



DRAFT

Eastern Connecticut Corridor Rail and Transit Feasibility Study (ECRTS)

Appendix L: Economic Market Analysis

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1. TOD Opportunities & Existing Conditions



- Transit Oriented Development (TOD) is an approach that focuses on creating compact, pedestrian-friendly, and vibrant mixed-use communities centered around public transit.
- TOD is often associated with a host of potential benefits, including increased property values, accelerated development, as well as a wide spectrum of economic, social, public health, and environmental benefits.
- Pairing rail investment with policies that promote densification, walkability, and connectivity with other modes of transportation can enhance the effectiveness and success of TOD.



Increase the number of jobs and economic competitiveness

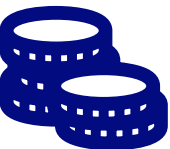
Increased transit access could spur regional economic productivity by:

- Providing lower-income residents with improved access to higher-paying jobs
- Attracting investments that have the potential to create higher-paying employment opportunities.



Improved public health and environment

TOD could reduce the negative impacts of automobile use, including traffic congestion, greenhouse gas (GHG) emissions, localized air pollution, traffic fatalities, and expensive wear-and-tear on road infrastructure. Additionally, TOD could enhance public health by encouraging walkability.



Increase household savings

Denser and more affordable residential housing that is connected to station areas could increase the number of potential riders for the transit line and reduce household costs associated with transportation and housing.

1. TOD Opportunities & Existing Conditions



Supportive land use policies and investments in local infrastructure have historically played a pivotal role in facilitating connectivity and fostering higher-density development along the corridor

Through a detailed screening process of 18 possible station locations during the Preliminary Feasibility Assessment for ECRTS, the study team identified six priority feasible station sites, as follows:

- **New London – Thames River Corridor** : Conn College, Montville, Norwich
- **New London – Westerly Corridor**: Groton West, Mystic Alternative, Stonington Borough

The selection of transit stations was influenced by:

- **Density of population.** More densely populated urban cores (e.g., in New London, Norwich, Groton) are likely to support the most transit ridership; densities in those three cities each have population + job densities of at least 15/acre, reaching the level suggested to sustain TOD (Massachusetts Housing Partnership, 2019).
- **Economic growth potential.** Discussions with major employers and major activity centers augment the data on the potential for ridership from workers and visitors, as well as opportunities to shift new investment proximate to stations or invest in last-mile connections.
 - ✓ General Dynamics Electric Boat will remain a critical employer for the region
 - ✓ Demand for improved commuting options to/from Conn College
 - ✓ Potential to enhanced accessibility to Mohegan Sun Resort through the utilization of rail services

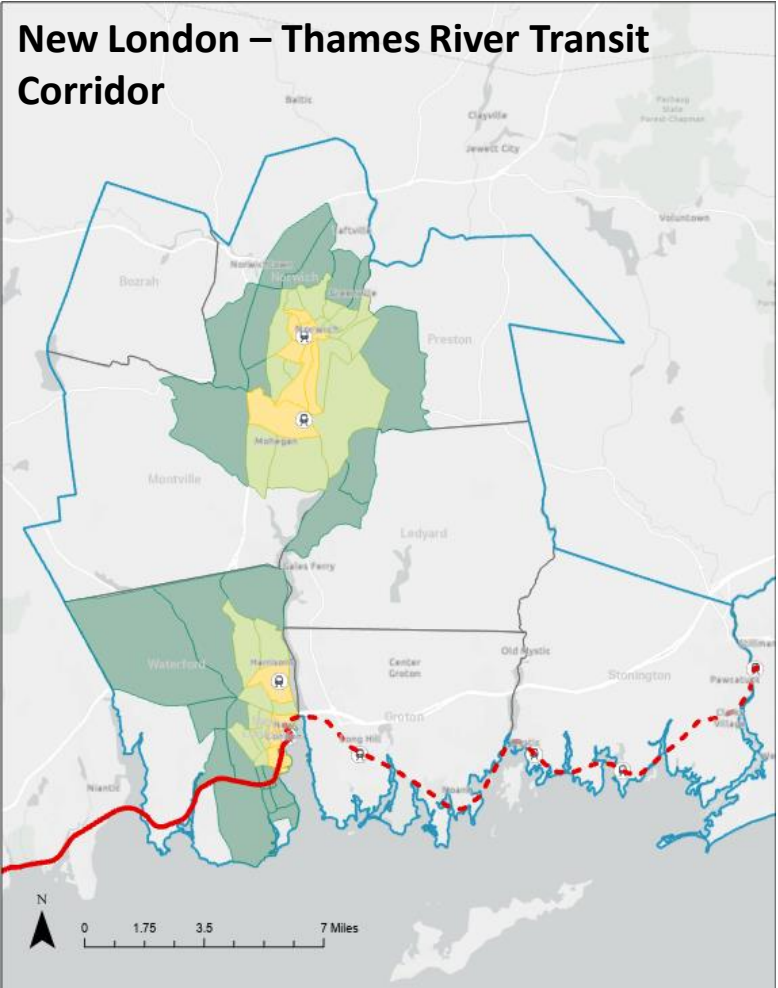
1. TOD Opportunities & Existing Conditions



The study area encompasses 2 corridors:

- 1. the Palmer Line (New London – Thames River Corridor); and
- 2. the expanded SLE service (New London – Westerly Corridor).

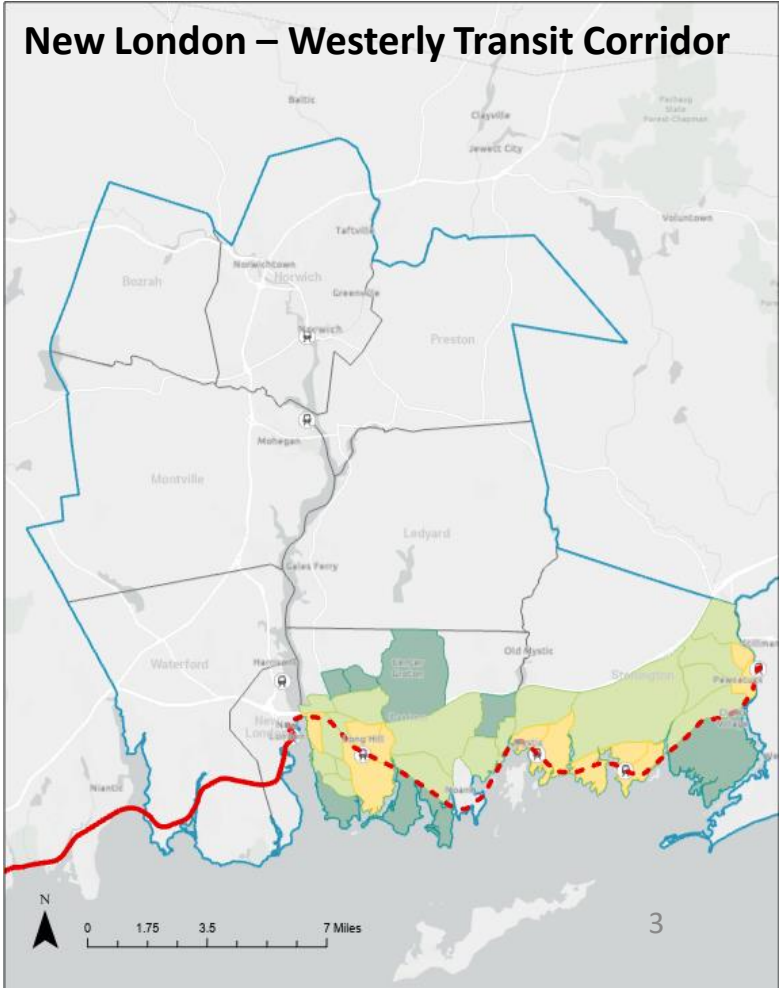
New London – Thames River Transit Corridor



Census Block Groups (BG)

- BG within 0.5 Miles
- BG within 1 Mile
- BG within 2 Miles

New London – Westerly Transit Corridor



1. TOD Opportunities & Existing Conditions



New London – Thames River Corridor

Distance from Stations	0.5 Mile	1-Mile	2-Mile
Demographics			
Population	16,800	47,875	78,475
Median Age	32.7	37.1	39.6
Households	6,283	19,666	32,023
% Renters	70.0%	57.7%	46.4%
% Single Households	41.2%	35.7%	33.5%
Median Income	\$48,492.06	\$51,609.44	\$67,624.27
Total Housing Units	7,166	22,195	35,599
Commuting Mode Share (Based on Total Workers 16 Years and Over)			
% Total Commuters	88.9%	94.0%	94.1%
% SOV	72.2%	84.3%	85.9%
% Bus	2.1%	2.7%	2.1%
% Rail	0.6%	0.4%	0.4%
% Renters with no Vehicles	25.2%	24.4%	22.1%

- 41.2% of single-person households are within 0.5 miles of the Thames River Corridor, in contrast to 33.5% of households located within 2 miles of the Corridor.
- Median age of residents living within a 0.5-mile radius of the Thames River Corridor is younger (average of 32.7 years), in contrast to state averages (median age of 41).
- Median income of households located within 0.5 miles of the Thames River Corridor is \$48,500 a year, which is lower than those who lived within 2 miles of the Corridor and have a median income of \$67,600 a year.
- 70% of households within 0.5 miles of the Thames River Corridor are renters, almost double that of those who lived within 2 miles of the Corridor.
- 25.2% of renters within 0.5 miles of the Thames River Corridor do not have vehicles

Lower median income, a higher share of renters, and higher share of zero-car renter households argue for provision of expanded transit options

Source: 2021 ACS 5-Year Estimate, the % in the Commuting Mode Share section is based on total workers except for renters with no vehicle and is based on the number of renter households. For the Demographic section, % of renters and % of single households is based on occupied housing units (number of households).

1. TOD Opportunities & Existing Conditions



New London – Westerly Corridor

Distance from Stations	0.5 Mile	1-Mile	2-Mile
Demographics			
Population	12,426	34,709	44,011
Median Age	45.5	42.5	42.0
Households	5,968	16,279	19,933
% Renters	44.7%	46.4%	44.0%
% Single Households	39.6%	36.7%	32.4%
Median Income	\$76,000.10	\$75,392.83	\$80,456.72
Total Housing Units	7,304	18,362	22,685
Commuting Mode Share (Based on Total Workers 16 Years and Over)			
% Total Commuters	86.7%	90.1%	90.7%
% SOV	82.1%	83.0%	84.5%
% Bus	0.8%	1.2%	1.1%
% Rail	0.6%	0.3%	0.2%
% Renters with no Vehicles	10.6%	13.6%	11.7%

- More than 50% of households around the Westerly Corridor are homeowners and 2-or-more-person households.
- Median income of households located in the Westerly Corridor is higher compared to the Thames River Corridor.
- Median age of residents living within a 0.5-mile radius of the Westerly Corridor is comparatively older, with an average of 45.5 years, in contrast to Connecticut's median age of 41.0.
- Only 10.6% of renters within 0.5 miles of the Westerly Corridor do not have vehicles, suggesting less dependency on public transport.

New London - Westerly Corridor demographic data suggest more affluent communities with older residents compared to New London - Thames River Corridor

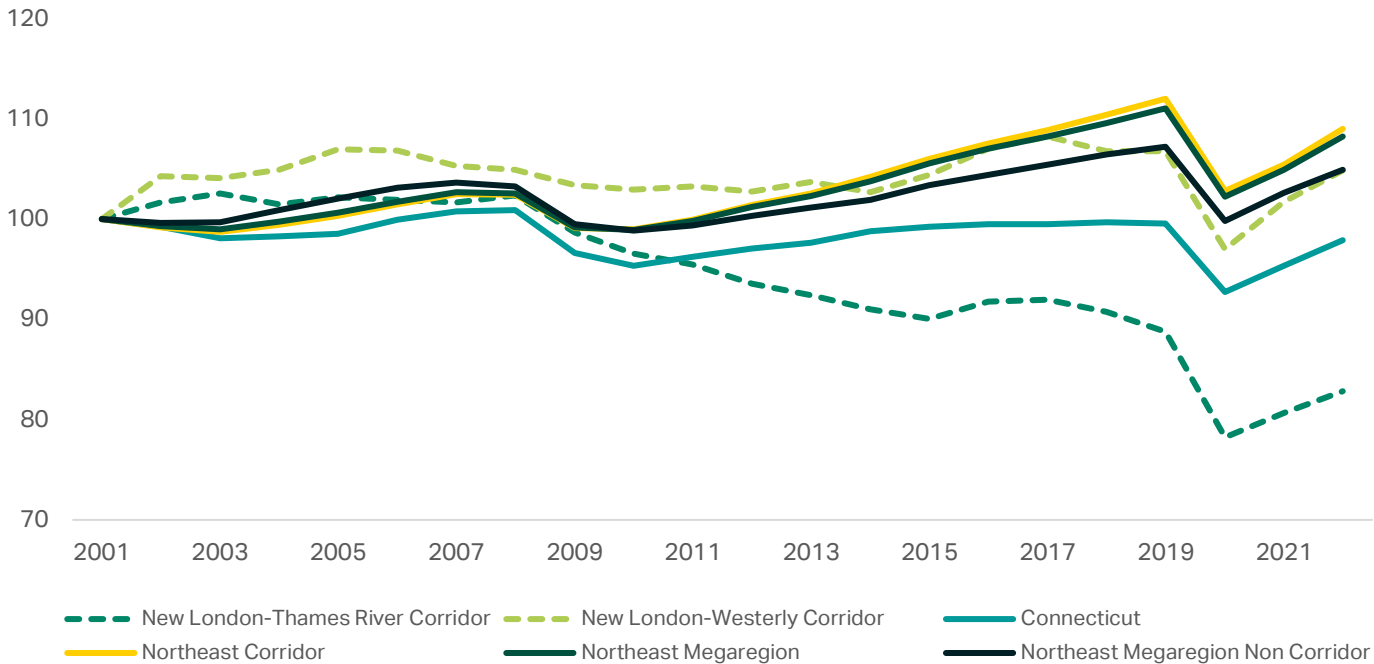
Source: 2021 ACS 5-Year Estimate, the % in the Commuting Mode Share section is based on total workers except for renters with no vehicle and is based on the number of renter households. For the Demographic section, % of renters and % of single households is based on occupied housing units (number of households).

1. TOD Opportunities & Existing Conditions



- Since 2001, the New London-Thames River Corridor has experienced persistent reductions in job creation relative to the New London-Westerly Corridor, Connecticut, Northeast Corridor, and Northeast Megaregion.
- The New London-Westerly Corridor has experienced modest growth in employment compared to the Northeast Megaregion and Northeast Corridor.
- Proposed rail investments have potential to boost regional economic activities by enhancing job-worker access, attracting private investment, and spurring job growth by providing potential employers with a larger pool of labor.

Job Growth Index (2001 = 100)



Region	CAGR* 2001 - 2022
New London-Thames River Corridor	-0.89%
New London-Westerly Corridor	0.22%
Connecticut	-0.10%
Northeast Corridor	0.41%
Northeast Megaregion	0.38%
Northeast Megaregion Non-Corridor	0.23%

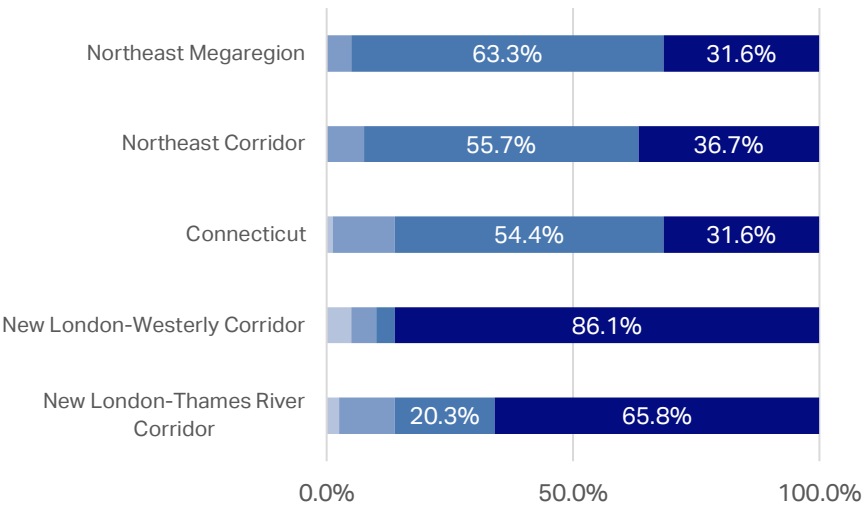
Source: EMSI Lightcast, AECOM Calculation. *CAGR refers to compound annual growth rate, an annualized percentage change over time. It provides a smoothed rate of growth that is consistent between metrics.

1. TOD Opportunities & Existing Conditions

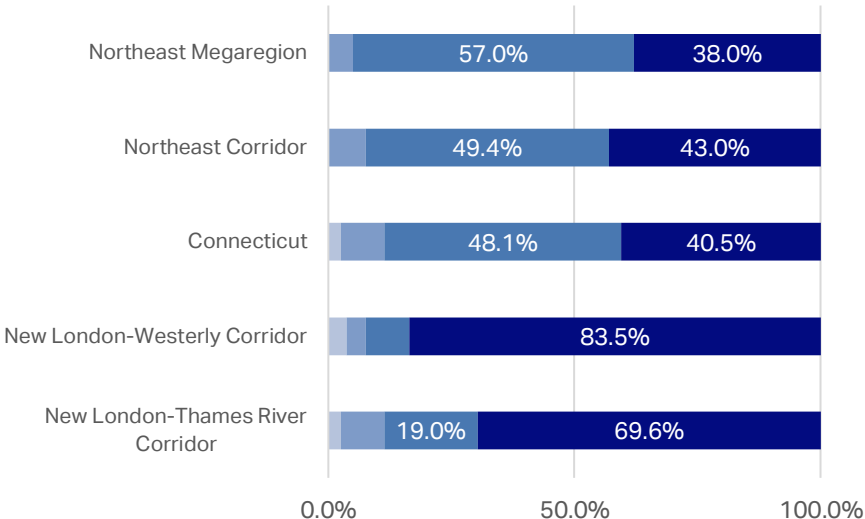


In terms of the mix of industries present within the Westerly and Thames River Corridors, the analysis reinforces a practical challenge of decreased economic diversification compared to Connecticut, the Northeast Corridor, and the Northeast Megaregion, with a majority of industry clusters being classified under long-term growth or under-developed. For perspective, nationally, a majority of jobs will tend to be created in industry clusters classified as being in short-term or medium-term sectors.

2001 Cluster Distribution



2022 Cluster Distribution



■ Super Sector ■ Mature
■ Medium-Term and Short-Term Growth ■ Long-Term Growth & Underdeveloped

■ Super Sector ■ Mature
■ Medium-Term and Short-Term Growth ■ Long-Term Growth & Underdeveloped

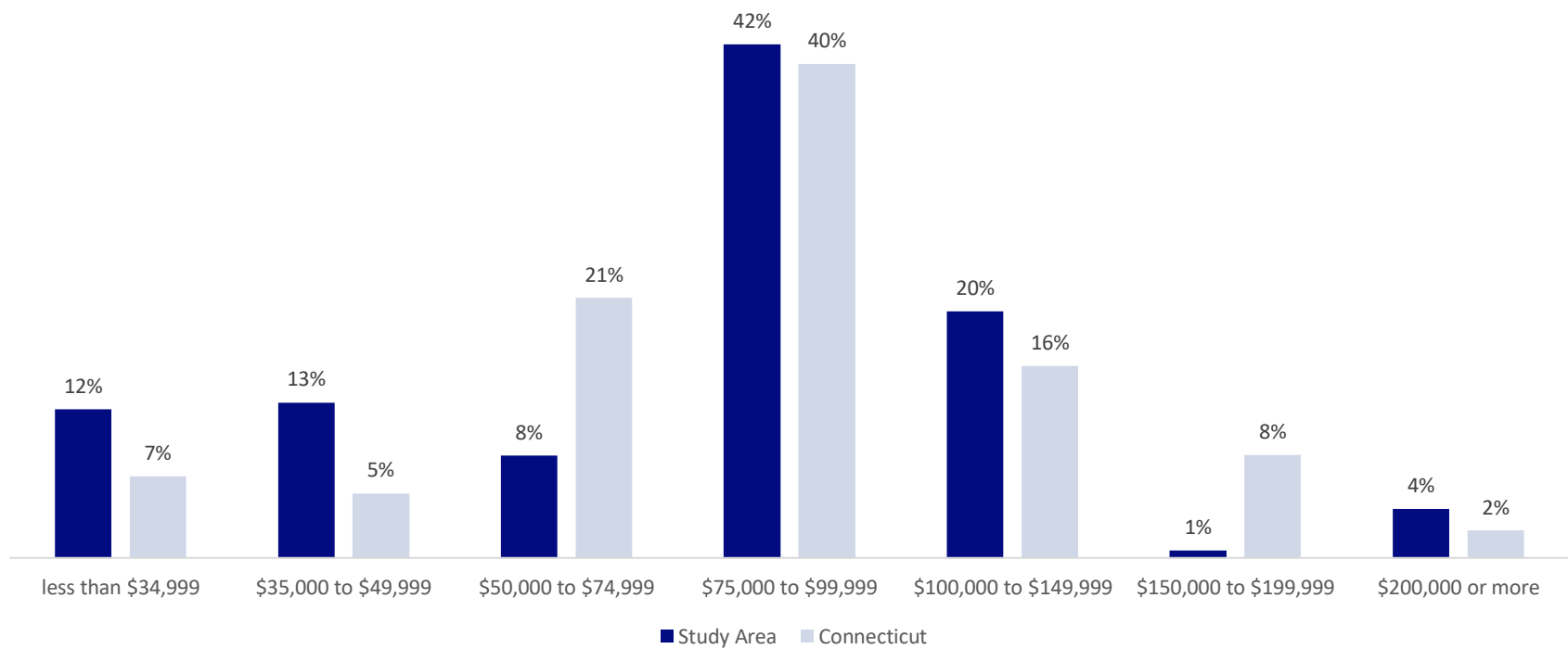
Source: EMSI Lightcast, AECOM Calculation. *AECOM identified 79 traditional industry clusters (groups of industries) in the study area. Based on the 79 traditional industry clusters, AECOM calculates the share of clusters that are classified as super-sector, mature, medium and short-term growth, and long-term and underdeveloped to gauge the level of economic diversification in the study area.

1. TOD Opportunities & Existing Conditions



The study area has a higher proportion of jobs (based on 79 AECOM industry clusters) with earnings below \$35,000 compared to the state average, suggesting that lack of transit access might hinder the expansion of higher-paying employment opportunities.

Average Earning Distribution Study Area vs Connecticut (Place of Establishment, 2022)



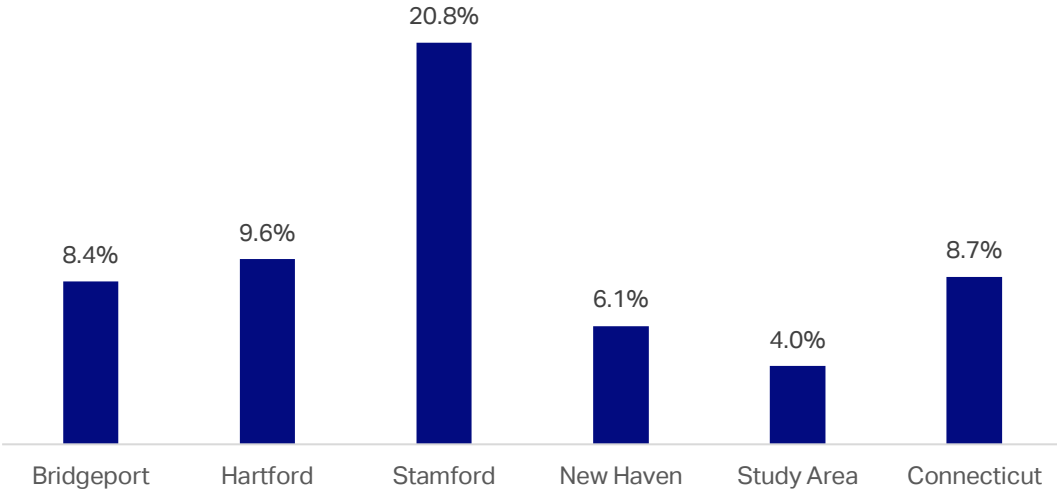
Source: EMSI Lightcast, AECOM Calculation. Average Earning is derived from the average earnings based on 79 AECOM industry clusters.

1. TOD Opportunities & Existing Conditions



- The study area also has the lowest concentration of professional jobs based on AECOM industry clusters* compared to the other benchmark places.
- Average earnings of the professional jobs located in the study area are also lower compared to the benchmark places.
- This suggests that lack of transit access may correlate to fewer employment opportunities, particularly in professional jobs.

Share of Professional Jobs based on Place of Establishment, 2022



Region	Average Earning 2022	Amtrak Ridership 2022
Bridgeport	\$251,319.30	98,572
Hartford	\$140,924.27	149,625
Stamford	\$330,798.67	269,195
New Haven	\$118,622.30	617,119
Study Area	\$110,601.50	162,888**
Connecticut	\$197,673.35	1,465,395

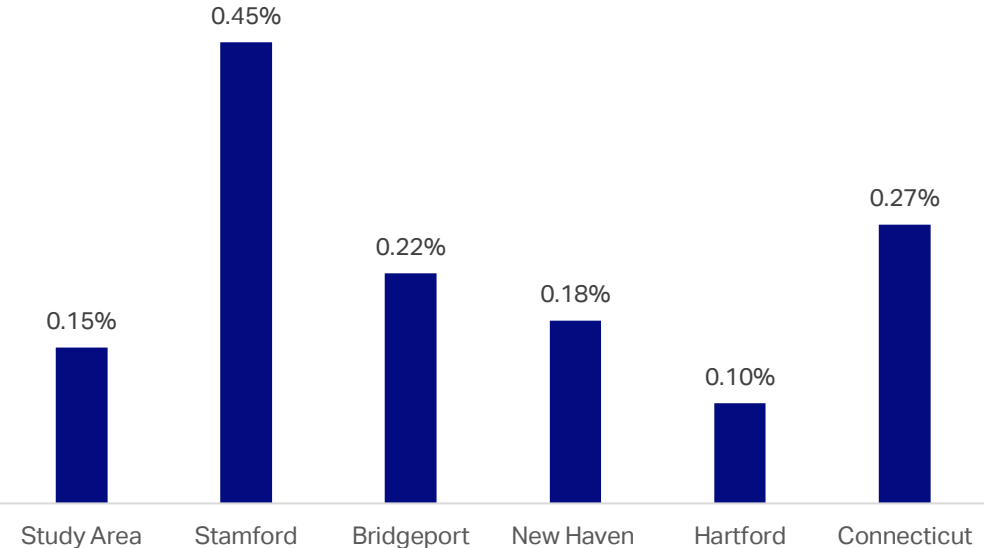
Source: EMSI Lightcast, Bureau of Transportation Statistics, AECOM Calculation. *AECOM identified 79 traditional industry clusters (groups of industries). The analysis was done using 5 miles radius from the place boundaries. Professional industry clusters are defined as Banking, Financial Investment and Supporting Facilities, Financing Institutions; and Management, Scientific and Technical Consulting Services. ** Study area Amtrak ridership consists of New London and Mystic Station.

1. TOD Opportunities & Existing Conditions



- Over the last two decades, the study area’s annual population growth has been sluggish at 0.15%, lower than the Connecticut average of 0.27%.
- Among the benchmark cities, Stamford experienced the fastest growth at 0.46% which could be attributed to its proximity and easy access to New York.
- Since 2000, the study area’s weighted median household income is relatively low compared to the benchmark places.

Population CAGR, 2000 - 2021



Median Household Income, 2000 - 2021

	2000	2021	CAGR 2000 - 2021
Study Area	\$ 46,341.39	\$ 76,454.71	2.41%
Stamford	\$ 90,571.40	\$ 139,346.49	2.07%
Bridgeport	\$ 61,264.19	\$ 96,504.55	2.19%
New Haven	\$ 48,291.66	\$ 77,702.05	2.29%
Hartford	\$ 49,699.10	\$ 80,680.75	2.33%
Connecticut	\$53,935.00	\$83,771.00	2.12%

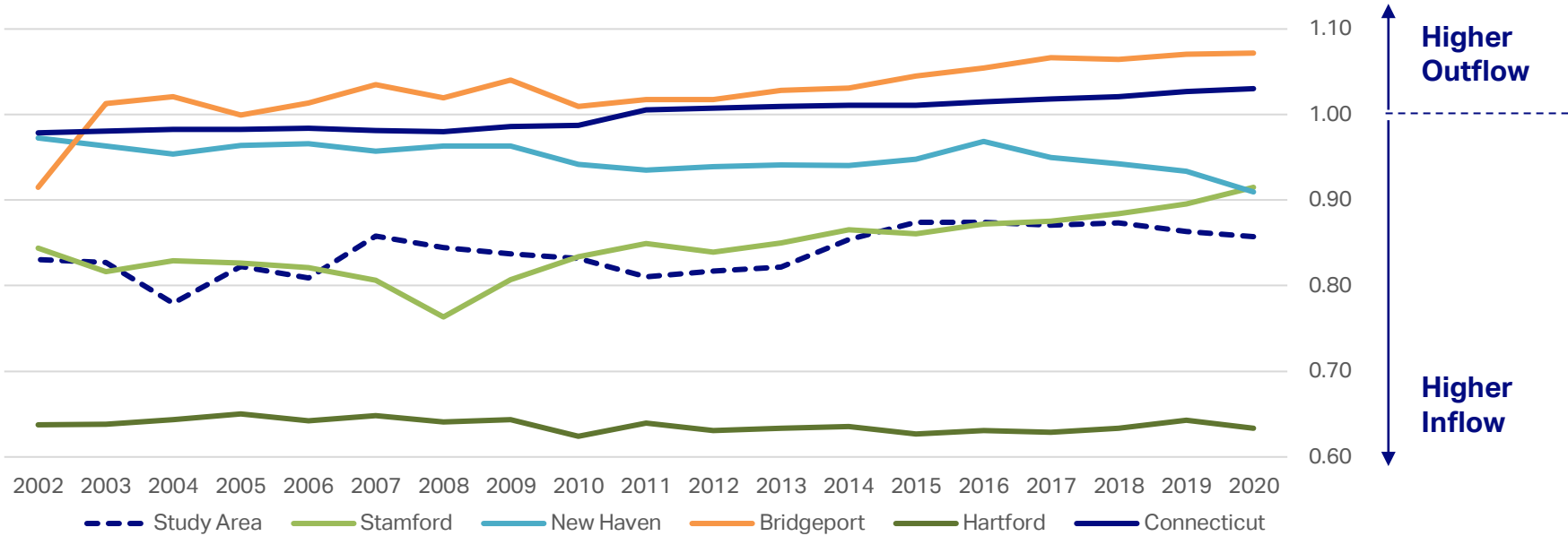
Source: IPUMS NHGIS, University of Minnesota, www.nhgis.org, 2021 ACS 5-Year Estimate, AECOM Calculation. The analysis was done using 5 miles radius from the place boundaries. Westerly* refers to the Rhode Island part of Westerly

1. TOD Opportunities & Existing Conditions



- In 2020, the study area experienced a net inflow of labor, with approximately 86% of people living in the area working within the area.
- Among benchmark cities, only Hartford stands out with a significant number of commuters, as around 63% of employed individuals in Hartford also reside in the city.
- The data suggests that a smaller value (indicating higher inflow) and a bigger value (indicating higher outflow) correlate with more commuters, whereas a value closer to 1 correlates with fewer commuters due to minimal inflow or outflow.

Job Inflow or Outflow
(Value Greater Than 1 indicate Outflow to Other Places)



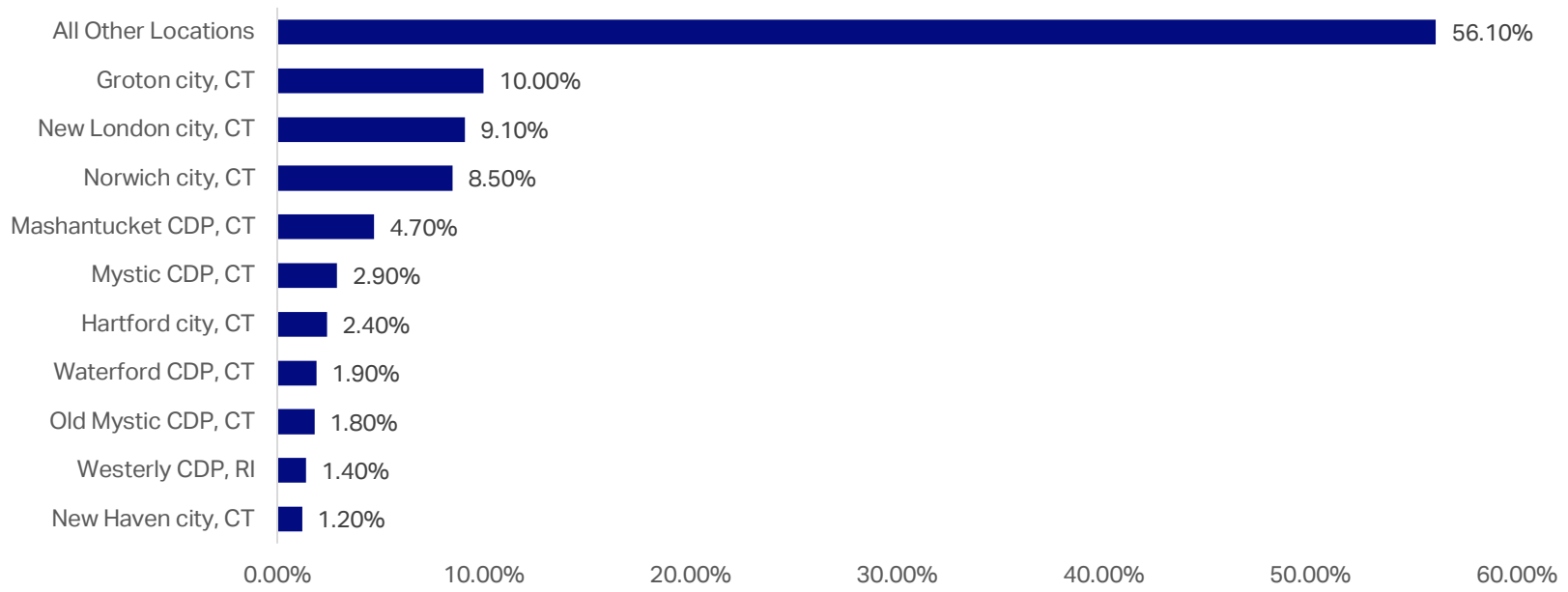
Source: Census on The Map Data

1. TOD Opportunities & Existing Conditions



- About 29% of residents within 2 miles of the New London – Thames River Corridor and New London – Westerly Corridor commute within the New London County.
- Groton, New London, Norwich, Mashantucket, and Mystic are the top destination of commuters in the study area.

Study Area Work Destination Analysis, 2019



Source: Census on The Map Data (all worker, 2019). CPD is Census Designated Place

1. TOD Opportunities & Existing Conditions



Transit and Equity Metrics

Over the past decade, the study area has experienced a smaller improvement in poverty (i.e., households earning less than \$20,000) compared to cities with better transportation access

Region	Transit Connectivity Index (0-100)	Transit Access Shed	Change in Share of Households Making Less than \$20,000
Bridgeport	7	26	-4.9%
Hartford	12	54	-7.1%
Stamford	7	23	-2.3%
New Haven	10	38	-4.9%
New London	4	15	1.9%
Norwich	2	13	-1.4%
Groton	2	8	2.5%
Mystic	3	8	-1.4%
Stonington	1	2	2.7%

- Note:**
- The Transit Connectivity Index (TCI) was developed by CNT as a measure of transit service levels. The TCI is based on the number of bus routes and train stations within walking distance for households in a given Block Group scaled by the Frequency of Service.
 - The Transit Access Shed is defined as the optimal accessible area from any block group within a 30-minute transit trip.

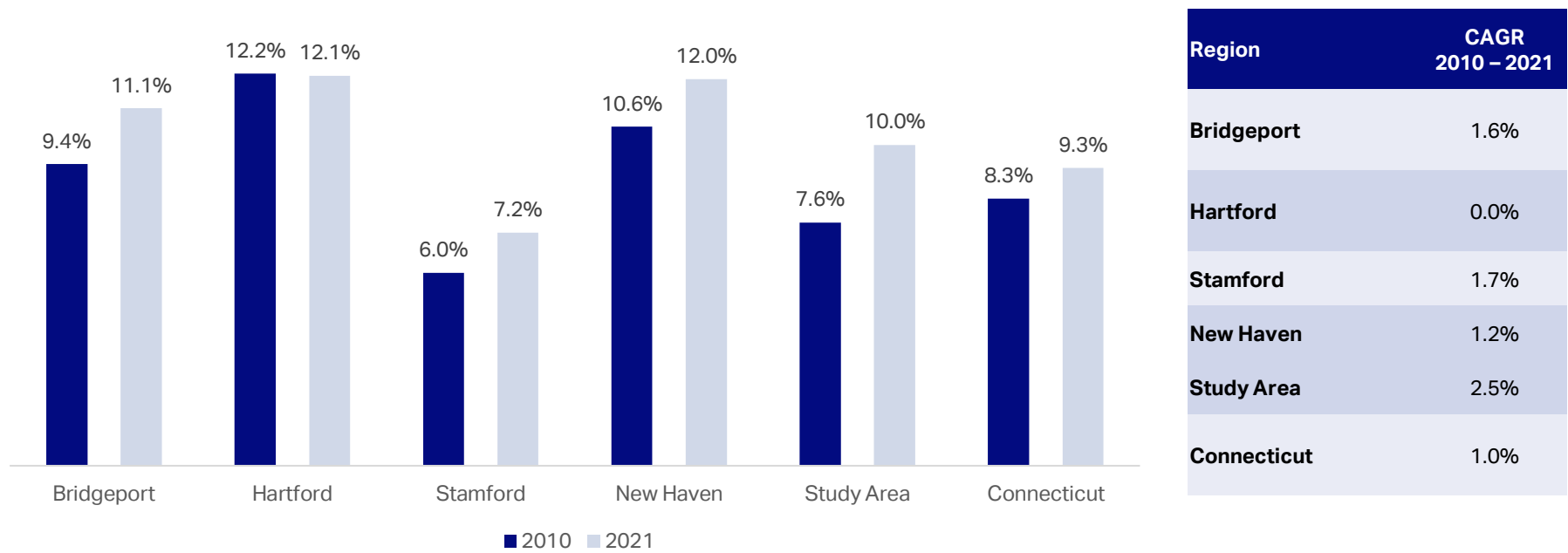
Source: All Transit Metrics (alltransit.cnt.org), ACS 5-Year Estimate (B19001)

1. TOD Opportunities & Existing Conditions



- Share of the civilian population 16 years or over living below the poverty level within the study area has been increasing at 2.5% annually, faster than benchmark cities.
- Limited population and job growth in the study area has likely exacerbated challenges faced by residents living in poverty.

Share of Population Living Below Poverty Level (Place of Resident, 2010 – 2021)

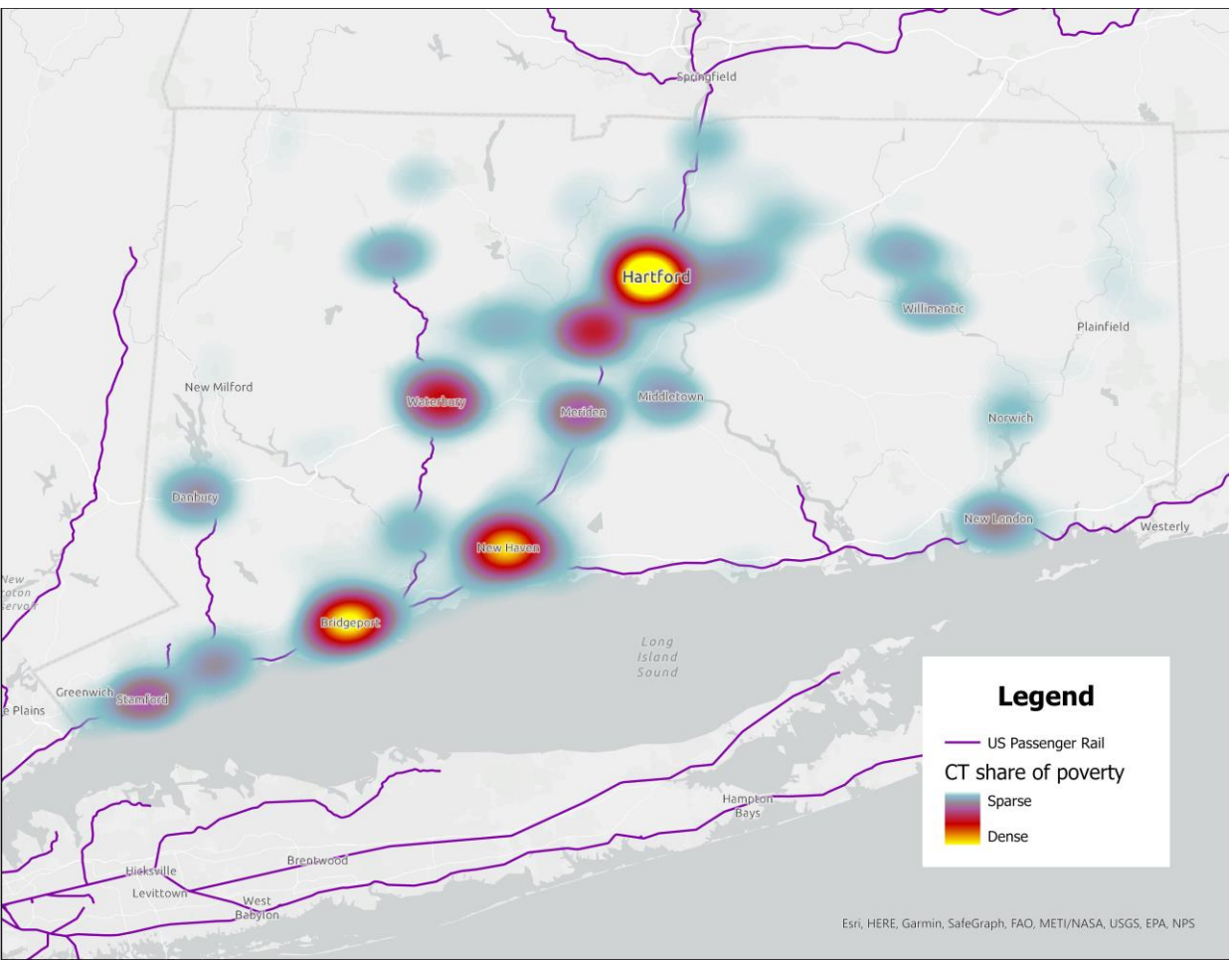


Source: 2010 and 2021 ACS 5-Year Estimates (B17005), AECOM Calculation. The analysis was done using 5 miles radius from the place boundaries.

1. TOD Opportunities & Existing Conditions



Heatmap: Share of Poverty in Connecticut (Civilian 16 years and over)



- Approximately 82.5% of the population aged 16 years and above that are living below the poverty threshold in the Northeast Megaregion are concentrated in the Northeast corridor, with the majority concentrated in cities such as New York, Philadelphia, Boston, Baltimore, and Washington DC.
- In Connecticut, the population 16 years and over living in poverty is more concentrated along the Waterbury Branch (Waterbury City), New Haven Line (New Haven City and Bridgeport City), and Hartford Line (Hartford City).

Source: 2021 ACS 5-Year Estimates (B17005), AECOM Calculation.

1. TOD Opportunities & Existing Conditions



Share of Households Making Less Than \$20,000

- While 65.3% of households within the Northeast megaregion live within 2 miles of the Northeast Corridor, 72.7% of households in the megaregion that make less than \$20,000 are located within 2 miles of the Northeast Corridor, which is partially a reflection of the influence of greater New York City.
- In Connecticut, tracts within 2 miles of the commuter rail tend to have a higher concentration of households earning less than \$20,000. Moreover, statistically, the tracts that are located within 2 miles of rail also have older housing units than the megaregion’s average, with a confidence level of 99%.
- Statistical analysis in the northeast corridor also demonstrates a negative correlation between the number of rail passengers and the proportion of people living in poverty. In this case, adding an additional 1 million passengers is associated with a 0.1% decrease in the poverty share, with a confidence level of 99%.

Region	Share of Households within 2 Miles of Northeast Corridor	Share of Households Making Less Than \$20,000 2 Miles of Northeast Corridor	Difference
Connecticut	62.7%	70.7%	8.0%
Delaware	41.9%	44.6%	2.7%
District of Columbia	75.2%	74.9%	-0.3%
Maine	58.4%	63.4%	5.0%
Maryland	41.5%	50.8%	9.3%
Massachusetts	67.6%	67.3%	-0.3%
New Hampshire	16.8%	18.0%	1.2%
New Jersey	69.8%	75.3%	5.5%
New York	95.5%	97.7%	2.2%
Pennsylvania	85.1%	92.8%	7.7%
Rhode Island	56.9%	62.8%	5.9%
Virginia	14.1%	8.6%	-5.5%
Total	65.3%	72.7%	7.5%

Source: 2021 ACS 5-Year Estimates (B19001), AECOM Calculation.

1. TOD Opportunities & Existing Conditions



Share of Households Making Less Than \$20,000 (Incorporated)

- 80.1% of households in the megaregion incorporated areas are living within 2 miles of the northeast corridor, higher than the megaregion average at 65.3%.
- 82.8% of households in the megaregion that make less than \$20,000 in the megaregion incorporated areas are living within 2 miles of the northeast corridor, higher than the megaregion average at 72.7%.
- Connecticut in general, also has a higher concentration of households located in incorporated areas (70.7% vs 88.0%).
- Statistical analysis in Connecticut reveals that a higher share of households without vehicles are located within 2 miles of the northeast corridor, with a confidence level of 99% (See Appendix). Suggesting that improvement in rail access could help the lower-income household access better opportunities.

Region	Share of Households within 2 Miles of Northeast Corridor (Incorporated)	Share of Households Making Less Than \$20,000 2 Miles of Northeast Corridor (Incorporated)	Difference
Connecticut	84.8%	88.0%	3.2%
Delaware	52.4%	65.9%	13.5%
District of Columbia	75.2%	74.9%	-0.3%
Maine	81.9%	81.9%	0.0%
Maryland	65.7%	71.5%	5.8%
Massachusetts	74.8%	71.7%	-3.1%
New Hampshire	15.5%	14.5%	-1.0%
New Jersey	83.7%	86.3%	2.6%
New York	98.3%	98.5%	0.2%
Pennsylvania	92.2%	95.3%	3.1%
Rhode Island	78.3%	79.8%	1.5%
Virginia	10.4%	5.9%	-4.5%
Total	80.1%	82.8%	2.6%

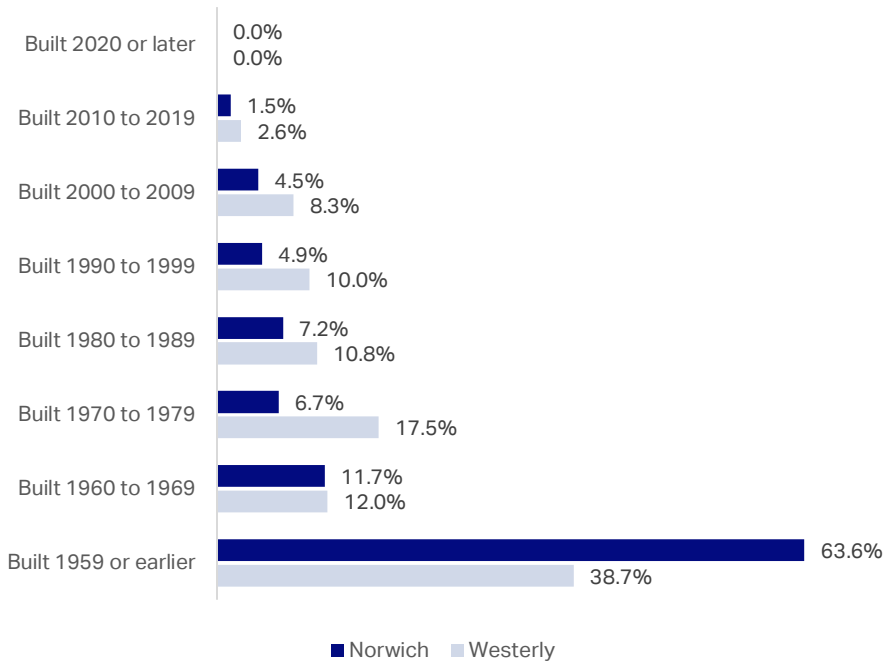
Source: 2021 ACS 5-Year Estimates (B19001), AECOM Calculation. Census defines incorporated places as places that have a legally defined boundary and an active functioning governmental structure. In this analysis, it helps us distinguish residents living in cities, towns, etc.



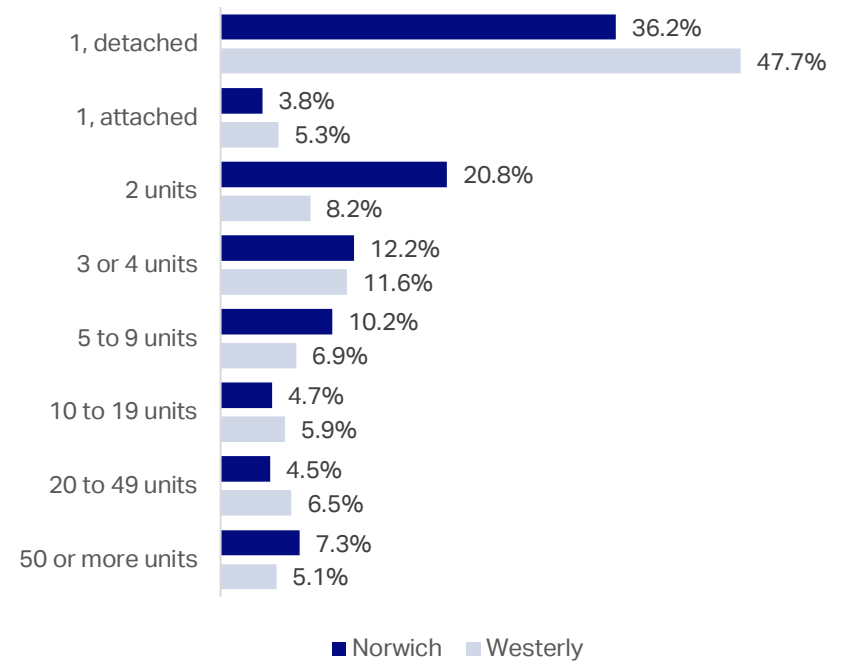
2. Existing Housing Supply

- Both Thames River Corridor and Westerly Corridor have a significant number of older housing inventories.
- 63.6% of housing units in Thames River Corridor are older than 1959, implying a significant number of these units are susceptible to change (indicating potential future development prospects).
- The Thames River Corridor has a higher share of multifamily housing units compared to Westerly, implying a higher density in the area.

Year Structure Built, 2021



Unit Type, 2021

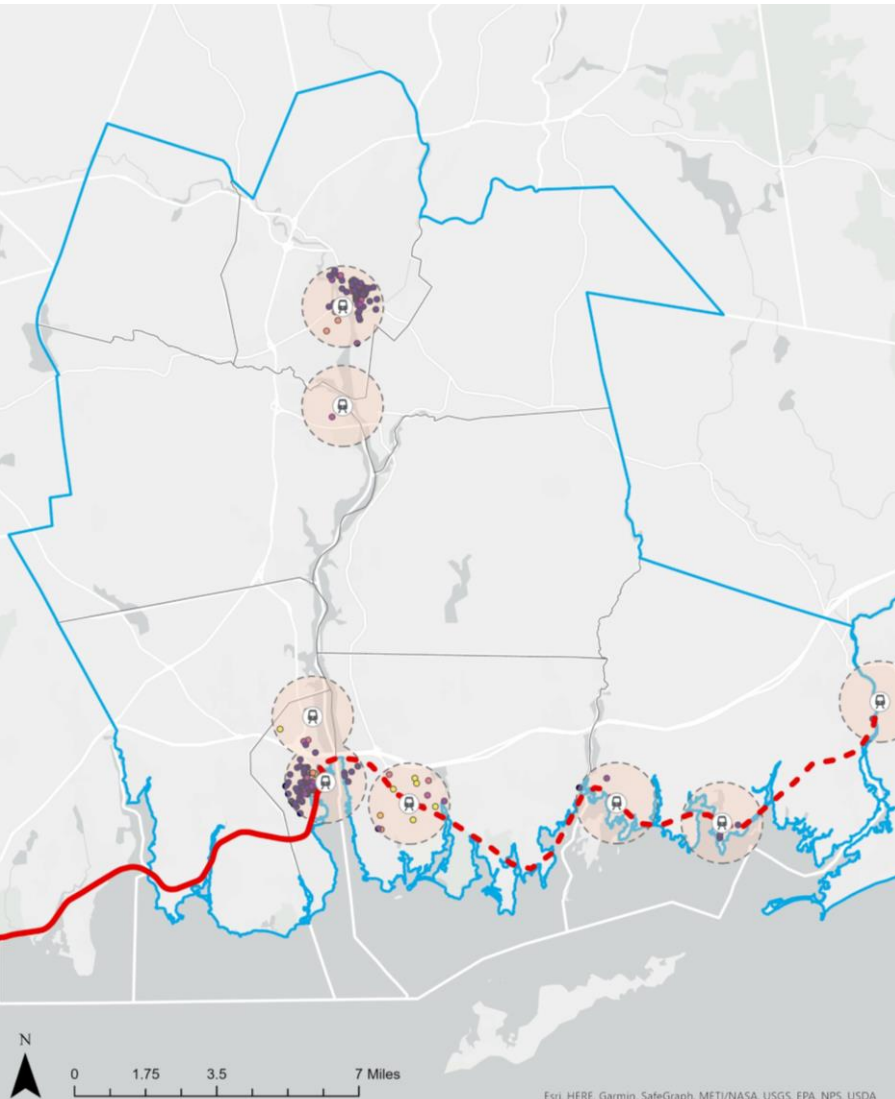


Source: ACS 5-Year Estimates, AECOM Calculation.

2. Existing Housing Supply



Multifamily Supply- Overview



- A majority of multifamily housing units tend to be located within 1 mile of proposed Amtrak station areas in Norwich and New London.
- Norwich accounts for 22.6% (1,196) of total available multifamily units.

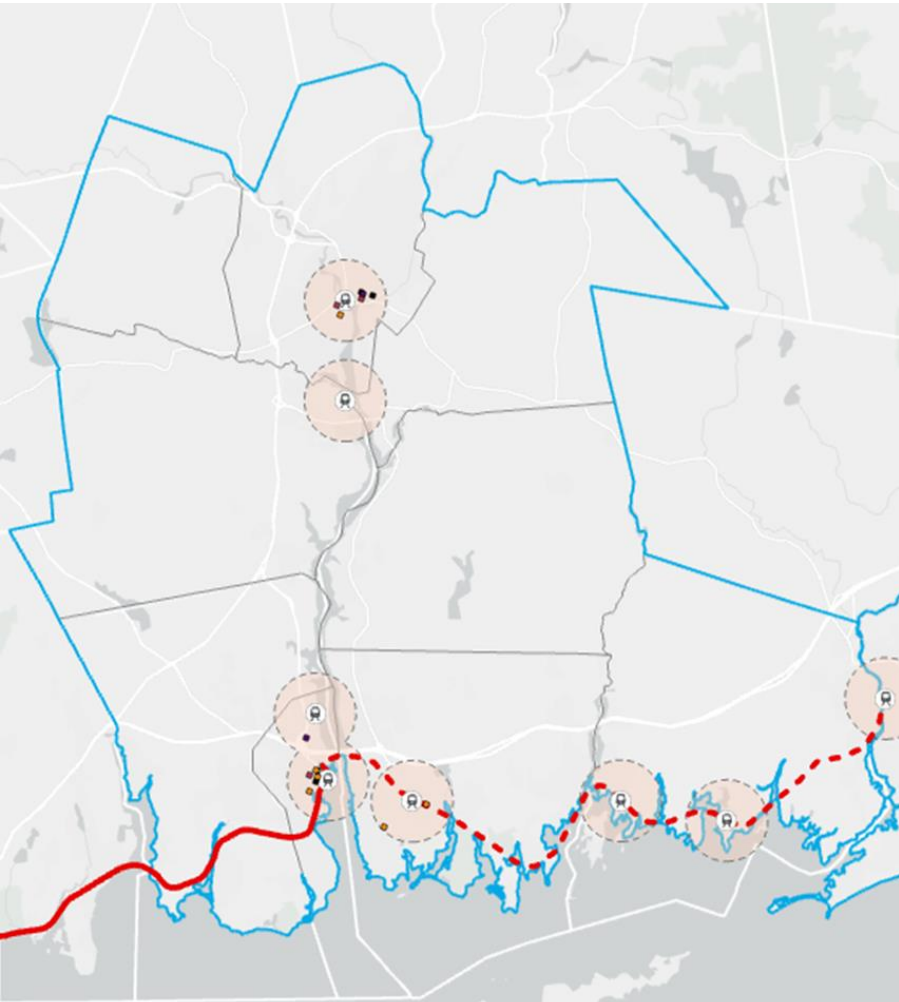
Multifamily Units: 1-Mile within Amtrak Stations

Total Units, 1-Mile	5,291
Average Units/Building	29
Median Units/Building	6
Average Vacancy (Market Rate)	3.06%
Average Asking Rent (Market Rate)	\$1.68/SF (Range: \$1 < x < \$2.7)
Average Unit Size (Market Rate)	779 SF

Source: CoStar

2. Existing Housing Supply

Affordable Multifamily Supply



- Most affordable multifamily housing units are in Norwich and New London.
- Lower vacancy rates for affordable housing indicate high demand for affordable units (1.37% vs 3.06% for market-rate units).
- Units in buildings designated as affordable see higher asking rents than units in the fully market-rate buildings.

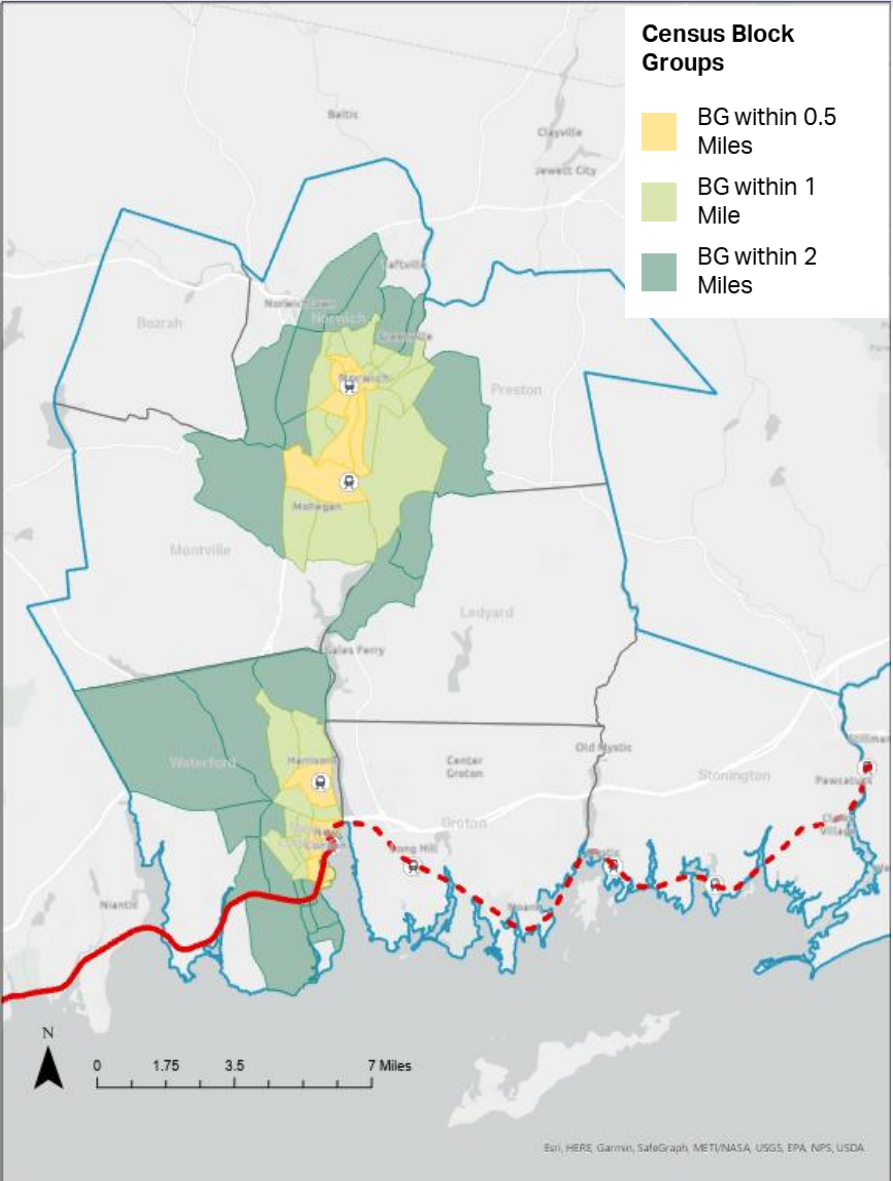
Affordable Multifamily Units: 1-Mile within Amtrak Stations

Total Buildings	15 (8%)
Affordable Units	1,407 (26.6%)
Average Units/Building	93.8
Average Vacancy Rate	1.37%
Average Asking Rent	\$1.94/SF (Range: \$1.06 < x < \$3.54)
Average Unit Size	712 SF

Source: CT Department of Housing



2. Existing Housing Supply

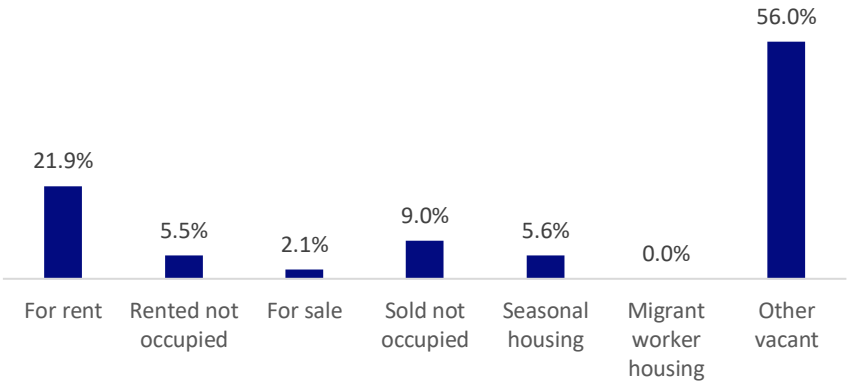


- 56% of the vacant housing units within 1 mile of the New London – Thames River Corridor are categorized as other vacant which means that the house is vacant but not up for rent or sale.

Thames River Corridor Housing Statistics, 2021

Boundaries	Total Housing Unit	Vacant Housing Units	Share of Vacant Housing
0.5-Mile	7,166	883	12.3%
1-Mile	22,195	2,529	11.4%
2-Mile	35,599	3,576	10.0%

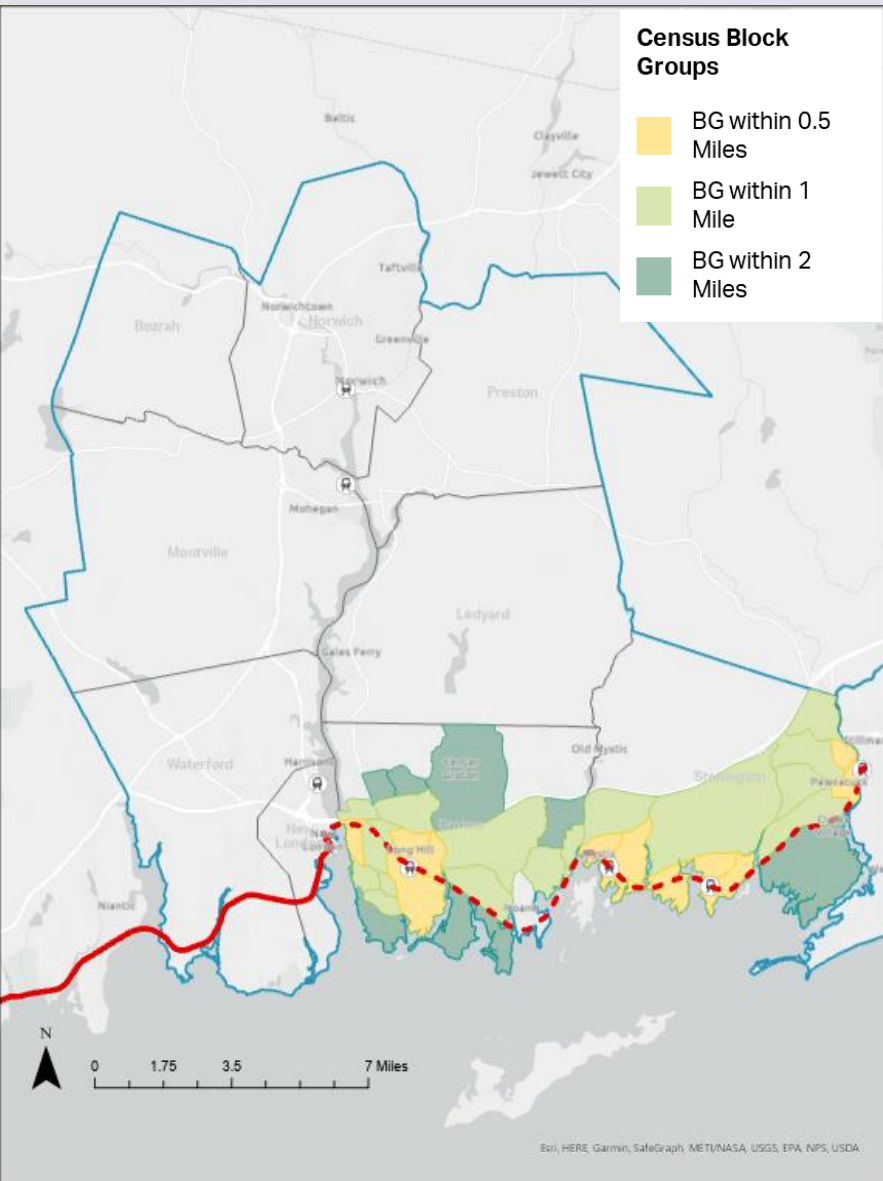
Thames River Corridor Housing Vacancy Status: 1 Mile, 2021



Source: ACS 5-Year Estimate (B25004)



2. Existing Housing Supply

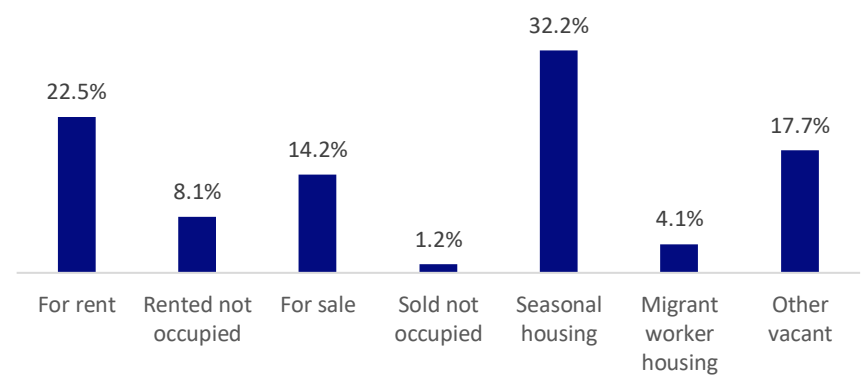


- 32.2% of the vacant housing units 1 mile from the New London – Westerly Corridor are categorized as seasonal housing and 17.7% are categorized as other vacant.

Westerly Housing Statistics, 2021

Boundaries	Total Housing Unit	Vacant Housing Units	Share of Vacant Housing
0.5-Mile	7,304	1,336	18.3%
1-Mile	18,362	2,083	11.3%
2-Mile	22,685	2,752	12.1%

Westerly Housing Vacancy Status: 1 Mile, 2021



Source: ACS 5-Year Estimate (B25004)

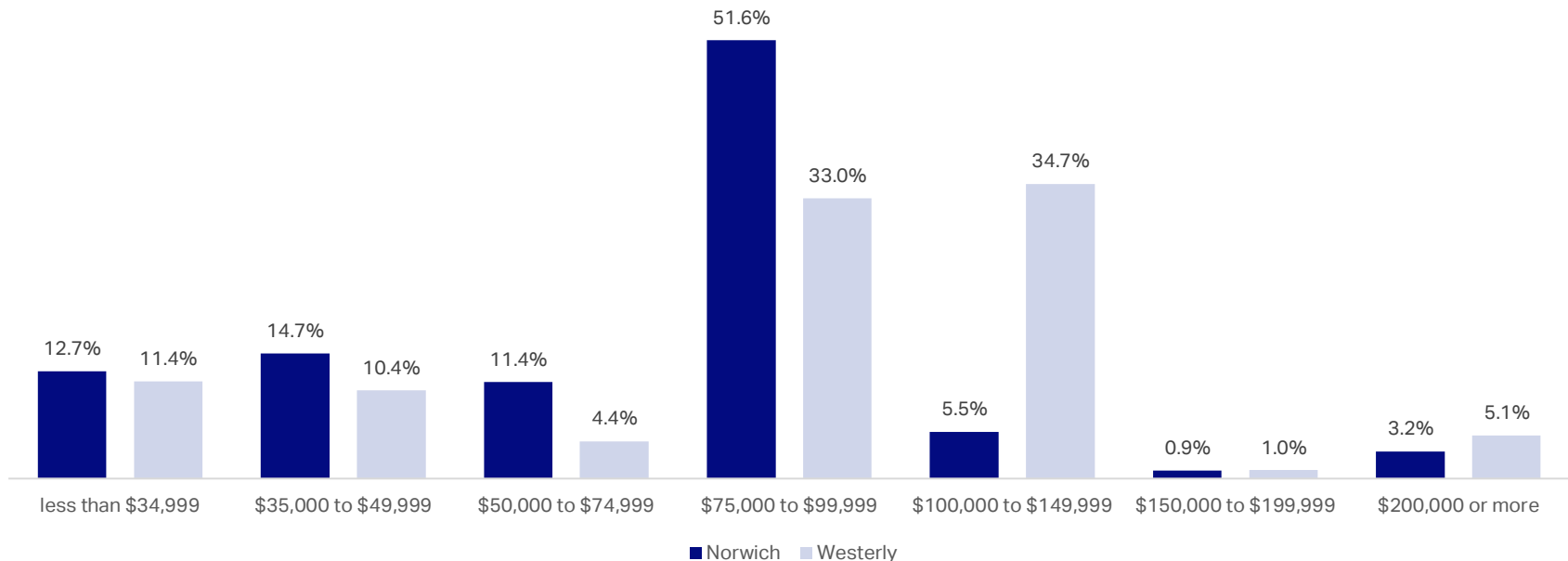
3. Equity & Housing Affordability



The study area faces existing challenges in the spheres of housing affordability, especially for low-income residents:

- About 12% of the employee in the study area are making less than \$35,000.
- In terms of housing affordability* for those employees, this roughly translates to a rent price of less than \$875 per month and a house value approximately below \$115,000
- Based on the ACS data, the current median gross rent in the study area is approximately \$1,150 dollar per month and the median house value is approximately \$260,0000

Income Distribution based on Employment in Study Area, 2022



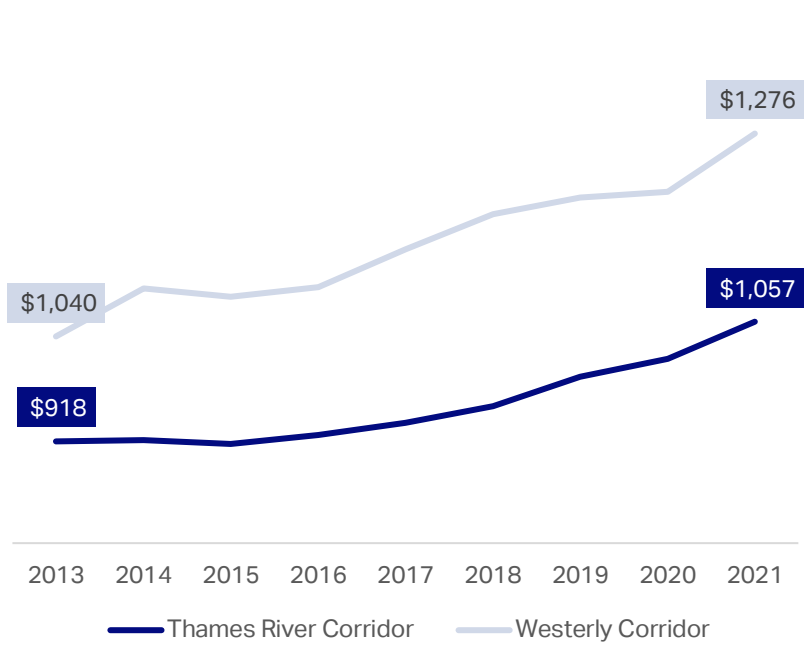
Source: EMSI Lightcast, AECOM Calculation. *Affordable rent is calculated as 30% of monthly income

3. Equity & Housing Affordability

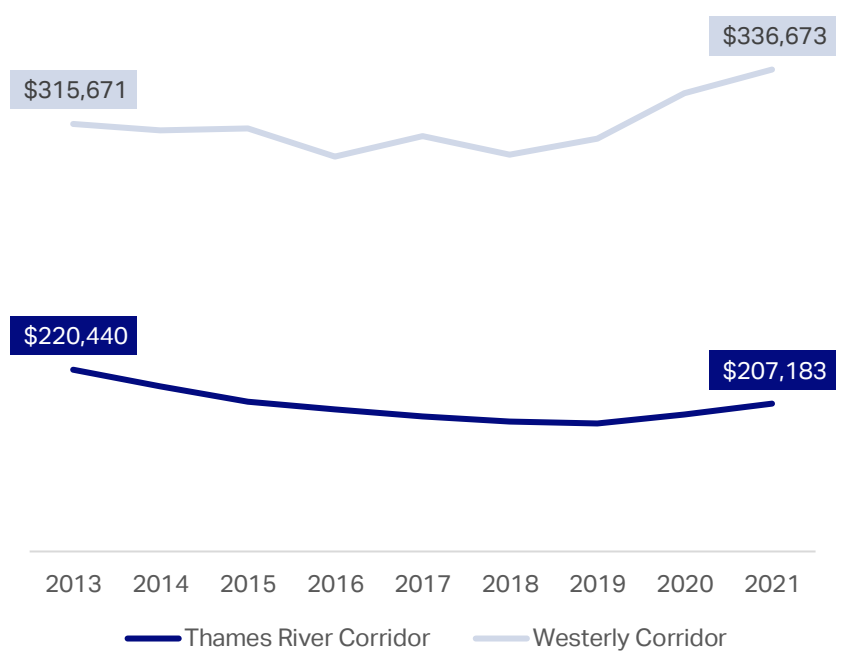


- Nearly half (44%) of all renter households in the study area are currently rent burdened*, or 16% of all households.
- Median gross rent has been increasing annually at around 1.6% in Thames River Corridor and 2.6% in Westerly Corridor, as a comparison Connecticut's median gross rent has been increasing annually at around 2.3%.
- Furthermore, approximately 25% of jobs in the study area pay less than \$50,000 annually, making homeownership unattainable at the current median house price of \$336,000 in Westerly and \$200,000 in Thames River.

Median Gross Rent: 2 Miles, 2013 - 2021



Median House Price: 2 Miles, 2013 - 2021



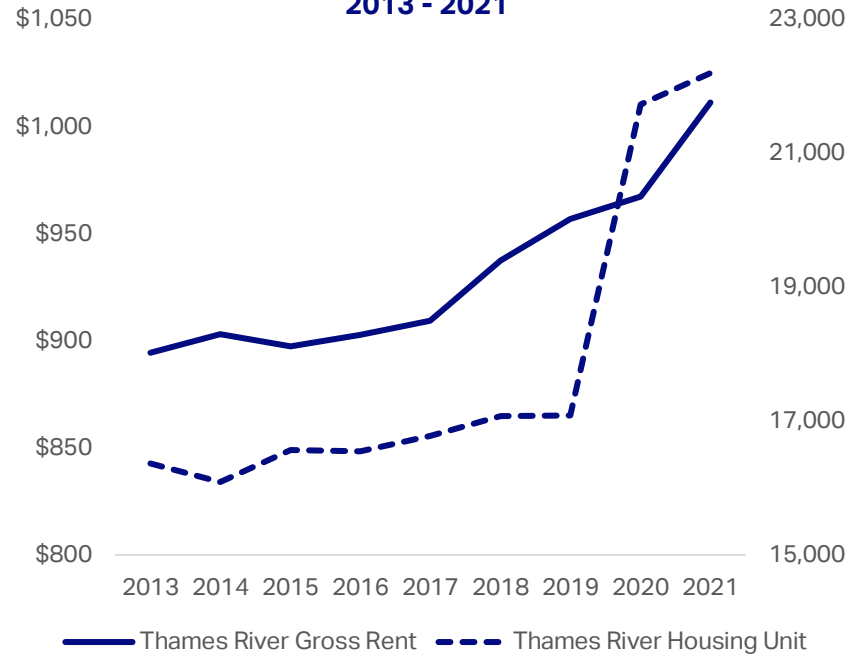
Source: ACS 5-Year Estimates, AECOM Calculation. *Rent burdened is defined as spending more than 30 percent of income on housing

3. Equity & Housing Affordability

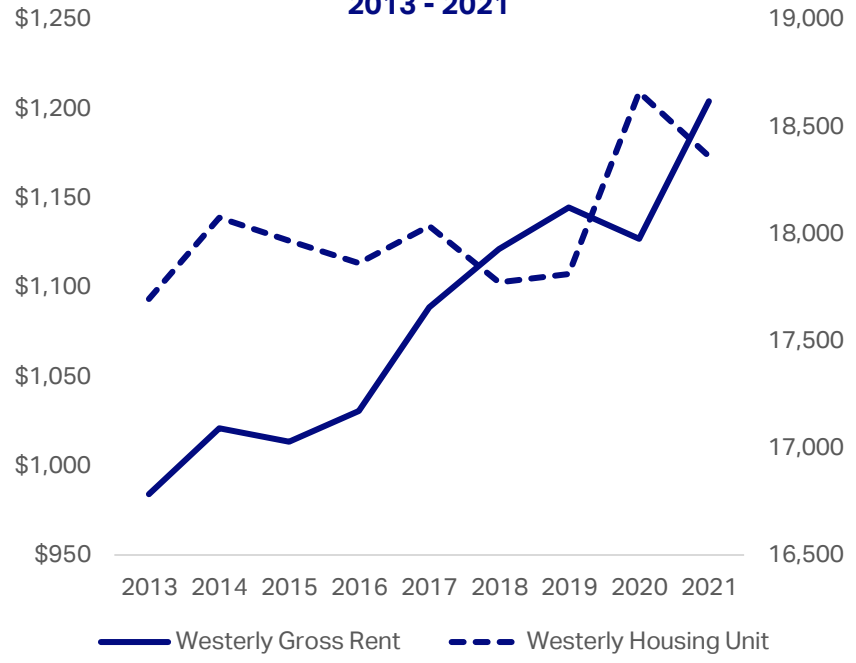


- In the past decade, the housing inventories in Thames River and Westerly have been relatively flat before picking up in 2020. The limited growth in inventory could potentially contribute to the continuous rise in rent prices.
- The steady rise in gross rent poses a higher risk of displacement. Some towns in the study area—particularly New London and Norwich—face eviction filing rates two- or three times Connecticut’s statewide average (Princeton Eviction Lab).
- Furthermore, an examination of net in-migration patterns in New London County post-Covid reveals that the people who have recently moved into the area tend to have higher incomes than the existing residents. This suggests a potential escalation of displacement pressure.

**Thames River Gross Rent vs Number of Housing Units
2013 - 2021**



**Westerly Gross Rent vs Number of Housing Units
2013 - 2021**



Source: ACS 5-Year Estimates, Princeton Eviction Lab, AECOM Calculation.

4. Transit User Market Characterization



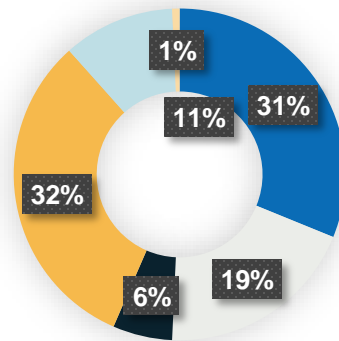
Who rides public transportation? (APTA 2021)

Key Findings:

- Majority of riders belonging to lower-income households and people of color.
- Ridership is higher among individuals without access to a private vehicle or with limited access to one.
- Public transit usage is more prevalent in densely populated urban areas, with a higher proportion of jobs, services, and amenities within walking distance to transit stops.
- Millennials and younger generations are more likely to use public transit.
- College students and individuals with higher education levels are more inclined to use public transportation.

“Majority of survey respondents (63%) consider an easy walk (less than 1 mile) or a short drive (up to 15 minutes) as close proximity to rail transit”

What do you consider close enough?



- An easy walk (less than 1 mile or 20 minutes)
- A short bike ride (less than 3 miles)
- A longer bike ride (more than 3 miles)
- A short drive (up to 15 minutes)
- I'd use it no matter how far away it was
- I would not use it no matter how close it was

4. Transit User Market Characterization



Two categories of transit users:

• Daily User Segments (Primary Market)

- ✓ Commuters: Users who travel to and from work on weekdays
- ✓ Students: Users who attend educational institutions around the rail line
- ✓ Local residents without a vehicle

Pros

New transit connections, particularly between Norwich and Mohegan Sun Casino in Montville, and Stonington and New London to Groton, would help increase workers' access to their existing employers.

Potential drawbacks

- **The low current residential density of the area at large may limit the potential ridership of new potential rail lines.** For example, LEHD data indicate that employees at Electric Boat come from very dispersed origins that are frequently far from potential station areas. Planning for increased residential density in station areas and encouraging developments that can attract higher-income Electric Boat workers in these areas could help eliminate or mitigate this issue.
 - **Aging population especially within the Westerly corridor.** The older population might not use rail lines as frequently due to various mobility challenges and personal preferences.
- **Occasional User Segments (Secondary Market)**
 - ✓ Tourists: Visitors to the area who use rail service to explore attractions
 - ✓ Population in Group Quarters*

Pros

New transit connections, particularly Mohegan Sun Casino in Montville, and Mystic, would help increase tourists' access to recreational areas.

Potential drawbacks

Tourists or the population in the group quarter might prefer alternative modes of transportation such as driving or taking a plane.



4. Transit User Market Characterization

New transit connections, would help increase workers' access to their existing employers, improve access for college students, and provide a transportation alternative for tourists visiting the region.

New London – Thames River Transit

Primary Market	0.5 Miles	1 Mile	2 Miles
Travel Mode			
Commuters: All	7,755	22,671	37,032
Commuters: Train	53	108	168
Commuters: Bus	179	647	813
Household without Vehicle	1,146	3,197	3,944
Secondary Market			
Population Living in Group Quarters	2,611	3,079	4,043
Nursing Facilities	108	215	586
College/ University Student Housing	1,663	1,663	2,142
Military Quarters	595	595	595

New London – Westerly Transit Corridor

Primary Market	0.5 Miles	1 Mile	2 Miles
Travel Mode			
Commuters: All	5,660	15,948	19,806
Commuters: Train	39	54	54
Commuters: Bus	55	217	236
Household without Vehicle	419	1,277	1,317
Secondary Market			
Population Living in Group Quarters	312	826	917
Nursing Facilities	150	579	659
College/ University Student Housing	0	24	24
Military Quarters	0	0	0

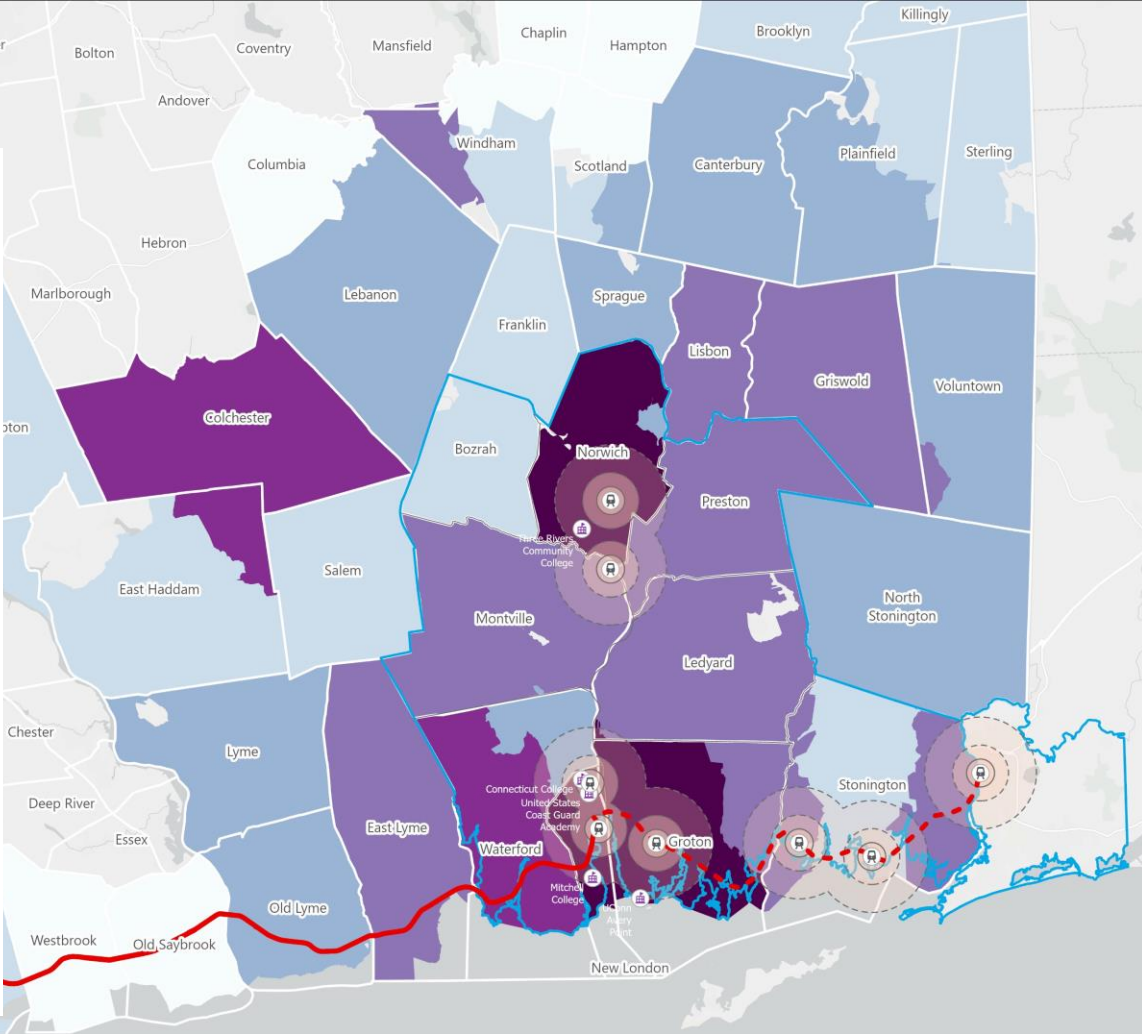
Source: 2021 ACS 5-Year Estimate, Commuters is based on total workers based on means of transportation to work (excluding residents who worked from home). Train is defined by public transportation long-distance train or commuter rail.



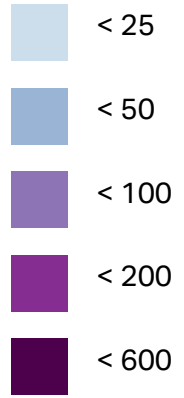
4. Transit User Market Characterization

Higher Education Student Commuters, 2022

- There were approximately **3,200** total students commuting to their respective institutions in 2023
- The map includes data from Three Rivers College, Mitchell College, and CT College
- Three Rivers College Students and UConn Avery Point represents majority of the student commuters
- Three Rivers College and UConn Avery Point do not provide on-campus housing; Students at US Coast Guard Academy must live on campus
- The map does not include information about UConn Avery Point, which has over 490 undergraduate students, all of whom are commuters.



Number of Student Commuters





4. Transit User Market Characterization

Potential Ridership Matrix

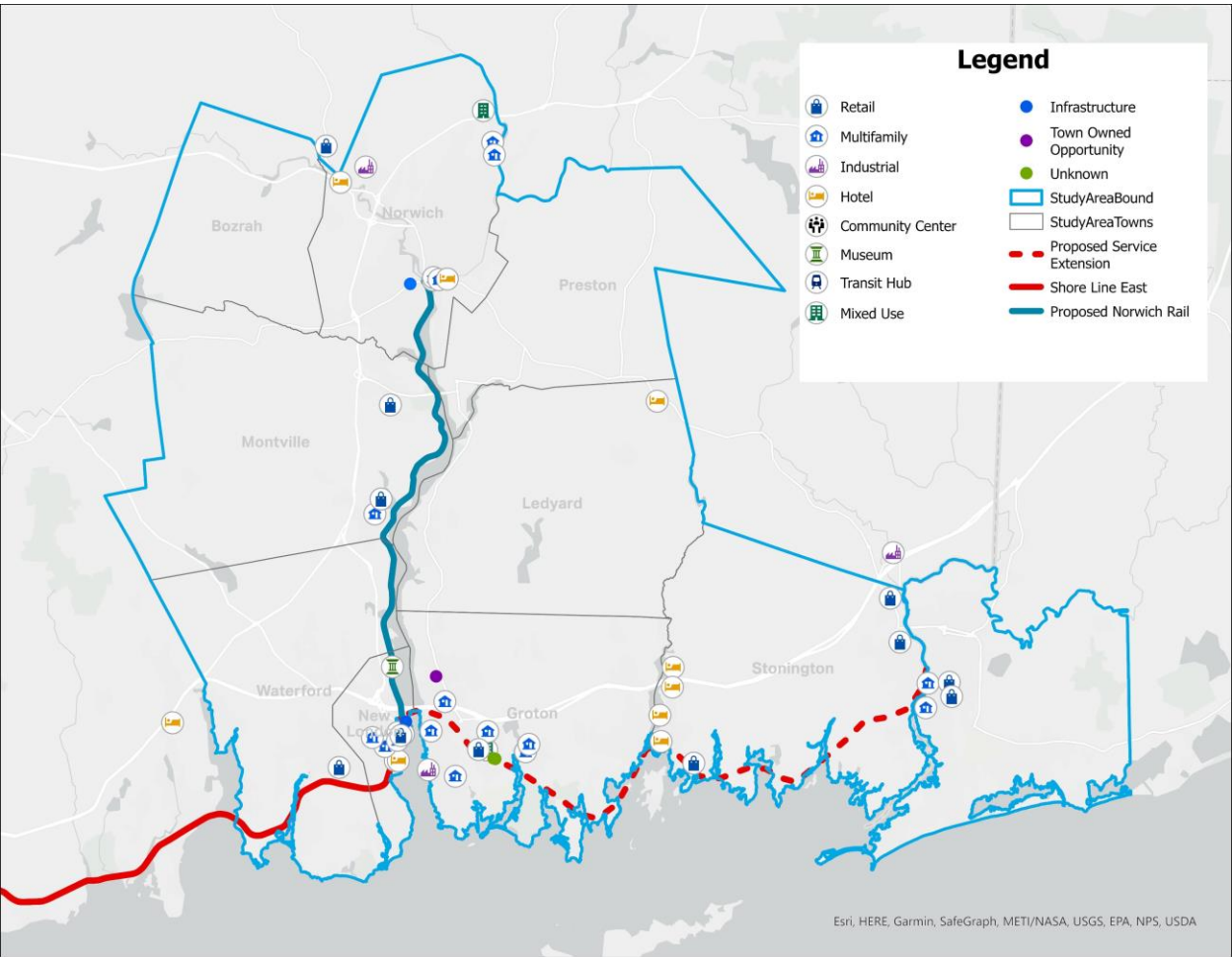
The matrix demonstrates that the Thames River Corridor population aligns with public transit user characteristics, indicating an opportunity for them to benefit from transit.

Demographic Characteristics Public Transit Users		Thames River 2 Miles	Westerly 2 Miles	New London County	Connecticut	Northeast Corridor
Income	<ul style="list-style-type: none"> Low-income households, less than \$25,000 a year, represent 31% of public transit users. Households with incomes between \$25,000 and \$50,000 a year constitute 25% of riders. 	40.7% of households making less than \$50,000 a year	32.4% of households making less than \$50,000 a year	31.3% of households making less than \$50,000 a year	30.7% of households making less than \$50,000 a year	29.3% of households making less than \$50,000 a year
Cost of Living Index	100 refers to US as the base	124	124	124	127	119.7
Race/Ethnicity	60% of public transit users identify as non-white.	34.7% population identify as non-white	24.3% population identify as non-white	21.5% population identify as non-white	28.0% population identify as non-white	41.5% population identify as non-white
Age	<ul style="list-style-type: none"> 39% of public transit users are millennials 7% of public transit users are people aged 65 and older 	Median age is 39.6	Median age is 41	Median age is 41	Median age is 39.6	Median age is 41.5
Education	<ul style="list-style-type: none"> 39% of public transit riders have a college degree or higher 21% have a high school diploma or equivalent. 	24.5% of the population over 25 has a bachelor degree or higher	42% of the population over 25 has a bachelor degree or higher	34.6% of the population over 25 has a bachelor degree or higher	40.6% of the population over 25 has a bachelor degree or higher	43.7% of the population over 25 has a bachelor degree or higher
Vehicle Access	68% of public transit users either do not have access to a private vehicle or have limited access to one.	12.3% of households have no vehicle	6.6% of households have no vehicle	2.7% of workers have no vehicle	3.3% of workers have no vehicle	12.9% of workers have no vehicle

Source: "Who Rides Public Transportation" APTA 2021, US Census ACS 5-Years Estimate, EMSI Lightcast

5. Development Potential

Major Developments are concentrated around New London and Groton supported by strong projected housing demand.



Multifamily

- 6 Groton
- 5 Norwich
- 5 New London

Hotel

- 4 Mystic
- 2 Norwich
- 1 New London

Retail

14 Development within New London County and Washington County

5. Development Potential



Multifamily*

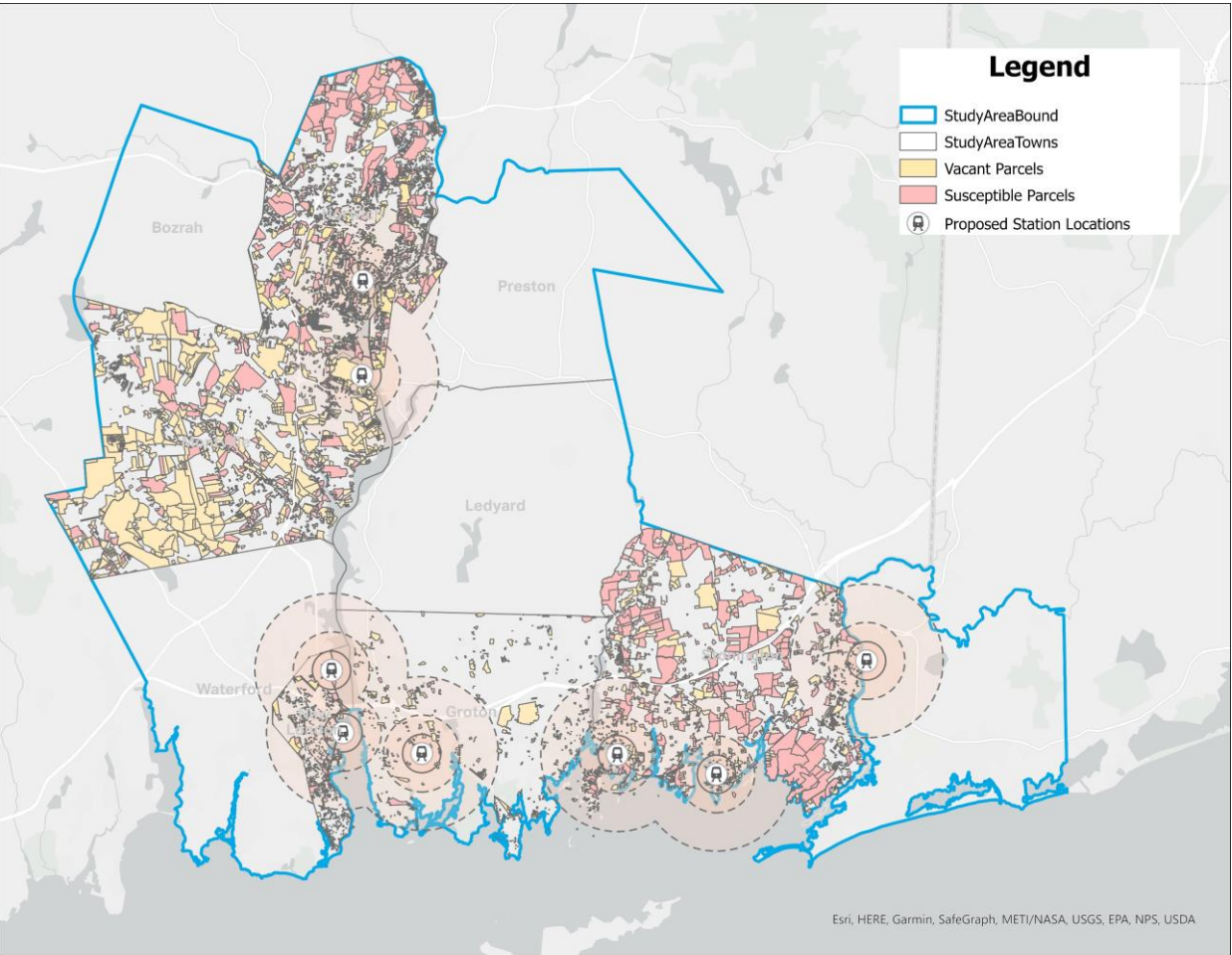
The study area is expected to add an additional 2,000++ units in the next 3 to 5 years

Index	Name	City	# Units
1	90-100 Garfield Ave	New London	90
2	174 Bank St	New London	34
3	281 Gardner Ave	New London	50
4	Downtown Redevelopment	New London	2018 MF
5	The Docks & Shaws Cover	New London	137
6	The Ledges Phase 2	Groton	200
7	Groton Public Library Area Apartments	Groton	200-250
8	Grasso Gardens	Groton	50+
9	Triton Square	Groton	306
10	West Street School	Groton	25 Phase 1 40 Phase 2
11	Groton Heights School	Groton	30,000 SF
12	77-91 Main Street Apartments	Norwich	42
13	Riverview Apartments	Norwich	120-160
14	Ponemah Mills Apartments	Norwich	447
15	Church Street Luxury Apartments	Norwich	70
16	Reid & Hughs Multi-Family Development	Norwich	17



5. Development Potential

Susceptibility Analysis



Majority of the vacant parcels and parcels that are susceptible to change are in towns that currently lack adequate transit connections (Norwich, Montville, Stonington)

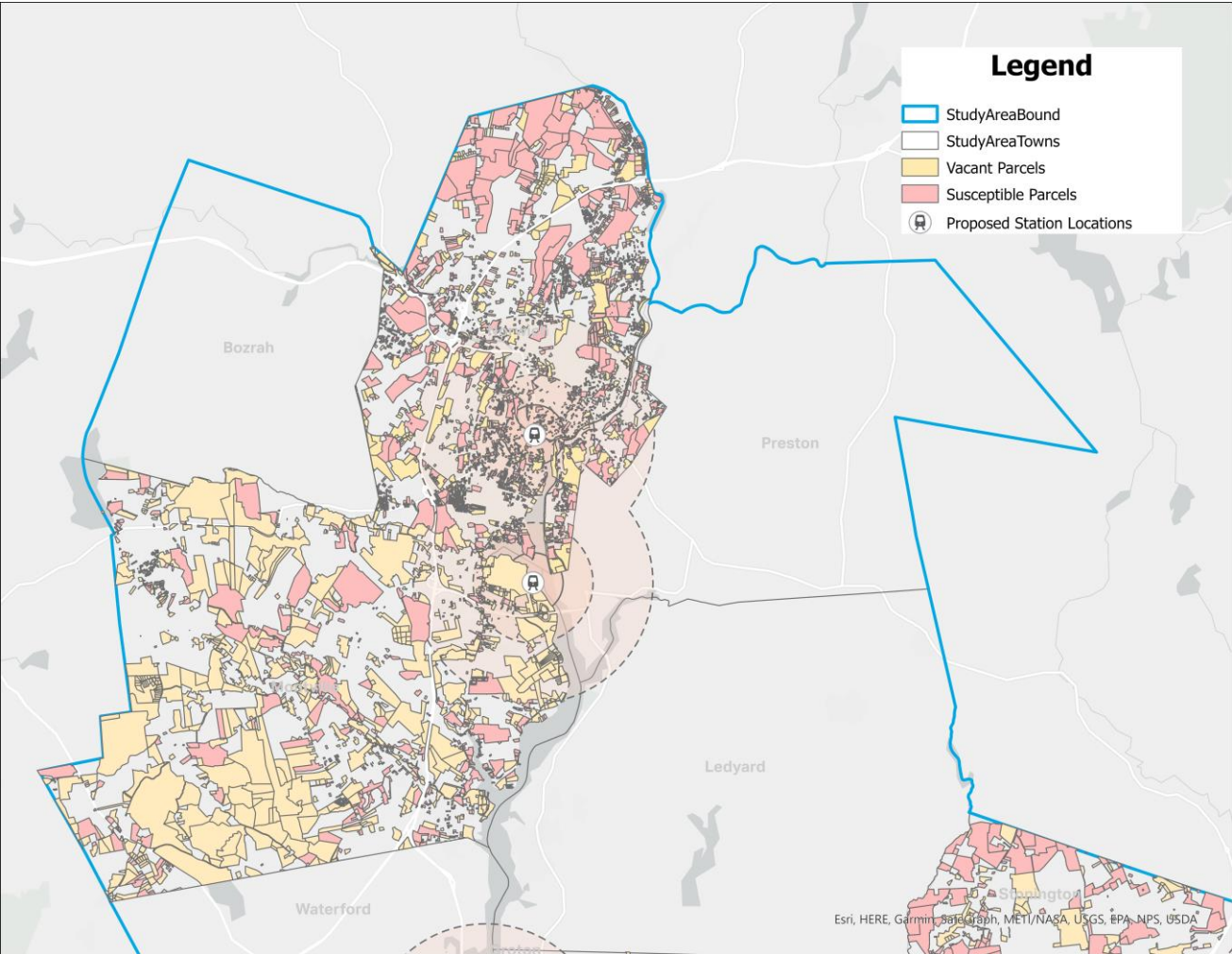
City	Susceptible to Change	Vacant
Norwich	2,766 (19.5%)	904 (6.4%)
Montville	439 (6.0%)	1,053 (14.5%)
New London	1,076 (17.1%)	337 (5.4%)
Groton	73 (0.7%)	534 (4.9%)
Stonington	762 (7.5%)	934 (9.2%)

Source: Goman + York Property Advisor, AECOM Analysis. The percentage in the bracket represents the share of the total parcel in the corresponding town. A susceptibility to change analysis is a method to uncover potential future development prospects. For detailed information about the analysis, please consult the methodology section.

5. Development Potential



Susceptibility Analysis: Norwich & Montville



Norwich has more parcels with old buildings that are susceptible to change, while Montville has more vacant parcels within 2 miles of proposed stations

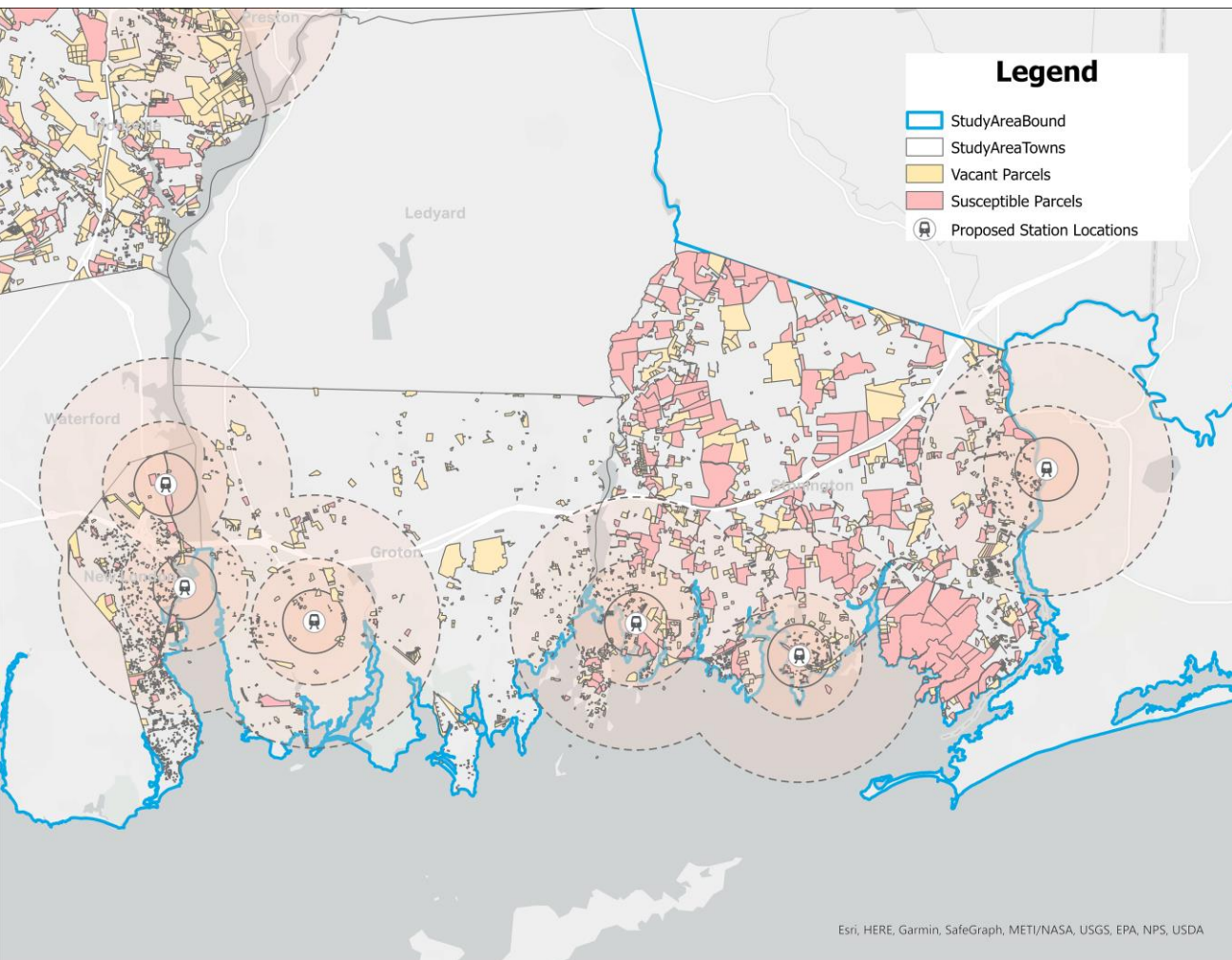
City	Susceptible to Change	Vacant
Norwich		
0.5 Miles	185	67
1 Mile	712	241
2 Miles	1,538	494
Montville		
0.5 Miles	0	14
1 Mile	22	81
2 Miles	47	232

Source: Goman + York Property Advisor, AECOM Analysis. A susceptibility to change analysis is a method to uncover potential future development prospects. For detailed information about the analysis, please consult the methodology section.

5. Development Potential



Susceptibility Analysis: New London, Groton, Stonington



New London has more parcels with old buildings that are susceptible to change, while Groton and Stonington have more vacant parcels within 2 miles of the proposed stations.

City	Susceptible to Change	Vacant
New London		
0.5 Miles	79	36
1 Mile	364	174
2 Miles	808	272
Groton		
0.5 Miles	6	17
1 Mile	19	97
2 Miles	50	348
Stonington		
0.5 Miles	130	107
1 Mile	277	283
2 Miles	477	623

Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

Source: Goman + York Property Advisor, AECOM Analysis. A susceptibility to change analysis is a method to uncover potential future development prospects. For detailed information about the analysis, please consult the methodology section.



6. Economic & Fiscal Impact

Rail Construction Economic Impact

Investment in Rail related construction to provide new service and infrastructure in these corridors is estimated to create up to 4500 jobs and \$860 million in sales (2023 Dollars) as well as \$340 million in earnings (2023 Dollars)



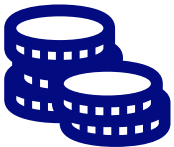
Construction: Sales/Output (2023 Dollars)

- **Initial & Direct:** \$760,134,885
- **Indirect & Induced:** \$101,070,991



Construction: Jobs (Job Years)

- **Initial & Direct:** 3,722
- **Indirect & Induced:** 725



Construction: Earnings (2023 Dollars)

- **Initial & Direct:** \$302,427,278
- **Indirect & Induced:** \$41,564,042

6. Economic & Fiscal Impact

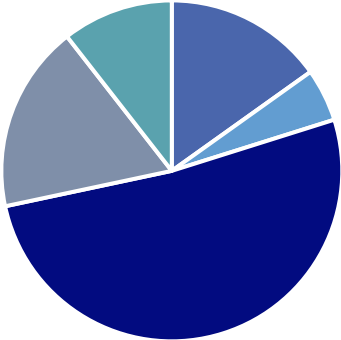


Fiscal Impact - Rail Construction & Post Completion (from 2023 to 2045)

Estimated fiscal impact of the rail is estimated to range between \$30 million (2023 Dollars) to \$100 million (2023 Dollars) over the next 22 years

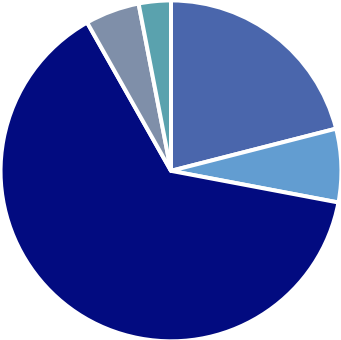
	Income Tax (CT)	Consumption Tax	Property Tax	Construction Sales Tax	Construction Income Tax (CT)	TOTAL
Baseline	\$4,527,232	\$1,498,658	\$15,412,210	\$5,322,301	\$3,153,292	\$29,913,693
Optimistic	\$21,747,772	\$7,199,205	\$66,059,914	\$5,322,301	\$3,153,292	\$103,482,484

Baseline



- Income Tax (CT)
- Property Tax
- Consumption Tax
- Construction Sales Tax
- Construction Income Tax (CT)

Optimistic



- Income Tax (CT)
- Property Tax
- Consumption Tax
- Construction Sales Tax
- Construction Income Tax (CT)

Source: EMSI Lightcast, AECOM Calculation. For detailed information about the calculation, please consult the methodology section.

7. Data Sources



Data Sources

Lightcast (formerly EMSI) – a private source for labor market data. For this analysis, employment data, gross regional product, and earnings were collected for the study areas.

Costar – a private data source for commercial real estate data, including rents, vacancy, and construction.

Goman + York Property Advisor – a consultant that provides commercial real estate data in the study area.

U.S. Census Bureau – Data from the Decennial 2000 Census and the American Community Survey (ACS) 2010 and 2021 were used for demographic and housing analysis in this report.

U.S. Bureau Labor Statistic – Data from the consumer expenditure survey were used for fiscal impact analysis in this report

CT.gov – Tax data from the CT Office of Policy and Management were used for fiscal impact analysis in this report

8. Definitions



Terms

LQ – a measure of relative concentration between a large geography (e.g. the United States) and a sub-geography (e.g. Youngstown MSA).

CAGR – compound annual growth rate, an annualized percentage change over time. It provides a smoothed rate of growth that is consistent between metrics.

North American Industrial Classification System (NAICS) Code – a standardized system for grouping places of work based on economic activities performed at the place. The Bureau of Labor Statistics (BLS) provides information on each NAICS Code in the U.S. Industry- an industry is a specific NAICS Code. For example, NAICS code 1110 is crop production activities.

Northeast Megaregion – Megaregion consists of the county or counties (or equivalent entities) associated with at least one urbanized area of at least 50,000 population, plus adjacent counties having a high degree of social and economic integration with the core as measured through commuting ties. Megaregions are highly populated regions that reflect powerful economic success and attract population growth either within a state or across state lines.

8. Definitions



Map of Northeast Megaregion, Northeast Corridor, and Passenger Rail

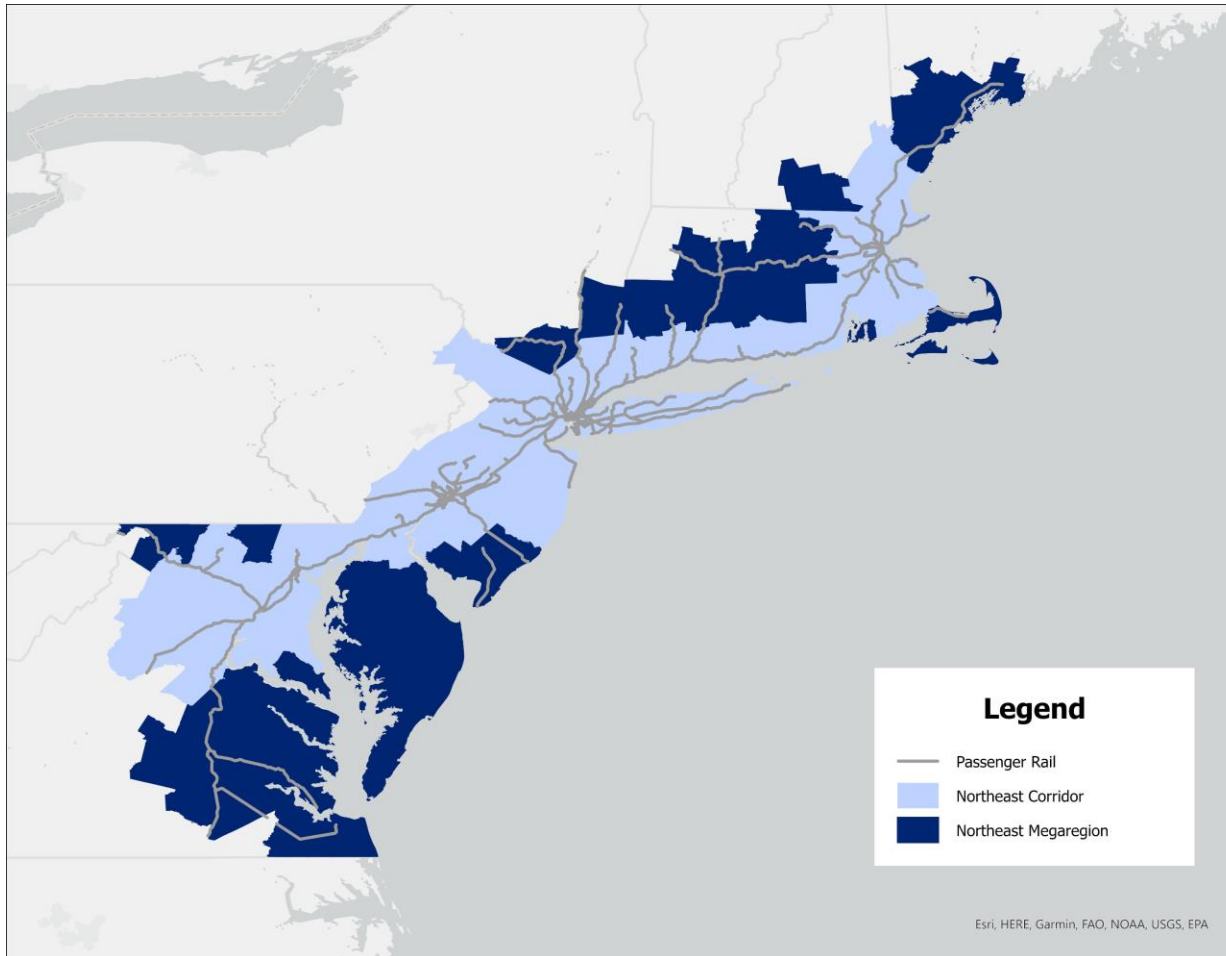


Exhibit: Methodology



AECOM Clusters

- AECOM identified 79 traditional industry clusters in the study area.
- Based on the 79 traditional industry clusters, AECOM calculates the share of clusters that are classified as super-sector, mature, medium and short-term growth, and long-term and underdeveloped to gauge the level of economic diversification in the study area.

Construction Economic and Fiscal Impact

- AECOM generates the economic and fiscal impact based on the multiplier data from EMSI Lightcast.
- Calculation of the sales tax during the construction period is estimated using the taxable in-region sales method. In this case, AECOM uses EMSI Lightcast and BLS Consumer Expenditure Survey data to calculate the taxable share of in-region final demand to estimate the share of construction sales subject to sales tax within the study area.
- Construction income tax calculations are based on total direct, indirect and induced earnings associated with project construction

Baseline Scenario: Fiscal Impact

- For estimating the fiscal impact, the baseline scenario assumes that the study area population and employment could grow as fast as the benchmark cities in Connecticut (Bridgeport, Stamford, New Haven, and Hartford).
- The additional population would contribute to income tax, consumption tax, and housing tax in CT.

Optimistic Scenario: Fiscal Impact

- For estimating the fiscal impact, the baseline scenario assumes that the study area population and employment could grow as fast as the northeast corridor.
- The additional population would contribute to income tax, consumption tax, and housing tax in CT.

Housing Unit Estimation: Fiscal Impact

- AECOM assumed that each 1 (one) job created would create 1 (one) household, which were directly converted into 1 (one) housing unit each.
- These additional housing units are assumed to bring additional housing tax in CT.

Exhibit: Methodology



AECOM Location Quotient (LQ) Classification

Cluster	LQ Range	Framework
Underdeveloped	< 0.4	Low probability of job creation
Long-Term Growth	0.4 – 0.8	Emerging opportunity for job creation
Medium-Term Growth	0.8 – 1.2	Core sectors for job creation
Short-Term Growth	1.2 – 1.6	Core sectors for job creation
Mature	1.6 – 4.0	Greater volatility in job creation vs. loss
Super Sector	> 4.0	Markets not limited by regional / national constraints

Exhibit: Methodology



Regression Results: Megaregion Data (Impact of Rail Availability)

Regression is done by regressing the dependent variable on the proximity of rail within the 2-mile radius which define as binary values (0 = no rail available within 2-mile of the census tract, 1= rail available within 2 mile of the census tract)

Dependent Variable	Coefficient	P-Value	Statistical Significance	Notes
Share of poverty (Civilian population over 16 years old)	0.036778	<2e-16	Significant at 99%	Higher share of poverty within 2 miles of the Northeast corridor
Share of household without vehicle	0.162857	<2e-16	Significant at 99%	Higher share of households without vehicles within 2 miles of the Northeast corridor
Unemployment rate	-0.002144	0.747	Not statistically significant	Inconclusive as not statistically significant
Share of population not in labor force	0.0001081	0.952	Not statistically significant	Inconclusive as not statistically significant
Median household income	-4809.5	4.2e-09	Significant at 99%	Lower median household income within 2 miles of the Northeast corridor
Median year structure built	-258.695	<2e-16	Significant at 99%	Older housing units within 2 miles of the Northeast corridor

Exhibit: Methodology



Regression Results: Connecticut Data (Impact of Rail Availability)

Regression is done by regressing the dependent variable on the proximity of rail within the 2-mile radius which define as binary values (0 = no rail available within 2-mile of the census tract, 1= rail available within 2 mile of the census tract)

	Coefficient	P-Value	Statistical Significance	Notes
Share of poverty (Civilian population over 16 years old)	0.043678	1.4e-10	Significant at 99%	Higher share of poverty within 2 miles of the Connecticut rail
Share of household without vehicle	0.064182	<2e-16	Significant at 99%	Higher share of households without vehicles within 2 miles of the Connecticut rail
Unemployment rate	0.011352	0.000369	Significant at 99%	Higher share of unemployment rate within 2 miles of the Connecticut rail
Share of population not in labor force	-0.001648	0.767	Not statistically significant	Inconclusive as not statistically significant
Median household income	-10155	0.00174	Significant at 99%	Lower median household income within 2 miles of the Connecticut rail
Median year structure built	-148.29	0.000213	Significant at 99%	Older housing units within 2 miles of the Connecticut rail



Susceptibility to Change Analysis

A susceptibility to change analysis is a method to uncover potential future development prospects. This analysis considered various factors such as the land-to-total parcel value ratio, current building condition, and the year that the building was built. The following steps were taken to identify the parcels that are most likely to undergo significant changes:

- Calculate the land-to-total value ratio: using the latest assessed land value and assessed total value, select the parcels that have a land-to-total value ratio higher than the average land-to-total value ratio in the selected region (i.e., Norwich County).
- Focus on buildings/parcels whose conditions are unknown or below the average
- Focus on buildings/parcels that are relatively older buildings or parcels, considering any renovations that have been undertaken. In this case, buildings that are built around 1950 to 1969 are likely to be the sweet spot for the analysis.
- Avoid historic buildings as those buildings are likely to be preserved

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