GRIFFIN LINE RAIL-WITH-TRAIL FEASIBILITY MEMORANDUM

April 2024 DRAFT

CAPITOL REGION
EAST COAST GREENWAY STUDY
SIMSBURY — BLOOMFIELD — HARTFORD — EAST HARTFORD

CRCOG
CAPITOL REGION COUNCIL OF GOVERNMENTS

FHI studio

TABLE OF CONTENTS

STUDY AREA AND PURPOSE

This technical memorandum evaluates the feasibility of rail-with-trail in the active Griffin Line rail corridor for the 4.4-mile extent between Garden Street in Hartford and Park Avenue in Bloomfield as shown in Exhibit 1. This memorandum was produced as part of the Capitol Region East Coast Greenway Study, which evaluates trail alternatives in a 12-mile gap in the East Coast Greenway (ECG) within the municipalities of Simsbury, Bloomfield, Hartford, and East Hartford. This memorandum explores and documents trail feasibility along the Griffin Line corridor given the existing and expected use of freight rail service in the corridor.

The Griffin Line corridor runs generally in a northwesterly-southeasterly direction within the study area. Between Garden Street and Route 44 (Albany Avenue) the rail line is oriented in an east-west direction. North of Route 44 (Albany Avenue) the corridor shifts direction and changes to a north-south direction. This memorandum uses the following conventions for direction:

- Entire Study Area:
  - Griffin Line defined as running northwest-southeast
  - Locations in reference to side of track: Northeast side & southwest side
- Specific Locations South of Route 44 (Albany Avenue):
  - Griffin Line runs east-west
  - Locations in reference to side of track: North side & south side
- Specific Locations North of Route 44 (Albany Avenue):
  - Griffin Line runs north-south
  - Locations in reference to side of track: East side & west side

This memorandum distinguishes between the terminology *alternative* and *alignment* in the following way:

- An *alternative* is used to denote a specific design option at a specific location within the study area. For this study, the three *alternatives* considered are:
  - The *Northeast Alternative* is rail-with-trail located on either the north or east side of the railroad in any given location, generally within the railroad right-of-way (ROW).
  - The *Southwest Alternative* is rail-with-trail located on either the south or west side of the railroad in any given location, generally within the railroad ROW.
  - The *Homestead / Mark Twain Alternative* is located outside the railroad ROW between Garden Street and Plainfield Street which utilizes Homestead Avenue, Route 44 (Albany Avenue), and Mark Twain Drive ROW.
- The term *alignment* is used to note an entire route through the study area. It could include varying *alternatives* in different locations. This is primarily used when discussing the *Preferred Alignment*.

Exhibit 1: Study Area Overview

Rail-*with*-Trail versus Rail-*to*-Trail

This memorandum evaluates the feasibility of various alternatives of rail-***with***-trail which would allow for a trail to coexist within the existing Griffin Line right-of-way (ROW) in tandem with rail service. This contrasts to rail-***to***-trail alternatives which would require the removal and replacement of a railroad with a shared-use trail or other uses (such as a right-of-way for exclusive trail use). This memorandum *does not* evaluate rail-***to***-trail alternatives as it is generally accepted that the corridor could accommodate a shared-use path should the Griffin Line be abandoned. It should be noted that trail alternatives which would first require the abandonment (or railbanking and/or land banking) of the railroad would result in additional procedural requirements including federal review which could add several years to project completion. Appendix B outlines the procedural requirements necessary to undertake this process.

KEY OBJECTIVES

The project aims to transform transportation, recreation, public health, economic development, and quality of life aspects for the people who live, work, or visit the study area and its surroundings. The study area spans 4.4 linear miles between Garden Street in Hartford and Park Avenue in Bloomfield and connects to several important destinations, such as The Hartford Financial Services Group, St. Francis Hospital, Keney Park, the University of Hartford, and 17 different K-12 schools with a total of about 8,000 students.[1] Some critical destinations are shown in Exhibit 2 in a graphic provided by iQuilt. The study area passes through the Hartford neighborhoods of Upper Albany, Blue Hills, Asylum Hill, and Clay-Arsenal. Together, they have approximately 34,000 residents, 13,000 households, and 16,000 employees. Approximately 24% of residents in these neighborhoods live below poverty.[2] The project will explore different trail options for the Griffin Line, keeping in mind the following objectives:

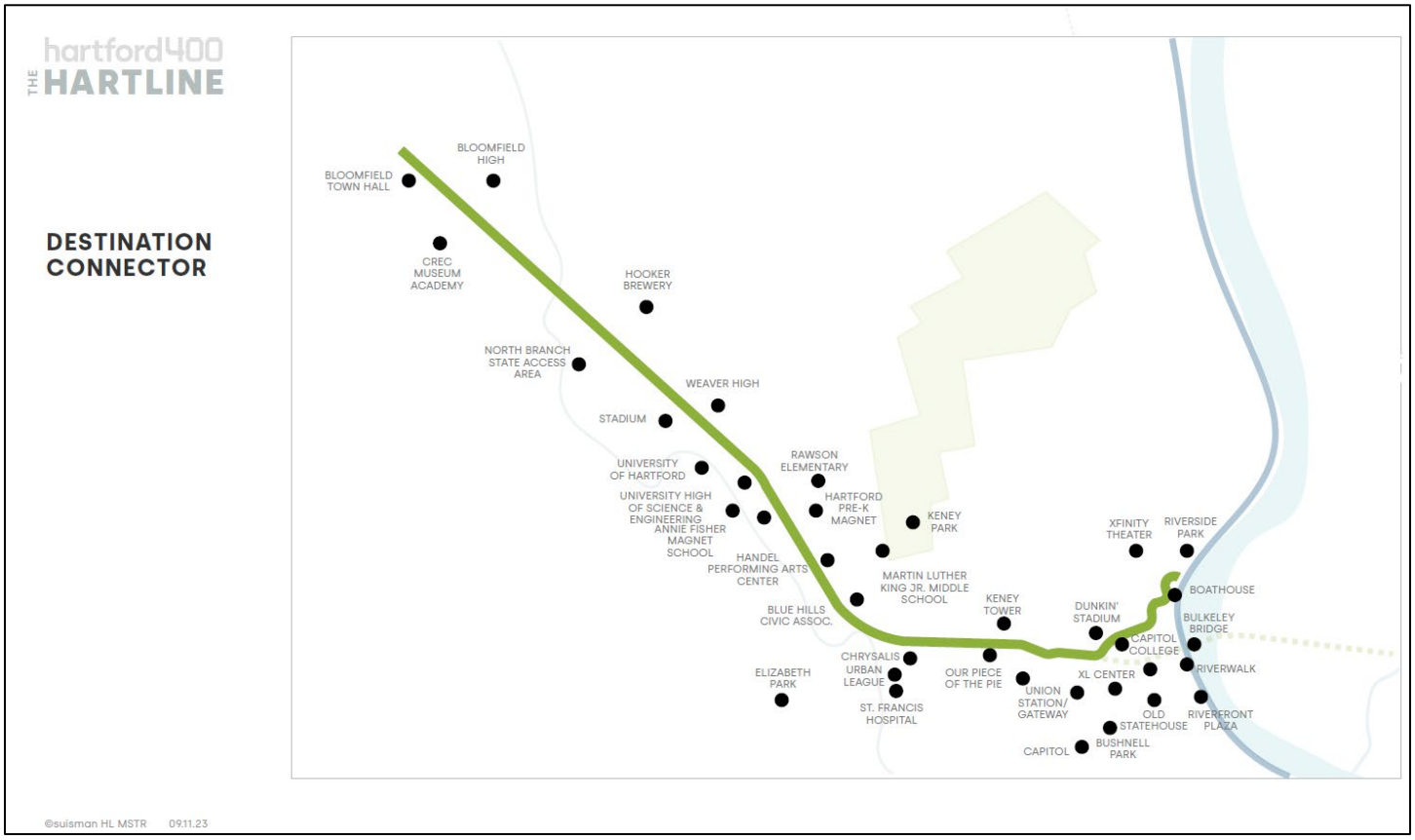
- **Expand Safe Multi-modal Transportation:** A shared-use path in the study area can offer a safe and convenient way for people to bike or walk to various destinations, such as work, school, or shopping. This can benefit especially those households that do not own a vehicle. About 34% of the households in the nearby Hartford neighborhoods fall into this category.[3] This compares with state average of 8.5% of households without access to a vehicle.
- **Recreation and Public Health:** A shared-use path in the study area can promote physical activity and recreation for the nearby residents, which can have a positive impact on their health and well-being. This is especially important considering the high rates of obesity and asthma among the residents of the neighboring areas. Heath data shows that adult obesity rates in the surrounding neighborhoods range between 31% and 51%, which is higher than the state's average of 26%.[4, 5] Similarly, adult asthma rates in the surrounding neighborhoods range between 13% and 17%, also higher than the state's average of 10.5%.[6, 7] A shared-use path can help reduce these health disparities and improve the quality of life for the adjacent communities.

---

[1] Global Communications Academy (430 students), Wish Elementary School (280 students), Jumoke Academy (680 students), West Middle School (260 students), Classical High School & Renzulli Academy (550 students), Covenant Preparatory School (40 students), Achievement First Academy (1,150 students), MLK School + Breakthrough Magnet (550 students), Rawson Elementary (250 students), Annie Fischer School (360 students), University High School (430 students), Watkinson School (240 students), University of Hartford Magnet School (480 students), Weaver High School + Kinsella Magnet (700 students), Bulkeley High School – North Campus (600 students), CREC Museum Academy (520 students), and Bloomfield High School (500 students)
[2] US Census Data, pulled from PolicyMap
[3] US Census Data, pulled from PolicyMap
[4] US Census Data, pulled from PolicyMap
[5] CDC: Connecticut State Nutrition, Physical Activity, and Obesity Profile
[6] US Census Data, pulled from PolicyMap
[7] Connecticut State Department of Public Health: Asthma Program

- **Quality of Life:** A shared-use path can also serve as a social and cultural hub for the neighboring communities. It can feature areas for gathering, relaxing, and enjoying the scenery. This can enhance the quality of life for the adjacent neighborhoods by creating these valuable spaces for residents.
- **Economic Development Opportunities:** A trail along the Griffin Line corridor can also create a link between several potential redevelopment sites. A shared-use path in this area can attract more investment, business, and tourism to the area. A shared-use path within this area could become a key component of these redevelopment efforts.

Exhibit 2: hARTline planning graphic showing destinations on or proximate to the Griffin Line (Source: iQuilt / Suisman Design)



TRAIL PLANNING CONTEXT

What is now the Griffin Line was originally constructed around 1870 to connect Hartford to Poughkeepsie, New York. While it originally carried passenger trains, sections were abandoned over the course of decades, and eventually, service on the track within Hartford was stopped by the 1980s. Central New England Railroad (CNZR), the current operator, resumed service and rehabilitated the easternmost 8.7 miles of the Griffin Line in 1999. Over the past 30 years, other potential uses for the corridor within the study area have been explored and are summarized below.

Bus Rapid Transit (BRT) Studies (2002-2010)

Three studies regarding the Griffin Line were commissioned by the Capitol Region Council of Governments (CRCOG) between 2002 and 2010.[8] These three studies recommended the conversion of the existing rail line to bus rapid transit. The existing right-of-way could accommodate bidirectional bus service with minor widening in the most constrained areas. However, more recent studies have assumed that rail service would be maintained on the Griffin Line.

Bloomfield Cross Town Trail Study (2017)

Rail-with-trail alternatives between Tobey Road and Park Avenue within Bloomfield were studied as part of the *Bloomfield Cross Town Trail Study* in 2017 (attached to this report in the Appendix). These areas were included as "Section 4" and "Section 5" of the study. The study reviewed three possible routing options:

1) Routing between Tobey Road and Route 218 via Goodman Street. Crossing Route 218 at Tyler Street and continuing north on Tyler Street to the Trolley ROW.
2) Routing via Northwest Drive "paper street" between Tobey Road and Route 218. Crossing Route 218 at Northwest Drive and continue north via Savin Road. This option was noted for its "substantive wetlands, floodplains and flood ways associated with Beaman's Brook" (See Appendix for environmental constraint mapping).
3) Routing via Griffin Line ROW. The cross section from the *Cross Town Trail Study* which depicts this option is shown in Exhibit 3. Note the embankment of the railroad in this area over the adjacent surface water, wetlands, floodplain, and floodway. In addition to these environmental constraints, the Griffin Line's at-grade crossing of Route 218 at an unsignalized location was identified as a significant concern for this alternative. Exhibit 4 shows the unsignalized at-grade rail crossing of Route 218 near Savin Road. Environmental constraints are discussed further in a subsequent section of this memorandum.

[8] Bradley Area Transportation Study, 2002; Griffin Busway Feasibility Report, 2004; and Northwest Corridor Study, 2010.

Exhibit 3: Cross Town Trail Study Griffin Line rail-with-trail option south of Route 218. This alignment was not considered in this memo due to constraints described above. (Source: Fuss & O'Neill)

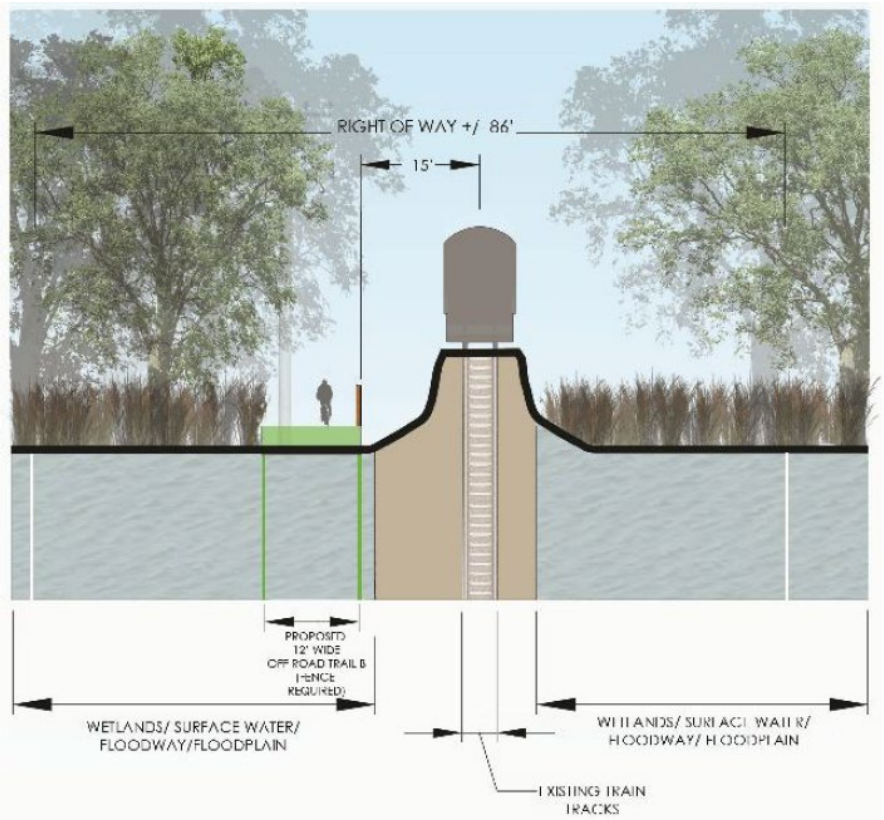


Exhibit 4: Aerial imagery of at-grade crossing of Griffin Line of Route 218. Note that the intersection with Savin Road is an unsignalized intersection, however, the adjacent railroad crossing includes an overhead cantilever flashing-light signal. (Source: ctroads.org / Google Maps)

CT State Rail Plan (2022)

The Connecticut Department of Transportation (CTDOT) released its most recent State Rail Plan in November 2022. This plan identifies all active rail lines in the state and lists planned service changes as well as recent and upcoming improvements. In addition to new locomotives and planned maintenance and upgrades along the Griffin Line, the State Rail Plan indicates that CTDOT and CNZR have plans to acquire right-of-way to Bradley International Airport with supporting federal grant applications to Federal Railroad Administration (FRA) and Federal Transit Administration (FTA).[9] This ROW would likely be intended for expansion of freight customers rather than passenger service, which would be expected to be maintained on the Hartford Line.

Greater Hartford Mobility Study (2023)

The Greater Hartford Mobility Study, commissioned by CTDOT, looked extensively at the Griffin Line as a multimodal corridor. Several different alternatives were analyzed including rail with trail, passenger light rail, and bus rapid transit (BRT) options. The preferred alternative was the construction of a shared-use trail alongside the existing freight rail, with an estimated implementation cost of $18.9 million. Other alternatives considered were passenger rail to Bradley International Airport (considered to be fatally flawed due to ROW impacts), passenger rail along the existing corridor (not favored due to poor benefit-to-cost ratio), and a combination rail-bus-trail (not fatally flawed but would require additional right-of-way).

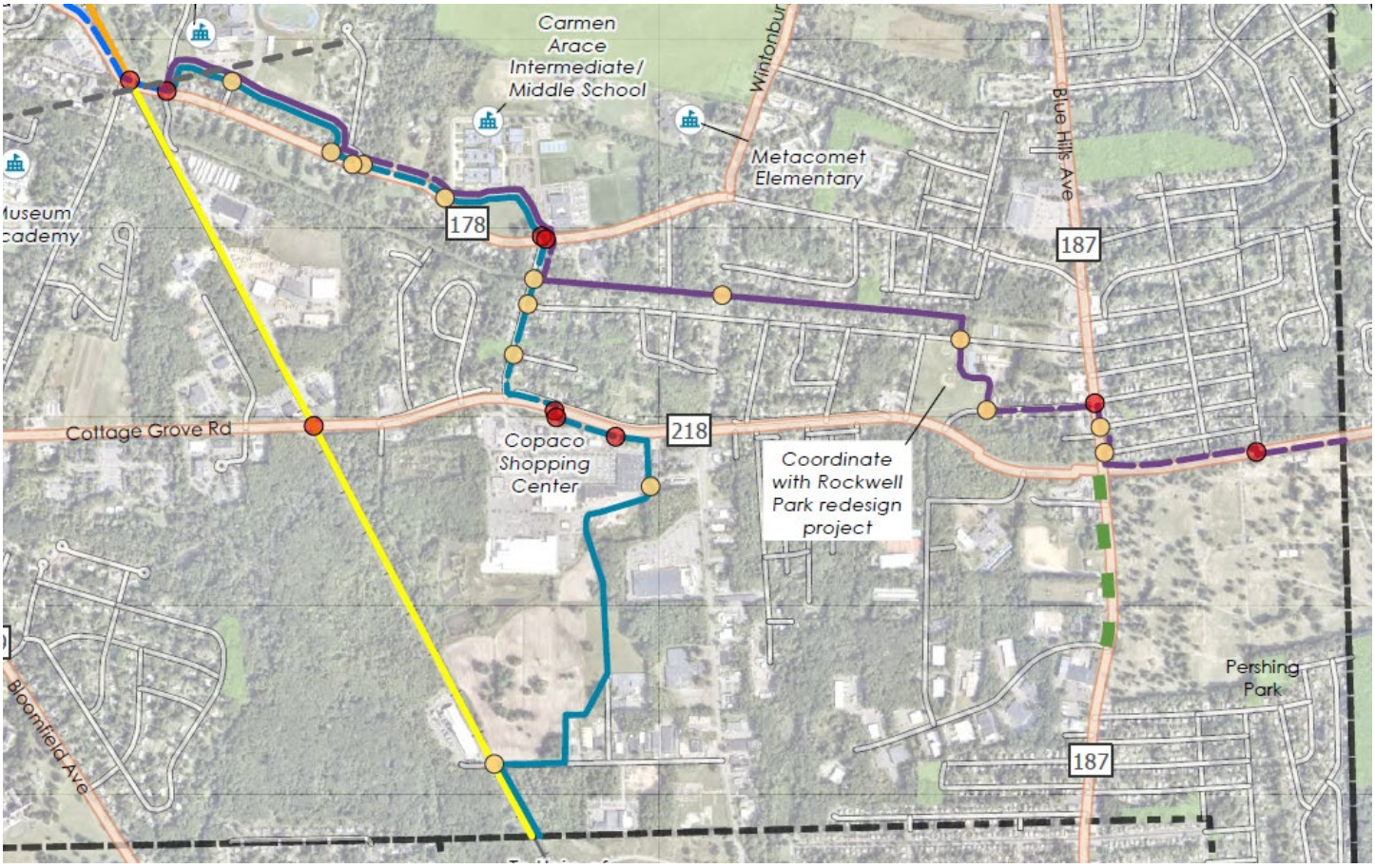
Other Related Planning Efforts

Capitol Region East Coast Greenway Study – Bloomfield Shortlist

This memo is part of the Capitol Region East Coast Greenway Study which is currently underway at the time of the development of this memo. However, trail alignment alternatives have been evaluated in Bloomfield between Park Avenue and the Hartford City Line with a shortlist being established for two scenarios 1) the ECG continues into Hartford along Griffin Line, and 2) ECG continues east along Route 218 corridor to connect to Riverfront Recapture Trails near the Connecticut River. The two shortlisted options to connect to the Griffin Line to the south included 1) the Griffin Line corridor, and 2) a connection via Park Avenue, Tyler Street, and Copaco Plaza to Tobey Road. This route is highlighted in dark blue in Exhibit 5 below.

[9] Connecticut State Rail Plan, CTDOT, 2022; https://portal.ct.gov/-/media/DOT/documents/dplansprojectsstudies/plans/State_Rail_Plan/CTSRP2022-2026v20221130.pdf ; Page 4-1.

Exhibit 5: Bloomfield shortlist map for the "South Bloomfield Analysis Area"



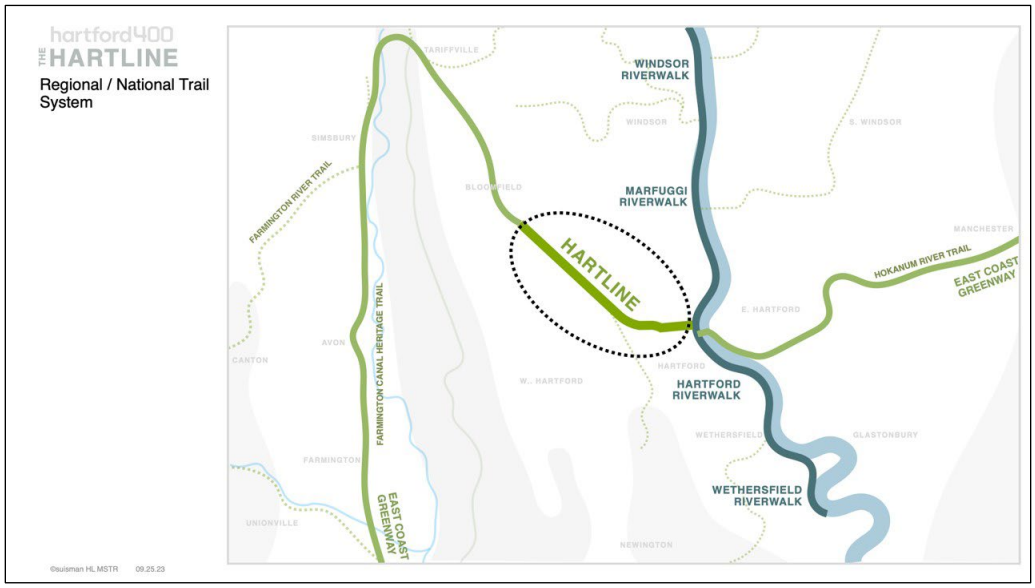
Hartford 400 and hARTline

The iQuilt Partnership (iQuilt) began work in 2020 to organize the Hartford 400 coalition which works to identify key, transformative projects which can be implemented by 2035 in time for Hartford's fourth centennial celebration. Three transformative projects were identified including the hARTline, River Road, and Midtown.[10] hARTline is an envisioned 6-mile path between the Connecticut River riverfront and the Town of Bloomfield as shown in Exhibit 6. The project includes the following components:

- **Riverlink Bridge:** Upgrading the existing pedestrian bridge between Market Street and the Connecticut River with a more pedestrian-friendly, sloping ramp crossing Market Street and connecting to Pleasant Street.
- **An On-Street, Separated Facility:** A connecting trail between the Riverlink Bridge and the Griffin Line at Edwards Street
- **Trail within the Griffin Line Corridor:** A trail continuing to the northwest between Edwards Street in Hartford to Bloomfield Center

[10] Hartford 400 | Hartford400

Exhibit 6: HARTline planning graphic (Source: iQuilt / Suisman Urban Design)

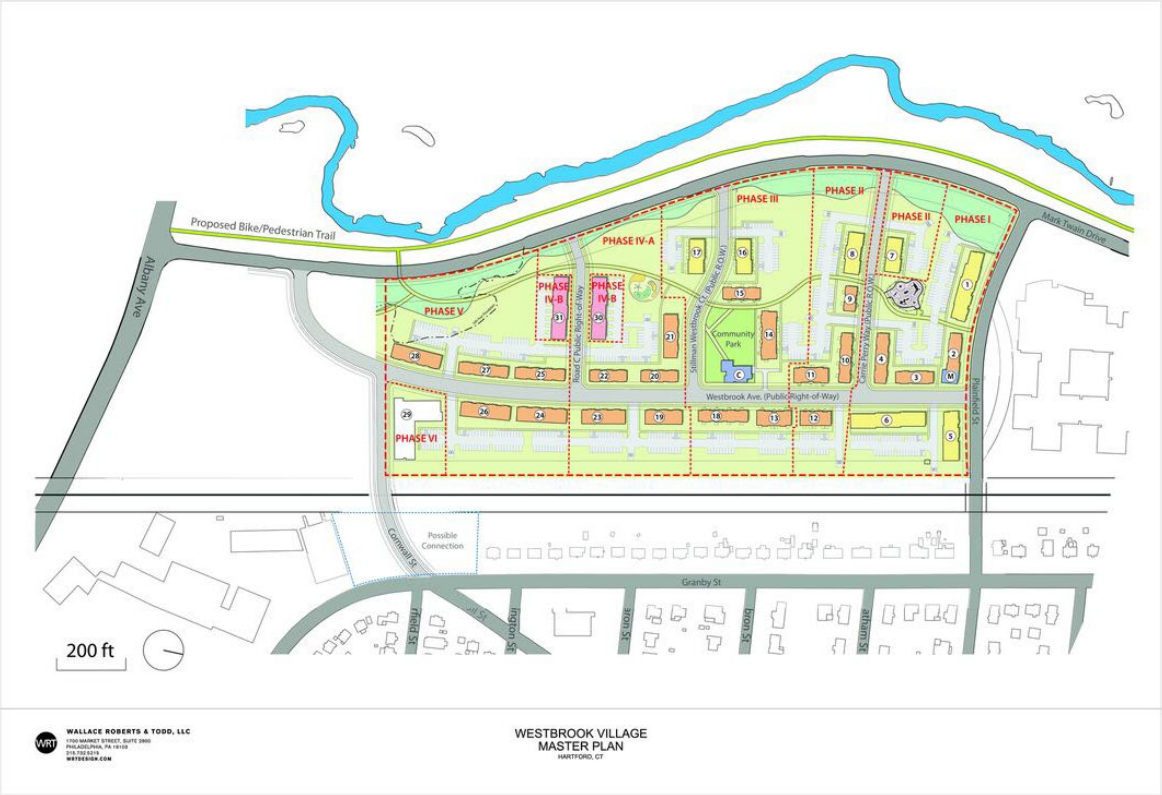


Other Trail Facilities

Other trail facilities in the vicinity of the study area may provide critical connections to a trail within the Griffin Line Corridor or provide an alternate route for a trail within the corridor. Two related projects underway include:

1) **Shared-Use Path at the Village at Park River:** The Village at Park River is an approximately 29-acre redevelopment of a Hartford Housing Authority-owned parcel to the north of Route 44 bounded by Mark Twain Drive, Plainfield Street and the Griffin Line. The redevelopment of this site has included a pathway which is currently in construction and will extend from Plainfield Street to Albany Avenue. This route is roughly parallel to a Griffin Line route and could serve as a potential route or alternate to a Griffin Line route. Additionally, the site plan at Village at Park River creates a "Cornwall Street Extension" which lines up with the intersection of Granby Street and Cornwall Street. An at-grade crossing of the Griffin Rail Line could expand the street network and provide trail connectivity to the Blue Hills neighborhood in this area. These planning efforts are shown in Exhibit 7.
2) **Albany Avenue Sidepath:** A sidepath is currently in design on the north side of Route 44 (Albany Avenue) between Route 189 and Homestead Avenue. This sidepath could intercept and connect to a trail in the Griffin Line corridor and provide east-west connectivity between Blue Hills, Upper Albany, West End neighborhoods as well as West Hartford.

Exhibit 7: Shared-use path through Village at Park River development



Trail Planning and Other Potential Future Corridor Uses

Based on corridor context as presented above, it is anticipated that any rail-with-trail alternative should also be compatible with other modal configurations to allow flexibility in future use which could be considered at a future time. This compatibility will ensure current trail development does not prevent the reconfiguration of the Griffin Line corridor to other modal options if these are pursued at a future date. Including these other potential configurations does not indicate CTDOT Office of Rail support for other configurations at this time. This study evaluates trail compatibility with the following configurations:

1) **Rail-with-Trail:** Single-track freight. This is the existing condition. This could also include geographic expansion of freight rail to the north as noted in the CT State Rail Plan.
2) **Rail-with-BRT:** This condition would require the abandonment of the rail line and convert this area to a bus rapid transit corridor.
3) **Trail-only Concept:** This condition would require the abandonment of the rail line and would convert the entire ROW to support a multimodal trail. Other space in the ROW could be used for enhanced trail amenities.

EXISTING CONDITIONS

The 8.7-mile-long Griffin Line, also known as the Griffins Industrial Track and the Griffins Secondary, consists of a single standard-gauge railroad track maintained to FRA Class 3 track standards. It runs from its northern terminus on Day Hill Road in Windsor (just north of the Bloomfield town line) to the New Haven – Springfield Line in Hartford, with both at-grade and grade-separated crossings. Owned by the State of Connecticut, freight service on the Griffin Line is provided by the Central New England Railroad (CNZR), a common carrier railroad. There is no passenger rail service on this line currently, however, the railroad has an option to operate passenger service.

Existing conditions are summarized in this section and displayed graphically as part of Appendix A. Appendix A identifies locations along the Griffin Line for which physical constraints may need consideration.

Exhibit 8 shows a CNZR freight train in the corridor in November 2023.

Exhibit 8: Central New England Railroad freight train passing the Woodland Street bridge eastbound.

Easements

The Griffin Line right-of-way (ROW) is encumbered by several known easements which must be considered in any work within the ROW. Known easements include:

- **Eversource:** An easement for transmission lines runs between an existing substation just south of Route 44 (Albany Avenue) in Hartford to the north into Bloomfield and continues beyond the study area extent at Park Avenue in Bloomfield. The easement is generally assumed to be 15 feet off center of the rail line in both directions. This area features transmission structures on both sides of the railroad as shown in Exhibit 9.

- **Metropolitan District Commission (MDC):** The MDC maintains several water, sewer, and/or water mains that run across or adjacent to the Griffin Line within the study area. These are presented in the Appendix.

The ROW may be encumbered by other easements that are not known at this time. A full review of all easements would be required in future stages of trail design in this corridor with a title search and survey.

Exhibit 9: Eversource transmission lines run between just south of Route 44 (Albany Avenue) in Hartford continue north beyond the study area extent at Park Avenue in Bloomfield

Right-of-Way (ROW)

Right-of-way width within the Griffin Line corridor varies throughout. ROW was obtained from municipal property maps in GIS provided by the City of Hartford and Town of Bloomfield. While GIS resources were the best available to the project team for this memorandum, GIS data are subject to errors and will have to be further investigated with survey and title search in future stages of trail design in this corridor. Generally, the ROW was found to be as follows:

- **Between Garden Street and Woodland Street:** The ROW varies from 30-feet to nearly 110-feet in width. Generally, the 30-foot ROW is found just west of Garden Street (behind 20 Sargeant Street) and just east of Woodland Street (behind Austin Organs at 156 Woodland Street).
- **Between Woodland Street and Route 44 (Albany Avenue):** The ROW is consistent at approximately 65 to 70-feet in width.
- **Between Route 44 (Albany Avenue) and Weaver High School at Tower Avenue:** The ROW varies from approximately 80-feet to nearly 110-feet in width.
- **Between Weaver High School at Tower Avenue and the Hartford / Bloomfield border:** The ROW varies from 65-feet to 95-feet. Generally, the ROW is 70-feet in this section.

- **North of the Hartford / Bloomfield border:** The ROW generally is 65-feet. A small portion of the Griffin Line south of Route 218 includes a 100-foot ROW.

Bridges and Adjacent Structures

Road Bridges

Three grade separated road crossings are provided in Hartford at Sigourney Street, Woodland Street, and Route 44 (Albany Avenue) and are shown in Exhibit 10. While grade separated crossings provide operational benefits for both railroad and road traffic in an urban area, these crossings can provide challenges in trail design as trail access is a key benefit for urban trails. Additionally, where the Griffin Line passes beneath these streets, the bridge abutments and piers act as horizontal constraints to rail-adjacent trail development. These constraints are as follows:

- Sigourney Street bridge (reconstructed in 2013) has three spans, with the railroad track beneath the central span (approximately 48-foot span) and the two flanking spans (approximately 20-feet) currently unoccupied. It is expected the Sigourney Street bridge could accommodate a trail in one of the unoccupied spans.
- Woodland Street bridge (reconstructed in 2004) is a single 29-foot span.
- Albany Avenue bridge (reconstructed in 1981) is a single 35-foot span.

Exhibit 10: The three bridges within the study area:
Left: *Sigourney Street bridge (view looking east),*
Center: *Woodland Street bridge (view looking east),*
Right: *Route 44 (Albany Avenue) bridge (view looking north)*



Adjacent Buildings and Site Restrictions

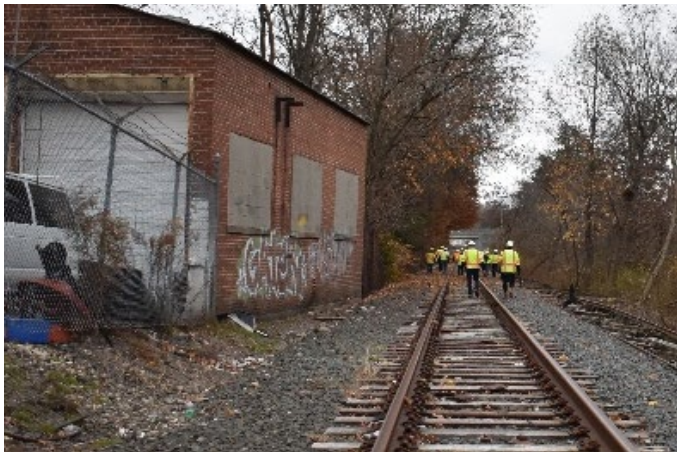
Several adjacent buildings and properties significantly impact potential trail design within the study area. While a trail within existing rail ROW is preferred, the acquisition of easements on adjacent properties may be possible; however, this should be explored with a review of existing buildings and site layouts that could be impacted by such an easement. Ideally, trail design should avoid areas that would require easements that would substantially impact adjacent property site layout (such as significant access modifications or parking reduction) or require demolition of adjacent buildings. Key properties identified in this study include:

- **20 Sargeant Street (Veeder Place):** Building frontage approximately 48-feet (min.) from railroad centerline. A driveway provides access within the parcel approximately 26-feet (min.) from railroad centerline. Project team review suggests opportunities for minor driveway realignment could increase offset from railroad centerline with minimal to no impacts to site access, on-site parking, or buildings.
- **51 Homestead Avenue (Saint Francis Hospital and Medical Center):** Building frontage approximately 49-feet (min.) from railroad centerline. A driveway which includes parking and provides access to a loading dock is 20-feet (min.) from railroad centerline. Project team review suggests that any easement in this area would likely result in 1) an elimination in up-to approximately 47 on-site parking spaces, 2) potentially render loading dock inaccessible, and 3) potentially require relocation of electrical transformer in this area. iQuilt has noted that this site may feature potential redevelopment, and trail planning could be incorporated as part of a future site plan.
- **156 Woodland Street (Austin Organs):** Building frontage approximately 29-feet (min.) from railroad centerline, however, this is highly variable due to the building design and building located on a curve on the railroad.
- **255 Homestead Avenue (Chrysalis Center):** Building frontage approximately 16-feet (min.) from railroad centerline. The closest portion of the building features a canopy structure and associated out-buildings which appear to be utilized as a loading dock. The structure sits above the railroad immediately on top of a retaining wall approximately 6-feet in height.
- **287 Homestead Avenue (The Smith Worthington Saddlery Company):** The closest building frontage is a set of additions off the main part of the building. These areas appear to be utilized as a loading dock and sit approximately 28-feet (min.) from railroad centerline. However, the majority of the building is approximately 60-80 feet from railroad. A rear driveway which serves the building as a loading dock is approximately 14-feet (min.) off railroad centerline and appears to serve many loading dock bays. Any easement in this parcel would likely reduce the driveway width in this area and could impact or eliminate truck access to loading bays on site. City staff has indicated that this parcel is subject to potential redevelopment into a cannabis facility.
- **333 Homestead Avenue (Salvation Army):** The closest building frontage to the rail line is an outbuilding which serves as a garage that is built near the railroad. This building is approximately 10-feet (min.) from railroad centerline. Aside from this outbuilding, the main building features a loading dock that features 6 bays that appears to be actively used by small box trucks. This loading dock is approximately 60-feet (min.) from railroad centerline. The entire site includes a driveway that is built up to the railroad, with this area being 11-feet (min.) from railroad centerline. Any easement in this parcel would likely reduce the driveway width in this area and could impact or eliminate truck access to loading bays on site. City staff and iQuilt have noted that the Salvation Army has recently relocated operations to a facility outside of Hartford. This parcel may be subject to redevelopment opportunities in the near future.

- **425 Homestead Avenue (Interstate Batteries):** This building is approximately 11-feet from the railroad centerline at its closest point. A trail between the site and the railroad would likely require significant building modification and/or demolition, or a realignment of the railroad further to the south.
- **1535 Albany Avenue (Russell Speeders Carwash):** The carwash driveway (entry into carwash) sits approximately 33-feet (min.) from the railroad centerline. The driveway, however, sits approximately 14-feet above the rail line, which creates a steep slope between the site and the railroad. Complicating obstructions include two transmission pylons which sit at the base of the slope adjacent to the railroad. The site obstructions combined with the two transmission pylons may create difficulties if siting a trail on the east side of the railroad in this area.
- **415 Granby Street (Weaver High School):** Weaver High School recently underwent renovations in 2020. The renovations included modifications to the site layout and adjacent ball fields. While the high school building sits far from the railroad site (relative to other nearby buildings), key considerations should be given to proximity to the football field and track on the south side of the campus and the baseball fields to the north side of campus. Circulatory paths to the football field and stands are approximately 70-feet offset from the railroad centerline, while the existing baseball field bleachers sit approximately 45-feet offset from rail centerline. Additionally, access between the trail and the campus should be considered in coordination with school officials. These design details could be addressed in future stages of the project, and include open access (no fencing), limited access (e.g. fence gates), or no access at all.

Exhibit 11: ***Upper left:*** *View looking west towards 20 Sargeant Street (Veeder Place) to left of photo. 51 Homestead Avenue is shown in the distance to the right.*
Upper right: *View looking east toward 51 Homestead Avenue (Saint Francis) to the left of photo.*
Lower left: *View looking west towards 156 Woodland Street (Austin Organs) to the left of photo. 255 Homestead Avenue is shown in the distance to the right.*
Lower right: *View looking west towards the Woodland Street bridge and 255 Homestead Avenue (Chrysalis Center) to the right.*

*Exhibit 12: **Upper left:** View looking west towards the loading dock at 287 Homestead Avenue (The Smith Worthington Saddlery Company).*
***Upper right:** View looking east towards 333 Homestead Avenue (Salvation Army).*
***Lower left:** View looking west towards 425 Homestead Avenue (Interstate Batteries). Note the transmission pylons in view.*
***Lower right:** View looking north from the parking lot of Weaver High School. Note the adjacent baseball fields to the right and transmission pylons.*



Transmission Pylons and Electrical Substations

The presence of high-voltage transmission lines along both sides of the Griffin Line presents an additional horizontal constraint. These pylons begin at the electric substation south of Route 44 (Albany Avenue) and continue north into central Bloomfield beyond the study area. The foundations are generally 15 to 20 feet from the center of the track as shown in Exhibit 13.

Exhibit 13: View looking north along the Griffin Line from the Plainfield Street crossing shows the transmission line pylons offset 15-20 feet on either side of the track.

In addition, there are two electrical substations within the study area, including one south of Route 44 (Albany Avenue) just west of the railroad and a second, smaller substation, at 273 Granby Street to the east of the railroad. These are shown in Exhibit 14. Alternatives should avoid impacts to the substations, but utility-owned parcels that are underutilized may present opportunities for trail development as well.

*Exhibit 14: **Left:** Electrical substation south of Route 44 (Albany Avenue) (Source: ctroads.org / Google Maps).*
***Right:** Electrical substation at 273 Granby Street (Source: Google Maps Streetview)*

University of Hartford (UHart)

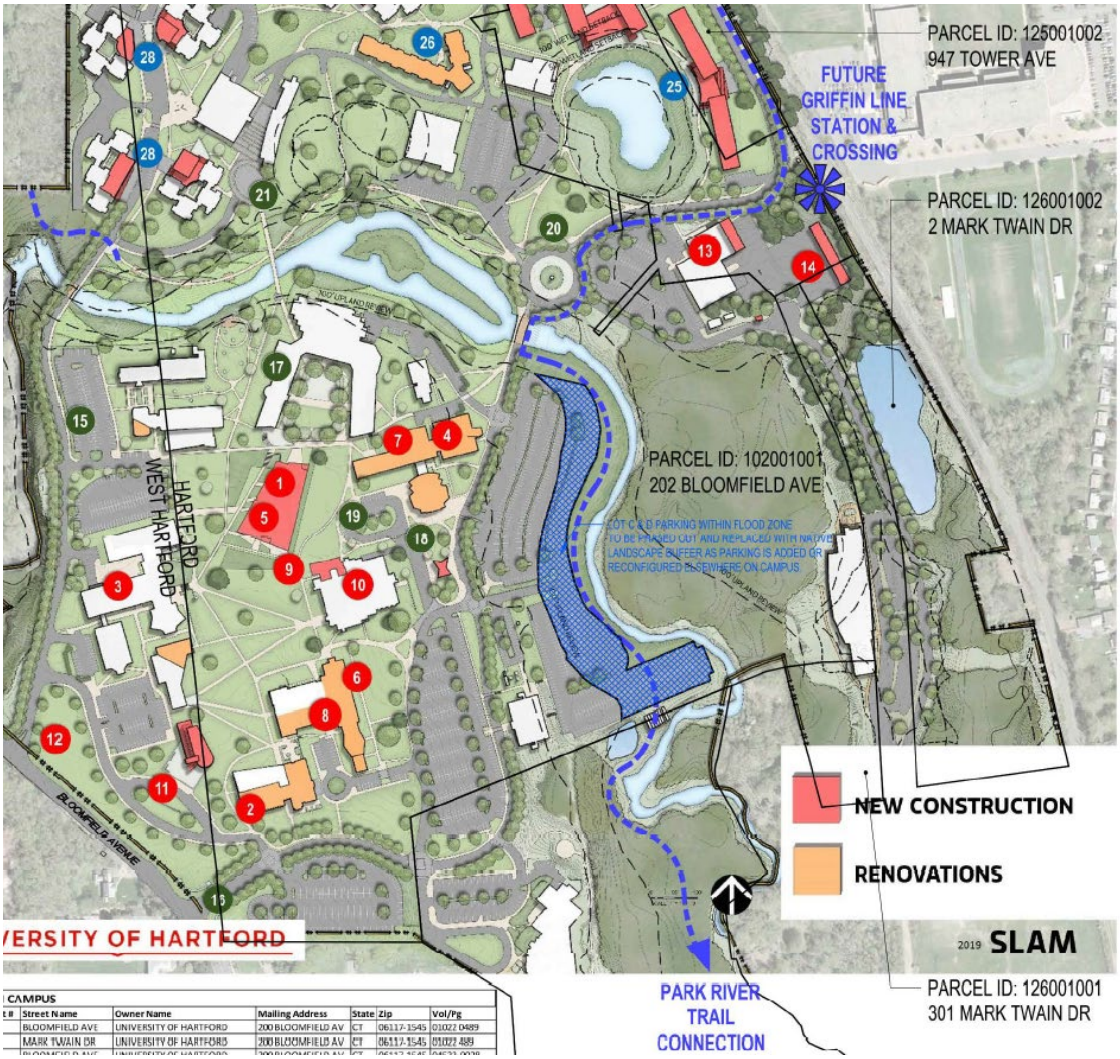
The University of Hartford (UHart) campus is located primarily in the northwestern corner of Hartford but spans into West Hartford with its main driveway just west of the Hartford city line on Route 189 in West Hartford (a secondary, typically gated access, is maintained at the north end of Mark Twain Drive). Additionally, the University owns large tracts of land between its main campus in Hartford to the north in Bloomfield stretching to Route 218. This area is commonly referred to as the "North Branch State Access Area" and features the North Branch of the Park River and associated floodway, floodplain, and wetlands. In total, the Griffin Line runs adjacent to the University of Hartford-owned property for approximately 1.5 miles. This distance underscores the importance of UHart as a critical stakeholder in the future vision for the Griffin Line.

Exhibit 15: UHart-owned parcels shown in blue.

The University has included a north-south regional trail in its planning work in its 2019 Campus Master Plan[11]. The proposed Park River Trail Connection in the 2019 Campus Master Plan was identified to the west of the Park River. Review of this alignment found that significant challenges to this route could include: 1) proximity to the University of Hartford Magnet School, 2) potential impacts to Watkinson School property including potential impacts to ballfields and community gardens, 3) potential impacts to property owned by The Village for Family & Children, and 4) environmental impacts associated with the adjacent Park River including its floodway, floodplain, and wetlands. Given these challenges for this route, this alignment was removed from consideration as part of the East Coast Greenway study, however, this trail could serve a valuable connection to a trail within the Griffin Line corridor should UHart pursue this alignment in the future.

[11] Hartford Planning & Zoning, University of Hartford Master Plan Submission, May 9, 2023 - LINK

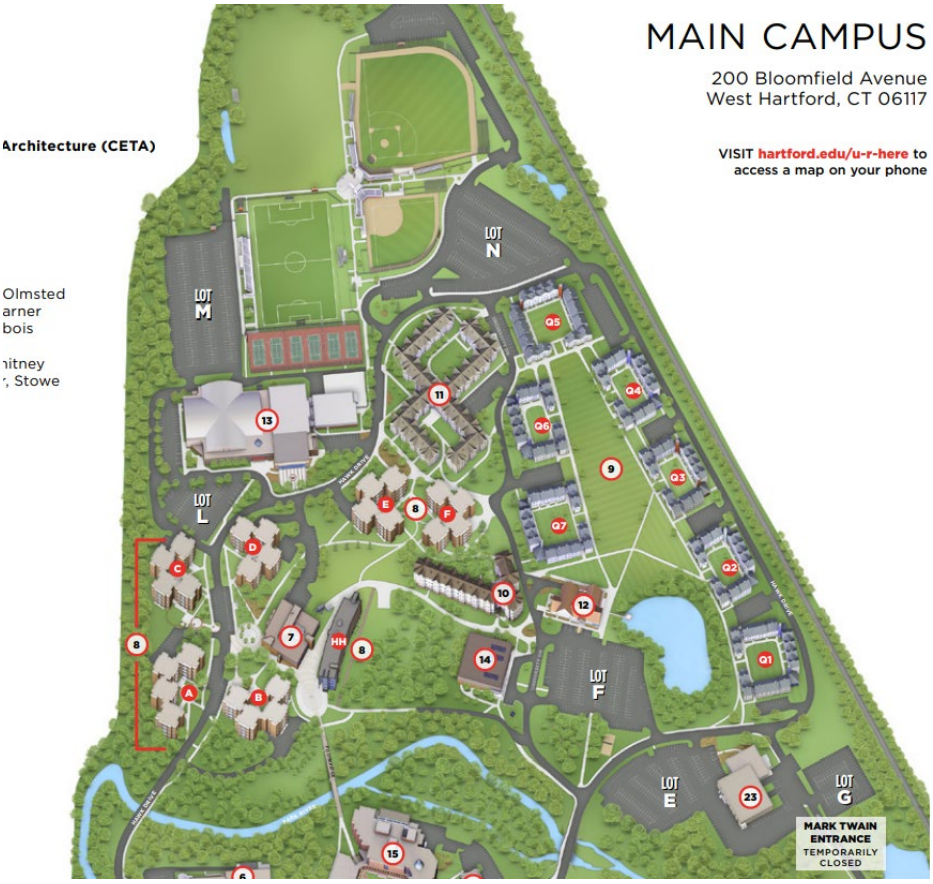
Exhibit 16: Excerpt from the 2019 Campus Master Plan for the University of Hartford showing trail planning work



Finally, any trail design on the west side of the Griffin Line should consider its design in relation to Hawk Drive, which runs approximately 50-feet offset rail centerline for approximately 1,500-feet in length. This space is also occupied by Eversource transmission pylons and UHart electrical transformers that should be considered in this area. A photo of this area is shown in Exhibit 17

Exhibit 17: Hawk Drive on the west side of the Griffin Line. Note the transmission towers which straddle the railroad.

Exhibit 18: University map showing Hawk Drive at right. (Source: University of Hartford)



Environmental Constraints

Various environmental constraints are present along the study area and were reviewed as part of the assessment process. This includes surface water, wetlands, floodplains, and topography constraints. These are summarized below.

Surface Water

1) North Branch Park River - The North Branch of the Park River is the most significant surface water constraint, and there are several locations which come close to the Griffin Line corridor. Additionally, the North Branch crosses the Griffin Line just south of Route 218. One other area of note is just West of Woodland Drive where the Park River comes within approximately 175-feet of the rail line.
2) Pond east of Mark Twain Drive – The pond is located east of Mark Twain Drive just north of Annie Fisher Montessori Magnet School. The centerline of the railroad is approximately 35-feet offset the closest point of water in this location, and the railroad sits on a steep embankment that elevates the railroad approximately 18-feet compared to the water level. This area is shown in Exhibit 19.

Exhibit 19: Surface water east of Mark Twain Drive just north of Annie Fisher Montessori Magnet School

Wetlands

Wetlands along the study area are primarily found in the following areas:

1) South of the pond on Mark Twain Drive between the pond and Annie Fisher School – West side – This is shown in Exhibit 20.
2) North of the University of Hartford baseball fields – West side
3) Tobey Road to Route 218 – Both sides - The railroad travels through this area on an embankment. Much of the area lower than the embankment are wetlands and/or floodplain within the North Branch State Access Area. See environmental constraints in this area in Exhibit 21.
4) Tobey Road to Park Avenue – West side

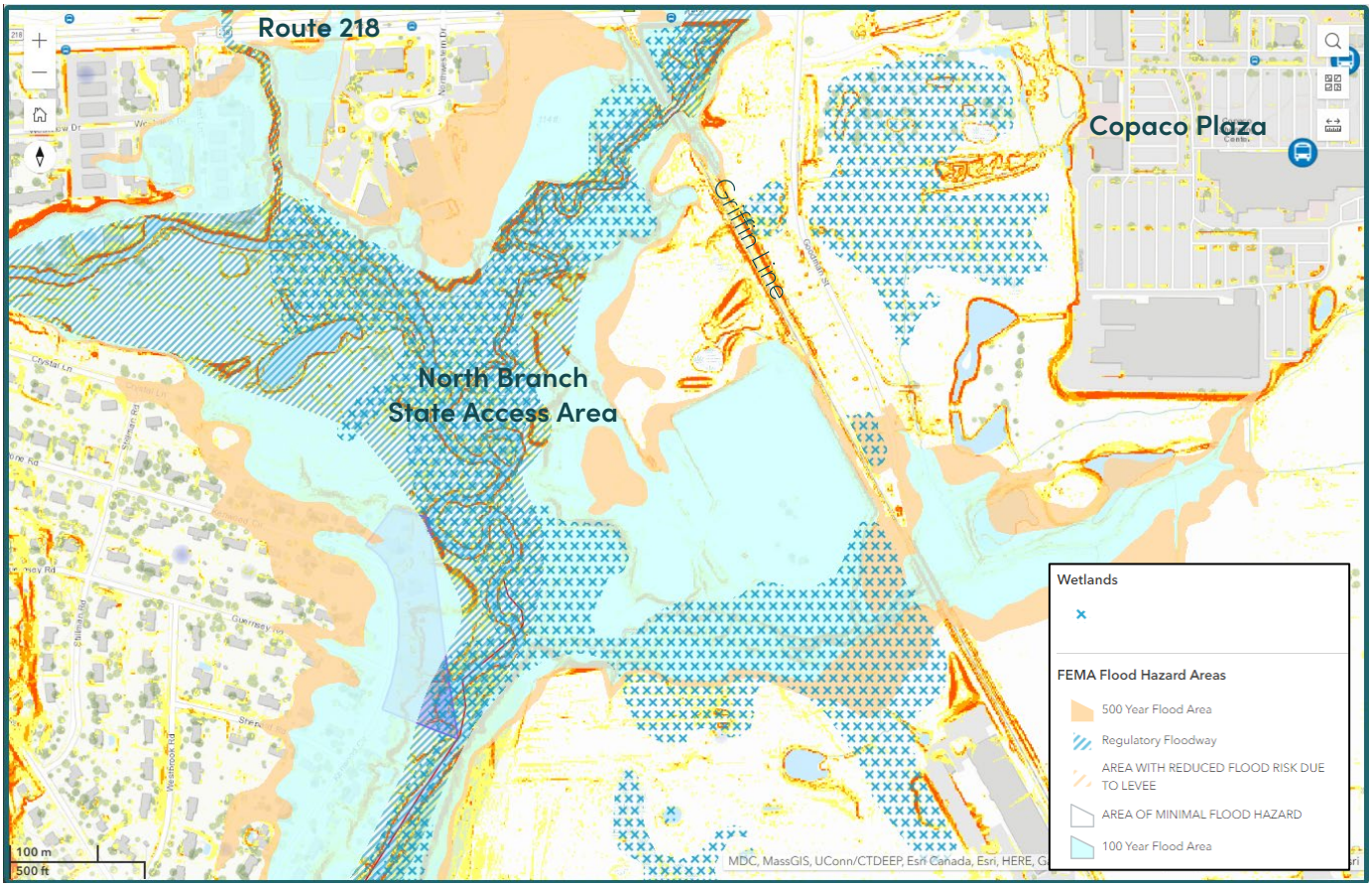
Floodplains

Floodplains along the study area are primarily found in the following areas:

1) West of Woodland Street – South side - FEMA mapping indicates floodplain between railroad and apartments on Woodland Drive. However, this may need to be verified as this is a small portion of land between these features.
2) South of the Weaver High School football field – East side - There is a culvert in this area which crosses underneath the railroad tracks.
3) Tobey Road to Route 218 – Both sides - The railroad travels through this area on an embankment. Much of the area lower than the embankment are wetlands and/or floodplain within the North Branch State Access Area. See environmental constraints in this area in Exhibit 21.

Exhibit 20: The area north of Annie Fisher School features steep embankments adjacent to the railroad with likely floodplains below. View looking east from Mark Twain Drive.

Exhibit 21: Environmental constraints in the North Branch State Access Area.



Topography

Topography and steep slopes can present a challenge to rail-with-trail development as many historic rail corridors were built upon steep embankments or within vertical depressions with very little lateral space to accommodate a trail. Areas that may need to be reviewed include:

1) Between Sigourney Street and Woodland Street – Both sides – This area is shown in Exhibit 22.
2) South of Route 44 (Albany Ave) – East side
3) Near pond on Mark Twain Drive – Both sides
4) South of Route 218 – Both sides

Exhibit 22: View looking toward northeast shows topography between Sigourney Street and Woodland Street.

APPLICABLE STANDARDS & GUIDANCE

Jurisdiction

National standards and guidance are summarized in the document *Rails with Trails: Best Practices and Lessons Learned* (e.g. the "RWT Guide"), published jointly by FRA and the Federal Highway Administration (FHWA). [12] According to this document, there are no national standards specifically for rails with trails, though federal requirements for specific elements of design still apply. For example, traffic control devices must comply with the *Manual for Uniform Traffic Control Devices (MUTCD)*.

State standards and guidance are provided by CTDOT and by the Connecticut General Statutes. Volume 4, Title 13b, Chapters 245 through 245b which provide legislative requirements for railroads. CTDOT has also provided design considerations for potential trails alongside the Griffin Line and released the *Griffin Line Rail with Trail Design Guidelines in 2023* (provided in Appendix)[13]. Finally, the CTDOT Highway Design Manual (HDM) provides some considerations for design elements surrounding railroads, such as vertical clearance requirements for new bridges over railroads.

Design Guidance

Trail Cross-Section

Both State and Federal sources recommend a minimum 10-foot shared-use trail, with a width as narrow as eight feet in constrained areas. This width does not include a two-foot buffer adjacent to any barrier at the edge of the trail (such as a fence). In total, then, the minimum width of a trail in a constrained location between barriers must be at least 12 feet. For trails with high anticipated usage, a greater width is preferred.

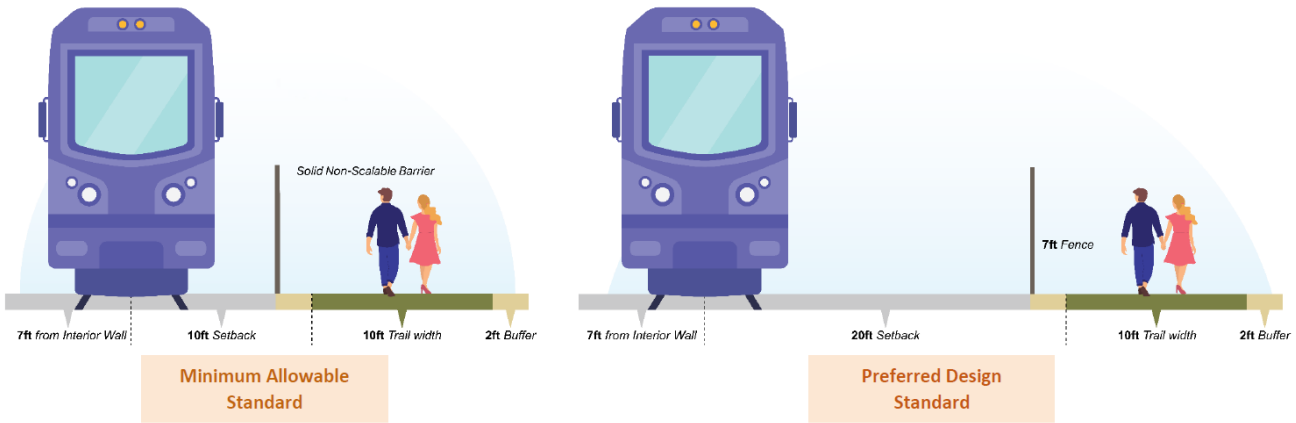
Offset

It is crucial that no portion of the trail comes within the railroad's dynamic envelope, a distance that varies greatly. The RWT Guide describes offsets as low as seven feet between the center of the railroad line and the inner edge of the adjacent trail. CTDOT specifies a minimum of 10 feet between the center of the railroad line and a vertical barrier between rail and trail. When considering a preferred two-foot offset between a trail and adjacent barrier, the offset between the center of the rail to the trail is a minimum of 12-feet. Where possible, CTDOT prefers at least a 20-foot offset to any vertical barrier as illustrated in Exhibit 23.

---

[12] Rails with Trails: Best Practices and Lessons Learned, USDOT, 2021; https://www.railstotrails.org/resourcehandler.ashx?name=rail-with-trails-best-practices-and-lessons-learned&id=26482&fileName=Rails-Trails-Layout_06_17_21_508.pdf .
[13] Griffin Line Rail with Trail Design Guidelines (Draft), CTDOT, 2023.

Exhibit 23: CTDOT Trail Design Guidelines for rail-with-trail in the Griffin Line (2023)



Barrier

There are no Federal requirements for barriers between trails and railroad tracks; however, most rails-with-trails include a barrier of some sort, whether landscaping, fencing, or a wall. This barrier serves to reduce the visual and noise impact of a passing train as well as to discourage trespassing. Care should be taken, though, to maintain the visibility of the trail itself for user security.

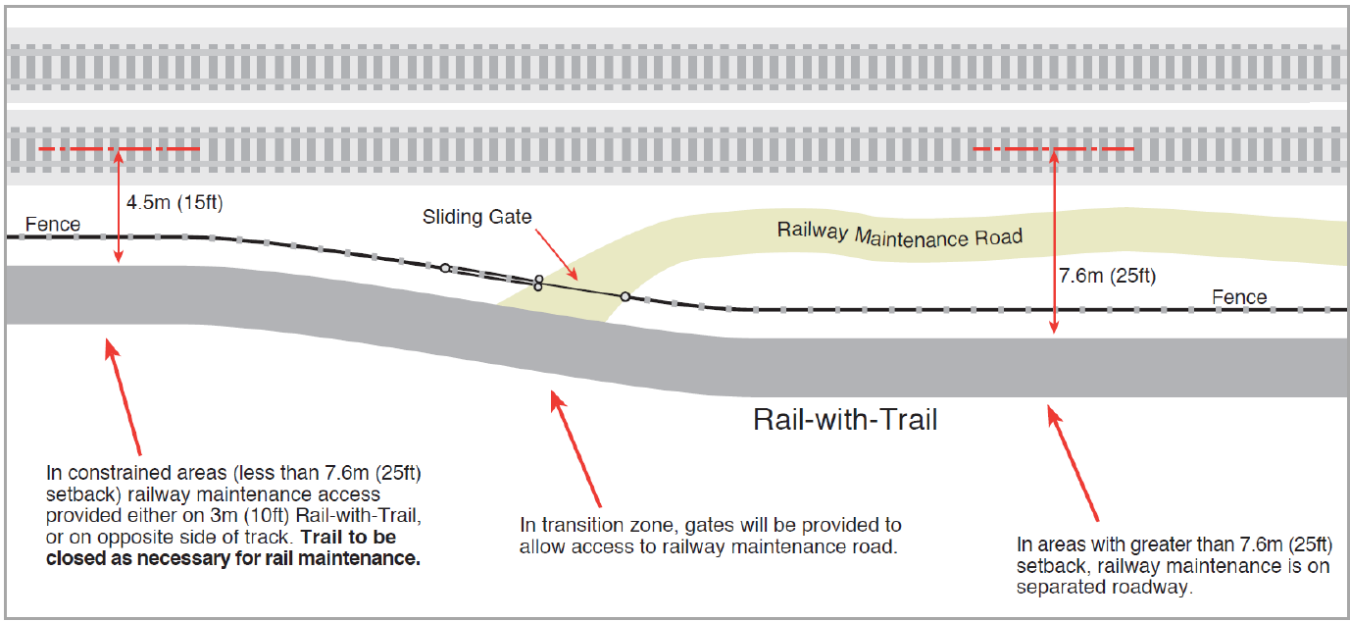
CTDOT guidance suggests a solid non-scalable barrier when a minimum 10-foot offset is used, and a seven-foot-tall fence for offsets at least 20-feet or more. Given the desire to maintain visibility, as well as the maintenance needs discussed below, it would be preferable to provide wide offsets wherever practical to avoid solid barriers.

Additionally, Eversource design requirements should be considered in future design stages to ensure compatibility within the transmission corridor. For example, the design of some metal fences may be limited due to the proximity to the transmission lines in this corridor.

Maintenance and Emergency Access to Rail

In locations where the shared-use trail is at least 25 feet from the centerline of the railroad track, rail maintenance and emergency vehicles can drive alongside the track. However, when the separation is below 25 feet, these vehicles may need to use the trail itself to perform their duties. Not only does this require the trail to be closed to other users during this time, but the barrier must also be designed to permit maintenance and emergency access. Alternatively, the rail maintenance road can be provided on the other side of the train track. Maintenance and emergency access considerations are shown in Exhibit 24.

Exhibit 24: Maintenance access considerations (RWT Guide, pg. 50)



At-Grade Crossings

At-grade crossings are subject to a great deal more scrutiny than parallel trails. The *Manual for Uniform Traffic Control Devices* discusses pavement markings, signing, and signalization requirements for railroad grade crossings, including for locations where trails cross active railroad tracks. The AASHTO *Guide for the Development of Bicycle Facilities* also discusses trail design, including at rail crossings. For improved guidance, the Transportation Research Record published an article titled *Rails-Next-to-Trails: A Methodology for Selecting Appropriate Safety Treatments at Complex Multimodal Intersections* in 2018. It is generally preferred to avoid creating new at-grade crossings, when possible, whether by grade separation or by rerouting the trail. This preference is reflected in Connecticut General Statute Section 13b-268 (b), which requires a special act of the General Assembly as a prerequisite for creating a new at-grade crossing.

Grade Separation

Where trails pass beneath cross streets or railroads, the Federal minimum height of the tunnel is eight feet, with ten to twelve feet preferred. When the trail crosses over a railroad, the height requirements are much greater: 20'6" as required by CTDOT HDM Section 9-4.0. These requirements can differ based on the railroad and the needs of the corridor. The RWT Guide suggests a minimum height of 23-feet for non-electrified track, but notes that the clearance provided "should be designed to meet the current and future operational needs of the railroad" (RWT Guide, pg. 69). **Vertical clearance on the corridor is currently constrained by the Woodland Street bridge with an existing vertical clearance of approximately 18-feet** (based on available mapping, photos, and visual inspection during the site visit).

CASE STUDIES

The Rail-to-Trail Conservancy (RTC) documented 442 rail-with-trails across the United States as of September 2023. This section summarizes an analysis of rail-with-trails in New England and the New York region. Rail-with-trail locations were identified from the RTC catalogue and a GIS review of Open Streets Map (OSM) data.

Exhibit 26 highlights attributes of rail-with-trails in the region that are longer than one mile. The following was analyzed to examine each trail:

- **Length**: Rail-with-trail length based on RTC's "September 2023 Rail-with-Trail List."
- **Offset:** Estimated distance from the track centerline to the inner edge of the adjacent trail based on Google Earth measurements.
- **Fence Type:** Description of fence material and height based on a visual review of Google Earth. A low fence is estimated to be 4-feet or shorter; a medium fence is estimated to be between 5 to 6-feet tall; a tall fence is estimated to be 7-feet tall or greater.
- **Corridor Status:** Active, inactive, or abandoned status based on available railroad operator information.
- **Railroad Type:** Description of active railroad services based on available railroad operator information.

Several rail-with-trails were examined as case studies. The case studies summarize general takeaways from the trail design, grade crossings, and safety features.

Connecticut has one existing rail-with-trail example in Derby, however at 0.2-miles in length, this was not included in the case studies table as this portion of trail is solely to pass under Main Street near the Naugatuck River. The trail is adjacent to the Metro-North Waterbury Branch Line owned by CTDOT. This trail is shown in Exhibit 25.

Exhibit 25: Rail-with-Trail example in Derby, CT. This section runs for approximately 0.2-mile. The Derby/Shelton Station is seen in the distance. (Source: CTDOT)

Exhibit 26: Rail-with-trail Case Studies

Name	State	Length [Mi.]	Min. Offset [Ft.]	Fence Type	Corridor Status	Railroad type
Connecticut River Walk and Bikeway	MA	1.5	18	Medium chain link	Active	Passenger & Freight
Manhan Rail Trail	MA	0.65	10	Medium chain link	Active	Passenger & Freight
Mass Central Rail Trail (Norwottuck Branch)	MA	1.43	65	None	Active	Passenger & Freight
Neponset River Greenway	MA	1.3	9	Medium chain link	Active	Light Rail
Somerville Community Path	MA	1.9	10	High chain link	Active	Light Rail
Southwest Corridor Park (Pierre Lallement Bike Path)	MA	1.8	8	Retaining wall	Active	Passenger & Freight
Blackstone River Greenway	MA + RI	8.7	15	Low chain link	Active	Freight
Down East Sunrise Trail	ME	2.6	10	None	Inactive	N/A
Eastern Promenade Trail	ME	1.33	9	None	Inactive	N/A
Ellsworth Trail	ME	1.3	12	Medium chain link	Active	Passenger (Scenic Tour Trains)
Kennebec River Rail Trail	ME	5.4	12	None	Inactive	N/A
Mountain Division Trail	ME	8.5	12	None	Inactive	N/A
Papermill Trail	ME	1.2	20	None	Inactive	N/A
Cheektowaga Historic Rails to Trails	NY	1.5	40	Medium chain link	Active	Freight
Maybrook Trailway	NY	26.85	10	None	Inactive	N/A
Island Line Rail Trail	VT	1.5	10	Medium chain link	Active	Passenger & Freight

Maybrook Trailway

Location: Hopewell Junction to Brewster, NY

Railroad Status: Inactive

Key Design Features: Paved trail

Other Notes: The Maybrook Trailway is 26.85 miles long within an inactive Metro North two-track corridor. One track has been converted to a paved shared-use path while the other track remains inactive. The rail-with-trail is 10-feet wide for bicycles and pedestrians. There is no fence between the trail and the tracks. In the most constrained areas, the offset from the trail to the track centerline is approximately 10 feet.

Blackstone River Greenway

Location: Worcester, MA to Providence, RI

Railroad Status: Active

Key Design Features: Paved trail; At-Grade crossings

Other Notes: The Blackstone River Greenway is envisioned to be a 48-mile trail from Worcester, Massachusetts to Providence, Rhode Island. There are two segments of rail-with-trail completed so far totaling 8.7 miles along active freight corridors. In Massachusetts, the most constrained offset between the trail and the track is approximately 10 feet with a tall, chain link fence dividing the track and trail. Meanwhile, there are low, wood slat fences where the offset is wider with a tree line. In some sections, the railroad corridor and trail abut the roadway, but the trail remains grade separated from the road. Similarly in Rhode Island, a tree line divides the trail and the tracks between the 24-foot offset, while a tall, chain link fence is used where the offset is tighter. Following the Providence and Worcester railroad, the trail also passes below-grade crossings underneath street bridges and at-grade crossings featuring crosswalks with designated bicycle and pedestrian signage.

Burlington Greenway

Location: Burlington, VT

Railroad Status: Active

Key Design Features: Paved trail

Other Notes: The Burlington Greenway includes 1.5 miles of paved rail-with-trail along an active train corridor. The rail-with-trail passes Burlington Union Station adjacent to tracks serving both freight and passenger trains. The trail is offset from the track centerline by approximately 10 feet, and a low, chain link fence separates the trail from the track. The trail is about 10 feet wide and open to pedestrians and bicyclists.

Manhan Rail Trail

Location: Northampton, MA

Railroad Status: Active

Key Design Features: Paved trail

Other Notes: The Manhan Rail Trail is 0.65 miles long adjacent to an active railroad corridor. The trail is paved and about 11-feet wide. A standard chain link fence divides the trail from the tracks with an approximate 10-foot offset. The Massachusetts Department of Transportation (MassDOT) owns the railroad with active freight service, as well as the Amtrak Vermonter and Valley Flyer passenger lines. This trail is a section of the New Haven & Northampton Canal Greenway envisioned to connect 81 miles of trails between Connecticut and Massachusetts.

Somerville Community Path

Location: Somerville, MA

Railroad Status: Active

Key Design Features: Paved trail; Grade crossings

Other Notes: This rail-with-trail is 1.9 miles along the active Massachusetts Bay Transportation Authority (MBTA) Green Line in Somerville. A tall, chain link fence and short guardrail separate the trail from the track by approximately 10 feet. The trail elevation slopes between the road and railway. While the light rail passes beneath bridges, the trail includes both at-grade and grade-separated crossings across roadways.

Exhibit 27: Rail-with-trail along active railroad corridors.

Upper left: *Blackstone River Greenway (Source: Google Earth)*
Upper right: *Burlington Greenway (Source: Stephen Mease Photography)*
Lower left: *Manhan Rail Trail (Source: Google Earth)*
Lower right: *Somerville Community Path (Source: Google Earth)*

ALTERNATIVE ANALYSIS

Alternatives within and adjacent to the Griffin Line study area were identified for analysis. This included alternatives within the ROW, but also included options off the Griffin Line corridor that could be considered as well. Three alternatives in total were reviewed:

- **Northeast Alternative:** This alternative includes rail-with-trail on the north or east side of the railroad. Railroad relocation is necessary between Route 44 (Albany Avenue) and Garden Street in this alternative.
- **Southwest Alternative:** This alternative includes rail-with-trail on the south or west side of the railroad. A 2,500-foot extent between Annie Fisher Magnet School and Hawk Drive (University of Hartford) is located on Mark Twain Drive ROW, and UHart property to avoid environmental constraints in this area.
- **Homestead / Mark Twain Alternative:** This alternative extends between Garden Street and Plainfield Street and utilizes areas outside the Griffin Line ROW. This is accomplished with 1) a shared-use sidepath constructed along Homestead Avenue, 2) use of the planned sidepath in design by the City of Hartford on the north side of Route 44 (Albany Avenue) between Westbourne Parkway and Mark Twain Drive, and 3) a sidepath along Mark Twain Drive.

Tobey Road to Park Avenue

Alternatives between Tobey Road and Park Avenue were previously reviewed as part of the *Cross Town Trail Study* and as part of the broader Capitol Region East Coast Greenway Study. Both these efforts are summarized in the sections above. This memorandum accepts the findings of the *Bloomfield Cross Town Trail Study* which found a rail-with-trail alignment on the Griffin Line between Tobey Road and Route 218 to be not preferred due to environmental constraints and crossing at an unsignalized intersection at Route 218. However, this memo proposes to advance the routing to the east of the Copaco Shopping Center (as shown in Exhibit 5) as the preferred alternative for connections between Tobey Road and Park Avenue. This alternative is preferred regardless of the alternative selected to the south of Tobey Road.

Northeast (NE) Alternative

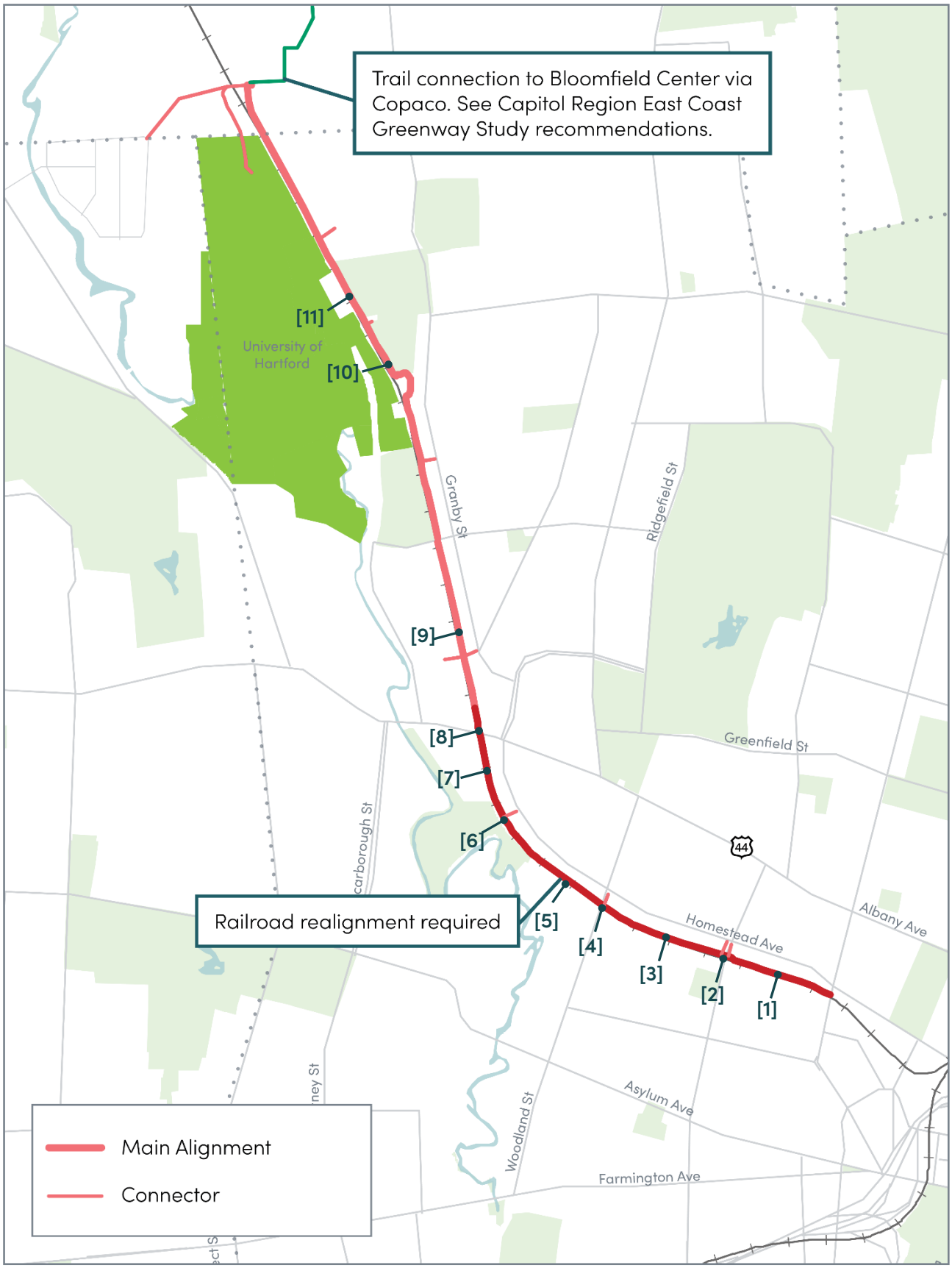
An alternative on the northeast side of the railroad was initially identified by iQuilt as their preferred location of a trail due to ease of access to properties on the south side of Homestead Avenue. It is envisioned that a trail in this location could be a feature in efforts to redevelop properties in the Homestead Avenue corridor, in addition to providing a non-motorized off-road route for area residents.

A mapbook detailing this alternative and cross sections at section locations are provided in the Appendix, and key considerations are presented below:

*Exhibit 28: Key considerations at cross section locations for the Northeast Alternative (**Red text** indicates values less than CTDOT preferred offset of 20-feet). Cross sections are located in the Appendix.*

Northeast (NE) Alternative Key Considerations				
Cross Section ID	**Cross Section Location**	**Trail Offset from RR Centerline**	**Easement Required**	**Other Notes**
1	51 Homestead Avenue	**15 feet**	Yes	Requires railroad realignment.
2	Sigourney Street	36 feet (Alt NE-A)/ **17 feet (Alt NE-B)**	No	Trail routed through unoccupied flanking span (Alt. NE-A) or main span with realigned railroad (Alt. NE-B).
3	Between Sigourney Street and Woodland Street	22 feet	No	
4	Woodland Street	**15 feet**	Yes	Requires railroad realignment. Requires reconstruction of Woodland Street bridge to 40-foot span length (min.). Trail adjacent to retaining wall and building.
5	333 Homestead Avenue	**11 feet**	No	Requires railroad realignment. Adjacent to building and loading dock / parking lot.
6	367 Homestead Avenue	**17 feet**	No	
7	425 Homestead Avenue	**12 feet**	No	Requires railroad realignment. Adjacent building on property side.
8	Route 44 (Albany Avenue)	**10 feet**	No	Requires railroad realignment. Trail routed under existing bridge with realigned railroad. Requires pylon relocation or reduced trail width through constrained area.
9	Village at Park River	26 feet	No	
10	Weaver High School Football Field	50 feet	No	Utilizes City of Hartford property at Weaver High School.
11	Weaver High School Baseball Field	34 feet	No	Utilizes City of Hartford property at Weaver High School.

Exhibit 29: Northeast Alternative summary map. See Appendix for detailed mapbook. Numbers show general location of each cross section.

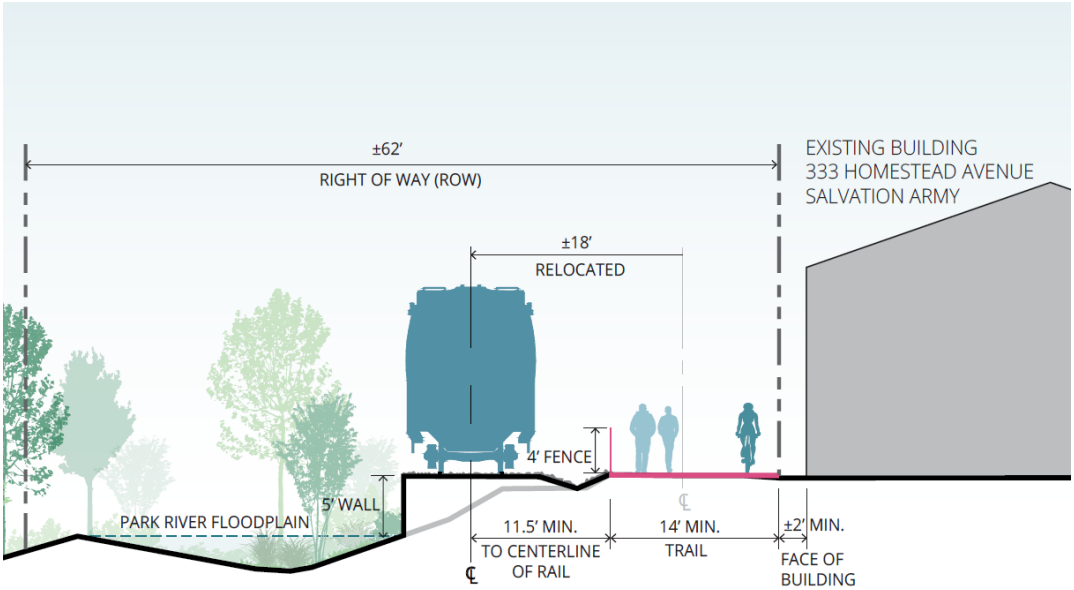


Garden Street to Plainfield Street

The Northeast Alternative would likely require rail realignment for an approximate 1.25-mile extent between Garden Street and Route 44 (Albany Avenue) due to adjacent buildings at many locations along this segment as noted in the Existing Conditions section above. A feasible realignment was evaluated and documented in the Appendix. Constraints on the south side of the railroad including 156 Woodland Street (Austin Organs) and the Park River floodplain limit the extent the rail may be realigned to the south through this entire section. In addition, realignment would likely require the reconstruction of the at-grade crossing at Garden Street.

While the realignment of the railroad would allow for the minimum horizontal clearance for a trail as noted in the cross sections in the Appendix, some locations would require easements for additional ROW. Additionally, this alternative would be relatively constrained compared to the Southwest Alternative presented in the following section. Typical constraints include many of the nearby adjacent buildings to the north side of the ROW. See Exhibit 30 for an example of this typical constraints with adjacent buildings such as near 333 Homestead Avenue.

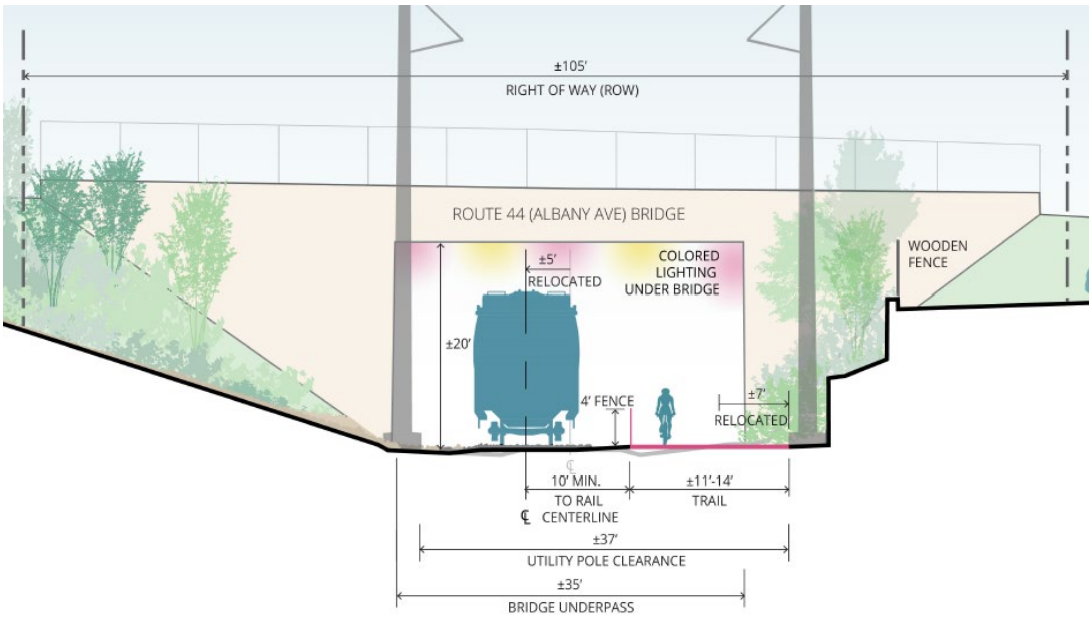
Exhibit 30: Cross Section excerpt of the Northeast Alternative, Location 5 (at 333 Homestead Avenue). See the Appendix for all cross sections.



Just south of the Route 44 (Albany Avenue) bridge, Eversource maintains two electrical transmission pylons approximately 14-feet off the existing rail centerline. While realignment of the railroad southwestward in this area would provide for approximately 19-foot offset between rail centerline and these pylons, this would still result in a constrained area between these two features. This constraint could reduce the effective trail width to 5-feet or less in this area (when accounting for 2-foot shy distances from adjacent vertical objects such as the fence and pylon). Therefore, this alternative includes the relocation of these two pylons further east to provide adequate clearance for a trail of sufficient width. This relocation would likely come at a considerable cost and require coordination

with Eversource. See Exhibit 31 for the area near Route 44 (Albany Avenue) bridge which shows railroad relocation in addition to relocation of the transmission pylons.

Exhibit 31: Cross Section excerpt of the Northeast Alternative, Location 8 (at Route 44 bridge). See the Appendix for all cross sections.



Between Route 44 (Albany Avenue) and Plainfield Street, the Northeast Alternative is routed outside the existing pylons and is located within an easement maintained by Eversource. Generally, Eversource maintains an easement 15-foot off center on both sides of the rail in this area. This places a trail approximately 26-feet offset the railroad centerline. There is flexibility in this area to provide additional offset to the railroad, however, this should be weighed against a trail location closer to residential properties fronting Granby Street.

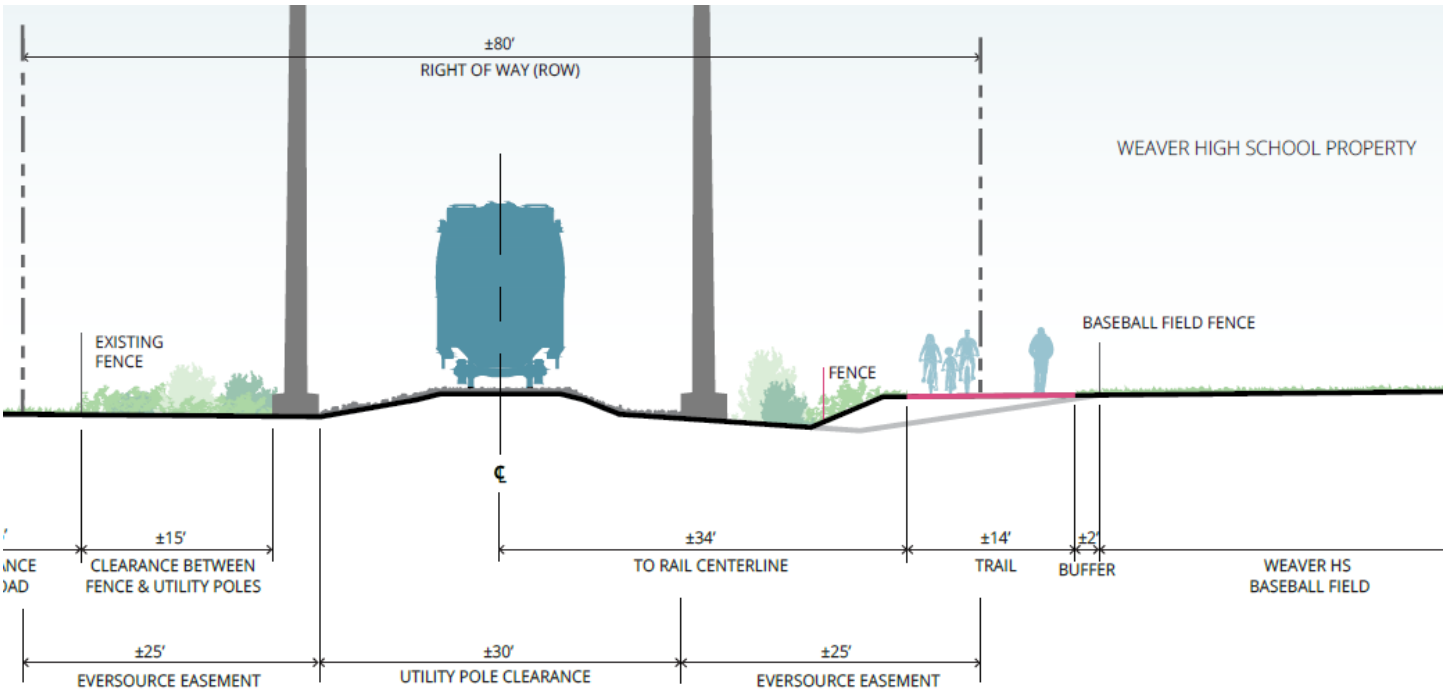
Of note, only three of the cross-section locations for the Northeast Alternative between Garden Street and Plainfield Street (Location 2 under Sigourney Street bridge, Location 3 west of Sigourney Street, and Location 9 north of Route 44) meet CTDOT's preference for a trail offset of 20-feet minimum. All other locations include a trail offset between 10 to 20-feet. While this exceeds CTDOT's minimum allowable standard, a greater offset is preferred. In addition, a reduced offset may require additional barriers and/or fencing to be installed between the trail and the railroad. CTDOT's *Griffin Line Rail with Trail Design Guidelines* provides guidance for a Solid Non-Scalable Barrier in trails with offsets between 10-20 feet.

Plainfield Street to Tobey Road

The segment between Plainfield Street and Tobey Road is similar to the section between Route 44 (Albany Avenue) and Plainfield Street. This section is characterized by existing pylons and Eversource easement 15-foot off center on both sides of the rail line. Generally, a trail within the ROW, but within Eversource easement, is feasible outside the pylons located in this area. Coordination with Eversource should be undertaken in future stages of the project, and key considerations are listed in the Preferred Alignment section below.

Just south of Weaver High School there is a drainage channel which flows towards the North Branch of the Park River. Within this area the Northeast Alternative shifts eastward to traverse this area over an existing culvert on Weaver High School property. The Northeast Alternative continues north through Weaver High School property. It is expected that some form of fencing between the trail and Weaver High School would be preferred by school officials. While the route could be located entirely within Griffin Line ROW, the cross-sections for this alternative demonstrate that use of both Griffin Line ROW and City of Hartford property could allow for a less constrained trail area. See Exhibit 32 for this area.

Exhibit 32: Cross Section excerpt of the Northeast Alternative, Location 11 (at Weaver High School Baseball Fields). See the Appendix for all cross sections.



The Northeast Alternative connects to the preferred route to Bloomfield Center at Tobey Road as described in the prior section. The trail would connect to Tobey Road via a University of Hartford-owned parcel. This location was identified as a potential trailhead and parking location.

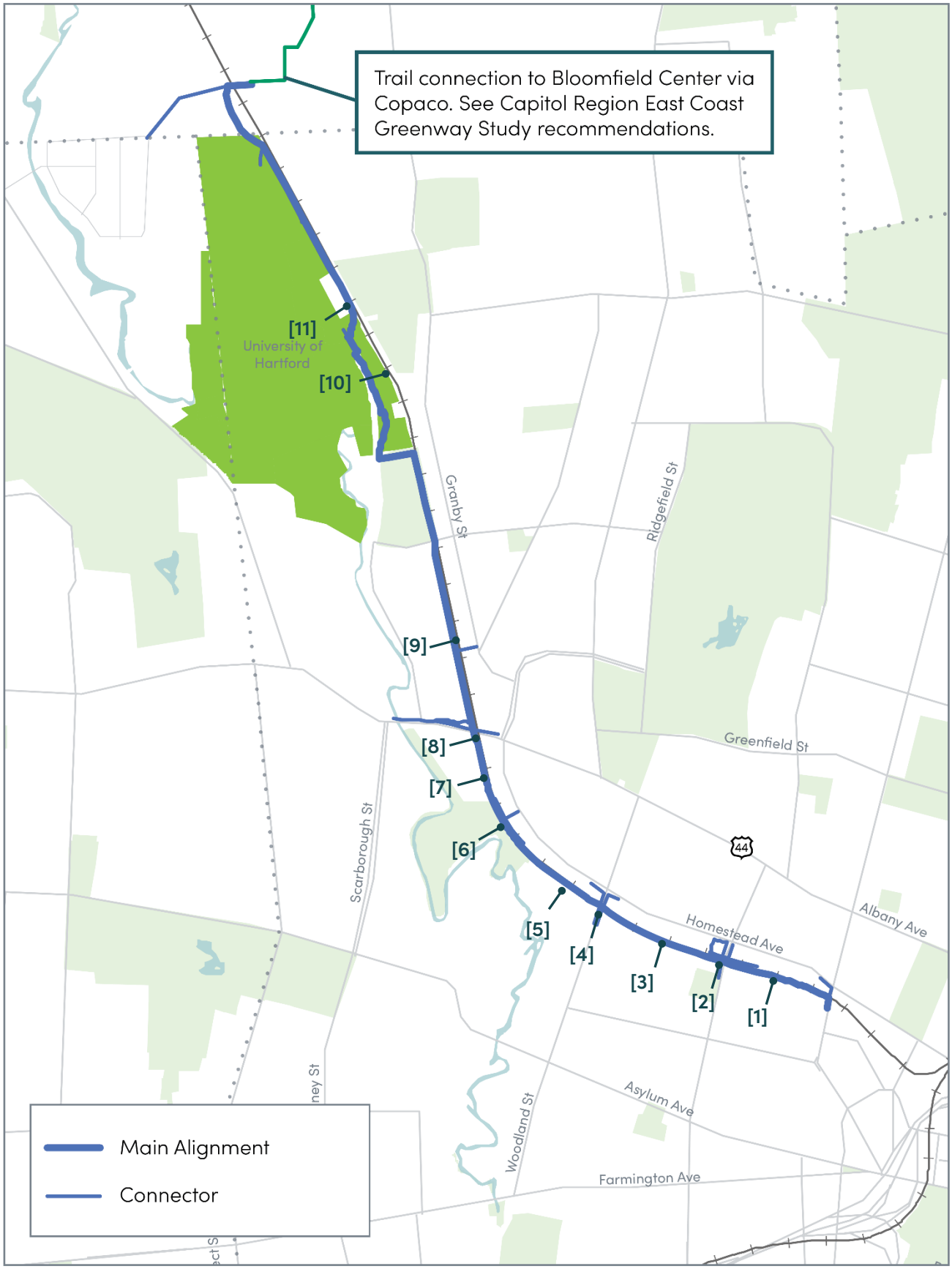
Southwest (SW) Alternative

A trail alternative was also evaluated on the southwest side of the railroad tracks. Generally, this area included more flexibility over alternatives to the northeast of the railroad tracks in the segment between Garden Street to Route 44 (Albany Avenue). This is because the rail line in this area favors the north side of the ROW and Homestead Avenue buildings were generally built adjacent to the rail line. North of Route 44 (Albany Avenue) the rail line does not feature nearby industrial uses. This segment is defined by several key considerations including the Village at Park River redevelopment, the Annie Fisher Magnet School, a pond on the east side of Mark Twain Drive which fronts the railroad, and the University of Hartford campus. These considerations are further detailed below.

*Exhibit 33: Key considerations at cross section locations for the Southwest Alternative. (**Red text** indicates values less than CTDOT preferred offset). Cross sections are located in the Appendix.*

Southwest (SW) Alternative Key Considerations				
Cross Section ID	**Cross Section Location**	**Trail Offset from RR Centerline**	**Easement Required**	**Other Notes**
1	51 Homestead Avenue	**14-feet *(See Note)**	Yes	Realignment of private drive likely required. While the trail is 14-foot offset rail centerline, existing ROW line (and fencing) approximately 15-feet from rail center. Much of trail to be constructed in acquired easement.
2	Sigourney Street	36-feet	No	Trail routed through unoccupied flanking span.
3	Between Sigourney Street and Woodland Street	32-feet	No	
4	Woodland Street	**13-feet**	Yes	Trail routed under Woodland Street via new culvert through bridge sidewall or reconstructed bridge. Alternative includes at-grade crossing at Woodland Drive signal. Approx. 250-feet constrained area with <20-foot offset from RR centerline (near 156 Woodland Street, Austin Organs).
5	333 Homestead Avenue	36 feet (Alt SW-A)/ **10 feet (Alt SW-B)**	No	Potential floodplain based on available mapping in Alt. SW-A location. Boardwalk or other design features may need to be included.
6	367 Homestead Avenue	20-feet	No	Recommended connection to Homestead Avenue with at-grade crossing of RR in this location. Not required for mainline of trail.
7	425 Homestead Avenue	30-feet	No	
8	Route 44 (Albany Avenue)	50-feet	Yes	Trail routed under Route 44 (Albany Avenue) with new culvert to west of existing bridge. Easement from Connecticut Light & Power (Eversource) required for approach to proposed culvert under Route 44.
9	Village at Park River	52-feet	Yes	Easement required from Hartford Housing Authority / Village at Park River. Trail in this location is compatible with masterplan of site redevelopment.
10	Weaver High School Football Field	20-feet	No	Located on embankment between rail line and water body. Likely structure required.
11	Weaver High School Baseball Field	26-feet	No* - See Note	ROW varies in this area. Easements may be required from the University of Hartford in some locations. Additionally, coordination with UHart on continuous connection (no fencing) should be pursued.

Exhibit 34: Southwest Alternative summary map. See Appendix for detailed mapbook. Numbers show general location of each cross section.



Garden Street to Plainfield Street

This alternative presents an option for rail-with-trail on the southwest side of the railroad tracks. Review of the critical locations in this report found that this alternative is compatible ***without*** the need for realignment of the existing freight railroad tracks between Garden Street and Plainfield Street as required in the Northeast Alternative. This is a major benefit of this alternative which potentially reduces project complexity and associated costs and project timelines.

However, a trail on the southwest side of the tracks presents design challenges to a key objective of trail planning in this corridor – connectivity to properties fronting Homestead Avenue as an amenity in future redevelopment of these parcels. To mitigate this concern, this alternative features connections to the north side of the railroad tracks on average of every 1/3-mile intervals. These connections are located as follows:

- **Garden Street:** Connection to Homestead Avenue can be achieved with the existing at-grade crossing of Garden Street. A connector trail and/or streetscape fronting Garden Street and Homestead Avenue could be constructed to connect to 51 Homestead Avenue.
- **West of Sigourney Street:** Connection to Homestead Avenue in the vicinity of Sigourney Street is proposed as a new trail bridge over the rail line connecting the main alignment of the Southwest Alternative to Homestead Avenue. This trail bridge would utilize the City of Hartford property at 135 Homestead Avenue and could be incorporated into redevelopment of city-owned property at 319/325 Sigourney Street. A north-side connector trail under Sigourney Street (through the unoccupied bridge span similar to that proposed on the south side) could connect to redevelopment at the city-owned property at 111 Homestead Avenue and Saint Francis-owned property at 51 Homestead Avenue. Key considerations should include ADA compliance and adequate vertical clearance for the railroad below. Initial planning in this memorandum assumed a vertical clearance similar to that of Woodland Street (18-feet), however this should be evaluated further in future design stages of trail development in the corridor in coordination with CTDOT.

  Review of other connections to Homestead Avenue in the area of Sigourney Street included:

  - An at-grade trail crossing of Sigourney Avenue - Dismissed due to safety concerns of trail crossing Sigourney Street due to traffic volumes and speeds and potential impacts to a residence at 306 Sigourney Street.
  - Providing secondary connector trail ramping up to the Sigourney Street bridge – While likely feasible, this option was not preferred as this would result in two narrower side-by-side trail alignments with a retaining wall of significant height between 10-20 feet. The primary alignment would be located closer to the railroad tracks. This alignment would serve as the mainline of the trail and be routed under an unoccupied span of the Sigourney Street bridge. Immediately adjacent to this alignment to the south (towards Sargeant Street) would be a connection ramp which would connect to Sigourney Street.

Given the grade separation of 10-20 feet between the two trail alignments near Sigourney Street, there would be the need for a retaining wall of significant size (both height and length) in this area. This retaining wall could be imposing for trail users and distract from the trail environment sought in the corridor.

- **Woodland Street:** Connection to Homestead Avenue is accomplished with ramp connector trails between the trail mainline and the south side of the Woodland Street bridge on either side of the bridge. On the east side of the bridge this utilizes city-owned property at 158 Woodland Street, while the west side of the bridge utilizes privately held property at Woodland Drive. The connection to Homestead Avenue could be improved with a connector trail and/or streetscape on the Woodland Street bridge to connect to Homestead Avenue.
- **Baltimore Street:** Connection to Homestead Avenue is proposed via an at-grade railroad crossing to city-owned property at 395 Homestead Avenue. This connection could be complemented with a connector trail on the north side of the railroad tracks which could connect to multiple parcels on the north side of the railroad tracks. While it is expected that this at-grade crossing may need to clear significant permitting and/or legal hurdles (for example, at-grade crossing within Connecticut require an act of the state legislature), this at-grade crossing ***is not*** necessary for the completion of the mainline of the trail and could be implemented in a future phase following the completion of the mainline of the trail. Furthermore, additional at-grade crossings are generally viewed as undesirable by CTDOT Office of Rail due to safety concerns.
- **Route 44 (Albany Avenue):** Connection to Homestead Avenue can be accomplished via the Albany Avenue sidepath currently in design by the City of Hartford. The sidepath is anticipated to be located on the northside of Route 44. Ample ROW between Route 44 and private property on the north side of the road allows the space needed for an exit from the proposed culvert and connection to the sidepath planned by the City.

Cross sections in the following pages show critical locations of the trail between Garden Street and Route 44. Note, full cross sections for all locations are available in the Appendix.

- Exhibit 35 shows the southwest alternative near 51 Homestead Avenue. At this location, the alternative would require an easement. The existing fence line would be reconstructed and slightly shifted closer to the railroad.
- Exhibit 36 shows the southwest alternative between Sigourney Street and Woodland Street. The ROW is approximately 100-feet in this location. In this area, the trail would be constructed approximately 32-feet off the railroad center, and up part of the embankment closer to the multi-family housing which fronts Sargeant Street. This would allow the trail to tie into a proposed bridge connecting to the parcels fronting Homestead Avenue as discussed previously.

- Exhibit 37 shows the southwest alternative just east of Woodland Street. At this location there is a constraint with Austin Organs building, however this pinch point is not consistent due to the building layout and geometry of the train tracks. The southwest alternative would then pass under Woodland Street via a new culvert south of the existing bridge span.
- Exhibit 38 shows the southwest alternative in the area of Route 44. This alternative would see a new culvert built under Route 44 just west of the existing bridge span.

Between Route 44 (Albany Avenue) and Plainfield Street, this alternative is proposed to be routed on City of Hartford-owned property as part of the redevelopment of the Village at Park River. The closest features within this site (parking lot) are approximately 100-feet offset the railroad centerline. The area between the parking lot and Griffin Line was utilized as excess site fill during the redevelopment of the site and currently features a berm in this area. This may need to be considered in the siting of a trail in this location. The redevelopment of this site also includes a shared use path through the site development which was considered in alternatives through this area in the Homestead / Mark Twain Alternative.

Exhibit 35: Cross Section excerpt of the Southwest Alternative, Location 1 (at 51 Homestead Avenue). See the Appendix for all cross sections.

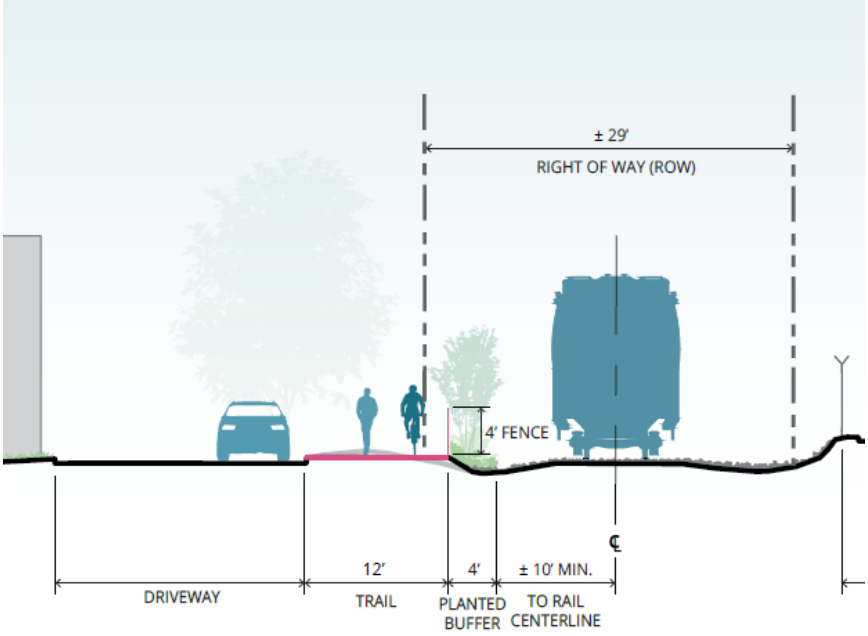


Exhibit 36: Cross Section excerpt of the Southwest Alternative, Location 3 (between Sigourney Street and Woodland Street). See the Appendix for all cross sections.

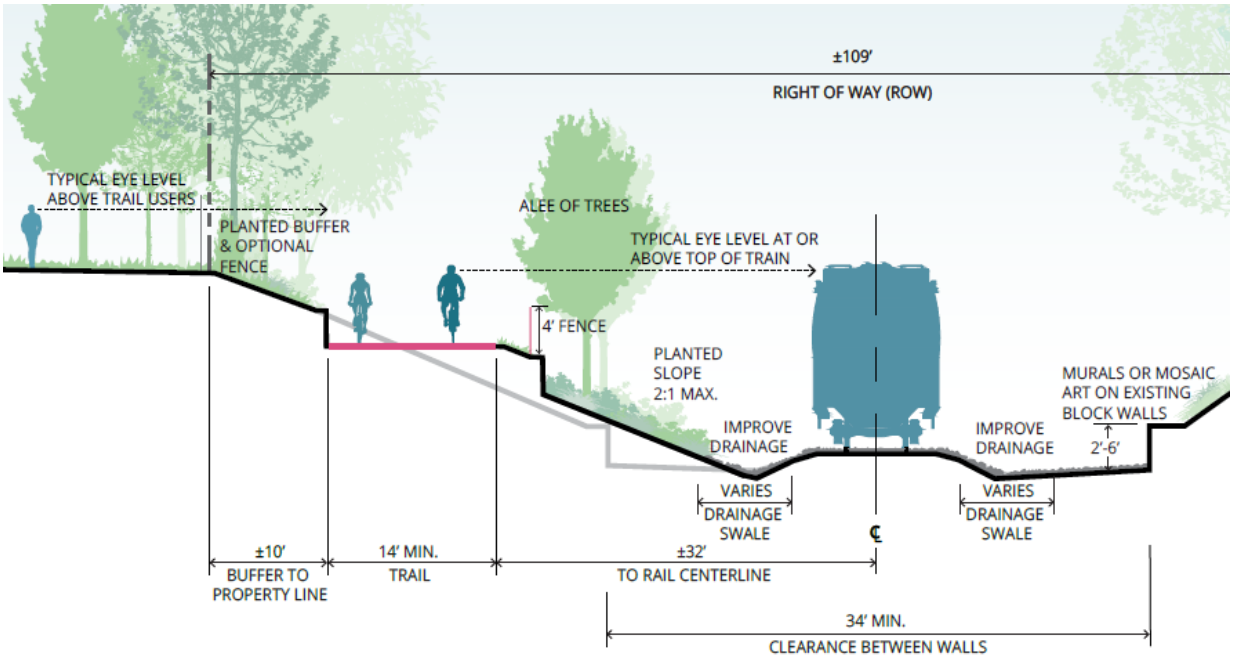


Exhibit 37: Cross Section excerpt of the Southwest Alternative, Location 4 (at Woodland Street). See the Appendix for all cross sections.

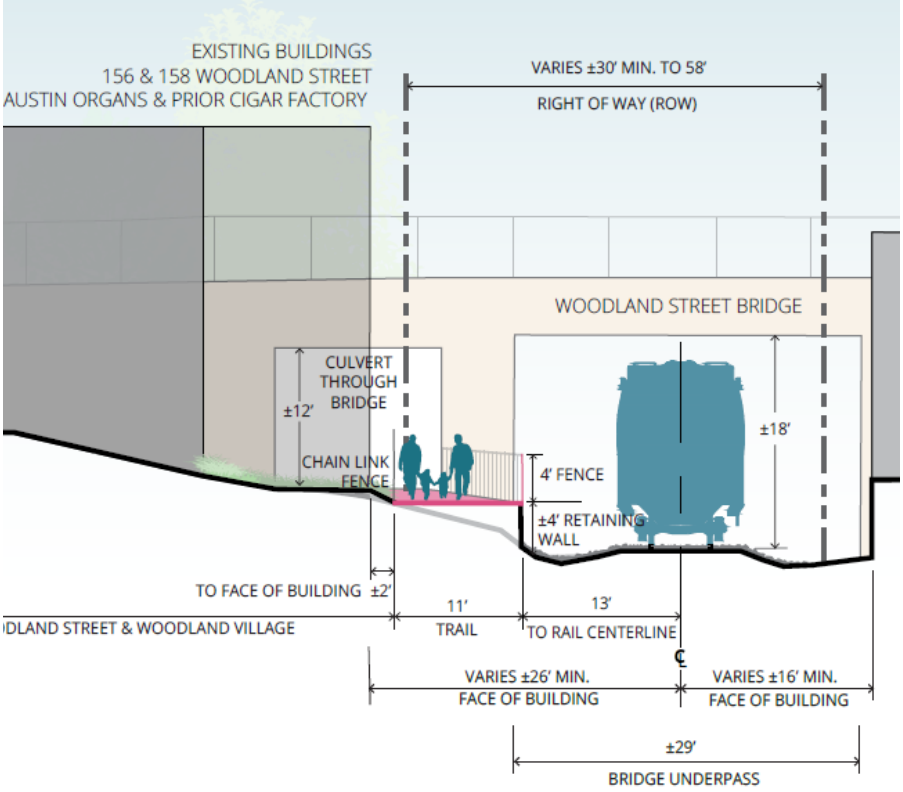
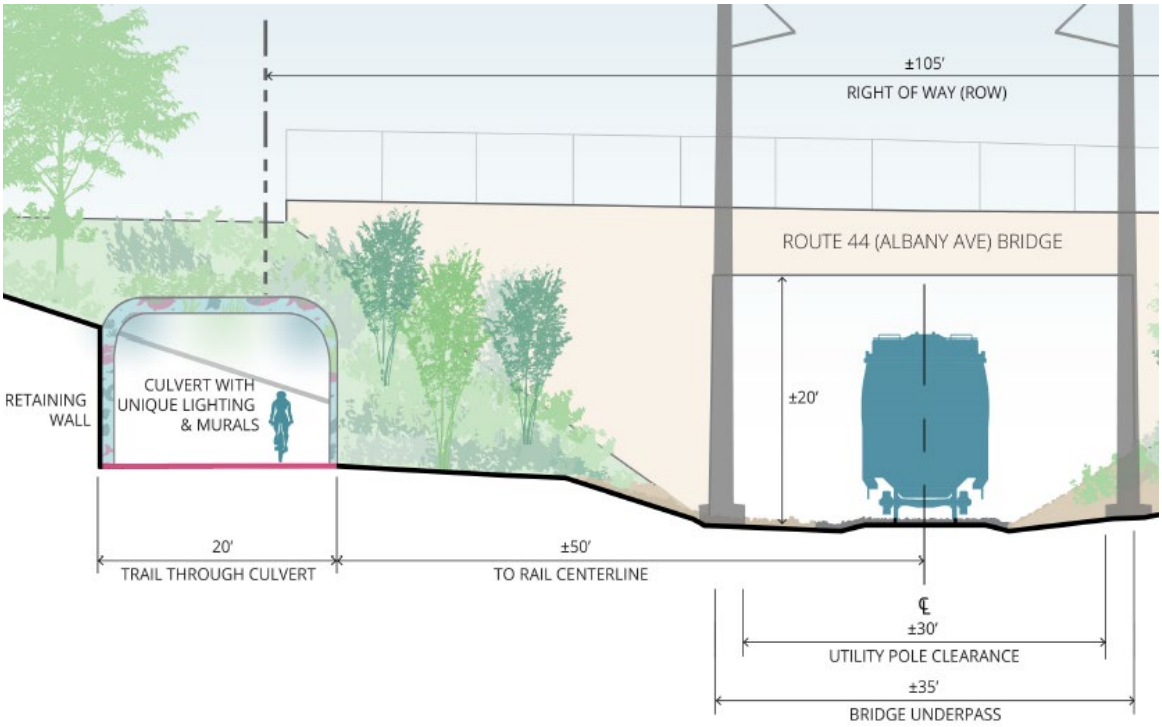


Exhibit 38: Cross Section excerpt of the Southwest Alternative, Location 8 (at Route 44). See the Appendix for all cross sections.



Plainfield Street to Tobey Road

The Southwest Alternative continues along the Griffin Line between the rail line and the Annie Fisher Magnet School until it turns west to follow the ballfields to connect with Mark Twain Drive. This section is characterized by existing pylons and Eversource easement 15-foot off center on both sides of the rail line. Generally, a trail within the ROW, but within Eversource easement, is feasible outside the pylons located in this area. Coordination with Eversource should be undertaken in future stages of the project, and key considerations are listed in the Preferred Alignment section below.

The shift to Mark Twain Drive is necessary due to environmental constraints between the Annie Fisher School and the University of Hartford campus including surface water (pond), wetlands, floodplains, a culvert, and significant slopes adjacent to the rail line. The trail continues as a sidepath on Mark Twain Drive to the access point at the University of Hartford.

Access between Mark Twain Drive and the Griffin Line corridor must traverse University of Hartford property. This entrance to the UHart campus is currently gated at all times for vehicular and non-motorized users. A new trail alignment here could result in a potential new connection into the campus. Additionally, a trail connection between Mark Twain Drive and the Griffin Line could require changes at the "Lot G" parking lot.

This alternative continues north within Griffin Line ROW within the Eversource easement and outside the existing pylons which are approximately 15-foot off center of the rail line. It is recommended that fencing ***is not*** installed on the UHart side of the path as this would result in a narrow corridor approximately 20-feet in width between the

rail-side fence and a fence along Hawk Drive. A narrow width between two fence lines should generally be avoided in trail development.

North of the UHart campus, the alternative traverses through UHart-owned parcels to Tobey Road in Bloomfield. This area features pockets of wetlands which should be considered during a future design stage.

Homestead / Mark Twain Alternative

In addition to alternatives within the Griffin Line, the Homestead / Mark Twain Alternative identifies a route which is immediately adjacent to, but outside of, the Griffin Line corridor. This alternative was identified to fully compare options for a trail within the corridor. A summary map of this alternative is shown in Exhibit 39. This alternative included:

- **Homestead Avenue:** The concept would include a reconstruction of Homestead Avenue for approximately 1.1-miles between Garden Street and Route 44 (Albany Avenue) to allow for the inclusion of a 12-foot shared-use sidepath on the south side of the street. While this roadway varies in width throughout, the most constrained section near Burton Street is currently 36-ft curb-to-curb within a 50-ft ROW. The proposed cross section for this alternative in this location is shown in Exhibit 40. While separated pedestrian and bicycle facilities may be preferred, the 50-foot ROW in some areas of this roadway may preclude this feature. The concept also includes work to reconfigure traffic signals at Sigourney Street and Woodland Street to accommodate the trail.
- **Route 44 (Albany Avenue):** This alternative would incorporate a portion of the Route 44 (Albany Avenue) sidepath currently in design by the City of Hartford between Westbourne Parkway and Mark Twain Drive.
- **Mark Twain Drive:** This alternative would include the construction of a sidepath on the west side of Mark Twain Drive between the roadway and the Park River. While the concept anticipates that a sidepath could be constructed to the west of the existing curbline, environmental constraints related to the Park River should be considered in siting a sidepath in this location. Alternatively, Mark Twain Drive could be narrowed to allow for the construction of a sidepath which could reduce any environmental impact of this concept. Modifications to Mark Twain Drive is not included in the estimate of this alternative. Additionally, a secondary alignment was identified through the Village at Park River which utilizes the existing shared-use path through that site development and shown in Exhibit 41. Coordination with the developer and residents should be a part of the process if this route should be selected, and consideration for the use of this trail (e.g., front doors of town homes are located on the trail) should be considered.

Alignments outside the Griffin Line corridor between Plainfield Street and Tobey Road were considered but are not included in this alternative. The Southwest Alternative in this area already includes significant routing off the Griffin Line corridor with a sidepath on Mark Twain Drive north of Plainfield Street and utilization of University of Hartford-owned property. If an alternative entirely outside the Griffin Line ROW is preferred, the Southwest Alternative could be modified slightly to be entirely within Mark Twain Drive ROW and UHart-owned property.

A key consideration for any alternative is the number of at-grade crossings required. With each at-grade crossing there is additional safety risk for a trail route as this introduces conflict areas between vehicles and trail users. Additionally, at-grade crossings could limit the appeal for the trail route for trail users (especially for less

experienced trail users such as children). While both rail-with-trail alternatives have **zero** at-grade crossings between Garden Street and Plainfield Street, this alternative could have **four** at-grade crossings of roadways with additional crossings of driveways. These at-grade crossings should be considered in review of a preferred alternative as they pose safety risk for trail users.

Exhibit 39: Homestead / Mark Twain Alternative summary map.

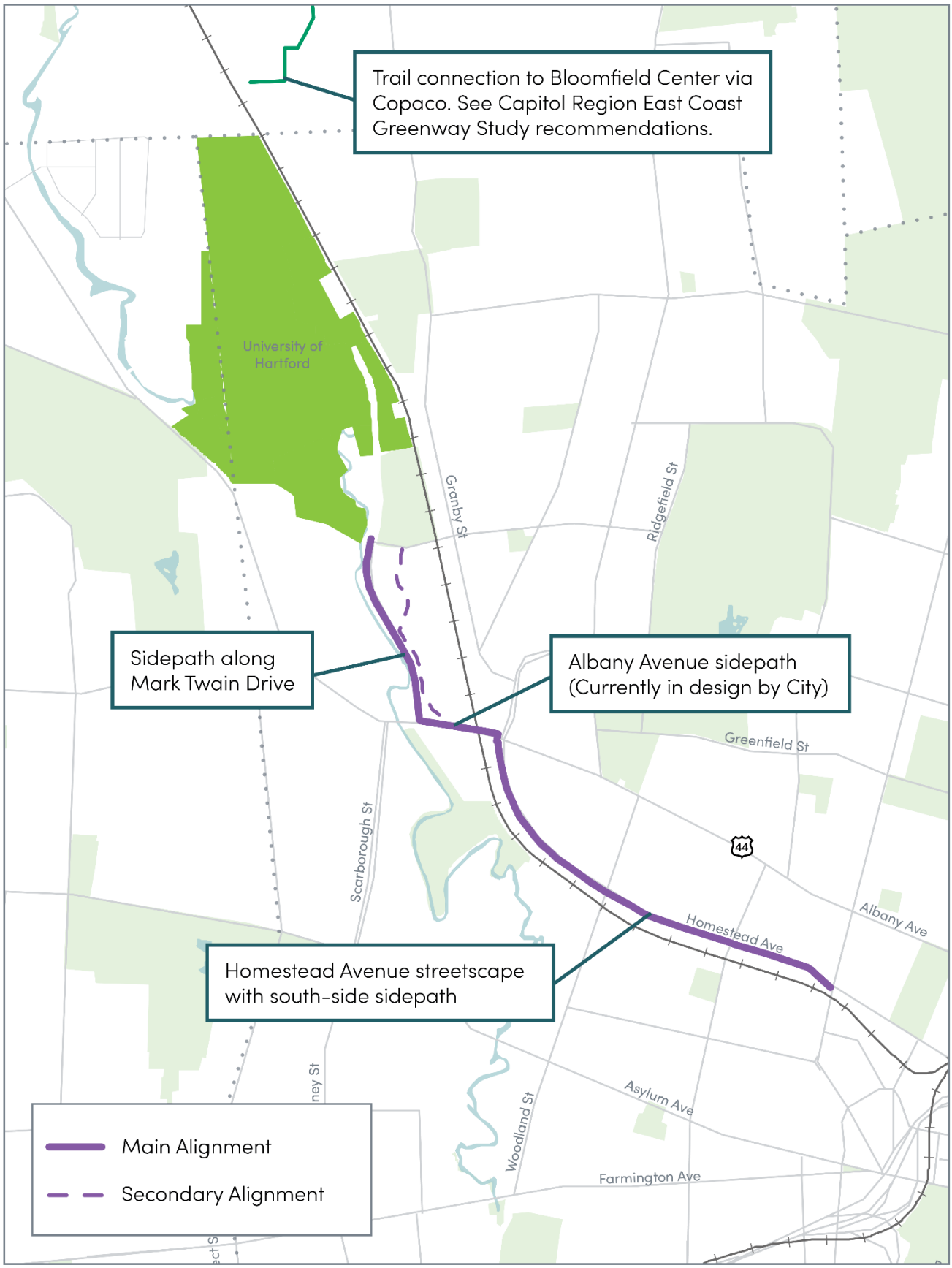


Exhibit 40: Proposed cross section for Homestead Avenue east of Burton Street for the Homestead / Mark Twain Alternative.

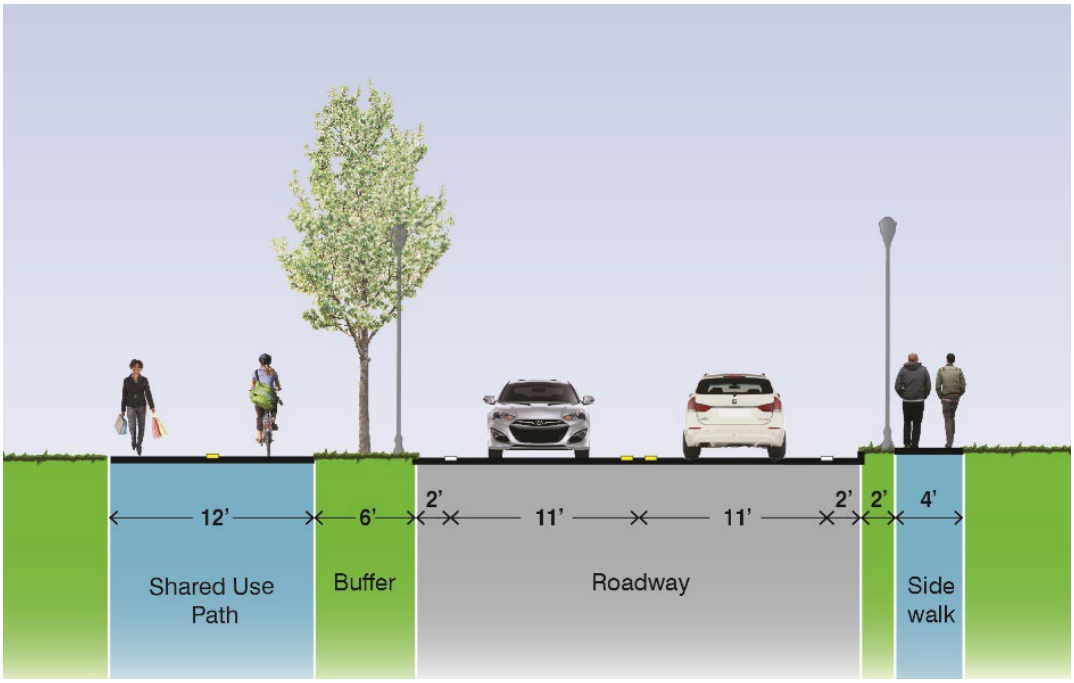


Exhibit 41: Shared use path through the Village at Park River redevelopment currently partially finished.

Alternative Comparison

In order to select a preferred alternative, a comparison of all three alternatives is presented. These alternatives are reviewed against the following criteria:

- **Order-of-Magnitude Costs:** Rough, order-of-magnitude costs are prepared for planning purposes only. Higher cost trails may be harder to fund and complete.
- **Potential Economic Benefits:** Considerations for how a trail may or may not impact economic development opportunities in the corridor.
- **Anticipated Project Complexity / Duration:** While a construction schedule is not set as part of this memorandum, it is generally assumed that additional project elements and stakeholders could increase project duration by several years or more. A trail which can be completed within a reasonable time horizon is preferred.
- **Rail & Traffic Safety for Trail Users:** A safe trail design for all users, especially trail users, is paramount. In the context of trail design within the railroad ROW, key considerations could include at-grade crossings of the railroad, and any separation and/or barriers proposed to prevent trespassing on the railroad. However, safety of a potential trail within the railroad ROW should be compared to alternatives of a trail routing alternatives within a roadway ROW. In many cases, alternatives within the roadway ROW will include additional at-grade crossings which could pose greater safety risk to trail users compared to rail-with-trail alternatives. Findings reported in the *RWT Guide* suggest that the vast majority (81%) of fatalities within rail corridors are related to individuals who intended suicide (Pg. 20 of RWT guide). This statistic underscores the differences in safety considerations when comparing trail options within a railroad corridor versus roadway corridor.
- **Trail Connectivity to Adjacent Properties, Neighborhoods and Destinations:** Considerations for how well alternatives interconnect to adjacent properties, especially properties with redevelopment potential, and the surrounding neighborhoods.
- **Impacts to Railroad Operations during Construction:** Considerations for railroad operations during construction could include periodic or prolonged closure of the railroad to allow for realignment. Any interruption in rail service and operations is viewed as highly unfavorable by CTDOT Office of Rail.
- **Impacts to Railroad Operations post-Construction:** Considerations for railroad operations following construction. For example, trails in close proximity to railroads may need to be shut down during maintenance activities.
- **On-Going Operations, Maintenance and Security Costs:** Considerations for on-going operations, maintenance, and security for the trail, especially for locations that may not be visible from adjacent streets.

Order-of-Magnitude Costs

Order-of-magnitude cost estimates for each alternative are detailed in the Appendix and summarized in Exhibit 42. These are derived based on a base cost for development of a 14-foot trail plus major infrastructure items required for each alternative.

Cost estimates for the Homestead Avenue alternative are based on the assumption that major reconstruction to reduce roadway widths to accommodate lateral space for a trail would be required. This would require major infrastructure modifications to curb lines and associated impacts to drainage. In addition, signalized intersections at Sigourney Street and Woodland Street would require substantiative modifications. Order-of-magnitude costs for this section are based on general streetscape costs for major reconstruction recently completed or underway in the city (Maple Avenue, Farmington Avenue, Jewell Street etc.). Mark Twain Drive does not carry the same costs for major reconstruction or streetscape improvements as it is assumed that a trail to the west of the current curbline could be constructed with minimal impact to the Mark Twain Driveway roadway.

Each alternative is broken into two segments, Garden Street to Plainfield Street and Plainfield Street to Tobey Road. This matches alternative descriptions above and reflects a preferred alignment that could utilize the existing at-grade crossing at Plainfield Street to align with the most logical route.

Exhibit 42: Order-of-Magnitude Cost Estimates for Each Alternative (for planning purposes only)

	Northeast Alternative	**Southwest Alternative**	**Mark Twain Drive / Homestead Avenue**
Garden Street to Plainfield Street	$31 - $38 M	$26 - $33 M *	$24 - $30M
Plainfield Street to Tobey Road	$4 - $6 M *	$4 - $6 M	No Alignment Identified**
Total	**$35 – 44 M**	**$30 – 39 M**	**N/A****

Notes:
* Denotes selected alternative of the Preferred Alignment. Preferred Alignment total cost approximately **$30-39M.**
** The Mark Twain Drive / Homestead Avenue alternative only covers the area between Garden Street and Plainfield Street. Thus, no total cost is reported. The Southwest Alternative could be utilized for an off-corridor alternative in this area utilizing property owned by the University of Hartford.

Economic Development Considerations

Economic development considerations were explored by E-Consult Solutions Inc. (ESI), a consulting firm specializing in the evaluation of economic and fiscal outcomes of programs and developments across various government agencies. ESI documented several items for consideration when determining a preferred alignment through the Griffin Line corridor. A *quantitative* analysis of the two alternatives was first proposed, however, following discussions with ESI this was modified to a *qualitative* review as presented here. This was based on discussions that there would be very negligible differences between the two trail alignments. These considerations are presented in a separate memorandum within the Appendix and summarized below:

	Southwest Alternative	Northeast Alternative
Trail usage as a driver of economic impact	*Pros:* • Trail could play supporting role in economic development.	*Pros:* • Trail could play supporting role in economic development.
	Cons: • Active rail line could discourage rail use.	*Cons:* • Active rail line could discourage rail use.
Property value impacts	*Pros:* • Could modestly boost values of complementary uses (residential, job centers, pedestrian friendly commercial areas)	*Pros:* • Could modestly boost values of complementary uses (residential, job centers, pedestrian friendly commercial areas)
	Cons: • No impact to industrial or large-footprint commercial areas.	*Cons:* • No impact to industrial or large-footprint commercial areas.
The trail's role in Homestead Avenue's economic development	*Pros:* • N/A	*Pros:* • Direct access to properties on Homestead Avenue
	Cons: • No direct access to Homestead Avenue. Access can be mitigated with frequent crossing points.	*Cons:* • Adjacent vacant or underutilized properties on Homestead Avenue may discourage trail usage
Trade-offs involved in removing rail access to nearby properties	*Pros:* • N/A	*Pros:* • N/A
	Cons: • N/A	*Cons:* • Trail on north side removes future potential for cargo transport by rail for industrial parcels on Homestead Avenue

Other Considerations

All other considerations noted above are discussed in Exhibit 43 below. This includes comparison of the following:

- Anticipated Project Complexity / Duration
- Rail & Traffic Safety for Trail Users
- Trail Connectivity to Adjacent Properties, Neighborhoods and Destinations
- Impacts to Railroad Operations during Construction
- Impacts to Railroad Operations post-Construction
- On-Going Operations, Maintenance and Security Costs

Exhibit 43: Other Considerations for Each Alternative (Continues on following pages)

	Extent	Southwest Alternative	Northeast Alternative	Mark Twain Drive / Homestead Avenue
Anticipated Project Complexity / Duration	*Garden Street to Plainfield Street*	• ROW and site work at 20 Sargent St could add complexity to project. • Woodland Street bridge could add complexity to the project. However, alternative to cross at-grade at Woodland Drive provides interim option. • Trail bridge and at-grade rail crossing could add complexity to the project. However, these connector trails could be programmed in a future phase.	• Realignment of railroad and relocation of transmission towers could add several years to project duration. • Woodland Street bridge replacement (with wider span) could add complexity to the project. Additionally, this may require repayment of original grant money to FHWA.	• Streetscape project may disrupt traffic flows and business access. Accommodations of traffic flow and access may add complexity to the project and could add to project duration.
	Plainfield Street to Tobey Road	• Significant coordination with the University of Hartford is required. Securing permanent easements and acceptance of design considerations (e.g., no fence on university side) may be difficult. • Coordination with Eversource required for trail construction in Eversource easement.	• Locating the trail behind Granby Street residences may require additional outreach and coordination. • Coordination with Eversource required for trail construction in Eversource easement.	

Exhibit 43: Other Considerations for Each Alternative (Continued)

	Extent	Southwest Alternative	Northeast Alternative	Mark Twain Drive / Homestead Avenue
Rail & Traffic Safety for Trail Users	*Garden Street to Plainfield Street*	• Greater separation from RR vs. Northeast Alternative. Some sections of trail (approx. 1,200 LF or 13% of segment) are within 10-20 feet of rail center. • Mid-height (4-6-foot) fencing mitigates trespassing concern on railroad. • At-grade rail crossing for connector trail to Baltimore Street poses risks which will be mitigated in design.	• Significant lengths of trail (approx. 5,150 LF or 57% of segment) within 10-20 feet of rail center. • Mid-height (4-6-foot) fencing mitigates trespassing concern on railroad.	• Four at-grade crossings (Sigourney, Woodland, Albany, and Mark Twain Drive) pose highest risk for traffic / rail safety to trail users.
	Plainfield Street to Tobey Road	• Alternative includes sidepath along Mark Twain Drive. At-grade crossings of roadways likely required.	• Limited traffic & rail safety concerns.	

Exhibit 43: Other Considerations for Each Alternative (Continued)

	Extent	Southwest Alternative	Northeast Alternative	Mark Twain Drive / Homestead Avenue
Impacts to Railroad Operations during Construction	*Garden Street to Plainfield Street*	• Trail construction would require significant coordination with active railroad.	• Railroad may require periodic or prolonged closure during realignment.	• None
	Plainfield Street to Tobey Road	• Limited anticipated impacts.	• Limited anticipated impacts.	
Impacts to Railroad Operations post-Construction	*Garden Street to Plainfield Street*	• Railroad maintenance activities may require closure and/or use of trail.	• Railroad maintenance activities may require closure and/or use of trail.	• None
	Plainfield Street to Tobey Road	• Limited anticipated impacts.	• Limited anticipated impacts.	
Trail Connectivity to Adjacent Properties, Neighborhoods and Destinations	*Garden Street to Plainfield Street*	• Connector trails to northside of railroad provide good connectivity to Homestead Avenue and parcels with redevelopment opportunities.	• Alignment adjacent to Homestead Avenue properties allows for direct connection to trail in select locations.	• While trail is well connected within neighborhood, this design does not serve as a destination for the neighborhood.
	Plainfield Street to Tobey Road	• Connectivity integrated into UHart campus.	• Connectivity to Blue Hills neighborhood at electric substation, Weaver High School and/or Willow Creek Apartments • Connectivity to UHart maintained through connector trails and/or loop trail	

Exhibit 43: Other Considerations for Each Alternative (Continued)

	Extent	Southwest Alternative	Northeast Alternative	Mark Twain Drive / Homestead Avenue
On-Going Operations, Maintenance and Security Costs	*Garden Street to Plainfield Street*	• Trail may have time-of-day restrictions (e.g. closed at dusk) which could limit benefit for trail users. • Trail may require special security considerations / patrols. • Trail may require special maintenance operations to ensure state of good repair.	• Trail may have time-of-day restrictions (e.g. closed at dusk) which could limit benefit for trail users. • Trail may require special security considerations / patrols. • Trail may require special maintenance operations to ensure state of good repair.	• On street facility open 24/7. • No requirement for special maintenance and security operations.
	Plainfield Street to Tobey Road	• Much of trail is located within street ROW and could be open 24/7. • Partnership with UHart could limit the need for additional security considerations / patrols. • Routine maintenance agreements with UHart (e.g., snow removal) could be explored.	• Trail may have time-of-day restrictions (e.g. closed at dusk) which could limit benefit for trail users. • Trail may require special security considerations / patrols. • Trail may require special maintenance operations to ensure state of good repair.	
Other	*Garden Street to Plainfield Street*			• Parking would be eliminated on Homestead Avenue to allow for trail development in Homestead ROW.
	Plainfield Street to Tobey Road			

Summary Comparison

Based on the information summarized above, a relative qualitative ranking is provided in Exhibit 44 and Exhibit 45. These comparison charts are only meant to convey the strengths and weaknesses of each alternative.

●●● : High performing alternative

●● : Moderate performing alternative

● : Low performing alternative

Alternatives which rank similarly were assigned the same qualitative score if applicable.

Exhibit 44: Summary Alternative Chart for Study Area between Garden Street and Plainfield Street

	Southwest Alternative	Northeast Alternative	Mark Twain Drive / Homestead Avenue
Order-of-Magnitude Costs	●●●	●	●●●
Potential Economic Benefits	●●	●●	●
Anticipated Project Duration / Complexity	●●●	●	●●
Rail & Traffic Safety for Trail Users	●●●	●●●	●
Trail Connectivity to Adjacent Properties, Neighborhoods and Destinations	●●●	●●●	●
Impacts to Railroad Operations during Construction	●●	●	●●●
Impacts to Railroad Operations post-Construction	●●	●●	●●●
On-Going Operations, Maintenance and Security Costs	●●	●●	●●●

Exhibit 45: Summary Alternative Chart for Study Area between Plainfield Street and Tobey Road

	Southwest Alternative	Northeast Alternative
Order-of-Magnitude Costs	●●●	●●●
Potential Economic Benefits	●	●
Anticipated Project Duration / Complexity	●	●●●
Rail & Traffic Safety for Trail Users	●●	●●●
Trail Connectivity to Adjacent Properties, Neighborhoods and Destinations	●●	●●●
Impacts to Railroad Operations during Construction	●●●	●●●
Impacts to Railroad Operations post-Construction	●●●	●●●
On-Going Operations, Maintenance and Security Costs	●●●	●●

AGENCY AND STAKEHOLDER COORDINATION

Site Visit

A site visit was conducted on November 21, 2023, between Garden Street and Route 44 (Albany Avenue) with the following stakeholders:

- CTDOT – Office of Rail
- City of Hartford
- iQuilt Partnership
- CRCOG
- Central New England Railroad (CNZR)
- FHI Studio (Consultant Team)

Key takeaways and discussion points included:

- Narrow ROW at 20 Sargeant Street would require additional easement.
- iQuilt noted that 51 Homestead Avenue (St. Francis Hospital-owned parcel) will likely be targeted for redevelopment at some point in the near future. A trail could be incorporated as part of that site development within what is now private property. A city easement should be obtained to ensure access if this is the case.
- Secondary spans at Sigourney Street bridge could likely accommodate a trail. Similar modifications have been completed elsewhere in the state.
- The retaining wall between Sigourney Street and Woodland Street on the south side of the tracks has a plaque. This should be noted as a consideration to explore if this is a historic resource.
- A freight train passed stakeholders around 156 Woodland Street (Austin Organs) and demonstrated freight train movements through corridor. Some participants agreed that 20-feet offset is likely as close as desired to freight movements. The freight train is noisy, could kick off debris, and generally vibrates the entire ground the closer you are to the tracks.
- A culvert tunnel punch-through of the south side of the bridge at Woodland Street could be considered based on CTDOT feedback. This would require coordination with the owner of the bridge.
- The bridge at Woodland Street was completed in the mid-2000's and within its projected lifespan. If the bridge is rebuilt, the project may be required to refund FHWA for the federal share of the project. In addition, it may not qualify for additional federal grants for reconstruction.
- West of Woodland Street, the significant proximity of the adjacent buildings was noted. While the south side is generally clear, it appears that a drainage swale is in this area. While there may be evidence that

this area may be considered a wetland, it was generally observed by stakeholders to be of questionable quality. This should be considered during future design stages of the project.

- Near 367 Homestead Avenue, there is generally good clearance to the embankment which leads down to the Park River floodplain. This is narrower at an undersized culvert in this area, and it appears that some of this embankment has been washed out. This should be considered during future design phases of the project.
- The transmission pylons south of Route 44 (Albany Avenue) were noted as a significant obstruction.
- Participants accepted a potential culvert to the west of the existing Route 44 (Albany Avenue) bridge. This was noted as working well with the existing terrain.
- City DPW noted a concern for liability if fencing of at least moderate height is not included between a trail and rail, especially with children on the trail.
- The railroad recently upgraded the tracks to welded rail. However, there are many areas where the old tracks and ties are being stored within the corridor and have yet to be removed. There was a discussed concern about the pollution this poses within the corridor, such as lead and arsenic. This is especially a concern for participants due to the nearby Park River.
- Emergency access points should be considered throughout the corridor.
- City DPW wants to install drainage infrastructure to address flooding in the Granby Street corridor. This would need to cross the Griffin Line to be able to discharge to the Park River.

Exhibit 46: Stakeholder site walk on November 21, 2023

Feedback on Draft Memorandum

CTDOT Office of Rail

CTDOT Office of Rail provided comment to the draft report and a virtual meeting was held on Friday, March 8th, 2024 with CRCOG, the consultant team, and CTDOT Office of Rail representatives to discuss the draft report. Where possible, edits were incorporated into this memorandum. Other comments included:

- CTDOT Office of Rail maintains general concern for rail-with-trail alternatives as presented in the memorandum. CTDOT Office of Rail indicated preference for alternatives outside the railroad right-of-way such as the alternative within Homestead Avenue and Mark Twain Drive as explored in this memorandum.
- CTDOT Office of Rail maintains general concern and opposition to any proposed at-grade rail crossings for safety reasons.
- CTDOT Office of Rail maintains general concern and opposition to any consideration for removal of rail service, including review in this report to indicate future compatibility with potential other future corridor uses.

City of Hartford and the iQuilt Partnership

City of Hartford and iQuilt staff provided comment to the draft report during two virtual meetings held on February 29th and March 12th, 2024. Where possible, edits were incorporated into this memorandum. City and iQuilt staff expressed continued interest in rail-to-trail alternatives which would see full removal of rail service and rail infrastructure from the corridor. Much analysis requested related to a rail-to-trail alternative was beyond the scope of this memorandum.

RECOMMENDATIONS

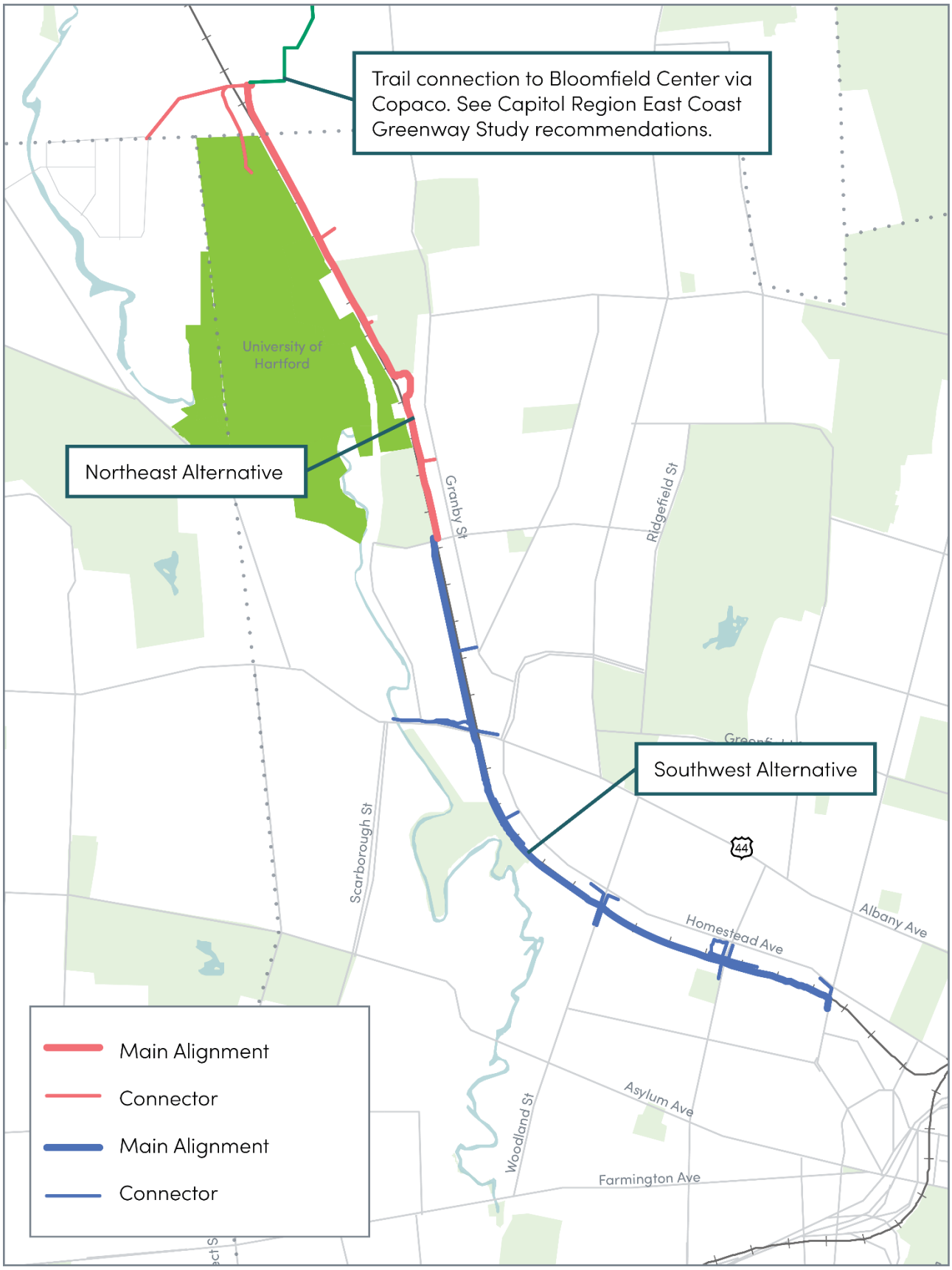
Overview

Based on the alternatives analysis, the Preferred Alignment is selected as follows:

- **Garden Street to Plainfield Street:** Southwest Alternative
- **Plainfield Street to Tobey Road:** Northeast Alternative

This option is shown in the summary map in Exhibit 47, while a detailed mapbook and concept plans are provided in the Appendix. While additional design details should be refined in the design stage of the project, Key Features of the Preferred Alignment are summarized below.

Exhibit 47: Preferred Alternative summary map. See Appendix for detailed mapbook.



Key Features

Trail Bridge West of Sigourney Street

A trail bridge west of Sigourney Street is proposed to link the main alignment of the trail located on the south side of the tracks in this location with potential development opportunities on the north side of the tracks along Homestead Avenue. A trail bridge allows seamless connection to these properties as well as to a North Side Connector Trail. A 3D rendering is shown in Exhibit 48 while Exhibit 49 shows the existing conditions in this area.

Exhibit 48: 3D rendering of view looking west from Sigourney Street with Preferred Alignment features

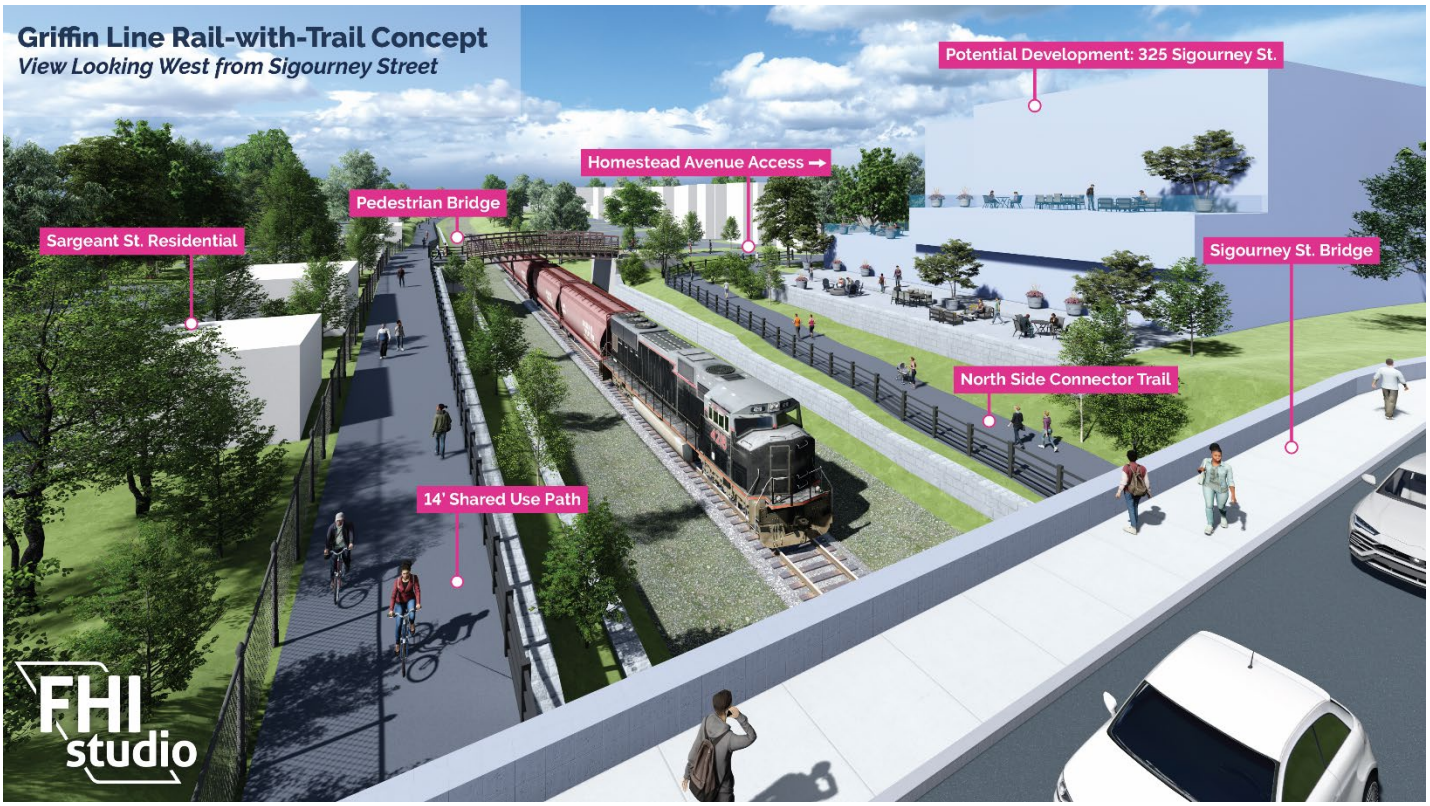


Exhibit 49: Existing photo of Griffin Line west of Sigourney Street

North Side Connector Trail

A North Side Connector Trail is proposed in several locations to provide access between key properties along Homestead Avenue to the main alignment of the trail on the south side of the railroad. This connector trail connects to several key properties along Homestead Avenue between Garden Street and Route 44 (Albany Avenue) including:

- 51 Homestead Avenue (Saint Francis Hospital-owned property)
- 111 Homestead Avenue (City of Hartford-owned property)
- 319/325 Sigourney Street (City of Hartford-owned property, trail fronting this property is shown in Exhibit 50)
- 333 Homestead Avenue (Salvation Army)
- 367/395 Homestead Avenue (City of Hartford-owned property)
- 419 Homestead Avenue (Interstate Battery)

Exhibit 50: 3D rendering showing northside connector trail looking west towards proposed trail bridge.

Fencing between Trail and Rail Line

Fencing between 4 to 5-feet in height is proposed throughout the study area. While no federal requirement for fencing design requirements for rail-with-trail exists, this matches best practices noted in FRA's and FHWA's *Rails with Trails: Best Practices and Lessons Learned* (e.g. the "RWT Guide") as well as of other trails as described within the Case Studies section of this memorandum (refer to Exhibit 51). Additionally, the RWT Guide notes that only 4% of rail-with-trail since 2000 has been installed *without* fencing or other type of barriers (*RWT Guide,* pg. 51)

The RWT Guide notes the following corridor characteristics should be considered when specifying fence design:

- Trail setback
- Type, speed, frequency of rail service on adjacent track with higher fencing being more appropriate for higher speed trains.
- Degree of trespassing concern – areas with infrequent legal crossings are more prone to trespassing and thus may be more appropriate for higher fences.
- Railroad maintenance requirements – taller fences may, in fact, *impede* maintenance activities.

In addition, the RWT Guide recognizes that:

> *While fencing can provide safety benefits and reduce trespassing, it also can reduce visibility. It is often important to maintain visual access to the trail corridor from adjacent land uses so that portions of the trail do not become isolated from public view. This is especially true in areas where perceived or actual levels of crime are high. Fence design in these instances should not block visual access to the trail corridor; a shorter height or transparent fencing style, such as chain-link, may be appropriate.*

Furthermore, the RWT Guide recognizes that vegetation, drainage ditches and/or vertical separation, where trails are located 10-feet or more higher than the adjacent rail line, all can reduce the concern for trespassing on the rail line, and similarly reduce the need for tall fencing or any fencing at all (*RWT Guide,* pg. 56). Many areas of the Preferred Alignment incorporate these design elements.

Efforts should be made during the design phase to choose an aesthetically pleasing fence design and one that does not preclude views within the corridor. Use of vegetation and plantings should be considered during the design stage which will further enforce the separation between the railroad and the adjacent trail. Not only can vegetation be a useful tool in mitigating trespassing concerns, but use of vegetation can also improve trail aesthetics to make the trail more inviting for users. Areas of the trail such as those shown in Exhibit 52 and Exhibit 53 will likely have fencing on both sides of the trail, underscoring the need to carefully design this element to ensure an inviting trail environment. The fencing separating the CTfastrak guideway and its adjacent shared use path was used as a design precedent. Furthermore, maintenance of needs of the adjacent railroad should be considered, and the RWT Guide notes that walls and solid barriers specifically may "impede access by railroad maintenance forces" (*RWT Guide,* pg. 53)

North of Plainfield Street, black, chain link-type fencing may be acceptable between the trail and railroad as the context of this area is substantially more rural in character, and the proposed fencing may be located further from the trail. The details for this fencing should be coordinated with Eversource to ensure compatibility within the transmission easement.

Exhibit 51: Diagram of trail fencing suggested by FRA and the FHWA in the Rail-with-Trail Guide

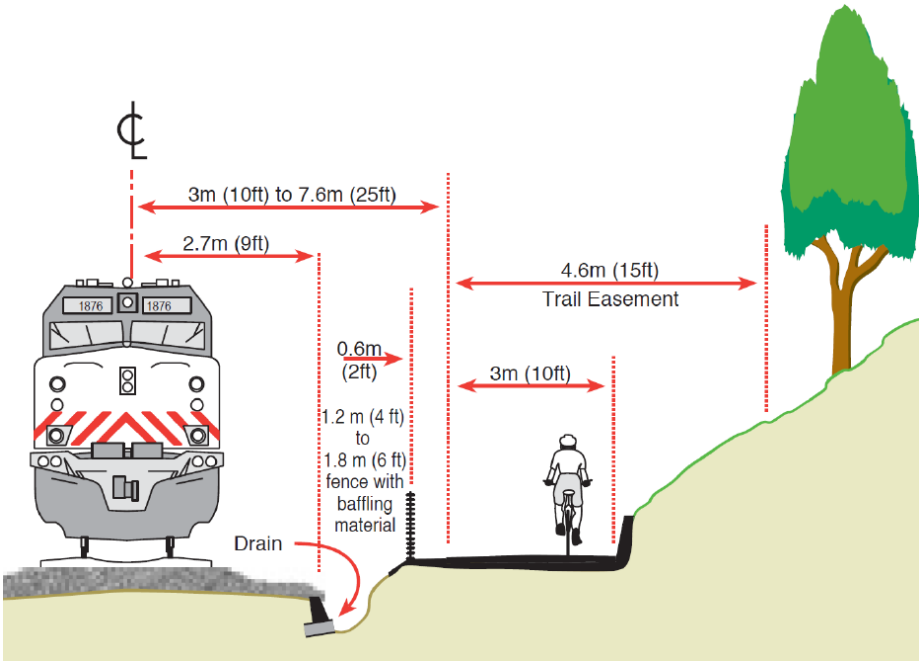


Exhibit 52: 3D rendering of mainline of the Preferred Alignment on the south side of the railroad. Note the fencing proposed between the trail and railroad.

Exhibit 53: Artistic rendering of Preferred Alternative looking west towards the Woodland Street bridge. Note the new culvert proposed to allow for the trail alignment. Austin Organs is shown on the left side of the photo.

At-Grade Crossing to Baltimore Street

Where feasible, the Preferred Alignment seeks to avoid at-grade crossings of the railroad. Grade separated crossings are preferred as there is no risk of conflict between trail users and the railroad. However, grade separated crossings are not feasible in all locations. This includes the connector trail proposed to Homestead Avenue at Baltimore Street. Grade separation was explored but determined as not feasible (a curvet was found to conflict within the flood plain while a bridge would have a very long runout for vertical clearance at ADA design standards).

This at-grade crossing may require substantial permitting and design considerations during the next phase of the project, including, but not limited to, an Act of the Connecticut Legislature. However, this at-grade crossing is not critical to the completion of the mainline of the trail alignment and can be phased after construction of the remaining pieces of the trail if desired. CTDOT Office of Rail has indicated that any additional at-grade crossings are highly undesirable.

Potential Deviations from Federal & State Guidelines

Deviations from Federal and State (CTDOT) guidelines are summarized below:

- **Trail Bridge Vertical Clearance to Railroad:** Section 9-4.0 of the CTDOT Design Manual requires that 20'-6" is maintained between the top of the rail to the bottom of the structure. Due to the proximity of the trail

underpass of Sigourney Street to the east, vertical clearance of the railroad may be limited to ADA design constraints. Initial planning work suggests a 20'-0" vertical clearance may be easily obtained, with additional vertical clearance possible with design tradeoffs that could be considered in a future design stage (such as bridge relocation further west, narrow trail segments with small switchback, use of north-side trail to east of proposed bridge [city-owned property allows for additional switchback to clear underpass of Sigourney Street Bridge], etc.). 20-foot vertical clearance is in excess of the existing clearance of the Woodland Street bridge of approximately 18-feet. Vertical clearance should be evaluated in further detail in the design stage of the trail compared to other requirements, including federal requirements.

- **Fencing Height**: CTDOT released initial guidelines for rail-with-trail constraints within the Griffin Line in 2023. The guidelines indicated a 7-foot fence be standard for trails setback 20+ feet from the railroad and a solid non-scalable barrier be standard for trails between 10 to 20-feet of the railroad (refer to Appendix and except graphic in Exhibit 23). As discussed above, these guidelines are in excess of similar rail-with-trail facilities in other jurisdictions as well as incompatible with the goals of rail-with-trail in the Griffin Line corridor. These requirements would result in unnecessary, imposing fencing which would visually constrain the corridor instead of connecting it to the surrounding community. As a result of the review of similar facilities, a shorter 4 to 5-foot fence is proposed along the extent of the corridor. Not only does this more closely align with rail-with-trail facilities completed by other agencies, but this also matches or exceeds fencing design between pedestrian areas of train stations and the adjacent railroads at some train stations in Connecticut including recently completed projects such as the CTrail Meriden Station shown in Exhibit 54.

Exhibit 54: Fencing between pedestrian areas leading up to the Meriden Train Station and the adjacent railroad tracks. (Source: Google Maps Streetview)

Coordination with Eversource

Coordination with Eversource will continue in future design stages of the development of any trail within their easements. Future considerations could include: 1) design requirements and offsets for Eversource access to pylon locations, 2) design requirements for any features under transmission corridors such as metal fencing, and 3) agreements for trail closures during Eversource maintenance activities.

Compatibility with Other Potential Future Corridor Uses

The Greater Hartford Mobility Study (GHMS, 2023) evaluated several future uses for the Griffin Line including rail options such as geographic expansion of freight services north of the current terminus at Day Hill Road in Bloomfield and passenger rail service and bus rapid transit options. While passenger rail service was eliminated from consideration as part of that study, the study identified bus rapid transit as feasible within this corridor. Additionally, iQuilt and the City of Hartford have expressed interest to see the corridor closed entirely to non-motorized uses and have advocated for the complete abandonment of the railroad and conversion of the entire right-of-way to a trail-only concept which could allow for additional space within the ROW for enhanced trail amenities.

Exhibit 55 and Exhibit 56 shows how the Recommended Alignment could be compatible with either of those future uses should they come to fruition.

Exhibit 55: 3D rendering of view looking west from Sigourney Street with Preferred Alignment and a potential Bus Rapid Transit alignment within the corridor.

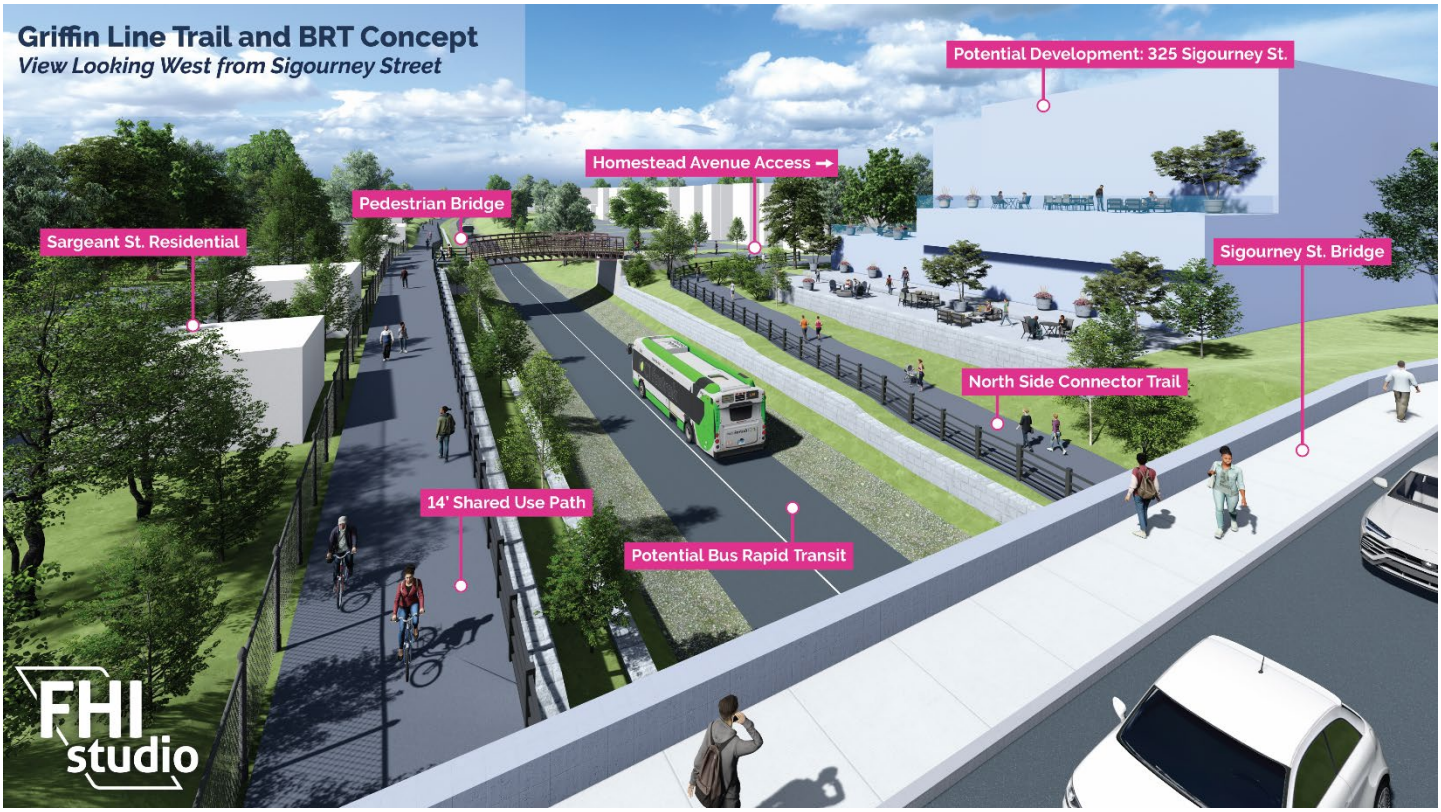


Exhibit 56: 3D rendering of view looking west from Sigourney Street with Preferred Alignment and rail abandonment. This concept would allow the entire corridor to support a shared use path and could allow for additional trail amenities.