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CHAPTER 5

# Connecticut-Westchester

NY

NJ

Stamford

New Rochelle



CT

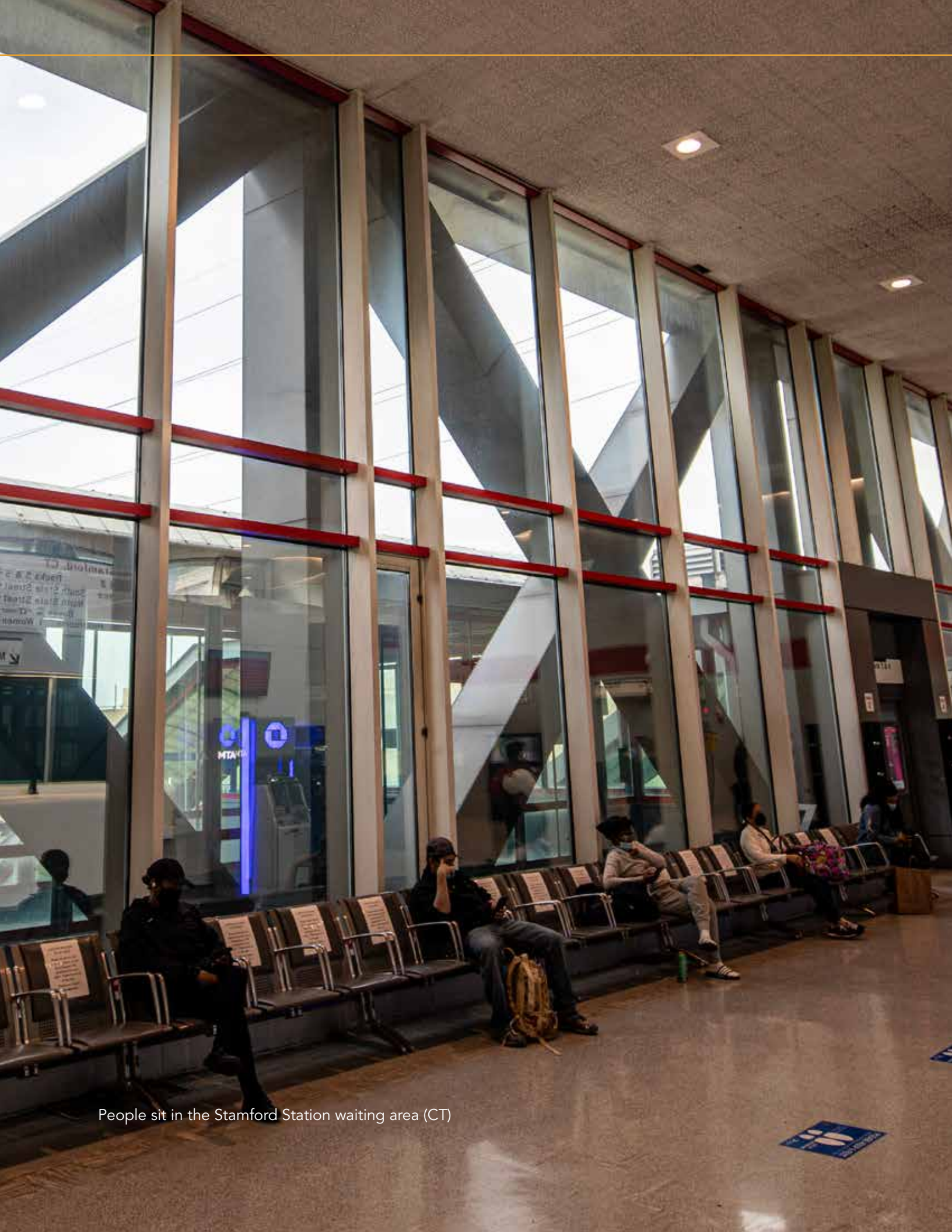
New Haven State Street  
New Haven Station

Bridgeport

NEC

Commuter Rail Lines

July 2021



People sit in the Stamford Station waiting area (CT)

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## Overview

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The Connecticut-Westchester (CTW) territory extends from New Haven, CT to New Rochelle, NY. The CTW territory is complex in its ownership and operations. Connecticut owns and manages the right-of-way from New Haven to Greenwich, CT, the CT-NY state border. The Metropolitan Transportation Authority (MTA) Metro-North Railroad (Metro-North) owns and manages the right-of-way from Port Chester, the NY state border to New Rochelle, NY. Metro-North operates commuter rail service between New York City and New Haven, CT in agreement with Connecticut's Department of Transportation (CTDOT). Infrastructure improvements, capital renewal, and service delivery require close coordination between Metro-North, CTDOT, and Amtrak.

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Amtrak Northeast Regional train near Bridgeport (CT)

CTW has dense commuter and Amtrak service with strong travel demand markets, but is challenged by reliability issues caused by century old high-maintenance movable bridges. While the catenary was replaced with a modern constant tension design, many of the supporting structures not replaced have now reached the end of their useful lives. The signal system also requires renewal and shorter blocks to support closer train spacing.

C35 includes speed, capacity, and reliability improvements that will make it possible to implement one-seat ride service to New York City from three lines currently requiring transfers (Hartford, SLE, and Waterbury). Both commuter and intercity passengers will enjoy faster travel times, shaving up to 25 minutes off trips to New York City through speed upgrades and new express services. Up to approximately 75 minutes is saved by future Penn Station Access riders on trips to Connecticut compared to current transit options. To achieve these goals, key investments in the C35 NYM territory are also necessary.



Metro-North train near Norwalk (CT)

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### *New Haven to New Rochelle NEC Capacity and Trip Time Planning Study*

C35 includes study of additional future CTW travel time and capacity improvements, particularly in the greater Bridgeport, CT area which sees some of the slowest speeds (30 mph) on the NEC. Bridgeport, Connecticut's largest city, is interested in a new station to gain access to Amtrak express trains and to anchor future TOD. Potential realignments of the NEC will be investigated in this area in order to increase operating speeds and facilitate the construction of a modern regional rail station. A potential solution is a tunnel which would minimize impacts and eliminate the Peck Moveable Bridge, miles of viaduct, and other major structures that would otherwise need to be maintained or replaced.

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# CTW Project Highlights

The C35 plan includes New Haven Line speed and capacity improvements and added track capacity between Devon and Woodmont interlockings at Milford Station (the last remaining 3-track segment of the line) will allow for increased service frequency for both commuter and intercity travelers and more balanced service throughout the day. Replacement of aging moveable bridges will improve travel times and reduce train delays. Fast and convenient commuter and intercity rail connections are essential for the continued growth and competitiveness of Connecticut's diverse finance, medical, education, technology, and bioscience economy. C35 improvements are foundational to achieving CTDOT's service goals to add regular service to PSNY, reduce trip times on the New Haven Line to Grand Central Terminal (GCT), and improve connections for the entire Connecticut rail network with more one-seat ride service and a more balanced service throughout the day.

The CTW territory benefits from improvements to the adjacent New England (NE) and New York City Metro (NYM) territories. Improvements in NE allow for more frequent service on the Hartford Line and Shore Line East (SLE), including new one-seat ride service to New York City. Improvements in the NYM territory support new commuter service to PSNY.

*"Connecticut's economic competitiveness depends in large part on its connection to Boston and New York."*

– Senator Chris Murphy<sup>54</sup>



## CTW Special Project Highlights

- **Moveable Bridge Replacement:** Aging moveable bridges pose a risk of long-term major disruptions. Walk, Devon, Saugatuck, and Cos Cob moveable bridges which, require constant maintenance, are functionally outdated, and well beyond their useful life, will be replaced.
- **Devon (CP261) to Woodmont (CP 266) 4th Track Project (near Milford Station):** Restores the full four-track configuration of the New Haven Line for its entire NEC limits, upgrading a 5-mile section that has only three mainline tracks. The additional track eliminates a chokepoint and provides greater operational flexibility.
- **Signal System Replacement:** Signal system upgrades between New Rochelle, NY and New Haven, CT allow for more frequent trains and improves scheduling of local and express trains to reduce trip times.
- **New Rochelle Turnback Track/Yard:** Allows turning trains from New York City to change direction off of the mainline, reducing congestion and increasing reliability. This additional capacity will improve Metro-North and Amtrak on-time performance and Metro-North scheduling flexibility.



Figure 5-1: CTW Special Project Groups and Benefits



## CTW Special Project Groups

(See Appendix for full list of projects)

- 1 New Haven
- 2 Devon
- 3 Saugatuck
- 4 Walk
- 5 Stamford
- 6 Noroton
- 7 New Haven Line Planning
- 8 New Haven Line Improvements
- 9 Greenwich
- 10 Bridgeport

## CTW 2035 Benefits



### More Frequent Service

- Amtrak maximum time between trains to NYC reduced from 60 to 30 minutes
- Frequent regional express service connecting New Haven, Bridgeport, Stamford and NYC



### Faster Service

- Amtrak Acela service 22 minutes faster between New Haven and NYC
- 25 minute faster commuter service from New Haven to NYC



### New Services

- New commuter service from the Bronx to NYC and Westchester/CT
- One-seat ride service on SLE, Hartford, and Waterbury Lines to NYC



### Upgrade and Replace Aging Assets

- Devon, Saugatuck, Walk, and Cos Cob moveable bridges replaced

Source: C35 Analysis, 2021



# CTW Capital Renewal Highlights

Capital renewal efforts in the CTW territory include upgrades to track (rail and ties) and many other critical right-of-way assets. Within this territory the original fixed termination catenary dating back to 1907 has been replaced with a constant tension system that does not sag or contract in temperature extremes. However, limited catenary structures supporting the wire were replaced during this upgrade program due to condition, realignment of the wire runs, interlockings, and requirements of the constant tension system. C35 capital renewal programs include replacement of 100 percent of the existing catenary poles and associated structures dating back to the original installation. Capital renewal in CTW also includes replacement of 20 undergrade bridges and 20 interlockings.

Figure 5-2: CTW Estimated Assets Replaced in Territory

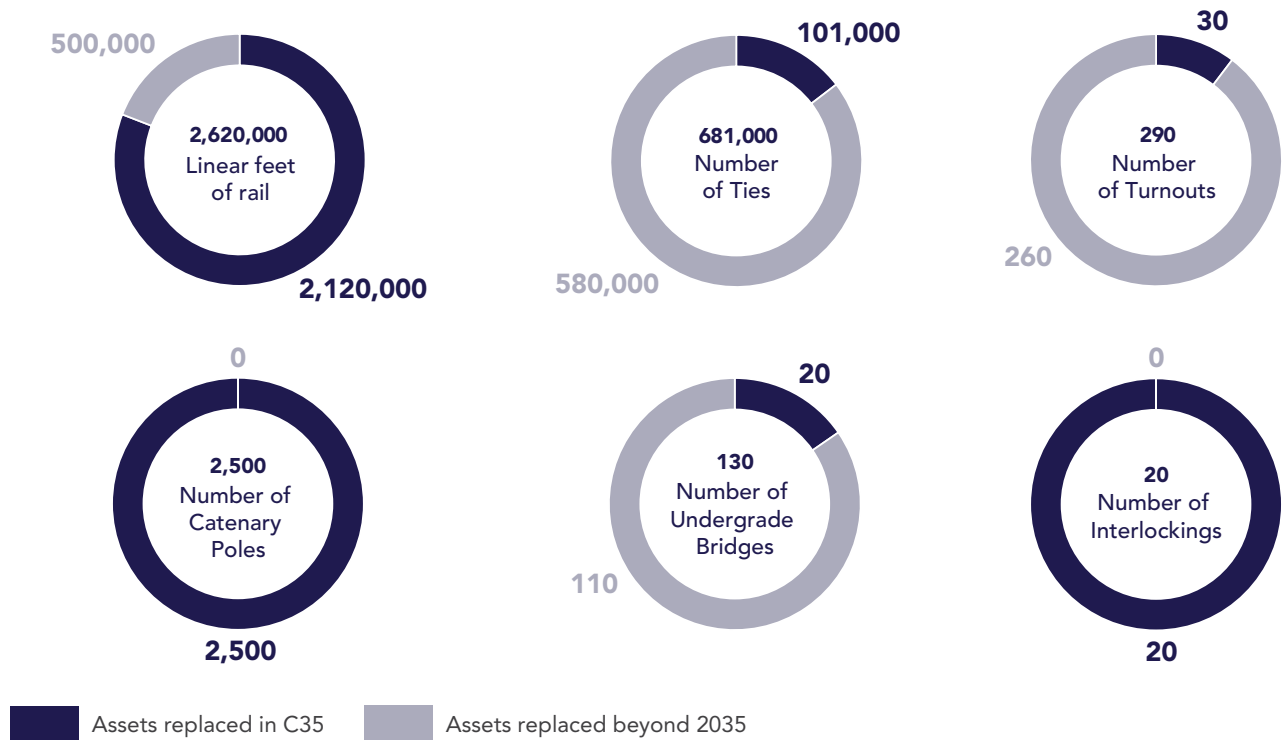
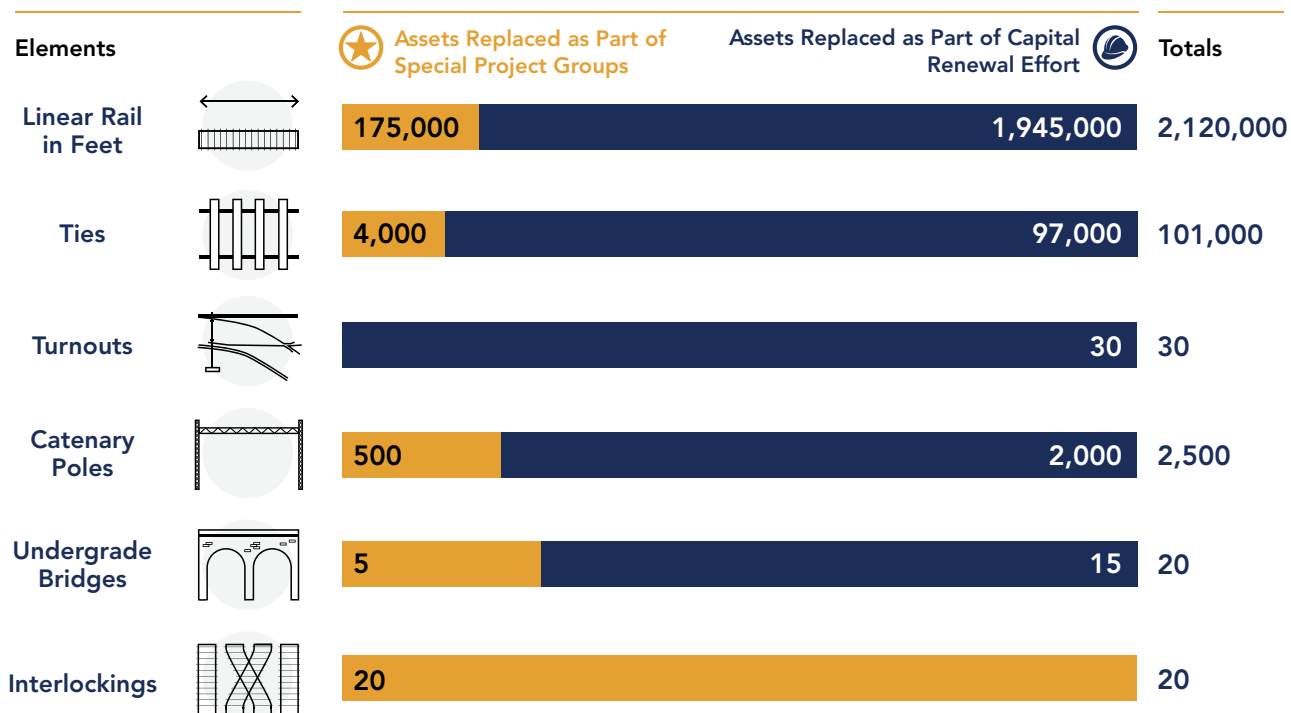


Figure notes:  
1. Number in center of circle represents total assets  
2. Numbers rounded  
Source: C35 Analysis, 2021

Figure 5-3: CTW Estimated Assets Replaced in Special Project Groups and Capital Renewal Programs



Source: C35 Analysis, 2021

# Schedule of Investments

The C35 plan sequenced 10 special project groups and 15 capital renewal programs in CTW, and evaluated temporary construction-related service adjustments and permanent service benefits. Special projects and capital renewal, such as the Cos Cob Bridge Replacement and the New Haven Line Signal System Replacement from New Rochelle to Stamford, were analyzed collectively and sequenced to maximize productivity of track outages, minimize service disruption, and create overall project delivery efficiencies in CTW. The C35 plan does require some peak-period service reductions for Metro-North, CTrail, and Amtrak to allow for necessary track outages longer than a midday, overnight, or weekend period.

The roadmap for future project delivery provides an initial schedule timeline for efficient construction of special projects and capital renewal over the 15-year period.

Figure 5-4: CTW Estimated Initial Timeline Capital Renewal and Special Project Groups

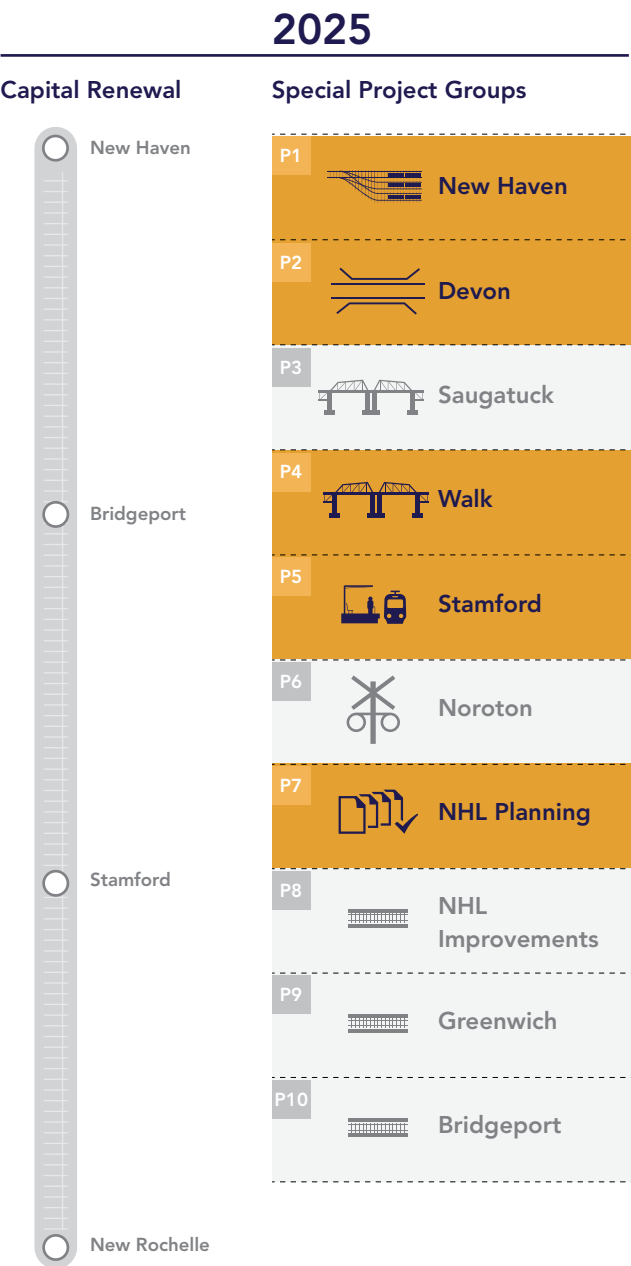
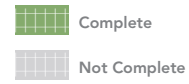
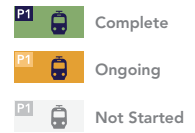


Figure note: Initial analysis results to be updated in C37  
 Source: C35 Analysis, 2021

## Capital Renewal

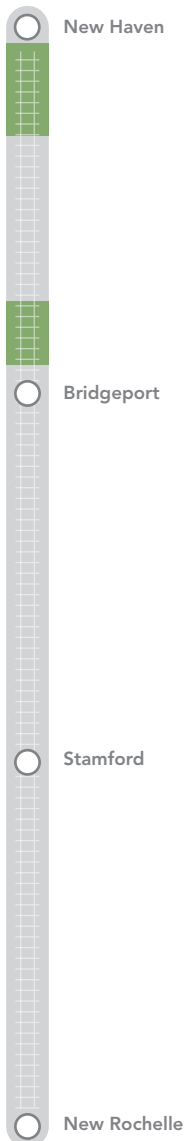


## Special Project Groups

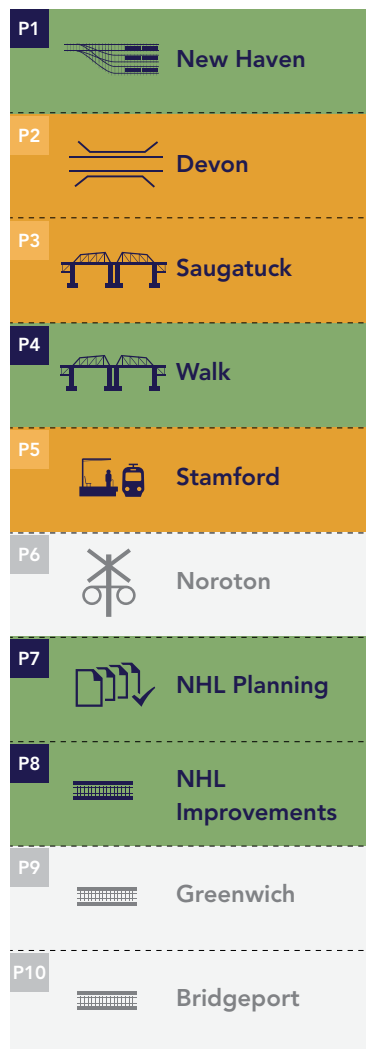


# 2030

## Capital Renewal

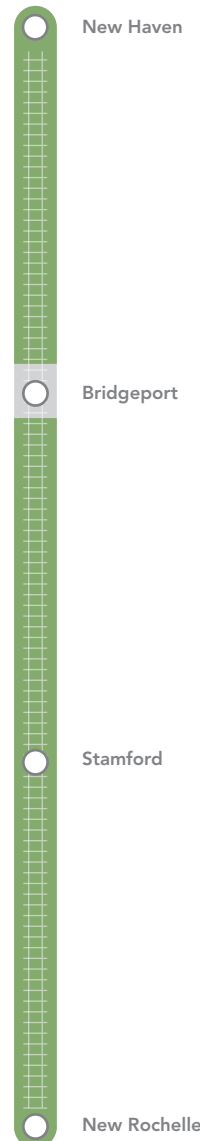


## Special Project Groups

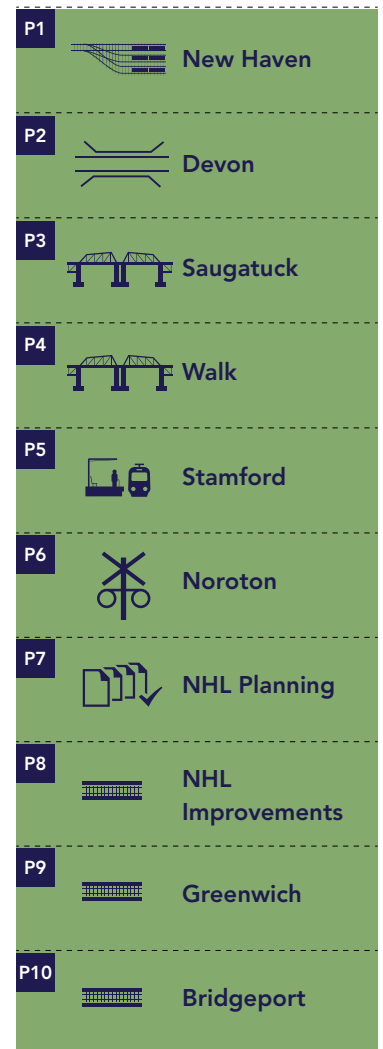


# 2035

## Capital Renewal



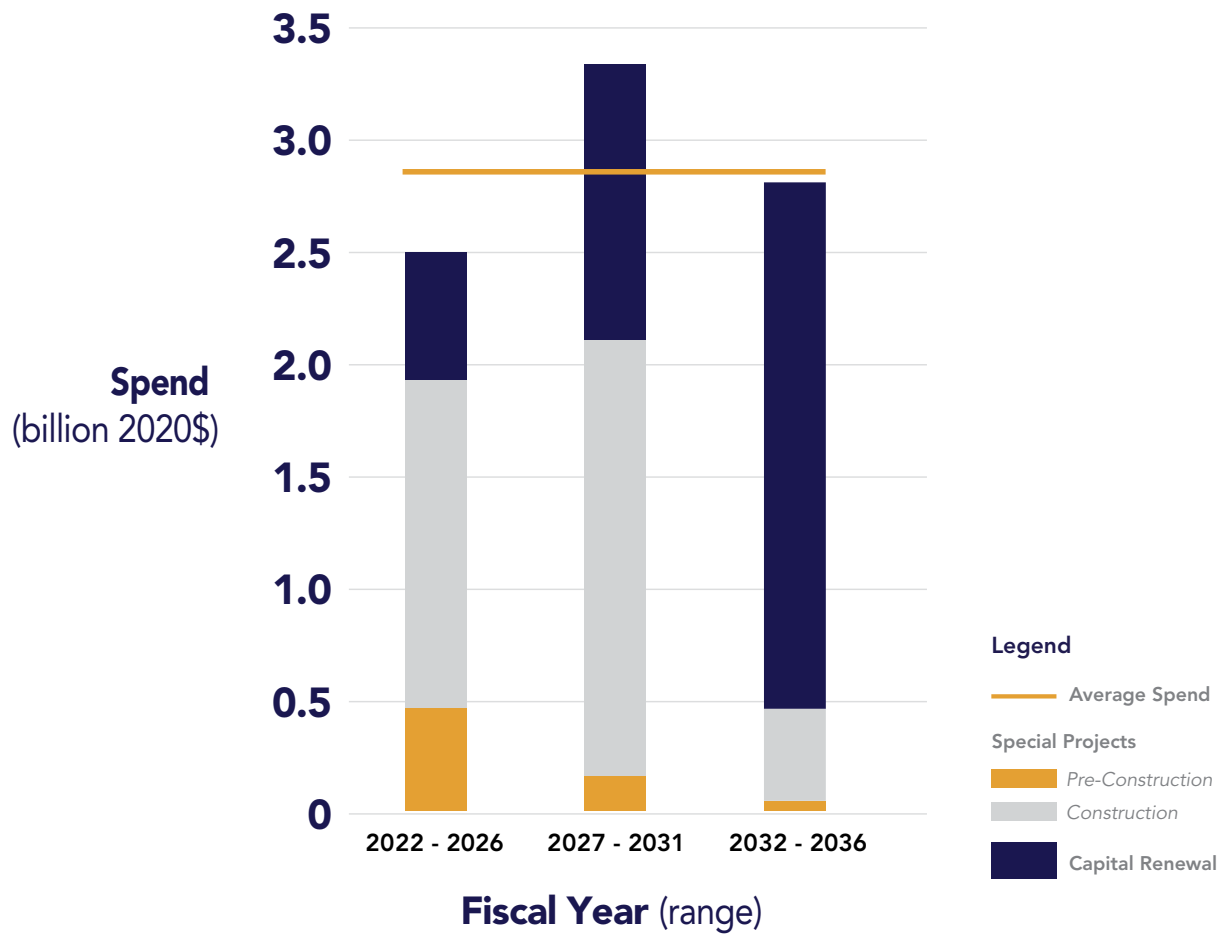
## Special Project Groups





*If the C35 project delivery sequence is followed, investment in this territory will be as much as \$9 billion total over 15 years.*

Figure 5-5: CTW Estimated Total Capital Costs – 5 Year Increments



Source: C35 Analysis, 2021

# Improve Mobility and Connections

## Reliable Service

In FY2019, Metro-North trains were delayed over 1,500 hours and eight percent of trains were late.<sup>55</sup> Special projects included in the C35 plan will mitigate delays attributed to bottlenecks at six locations between New Rochelle, NY and New Haven, CT. Upgrades to the signal system, new interlockings, track capacity, and replacement of four aging moveable bridges (Cos Cob, Walk, Devon, and Saugatuck) support schedule improvements for the operation of a mix of express and local services. These projects will improve the quality and reliability of over 130,000 trips each weekday in Connecticut and New York.<sup>56</sup>



Figure 5-6: CTW Estimated Delay Relief Improvements

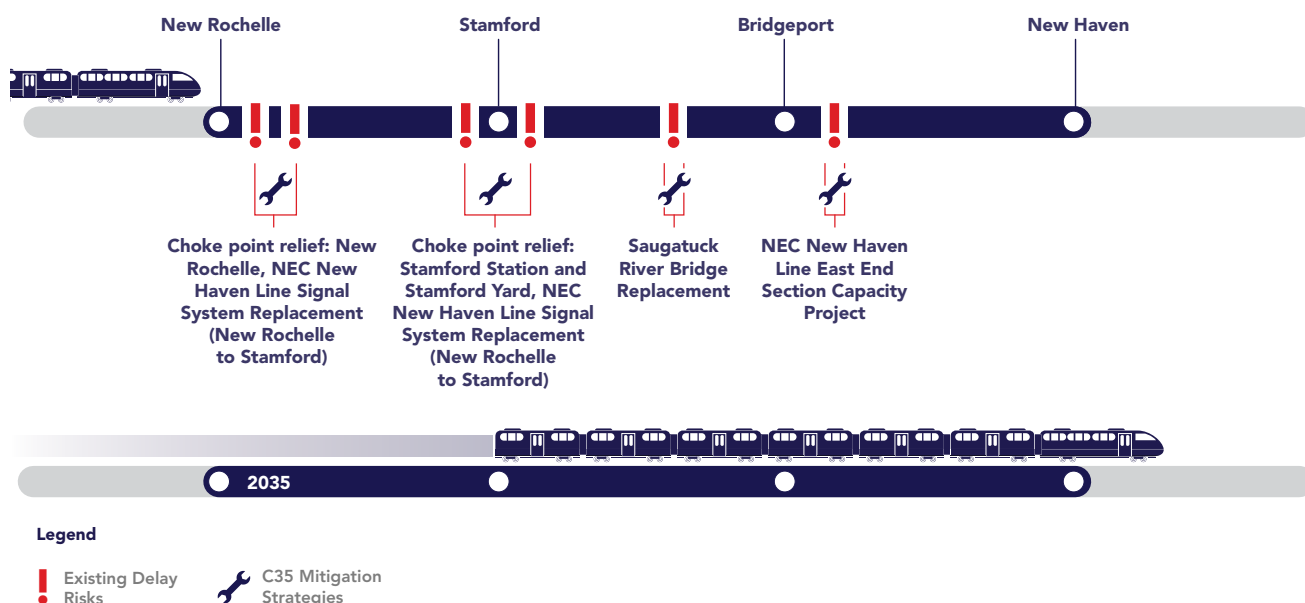


Figure note: Connecting corridors not included

Source: C35 Analysis, 2021

## New Services

The C35 operating plan includes new one-seat ride, reverse direction, and off-peak service in the CTW territory. New one-seat ride service to New York from the non-electrified Waterbury Line, coupled with New England territory one-seat ride service from Springfield/Hartford and New London to New York City mean that all Connecticut rail stations will have direct service to New York for the first time. These new services will benefit the entire CTW territory with improved connections between mid-size cities in Connecticut.

Metro-North's Penn Station Access will also provide new commuter service from the East Bronx to PSNY and to Westchester and Southern Connecticut for direct access to jobs, education, healthcare, and other opportunities. Service targeted to begin in 2025 will include three trains per hour in the peak and two trains per hour in the off-peak in each direction.

## Frequent Service

The C35 plan supports dramatic increases in commuter service frequency on the NEC between New Haven, CT and New York City. Commuter service increases will fill existing service gaps, particularly for travel in the reverse-peak direction and in off-peak periods. Combination of new regional express services (Metro-North, CTail, and Amtrak) provide at least hourly daily service throughout the territory, and at least half-hourly service in the largest markets.

The maximum time between trains for commuters in Bridgeport, CT during the morning peak period will be reduced from 13 to 11 minutes. For Amtrak passengers during the same period, time between trains traveling toward New Haven will be reduced from 60 to 30 minutes.

Connecticut and Westchester commuters will benefit from new service to PSNY with the NYM territory Penn Station Access project. Service to Manhattan (both GCT and PSNY) will be increased by nearly 60 percent (from 145 daily round trips to 231). With C35 investments, gaps in Amtrak service will be filled so that travelers have consistent hourly Regional and Acela service all day long.

Figure 5-7: CTW Estimated AM Peak Maximum Time Between Trains (minutes)

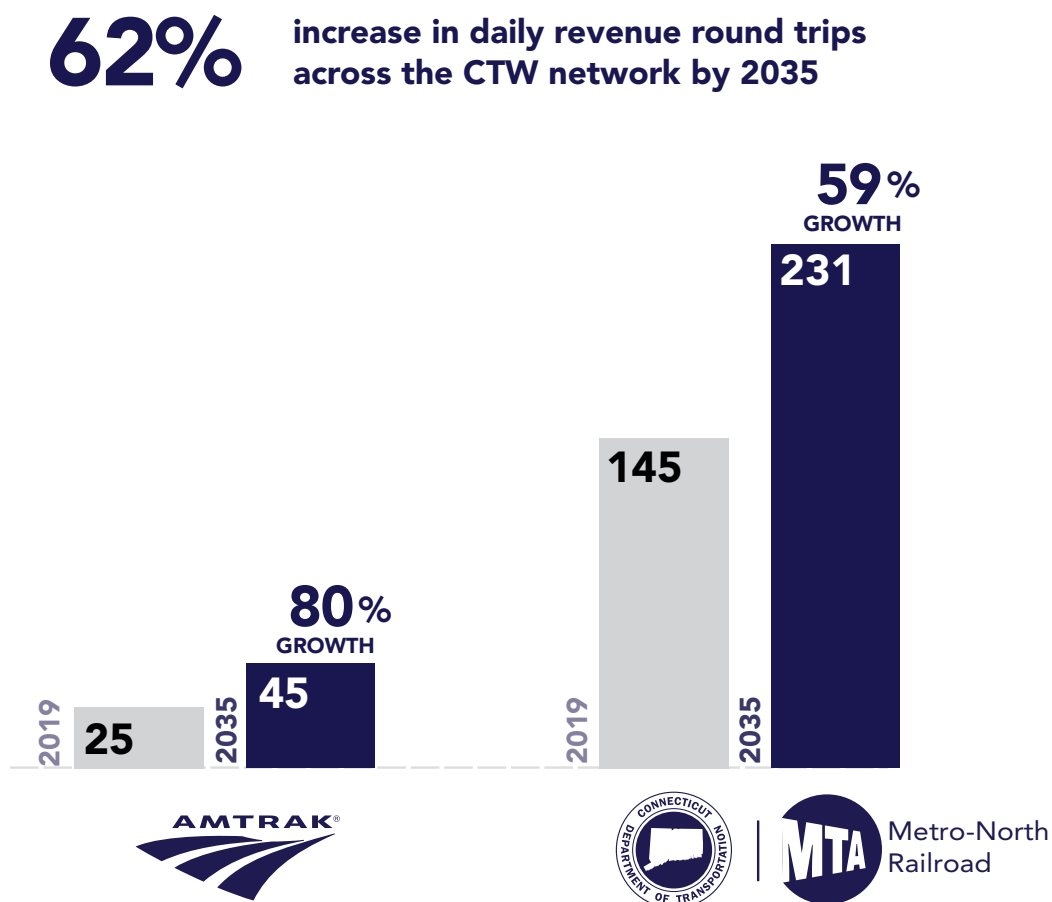


*Figure note: Actual times will vary by destination.*

*Source: C35 Analysis, 2021*

C35 investments in upgraded signal systems, new interlockings, improvements to yards and facilities, and restoration of a four-track railroad between Devon and Woodmont at Milford Station allows for 40 additional daily round trips (61 percent growth) in the Stamford to New Haven, CT segment of the larger CTW territory. A new Bridgeport area turnback track will also allow for an increase in connecting service on the Waterbury Line between Waterbury, CT and Bridgeport, CT. Achieving the proposed increases in service frequency will require coordination between CTDOT/CTrail, Metro-North, and Amtrak to balance the ambitious service increases proposed for this territory.

Figure 5-8: CTW Estimated Daily Revenue Round Trips



Source: C35 Analysis, 2021



## Faster Service

As a result of C35 improvements, Amtrak's Acela service will be approximately 28 minutes faster between Boston, MA and New York City, with 22 minutes of those savings between New Haven, CT and New York City (23 percent less than current travel time). The C35 plan supports higher curve and moveable bridge speeds to reduce trip times. CTDOT proposed 'super express' service in this territory will save travelers up to 25 minutes between New Haven, CT and New York City.

If the C35 plan is implemented, CTW will benefit from a more reliable railroad with fewer service disruptions and delays. This can translate to even faster commuter travel times, and schedules could be modified to eliminate extra time built in to recover from recurring or typical delays. The C35 analysis did not yet incorporate this improvement and future analyses will revisit commuter operating schedules and potential travel time savings.

## Station Improvements

The Stamford Transportation Center has the highest volume of commuters of any train station between New York City and Boston, MA and is important for the continued economic vitality of lower Fairfield County, CT. Improvements at Stamford Station include repairs to station platforms and waiting areas and making the station ADA accessible. The future program also includes the construction of a pedestrian bridge at Stamford Station as well as a new parking garage. A more accessible and convenient station is a key element for proposed plans for residential and commercial development in the area surrounding the station.

Figure 5-9: Estimated Travel Time Improvements between New Haven and New York



Source: C35 Analysis, 2021

# Create Economic Opportunity

## Job Creation

C35 investment will generate more than 62,000 total new jobs (direct construction-related, indirect [non-construction] and induced) in CTW over the 15-year plan, an average of 4,100 jobs per year. These jobs will in turn generate \$4 billion in earnings throughout the territory over the 15-year period.

Delivering the C35 plan will require an estimated average of 600 specialized railroad construction jobs each year, well in excess of current staffing levels. Workforce development initiatives are necessary to make sure opportunity is afforded to residents within the CTW territory to fill the skilled workforce needs of the C35 plan.



## Equity and Access

The NEC serves diverse populations in CTW. While C35 will improve rail for higher income Acela riders with speedier intercity service, an estimated 90 percent of riders in CTW use Metro-North services which create access to economic opportunity for a variety of high, medium, and lower income communities.

Forty-three percent of people living within three miles of an NEC or connecting corridor station in this territory are minorities, 17 percent of households are low-income, and 12 percent are without a car. 64 percent of people living within three miles of NEC stations in New Haven are minorities, and 31 percent are low-income. This compares with a third of Connecticut residents who are minorities. Across the unemployed population in Connecticut, transportation is by far the most commonly reported barrier to getting a job; 84 percent of CTWorks (training and employment centers) registrants identify transportation as a barrier to work. 10 percent of workers who say they often have a car available are unemployed, whereas the unemployment rate among workers who say they do not often have access to a car is 35 percent.<sup>57</sup>

# Combat Climate Change

## Reduced Carbon Footprint

Connecticut legislators have introduced Senate Bill 884 and House Bill 6441 that directly address GHG emissions and climate change. Senate Bill 884 aims to reduce transportation-related carbon emissions (February 2021). The goal is to reduce GHG from motor vehicles, which accounts for 38 percent of all GHG emissions in Connecticut. House Bill 6441 addresses the need for climate change adaptation. It encourages implementation of resiliency plans in vulnerable communities. C35 supports this legislation by providing more rail service, capacity, and reliability that could attract riders thereby contributing to a reduction in GHG.



## Resilient Infrastructure

Throughout this territory, the railroad runs adjacent to the Long Island Sound shoreline. Fairfield and New Haven Counties were identified as areas at risk for inundation from sea level rise, storm surge, and riverine flooding. The NEC FUTURE ROD calls for additional study of the CTW territory to identify additional infrastructure to achieve identified service and performance objectives. Through a combination of hardened infrastructure, adaptation measures, and consideration of new routes that shift the rail line away from the shoreline, C35 and other investments would create more resilient infrastructure. One of the C35 special projects in this territory, New Haven Line Speed Improvements, will address SOGR bridge replacements. These bridge replacements would incorporate the latest design standards and adaptation measures to minimize flooding risks associated with riverine flooding. In addition, the capital renewal program includes culvert repair and replacement of damaged culverts to lessen the risk of flooding from storm surge.

# Support Desirable Cities and Communities

## Station Area Development

Downtown New Haven is in the midst of an economic and cultural renaissance. Access to New York City and Boston, MA via the NEC is an important component of its success.

The City of New Haven is engaging in a significant amount of planning and development in the area surrounding Union Station. The station itself, which caters to more than 700,000 Amtrak customers and more than 1 million Metro-North riders each year, is the subject of the “Moving Union Station Forward” Plan, which proposes renovating the original building and adding new parking and passenger amenities. In the half mile surrounding the station, a new transit-oriented development program is encouraging several mixed-use developments featuring commercial and residential space. New Haven is also increasing access to Union Station via the Downtown Crossing project, which will convert Route 34 from an expressway into an active mobility corridor with low-speed car traffic. Combined, these new developments and infrastructure projects are reshaping Union Station into a modern economic and transportation hub with better connections between the station and downtown.<sup>58</sup>



Rendering from “Moving New Haven Forward” plan (CT)



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C35 improvements on the NEC have cascading benefits to cities and communities along connecting lines. Connecticut is investing in upgrading the one-track Waterbury Line that connects to the NEC in Bridgeport, CT. New signals and sidings will allow operation of two-way train service. The rail line only has eight outgoing trains per weekday, and seven incoming trains. Improvements to the Waterbury Line and plans for dramatic increases in shuttle service and one-seat ride service to New York City would be a catalyst for development along the rail line providing affordable housing options with good connections to jobs in Bridgeport, CT, Stamford, CT, and New York City.

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## **Innovation Districts**

CTNext, which supports innovation and entrepreneurship in Connecticut, has partnered with the state to fund 'Innovation Places' - locations within the state that are driving economic development through innovation<sup>59</sup>. In 2017, Stamford received this designation, along with a \$2 million grant. The funding and support has enabled the city to hold Stamford Innovation Week, providing networking and learning opportunities for attendees, and a partnership between the University of Connecticut and Innovate Stamford to connect students to local companies.<sup>60</sup> The Program Manager of Innovate Stamford, Sam Gordon, noted that these companies stated that their biggest challenge to growth was access to a larger talent pool, something that better, faster connections along the NEC could help achieve.

Continued growth within the medical, education, and bioscience industries will generate additional high-skilled jobs and open up career opportunities. That growth depends on quality rail connections provided on the NEC. Key research institutions, including New Haven's Yale University, provide the foundation for an innovative and entrepreneurial ecosystem throughout the state, including numerous highly successful homegrown startups such as Arvinas, Biohaven Pharmaceuticals, and Sema4. The Connecticut Economic Resource Center calculates that each job in the bioscience sector supports an additional 2.9 jobs throughout the larger economy.

The non-profit NXTHVN, founded in 2019, supports artists, art professionals, and local entrepreneurs and the growth of New Haven's creative community. Titus Kaphar, co-founder and President, describes NXTHVN as "a new national arts model that empowers emerging artists and curators of color through education and access." NXTHVN's studio and creative center is located just outside of downtown New Haven not far from Union Station in the predominately African American, economically disadvantaged Dixwell neighborhood. Cultivating cultural entrepreneurship and social innovation in Dixwell is a key component of NXTHVN's mission.<sup>61</sup>



Rendering of NXTHVN multi-use space (CT)