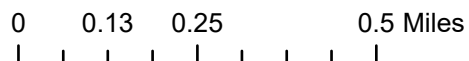
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Eastern Connecticut Rail Study

Historic Resources

Norwich Rail Page 5 of 9

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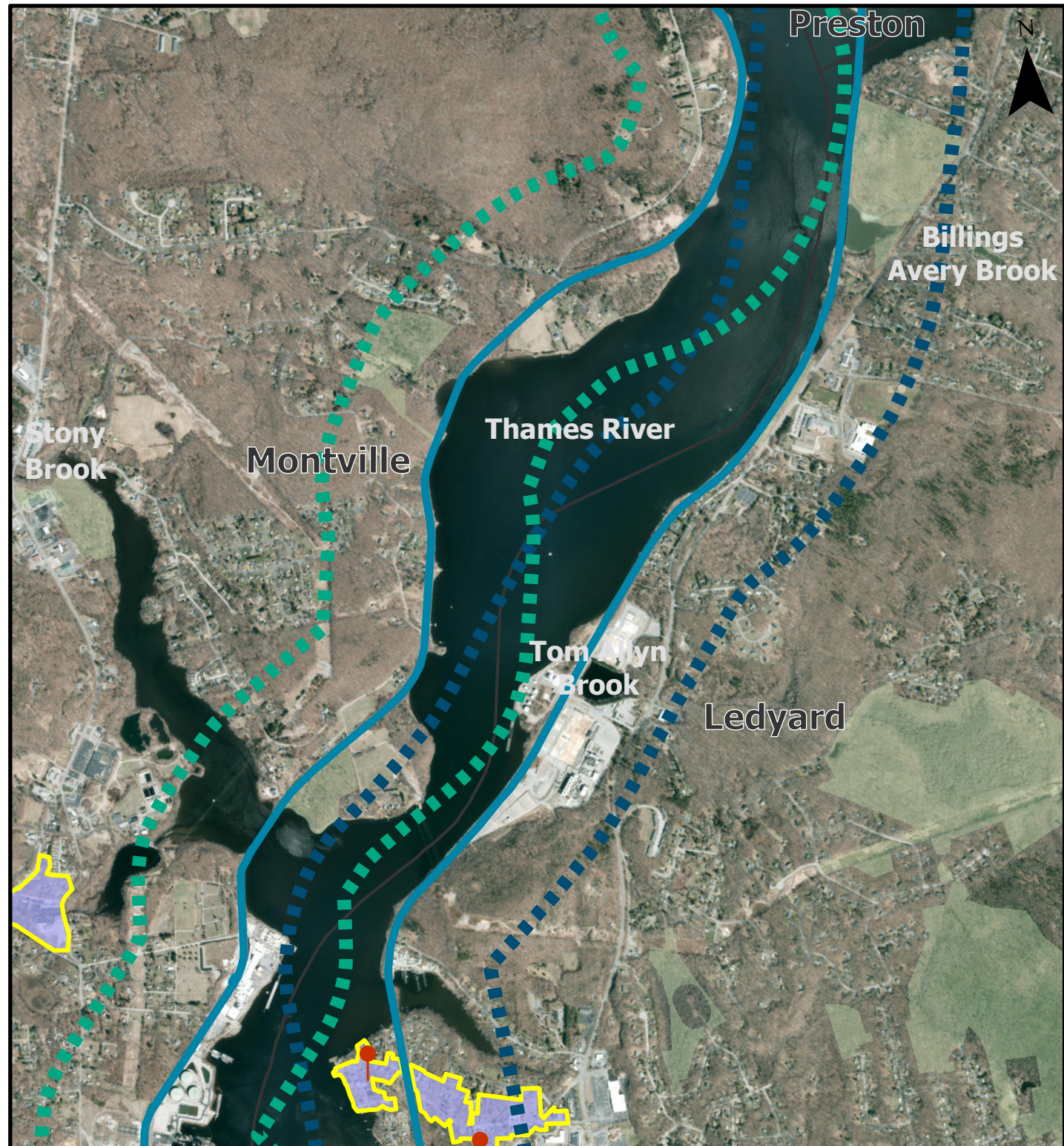
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0 0.15 0.3 0.6 Miles



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Eastern Connecticut Rail Study

Historic Resources

Norwich Rail Page 6 of 9

Study Area

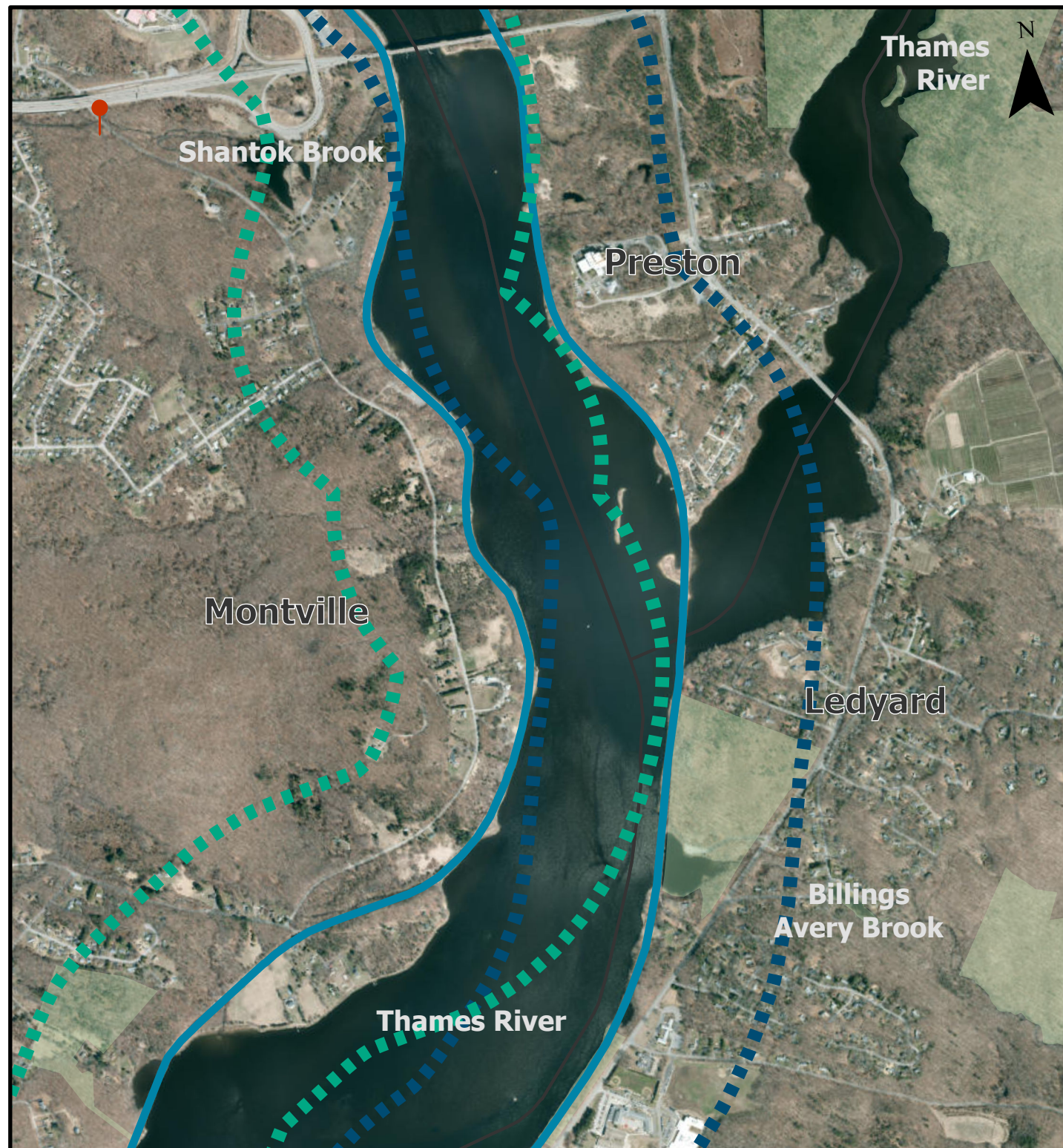
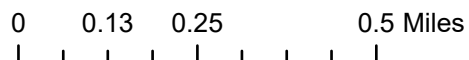
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Eastern Connecticut Rail Study

Historic Resources

Norwich Rail Page 7 of 9

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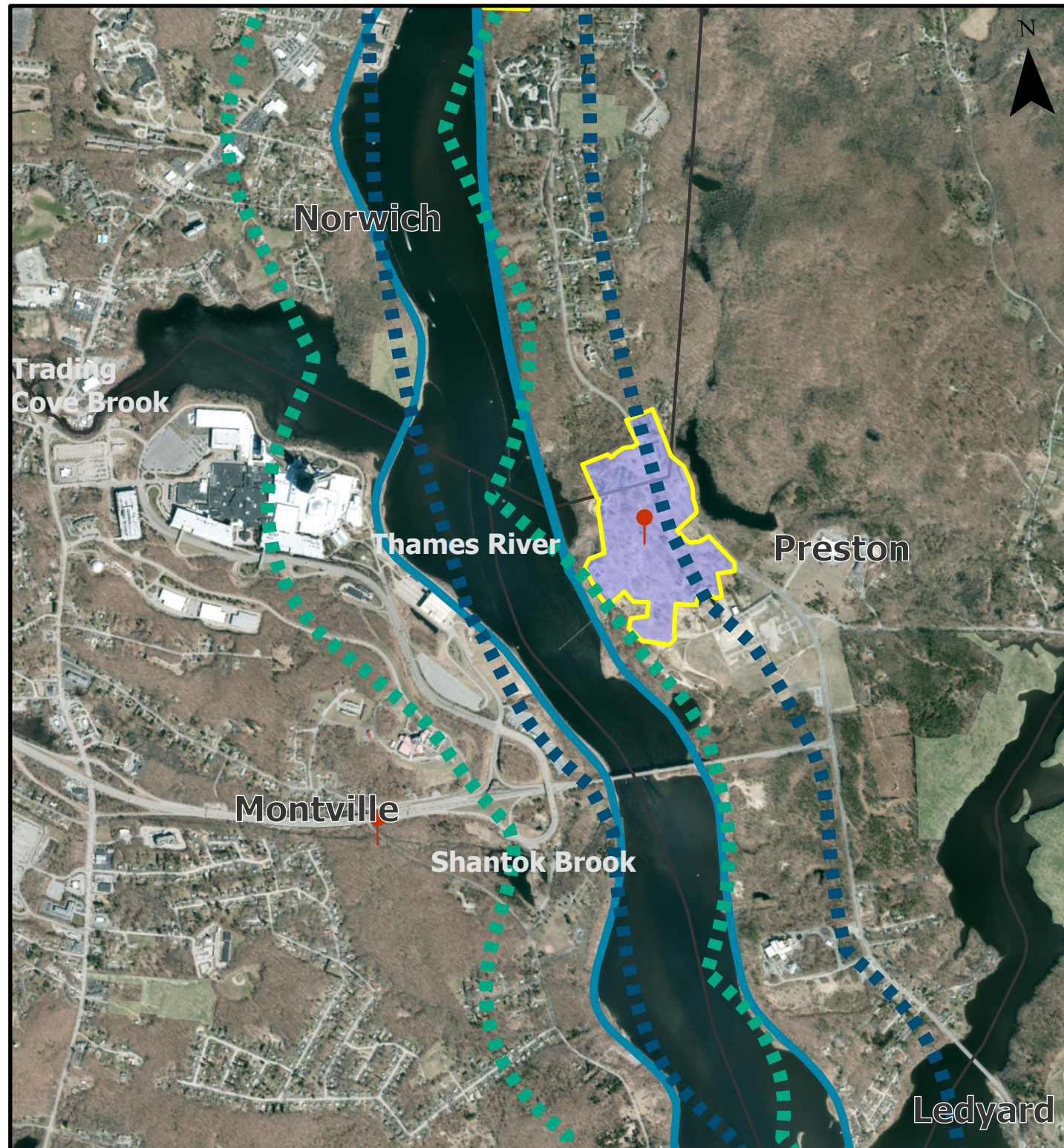
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Eastern Connecticut Rail Study

Historic Resources

Norwich Rail Page 8 of 9

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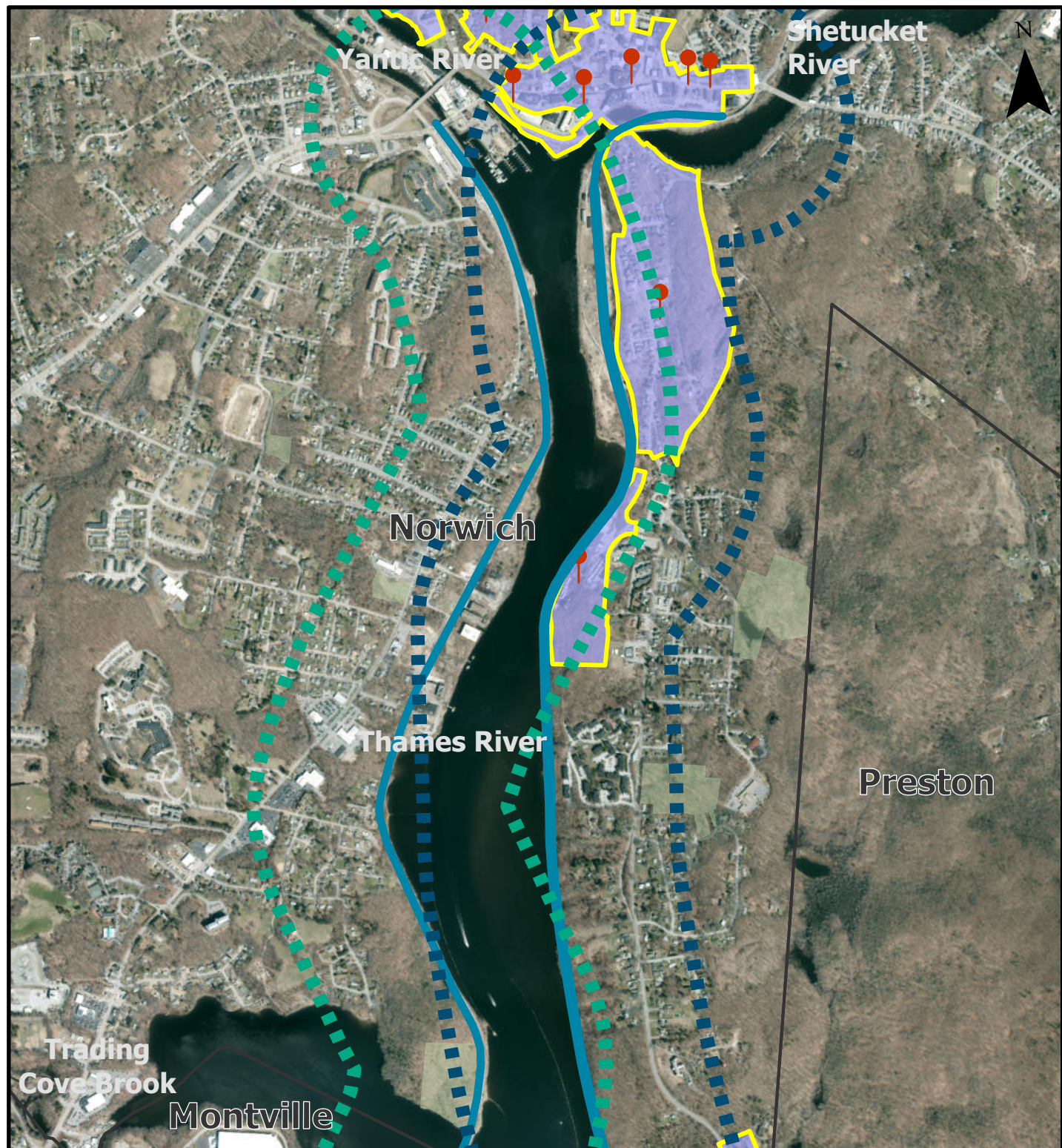
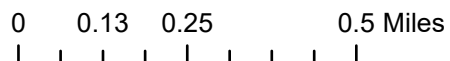
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Eastern Connecticut Rail Study

Historic Resources

Norwich Rail Page 9 of 9

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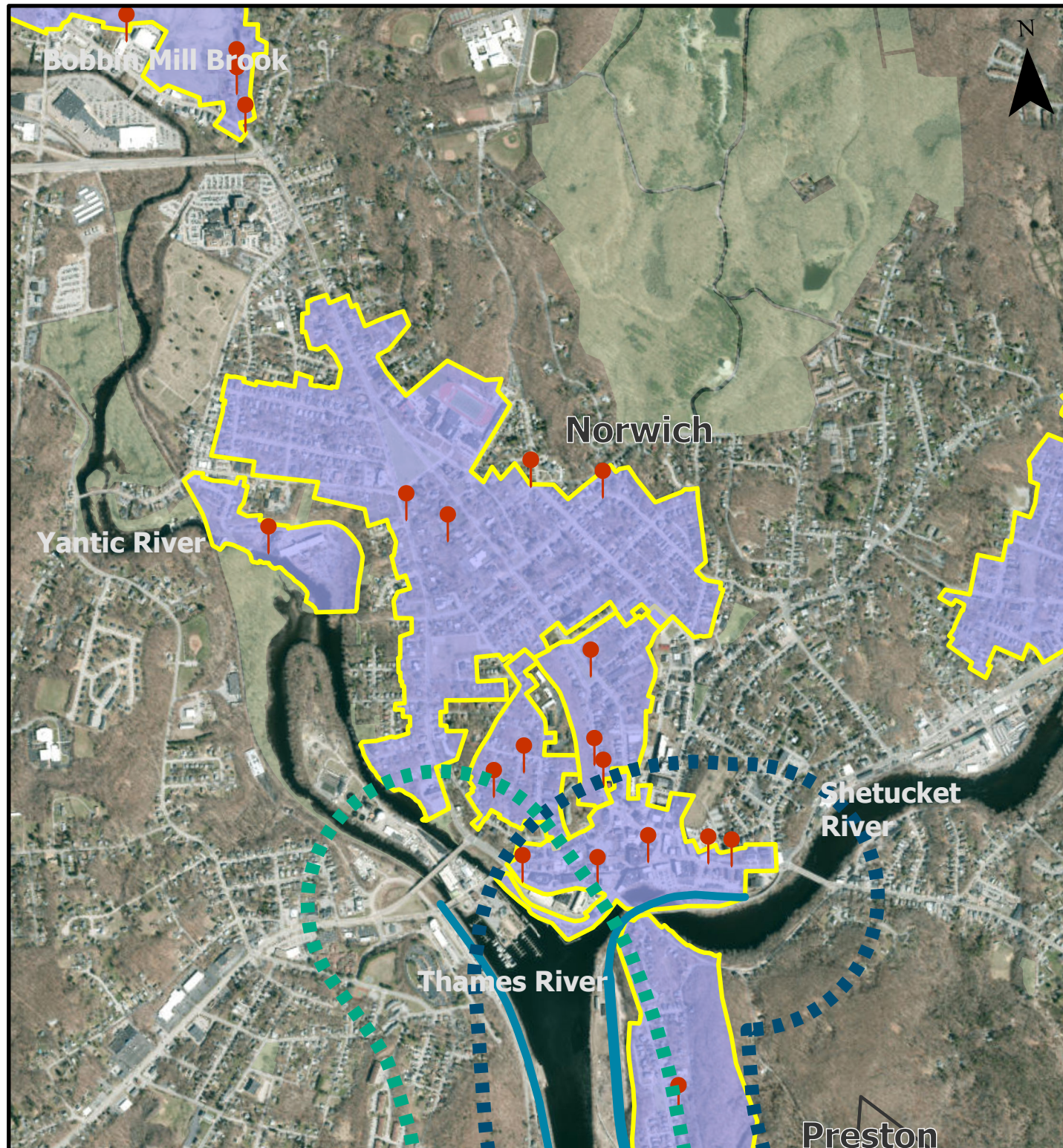
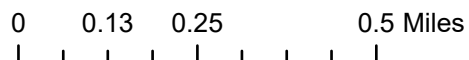
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Source: National Register of Historic Places

Eastern Connecticut Corridor Area Study

Wetlands Mapping

Electric Boat Spur Page 1 of 5

Legend

Study Area

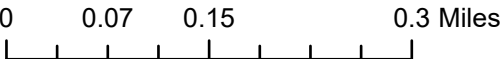
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Rail Infrastructure

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Wetland Soils

- Marine Wetlands
- Freshwater Wetlands



Source: CTDEEP National Wetlands Inventory

Eastern Connecticut Corridor Area Study

Wetlands Mapping

Electric Boat Spur Page 2 of 5

Legend

Study Area

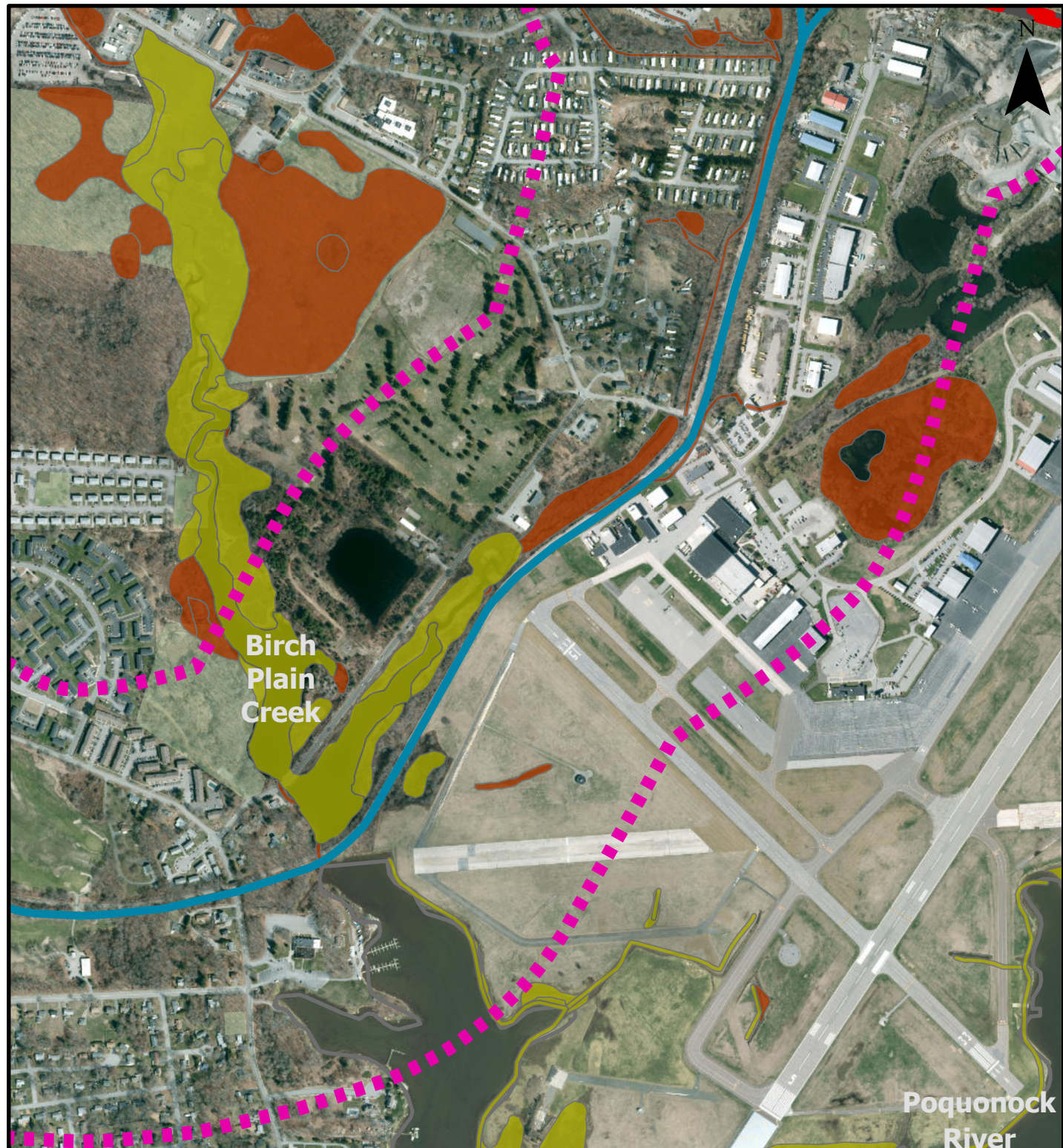
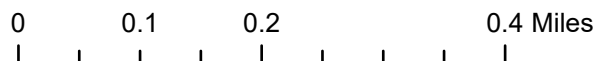
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Wetlands Mapping

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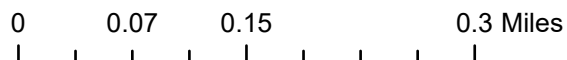
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Eastern Connecticut Corridor Area Study

Wetlands Mapping

Electric Boat Spur Page 4 of 5

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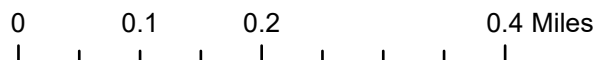
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Eastern Connecticut Corridor Area Study

Wetlands Mapping

Electric Boat Spur Page 5 of 5

Legend

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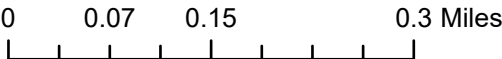
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Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

Electric Boat Spur Page 1 of 5

Legend

Study Area

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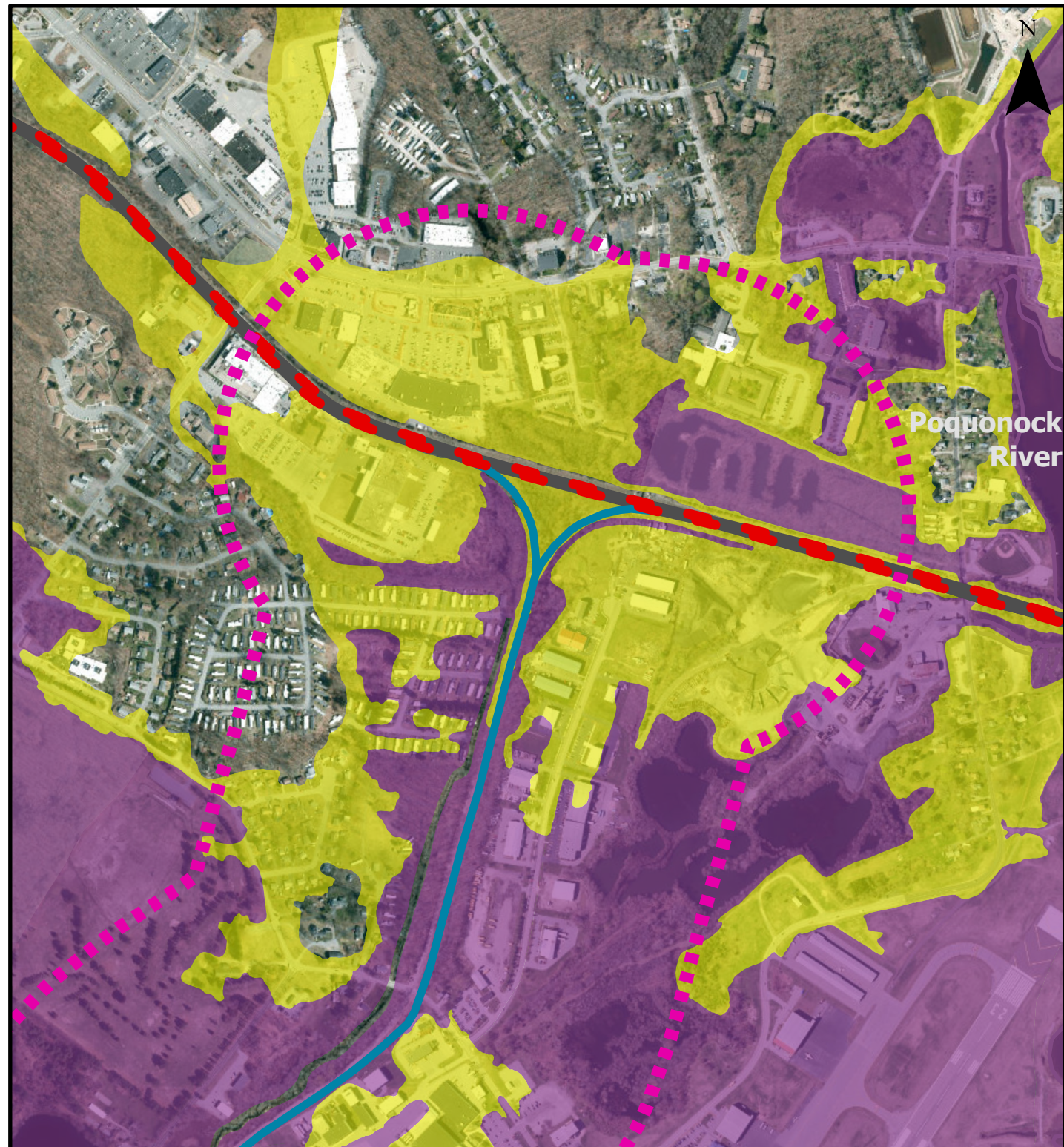
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0 0.07 0.15 0.3 Miles

A horizontal scale bar with tick marks at 0, 0.07, 0.15, and 0.3 miles.

Source: FEMA National Flood Hazard Layer

Eastern Connecticut Corridor Area Study

FEMA Flood Mapping

Electric Boat Spur Page 2 of 5

Legend

Study Area

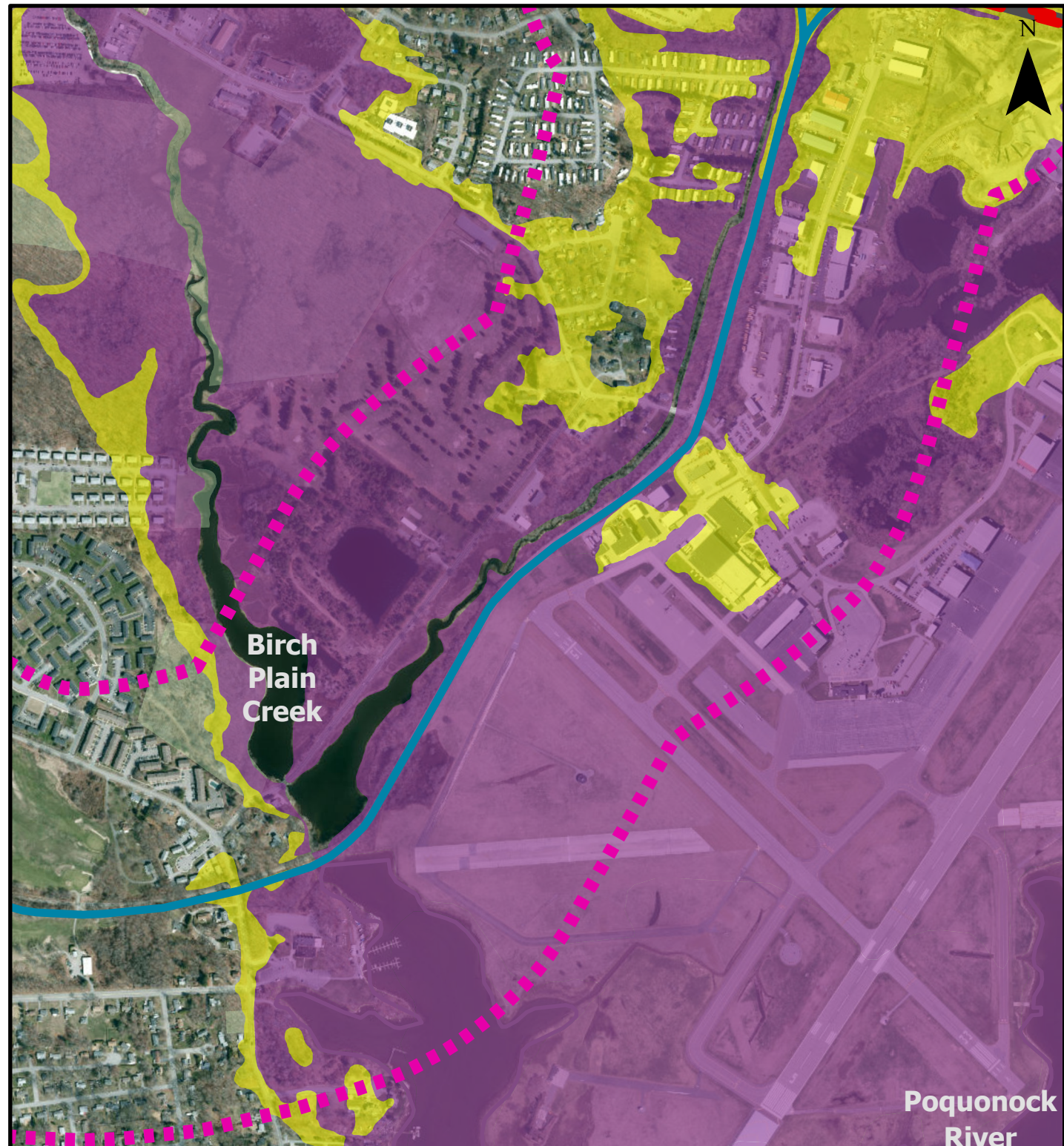
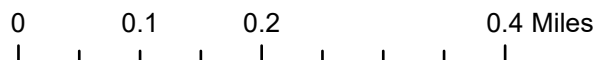
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Electric Boat Spur Page 3 of 5

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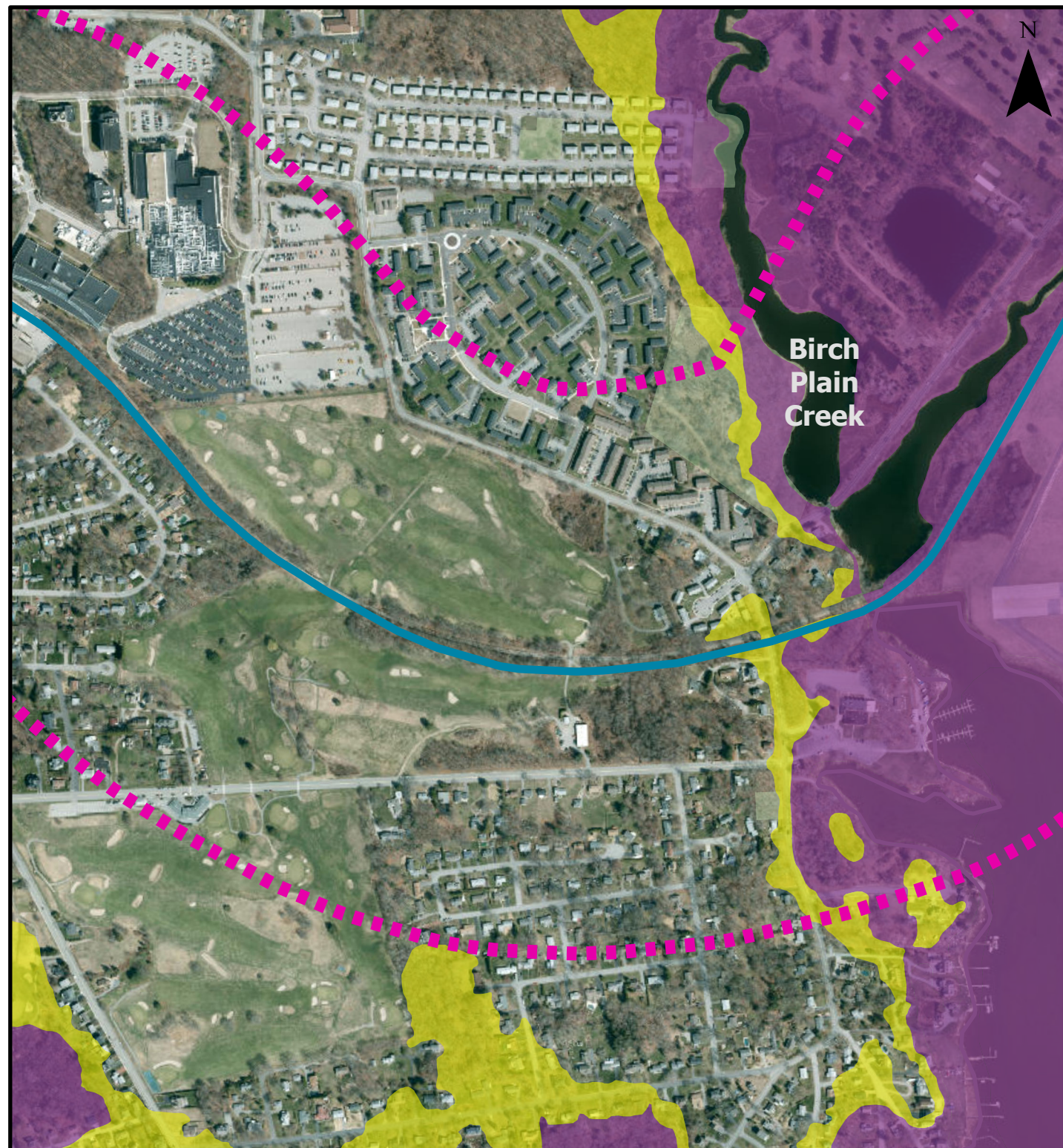
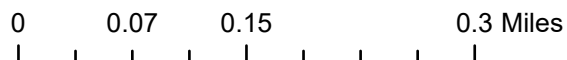
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Electric Boat Spur Page 4 of 5

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Electric Boat Spur Page 5 of 5

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0 0.07 0.15 0.3 Miles

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Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

Electric Boat Spur Page 1 of 5

Legend

Study Area

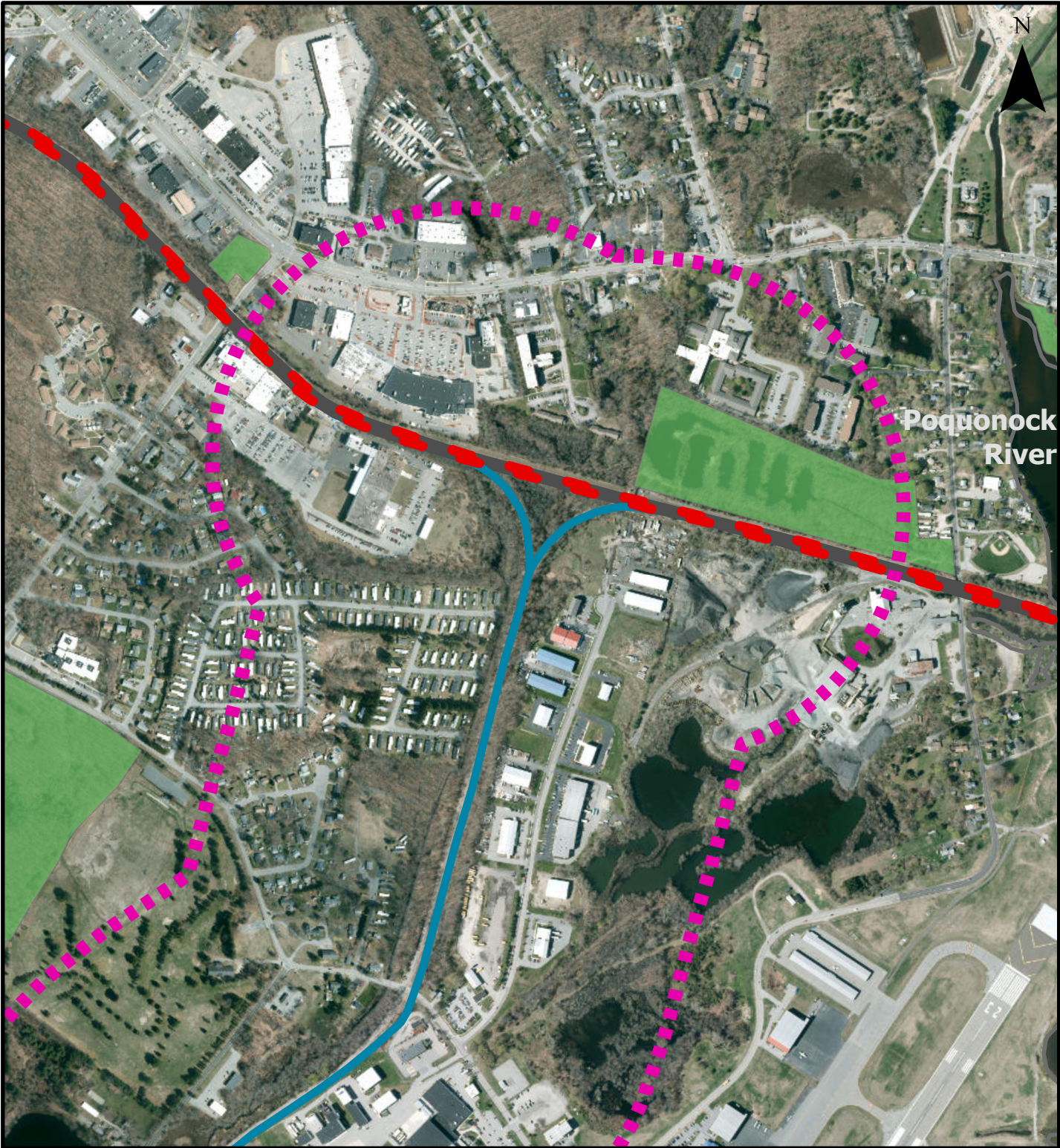
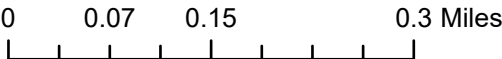
- Municipal Boundary
- Electric Boat Spur 1/4 Mile Buffer

Rail Infrastructure

- Existing Rail Stations
- Shore Line East
- Proposed Service Extension
- Proposed Norwich Rail
- NEC

Protected Open Space

- Federal Land
- Land Trust Land
- Municipal Open Space
- Private Open Space
- State
- Utility Company Land



Source: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

Electric Boat Spur Page 2 of 5

Legend

Study Area

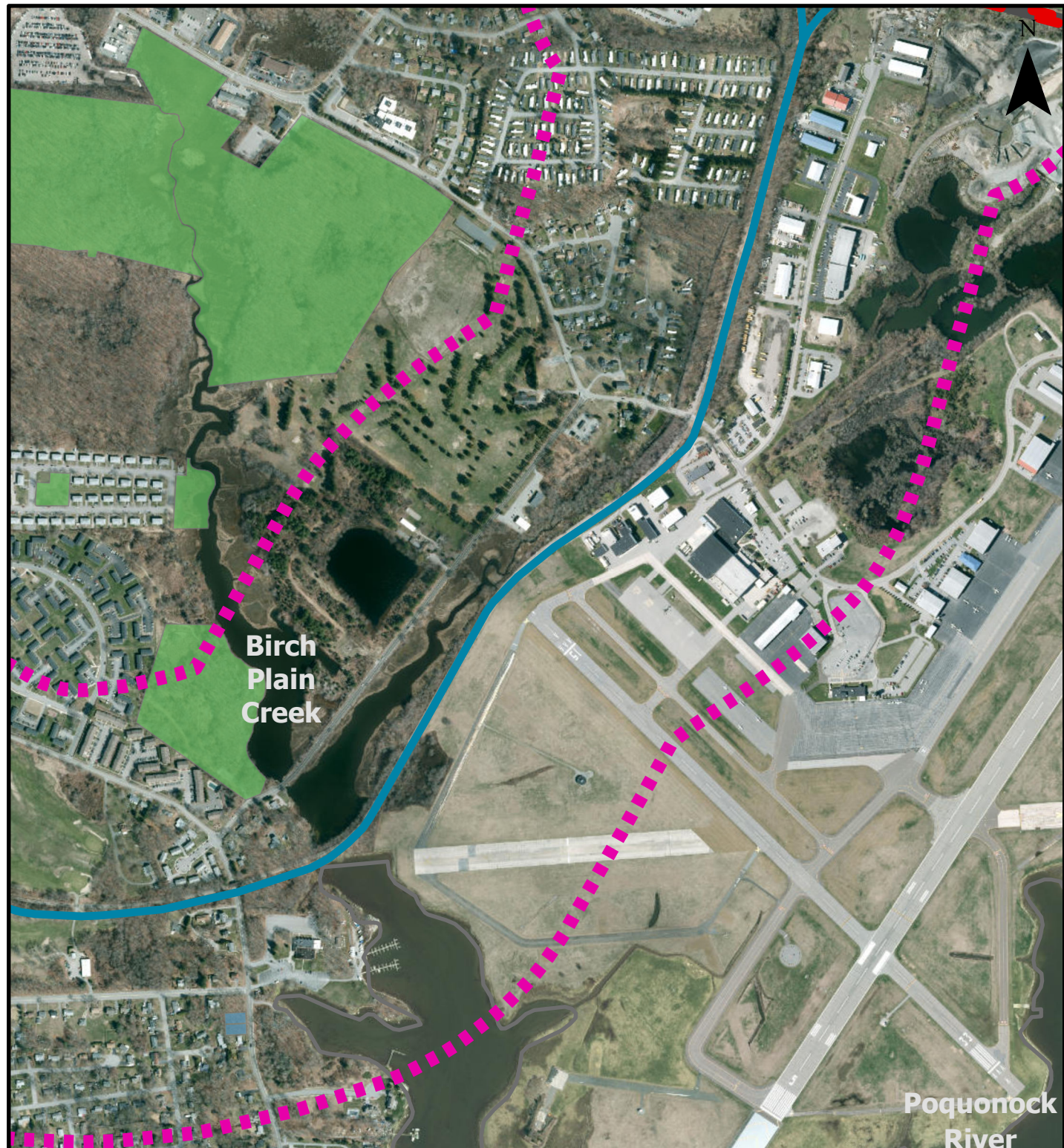
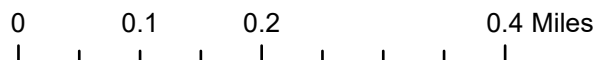
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Recreational and Protected Lands

Electric Boat Spur Page 3 of 5

Legend

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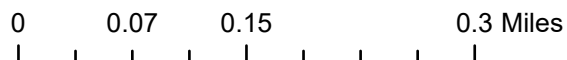
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Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

Electric Boat Spur Page 4 of 5

Legend

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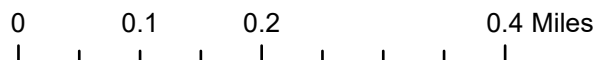
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Thames River

Source: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Recreational and Protected Lands

Electric Boat Spur Page 5 of 5

Legend

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0 0.07 0.15 0.3 Miles

A horizontal scale bar with tick marks corresponding to the distances 0, 0.07, 0.15, and 0.3 miles.

Source: CTDEEP Protected Open Space

Eastern Connecticut Corridor Area Study

Historic Resources

Electric Boat Spur Page 1 of 5

Legend

Study Area

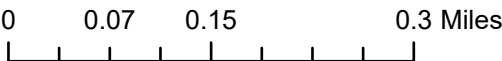
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Historic Resources

-  NRHP Properties
-  NRHP Historic Districts



Source: National Register of Historic Places

Eastern Connecticut Corridor Area Study

Historic Resources

Electric Boat Spur Page 2 of 5

Legend

Study Area

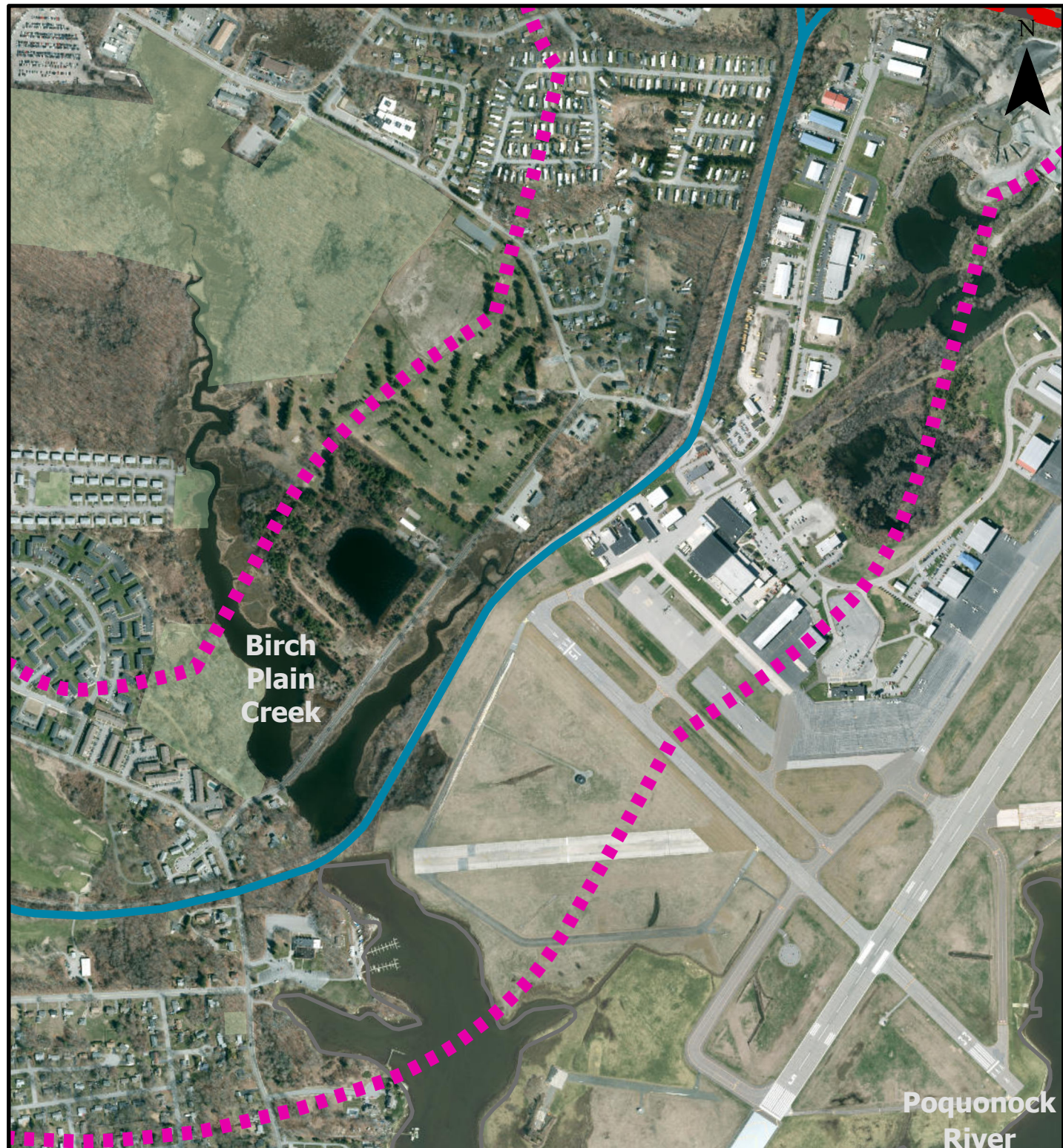
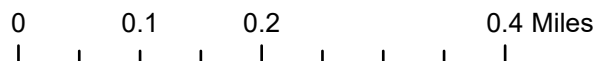
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Eastern Connecticut Corridor Area Study

Historic Resources

Electric Boat Spur Page 3 of 5

Legend

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Historic Resources

Electric Boat Spur Page 4 of 5

Legend

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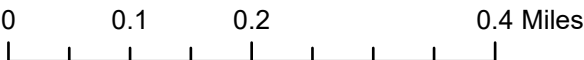
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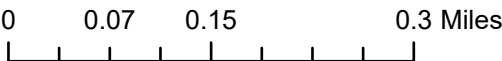
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