Appendix J: Alternatives Screening

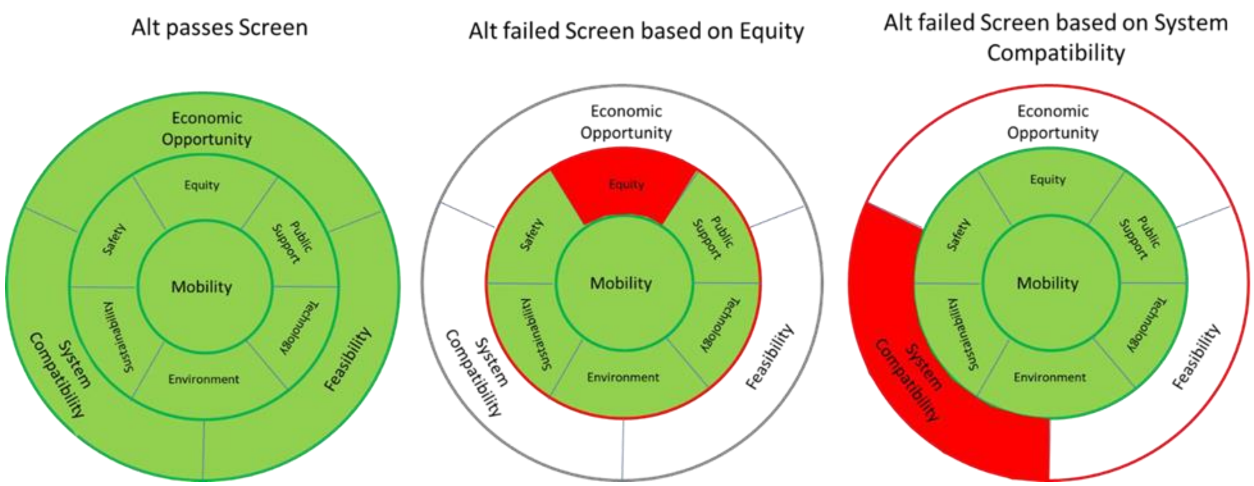
GREATER
HARTFORD
MOBILITY STUDY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

Purpose

The Alternatives Screening Tech Memo explains the detailed alternatives evaluation process and screening outcomes based on the established screening criteria. Multi-layered screening criteria were developed for conducting a detailed planning-level analysis for the identified alternatives that passed the high-level fatal flaws screening assessment in Phase 1 of the study. Considering that mobility has been the focus of this PEL study, core screening criteria related to multimodal mobility were established at the "bull's eye" of the screening process. Then a second layer of supporting screening criteria were established that were aligned with established study goals and finally a third layer of pragmatic and overarching screening criteria were established that aligned with the overall vision for the study
core mobility and supporting criteria. The screening assessment has been done at a planning level and it focused on assessing benefits or impacts related to each screening criteria. Critical flaw considerations were identified for most of the screening criteria that would support elimination of some alternatives from further consideration with appropriate documentation of the associated reasoning.

The following graphics illustrates examples of alternatives screening outcomes.



Key Components

The Alternatives Screening Tech Memo focuses on the following topics:

1. Screening Criteria Development
2. Screening Criteria Definitions
3. Summary of Overall Screening Outcomes
4. Detailed Screening Outcome Assessment for Each Alternative
5. Documentation of Eliminated Alternatives

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Screening Criteria Development

Multi-layered screening criteria were developed for conducting a detailed planning-level analysis in Phase 2 for the identified alternatives that passed the high-level critical flaws screening assessment in Phase 1 of the study. Considering that mobility has been the focus of this PEL study, core screening criteria related to multimodal mobility were established at the "bull's eye" of the screening process. Then a second layer of supporting screening criteria were established that were aligned with established study goals and finally a third layer of pragmatic and overarching screening criteria were established that aligned with the overall vision for the study.

Critical flaw assessment, established within Phase 2 of the study, builds upon the "high-level" critical flaw determinations in Phase 1. "High-level" critical flaw screening in Phase 1 only ensured that each alternative met at least one study goal, one identified need, aligned with local and regional plans, and has not been previously dismissed.

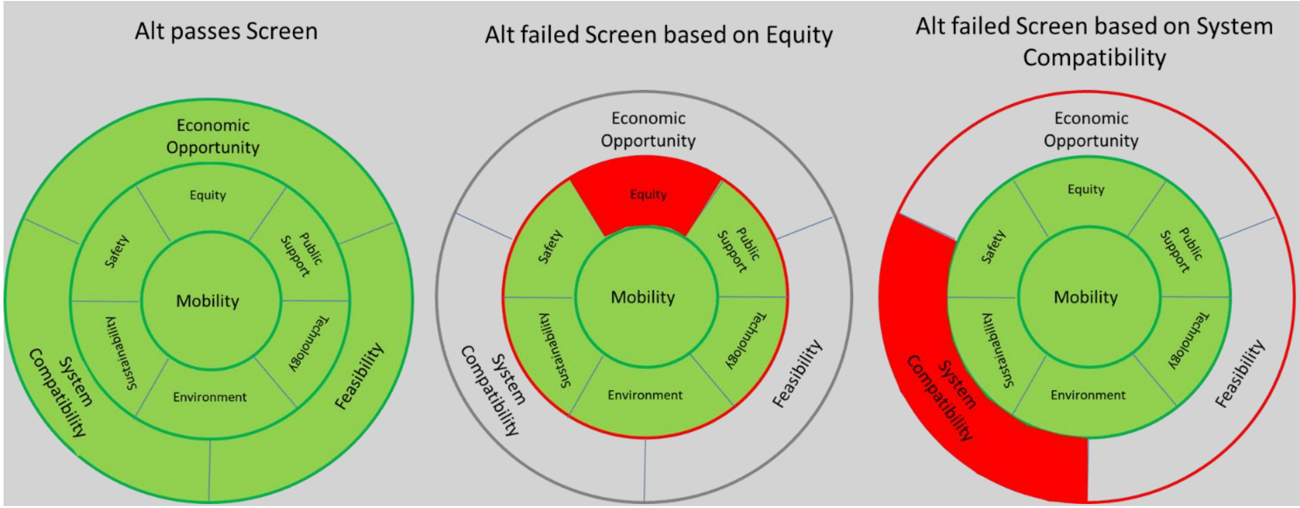
The screening evaluation framework was established to determine likely extent of benefit or impact each alternative would have based on the well-defined parameters associated with each of the screening criteria as shown below:

- High Benefit – Satisfies all aspects of the identified criteria.
- Moderate Benefit – Satisfies most aspects of the identified criteria.
- Low Benefit – Satisfies some aspects of the identified criteria.
- Neutral – Does not satisfy any of the aspects of the identified criteria, but also does not have any negative impacts.
- Low Impact – Has impacts to some aspects of the identified criteria.
- Moderate Impact – Has impacts to most aspects of the identified criteria.
- Critical Flaw – significantly and permanently impacts performance of the system that is not aligned with the overall transportation vision for the region and/or environmental review considerations. A critical flaw amongst any of the pertinent criteria is cause for elimination of the alternative from continuing onto the next phase of the study.

It should be noted that not all criteria within this screening process have been determined to have critical flaw parameters. For example, criteria like Travel Convenience and Options, Public/Stakeholder Acceptance, Future Technology Accommodation do not have any critical flaw parameters. For every alternative that was eliminated due to a potential critical flaw, appropriate reasoning/description has been provided in this technical memorandum.

As depicted in Figure 1, if an alternative was identified to have a potential critical flaw with one of the screening criteria, screening for the remaining criteria was not conducted. The parameters or aspects used to define benefit or impact level for each of the screening criteria are described below.

Figure 1: Screening Outcome Examples



Mobility Related Core Screening Criteria

As the primary screening consideration, the following three (3) mobility related criteria were used for benefit/impact assessment for each alternative. These factors align with the goals of improving the movement of people and goods, increasing transportation options, and improving the accessibility and reliability of travel.

1. Travel Time and Reliability
2. Access and Connectivity
3. Travel Convenience/Travel Options

Table 1 shows parameters used to define extent of benefit or impact for the above mobility related screening criteria.

Supporting Screening Criteria Based on Other Study Goals

The following six (6) supporting screening criteria were established based on the remaining study goals:

1. Promotes Equity
2. Enhances Safety
3. Improves Infrastructure, Resiliency, and Sustainability
4. Limits Adverse Impacts on the Environment
5. Supports Future Technology
6. Public/Stakeholder Acceptance

Table 2 and Table 3 show parameters used to define extent of benefit or impact for the above supporting screening criteria.

Economic & Pragmatic

The following three (3) overarching screening criteria were established that generally align with the study vision:

1. Feasibility, Complexity, and Right-of-Way (ROW) Needs

2. Economic Opportunity
3. Overall System Compatibility

Table 4 shows parameters used to define benefit or impact for the above overarching screening criteria.

Table 1: Mobility Screening Criteria Definitions

Change Outcome	Benefit/Impact Level	Mobility Screening Criteria (Figure 1)		
		Travel Time and Reliability	Access and Connectivity	Travel Convenience/Travel Options
Positive	High Benefit	Improves both travel time AND reliability; helps to eliminate one or more congestion hot spots	Improves both access to transportation facilities AND connectivity between compatible land use pairs and/or travel modes	Provides redundant travel option AND improves end user travel experience
	Moderate Benefit	Improves EITHER travel time OR reliability	Improves EITHER access to transportation facilities OR connectivity between compatible land use pairs and/or travel modes	Provides Either redundant travel option OR improves end user experience
	Low Benefit	Minor improvement in EITHER travel time OR reliability	-	Provides redundant travel option without any enhancement in end user experience
Neutral	No Change	No change in travel time or reliability	No access or connectivity improvement	No new travel option or user experience enhancement
Negative	Low Impact	Minor deterioration in travel time or reliability	-	No new travel option and some deterioration in end user experience
	Moderate Impact	Moderate deterioration in travel time or reliability	Deteriorates EITHER access to transportation facilities OR connectivity between compatible land use pairs and/or travel modes	No new travel option and major deterioration in end user experience
	Critical Flaw	Excessive deterioration in travel time or reliability when analyzed at systemic level	Excessively deteriorates both access to transportation facilities AND connectivity between compatible land use pairs and/or travel modes	-

Table 2: Supporting Screening Criteria Definitions - Equity, Safety, Resiliency

Change Outcome	Benefit/Impact Level	Supporting Screening Criteria		
		Promotes Equity	**Enhances Safety**	**Improves Infrastructure, Resiliency, and Sustainability**
Positive	High Benefit	No EJ impacts AND Creates opportunities for disadvantaged population	May support significant improvements in safety KPIs	Supports major VMT reduction OR aids directly to enhance sustainability
	Moderate Benefit	Minor EJ impacts outweighed by opportunities created for disadvantaged population	May support moderate improvements in safety KPIs	Either includes elements to enhance infrastructure resiliency OR encourages modal shift to non-auto mode OR aids indirectly to enhance sustainability
	Low Benefit	Moderate EJ impacts but also creates opportunities for disadvantaged population	May support minor improvements in safety KPIs	Supports minor modal shifts to non-auto mode but no other network resiliency and sustainability aspects
Neutral	No Change	No EJ impacts BUT no new opportunities for disadvantaged population	No change	No change in infrastructure resiliency; no mode shift potential; no sustainability aspects
Negative	Low Impact	Minor EJ impacts	May contribute to minor deterioration in safety KPIs	Potential for minor VMT increases but no negative impacts on network resiliency and/or sustainability
	Moderate Impact	Moderate EJ impacts	May contribute to moderate deterioration in safety KPIs	Either includes elements that can impact infrastructure resiliency negatively OR potential for moderate VMT increases
	Critical Flaw	Disproportionate impacts on disadvantaged population	May result in significant deterioration in safety KPIs	Excessive VMT increase as guaranteed outcome at systemic level OR critical impacts on network resiliency

Table 3: Supporting Screening Criteria Definitions - Environment, Technology, Public Support

Change Outcome	Benefit/Impact Level	Supporting Screening Criteria		
		Limits Adverse Impact on Environment	Supports Future Technology	Public and Stakeholder Acceptance
Positive	High Benefit	No impacts on built and/or natural environment	-	Significant public/ stakeholder support
	Moderate Benefit	Minor but mitigable impacts on built and/or natural environment	Consideration for supporting future technologies, if applicable	Moderate public/ stakeholder support
	Low Benefit	Moderate but mitigable impacts on built and/or natural environment	-	Some public/ stakeholder support but no opposition
Neutral	No Change	-	Neutral, the alternative does not inherently address Technology	No public/ stakeholder feedback
Negative	Low Impact	Minor and unmitigable impacts on built and/or natural environment	-	Minor public/ stakeholder opposition
	Moderate Impact	Moderate and unmitigable impacts on built and/or natural environment	No consideration for supporting future technologies, if applicable	Moderate public/ stakeholder opposition
	Critical Flaw	Severe and unmitigable impacts on built and/or natural environment	-	-

Table 4: Economic and Pragmatic Screening Criteria Definitions

Change Outcome	Benefit/Impact Level	Supporting Screening Criteria		
		Feasibility/Complexity/ Need for Additional ROW	Economic Opportunity	Overall System Compatibility
Positive	High Benefit	No additional ROW required; high engineering feasibility; minimal complexity	Creates economic opportunity for the region	Has independent utility and potential to support systemic enhancements
Neutral	No Change	ROW requirements have no negative impacts; standard feasibility/complexity	No change	Has independent utility but does not enhance system
Negative	Critical Flaw	ROW requirements have disproportionate impacts on disadvantaged population OR very low engineering feasibility due to excessive complexity	Excessive and long-term adverse impacts on economic opportunity	Does not have independent utility and/or adversely impacts transportation system

Screening Outcomes

Performance assessment of each alternative against the established multi-layered screening criteria led to an overall benefit assessment for every alternative that passed the detailed screening. A planning level order of magnitude cost was then determined for the alternatives passing this detailed screening based on similar projects in the region or based on assumptions related to standard unit costs (such as cost/mile of construction or operation). The cumulative assessment of overall benefits and planning level order of magnitude costs were then undertaken to determine planning level qualitative benefit-cost outlook with the following categories:

1. Benefits overwhelmingly exceed costs
2. Benefits exceed costs
3. Benefits balanced with costs
4. Costs exceed benefits
5. Costs overwhelmingly exceed benefits

Table 5 through Table 8 provide screening outcomes for Highway, Rail, Bus Transit and Bicycle/Pedestrian alternatives respective.

Table 9 provides documentation of identified critical flaws that led to eliminating certain alternatives from further consideration in this GHMS PEL Study.

See Appendix J-1 for detailed screening assessment of each identified alternative using the process explained in this document.

Table 5: Highway Alternatives

Alternative	Corridor of Significance	Implementation Timeframe	Planning Level Order of Magnitude of Cost	Benefit-Cost Outlook
Goodwin University and East Hartford Improved Connections	Study Core	Early Action	$100K	Benefits Exceed Costs
I-91 Coltsville Curve Realignment	Study Core	Early Action	$25M-$50M	Benefits Align with Costs
Truck Parking at Park and Rides	N, NE, S, SW	Early Action	$1.4M	Benefits Exceed Costs
I-91 Northbound Auxiliary Lane - Interchange 21 to 22	S	Early Action	$10M-$20M	Benefits Align with Costs
Reconfigure Intersection at Albany Avenue and Main Street	Study Core	Mid-Term	$15M-$30M	Benefits Exceed Costs
New South Meadows Local Road(s)	Study Core	Mid-Term	$200M-500M	Benefits Exceed Costs
Retreat Avenue Realignment	Study Core	Mid-Term	$4M-$10M	Benefits Align with Costs
Trident Mobility Improvements	Study Core	Mid-Term	$1M (Early Action) $10M (Mid-Term)	Benefits Exceed Costs
Albany Avenue/Route 44 Reconfiguration Study	Study Core, NW	Mid-Term	$750k-$1M	Benefits Exceed Costs
I-91 Southbound Capacity Improvements between Interchange 29 to 25	N	Mid-Term	$100M-$150M	Benefits Align with Costs
New East-West Connection, Newington	S, SW	Long-Term	$50M-$150M	Cost Exceeds Benefits
Route 175 Corridor Study	S, SW	Mid-Term	$500K	Benefits Exceed Costs
Cap I-91, Hartford	Study Core	Long-Term	$2B-$2.5B	Benefits Exceed Costs
I-84 Lowered Highway, Hartford	Study Core	Long-Term	$4B-$6B	Benefits Exceed Costs
New Connecticut River Bridge at Charter Oak Avenue/East River Drive	Study Core	Long-Term	$250M-$1B	Benefits Align with Costs
Whitehead Highway Reconfiguration	Study Core	Long-Term	$50M-$100M	Benefits Align with Costs

Alternative	Corridor of Significance	Implementation Timeframe	Planning Level Order of Magnitude of Cost	Benefit-Cost Outlook
Route 2 Lowered Highway - Willow Street to High Street	Study Core	Mid-Term	$500M-$600M	Cost Exceed Benefits
Pulaski Circle improvements	Study Core	Early Action	$10M-$19M	Benefits Exceed Costs
Rev. Moody Overpass Traffic Corridor (Formerly Hartford North End Congestion Reduction)	Study Core	Early Action	$3M-$4.5M	Benefits Exceed Costs
Bulkeley Bridge Conversion	Study Core	Long-Term	$2M-$5M	Benefits Exceed Costs
I-91/Route 2 Direct Connection	NW, SW	Long-Term	$900M	Benefits Exceed Costs
Regional Freeway System Interchange Completion: Route 5/Route 99 Interchange	S	Early Action	$10M-$15M	Cost Exceed Benefits
Regional Freeway System Interchange Completion: Day Hill Road/I-91 Interchange	N	Mid-Term	$40M-$50M	Cost Exceeds Benefits
Regional Freeway System Interchange Completion: I-84/ Route 4 Connector	NW, SW	Mid-Term	$200M	Benefits Exceed Costs
I-84/Route 6/Route 4/Route 9 Improvements	SW	Mid-Term	$171M	Cost Exceeds Benefits
Route 3 Northbound Weave Mitigation, Glastonbury	SE	Mid-Term	$70M	Cost Exceeds Benefits
I-84/I-91 Interchange - Northern Alignment	Study Core	Long-Term	$9B	Benefits Align with Costs
Putnam Bridge Replacement	S, SE	Long-Term	$471M	Benefits Exceed Costs
Ramp Closure(s) at High/Trumbull Streets, Hartford	Study Core	Early Action	$1.5M-$3M	Benefits Exceed Costs
Silas Deane (Route 99) Corridor Study, Wethersfield	S	Early Action	$500k	Benefits Exceed Costs
Develop and Implement Local Complete Streets Plans	All	Early Action	$300k-500k	Benefits Exceed Costs

Table 6: Rail Alternatives

Alternative	Corridor of Significance	Implementation Timeframe	Planning Level Order of Magnitude of Cost	Benefit-Cost Outlook
Hartford Line Upgrades (NHHS EA)	Study Core, N, SW	Early Action	$250M-$430M (double tracking); $940M (fleet upgrades)	Benefits Exceed Costs
286K Freight Rail Capacity Upgrade Study	All	Mid-Term	$400k	Benefits Exceed Costs
Dual-Mode Locomotives and Fleet Upgrades	Study Core, N, SW	Mid-Term	$81M	Benefits Exceed Costs
Expand Yard Storage and Maintenance Facilities	Study Core, N, SW	Mid-Term	$400k-$450k (study)	Benefits Exceed Costs
Griffin Line - Multimodal Alternatives	Study Core, NW	Long-Term	$18.9M	Benefits Exceed Costs
Infrastructure Hardening to Address Drainage and Flooding Vulnerabilities	Study Core, N, SW	Early Action	$400K-$500K	Benefits Exceed Costs
Electrify the Hartford Line	Study Core, N, SW	Mid-Term	$2B-$3B	Benefits Exceed Costs
Double Tracking into Union Station*	Study Core	Long-Term	$5.5M	Benefits Exceed Costs
Griffin Line - Rail Alternatives	Study Core, NW	Long-Term	$100M	Benefits Exceed Costs
Hartford Land Reclamation	Study Core	Long-Term	$5.5M	Benefits Exceed Costs
Providence Rail Access through Hartford	Study Core, NE	Long-Term	$4B-$5B	Benefits Align with Costs
Hartford Rail Viaduct Realignment and/or Reconstruction	Study Core	Long-Term	$5.5M	Benefits Exceed Costs
Connecticut River Rail Bridge	N	Mid-Term	$250M-$300M	Benefits Exceed Costs
New Rail Station in North Haven	Outside	Mid-Term	$50M-$70M	Benefits Exceed Costs
Strengthen Regional Identity with Branding and Wayfinding	All	Early Action	$1M-$10M	Benefits Exceed Costs
Rail Station Solar Canopies	Study Core, N, SW	Mid-Term	$2.6M (per acre)	Benefits Exceed Costs
Implement Rail Station Amenities	Study Core, N, SW	Early Action	*varies**	Benefits Exceed Costs
Mobility as a Service (MaaS)	All	Early Action	$2M-$5M	Benefits Exceed Costs
High Frequency Regional Rail	All	Early Action	$8B-$10B	Benefits Exceed Costs

**this alternatives costs vary significantly, please see the detailed documentation sheet*

Table 7: Bus Alternatives

Alternative	Corridor of Significance	Implementation Timeframe	Planning Level Order of Magnitude of Cost	Benefit-Cost Outlook
Support Microtransit Initiatives	All	Early Action	$200k-$1M (annual)	Benefits Exceed Costs
Mobility as a Service (MaaS)	All	Early Action	$600k	Benefits Exceed Costs
Support for TOD (Rail and Bus)	All	Long-Term	Varies by station	Benefits Exceed Costs
Improve Evening Service in Transit Priority Areas	All	Early Action	$2.5M-$3M	Benefits Exceed Costs
Enhance Service Frequency in Transit Priority Areas	All	Early Action	$7.5M-$8M (annual)	Benefits Exceed Costs
Serve Major Employment Centers	All	Early Action	$10M	Benefits Exceed Costs
Mobility Hubs	All	Mid-Term	$250k-$10M (site)	Benefits Exceed Costs
Enhance Bus Stop Amenities	All	Mid-Term	$22k-$80k (site)	Benefits Exceed Costs
Provide Transit Priority Infrastructure	Study Core, N, NE	Mid-Term	$37M	Benefits Exceed Costs
Griffin Corridor Bus Rapid Transit (BRT) Expansion	Study Core, NW	Long-Term	$635M	Benefits Exceed Costs
North Corridor Bus Rapid Transit (BRT) Expansion	Study Core, N	Long-Term	$120M	Benefits Exceed Costs
NE Corridor Bus Rapid Transit (BRT) Expansion	Study Core, NE	Long-Term	$240M	Benefits Exceed Costs
South Corridor Bus Rapid Transit (BRT) Expansion	Study Core, S	Long-Term	$190M	Benefits Exceed Costs
Bus Rapid Transit (BRT) over CT River	Study Core	Long-Term	$100M-$200M	Benefits Align with Costs
New Crosstown Routes	Study Core	Mid-Term	$6M	Benefits Exceed Costs
Route 30 Airport Service Enhancements	Study Core, N	Early Action	$4M	Benefits Exceed Costs

Table 8: Bicycle/Pedestrian

Alternative	Corridor of Significance	Implementation Timeframe	Planning Level Order of Magnitude of Cost	Benefit-Cost Outlook
Enhance Snow Clearing of Sidewalks Across the Region	All	Early Action	$300k	Benefits Exceed Costs
Complete Pedestrian Facilities along Day Hill Road, Windsor	N	Early Action	$900k	Benefits Exceed Costs
Complete Pedestrian Facilities along International Drive, Windsor	N	Early Action	$700k	Benefits Exceed Costs
Complete Pedestrian Facilities along Murphy Road, Hartford	Study Core	Early Action	$700k	Benefits Exceed Costs
Complete Pedestrian Facilities along Main Street, East Hartford	Study Core	Early Action	$350k-$400k	Benefits Exceed Costs
Complete Pedestrian Facilities along Charter Road, Wethersfield	S	Early Action	$250k	Benefits Exceed Costs
Provide Bicycle Network Servicing Windsor Station	N	Early Action	$2.1M	Benefits Exceed Costs
Provide Bicycle Network Servicing Hartford Union Station	Study Core	Early Action	$6M	Benefits Exceed Costs
Provide Bicycle Network Servicing Sigourney Street CT*fastrak* Station	Study Core	Early Action	$80k	Benefits Exceed Costs
Provide Bicycle Network Servicing Kane Street CT*fastrak* Station	Study Core	Early Action	$250k-$300k	Benefits Exceed Costs
Provide Bicycle Network Servicing Flatbush Avenue CT*fastrak* Station	SW	Early Action	$700k	Benefits Exceed Costs
Provide Bicycle Network Servicing Elmwood CT*fastrak* Station	SW	Early Action	$3M	Benefits Exceed Costs
Provide Bicycle Network Servicing Parkville CT*fastrak* Station	Study Core	Early Action	$500k	Benefits Exceed Costs
East Coast Greenway	Study Core	Mid-Term	$24M	Benefits Align with Costs
Riverfront Greenway	Study Core, N	Mid-Term	$9M	Benefits Align with Costs
South Branch Park River Greenway	Study Core, SW	Mid-Term	$3.5M	Benefits Align with Costs
Newington to Wethersfield Greenway	S, SW	Mid-Term	$6M	Benefits Align with Costs
Trout Brook Greenway	Study Core, NW	Mid-Term	$4M	Benefits Align with Costs
Bloomfield to Windsor Greenway	N	Mid-Term	$3M	Benefits Align with Costs

Alternative	Corridor of Significance	Implementation Timeframe	Planning Level Order of Magnitude of Cost	Benefit-Cost Outlook
Hartford Parks Greenway	Study Core	Mid-Term	$3M	Benefits Align with Costs
Bike and Pedestrian Facilities at Berlin Turnpike (Route 5/15)	S, SW	Mid-Term	$6M	Benefits Align with Costs
Main Street Complete Streets, Hartford	Study Core	Mid-Term	$10M	Benefits Align with Costs
Enhance Pedestrian Facilities at Freeways and Ramps	All	Early Action	$4M	Benefits Exceed Costs
Enhance Cross-River Connections	Study Core, N, SW	Mid-Term	$4M	Benefits Align with Costs
Complete and Improve Bicycle Networks in Moderate and High Demand Areas	Study Core, SW	Early Action	$15M	Benefits Align with Costs
Riverside Park to Downtown North (DoNo) via Riverlink Connection, Hartford	Study Core	Early Action	$20M-$30M	Benefits Align with Costs

Table 9: Critical Flaw Documentation for Eliminated Alternatives

Alternative	Critical Flaw Category	Description
		HIGHWAY
New North-South Connection, East Hartford	Feasibility and Complexity Overall System Compatibility	This alternative has a critical flaw related to its feasibility and complexity. The only new direct access path between Silver Lane Way and Burnside Ave would require running the street through two well established neighborhoods – requiring ROW access on private property, resulting in displacement, and increasing throughway traffic, ultimately diminishing the quality of the existing communities. The surrounding area already has high access density and creating this new roadway would not connect users to any resources or amenities they do not already have access to. Bike and pedestrian connections were also explored for this alternative; however, they would require a moderate amount of ROW acquisitions.
Regional Freeway Interchange Completion - Route 2/Route 15, East Hartford	Feasibility and Complexity	This alternative has a critical flaw related to its feasibility and complexity. Due to its existing geometry, this alternative cannot be completed as conceived within the "interchange completion" concept and would require a complete reconstruction of the intersection that is not within the scope of this alternative. The surrounding area already has high access density and users will not be adversely impacted by this interchange remaining as is.
Regional Freeway Interchange Completion - Route 3/I-91	Feasibility and Complexity	This alternative has a critical flaw related to its feasibility and complexity. Due to its existing geometry, this alternative cannot be completed as conceived within the "interchange completion" concept and would require a complete reconstruction of the intersection that is not within the scope of this alternative. The surrounding area already has high access density and users will not be adversely impacted by this interchange remaining as is.
Interchange Completion: Route 5/Route 99	Feasibility and Complexity	This alternative has a critical flaw related to its feasibility and complexity. Due to its existing geometry, this alternative cannot be completed as conceived within the "interchange completion" concept and would require a complete reconstruction of the intersection that is not within the scope of this alternative. The surrounding area already has high access density and users will not be adversely impacted by this interchange remaining as is.
Regional Freeway Interchange Completion - Route 6/I-84 Interchange at Trout Brook	Feasibility and Complexity	This alternative has a critical flaw related to its feasibility and complexity. Due to its existing geometry, this alternative cannot be completed as conceived within the "interchange completion" concept and would require a complete reconstruction of the intersection that is not within the scope of this alternative. The surrounding area already has high access density and users will not be adversely impacted by this interchange remaining as is.

Alternative	Critical Flaw Category	Description
Regional Freeway Interchange Completion - I-84 at South Brook	Feasibility and Complexity	This alternative has a critical flaw related to its feasibility and complexity. Due to its existing geometry, this alternative cannot be completed as conceived within the "interchange completion" concept and would require a complete reconstruction of the intersection that is not within the scope of this alternative. The surrounding area already has high access density and users will not be adversely impacted by this interchange remaining as is.
I-84 Capacity Improvements	Equity Resiliency and Sustainability	This alternative has been eliminated due to critical flaws in equity and resiliency and sustainability. By increasing the capacity along this route, overall user demand and emissions will increase, impacting the environment and residents of Hartford, which already suffer from adverse health impacts due to the proximity to traffic.
Northern Relocation with Southern Tunnel	Economic Opportunity Feasibility/Complexity System Compatibility	This alternative does not offer significant improvements in traffic operations, regional travel times, truck/freight operations, economic opportunities, mode shift potential, emergency response, or a reduced I-84 footprint through North Hartford. However, it does demonstrate positive effects on local travel time along I-84 and network resilience. The alternative has been eliminated due to fatal flaws in Economic Opportunity, Feasibility/Complexity, and System Compatibility. These findings highlight the limited benefits and critical shortcomings.
I-84 Hartford Southern Alignment	Access and Connectivity Mobility Equity	This alternative has a critical flaw related to access and connectivity, mobility, and equity. This alternative was previously studied, which determined that peak congestion would remain an issue and complex weaves within tight corridors would limit mobility. Further, this alternatives proximity to EJ neighborhoods, these communities would experience disproportionate impacts and minimal benefits, as this alternative primarily serves those using the area as a throughway.
I-84/I-91 Interchange Improvements – Existing Locations	Feasibility and Complexity	This alternative has a critical flaw related to its feasibility and complexity. Due to its existing geometry, this alternative cannot be completed as conceived within the "interchange completion" concept and would require a complete reconstruction of the intersection that is not within the scope of this alternative. Although creating a connection between I-91 northbound and I-84 eastbound at this interchange is entirely unfeasible, the surrounding area already has high access density and users will not be adversely impacted by this interchange remaining as is.
New Connecticut River Bridge, Cromwell	Adverse Environmental Impacts Feasibility and Complexity	This alternative has been determined to have a critical flaw in terms of feasibility and complexity and environmental impacts. This alternative would require extensive ROW access within established neighborhoods or the Quarry, which is designated historic and a natural asset, and other nature based amenities.

Alternative	Critical Flaw Category	Description
Route 4 Farmington Improvements	Feasibility and Complexity	This alternative has a critical flaw related to feasibility and complexity. Due to the Town of Farmington legislation establishing that no Scenic Roads may be modified, the widening of this road is infeasible.
White Street/Brown Street Alignment	Equity Feasibility and Complexity	This alternative has a critical flaw related to equity and feasibility and complexity. Due to the alignment of this alternative, extensive ROW within established, environmental justice neighborhoods would be required, resulting in both temporary and permanent displacement of residents.
I-84 Parkville Tunnel	Feasibility and Complexity	This alternative has a critical flaw related to feasibility and complexity. Due to elevations, grading, and engineering standards the depth of tunnelling required would result in further complications related to resiliency due to the proximity to Park River.
I-84/I-91 Tunnel through Hartford	Feasibility/Complexity System Compatibility	This alternative has a critical flaw related feasibility and complexity, as well as short term access and mobility. The construction complexity of this alternative is at a scale that warrants challenges due to existing geotechnical conditions. Further, during the period of construction, travel east-west across the Connecticut River would be significantly impaired.
Hartford Northwest Bypass	Equity Feasibility and Complexity	This alternative has a critical flaw related to equity and feasibility and complexity. Due to the alignment of this alternative, extensive ROW within established, environmental justice neighborhoods would be required, resulting in both temporary and permanent displacement of residents.
Metacomet Ridge Crossing	Feasibility and Complexity Overall System Compatibility	This alternative has a critical flaw related feasibility and complexity. The construction complexity of this alternative is at a scale that warrants challenges due to existing geotechnical conditions, which would drive the costs up. The scale of travel demand does not warrant such a costly alternative, particularly since there are other existing travel routes that do not significantly impair the users access or mobility.
New Connecticut River Bridge – Airport Road to Brewer Street	System Compatibility	In addition to Brainard Airport, Route 2 lies in the path of the proposed alignment, on the eastern side of the river, and rests upon a fill section approximately 15 feet above the elevation of the surrounding area. Other alternatives for new local road crossings, such as Bulkeley Bridge Conversion and a new bridge in the vicinity of Charter Oak Avenue, have much better cost-benefit projections and are more compatible with the existing network and proposed future improvements.

Alternative	Critical Flaw Category	Description
New North-South Connection, East Hartford	Equity Feasibility and Complexity	This alternative has a critical flaw related to its feasibility and complexity. The only new direct path between Silver Lane and Burnside Ave would require running a new street through two neighborhoods – requiring ROW acquisitions and routing through traffic through a residential neighborhood. Bike and pedestrian connections were also explored for this alternative; however, they would also require a ROW acquisition. The ROW costs and impact on the residential communities have been deemed a critical flaw.
RAIL		
Griffin Line: Passenger and Freight Rail	Feasibility and Complexity	This alternative has a critical flaw related to feasibility and complexity. Due to the alignment of this alternative, extensive ROW within established neighborhoods and farmlands would be required, resulting in both temporary and permanent displacement of residents. Additionally, the creation of a new alignment crossing the Farmington River and above/below I-91 to connect the alternative towards the airport has substantial engineering complexity.
Light Rail from Colchester	Feasibility and Complexity	This alternative has a critical flaw related to feasibility and complexity. Due to the construction of a new rail alignment, extensive ROW will be required in addition to trying to balance the accommodations of private property, established neighborhoods, and FRA engineering standards.
Hartford Line – Downtown to Bradley	Feasibility and Complexity	Most of the ROW access would require repurposing the existing I-91 HOV lane. Difficulties with the ROW for this alternative also exist with the path from Downtown Hartford to the existing I-91 HOV lane and off the HOV lane to the Airport. The path to the Airport is also constrained with. Ultimately a BRT system would like be a more efficient and cost effective solution to enhance service in this corridor.
Improve Service Options to Knowledge Corridor	System Compatibility	This alternative requires coordination with other states; however, this alternative is not a priority for other states at this time, so it is not compatible with the existing system.

Alternative	Critical Flaw Category	Description
BICYCLE AND PEDESTRIAN		
Reservoir Greenway	Feasibility and Complexity	This alternative has a critical flaw related to feasibility and complexity. Due to the alignment of this alternative, extensive ROW within existing Route 9 and I-84 right-of-ways adds additional complexity to this alternative. Other routes may be considered but are outside of the scope of this alternative.
Wethersfield/Rocky Hill Rail Trail	Feasibility and Complexity	This corridor was recently reactivated for freight rail. Rail operators and the CTDOT Division of Rail are generally oppositional to the colocation of trails and active rail lines. The proposed shared use pathway would be located on an existing rail corridor that actively serves a small number of industrial properties along the corridor.

HIGHWAY ALTERNATIVES

GREATER HARTFORD MOBILITY STUDY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

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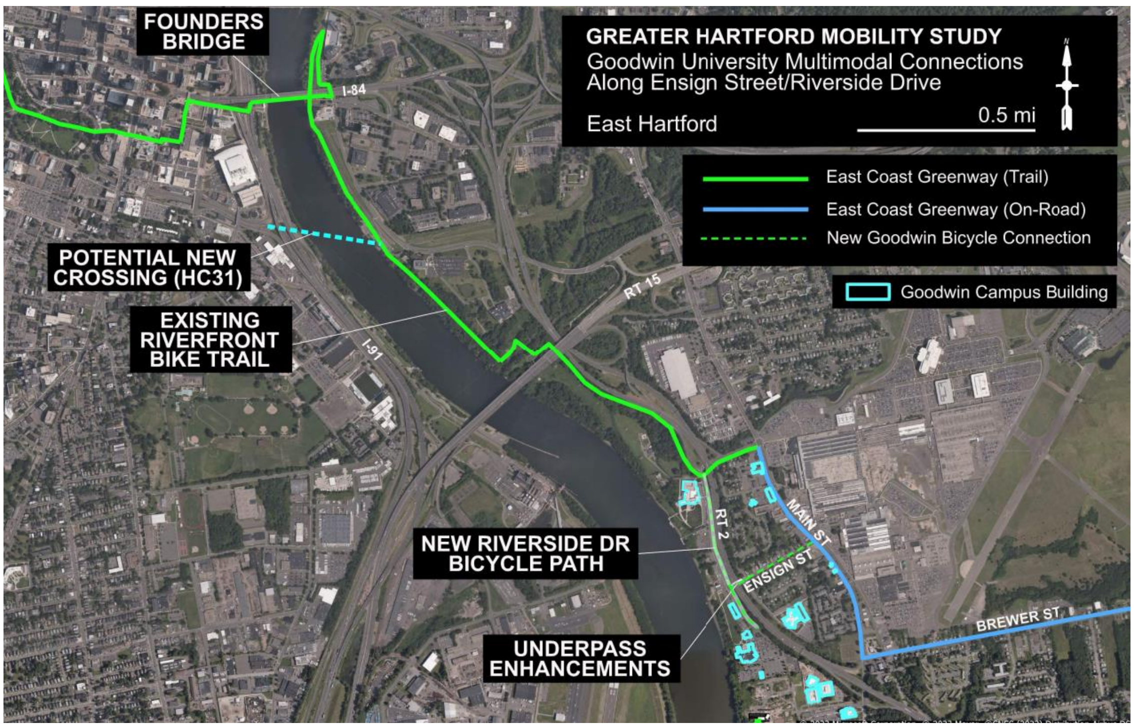
Goodwin University and East Hartford Improved Connections

Detailed Project Description

This alternative consists of an improved road connection between Goodwin University, located adjacent to the Connecticut River in East Hartford, and the neighborhoods to the east. Currently, Ensign Street and Willow Street form this connection, each with pedestrian and/or bicycle accommodations. This alternative envisions the addition of bicycle lanes and improved under-bridge lighting. At the time of bridge replacement, lengthening the Route 2 bridges over Ensign Street (Bridges No. 00378A and 00378B) in order to provide a more comfortable and open connection may be considered.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take 2 years to implement.

Project Development Process

The project would require a multimodal analysis of the impact of the new connections on the traffic network in East Hartford waterfront area. Environmental impacts of the construction of new paved bicycle paths and overpass expansion would need to be evaluated, although major impacts are not anticipated.

Project Phasing

The north and south sides of Ensign Street may be addressed separately with independent utility.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the quality of active transportation accommodations between Goodwin University and the rest of East Hartford would be beneficial to connectivity.

Travel Options and End User Convenience – High Benefit

This alternative would improve user comfort and enable a wider variety of bicyclists to use Ensign Street. For many, this could be alternative to vehicular travel.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The potential for environmental impacts to minority and low-income populations would be outweighed by opportunities created to better connect the two destinations.

Safety - Moderate Benefit

While adding bicycle lanes is known to increase bike crash rates, it is generally accepted that this is due to the increase in the number of bicyclists, and that the overall result is positive for public health and safety.

Resiliency and Sustainability – Low Benefit

The alternative includes elements that would facilitate non-motorized transportation and could support a minor modal shift within the region.

Environment – Neutral

No major changes to the environment, although encouraging modal shift to bike and pedestrian opportunities may decrease GHGs.

Technology – Moderate Benefit

Improving lighting in under-bridge areas would enhance the visibility of road users to autonomous vehicles.

Public Support – Moderate Benefit

According to the public comment portal, there is moderate support for this alternative. Access to the university is a priority, comments include streetscape lacks lighting and width.

Overarching Criteria

Economic Opportunity - Neutral

This alternative would provide some local benefit, but regional economic growth is not an expected outcome.

Feasibility/Complexity - High Benefit

This alternative requires only low-cost improvements within the ROW and has standard engineering complexity.

System Compatibility – High Benefit

This alternative would be synergistic with other bike network improvements, while providing a concrete benefit itself.

Overall Assessment of Benefits/Impacts

This alternative would provide the residents of East Hartford and students of Goodwin College with safe and accessible options within 2 years.

Order of Magnitude Cost

This alternative is fairly low cost at approximately $100,000 (2022).

High Level Benefit-Cost Outlook

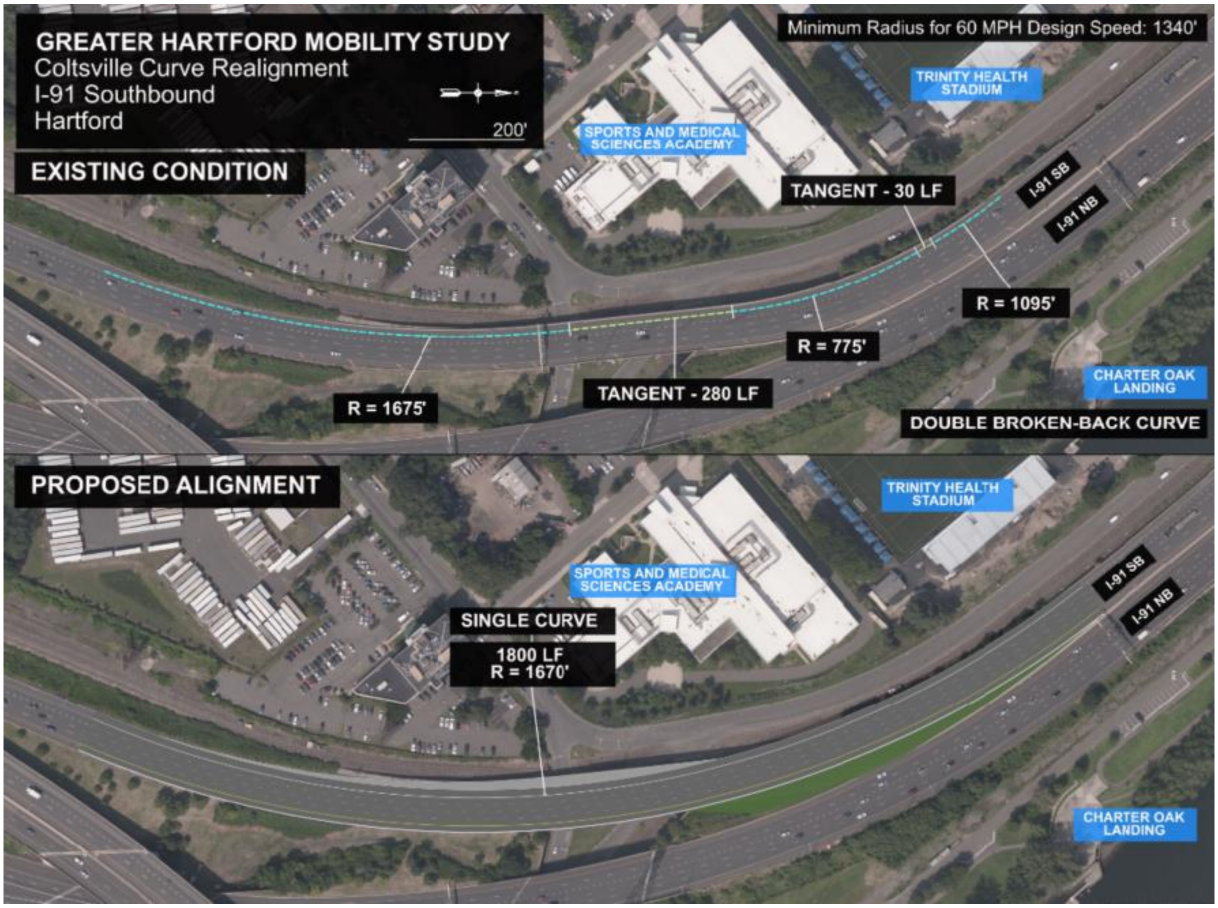
With relatively low costs and high benefits, the benefits exceed costs.

I-91 Coltsville Curve Realignment

Detailed Project Description

This alternative consists of a minor realignment of I-91 Southbound in the vicinity of the Reserve Road overpass. The alignment is currently made up of two sharp curves linked by a short tangent section (a.k.a "broken-back curve"). There have been two fatal crashes on this curve in recent years. Expanding the Reserve Road overpass slightly to the east would permit the use of a single, gentler curve.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take 5-7 years from 10% design and environmental to completion.

Project Development Process

The existing viaduct structure is viable for carrying the reconfigured lanes, but extending the bridge to the east slightly will require substantial structural engineering to ensure the stability of the expansion. Modifications to the bridge substructure will likely be required to accommodate the redistribution of loads.

Project Phasing

As this alternative is very limited in scale, there would not be any benefit to breaking it into multiple segments. It is complementary to other alternatives.

Environmental Review

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

Redesigning the curve would improve overall operations at the location, increasing reliability and travel times.

Access and Connectivity – Neutral

The alternative would not result in any change to access or connectivity.

Travel Options and End User Convenience – Low Benefit

Realigning the curve would improve the end user experience by reducing speed differential; however, it does not change travel options.

Criteria Supporting Other Study Goals

Equity – Neutral

This alternative would not impact EJ communities, nor would it provide new opportunities.

Safety – High Benefit

The intended outcome of this alternative would be a reduction in crash rates on I-91 SB. This would be accomplished due to reduced speed differential and reduced demands on driver focus.

Resiliency and Sustainability – Neutral

This alternative does not include elements designed to increase resiliency and sustainability; nor would it support modal shifts to non-auto modes.

Environment – Moderate Benefit

The presence of natural resources is more prevalent in East Hartford on the opposite side of the Connecticut River. Built Resources are more prevalent in Hartford. Protected open space, historic districts, and public schools are immediately adjacent to the proposed alignment. Populations of concern exist immediately adjacent to alternative in Hartford. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Neutral

This alternative has no consideration for supporting future technologies.

Public Support – High Benefit

This alternative does not have strong support. Comments include concerns with inducing higher speeds and offset safety increases. Feedback includes desire for rerouting 91 through East Hartford and tunneling through Charter Oak Landing and North Meadows.

Overarching Criteria

Economic Opportunity – Neutral

This alternative would not have a significant impact on economic opportunity beyond reducing the societal cost of crashes.

Feasibility/Complexity – High Benefit

This alternative would not require additional right-of-way. Bridge widening and approach realignment are common CTDOT projects and engineering complexity would be minimal.

System Compatibility – Neutral

This alternative would have independent utility, but it would not explicitly support transportation system enhancements.

Overall Assessment of Benefits/Impacts

The most significant benefit of this alternative would be improved safety. The impacts are largely due to the limited scope of this alternative – it would only serve vehicular traffic on I-91.

Order of Magnitude Cost

The cost of the project is estimated to be between $25M and $50M (2022), primarily due to the required alterations to approximately 1350 linear feet of an elevated section of I-91 South, including a new retaining wall and an expansion of the existing bridge.

High Level Benefit-Cost Outlook

This alternative would have a moderate cost but would be expected to have long-term safety benefits. Over the expected service life of the improvement, it is expected that benefits would be balanced with costs.

Truck Parking at Park and Rides

Detailed Project Description

This alternative comprises improved and expanded accommodations for freight traffic on major roads throughout the region. Overnight parking can be difficult to find, causing truck drivers to park on freeway and ramp shoulders. Other accommodations, such as sanitary facilities and fuel stations with clearance for trucks, can also be difficult to find.

While it would be ideal to develop a statewide network of dedicated truck rest areas, this would be beyond the scope of this study. Instead, this alternative proposes making improvements to existing Park & Ride lots to better accommodate tractor-trailers, as well as constructing new lots where there are currently gaps, such as I-91 between Cromwell and Windsor.

Current Park & Ride lots that may be well suited to truck parking are:

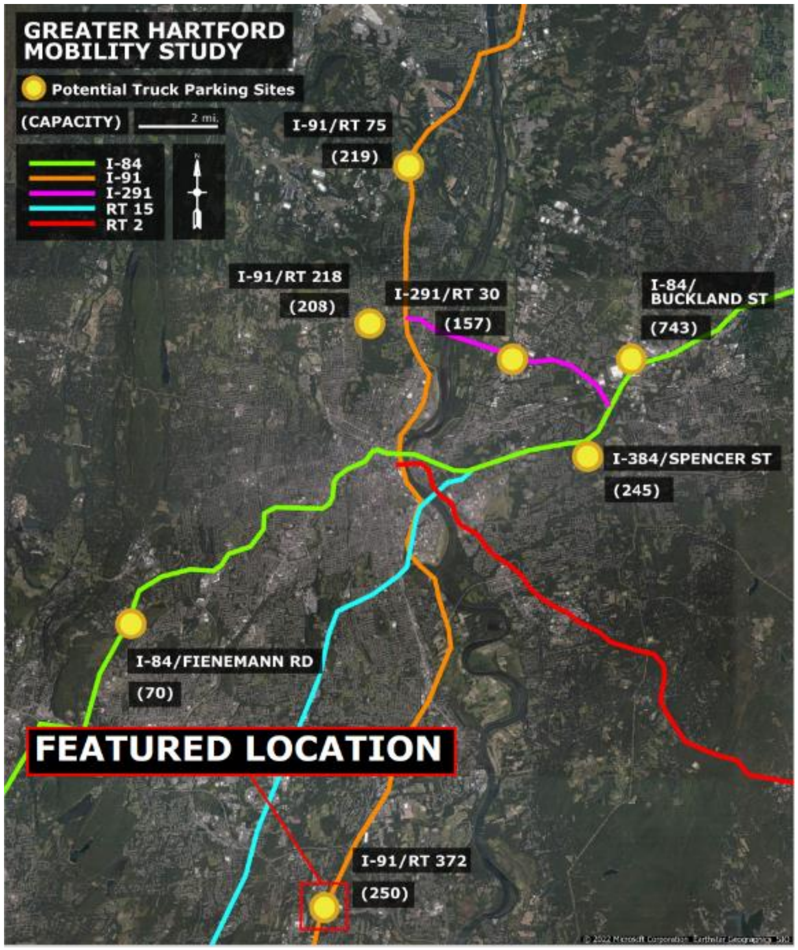
- I-84 Exit 37, Batterson Park Road, Farmington
- I-84 Exit 62, Buckland Street, Manchester
- I-91 Exit 21, Industrial Park Road, Middletown
- I-91 Exit 35, Route 218, Windsor
- I-91 Exit 38, Route 75, Windsor
- I-291 Exit 4, Route 30, South Windsor
- I-384 Exit 1, Cemetery Road, Manchester

These sites already have lighting, are easily accessible from major freeways, have straightforward access/egress, and are large enough to accommodate truck movements.

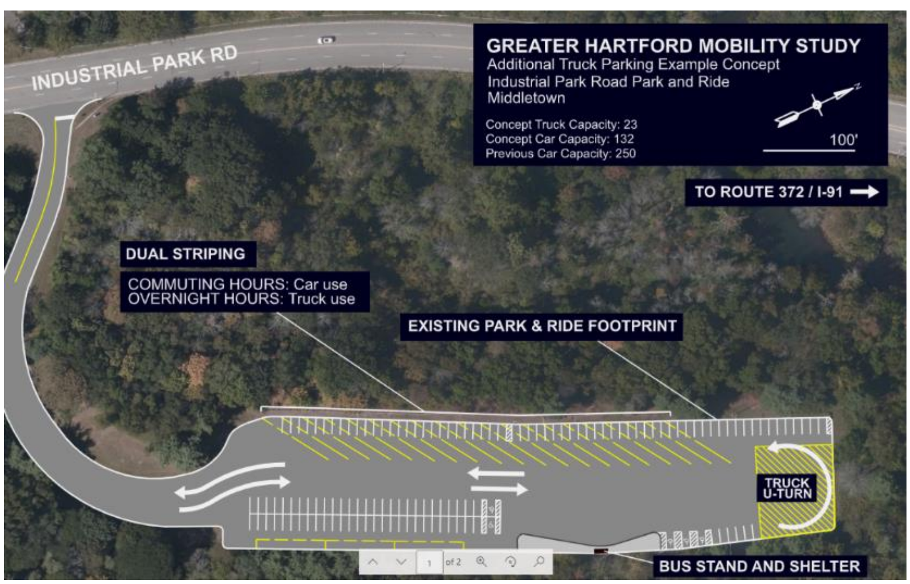
A sample concept was created for the Industrial Park Road Park and Ride Lot in Middletown. It includes additional striping in yellow to specifically accommodate trucks. The lines are also slanted so that trucks could maneuver in and out of the spaces more easily. This alternative shows the potential to initiate early-action projects in order to resolve the shortage of truck parking spaces. CTDOT has been pursuing increased truck parking as well and showed general support of this alternative, should the legislative issue be addressed. According to the Draft Connecticut Statewide Freight Plan, truck parking demand is estimated to increase by 18 percent by 2040.

See next page for proposed locations and example lot configuration.

Alternative Map



Proposed truck parking locations



Example configuration

Implementation Timeframe

Timeframe

Legislative action is anticipated to take approximately 3 years, while implementation could take anywhere from 1-6 years based upon final design.

Project Development Process

Following legislative action permitting overnight parking, some aspects of this alternative could be implemented rapidly using CTDOT Maintenance forces: re-striping Park & Ride lots to add truck parking and adjusting curb radii as needed. Others, such as constructing new lots, would go through the same design process as other capital improvements.

First, preliminary engineering would identify appropriate sites. The environmental process would begin, as would design and right-of-way acquisition. It is expected that this would take no more than three years. Construction would follow, the duration of which would depend on the number of sites and the amount of preparation needed.

Project Phasing

Following legislative action permitting overnight parking, this alternative can be developed in phases of independent utility based upon the development of each site.

Environmental Review Process

Lots where existing footprint is large enough to accommodate overnight truck parking: NA

Lots requiring expansion, newly constructed, or substantially reconstructed will need to go through: Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Low Benefit

This alternative would slightly improve travel time reliability for freight traffic by reducing the need to search for overnight parking at the end of shifts.

Access and Connectivity – Neutral

This alternative would not be expected to result in a significant change to access or connectivity, as defined.

Travel Options and End User Convenience – Moderate Benefit

This alternative would provide a major enhancement to the end user experience of truck drivers.

Criteria Supporting Other Study Goals

Equity – High Benefit

This alternative would not have any EJ impacts and would improve safety and working conditions for truck drivers, who are largely economically disadvantaged.

Safety – Moderate Benefit

Providing dedicated truck parking would reduce the unsafe practice of overnight parking on freeway shoulders.

Resiliency and Sustainability – Neutral

This alternative does not include elements that are expected to impact resiliency and sustainability.

Environment – Low Benefit

Constructing new Park & Ride lots would have some impacts, though this could be mitigated by repurposing existing underused surface parking lots in high traffic areas. Environmental impacts are anticipated to be moderate but mitigable.

Technology – Moderate Benefit

Adding dedicated truck parking would allow for future electric vehicle charging stations and provide discrete start- and endpoints for semi-autonomous truck convoys.

Public Support - Neutral

The primary impact of this alternative will be to commercial trucking, and no support or opposition from the general public is expected.

Overarching Criteria

Economic Opportunity – Neutral

This alternative would not be expected to lead to a significant change in economic opportunity for the region.

Feasibility/Complexity – High Benefit

The potential early actions have minimal complexity and no right-of-way requirements, resulting in a high feasibility.

System Compatibility – Neutral

This alternative has independent utility but would not support systemic enhancements.

Overall Assessment of Benefits/Impacts

This alternative entails a relatively cost-effective change that would greatly benefit a portion of road users without negatively impacting others. Its benefits would greatly exceed its impacts.

Order of Magnitude Cost

Base on the conclusion that seven park and ride lots are being estimated for a cost of approximately $1.4M (2022), inflated for implementation timeframe. There would need to be pavement restriping for additional truck spaces and signage provided to guide truck drivers. Adding light poles is not necessary since these lots already have sufficient lighting.

High Level Benefit-Cost Outlook

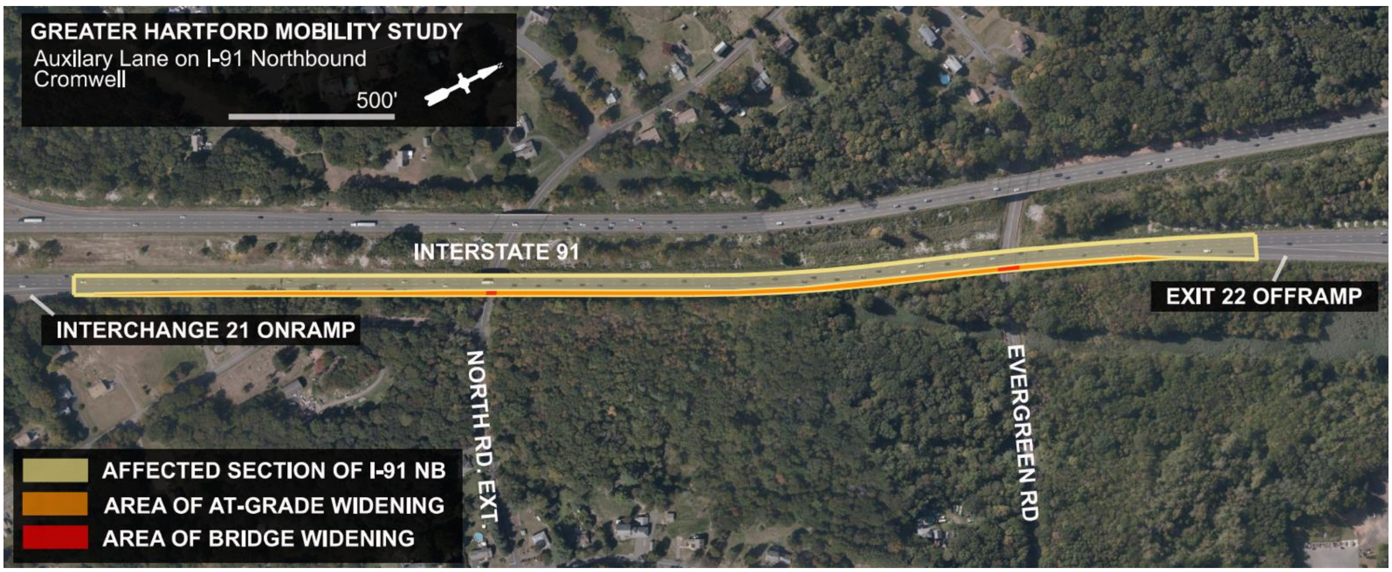
The cost of this alternative would be very low, and the resulting benefits for freight traffic would be high. Benefits are expected to overwhelmingly exceed costs.

I-91 Northbound Auxiliary Lane - Interchange 21 to 22

Detailed Project Description

This alternative comprises the construction of an auxiliary lane on I-91 northbound between the Route 372 on-ramp and the Route 9 off-ramp in Cromwell, a distance of 0.6 miles. This would require the widening of two bridges. The uphill grade of I-91 here, combined with the short distance that low-speed vehicles have to enter the traffic stream, results in recurring congestion in the morning peak period. An auxiliary lane would provide vehicles with more time to accelerate to freeway speeds before merging with through traffic.

Alternative Map



Implementation Timeframe

Timeframe

It is expected that the preliminary engineering and design process could be accomplished within three years with construction lasting five to six years.

Project Development Process

This project will require substantial structural engineering to widen the existing overpasses at North Road Extension and Evergreen Road. Due to the length of the project, it is proximate to environmental resources, including wetlands and potential threatened species habitats, in multiple locations. An Environmental Impact Statement will likely be required.

As the area of expansion, to the east of the existing highway, is within the existing State right-of-way, there are unlikely to be property issues with this alternative.

Project Phasing

This alternative could not be divided into multiple segments of independent utility as it focuses on a single improvement.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative would improve travel time by reducing recurring congestion on I-91 northbound during the morning peak period.

Access and Connectivity – Neutral

This alternative would not result in significant changes to access or mobility.

Travel Options and End User Convenience – Moderate Benefit

This alternative would improve the end user experience for both through traffic on I-91 and entering traffic from Route 372.

Criteria Supporting Other Study Goals

Equity – Neutral

This alternative would not impact EJ communities, nor would it provide new opportunities.

Safety – Moderate Benefits

Moderate improvements in safety would be anticipated to result from this alternative. In particular, the reduction of recurring congestion would likely result in a reduction in peak-period rear-end crashes, and the longer merge distance would likely result in an overall reduction in sideswipe crashes.

Resiliency and Sustainability – Low Impact

The increased lane capacity would have the potential for minor VMT increases but little or no negative impacts on network resiliency and sustainability.

Environment - Neutral

Although an additional lane is being added, it is in the ROW of the interstate and would reduce stop and go traffic.

Technology – Neutral

This alternative does not include any elements that support future technologies.

Public Support – Low Benefit

Lack of strong support for this alternative. Comments surround concern for general highway expansion. However, one comment includes support stating it would give drivers more time to enter dedicated exit lane. Other comments include concern of safety within weave lanes.

Overarching Criteria

Economic Opportunity – Neutral

This alternative would not result in significant economic changes for the region.

Feasibility/Complexity – High Benefit

This alternative could easily be accomplished with common construction techniques and without any significant right-of-way acquisition.

System Compatibility - Neutral

This alternative has independent utility, and would reduce system delay and inefficiency, though its effects would be limited to I-91 northbound.

Overall Assessment of Benefits/Impacts

This alternative would have few impacts, and those would be relatively minor compared to the benefits provided. The primary benefits would be improved mobility and safety.

Order of Magnitude Cost

This project cost is estimated to be between $10-20M (2022). The primary cost is the addition of a new 12' lane along approximately 3600 feet of I-91, mostly at-grade but with additional costs incurred by the widening of two overpasses at North Rd and Evergreen Rd. Minor expenses will include relocation of the guiderail in this section and regrading on the east side of I-91.

High Level Benefit-Cost Outlook

Assuming a modest reduction in peak period travel times, it is estimated that this alternative would result in half a million dollars of user cost savings per year. This would result in an effective 'repayment' within one decade. Its benefits are considered to be balanced with costs.

Widen Route 2 Over Griswold Street

Detailed Project Description

CTDOT has a current project including this alternative. The project is expected to go into construction between 2023 and 2024. As a result, this alternative is being removed from the screening process.

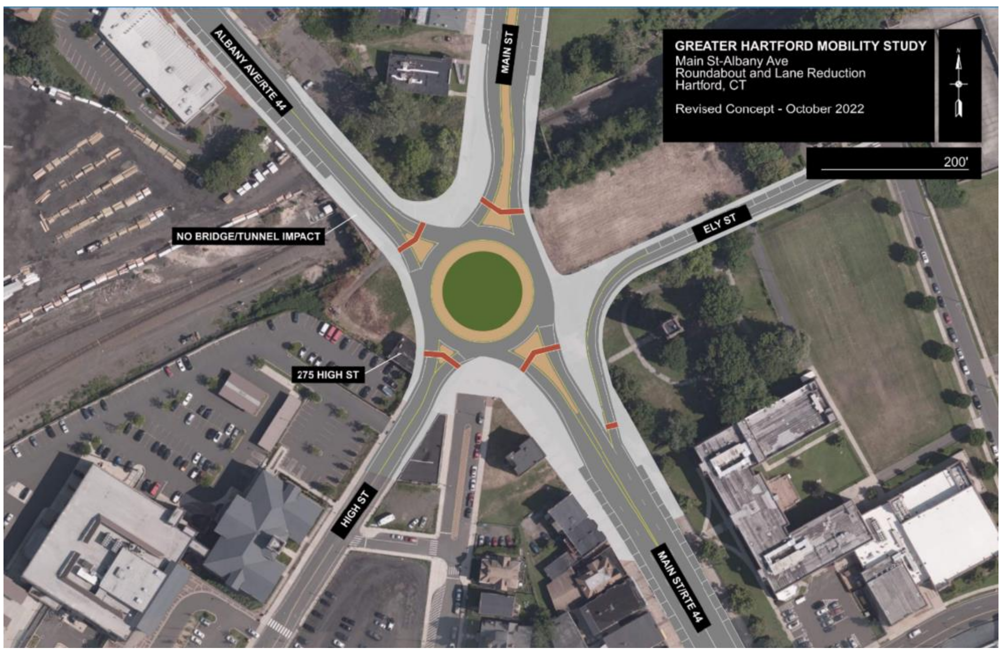
Reconfigure Intersection at Albany Avenue and Main Street

Detailed Project Description

This alternative comprises the reconfiguration of the five-way intersection of Albany Avenue, Main Street, High Street, and Ely Street in Hartford's Downtown North neighborhood. At present, the intersection is mainly configured to facilitate north-south vehicular traffic.

For the purposes of this level of screening, it is assumed that the intersection would be replaced by a single-lane modern roundabout. The actual design would depend on a detailed analysis of the intersection.

Alternative Map



Implementation Timeframe

Timeframe

From concept design and environmental to construction, this alternative would take approximately 4 years.

Project Development Process

The first step toward implementation would be to collect traffic data and conduct an analysis of existing and future conditions in order to select an alternative. Included in this would be stakeholder outreach and coordination with other ongoing projects. This would take one to two years. Once an alternative is selected, design would proceed, as well as any environmental analysis required. If right-of-way were required, this would also occur during the later stages of design. This would take approximately two years.

Construction would likely need to be staged in order to maintain existing traffic as much as practical. Much, if not all, of the work of building a roundabout could be completed within one construction season, though work could extend to two depending on utility involvement or staging.

Project Phasing

This alternative could not easily be split into multiple segments of independent utility as it concerns only a single intersection. It is considered to be complementary to other alternatives, though it may need to be modified in order to accommodate traffic changes due to major road reconfigurations.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Low Impact

The exact change in travel time would depend on design details, but roundabouts do not prioritize any one traffic movement, so the heavy north-south through traffic may experience additional delay.

Access and Connectivity – Neutral

This alternative would not include any access changes. Connectivity would depend on traffic operations, though generally it is anticipated that pedestrian conditions would improve.

Travel Options and End User Convenience – Moderate Benefit

This alternative would enhance the end user experience for non-through traffic, pedestrians, and bicyclists.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The potential for environmental impacts to minority and low-income populations would be outweighed by opportunities created to better connect the two destinations.

Safety – High Benefit

Modern roundabouts have a proven record of reducing crash rates and severity when used to replace traffic signals.

Resiliency and Sustainability - Neutral

This alternative does not include elements designed to increase resiliency and sustainability; nor would it support modal shifts to non-auto modes.

Environment – Moderate Benefit

Intersection reconfiguration is located in an urban area. There are limited natural resources within the project corridor, and moderate built resources within the project corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Moderate benefit

The replacement of a 5-leg intersection with a modern roundabout would be beneficial to autonomous vehicles due to the unambiguous right-of-way assignment.

Public Support – High Benefit

Strong support for improvements in this intersection. Comments suggest prioritizing pedestrian and bicycle safety in this crash hot spot. A roundabout in this area was suggested and liked by many other participants. This area can serve as a connection point to other areas downtown.

Overarching Criteria

Economic Opportunity – Neutral

This alternative would have economic benefits, but these would be mainly limited to local neighborhoods and not regional in scale.

Feasibility/Complexity – High Benefit

It is unlikely that this alternative would require additional right-of-way, and modern roundabouts are now a common intersection treatment statewide.

System Compatibility – High Benefit

This alternative would provide opportunities for further enhancements in the Clay Arsenal and Upper Albany neighborhoods, and it has independent utility of its own.

Overall Assessment of Benefits/Impacts

This alternative is largely beneficial, with its only notable impact being a potential increase in travel delay.

Order of Magnitude Cost

Based on the amount of local road construction in the vicinity of the intersection and roundabout infrastructure costs, the estimated cost for this project is in the range of $15M-$30M (2022).

High Level Benefit-Cost Outlook

This alternative would produce numerous benefits and has strong public support. Costs would be moderate. As a result, benefits are expected to exceed costs.

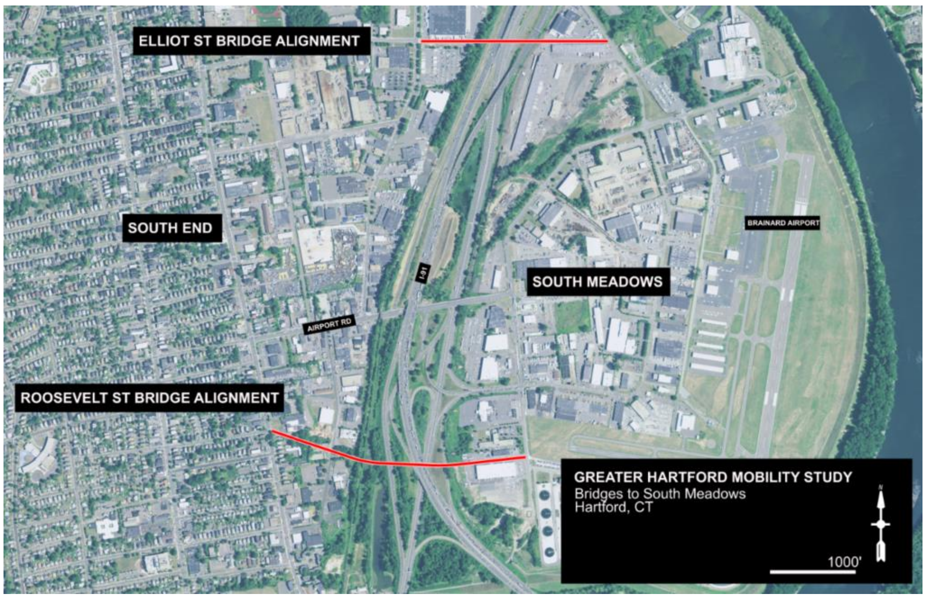
New South Meadows Local Road(s)

Detailed Project Description

This alternative comprises the construction of one or more new local roads crossing I-91 and Route 15 in Hartford's South Meadows. There are currently two crossings in this area: Airport Road, a busy arterial with two freeway ramps, and Reserve Road, which is more circuitous and has at-grade railroad crossings. This alternative would seek to better connect the industrial and commercial areas adjacent to Brainard Airport with Hartford's South End.

Two possible locations for a connection have been identified. Either could support either low-speed local road intended for vehicular and non-motorized use, or a smaller pedestrian bridge with a substantially lower cost.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would likely take 4-8 years to complete. This duration is unlikely to be substantially affected by the location or modal support of the new crossing.

Project Development Process

The first step towards building this alternative would be identifying the preferred alignment for a new bridge. This would entail a more detailed look at potential impacts and the traffic implications of building a new road and new bridge approaches, which may have property impacts. An analysis of the environmental impacts would also be necessary as the bridge would cross or impinge upon wetlands. This preliminary engineering and environmental analysis would take approximately three years.

The next step would be design, including right-of-way acquisition and utility coordination, which would take another three years. Once complete, construction could proceed. The duration of construction would depend on the nature of the bridge and exact alignment and could be as short as one season or as long as five.

Project Phasing

This alternative could not easily be split into multiple segments of independent utility unless multiple bridges are proposed instead of one. Multiple bridges are not recommended from a cost-benefit perspective.

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative would reduce travel time between portions of the South End and South Meadows, compared to taking Airport Road. Adding a new connection would also improve travel time reliability.

Access and Connectivity – Moderate Benefit

This alternative would improve connectivity between residential areas in the South End and jobs in the South Meadows.

Travel Options and End User Convenience – High Benefit

This alternative would add a redundant travel option, as well as improving the end user experience for non-motorized and local users.

Criteria Supporting Other Study Goals

Equity – Low Benefit

The proposed roadway(s) would have the potential to impact minority and low-income populations but also creates opportunities for disadvantaged populations access to land uses east of I-91 and Route 5.

Safety – Moderate Benefit

This new connection would provide a more convenient and lower volume means for pedestrians and bicyclists to access the South Meadows, reducing crash exposure.

Resiliency and Sustainability – Low Impact

The improved connection would likely distribute east-west traffic, reducing demand on Airport Road, and would likely have little potential to increase VMT with no impacts on network resiliency and sustainability.

Environment – Neutral

Minimal presence of natural and built environmental resources within the project corridor. Wetlands exist between I-91 and US-5. Great Meadows Conservation Trust is at southern end of Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Neutral

This alternative would not include elements intended to support future technologies.

Public Support – Moderate Benefit

There is support for this alternative and there is a perceived benefit to improvements on this road. Comments suggest considering Complete Streets designs.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative would contribute to economic growth in the South Meadows and South End neighborhoods of Hartford.

Feasibility/Complexity – Neutral

This alternative has moderate complexity, requiring several spans over wetland, active railroad tracks, and two freeways. That said, right-of-way requirements are small and without a disproportionate adverse impact.

System Compatibility – High Benefit

This alternative offers an enhancement to the transportation system and would complement other system changes, as well as having its own utility.

Overall Assessment of Benefits/Impacts

This alternative is largely beneficial, with few impacts. Its primary benefit would be providing an additional connection to Hartford's South Meadows.

Order of Magnitude Cost

This project is estimated to cost between $200M-$500M (2022). This total represents the cost for two car bridges on Roosevelt St and Elliot St which would go over I-91. The majority of the cost includes construction of these two bridges with an estimated bridge unit cost of $800 per square foot.

High Level Benefit-Cost Outlook

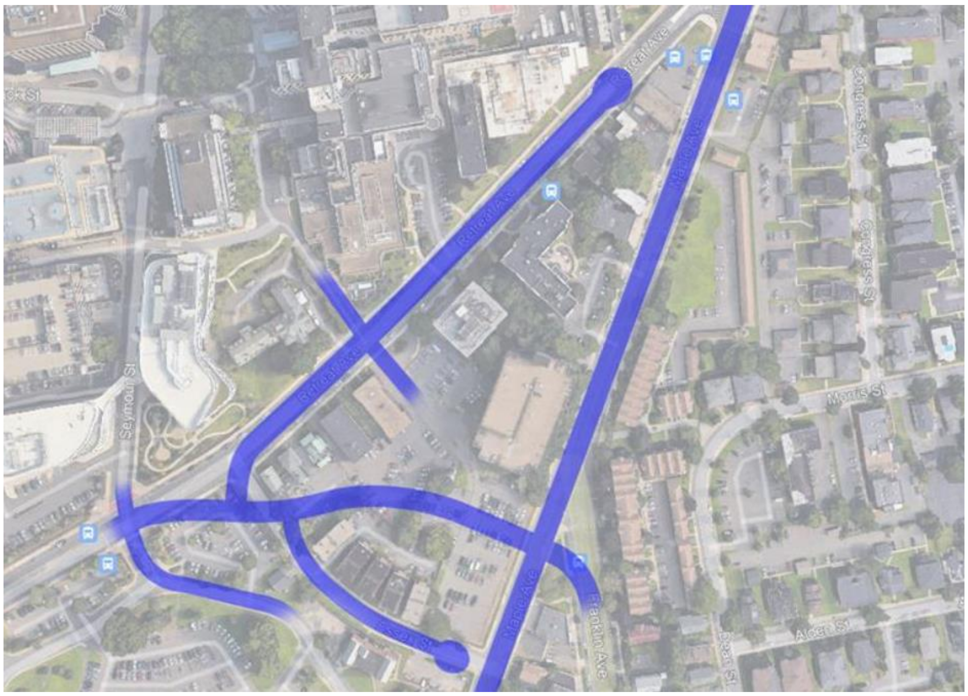
As Airport Road is currently able to support the traffic generated by Brainard Airport and crossing I-91 with bridges is very expensive, it is unlikely that this alternative's benefits will exceed its costs. However, potential future changes to land use in the South Meadows area may change the benefits profile.

Retreat Avenue Realignment

Detailed Project Description

This alternative comprises the realignment of the easternmost portion of Retreat Avenue. The road would curve southward at its current intersection with Seymour Street, continuing eastward to a new four-leg intersection with Maple Avenue and Franklin Avenue. The remainder of the current Retreat Avenue would be reduced in width and potentially turned into a cul-de-sac to maintain access and provide additional parking.

Alternative Map



Implementation Timeframe

Timeframe

From preliminary engineering through construction completion, this alternative is anticipated to take 5-7 years.

Project Development Process

Coordination with Hartford Hospital and the Institute of Living is required to ensure this alternative could be put in place without disruptions to their operations. Because of how heavily developed this area is, any road realignment would impact several properties, including surface parking for adjacent buildings and the Institute of Living. Determining an alignment with minimal impacts would be crucial to the project schedule as the right-of-way process could be protracted and create indefinite delays. Preliminary engineering and design would likely take three to five years. Construction would likely take at least two seasons, considering the need for demolitions of existing properties and required staging to maintain fast access to the hospital for patients and emergency vehicles.

Project Phasing

This alternative could not easily be divided into segments of independent utility because of its limited scope. Although it should be built in a single phase, careful staging will be required through construction to avoid disruptions to the traffic pattern or a reduction in capacity, due to the critical public health role of the affected property. This reconfiguration would be complementary to other alternatives and could be constructed without impacting them.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would be unlikely to have a significant impact on travel times. The removal of one traffic signal would be beneficial, but one four-leg intersection would not necessarily have less delay than two three-leg intersections. More detailed traffic analysis would be needed.

Access and Connectivity – Moderate Benefit

This alternative would improve connectivity across Maple Avenue. Trips between Franklin Avenue and Retreat Avenue, especially, would be better accommodated after realignment. Given the relative lack of existing east-west connections in the area south of downtown, this should provide a significant benefit to mobility.

Travel Options and End User Convenience – Moderate Benefit

The end user travel experience would be improved for pedestrians, with shorter crossing distances at intersections, and for drivers with limited mobility, due to reduced intersection skew.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The potential for environmental impacts to minority and low-income populations would be outweighed by opportunities created to better connect the two destinations.

Safety - Moderate Benefit

By reducing skew angles and crossing distances on Maple Avenue, this alternative can be expected to bring about a minor improvement in safety.

Resiliency and Sustainability – Neutral

This alternative does not include elements designed to increase resiliency and sustainability; nor would it support modal shifts to non-auto modes.

Environment – Neutral

Limited presence of natural resources in Project Corridor. Moderate presence of built resources in the Project Corridor and immediately adjacent to the proposed alternative. Environmental impacts are anticipated to be moderate but mitigable.

Technology – Neutral

This alternative would not include elements that support future technologies.

Public Support – Low Impact

There is a need to improve travel around this corridor (Franklin Avenue to Washington Street, from South End to the Hospital), but there is mixed sentiment about how to approach the issue. Comments suggest that moving the intersection may not be the best solution.

Overarching Criteria

Economic Opportunity – Neutral

This alternative would have a minor negative impact in its immediate area due to property impacts but would be unlikely to result in regional changes.

Feasibility/Complexity – Neutral

Right-of-way impacts would depend on the exact alignment chosen and are difficult to quantify at this stage. Construction would be straightforward.

System Compatibility – High Benefit

This alternative has independent utility and would support local road enhancements such as complete streets and potentially transit priority.

Overall Assessment of Benefits/Impacts

This alternative would have more benefits than impacts. Several of the criteria are 'Neutral, indicating that this alternative would be unlikely to have a major positive or negative effect.

Order of Magnitude Cost

This project will cost approximately $4M-$10M (2022), requiring substantial new construction of local roads, reconstruction of three intersections and substantial right-of-way costs.

High Level Benefit-Cost Outlook

This alternative would require a moderate investment of funds. As the scope and magnitude of benefits are relatively limited, the benefits seem to be balanced with the costs.

Trident Mobility Improvements

Detailed Project Description

The 'Trident' is a name given to the confluence of Farmington Avenue, Trident Avenue, and Broad Street in Hartford. These closely spaced intersections comprise a major bottleneck that results in recurring congestion on Hartford's streets and on I-84. This alternative involves changing the traffic control or geometry of the Trident to facilitate traffic flow.

Several alternatives have been explored in the past few years, including closing road segments, one-way streets, roundabouts, and signalizing the currently stop-controlled intersection of Asylum and Farmington Avenue.

The short-term improvements are intended to accommodate existing traffic patterns until the long-term design can be completed.

Short term actions would include pavement markings and bollards designed to reallocate space within the intersection footprint. This project will not include substantial curb line modifications or intersection reconfiguration.

A longer-term improvement plan would require the completion of the City Link program, so that the ramps are no longer in use and the redesign has the potential to utilize some of the reclaimed land from the cap.

Alternative Map

Existing Condition

Sample Alternative Configuration

Implementation Timeframe

Timeframe

This alternative would take approximately 2 years to implement for early action improvements and 5-8 years for the longer-term improvements.

Project Development Process

This alternative would require traffic counts during preliminary design and engineering followed by implementation that can be conducted internally by the City of Hartford DPW.

Project Phasing

Due to its limited scope, this alternative would not be split into segments of independent utility. It is considered a complementary alternative as it could be accomplished regardless of what other alternatives are chosen.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

The Trident is a major bottleneck, resulting in significant recurring congestion. This alternative would address this issue to improve travel time and reliability on Hartford's local roads and on I-84.

Access and Connectivity – Moderate Benefit

This alternative would improve access to and from I-84 via several nearby on- and off-ramps.

Travel Options and End User Convenience – Moderate Benefit

This alternative would improve the end-user travel experience in the vicinity of the Trident.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The potential for environmental impacts to minority and low-income populations would be outweighed by the access, safety, and mobility opportunities created.

Safety – Low Benefit

This alternative would likely improve safety by reducing queueing onto I-84, though the extent would depend on the design chosen.

Resiliency and Sustainability – Neutral

This alternative may include any elements intended to improve resiliency and sustainability or support modal shifts to non-auto modes.

Environment – Moderate Benefit

No impacts are anticipated from this alternative; however, minor improvements may occur due to modal shift and reduced congestion.

Technology – Neutral

It is not known at this stage whether this alternative would include any elements intended to support future technologies.

Public Support – Moderate Benefit

Improvements to the road network that reduce traffic congestion are broadly popular.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative would alleviate a traffic bottleneck and improve regional economic prospects.

Feasibility/Complexity – Neutral

The right-of-way requirements and engineering complexity are not yet known and would depend on the results of preliminary engineering.

System Compatibility – High Benefit

This alternative has independent utility, and its location at a nexus of many modes of transportation means it would have positive knock-on effects for other projects.

Overall Assessment of Benefits/Impacts

This alternative is largely beneficial with no significant impacts. As the extent and nature of improvements to the Trident would depend on a traffic study, the benefit-impact balance may change.

Order of Magnitude Cost

This early action alternative would cost approximately $1M (2022).

Longer term improvements are estimated to cost $10-12M (2022).

High Level Benefit-Cost Outlook

Traffic signal improvements are typically associated with high benefit-to-cost ratios. The Trident is the source of peak and off-peak congestion as well as standing queues on I-84 Westbound. Mitigating these problems would result in benefits overwhelmingly in excess of the alternative's costs.

Align White Street with Brown Street

Detailed Project Description

This alternative comprises the realignment of Brown Street and White Street at Maple Avenue in Hartford. This would create a continuous east-west connection from Route 71 in New Britain to Airport Road in Hartford. White Street and Brown Street presently both meet Maple Avenue at skewed intersections; this would reduce intersection skew as well as the overall number of intersections on Maple Avenue.

Alternative Map

Potential reconfiguration of White and Brown Streets and Affected Properties

Overall Assessment of Benefits/Impacts

The temporary and permanent EJ impacts associated with the alternative could reduce the number of affordable housing units and require relocation of residents. Further, with at least 12 total property acquisitions required, the ROW costs would be substantial and further outweigh potential benefits. Due to the disproportionate impact on economically vulnerable populations and disruptions to existing development, the costs of this alternative outweigh the potential benefits to mobility. Due to these collective challenges, this alternative is considered critically flawed.

Tunnel I-84 in Parkville

Detailed Project Description

This alternative consists of lowering the grade of I-84 in the Parkville neighborhood to provide stronger connections between both sides of the freeway. Project limits would be approximately New Park Avenue to Park Street. Tunneling I-84 beneath Park Street itself is not practical due to the adjacent North Branch Park River Conduit. The primary benefit of this alternative would be to reduce the visual and audio impact of I-84 traffic on Hamilton Street's and Olive Street's residents and road users.

This alternative has numerous challenges to feasibility. Due to the elevation difference between local roads in this part of the city, it would not be possible for a tunnel to travel beneath New Park Avenue while maintaining access to Prospect Avenue. Additionally, there is insufficient space for the tunnel profile to pass below Hamilton Street and then above Park Street while meeting geometric standards for freeways.

In addition to those grading challenges, at its lowest point, I-84 would be well below the level of the adjacent Park River, which would reduce the resiliency of the tunnel and require continually operating pumps to avoid flooding.

Finally, in this proposed configuration, maintaining the Flatbush Avenue ramps would be challenging and potential completely infeasible. Considering that this alternative also eliminates the ramps at Prospect Avenue and Kane Street in West Hartford, this would concentrate exiting and entering freeway traffic at Park Road in West Hartford and at Sisson Avenue. Both roadways are already at or near capacity and would require substantial reconfiguration to handle additional volumes.

Due to the significant issues with feasibility and very high anticipated cost, this alternative is considered critically flawed.

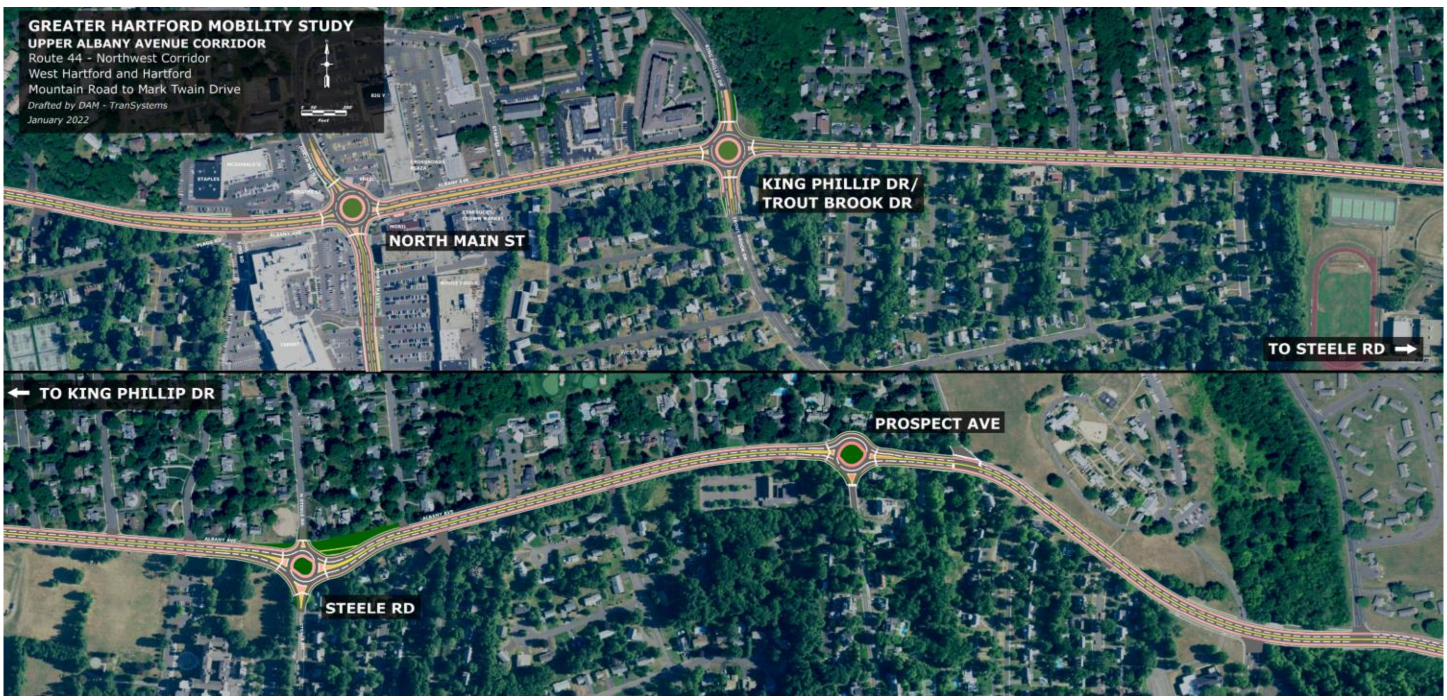
Albany Avenue/Route 44 Reconfiguration Study

Detailed Project Description

This alternative is a wide-ranging set of improvements to the cross-section of Albany Avenue (US Route 44) between Mountain Road in West Hartford and Homestead Avenue in Hartford. The exact treatments chosen would depend on engineering analysis and public involvement, but this alternative would likely include measures such as expanded pedestrian and bicycle accommodations, mid-block pedestrian beacons, and turn lanes, roundabouts, new signals, or other measures for improving the safety of turning operations.

This alternative is intended to improve lane continuity and multimodal safety, and to provide more consistent travel speeds through the corridor. It also provides a transition between the less developed high-speed areas of Route 44 to the west and the dense Upper Albany neighborhood in Hartford, which features high pedestrian traffic. Treatments such as modern roundabouts can be used to calm traffic as it approaches more urban areas along the corridor.

Alternative Map



Possible reconfiguration of Albany Avenue with bike lanes, roundabout, and median divider. (Roundabout and median locations are conceptual and subject to change based on operational analysis and public input.)

Implementation Timeframe

Timeframe

From initial analysis, design and preliminary engineering, and construction completion would take 2 years.

Project Development Process

This alternative would require a relatively straightforward design, and engineering and implementation can be conducted quickly. The largest engineering requirement would be study and design of the intersections that have been determined to be operating insufficiently, from either a capacity or safety standpoint.

Project Phasing

This section of corridor is over three miles long and could be divided into multiple segments of independent utility. For example, shared-use side paths could be broken out as an independent project, or bike lanes could be implemented prior to redesign of the intersections.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative would be expected to improve travel time reliability throughout the corridor.

Access and Connectivity – Moderate Benefit

This alternative would improve multimodal connections by adding bicycle accommodation and reducing conflicts. Access management would reduce the number of access points but improve their quality and safety.

Travel Options and End User Convenience – High Benefit

This alternative would greatly improve the quality of non-motorized transportation in the corridor, which would offer more travel options and improve the experience for all users.

Criteria Supporting Other Study Goals

Equity – Low Benefit

The effects to minority and low-income populations in the eastern portion of the project corridor and potential increases in VMT would be outweighed by accessibility and safety opportunities created.

Safety – High Benefit

This alternative could be expected to result in and to provide a safer and more comfortable environment for non-motorized transportation.

Resiliency and Sustainability – Low Benefit

The proposed action would likely support minimal reduction in VMT with minimal impacts on network resiliency and sustainability.

Environment – Moderate Benefit

Natural resources are prevalent throughout the project corridor. Areas of concern are near Hartford Reservoir No. 6; CTDEEP owned South Branch Park River Flood Control site, and the North Branch Park River. Sensitive land uses are adjacent to the alternative on Albany Avenue. Prospect Avenue Historic District is located on the east end of the corridor in West Hartford and Hartford. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Neutral

This alternative does not contain elements that would support future technologies.

Public Support – Neutral

No strong sense of public support or opposition. The public supports increased safety, but it is not clear that this corridor is currently a major source of public concern, despite its poor statistical performance.

Overarching Criteria

Economic Opportunity – High Benefit

By giving travelers more modal options, this alternative would provide improved opportunities for the communities it connects.

Feasibility/Complexity – High Benefit

Limited ROW acquisitions would be required, the engineering complexity of the treatments identified is relatively low, and construction would be straightforward.

System Compatibility – High Benefit

This alternative has independent utility and could also act as a backbone for further non-motorized network enhancements in the region.

Overall Assessment of Benefits/Impacts

This alternative is predominantly beneficial with few negative impacts. Additionally, several criteria are rated 'High Benefit', indicating a high potential utility.

Order of Magnitude Cost

The cost of this alternative would be approximately $750k-$1M (2022) for a study to determine final design and an accurate cost estimate for implementation.

High Level Benefit-Cost Outlook

This alternative would result in significant benefits at a low overall cost.

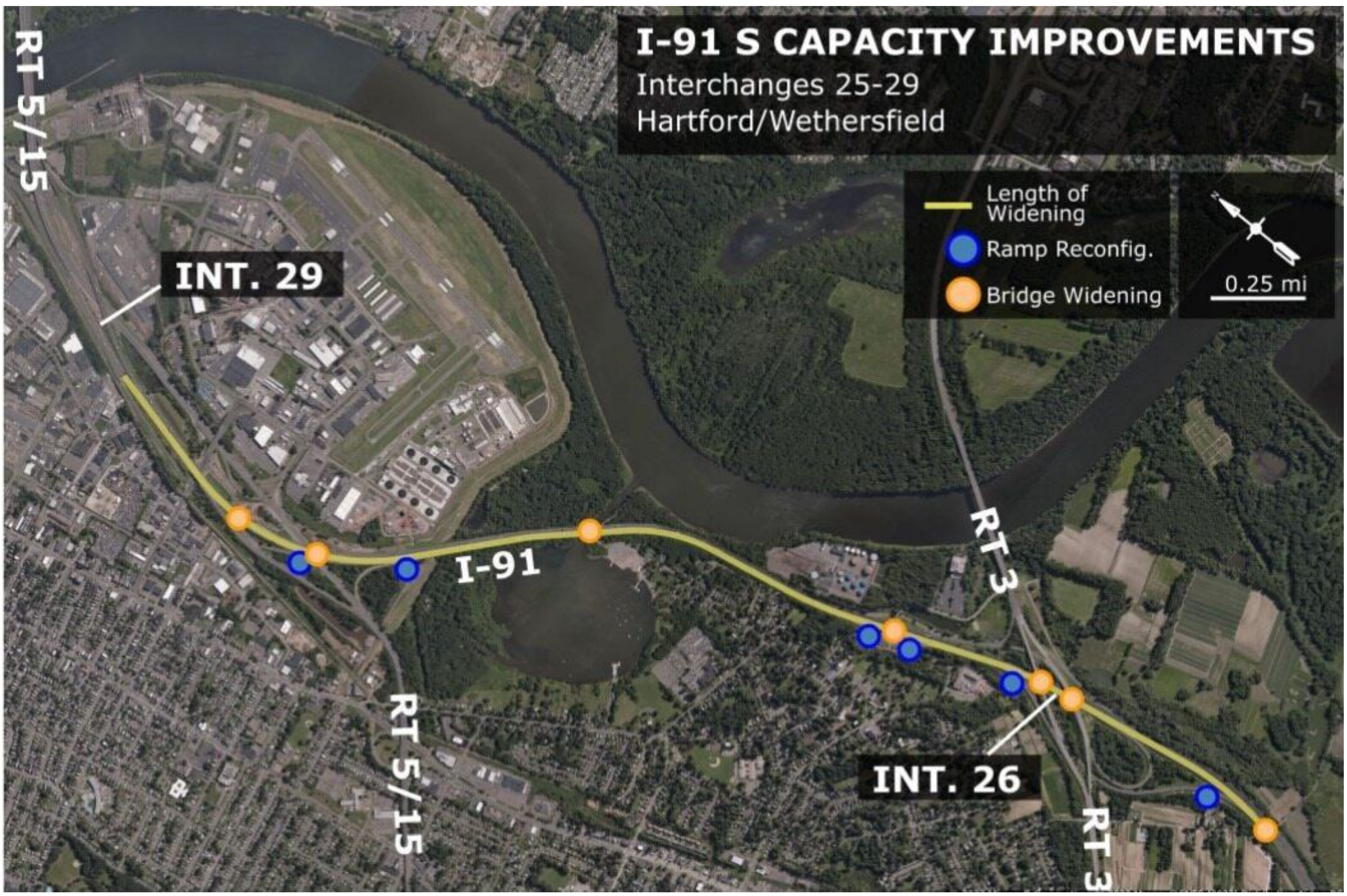
I-91 Southbound Capacity Improvements – Interchange 29 to 25

Detailed Project Description

This alternative consists of added capacity and improved lane balance on I-91 southbound between the Charter Oak Bridge and the Putnam Bridge. Currently, there are four through lanes in the northbound direction in this area, but only three in the southbound direction, acting as a bottleneck and causing recurring congestion in the evening peak period.

This alternative focuses primarily on widening I-91 southbound to accommodate a fourth lane, which would serve mainly passenger vehicles and freight.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take 8-15 years to implement, due to the large number of bridge and ramp reconfigurations and reconstructions required, each with its own challenges in feasibility and environmental impact.

Project Development Process

This alternative would begin with preliminary engineering, including identifying likely impacts and long-term traffic projections to ensure other bottlenecks were not created. The design and environmental EIS/EIE processes would occur next, with the total pre-construction duration likely taking five to ten years. For construction, no major challenges are expected. Constituent projects will include bridge widening, ramp realignment/relocation, noise wall reconstruction, and environmental remediation. This would likely take three to five years.

Project Phasing

This alternative could be split into segments of independent utility, with minor widening at the worst existing pinch points (e.g., the Route 15 NB ramp to I-91 SB), which could accomplish some reduction in recurring congestion with reduced cost and impacts. These segments could be implemented individually over an extended period, as sections of the project received environmental approval or as funding was secured, resulting in a continuous improvement of operations until the proposed final condition is achieved. Phasing could also be used to limit the scope of the project should future traffic volumes fall short of projections.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This alternative would alleviate a major congestion hot spot on I-91 SB, improving both travel time and travel time reliability.

Access and Connectivity – Neutral

This alternative would not improve access or connectivity.

Travel Options and End User Convenience – Moderate Benefit

Reducing congestion on I-91 southbound would provide an enhancement to the user experience.

Criteria Supporting Other Study Goals

Equity – Neutral

This alternative would not impact EJ communities, nor would it provide new opportunities.

Safety – Moderate Benefit

Reducing recurring congestion on I-91 southbound would be likely to reduce the frequency and severity of rear-end crashes by decreasing speed differential.

Resiliency and Sustainability – Moderate Impact

As this alternative would add capacity and address a bottleneck, it would likely result in increased VMT on I-91.

Environment – Neutral

Although this alternative would increase the number of lanes, it would reduce the current congestion hotspot, reducing overall GHGs.

Technology – Neutral

This alternative does not include elements that would support future technologies.

Public Support – No Input

There were no public comments on this alternative.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative would enhance economic opportunities by reducing travel time uncertainty and improving throughput. This metric is especially important for freight traffic, which is heavily sensitive to reliability.

Feasibility/Complexity - Neutral

This alternative would be a relatively straightforward project. There would likely be some ROW required in order to accommodate the widening, though with few-to-no property impacts.

System Compatibility – High Benefit

This alternative has independent utility and would support systemic enhancements by removing a bottleneck. This would, for example, potentially permit changes to be made on the Silas Deane Highway, which would see a reduction in traffic.

Overall Assessment of Benefits/Impacts

This alternative has a mix of benefits and impacts, with benefits predominating. The primary benefits would be experienced by freight and commuter traffic.

Order of Magnitude Cost

This project cost ranges from $100M-$150M (2022). The main contributor to this cost is bridge widening of I-91 southbound over Elm St, Great Meadow Rd, Airport Rd, Wilbur Cross Highway and Wethersfield Cove, as well as partial reconstruction of bridges on Route 3 that cross over I-91 at Interchange 25.

High Level Benefit-Cost Outlook

Given the high traffic volume and magnitude of recurring congestion on I-91 Southbound, even a modest 15% increase in peak-hour travel speed would result in over 1 million dollars of annual cost savings. This and other benefits would counterbalance the construction costs over the life cycle of the improvement. The benefits of this alternative are well-balanced with costs.

Route 2 Safety and Operational Improvements – Route 15 to Route 3

Detailed Project Description

CTDOT has a current project including this alternative. The project is expected to go into construction between 2023 and 2024. As a result, this alternative is being removed from screening.

Route 2/Route 3/Route 17/Route 94 Improvements

Detailed Project Description

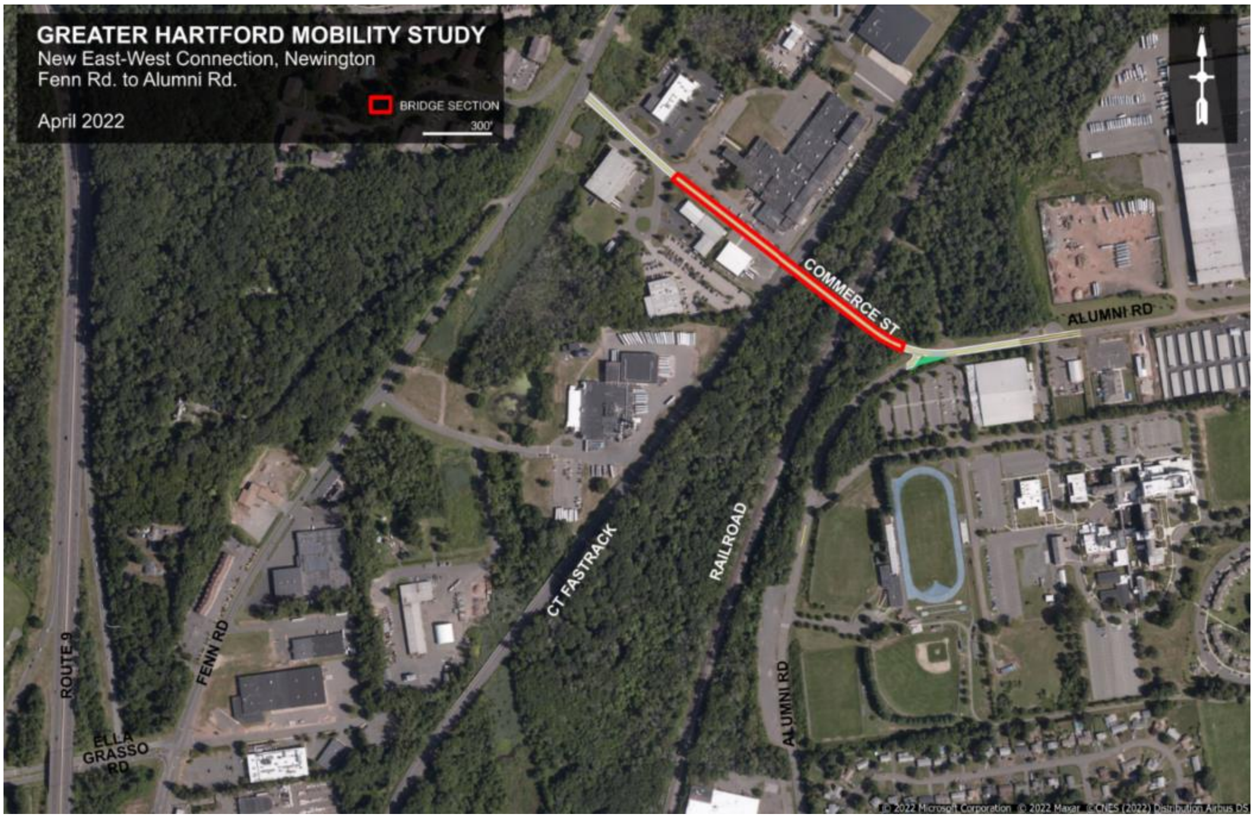
CTDOT has a current project including this alternative. The project is expected to go into construction between 2023-2024. As a result, this alternative is being removed from screening.

New East-West Connection in Newington

Detailed Project Description

This alternative comprises a new local road built across CT*fastrak*, the Hartford Line, and Piper Brook in Newington. This new road would be about ¼ mile long and would connect Alumni Road to Fenn Road by way of Commerce Court or Milk Lane. This new connection would reduce travel times between Newington and New Britain, especially for non-motorized traffic. This new road could also connect the multi-use path adjacent to CT*fastrak* to Newington High School and the VA Hospital.

Alternative Map



Implementation Timeframe

Timeframe

This alternative is expected to have a longer timeline due to environmental analysis; therefore, this alternative may take approximately 11-16 years.

Project Development Process

This alternative would first go through preliminary engineering and environmental analysis. Since this new road would pass through a wooded wetland, the environmental process might be protracted. It is expected that this would take five to ten years. Design would proceed afterwards, along with right-of-way acquisition. For this relatively small project, this would likely take three years or less.

Project Phasing

This alternative could not easily be split into segments of independent utility as benefits would not be realized without the entire connection. It is complementary to other alternatives.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative would reduce east-west travel time within Newington and greatly reduce non-motorized travel time.

Access and Connectivity – Moderate Benefit

This alternative would provide a connection between the multi-use path and key locations, such as Newington High School and the VA Hospital.

Travel Options and End User Convenience – High Benefit

This alternative would provide an additional means to cross the rail and bus guideway between Cedar Street and Willard Avenue. It would also enhance the end-user experience for non-motorized users seeking to avoid high-volume roads.

Criteria Supporting Other Study Goals

Equity – Neutral

This alternative would not impact EJ communities, nor would it provide new opportunities.

Safety – Low Benefit

This alternative would not be expected to have a major impact on safety but may reduce motorized and non-motorized conflict with additional accommodations.

Resiliency and Sustainability – Low Impact

The improved connection would likely distribute east-west traffic and would likely have little potential to increase VMT with no impacts on network resiliency and sustainability.

Environment – Moderate Impact

Natural resources of concern are near Piper Brook, which bisects the alternative project corridor and alternative representative alignment. Sensitive land uses adjacent to the alternative on the east side of Piper Brook include Newington High School and VA Connecticut Healthcare System campus. Environmental impacts are anticipated to be moderate but mitigable.

Technology – Neutral

This alternative does not incorporate any elements that would support future technologies.

Public Support – Moderate Benefit

Alternative has general support. Comments include desire for a stop serve the VA and businesses on alumni road. Comment also includes desire for a CT*fastrak* station to service this section.

Overarching Criteria

Economic Opportunity – Neutral

This alternative would not have a significant impact on regional economic opportunities.

Feasibility/Complexity – Neutral

This alternative has some complex elements, such as a bridge over railroad tracks and a dense built environment on the west end, but it is straightforward overall. There is some right-of-way required.

System Compatibility – High Benefit

This alternative has independent utility, and the potential reduction in traffic volume on Route 175 may enable new options for roadway reconfiguration there.

Overall Assessment of Benefits/Impacts

This alternative has more benefits than impacts if it is determined by detailed environmental review to not impact Piper Brook or neighboring wetlands.

Order of Magnitude Cost

This project cost is estimated to be between $50M-150M (2022). Majority of the cost would be the new bridge that would need to be constructed, with additional costs for additional at-grade local roads and intersection construction.

High Level Benefit-Cost Outlook

Benefits are moderate for this alternative, and benefits are local in scale. Additionally, the utility of removing traffic from Route 175 may be decreased if operational improvements on Route 175 improve traffic flow along that corridor. Considering the potential environmental impacts and the high cost of bridge construction, it is questionable whether the benefits of this alternative would exceed the costs.

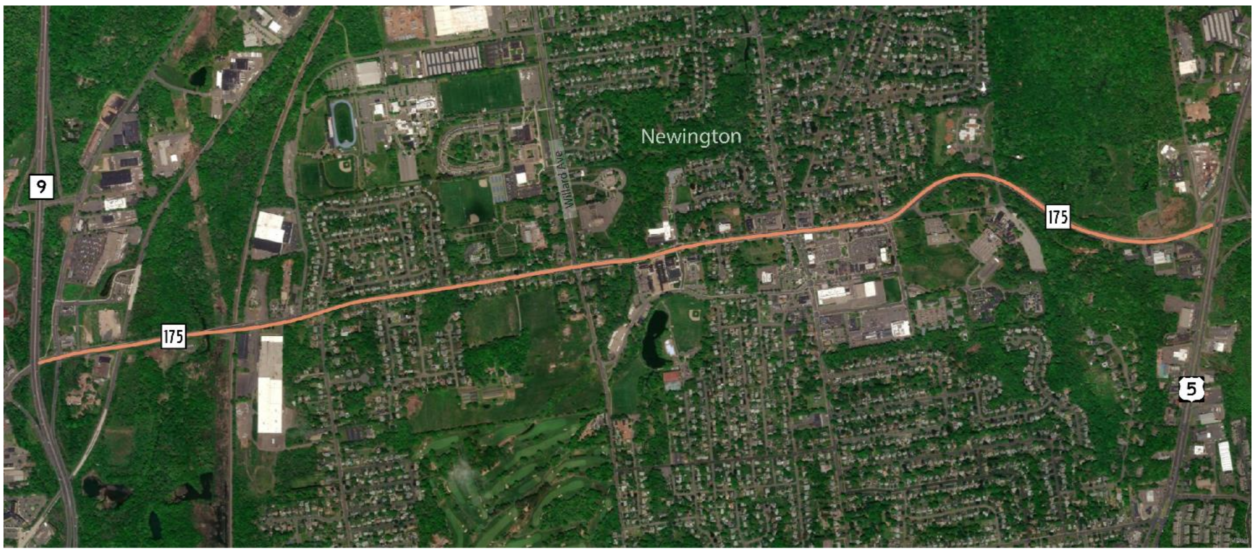
Route 175 Corridor Study

(Formerly Operational Improvements on Route 175)

Detailed Project Description

This alternative would investigate the corridor of Route 175 (Cedar Street) between Route 9 and Route 15, primarily in Newington. This section of road is generally four lanes wide and carries over 30,000 vehicles per day. When I-84 is congested, Route 175 becomes a major alternate route for traffic headed to or from Hartford. The study would assess safety, operational, and multimodal changes on this section of Route 175, as well as evaluating potential realignments and reconfigurations of side roads that could improve intersection safety and highway operations.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take approximately 3 years to complete.

Project Development Process

The Town of Newington would need to release an RFP or request CRCOG complete a study to assess the existing conditions, best uses, concept alternatives, and next steps.

Project Phasing

This study cannot be split into phases of independent utility. Recommendations from the study could foreseeably be split into multiple segments of independent utility, with early actions such as sidewalk construction done before roadway work.

Environmental Review Process

Not Applicable (NA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative investigates improvements to travel reliability by reducing left lane blockages and crash rates.

Access and Connectivity – High Benefit

This alternative investigates improvements to non-motorized access to and connectivity between the CT*fastrak* Cedar Street Station and downtown Newington.

Travel Options and End User Convenience – Moderate Benefit

This alternative would investigate the end user experience for all users of Route 175.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The potential for environmental impacts to minority and low-income populations are likely to be outweighed by the access, safety, and mobility opportunities created.

Safety – High Benefit

The corridor study would seek to examine and recommend safer conditions for automobiles, particularly at the interchange with Route 15 where high crash rates currently exist. In addition, recommendations would be to improve the experience for non-motorized users.

Resiliency and Sustainability – Low Benefit

The alternative may recommend improvements that would support minor modal shifts to non-auto modes and provide little improvements to network resiliency and sustainability aspects.

Environment – Moderate Benefit

Aquatic resources associated with Mill Brook and Piper Brook are present in the central and western portions of the project corridor. Protected open space is present in the central portion of the project corridor. Environmental impacts will be investigated for the recommendations that come out of the corridor study, but it is anticipated that any recommendations would provide benefits to the communities present.

Technology – Moderate Benefit

This study would consider improvements that take into consideration the performance of autonomous vehicles by providing a more consistent driving environment.

Public Support – Moderate Benefit

The public generally supports improvements to this corridor with key themes including the need for safe bike and pedestrian facilities and roadway improvements.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative would investigate improvements to the CT*fastrak* Cedar Street Station, making underdeveloped parcels nearby more desirable, and improve travel time reliability for through traffic.

Feasibility/Complexity – Neutral

Based upon recommendations there would likely be some additional right-of-way required, but engineering complexity would not be particularly high.

System Compatibility – High Benefit

This alternative has independent utility and would also enhance connections between different modes.

Overall Assessment of Benefits/Impacts

The assessment of this alternative is overwhelmingly positive with no significant impacts.

Order of Magnitude Cost

This alternative is estimated to cost approximately $500,000 (2022) for a corridor study to determine a final design and implementation cost.

High Level Benefit-Cost Outlook

This alternative would provide numerous benefits to users of all modes and act in a synergistic manner with other mobility alternatives. The benefits of the study are expected to outweigh its anticipated cost. Additionally, it is anticipated that its conclusions will determine a high cost-benefit ratio for the eventual construction of the project.

Cap I-91, Hartford

Detailed Project Description

This alternative comprises the covering of a portion of I-91 in Hartford. This was previously explored under the I-84 / I-91 Interchange Study, to determine which areas would be best suited to capping. There are three significant features that currently represent a barrier to movement: road infrastructure (including I-91), a freight railroad track, and Hartford's flood control system. The study concluded that the area's most conducive to capping are in the vicinity of the Bulkeley and Founders Bridges. In other locations, underpass-like treatments might be preferable.

The most obvious barrier to capping in the vicinity of the Bulkeley Bridge is the I-84 / I-91 interchange – aside from the ramps connecting the two interstates, the I-91 southbound through lanes are elevated two levels above the northbound through lanes. Capping in this area has the reconstruction of I-91 as a prerequisite.

This alternative has been included in the implementation plan as a component of City Link.

Alternative Map

Map of I-91 Cap location (note: drawing portrays other GHMS alternatives that are distinct from the I-91 cap alternative.)

Implementation Timeframe

Timeframe

This alternative would take 10-15 years to complete.

Project Development Process

Capping I-91 would require a substantial amount of construction to be accomplished beforehand, primarily in the reconstruction of I-91 and removal of the existing viaduct. It is foreseeable that any design, outreach, and environmental planning required for the cap itself could be accomplished concurrent to the design and construction of the necessary road work.

Project Phasing

The alternative could be divided into smaller segments to be constructed as needed, as any amount of capping can provide benefits to the city, even with a fraction of the full project length in place. But it is highly recommended, for smooth construction operations, that construction on a cap does not commence before I-91 reprofiling and reconstruction is substantially completed. A plan for relocation of the I-84/I-91 interchange should be established before moving forward with this alternative, as it is incompatible with the existing interchange.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in any changes to travel time or reliability.

Access and Connectivity – Moderate Benefit

This alternative would provide improved connectivity between Hartford's central business district and recreational areas along the Connecticut River.

Travel Options and End User Convenience – Moderate Benefit

Capping over I-91 in this area would improve the end user experience for recreational users by mitigating some of the visual and noise impacts of I-91.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The temporary effects to minority and low-income populations would be outweighed by opportunities created to better connect these communities to and across the Connecticut River.

Safety - Neutral

It is not expected that capping would result in a significant change in safety. Vehicular safety may be impacted by the fluctuating lighting caused by capping, and pedestrian safety may be improved, but the overall result would be minor.

Resiliency and Sustainability – Neutral

This alternative does not include elements designed to increase resiliency and sustainability; nor would it support modal shifts to non-auto modes.

Environment – Low Benefit

Aquatic resources associated with the Connecticut River are located in the eastern portion of the Project Corridor. Protected open space resources and Natural diversity habitats are present throughout the Project Corridor. Built resources, including historic districts and structures are present in the western portion of the Project Corridor. Environmental impacts are anticipated to be moderate but mitigable.

Technology – Low Impact

This alternative would introduce areas with sudden changes in brightness, as well as potentially interrupting cell and/or GPS signals if significant length is capped; however, with new technologies the impacts can be mitigated.

Public Support – Moderate Benefit

Strong general support for this alternative. Comments include a strong desire to reconnect the city back to the River. However, comments also show strong desire to ensure that surface roads are planned carefully for bike/ped safety with the possibility that more traffic may shift to surface roads.

Overarching Criteria

Economic Opportunity – High Benefit

Capping I-91 along the Connecticut River could have a major positive effect on the economic viability of surrounding properties and provide a venue for new events.

Feasibility/Complexity – Neutral

This alternative would require a great deal of construction, but so long as the potential capping is accounted for in the freeway design, there would not be feasibility or complexity concerns.

System Compatibility – High Benefit

This alternative has independent utility and would also enhance potential mid- and long-range recreational trails such as the East Coast Greenway traveling through this corridor.

Overall Assessment of Benefits/Impacts

This alternative has significant benefits and few impacts that are not mitigatable.

Order of Magnitude Cost

This project would cost approximately $2-2.5B (2022). This cost reflects the addition of an entire new bridge deck over I-91 and does not include additional freeway projects in downtown Hartford that would support the alternative.

High Level Benefit-Cost Outlook

This alternative would have a high cost. It is important to note that it could only be pursued as part of another freeway project. This project may also enable other river access options, for multiple modes, as well as potential uses for valuable riverfront areas that are currently occupied by expressway. This alternative would be potentially catalytic to massive new investment in Hartford, and despite the high initial investment, it is expected that the benefits would greatly exceed its cost.

I-84 Hartford - Lowered Highway

Detailed Project Description

This alternative entails the reconfiguration of approximately two miles of I-84 between Park Street and High Street in Hartford. The existing train tracks in this corridor would be relocated to the northwest to allow I-84 to be lowered to or below ground level. This alternative also includes the construction of a new train station, as Union Station would no longer be connected to the rail network, and the reconnection of the city street network across I-84. Other potential improvements include capping a portion of I-84 and constructing dedicated facilities for CT*fastrak* and the East Coast Greenway within the corridor.

This alternative was developed during the I-84 Hartford Project and emerged as the most promising treatment for this portion of I-84.

This alternative has been included in the implementation plan as a component of City Link.

Alternative Map

I-84 Lowered Highway. Drawing portrays recommended Northern Alignment alternative; however, lowering the highway is compatible with multiple I-84 alignments.

Implementation Timeframe

Timeframe

This alternative would take approximately 15-20 years.

Project Development Process

Much of the preliminary design and public involvement for the Lowered Highway has already been done as part of the I-84 Hartford Project. This included preliminary cost estimates, identification of impacts, and the relocation of the rail and

CT*fastrak* corridors. If selected for construction, some additional effort would be required to integrate other outcomes of this study and prepare the EIS.

With the EIS complete, right-of-way acquisition and design would begin, lasting five to eight years. Construction would follow. Given the high complexity of the alternative and the amount of preparatory work needed before I-84 can be lowered, it is estimated that construction would last around 20 years.

Project Phasing

Some portions of this alternative could be constructed before others, such as the railroad relocation, but the multimodal station could not be finished until the freeway work was completed.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This alternative would improve both travel time and reliability by improving traffic safety and operations on I-84, its ramps, and the local road network. Modern design features such as improved interchange spacing, full shoulders, lane balance, and lane continuity would result in significant benefits to the traveling public.

Access and Connectivity – High Benefit

This alternative would improve multimodal connectivity by integrating rail, bus, and vehicular traffic, expanding bike and pedestrian infrastructure, and improving connections across and along I-84.

Travel Options and End User Convenience – High Benefit

With its integration of several different modes and balance of mass transit with road operations, this alternative would provide redundant travel options as well as improving the user experience.

Criteria Supporting Other Study Goals

Equity – Low Benefit

The effects to minority and low-income populations in the eastern portion of the Project Corridor and potential increases in VMT would be outweighed by accessibility and safety opportunities created.

Safety – High Benefit

The incorporation of modern design features on I-84, the reconfiguration of interchanges to emphasize the transition to urban driving, and the addition of active transportation facilities throughout the corridor would improve safety for all users.

Resiliency and Sustainability – Moderate Benefit

This alternative's multimodal hub would greatly increase the multimodal utility of rail and bus connections, enabling non-automobile-based growth such as TOD.

Environment – Moderate Benefit

This alternative takes place in an already developed area and capping will reduce noise in the adjacent neighborhoods, while also providing additional accommodations for a local mobility hub.

Technology – Moderate Benefit

The use of modern design principles and the inclusion of dedicated space for Mobility-as-a-Service (MaaS) connections at the multimodal hub both support future technology.

Public Support – High Benefit

General support for this alternative. Comments include a desire for the Park River to be better utilized.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative would dramatically improve economic opportunity in Hartford by providing significant investments in multimodal infrastructure, as well as making large parcels available for development.

Feasibility/Complexity - Neutral

The constructability of this alternative was explored in detail as part of the I-84 Hartford Project, as were the likely right-of-way impacts. Construction would be complex, but not inordinately so, and ROW impacts were judged to be acceptable compared to the project's benefits.

System Compatibility – High Benefit

This alternative has independent utility, and would also support improvements to the regional train, bus, and highway networks.

Overall Assessment of Benefits/Impacts

This alternative would be overwhelmingly beneficial, reflecting the decade of work that has been put into mitigating impacts and optimizing the design.

Order of Magnitude Cost

Detailed cost estimates were produced during the I-84 Hartford Project. The overall costs were typically estimated as $4-6B (2022). Major contributors to this cost were the relocation of the rail line and CT*fastrak*, the construction of the new multimodal station and parking garage, and the construction of widened overpasses over I-84 between Capitol Avenue and High Street.

High Level Benefit-Cost Outlook

While this alternative would doubtless be costly, it would be transformative for Hartford and its residents and businesses. The alternative would enable economic growth due to new development parcels being made available and improved access to existing parcels. It is expected that benefits would exceed costs.

New Connecticut River Bridge - Charter Oak Avenue & East River Drive

Detailed Project Description

This alternative comprises a new crossing of the Connecticut River linking the Coltsville neighborhood of Hartford with East River Drive in East Hartford. Multiple alignments are possible in this area, depending on the configuration of I-91, the Whitehead Highway, and the railroad track. The bridge would serve as an extension of either the Whitehead Highway, Sheldon Street, Charter Oak Avenue, or Van Dyke Avenue, and would provide access between the local road networks of Hartford and East Hartford. It would serve both vehicular and non-motorized traffic.

This alternative has been included in the implementation plan as a component of River Gateway.

Alternative Map

Concept drawing includes implementation of "Whitehead Highway Reconfiguration" and "I-91 Cap" alternatives.

Implementation Timeframe

Timeframe

This alternative would take 10-15 years to implement.

Project Development Process

The choice of alignment would depend heavily on the reconfiguration of the Whitehead Highway and the lowering and capping of I 91. Much of the pre-construction period would be spent performing an analysis of the environmental impacts of a new river crossing. Assuming funding is available, construction could begin within ten years of the beginning of studies and would likely last another three to five years.

If I-91 and/or the Whitehead Highway were relocated, the design and construction of this new bridge would likely be combined with those projects.

Project Phasing

It is unlikely that this alternative could be divided into multiple segments of independent utility, as its utility depends on the new bridge crossing and would serve little purpose otherwise.

Given the existing constraints of the three-level interchange, the railroad, the Park River Conduit, and the flood control system, construction of the new bridge would best be pursued once the I-91/Whitehead Highway interchange was revised.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative would reduce travel times for local traffic between Hartford and East Hartford, especially for non-motorized traffic.

Access and Connectivity – Moderate Benefit

This alternative would provide better access to educational facilities and offices in East Hartford for Hartford residents, as well as reducing reliance on freeway travel for short-distance trips.

Travel Options and End User Convenience – High Benefit

This alternative would provide an alternative connection between Hartford and East Hartford, adding a redundant travel option. It would also greatly improve the end user travel experience by reducing trip length and stress for local traffic.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The effects to minority and low-income populations would be outweighed by opportunities created to better connect these communities to and across the Connecticut River.

Safety – Low Benefit

By providing a more direct path between local roads in Hartford and East Hartford, this alternative would reduce crash exposure. Actual crash rates would depend on specific design elements.

Resiliency and Sustainability – Low Benefit

By providing more convenient non-motorized access between Hartford and East Hartford, this alternative would support minor shifts to alternative modes.

Environment – Low Benefit

This alternative would take significant environmental assessments to reduce any negative impact to the Connecticut River; however, it would support non-motorized travel between Hartford and East Hartford.

Technology – Neutral

This alternative would not incorporate elements that support future technologies.

Public Support – Neutral

Overall, people who commented on this alternative prefer this crossing to be a bike/pedestrian bridge. Suggestions also include a railroad bridge between the riverfront and East Hartford.

Overarching Criteria

Economic Opportunity – High Benefit

By connecting complementary land uses and providing better access to underdeveloped areas, this alternative would provide an opportunity for regional economic growth.

Feasibility/Complexity – Neutral

Right-of-way requirements for this alternative are relatively modest and without significant property impacts. The complexity of this alternative is standard, involving a long bridge and local road realignment.

System Compatibility – High Benefit

This alternative has independent utility, and its construction would reduce traffic demand elsewhere, providing an overall benefit to the transportation network.

Overall Assessment of Benefits/Impacts

This alternative could be highly beneficial, with most criteria rated as benefits and only one impact.

Order of Magnitude Cost

This project cost is estimated be between $250M-$1B (2022). The cost will be dependent on the alignment used, the number of lanes included, and any potential impacts on the interchange between the Whitehead Highway and I-91.

High Level Benefit-Cost Outlook

This alternative would have a high cost. It is important to note that it could only be pursued as part of (or after) a multi-billion-dollar freeway project, and such a project might enable other new river crossings. This alternative would also hold numerous benefits for Hartford and East Hartford. Its benefits are thought to be balanced with its costs.

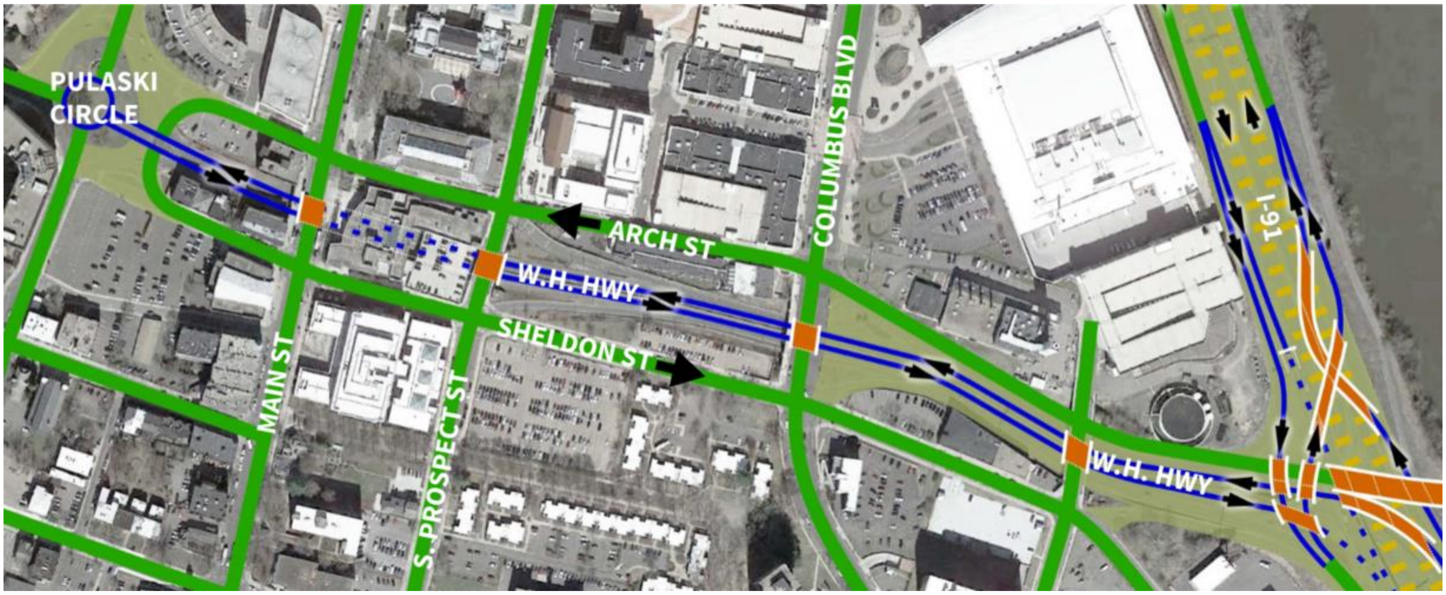
Relocate Whitehead Highway

Detailed Project Description

This alternative comprises the reconfiguration of the Whitehead Highway between Pulaski Circle and I-91. The extent of this work would depend heavily on the access needs between I-91 (particularly to and from the southern project corridor) and Hartford. The Whitehead Highway presently accommodates higher peak-hour volumes than the Founders Bridge. The proposed alternative would convert Arch Street and Sheldon Streets into one-way frontage roads. Connections to Columbus Boulevard and Prospect Street could be removed, with all Whitehead traffic routed to Pulaski Circle. Alternatively, the highway could be terminated by connecting to Columbus Boulevard or Prospect Street.

This alternative has been included in the implementation plan as a component of River Gateway.

Alternative Map



Concept drawing depicting the Whitehead Highway connecting directly to Pulaski Circle, with reconfiguration of adjacent surface roads. Concept includes implementation of I-91 cap alternative and Whitehead-East River Drive River Crossing alternative, with corresponding interchange redesign.

Implementation Timeframe

Timeframe

This alternative would take approximately 10-15 years to complete.

Project Development Process

Advancing this alternative into design would require a detailed preliminary engineering process, including in-depth traffic analyses of Arch Street, Sheldon Street, and the Whitehead Highway, to ensure that peak hour queues do not stretch to either I-91 or north-south downtown corridors and potentially interfere with their operations. After five to ten years of traffic study, design, environmental planning, and right-of-way acquisition, the project could move into construction.

Project Phasing

This alternative would not have segments of independent utility. The highway may not be reconfigured as designed in this alternative without corresponding widening and reconfiguration of Arch Street and Sheldon Street. This would require the demolition of existing properties on those streets.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Low Benefit

Reconfiguration of the Whitehead Highway could result in improved performance, which would improve the speed of access to the Capitol area and other destinations on the South End.

Access and Connectivity – Moderate Benefit

More predictable performance of the Whitehead Highway in peak hours could prevent redistribution of traffic onto adjacent surface roads, improving overall network performance. The utility of the alternative would be greatly improved if either the reconfigured Whitehead Highway or its frontage roads connect to a new bridge across the Connecticut River, as has been proposed. Were that project to advance, the alternative would be considered to have a High Benefit to Access and Connectivity, as it could provide faster access between downtown and East Hartford.

Travel Options and End User Convenience – Moderate Benefit

Most of the users of the reconfigured Whitehead Highway would likely be current users of the Whitehead Highway. They may benefit from improved travel times. The Whitehead will also continue to provide an alternative connection to downtown in the case of disruption to the Trumbull Street ramps or any future ramps constructed to the north.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The project is unlike to directly impact any economically vulnerable populations or interfere with local access. The project could improve connectivity between the South End of Hartford, East Hartford, and the eastern study corridor, particularly if implemented alongside a new Connecticut River crossing.

Safety – Moderate Benefit

A reconfiguration of the Whitehead Highway can include traffic calming measures that will improve safety at Pulaski Circle, which currently experiences a high number of crashes, the majority of which are front-to-rear collisions from cars exiting the Whitehead Highway.

Resiliency and Sustainability – Moderate Benefit

Better performance on the Whitehead Highway, and diversion of traffic from north-south downtown connections such as Main Street, Prospect/Market Street, and Columbus Boulevard, could improve local road network resiliency. If a new bridge across the river were constructed, an improved Whitehead Highway would enhance its performance as a redundant connection supporting the Bulkeley and Founders Bridges, sustaining cross-river performance through any future increases in traffic volume.

Environment – Low Impact

The reconfiguration will be performed within the existing right-of-way of the Whitehead Highway, so no impacts to the natural environment are expected.

The potential presence of cultural resources at the western end of the Whitehead and along Arch and Sheldon Streets will have to be examined to determine if any major impacts are likely, and to devise strategies for mitigating them. This may include widening Sheldon and Arch Streets on the side facing the Whitehead Highway, rather than their built-up sides, which could reduce right-of-way costs but substantially increase structural costs.

Technology - Neutral

No novel technologies are expected to be implemented in this alternative.

Public Support - Neutral

The public is generally support of projects that increase access and mobility but has not expressed any enthusiasm for changes to the Whitehead Highway.

Overarching Criteria

Economic Opportunity – Moderate Benefit

A reconfiguration of the Whitehead Highway could improve connections from downtown and the South End, particularly to the southern study corridor.

Feasibility/Complexity – Moderate Benefit

The actual reconfiguration of the highway is not anticipated to present engineering challenges. Further complexity would be introduced by changes to the interchange with I-91 or the addition of a new river crossing.

System Compatibility – Moderate Benefit

The alternative would slightly improve performance without making major changes to the existing road network.

Overall Assessment of Benefits/Impacts

Reconfiguration of the Whitehead Highway provides a limited amount of independent utility, mostly by improving peak hour volumes and improving connections between I-91 and the Bushnell Park and Capitol areas. However, the benefits of the alternative are vastly improved by tying the highway and its interchange to a new East Hartford connection.

Order of Magnitude Cost

The standalone Whitehead Highway reconfiguration is expected to cost in the vicinity of $50-$100 million.

High Level Benefit-Cost Outlook

There are benefits to mobility and access from this alternative. However, in the absence of other network improvements such as a new river crossing, the benefits will be limited. The cost-benefit ratio is approximately even for the reconfiguration alone but becomes very positive when combined with the synergistic alternatives.

I-84/I-91 Tunnel through Hartford

Detailed Project Description

This alternative consists of tunneling I-84 from New Park Avenue in Hartford to Main Street in East Hartford, as well as tunneling I-91 from Airport Road to Leibert Road, both in Hartford. The interstates would have an interchange underground, as well as interchanges near the tunnel portals to provide access to and from surface streets. The alternative diverts traffic from the existing freeways in Hartford and East Hartford, allowing them to bypass central Hartford via the tunnel system. This reduction in traffic, estimated to result in about one third of existing volumes, could be used to reconstruct I-91 and I-84 in their existing alignments, which would need to be used for local access, given the infeasibility of adding multiple surface connections to a deep tunnel.

Alternative Map

Implementation Timeframe

Timeframe

This alternative would take at least 10 years to complete environmental review and preliminary engineering with approximately 20 years dedicated to construction, bringing the total implementation time to 30+ years.

Project Development Process

This alternative would take decades to design and construct. One major factor is the tunnel boring itself – even using several tunnel boring machines, the 18 miles of bored tunnel would take years to dig. Then, the tunnels would need to be tied into the surrounding freeway network. Finally, the existing interstates could be reconfigured to handle the new traffic patterns.

Project Phasing

This alternative would, by its nature, be difficult to split into segments with independent utility. The tunnels would not be useful until they are connected to the road network, and modifications to the existing freeways could not be completed before the tunnels are brought into use.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Impact

Adding freeway tunnels for through traffic would provide alternative routes and potentially increased capacity. The surface highways, with the majority of their traffic diverted, would provide smoother local access than the current crowded downtown freeways. However, there are concerns that the constraints on the subterranean interchange could result in poor traffic flow, leading to bottlenecks approaching the exit ramps.

Access and Connectivity –Moderate Impact

This alternative would not add new access points or new modal connections. Additionally, the necessity of keeping the existing I-84 and I-91 alignments as freeway corridors would undermine attempts to connect the city across the viaduct locations or to the riverfront. Meaningfully addressing these concerns would likely require incorporating elements of the I-84 lowered highway alternative, which is a further major expense added atop tunnel construction.

Travel Options and End User Convenience - Neutral

The tunnels would provide an alternate route for through traffic, improving the redundancy of the regional road network. Users would have the option to use the surface freeways or tunnel freeways, depending on traffic conditions and their destination. However, this alternative does not allow for any "spur of the moment" modifications to plans, which requires that the user have an end destination in mind at the start of their journey.

Criteria Supporting Other Study Goals

Equity – Moderate Impact

The effects to minority and low-income populations in the eastern portion of the Project Corridor are of major concern. Approaches to the tunnels are likely to be inhospitable to bicyclists and pedestrians and create physical barriers in the urban environment.

Safety – Moderate Benefit

Tunnels are not inherently less safe than surface roads, and due to the substandard geometry and high crash rates of the existing freeways, it is likely that the alignment would represent an improvement in safety. However, the difficulty of responding to a traffic incident in a long tunnel with no intermediate access could increase emergency response time, affecting the operational impact and serious injury potential of crashes.

Resiliency and Sustainability – Moderate Benefit

Although the increased mobility may result in a slight uptick in VMT, it would not be expected to increase significantly, as decreases in congestion would be offset by shorter, more direct travel paths for through movements, and a reduction in rerouting by drivers attempting to bypass freeway traffic. This could also improve performance of the local road network. The tunnel portals would be in low-elevation areas, leaving them vulnerable to flooding in extreme weather events. The risk of a disruption to access during a weather emergency is of serious concern, and major flood control measures with strong redundancy would be necessary.

Environment – Critical Flaw

Tunnel portal interchanges would be located in the Park River and Hockanum River wetlands, and there may be impacts to historic properties where ventilation shafts are installed. Environmentally sensitive areas are present, particularly along the Connecticut River and its tributaries. There is a moderate presence of natural environmental resources immediately adjacent to alternative alignment, and significant geotechnical challenges would be expected, based upon the complex composition of the soil and bedrock in the lower Connecticut River Valley.

Technology – Moderate Impact

Long, deep tunnels prevent the operation of satellite and cellular-based navigation unless special repeaters are installed. However, these repeaters have been very successful in other underground facilities, such as the New York City subway, and while the cost is not negligible, it is minor relative to that of major tunnel boring operations. Should autonomous driving systems continue to become more commonly used, the sudden changes in lighting levels at tunnel entrances and exits could pose a challenge for their cameras and sensors.

Public Support – High Impact

Overall, comments are not supportive of this alternative. A few comments are supportive. Members of the public have suggested additional solutions, such as a tunnel connecting routes to Newington. There is a common concern that this alternative encourages more car traffic, as well as major concerns about the high cost.

Overarching Criteria

Economic Opportunity – Critical Flaw

This alternative would result in access and mobility impacts during construction, as well as long-term negative impacts due to the land taken up by portal interchanges. In addition, a project of this magnitude would take up a substantial fraction of CTDOT's entire budget for decades, severely limiting other potential projects.

Feasibility/Complexity – Critical Flaw

This alternative requires the use of four tunnel boring machines (TBM), each of which is at least as large as the largest TBM ever used, Big Bertha for Seattle's SR 99 tunnel. Several smaller TBMs would simultaneously be used for interchange ramps. These TBMs are abandoned in place after construction. Procuring and running four of these massive machines at once in Hartford's challenging geotechnical conditions is well beyond the scale of any construction activity attempted in the U.S.

System Compatibility – Critical Flaw

This alternative may adversely impact the overall transportation system, due to its single option travel opportunities.

Overall Assessment of Benefits/Impacts

Due to this project's extremely high costs and the potential economic harm involved with construction, combined with only modest potential benefits to mobility, this alternative has been removed from consideration.

Lower Route 2 in East Hartford

Willow Street to High Street

Detailed Project Description

This alternative comprises the lowering of Route 2 in East Hartford between the Willow Street and High Street interchanges. This would result in a capped portion approximately 2,000 feet long centered on Ensign Street. The primary purpose of this alternative would be to improve connectivity between the residential areas to the east and the educational institutions along Riverside Drive.

Alternative Map

Implementation Timeframe

Timeframe

This alternative would take 6-10 years to implement.

Project Development Process

Preliminary engineering must be performed to evaluate the locations where a cap on Route 2 is or is not feasible, and the required roadway depth. The project location is adjacent to the Connecticut River, and outside of East Hartford's flood control system, so flood risk must be carefully considered. Permitting and design would take approximately three to five years. Maintaining traffic on Route 2 during construction would require staged construction and increase the duration. Given the large amount of excavation and necessary installation of dewatering systems, it would likely take at least three years of construction to complete the project.

Project Phasing

This alternative could not be divided into segments of independent utility as it only contains one element.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not be expected to produce a significant change in travel time or travel time reliability.

Access and Connectivity – Moderate Benefit

This alternative would provide a small improvement in connectivity across Route 2 for residents living immediately adjacent. Non-motorized travel distances could be reduced by as much as several hundred feet.

Travel Options and End User Convenience – Moderate Benefit

This alternative would not provide redundant travel options. It would improve travel conditions for users of Ensign Street.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The effects to minority and low-income populations would be outweighed by opportunities created to better connect these communities to the Connecticut River.

Safety – Low Impact

Though tunnels are not inherently unsafe, there is evidence to support the conclusion that crash rates are increased at their entrances and exits. Additionally, emergency vehicle access is more difficult in a tunnel.

Resiliency and Sustainability – Moderate Impact

This alternative does not include elements designed to increase resiliency and sustainability; nor would it support modal shifts to non-auto modes. However, lowering Route 2 well below the current Connecticut River flood elevation has the potential to negatively impact resiliency.

Environment – Moderate Benefit

Minor presence of resources within project corridor associated with the Connecticut and Hockanum Rivers and Willow Brook; however, there the opportunity for the addition of green space on the cap and active transit accommodations. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Neutral

This alternative would introduce areas with sudden changes in brightness, as well as potentially interrupting cell and/or GPS signals if significant length is capped; however, with new technologies the impacts can be mitigated.

Public Support – Moderate Benefit

There is support for converting Route 2 into a boulevard. Comment suggests running Route 2 through different streets: West of Main Street in East Hartford, between Hartford and Hebron Ave, and more.

Overarching Criteria

Economic Opportunity – Neutral

This alternative would improve property values in adjacent neighborhoods but would not produce new regional economic opportunities.

Feasibility/Complexity – Neutral

This alternative includes complex elements but is not unfeasible and it could reasonably be accomplished within existing right-of-way.

System Compatibility – Neutral

This alternative has independent utility but would not support overall systemic enhancements.

Overall Assessment of Benefits/Impacts

Relative to its size, the potential benefits of this alternative are meager and largely limited to a few residences. It is important to note that many of these benefits could also be realized with the alternative Goodwin University to East Hartford Connection, sooner and at a lower cost. In addition, the potential flooding issue makes lowering Route 2 here unfavorable.

Order of Magnitude Cost

This alternative is projected to cost between $500M-$600M (2022). The majority of the cost is contributed by a lowered capped portion of Route 2 that would run between Willow St and High St. This is represented as a bridge deck cost with a unit price of $960 per square foot.

High Level Benefit-Cost Outlook

The benefit-cost profile of this alternative is poor due to the high cost of freeway reconstruction combined with little to no benefit to mobility. The modest improvements to access and connectivity in southern East Hartford do not justify the high cost.

Hartford Northwest Bypass

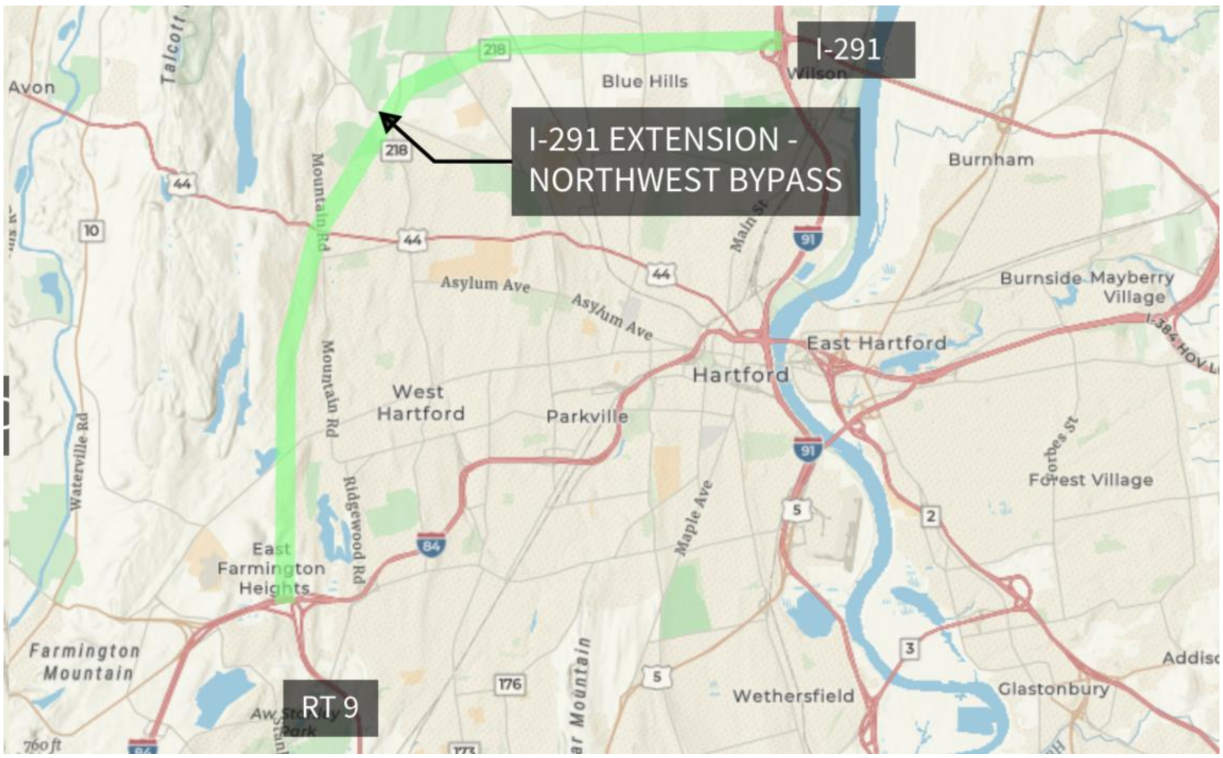
Detailed Project Description

This alternative is a new freeway connection between I-84 west of Hartford, at its interchange with Route 9, and the interchange of I-91 and I-291 north of Hartford. This design is similar to the original conceptualization of I-291 in the early 1970s. It would likely pass through Farmington, West Hartford, Bloomfield, and Windsor.

As an alternative, the existing I-291 could be extended west along Route 218 to minimize property impacts, ending near Route 189 in Bloomfield. This would avoid impacting environmentally sensitive areas and could be constructed as a segment of independent utility. However, the utility would be limited, given the current adequate performance of Route 218, and impacts in the vicinity of would be significant.

This alternative would mainly serve passenger vehicles heading from the areas west of Hartford to the north and northeast, and would also divert a modest amount of traffic away from the center of Hartford.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take well over 30 years to complete, given its large scale (over 10 miles in length) and significant environmental concerns, particularly in the area between I-84 and Route 44, which is the location of the reservoirs serving Hartford and West Hartford.

Project Development Process

This alternative would require a great deal of planning and preliminary engineering before beginning design. The north-south portion of the alignment, from I-84 to Route 44, is in an environmentally sensitive area, and the east-west portion along Route 218 is densely settled. As a result, the environmental review and right-of-way periods would be protracted and would likely last a decade or longer. It is also possible that these issues will be insurmountable under current EPA and DEEP regulations. This portion of I-291 was canceled half a century ago due to these same impacts, and the area has only grown more densely developed in the meantime, and the magnitude of allowable environmental impacts has decreased.

A potential design phase would last five to ten years, followed by another 5 to 10 years of construction. The combined duration of the environmental review, engineering and construction would likely last in excess of 30 years. This depends heavily on the exact alignment and method; tunneling, for example, would result in a longer construction duration.

Project Phasing

The connection between the I-84/Route 9 interchange and Routes 4 and 44 would have independent utility, although its benefits would be unlikely to exceed the cost given the sensitive environmental context. The east-west segment (I-91 to Route 189) along Route 218 could also be considered a segment of independent utility, and prioritized or constructed alone. However, the benefits of this segment are also unlikely to exceed the costs, and it would create severe impacts to private property along Route 218, in the form of both property acquisition and reduced access to Route 218.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This alternative would greatly reduce travel time and increase reliability for trips beginning or ending northwest of Hartford. A full bypass would reduce peak-hour traffic on I-84 in Hartford by 3-10%, which would not have a major effect on travel times there, but would provide an alternate route in high-traffic periods.

Access and Connectivity – Moderate Benefit

This alternative would improve access to the northwest of Hartford by reducing travel time and trip complexity.

Travel Options and End User Convenience – Low Benefit

This alternative would provide a redundant travel option and improved end user experience, but mainly for through traffic, providing little local access. It could possibly disrupt access to existing routes such as Route 189 and Route 218 for residents adjacent to the corridor, offsetting and reducing the value of the new route option.

Criteria Supporting Other Study Goals

Equity – Moderate Impact

The east-west portion of this alternative runs through southern Bloomfield and northern Hartford, an economically disadvantaged area. Either the alignment would follow the existing Route 218, reducing access, or it would run south of Route 218, with attendant property impacts.

Safety – Moderate Benefit

Moving traffic from surface streets with traffic signals to freeways would likely result in a significant reduction in crash rate.

Resiliency and Sustainability – Moderate Benefit

The additional lane capacity added to the network will have the potential for VMT increases to the regional network. The bypass route will also contribute to increased travel times and emissions.

Environment – Critical Flaw

Environmentally sensitive areas are present particularly along centered on the Connecticut River and its tributaries. Moderate presence of natural environmental resources immediately adjacent to alternative alignment and significant geotechnical challenges based upon the makeup of the soil and bedrock in the region.

Technology - Neutral

This alternative does not include elements that offer consideration for supporting future technologies.

Public Support – Moderate Impact

There is very little support for this alternative. There were concerns about the impact of the bypass on the environment.

Overarching Criteria

Economic Opportunity – Neutral

This alternative would improve access to Hartford in the northwest corridor but has the potential to harm existing businesses in Bloomfield. It would allow for greater access to the dense employment center along Route 218, but the main beneficiaries of that access would not be economically vulnerable communities. They would be little served by the bypass, which largely improves connections between the Hartford area and affluent areas to the west.

Feasibility/Complexity – Critical Flaw

Negative impacts, whether through reduced access or right-of-way acquisition, would have a profound negative effect on economically disadvantaged neighborhoods in Bloomfield and/or Hartford. In addition, previous studies have failed to find a route through Farmington or West Hartford that would minimize impacts to the West Hartford reservoirs.

System Compatibility – Moderate Benefit

The corridor would increase the utility of I-291, allowing it to function as a more proper bypass of Hartford while providing improved highway access for those on the west side of West Hartford and the south side of Bloomfield.

Overall Assessment of Benefits/Impacts

Due to the high costs associated with avoiding environmental impacts, and unavoidable negative consequences in terms of impacts on disadvantaged communities, this alternative has been removed from consideration.

Metacomet Ridge Crossing

Detailed Project Description

This alternative comprises a new connection between I-84 and Route 10 in Farmington. The purpose of this alternative would be to alleviate congestion on Route 4 and US Route 44 by providing a redundant connection across the Metacomet Ridge. Due to the topography of the area, it is assumed that this connection would be an undivided surface road from I-84 Exit 39A to Route 4, then a single-bore tunnel from Route 4 to Route 10.

Alternative Map

Implementation Timeframe

Timeframe

This alternative would take 15-20 years to implement.

Project Development Process

The most extensive pre-construction activity would be the NEPA process, including an analysis of potential impacts to the West Hartford reservoirs, open space, and the Farmington River wetlands. It is expected that at least ten years of study and careful documentation would be required before the project could move into design. The design itself would be relatively straightforward, though it would require some extensive geotechnical work along the tunneled section and a potentially lengthy right-of-way acquisition process. This would likely take five years. The construction of the tunnel would take approximately two years at a pace of 25 feet per workday, and only a single tunnel boring machine would be used. Additional work, such as utilities and traffic signal installation, would require another construction season.

Project Phasing

The proposed roadway, an extension of Route 9 to the north of its current terminus at I-84, is of little benefit unless it crosses the Metacomet Ridge to Route 10. This extension, to the east of the ridge, would provide only slightly improved between Route 4/Route 44 and Route 9/I-84. That access could be implemented before a tunnel was built, but in the absence of plans for a tunnel, the Route 9 expansion would not be warranted.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative would help to improve travel time for users of Route 10, Route 4, and US Route 44.

Access and Connectivity – Moderate Benefit

This alternative would provide a new connection between residential and recreational areas to the west and residential and employment centers to the east.

Travel Options and End User Convenience – Low Benefit

This alternative would provide a redundant travel option for east-west traffic northwest of Hartford.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

This alternative would not impact EJ communities, nor would it provide new opportunities.

Safety – Moderate Impact

While tunnels do not necessarily result in increased crash rates, they do complicate incident management, leading to worse outcomes, and there is a proven correlation between the high-contrast environment at tunnel entrances and exits and higher crash rates.

Resiliency and Sustainability – Low Impact

The increased lane capacity will have the potential for minor VMT increases but little or no negative impacts on network resiliency and sustainability.

Environment – High Impact

Natural resources are prevalent throughout the project corridor. The project area is adjacent to, or passes through, CTDEEP owned South Branch Park River flood retention sites, the Hartford reservoirs, and MDC Reservoir Park, and its terminus lies near the Farmington River. Additionally, the Metacomet Ridge itself is a protected area due to its unique ecological profile, the result of a microclimate created by the unusual terrain. The ridge is home to many plant species not found elsewhere in the state or northeast US.

Technology – Moderate Impact

The rapid changes in brightness at tunnel portals and the lack of cellular and GPS signals in their interior would make driving more challenging for autonomous vehicles and satellite navigation.

Public Support – Low Impact

No support for this alternative. There is little support for building new roads as such measures could potentially increase, rather than decrease, VMT. Public comments support BRT or rail alternatives in order to reduce congestion and improve access in the northwest corridor.

Overarching Criteria

Economic Opportunity – Neutral

This alternative would not be likely to have a significant effect on regional economic opportunities.

Feasibility/Complexity – Critical Flaw

Given the expense and complexity of tunneling, it is difficult to justify such a major expenditure for the benefit of only a small portion of the Capitol Region's population. Adding capacity to existing roadways would be much less complex and avoid many of the downsides of this alternative.

Overall Assessment of Benefits/Impacts

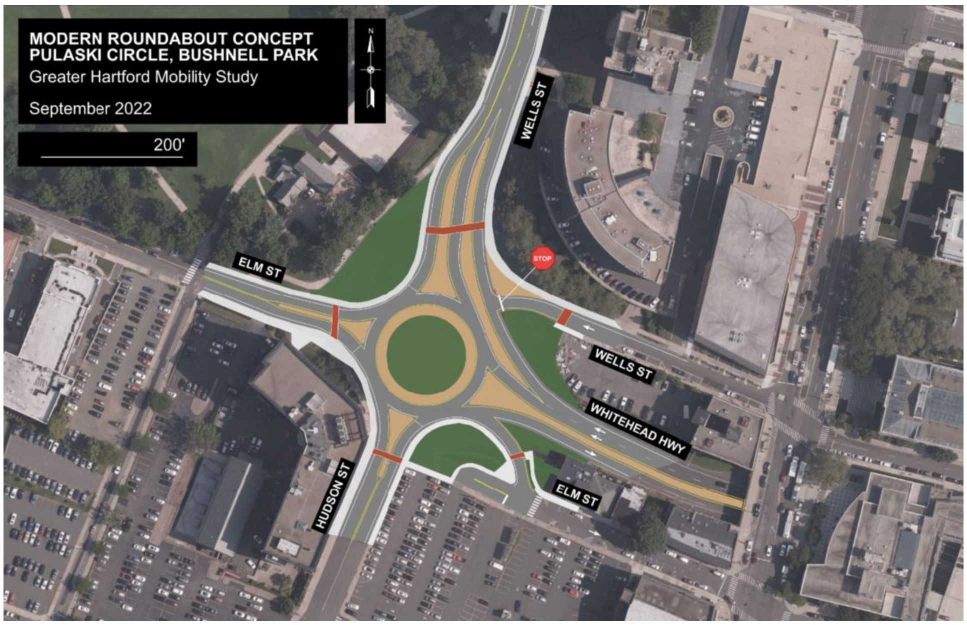
Due to the infeasibility of building a tunnel through the existing ridge, lack of public demand, and the low number of residents that would benefit, this alternative has been removed from consideration.

Pulaski Circle Improvements

Detailed Project Description

This alternative comprises the reconfiguration of Pulaski Circle into a modern roundabout. This would be done within the existing footprint with few-to-no right-of-way impacts. Modern roundabouts require all entering traffic to yield; in order to avoid queueing on the Whitehead Highway, a bypass lane might be needed in the northeast quadrant of the roundabout. This alternative would also include dedicated pedestrian and bicyclist accommodations.

Alternative Map



Implementation Timeframe

Timeframe

This alternative can be implemented within the next 5 years.

Project Development Process

The above design is a preliminary rendering and will require further analysis including traffic assessments and final design before beginning construction. The most difficult part of this alternative would be maintaining traffic during construction, requiring specialized staging. Additionally, the Park River Conduit is just beneath the Circle, adding a design constraint.

Project Phasing

This alternative could not reasonably be broken into segments of independent utility. It is complementary with other options, even those that would reconfigure the Whitehead Highway, especially since it could be completed so quickly.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Low Impact

A modern roundabout would reduce vehicular speeds at Pulaski Circle and force entering vehicles to yield, reducing travel time but not hindering reliability.

Access and Connectivity – Moderate Benefit

This alternative would improve non-motorized connectivity between Bushnell Park and neighborhoods to the south and east.

Travel Options and End User Convenience – Moderate Benefit

This alternative would improve the end user experience for all users of this intersection by improving non-motorized accommodations, using standard traffic control, and slowing freeway traffic entering the city.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The potential for minor effects to minority and low-income populations would be outweighed by opportunities created to better connect these communities to Bushnell Park.

Safety – High Benefit

Modern roundabouts have proven safety benefits and given the unusual nature of the existing traffic circle, a large reduction in crashes and crash severity is expected.

Resiliency and Sustainability – Neutral

This alternative does not include elements designed to increase resiliency and sustainability; nor would it support modal shifts to non-auto modes.

Environment – Moderate Benefit

Pulaski Circle is in an urban area, adjacent to Bushnell Park. Water resources are present mostly adjacent to the Connecticut River. Protected open space and natural diversity areas, and historic resources are immediately adjacent to Pulaski Circle. Since this alternative would bring facility to modern standards and is mostly within the existing footprint; direct impacts on adjacent resources are likely minimal and mitigable.

Technology – Moderate Benefit

Replacing a non-standard intersection with a conventional design would make it easier for autonomous vehicles to navigate this intersection.

Public Support – Neutral

There were no public comments on this alternative.

Overarching Criteria

Economic Opportunity – Neutral

This alternative would have limited economic benefits on a regional scale.

Feasibility/Complexity – High Benefit

A modern roundabout could likely be accommodated within existing right-of-way. Roundabouts have been built in several places around the state in recent years and the design would not be complex.

System Compatibility – Neutral

This alternative has independent utility. It would provide a local enhancement but would not make a major change to the transportation system as a whole.

Overall Assessment of Benefits/Impacts

This alternative would be highly beneficial, although its benefits would be limited to a relatively small area. Impacts would be few, resulting in a high benefit-to-impact ratio.

Order of Magnitude Cost

This project cost is estimated to be in the vicinity of $10M-$19M (2022).

High Level Benefit-Cost Outlook

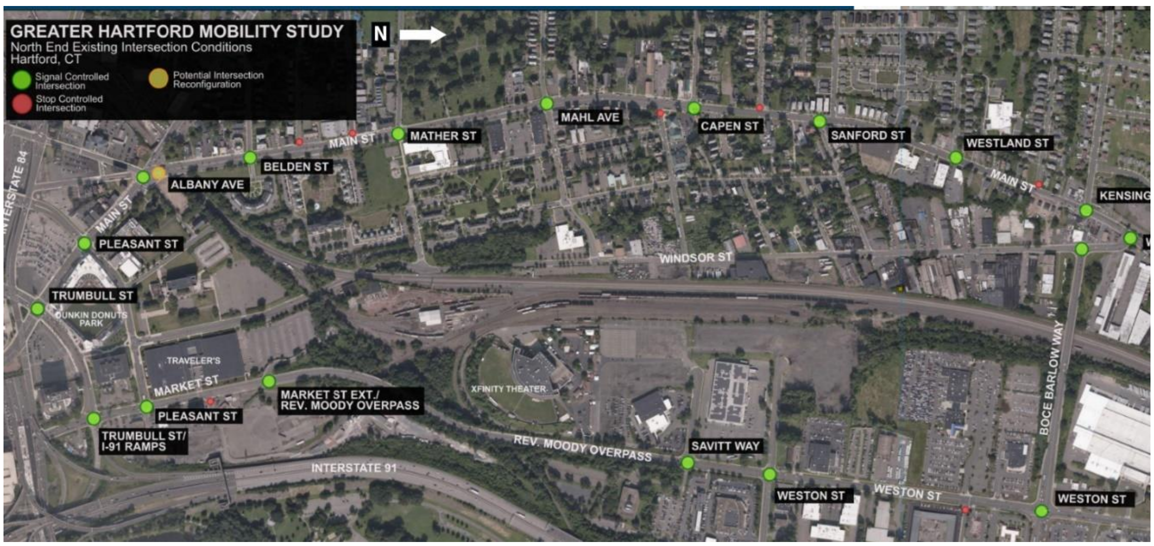
Modern roundabouts are known to have very high benefit-to-cost ratios due to their low rate of serious accidents compared to traditional intersections. In the case of Pulaski Circle, the room for improvement is so large that this relatively inexpensive alternative would result in benefits overwhelmingly exceeding costs.

Rev. Moody Overpass Traffic Corridor (Formerly Hartford North End Congestion Reduction)

Detailed Project Description

This alternative comprises improvements to traffic signals on Main Street between Trumbull Street and Windsor Street. It calls for the implementation of modern traffic signal infrastructure, allowing Main Street to better accommodate buses, bicyclists, and pedestrians, as well as reducing overall delay.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take 4 years to implement.

Project Development Process

The alternative focuses on improvements to the incident management and traffic signal systems in Hartford's North End. This would require a great deal of data collection, especially traffic data collection, utilities, and existing incident management infrastructure. Close coordination with CTDOT's Highway Operations team and the City of Hartford's Public Works Department would be needed. Construction duration would depend on utility schedules, including telecommunications, and the installation of new traffic signal equipment. In addition, a calibration and training period would be necessary to fine-tune signal system response and incident management effectiveness. It is possible that the system could be operational within two years of the beginning of construction, but it could take longer to fully achieve its potential.

Project Phasing

Installation of the new signals may occur on an intersection-by-intersection basis without disrupting operations, although the full implementation is required for major benefit to traffic operations. Once all signals have been installed, the new signal pattern can be fully established.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

Adaptive traffic control systems are known to reduce travel times, and incident management would improve travel time reliability between Hartford and Windsor.

Access and Connectivity – Moderate Benefit

This alternative would improve connectivity between the largely residential areas north of Hartford and employment centers in the city's core.

Travel Options and End User Convenience – Moderate Benefit

This alternative would improve the end user travel experience, especially during traffic incidents.

Criteria Supporting Other Study Goals

Equity – Neutral

This alternative is not anticipated to result in any significant EJ impacts or opportunities. Adaptive traffic signal control systems would reduce pollutant emissions in the Clay Arsenal and North End neighborhoods.

Safety – Low Benefit

Incident management systems have the potential to reduce the frequency of secondary incidents.

Resiliency and Sustainability – Neutral

This alternative does not include elements intended to improve resiliency or sustainability. VMT would not be expected to change substantially, though improved traffic signal timings would reduce greenhouse gas emissions.

Environment – Neutral

This alternative is not anticipated to have impacts on the built or natural environment.

Technology – Moderate Benefit

This alternative's use of intelligent transportation systems would help lay the framework for technological growth in transportation statewide.

Public Support – Moderate Benefit

There is support for the purpose of this alternative. Comments include a preference for multi-modal accommodations given low car ownership neighborhood. Proposed feedback includes the proposal of bus rapid transit between downtown and Windsor's Wilson neighborhood along with traffic calming measures, with a strong desire for bicycle/ped improvements.

Overarching Criteria

Economic Opportunity – Neutral

This alternative would reduce user costs but would not be expected to have a major effect on regional economic opportunity.

Feasibility/Complexity – Neutral

This alternative could be built largely or entirely within existing right-of-way. Its complexity is high, due to the lack of existing adaptive signal systems in the area, but not unprecedented.

System Compatibility – High Benefit

This alternative has independent utility and would also serve to reduce non-recurring congestion on I-91, provide opportunities for transit priority at new signals, and allow for flexibility during large construction projects.

Overall Assessment of Benefits/Impacts

This alternative would have moderate-to-high benefits with few impacts. As a result, it would have a high benefit-to-impact ratio.

Order of Magnitude Cost

This project cost estimates to be between $3M-$4.5M (2022). An adaptive traffic signal system would be used for 10 intersections between Windsor and Hartford.

High Level Benefit-Cost Outlook

Adaptive traffic signals are highly effective in congested areas, with user costs decreasing substantially as a result of continually optimized timings. This alternative's benefits are expected to exceed its costs.

Update Guide Signage on I-84

Detailed Project Description

CTDOT is incorporating guide sign updates in their current signing projects. These signs will be replaced at the end of their useful life and will be replaced by updated guide signs. As a result, this alternative is being removed from screening.

Bulkeley Bridge Conversion

Detailed Project Description

This alternative comprises the reconfiguration of the Bulkeley Bridge to accommodate local trips instead of through traffic. The bridge currently carries eight freeway lanes, minimal shoulders, and a narrow walkway. After conversion to carry local traffic, it would carry four to six vehicular lanes, two dedicated bus rapid transit lanes, and appropriate accommodations for non-motorized traffic, such as side paths or buffered bike lanes and sidewalks.

This alternative presupposes the relocation of I-84 away from the Bulkeley Bridge. Several other alternatives could achieve this, and the exact configuration of the converted bridge would depend on the alternative. For the purposes of this analysis, it is assumed that all needs could be accommodated without requiring bridge widening.

This alternative has been included in the implementation plan as a component of City Link.

Alternative Map

mplementation Timeframe

Timeframe

This alternative would take 2-4 years to complete.

Project Development Process

This alternative would require the relocation of I-84 to be feasible. As a result, its environmental planning and preliminary engineering processes could occur concurrent to either the design or construction of that project.

Project Phasing

This alternative could not be broken into segments of independent utility as it involves only one discrete element.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Low Impact

As this alternative would be paired with the relocation of I-84, the Bulkeley Bridge would primarily serve short-distance trips, and these would only experience a minor travel time impact due to the lower speeds.

Access and Connectivity – High Benefit

This alternative would greatly improve connectivity between residential, commercial, and recreational land uses in Hartford and East Hartford. It would provide a direct, dedicated bus connection between Hartford and East Hartford. It would also improve access by providing direct local road connections to the Bulkeley Bridge.

Travel Options and End User Convenience – High Benefit

This alternative would provide a redundant travel option for non-motorized transportation between Hartford and East Hartford. It would also improve the end-user travel experience for all modes, especially bus and non-motorized.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

This alternative would not have any impacts on EJ populations and would increase transportation options for residents on both sides of the Connecticut River, creating opportunities for disadvantaged populations.

Safety – Low Benefit

Pedestrian and bicyclist safety would likely be improved over existing conditions by the inclusion of more comprehensive facilities.

Resiliency and Sustainability – Moderate Benefit

The inclusion of multimodal facilities, including dedicated BRT lanes, would have a significant effect in improving bus competitiveness and encouraging shifts to non-automotive modes of travel.

Environment – Moderate Benefit

Natural resources of concern are near Connecticut River, which bisects the alternative project corridor and alternative representative alignment. Sensitive land uses adjacent to the alternative on the west side of the Connecticut River in Downtown Hartford. However, modifying this bridge to carry non-motorized and shared traffic between the two communities may reduce GHGs.

Technology – Moderate Benefit

The inclusion of dedicated lanes for bus rapid transit would provide versatility and better accommodate self-driving transit vehicles, should these be implemented in the future.

Public Support – Moderate Benefit

There is general public support for this alternative. Comments include suggestions about looking at the East Hartford area holistically to make multi-modal transportation improvements that connect with the Bulkeley Bridge. There has also been a suggestion to consider the Founders Bridge for this alternative.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative has the potential to increase land values and development density near the Bulkeley Bridge.

Feasibility/Complexity - High Benefit

This alternative could be realized within the existing right-of-way and the engineering required is relatively standard.

System Compatibility - High Benefit

This alternative has independent utility, and its construction would be crucial to extending bus rapid transit across the Connecticut River.

Overall Assessment of Benefits/Impacts

Assuming a complementary relocation of I-84, this alternative would provide relatively high benefits, especially for economic opportunity and equity. Negative impacts would be relatively limited. This alternative appears to have several advantages when combined with I-84 relocations such as the northern alignment carrying I-84 over a new bridge over the Connecticut River.

Order of Magnitude Cost

With I-84 moved off the Bulkeley Bridge, the converted bridge would only serve local traffic. Costs would be limited to reconfiguring the lane use on the bridge, adding sidewalks, and potential decorative elements. It is anticipated that these would cost between $2M-5M (2022). Additional costs would be incurred by the reconfiguration of local roads in the vicinity of the bridge to support access to the bridge on surface roads.

High Level Benefit-Cost Outlook

Given the low cost of this alternative and the potentially transformative benefits afforded by its implementation, the benefits of converting the bridge are expected to overwhelmingly exceed the costs in any situation where I-84 is relocated to a new crossing.

Route 218/Route 187 Intersection Improvements

Detailed Project Description

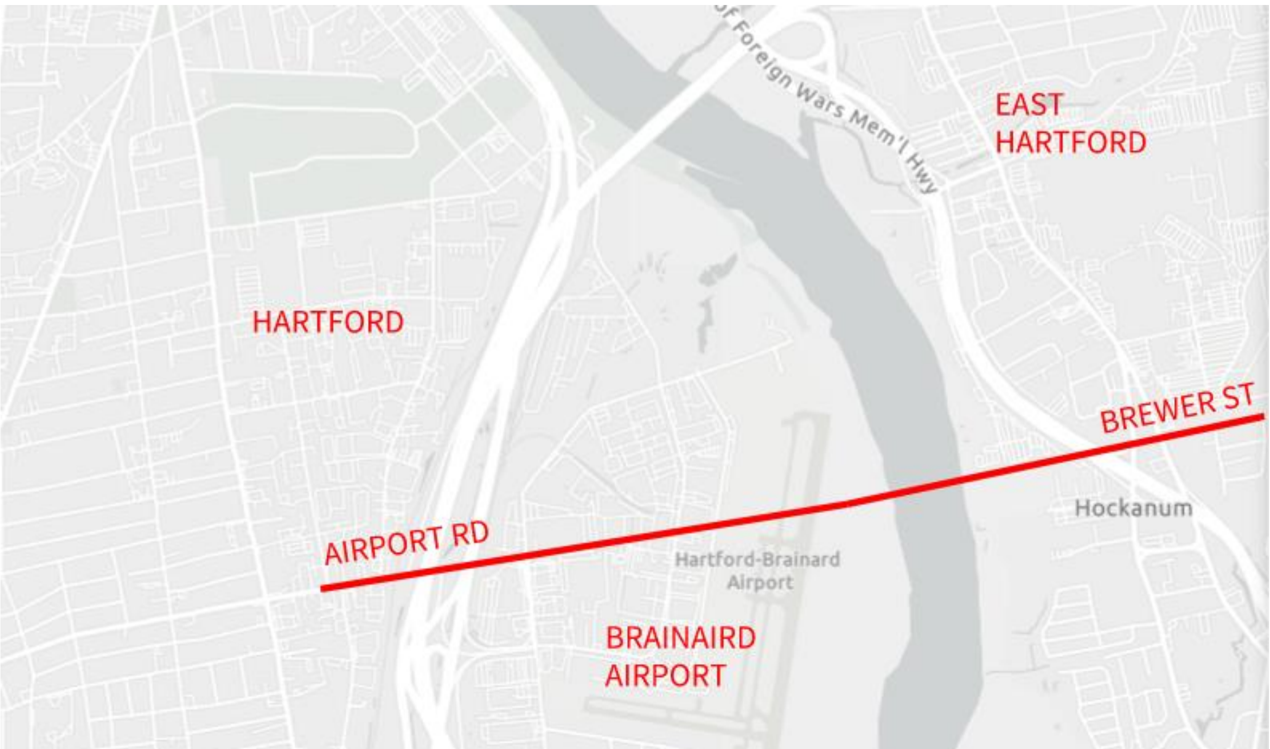
This alternative has been developed by the Town of Bloomfield and underwent a technical analysis in 2021; therefore, it has been eliminated from the Study.

New Connecticut River Bridge – Airport Road & Brewer Street

Detailed Project Description

This alternative proposes a new local road bridge between Airport Road in Hartford and Brewer Street in East Hartford. The purpose is to add a multimodal connection between the South End of Hartford and East Hartford, reducing the need for short-distance trips to use the freeways and improving access to the South Meadows from the South End and East Hartford.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take 13-15 years to implement.

Project Development Process

Much of the pre-construction period would be spent performing an analysis of the environmental impacts of a new river crossing. Additionally, Brainard Airport, which opened in 1921, is a location with cultural and historical resources, and an extension of Airport Road to a bridge crossing the river would require the closure of Brainard Airport.

Project Phasing

It is unlikely that this alternative could be divided into multiple segments of independent utility, as its utility depends on the new bridge crossing.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative would add a new connection between East Hartford and Hartford, which would have the potential to improve service on existing crossings.

Access and Connectivity – Moderate Benefit

This alternative would increase network connectivity across the river and add a local road connection which would be advantageous for shorter trips relative to the existing expressway bridges. However, would be offset by the necessary closure of Brainard Airport, which provides regional connections that bypass the highway system.

Travel Options and End User Convenience – Moderate Benefit

The alternative would provide a new option for crossing the river, and a new crossing between the Hartford and East Hartford local road networks would present an opportunity to support bicycle and pedestrian facilities or a dedicated busway. The closure of Brainard Airport would mean less options for small aircraft, but the effect would be minor as the airport's volumes are relatively low. In terms of user convenience, there is little to distinguish this crossing location from the preferred location at the Whitehead Highway interchange, which has significantly less impact on the existing built environment.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The alternative would improve connectivity to economically distressed areas in southern Hartford and East Hartford, potentially improving access to employment centers. Low-income and disadvantaged populations could be negatively impacted by construction.

Safety – Moderate Benefit

Reducing volumes and congestion on other Connecticut River crossings could have a positive effect on crash rates.

Resiliency and Sustainability – Low Impact

A new crossing could shorten some local trips, but closing Brainard Airport would redirect air routes to other regional airports outside the study core, which could increase total VMT.

Environment – Low Impact

This alternative would take significant environmental assessments to reduce any negative impact to the Connecticut River. There is also a historic cemetery within the alignment, at the west end of Brewer Street.

Technology – Neutral

This alternative does not take future technologies into consideration.

Public Support - High Benefit

There is broad public support for new Connecticut River crossings, especially those that can significantly reduce congestion and improve mobility between Hartford and points in the eastern study corridor.

Overarching Criteria

System Compatibility – Critical Flaw

In addition to Brainard Airport, Route 2 lies in the path of the proposed alignment, on the eastern side of the river, and rests upon a fill section approximately 15 feet above the elevation of the surrounding area. Other alternatives for new local road crossings, such as Bulkeley Bridge Conversion and a new bridge in the vicinity of Charter Oak Avenue, have much better cost-benefit projections and are more compatible with the existing network and proposed future improvements.

Overall Assessment of Benefits/Impacts

Given the effects to historic properties and conflicts with the existing alignment of Route 2, as well as the presence of other alternatives for new local road crossings that would have less impact, this alternative will not be considered.

City Link East (I-91/Route 2 Direct Connection)

Detailed Project Description

This alternative would require the construction of a direct link between I-91 and Route 2 in Hartford and East Hartford north of the existing I-84/I-91 interchange. Currently, those using Route 2 to access I-91, or vice versa, must cross Founders Bridge or Bulkeley Bridge and utilize local roads or the already overburdened I-84 interchange.

This alternative would extend the Governor Street ramps to the nort h, adding a new bridge across the Connecticut River and a connection to I-91 in Hartford's North Meadows. This would also allow traffic between I-84 to the east and I-91 to the north to avoid the Bulkeley Bridge and closing the ramps from I-91 southbound to I-84 eastbound and I-84 westbound to I-91 northbound would improve safety on both I-84 and I-91.

This alternative has been included in the implementation plan as a component of City Link East.

Alternative Map

Implementation

Timeframe

This alternative would require significant environmental review, prior to design and right-of way acquisition. The overall timeframe from environmental review to construction completion would take 10 to 15 years.

Project Development Process

This alternative would require preliminary design (10%) and engineering, environmental screening, and right-of-way acquisition.

Project Phasing

Dividing this alternative into segments of independent utility is not likely to be practical. The alternative would compete with others requiring the construction of a new bridge north of the Bulkeley Bridge - the Northern and Southern Alignment, Hartford and the I-84 / I-91 Northern Interchange.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This alternative would result in reduced travel times for traffic moving between East Hartford and North Hartford, by mitigating throughway traffic at Bulkeley and Founders Bridge which exit into Downtown Hartford.

Access and Connectivity – Moderate Benefit

Users are not connected to alternative transportation facilities but are provided with improved connectivity between I-91 and Route 2.

Travel Options and End User Convenience – High Benefit

This alternative creates redundant travel options and flexibility for users, resulting in improved convenience with travel.

Criteria Supporting Other Study Goals

Equity - High Benefit

The proposed alternative is located in an area of moderate minority and low-income populations and would provide little opportunity to improve access and mobility opportunities for disadvantaged populations.

Safety – Moderate Benefit

Providing this direct connection would reduce the overall VMT traveled, which may reduce KPIs. Additionally, by eliminating unnecessary local and regional traffic interactions and points of conflict along the Bulkeley Bridge to I-91 ramps, crashes may be reduced.

Resiliency and Sustainability – Low Impact

Increased lane capacity would have the potential to increase network VMT with little to no negative impacts on network resiliency and sustainability.

Environment – Moderate Benefit

Natural resources of concern are near the Connecticut River, which bisects the alternative Project Corridor and alternative representative alignment. Sensitive land uses adjacent to the alternative on the east side of the Connecticut River in East Hartford. Low-income and disadvantaged populations are prevalent throughout Project Corridor in Hartford and East Hartford. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

This alternative may reduce overall VMT making it more desirable for EV users, due to their limited milage.

Public Support - Neutral

There were no public comments on this alternative.

Overarching Criteria

Economic Opportunity - Neutral

Regional economic opportunity is unlikely to be a result of this alternative, although North Meadow may see an uptick in development.

Feasibility/Complexity – Neutral

Additional ROW will be required, but it is unlikely to disproportionately impact residents or residential properties. Engineering is relatively standard for the concept design.

System Compatibility – High Benefit

This alternative has independent utility and would overall benefit traffic flow at Bulkeley and Founders Bridges, the I-84/Route 2 interchange, and in Downtown Hartford.

Overall Assessment of Benefits/Impacts

This alternative has the ability to improve overall mobility within the study core, while addressing the movement of people and goods, increasing travel options access, reliability, and safety, and accommodating future needs (Goals 1-3). However, there would be some negative impacts on disadvantaged populations and sustainability.

This alternative also competes with the Northern and Southern Alignment, Hartford and I-84 / I-91 Northern Interchange. When compared with the Northern and Southern Alignment, Hartford, this alternative ranks lower simply due to the magnitude of benefits provided by Northern and Southern Alignment, Hartford.

Order of Magnitude Cost

The total estimated project capital cost for this alternative totals to $900M (2022). The operating costs for this alternative have not been calculated at this time and would require further design and feasibility studies to accurately determine.

High Level Benefit-Cost Outlook

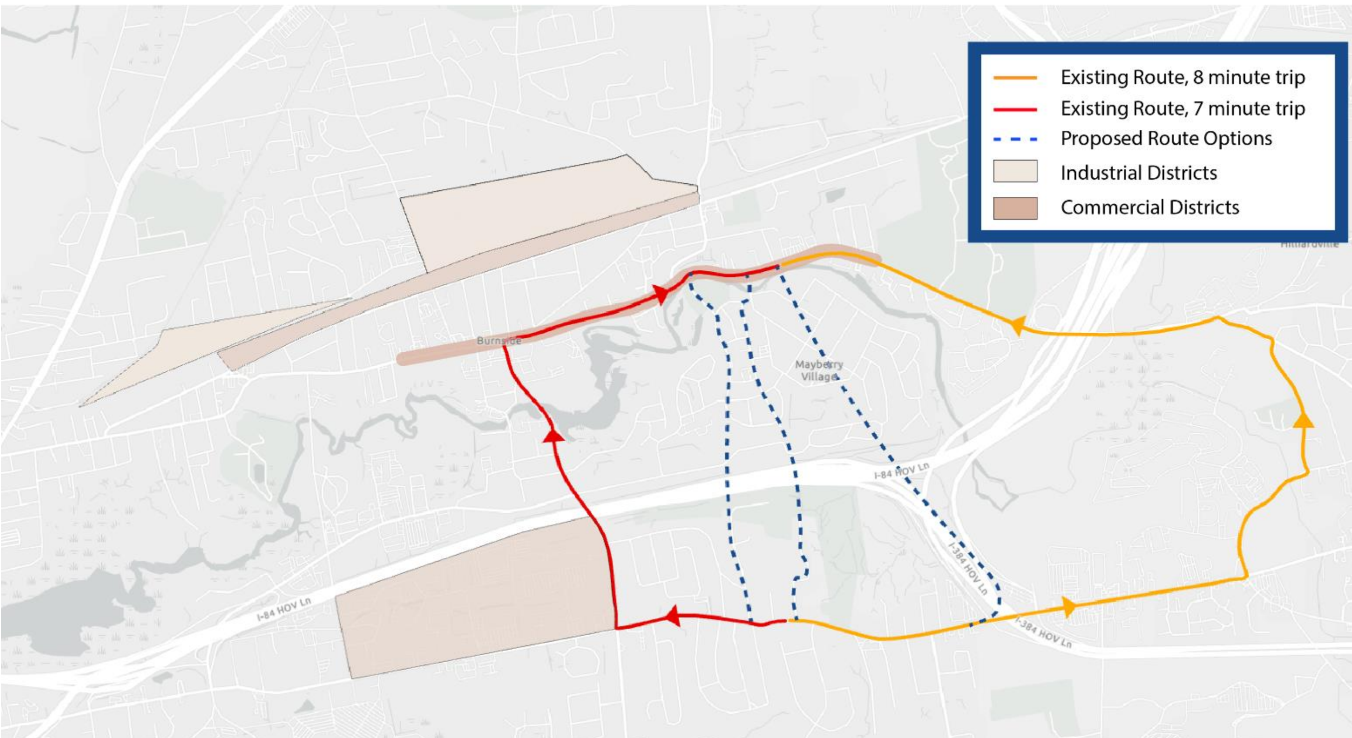
Although the cost is significant, the benefits of this alternative may outweigh the cost – additional studies on the impact on disadvantaged populations via preliminary design and engineering will need to be conducted.

New North-South Connection in East Hartford

Detailed Project Description

Constructing an entirely new connection between Silver Lane and Burnside Avenue would improve the connectivity between neighborhoods in East Hartford and Manchester (Study Core and Northeastern Corridor) that are segmented by I-84.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take 3 to 4-year years to complete, excluding the time to acquire right-of-way access.

Project Development Process

Significant concept development would be required for this alternative, along with feasibility and impact studies, due to the disruption of two established neighborhoods.

Project Phasing

This alternative would need to be completed in a single phase to have independent utility.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This alternative would provide users with a more direct path, saving them a few minutes each way from Silver Lane to Burnside Avenue and would also create a more reliable connection that does not move throughout the existing intersections that can be congestions hotspots.

Access and Connectivity – High Benefit

A new connection for the system is being created and providing users with improved access between the two neighborhoods that are currently segmented by I-84.

Travel Options and End User Convenience – High Benefit

This alternative creates redundant travel options, providing users with an enhanced experience that allows them to access resources more easily.

Criteria Supporting Other Study Goals

Equity – Critical Flaw

The proposed alternative is located in an area of moderate minority and low-income populations and would result in the degradation of the community, due to the need to take private property to establish ROW.

Safety - Neutral

Although reducing the users traveling through the existing pathways between Silver Lane Drive and Burnside Avenue may have a benefit for safety, there are no significant design considerations to improve overall safety.

Resiliency and Sustainability - Neutral

The additional connection between two east-west arterial roads would have the potential to better distribute traffic but would have the potential to reduce network VMT.

Environment - Low Benefit

There is a moderate presence of aquatic resources associated with the Hockanum River and Laurel Marsh. Moderate presence terrestrial resources within the Project Corridor and representative alternative alignment. Minimal presence of built resources within the Project Corridor. Moderate presence of minority and low-income populations. Environmental impacts are anticipated to be moderate but mitigable.

Technology - Neutral

No consideration for new or future technologies.

Public Support - Low Impact

Alternative's purpose is supported but a new road is not desired. Comments include better connectivity through sidewalks and bike lanes and addressing pedestrian gaps.

Overarching Criteria

Economic Opportunity - Neutral

No long-term economic benefits are provided to the region.

Feasibility/Complexity – Critical Flaw

This alternative would require a significant amount of ROW access, disproportionate to the benefits.

System Compatibility – Moderate Benefit

This alternative has independent utility and would create an entirely new connection between neighborhoods, improving users experience across the system.

Overall Assessment of Benefits/Impacts

This alternative has a critical flaw related to its feasibility and complexity. The only new direct path between Silver Lane and Burnside Ave would require running a new street through two neighborhoods – requiring ROW acquisitions and routing through traffic through a residential neighborhood. Bike and pedestrian connections were also explored for this alternative; however, they would also require a ROW acquisition. The ROW costs and impact on the residential communities have been deemed a critical flaw.

Order of Magnitude Cost

This alternative has been determined to have a critical flaw; therefore, no assessments have been conducted for capital or operation and maintenance costs.

High Level Benefit-Cost Outlook

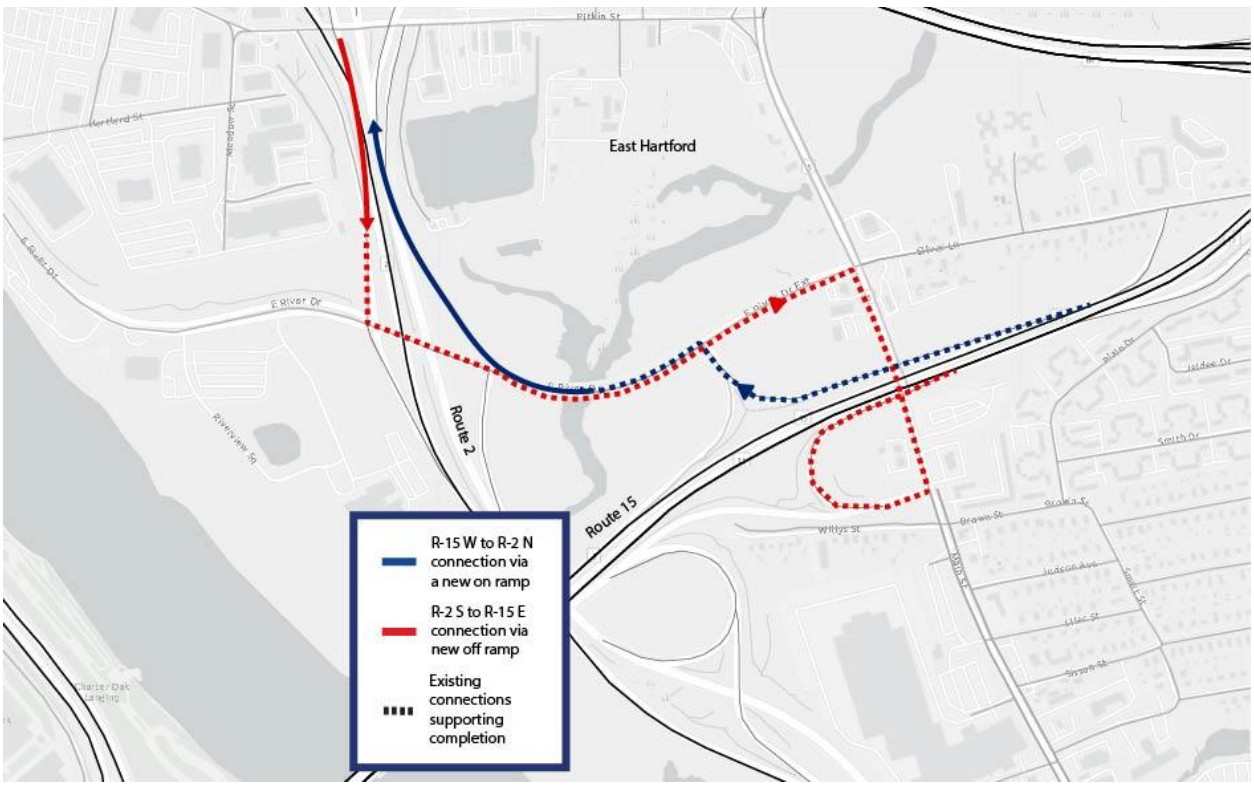
No benefit-cost outlook has been conducted for this alternative since it has been determined to have a critical flaw.

Regional Freeway Interchange Completion – Route 2/Route 15, East Hartford

Detailed Project Description

This alternative would allow for improved access between Route 2 and Route 15. Currently, the missing interchange connections are Route 15 westbound to Route 2 westbound and Route 2 eastbound to Route 15 east. This alternative would require the addition of a new on ramp from Route 15 westbound to Route 2 northbound via the East River Drive Extension and an off ramp from Route 2 southbound connecting to the East River Drive Extension to Route 15 eastbound.

Alternative Map



Implementation Timeframe

This alternative has a critical flaw due to the existing highway geometry and interchange spacing, which do not permit for the addition of any new on or off ramps, per highway design and safety standards. Although interchange completion is not feasible at this site, the surrounding area already has high access density and users will not be adversely impacted by this interchange remaining as is.

Regional Freeway Interchange Completion – Route 2/Route 17/Route 94

CTDOT has a current project including this alternative. The project is expected to go into construction in 2023. As a result, this alternative is being removed from screening.

Regional Freeway Interchange Completion – Route 3/I-91

This interchange and the surrounding area do not have significant destinations or opportunities that cannot be accessed by the existing infrastructure. If a development plan were in place for the surrounding area this alternative would have higher benefits; however, as it currently exists the cost far outweighs this alternative.

Regional Freeway Interchange Completion – Route 5/Route 99

Detailed Project Description

This alternative requires creating signalized T intersections along Route 99 on either side of Route 5 to allow for access from Route 5 to Route 99 northbound and southbound. To create these intersections, signals will need to be added to control traffic conflicts; however, this modification will also aid in the slowing of vehicles along Route 99, particularly those exiting Route 5.

Alternative Map

Implementation Timeframe

Timeframe

The interchange completion south of Route 5 is not feasible due to the existing highway geometry and interchange spacing, which do not permit for the addition of any new on or off ramps, per highway design and safety standards. However, the interchange north of Route 5 is feasible within 3-5 years.

Project Development Process

This alternative would require preliminary design (10%) and engineering, environmental screening, and right-of-way acquisition.

Project Phasing

This alternative can be completed in a single phase of independent utility, correlating with the single feasible interchange.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative does not reduce travel times but may improve traffic flow at the intersections.

Access and Connectivity – Moderate Benefit

This alternative provides users with a new connection to Route 99 N when exiting from Route 5 N, rather than requiring the user travel extra miles to facilitate the connection.

Travel Options and End User Convenience – High Benefit

This alternative improves user convenience by integrating an all-way intersection that allows for a new travel option, in addition to ensuring a more predictable and safe traffic flow.

Criteria Supporting Other Study Goals

Equity – Low Impact

This interchange is in an area with moderate minority and low-income populations. The improvement would provide little benefit to those with no access to a vehicle.

Safety – High Benefit

The nature of the intersection at Route 99 and Jordan Lane encourages high speeds as many users are either coming off Route 15 without appropriately reducing speeds or are preparing to take the on ramp to Route 15. These high speeds and the risks associated are evidenced by the CTDOT crash data, which shows 91 non-serious crashes between 2015 and present, with 60% being front to rear. By implementing this alternative, vehicle speeds will be overall reduced by requiring the additional signalization as vehicles converge onto Route 99.

Resiliency and Sustainability – Low Benefit

The interchange improvements may increase VMT but would also increase the resiliency of the regional highway network.

Environment – Low Benefit

Presence of natural and built resources within the Project Corridor and immediately adjacent to the proposed alternative. Great Meadows Preservation Trust is adjacent to proposed location. Presence of minority and low-income populations within the Project Corridor and immediately adjacent to the proposed alternative. Environmental impacts are anticipated to be moderate but mitigable.

Technology – Moderate Benefit

The addition of signal infrastructure will simplify the integration of future traffic signal technology. Further, due to the limited milage of EVs, this alternative improves mobility for them along this route.

Public Support – No Input

This alternative was added as a part of the original "Regional Freeway Interchange Completion" and has no alternative specific community input.

Overarching Criteria

Economic Opportunity - Neutral

Economic opportunities are not significantly hindered or improved by this alternative.

Feasibility/Complexity - High Benefit

This alternative is relatively standard in terms of engineering, and it is unlikely any additional ROW will be required.

System Compatibility - High Benefit

This alternative has independent utility and can support systemic enhancements.

Overall Assessment of Benefits/Impacts

This alternative provides benefits to core mobility factors, increases transportation options, access reliability, and safety (Goal 2) and Goal 3 – accommodating future needs and emerging technology.

Highway operations are improved and there are no competing alternatives.

Order of Magnitude Cost

The total estimated project capital cost for the northern portion of the alternative totals to $14,373,200 in 2022 dollars. The operating costs for this alternative have not been calculated at this time and would require further design and feasibility studies to accurately determine.

High Level Benefit-Cost Outlook

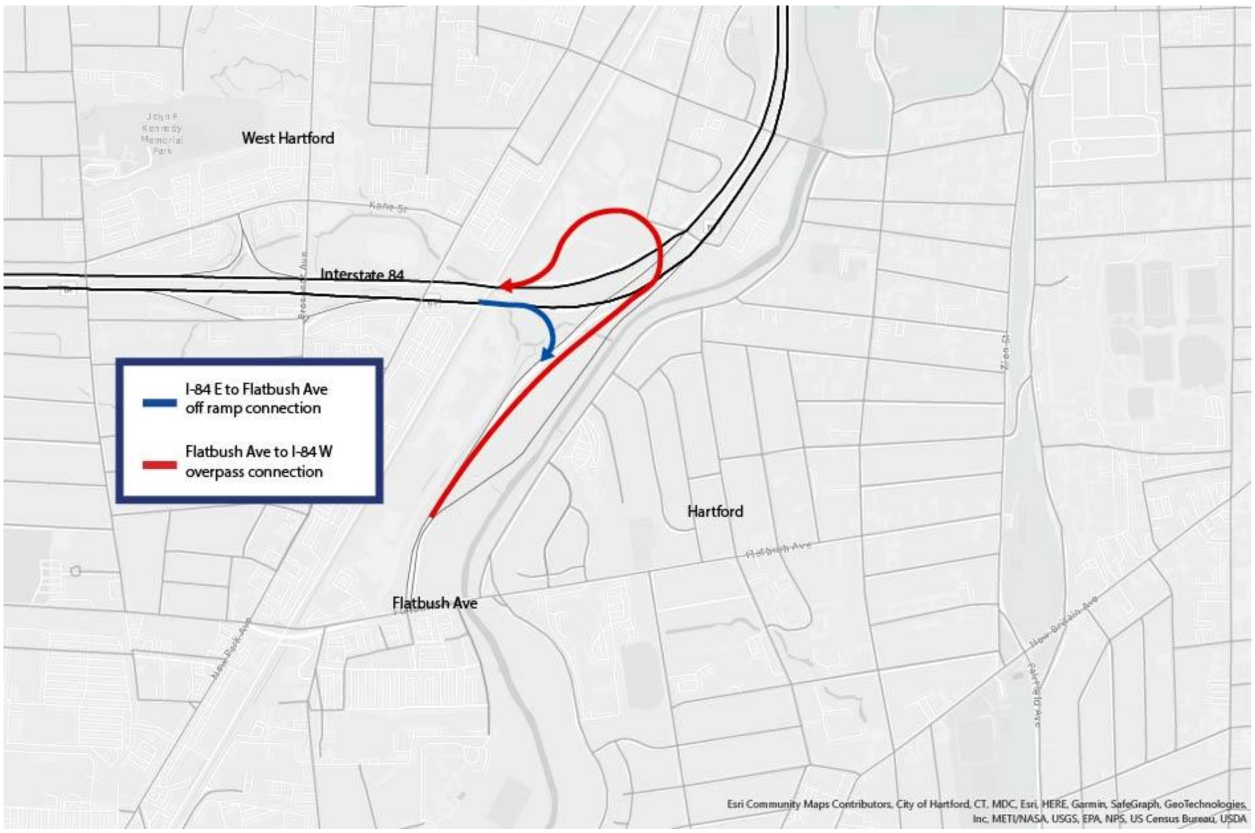
Due to the southern intersection, which has higher safety risks due to the crash statistics, not being feasible the overall alternative cost, for only a partial completion, outweighs the benefits.

Regional Freeway Interchange Completion – I-84 at South Brook

Detailed Project Description

This alternative would result in the addition of a flyover to connect the ramp at Flatbush Ave to I-84 westbound, as well as an off ramp from I-84 eastbound to the Flatbush Ave ramp.

Alternative Map



Implementation Timeframe

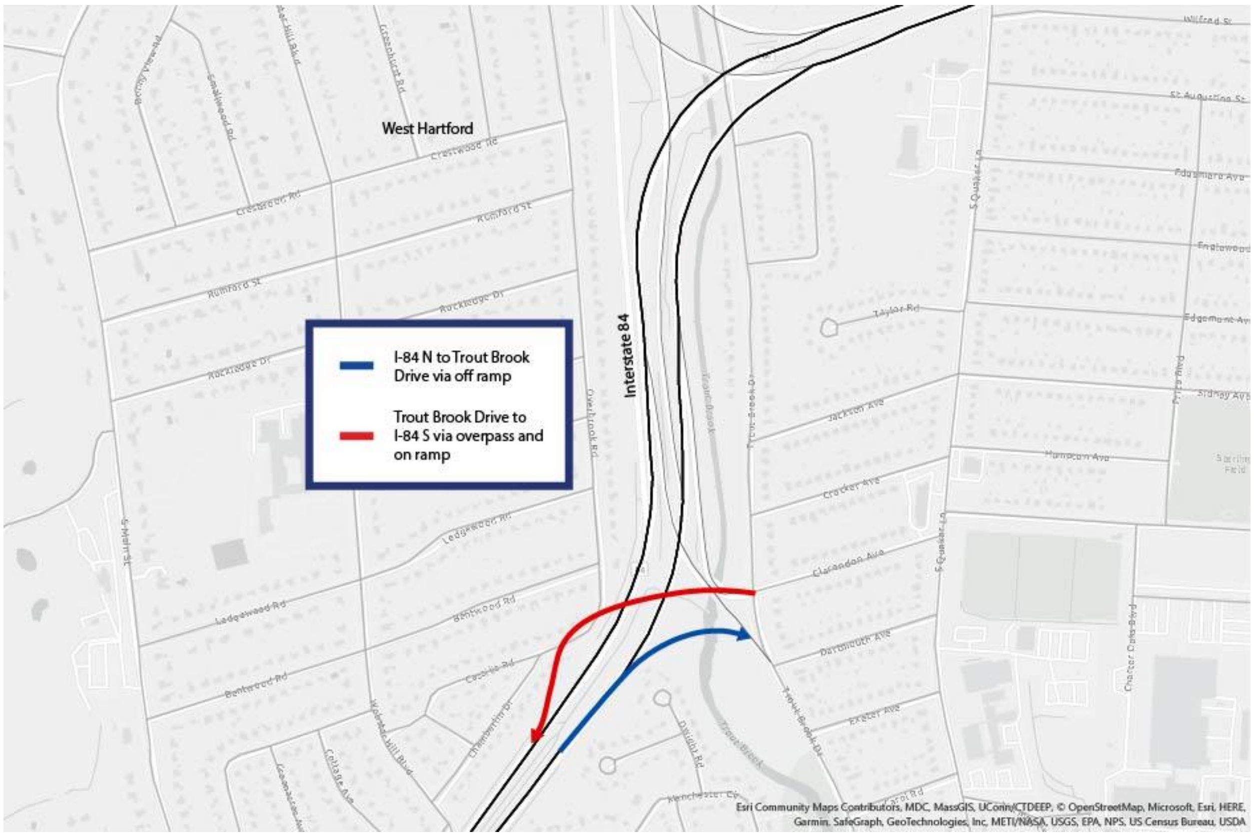
Due to the existing highway geometry and interchange spacing, this alternative suffers from a critical flaw, as the existing infrastructure does not permit for the addition of any new on or off ramps, per highway design and safety standards. Completing this interchange would require an entirely new interchange design, which is not in alignment with this alternative. Although interchange completion is not feasible at this site, the surrounding area already has high access density and users will not be adversely impacted by this interchange remaining as is.

Regional Freeway Interchange Completion – Route 6/I-84 at Trout Brook

Detailed Project Description

This alternative would complete the interchange at Trout Brook Drive be adding a new flyover from Trout Brook Drive to I-84 southbound and creating an exit ramp from I-84 northbound to Trout Brook Drive.

Alternative Map



Implementation Timeframe

Due to the existing highway geometry and interchange spacing, this alternative suffers from a critical flaw, as the existing infrastructure does not permit for the addition of any new on or off ramps, per highway design and safety standards. Completing this interchange would require an entirely new interchange design, which is not in alignment with this alternative. Although interchange completion is not feasible at this site, the surrounding area already has high access density and users will not be adversely impacted by this interchange remaining as is.

Regional Freeway Interchange Completion – Day Hill Road/I-91

Detailed Project Description

This alternative explores the establishment of a direct connection between I-91 Northbound and Day Hill Road, as the existing use of Poquonock Ave to facilitate this interchange may be causing unnecessary congestion and increased chances of conflict. This can be achieved by adding a fly over originating on I-91 N directly connecting to the Day Hill Road off ramp from I-91 S. Conversely, by widening the existing I-91 bridge to accommodate for a direct path in the vicinity of the underpass.

Alternative Map

Implementation Timeframe

Timeframe

This alternative will require an assessment, environmental reviews, and right-of-way acquisition, in addition to standard design and construction, making the timeline approximately 5-10 years.

Project Development Process

Before dedicating additional resources to this alternative, an assessment of existing traffic and congestion at this intersection will be necessary. Following the determination that existing traffic flows are being negatively impacted by the I-91 N to Day Hill Rd connection, this alternative will need more detailed concept design and engineering feasibility to determine the cost benefit.

Project Phasing

There is no ability to split the alternative into sequential phases of independent utility.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

Although overall travel time is not significantly reduced, providing a direct path to Day Hill Road from I-91 N would improve reliability of the route and reduce congestion along Poquonock Ave.

Access and Connectivity – Moderate Benefit

This alternative does not improve access to other modes or transportation facilities, but overall improves the connectivity between I-91 and Day Hill Road, which is a hub for employment.

Travel Options and End User Convenience - Moderate Benefit

Dependent upon final design, there may not be any additional redundancy in travel options; however, the convenience for users travelling from Hartford and surrounding areas to Day Hill Road is improved.

Criteria Supporting Other Study Goals

Equity - Neutral

This alternative would not impact EJ communities, nor would it provide new opportunities.

Safety – Moderate Benefit

This alternative may support moderate improvements to KPIs by reducing the overall VMT of users and potentially decreasing the number of crossing and opposite travel interactions between vehicles.

Resiliency and Sustainability – Low Benefit

The interchange improvements may increase VMT but would also increase the resiliency of the regional highway network.

Environment - Neutral

Presence of natural and built resources within the Project Corridor and immediately adjacent to the proposed alternative. Presence of minority and low-income populations within the Project Corridor and immediately adjacent to the proposed alternative. Environmental impacts are anticipated to be moderate but mitigable.

Technology - Neutral

Due to the limited milage of EVs, this alternative improves mobility for them along this route.

Public Support - No Input

This alternative was added as a part of the original "Regional Freeway Interchange Completion" and has no alternative specific community input.

Overarching Criteria

Economic Opportunity - Neutral

This alternative does not inherently improve regional economic opportunities.

Feasibility/Complexity - High Benefit

Any additional ROW would be limited and not negatively impact the greater community. The engineering is somewhat complex due to grading and the existing weaves, but still feasible.

System Compatibility – High Benefit

This alternative can function with independent utility and overall improve systems and traffic flow.

Overall Assessment of Benefits/Impacts

This alternative improves the overall movement of people and goods to Day Hill Road, which is a highly commercialized area (Goal 1) and improves users access, reliability, and safety (Goal 2). Additionally, there are no moderate or significant impacts from this alternative. Overall efficiency of the highway system is improved by this alternative.

Order of Magnitude Cost

The total estimated project capital cost for this alternative totals to $46,463,100 in 2022 dollars. The operating costs for this alternative have not been calculated at this time and would require further design and feasibility studies to accurately determine.

High Level Benefit-Cost Outlook

Although this alternative shows moderate mobility benefits, the cost likely outweighs the extent of benefits achieved.

Regional Freeway Interchange Completion - I-84/Route 4 Connector

Detailed Project Description

Completing the I-84 and Route 4 connection via a diamond weave would improve the mobility west of Hartford, better connecting access to UConn Heath Center and reducing Route 4 (Farmington Ave.) congestion in the Northwestern and Southwestern Corridor.

Alternative Map

Implementation Timeframe

Timeframe

This alternative will require an assessment, environmental reviews, and right-of-way acquisition, in addition to standard design and construction, making the timeline approximately 5-10 years.

Project Development Process

Concept development for this alternative has also occurred under CTDOT and CRCOG; however, no action has been taken. The study team will need to access these concepts for modifications and undergo preliminary design and an Environmental Assessment to determine feasibility.

Project Phasing

Segments of this alternative may be completed through phasing; however, the full function of this alternative cannot be realized without total completion.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative provides improves travel time for the user by providing the opportunity for direct access as opposed to needing to travel just under 4 miles south via Route 4 to Highway 508.

Access and Connectivity – Moderate Benefit

By providing a direct connection to compatible land use pairings this alternative provides a moderate benefit to the community.

Travel Options and End User Convenience - High Benefit

This alternative improves end user experience by directly connecting users to opportunities at the UConn Health Center and/or Route 4, as well as providing redundant travel options to the same destination, providing users with a variety of methods for access.

Criteria Supporting Other Study Goals

Equity – Low Benefit

No negative impacts for this alternative are anticipated; however, the residents of New Britain – a distressed municipality – have the opportunity to benefit from the interchange completion, by providing them with a more direct route from New Britain.

Safety – Moderate Benefit

This alternative may support moderate improvements to KPIs by reducing the overall VMT of users and potentially decreasing the number of crossing and opposite travel interactions between vehicles.

Resiliency and Sustainability – Low Impact

The interchange improvements may increase VMT but would also increase the resiliency of the regional highway network.

Environment – Low Benefit

Moderate presence of natural resources within the corridor, including floodplains, wetlands, and protected open space. Most natural resources are in the north end of the Project Corridor approaching Route 4. Limited built resources in Project Corridor. Environmental impacts are anticipated to be moderate but mitigable.

Technology - Neutral

Due to the limited milage of EVs, this alternative improves mobility for them along this route.

Public Support – Low Impact

Lack of general support for this alternative. Comments include interchange completion to be unnecessary given highway access already exists. Concern for environmental impact on proposed paths. Comments include non-auto-centric accommodations given low car-ownership neighborhood. Proposed feedback would be bus rapid transit between Downtown and Windsor's Wilson neighborhood/traffic calming measures. Strong desire for bicycle/ped improvements.

Overarching Criteria

Economic Opportunity - Neutral

This alternative does not inherently improve economic opportunities for the region but does provide more ease of access to users who may be seeking employment amongst the UConn Health Campus.

Feasibility/Complexity - Neutral

This alternative would require additional ROW; however, negative impacts on the community are not expected. Engineering for this alternative is relatively standard.

System Compatibility – High Benefit

This alternative is not dependent upon exterior infrastructure projects and would benefit the overall freeway system by providing better direct connections.

Overall Assessment of Benefits/Impacts

This alternative provides benefits to core mobility factors (Goal 1), increases transportation options, access reliability, and safety (Goal 2) and accommodates future needs and emerging technology (Goal 3). However, public comment suggests expanding the design into bike and ped accommodations.

Highway operations are improved and there are no competing alternatives still being considered as Route 4 Farmington has been eliminated as a critical flaw.

Order of Magnitude Cost

The total estimated project capital cost for this alternative totals to $194M (2022). The operating costs for this alternative have not been calculated at this time and would require further design and feasibility studies to accurately determine.

High Level Benefit-Cost Outlook

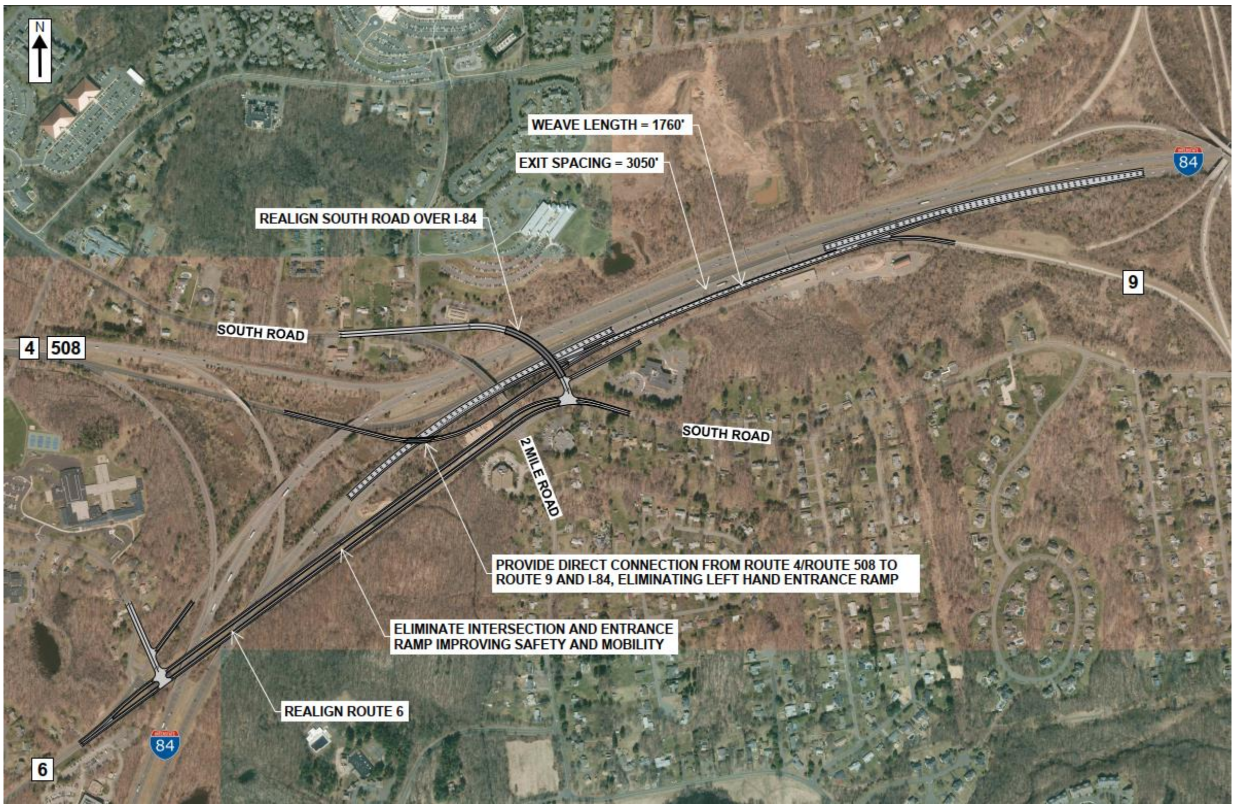
Although this alternative has moderate mobility benefits, the planning level cost seems to outweigh the extent of mobility benefits achieved. Further assessment will be required prior to including this alternative to in the implementation plan.

I-84/Route 6/Route 4/Route 9 Improvements

Detailed Project Description

The reconfiguration of I-84 interchanges in Farmington will improve Parkville (Southwestern Corridor) safety and mobility by eliminating left-hand ramps, lane rebalancing, and providing a direct pathway from Route 4 to Route 9.

Alternative Map



Implementation Timeframe

Timeframe

This alternative will require an assessment, environmental reviews, and right-of-way acquisition, in addition to standard design and construction, making the timeline approximately 4-6 years.

Project Development Process

CTDOT has already developed some concepts to address deficiencies at these interchanges, GHMS group will be conducting a review of these and developing detailed design for a single, best use concept. Preliminary design for these initial concepts will be necessary for determining feasibility assessments.

Project Phasing

This alternative can be developed and constructed in a variety of phases associated with each interchange. The ultimate impact is to improve overall mobility and safety, so impacts will be felt with each phase, but not fully realized until entire completion..

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative provides improves travel time for the user by providing the opportunity for direct access as opposed to needing to travel just under 4 miles south via Route 4 to Highway 508.

Access and Connectivity – Moderate Benefit

By providing a direct connection to compatible land use pairings this alternative provides a moderate benefit to the community.

Travel Options and End User Convenience - Moderate Benefit

This alternative improves end user experience by directly connecting users to opportunities at the UConn Health Center and/or Route 4, as well as providing redundant travel options to the same destination, providing users with a variety of methods for access.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

This alternative would not impact EJ communities, nor would it provide new opportunities.

Safety – Moderate Benefit

This alternative would reduce overall VMT for users travelling from Route 4 to Route 9. Further, the elimination of left-hand exit ramps establishes predictability for infrequent users and reduces the likelihood of risky lane changes to make the exit.

Resiliency and Sustainability – Low Impact

The additional lane capacity will have the potential for moderate increases in VMT but little or no negative impacts on network resiliency and sustainability.

Environment – Moderate Benefit

Presence of natural resources in southern portion of the Project Corridor, particularly protected open space and floodplains associated with Batterson and Colt Parks. Natural diversity areas are located in the western and southern portion of the Project Corridor. Limited presence of built environmental resources. Minimal presence of minority and low-income populations. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

Due to the limited milage of EVs, this alternative improves mobility for them along this route.

Public Support – Moderate Impact

Comments include strong desire for a boulevard instead. Alternative doesn't have strong support; comments encourage less car-centric approach.

Overarching Criteria

Economic Opportunity – High Benefit

The creation of this direct path to get to and from the Study Core provides those who live within the Southwestern Corridor access to new job opportunities that seemed out of reach due to extended travel times.

Feasibility/Complexity - Neutral

Dependent upon final design some additional ROW may be required, which may have low impacts on the existing population; however, the engineering complexity for this interchange is relatively standard.

System Compatibility – High Benefit

Each phase of this alternative can be completed with independent utility, and it would overall improve traffic flow.

Overall Assessment of Benefits/Impacts

This alternative provides benefits to core mobility factors (Goal 1), increases transportation options, access reliability, and safety (Goal 2) and accommodates future needs and emerging technology (Goal 3). However, public comment suggests expanding the design into bike and ped accommodations.

Highway operations are improved and there are no competing alternatives still being considered as Route 4 Farmington has been eliminated as a critical flaw.

Order of Magnitude Cost

The total estimated project capital cost for this alternative totals to $193,822,400 in 2022 dollars. The operating costs for this alternative have not been calculated at this time and would require further design and feasibility studies to accurately determine.

High Level Benefit-Cost Outlook

Although this alternative has moderate mobility benefits, the planning level cost seems to outweigh the extent of mobility benefits achieved. Further assessment will be required prior to including this alternative to in the implementation plan.

Route 3 Northbound Weave Mitigation, Glastonbury

Detailed Project Description

This alternative addresses the two-sided weave between the Glastonbury Boulevard on Ramp and the Route 2 split in Glastonbury. To improve safety and mobility on Route 3, a 3-lane section would be provided between the entrance ramp and split. As drivers approach the Route 2 split a decision lane will form allowing drivers to travel East or West from the center lane. Both ramps would consist of 2 lanes. The ramp to Route 2 East would merge with Route 2 providing 2 additional lanes in the eastbound direction. 1 lane would drop at Exit 7 to Route 17 South and the additional lane would drop at Exit 8 to Hebron Avenue.

Alternative Map

Implementation Timeframe

Timeframe

From environmental review to completed construction this alternative would require 2 to 4 years to complete.

Project Development Process

CTDOT has already developed some concepts to address deficiencies at these interchanges, GHMS group will be conducting a review of these and developing detailed design for a single, best use concept. Preliminary design for these initial concepts will be necessary for determining feasibility assessments.

Project Phasing

This alternative may have the ability to be phased in segments of independent utility; however, this is pending an operational analysis that will be completed during concept development.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Low Benefit

This alterative would not have a significant impact on overall travel time but may reduce congestion due to lane changes and merging.

Access and Connectivity – Moderate Benefit

This alternative improves the connectivity between Route 2 and Route 3 but does not improve overall access to transportation facilities.

Travel Options and End User Convenience - Moderate Benefit

By providing a temporary lane the users experience is improved while navigating the interchange and interacting with other users.

Criteria Supporting Other Study Goals

Equity – Low Impact

The proposed alternative is in an area of moderate minority and low-income populations and would provide little opportunities for disadvantaged populations.

Safety – Moderate Benefit

This alternative would work to reduce overall congestion and safety impact of the Route 3 weaves. By addressing high off ramp speeds and potentially decreasing the number of crossing and opposite travel interactions between vehicles overall KPIs may reduce.

Resiliency and Sustainability – Neutral

This alternative does not include elements designed to increase resiliency and sustainability; nor would it support modal shifts to non-auto modes.

Environment – Moderate Benefit

Large presence of natural resources within the Project Corridor; less immediately adjacent to the project alternative. Aquatic resources associated with the Connecticut River, Salmon Brook, and Porter Brook. Cultural and historic resources are located in the southern portion of the Project Corridor. Minimal presence of minority and low-income populations. As such overall environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

Due to the limited milage of EVs, this alternative improves mobility for them along this route.

Public Support – Low Benefit

Very little support for this alternative. It is not seen as necessary. Two comments suggested the description and image was not clear enough to provide an understanding of the alternative.

Overarching Criteria

Economic Opportunity – Neutral

No significant economic opportunities for the region are realized by this alternative.

Feasibility/Complexity – High Benefit

Engineering complexity is relatively standard, and most of the modifications can be made in the existing ROW.

System Compatibility – High Benefit

This alternative would enhance the overall system and traffic flow along Route 3 to I-91 and Route 2.

Overall Assessment of Benefits/Impacts

This alternative provides moderate benefits to the core mobility criteria and addresses Goal 1 (improving the movement of people and goods), Goal 2 (increases transportation options, access, reliability, and safety), and Goal 3 (accommodating future needs and emerging technology). This alternative is complementary with overall highway operations.

Order of Magnitude Cost

The total estimated project capital cost for this alternative totals to $71,854,700 in 2022 dollars. The operating costs for this alternative have not been calculated at this time and would require further design and feasibility studies to accurately determine.

High Level Benefit-Cost Outlook

Although this alternative has low to moderate mobility benefits, the planning level cost seems to outweigh the extent of mobility benefits achieved. Further assessment will be required prior to including this alternative to in the implementation plan.

Added Capacity – I-84

Detailed Project Description

This alternative would add capacity to I-84 in Hartford going in both directions while also rebalancing the lanes at all interchanges with the intent of reducing congestion and improving safety along this corridor.

Alternative Map

Implementation Timeframe

Timeframe

From environmental review to completed construction this alternative would require 10-15 years to complete.

Project Development Process

Partial concept development for this alternative has already occurred under the I-84 project which advanced to NEPA; however, no action further has been taken. The study team will need to undergo compatibility will existing plans and total concept development.

Project Phasing

This project can be phased in segments of independent utility via eastbound and westbound roadway segments.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Impact

This alternative only includes the addition of new lanes amongst the segment running through Hartford, which simply moves the congestion to a different segment rather than resolving the congestion. For example, the historic Bulkeley Bridge cannot be widened, so the addition of lanes would only create a larger bottleneck approaching the I-84/I-91 interchange.

Access and Connectivity – Moderate Benefit

The rebalancing of lanes and improved access along interchanges improves overall connectivity amongst this transportation option.

Travel Options and End User Convenience - Low Benefit

This alternative does not create any new travel options, but the rebalancing of lanes would overall improve user convenience when traveling along these corridors.

Criteria Supporting Other Study Goals

Equity – Critical Flaw

Widening I-84 at its existing location would only further segment the neighborhoods of Hartford, which is antithetical to the vision and goals set forth in this study.

Safety – Low Impact

Although I-84 would benefit from lane rebalancing and improve user safety, adding additional lanes to the corridor may encourage more users along the facilities, overall increasing the potential for conflicts between users.

Resiliency and Sustainability – Critical Flaw

This alternative does not include elements designed to increase resiliency and sustainability; nor would it support modal shifts to non-auto modes. Additionally, the insufficient accommodations for traffic outside of the widening zone would create more congestion, idling, and GHG emissions.

Environment – Moderate Impact

Protected open space resources are present throughout the Project Corridor and immediately adjacent to the proposed alternative. Built resources, including historic districts are present in the central and eastern portion of the Project Corridor. Resources associated with the Connecticut River are present on the eastern portion of both the Project Corridor and proposed alternative. Moderate presence of minority and low-income populations. Environmental impacts are anticipated to be moderate but mitigable.

Technology - Neutral

No considerations for future technologies considered in this alternative.

Public Support – High Impact

Strong disagreement to this alternative. Comments strongly show a desire against expanding capacity for highway demand with concerns to incentivizing other multi-modal options.

Overarching Criteria

Economic Opportunity – Low Impact

No long-term economic opportunity is created for the region, some businesses abutting I-84 may be directly impacted.

Feasibility/Complexity – High Benefit

Additional ROW will be required for this alternative; however, it is relatively standard in terms of engineering complexity.

System Compatibility – Neutral

This alternative does not improve the overall system, it only temporarily alleviates some congestion issues within the alternatives immediate vicinity and may cause later congestion within the system.

Overall Assessment of Benefits/Impacts

This alternative has been eliminated due to critical flaws in resiliency and sustainability as increasing capacity will encourage auto centric design, user demand, and overall emissions. Additionally, community input has stated that this alternative is not desirable because it will have negative impacts on current residents in Hartford.

Order of Magnitude Cost

This alternative has been determined to have a critical flaw; therefore, no assessments have been conducted for capital or operation and maintenance costs.

High Level Benefit-Cost Outlook

No benefit-cost outlook has been conducted for this alternative since it has been determined to have a critical flaw.

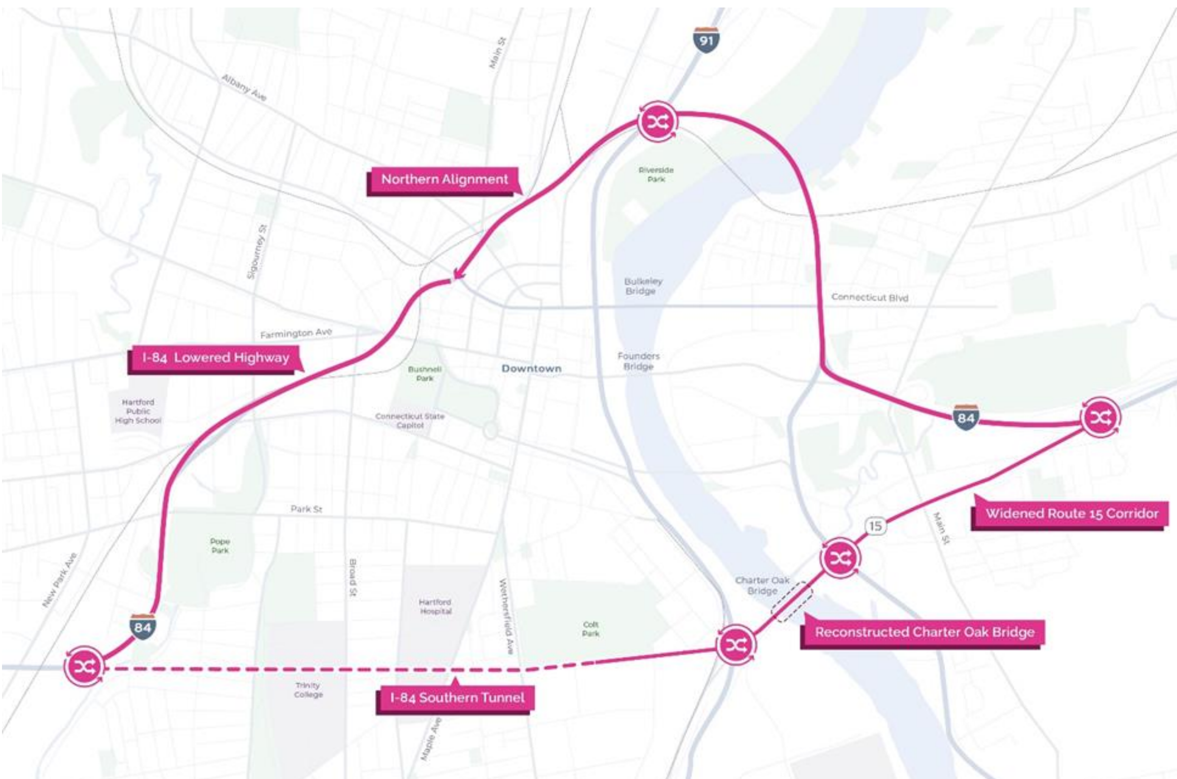
Northern Relocation with Southern Tunnel

Detailed Project Description

This alternative addresses the I-84/I-91 interchange deficiencies by realigning I-84 between and. This new alignment would locate a new interchange with I-91 on the west side of the Charter Oak Bridge. It would also have a reconstructed interchange with Route 2 east of the bridge. A freeway would be maintained through the existing I-84 corridor to maintain access to Downtown. It would be reconstructed as the I-84 Hartford Lowered Highway to address the existing structural and operational deficiencies along the corridor. The former I-84 corridor would be realigned north of Downtown North, like the I-84 Northern Alignment concept. Capping of I-91 would be possible but is not integral to this alternative and is discussed elsewhere.

Similar to the I-84 Southern Alignment concept, the reconstructed I-84 would be tunneled beneath the southern neighborhoods of Hartford, between Behind the Rocks and Shelden Chart Oak. It would emerge from the tunnel just west of the new I-91 interchange near the Charter Oak Bridge. The Charter Oak Bridge would be reconstructed or expanded to manage the significant additional demand. The Route 15 corridor between the Charter Oak Bridge and the existing I-84 must be widened to accommodate the additional demand.

Alternative Map



Implementation Timeframe

Timeframe

From environmental review to completed construction this alternative would require 10-20 years to complete.

Project Development Process

Concept design (10%) and NEPA will required for moving this alternative forward.

Project Phasing

This alternative would be constructed as a program, likely broken into several projects. The GHMS process identified part of this alternative with independent utility that can be advanced in parallel, namely the I-84 Hartford Lowered Highway and Northern Relocation, and I-91 to Route 2 connection.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

The additional through capacity of this alternative offers travel time and reliability benefits. It is uncertain that it would eliminate a congestion hotspot as the complex and closely spaced high-demand interchanges between I-84 and I-91 and I-84 and Route 2 could become congestion hotspots.

Access and Connectivity – Moderate Benefit

The additional east-west freeway offers improved access between I-84 and I-91. It emphasized connectivity between points west of Hartford and east of East Hartford rather than connectivity to Downtown.

Travel Options and End User Convenience - Low Benefit

The additional east-west freeway provided by this alternative would benefit through traffic and offer freeway network redundancy in the event of crashes or other events that disrupt one of the two facilities.

Criteria Supporting Other Study Goals

Equity – Low Benefit

EJ neighborhoods in both north and south Hartford will likely have direct impacts. The project will improve connectivity across the highway corridors and help address historic inequities associated with access to Downtown and other areas.

Safety – Moderate Benefit

This alternative may support moderate improvements to KPIs by improving interchange spacing and design. It will also address deficient horizontal curvature on I-84.

Resiliency and Sustainability – Moderate Impact

The additional capacity provided by this project results in moderate VMT increases.

Environment – Low Benefit

Environmentally sensitive areas are present, particularly on the east side of the Connecticut River. There is a high presence of natural environmental resources immediately adjacent to the area where Route 15 would be widened, including Riverview Park and the Hockanum River. There are potential impacts to built resources in the study corridors. There is a moderate presence of minority and low-income populations within the corridors. The design of the proposed tunnel's ventilation systems will affect air quality in southern Hartford.

Technology - Neutral

This alternative will be designed to highway standards but does not necessarily consider future or current technologies.

Public Support – High Impact

Stakeholder opinions are mixed about this alternative. Several major organizations voiced support for the urban master plan that first outlined combining the northern relocation of I-84 with a southern tunnel. However, stakeholders generally did not support new or expanded highways and were moderately against tunneling. The study team has observed advocates in the bicyclist and pedestrian community denouncing the additional capacity provided by this alternative.

Overarching Criteria

Economic Opportunity – Critical Flaw

This alternative would have a long-term adverse impact on economic opportunity. The sheer cost, essentially double its primary alternative, is expected to detract from the state's ability to invest elsewhere in the region. The cost-benefit-ratio is less than competing alternatives as the additional freeway capacity provides marginal benefits, but the cost is substantially higher. Additionally, this alternative prioritizes traffic bypassing Hartford, potentially harming the city's continued economic growth.

Feasibility/Complexity – Critical Flaw

This alternative would require one of the longest bored highway tunnels in the country in challenging geotechnical conditions. This alternative carries higher risks than competing alternatives due to its reliance on subsurface construction. ROW impacts will include disadvantaged areas near Coltsville and the Sheldon/Charter Oak and in East Hartford. These are areas that competing alternatives would not affect.

System Compatibility – Critical Flaw

This alternative relies on additional freeway capacity to provide traffic key performance indicators marginally better than other competing alternatives. It would require substantial reconstruction of the Charter Oak Bridge to accommodate the additional demand, devaluing the state's recent $240M improvement project. Fundamentally, it is incompatible with the study's vision to balance mobility needs with urban design and economic development.

Overall Assessment of Benefits/Impacts

This alternative does not offer significant improvements in traffic operations, regional travel times, truck/freight operations, economic opportunities, mode shift potential, emergency response, or a reduced I-84 footprint through North Hartford. However, it does demonstrate positive effects on local travel time along I-84 and network resilience. The alternative has been eliminated due to fatal flaws in Economic Opportunity, Feasibility/Complexity, and System Compatibility. These findings highlight the limited benefits and critical shortcomings.

Order of Magnitude Cost

The total estimated escalated project capital cost for this alternative totals to $23,800,000,000. The operating costs for this alternative have not been calculated at this time and would require further design and feasibility studies to accurately determine.

High Level Benefit-Cost Outlook

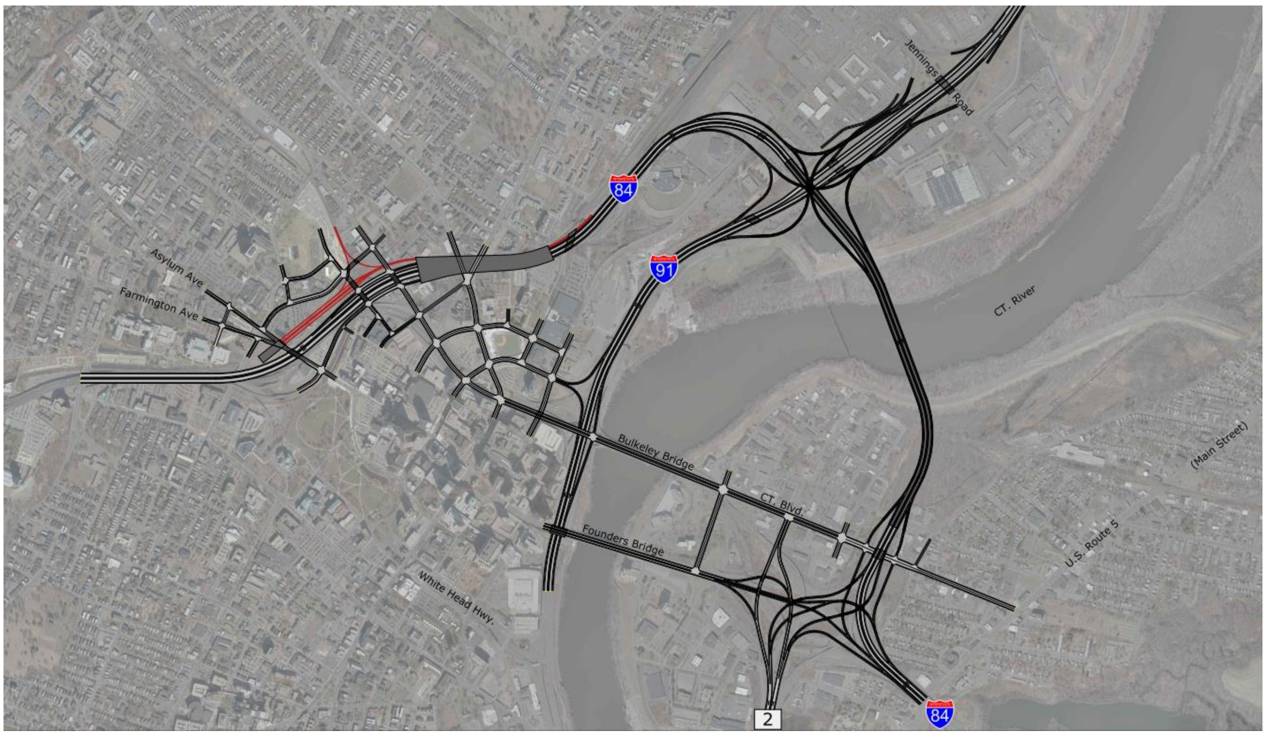
This alternative offers marginal relative benefits compared with competing alternatives, while it has a high capital cost compared with other competing alternatives.

I-84/I-91 Interchange Relocation – Northern Alignment

Detailed Project Description

This alternative has been further divided into City Link, City Link East, and I-84/Route 2 Interchange Improvements, with independent detailed documentation.

Alternative Map



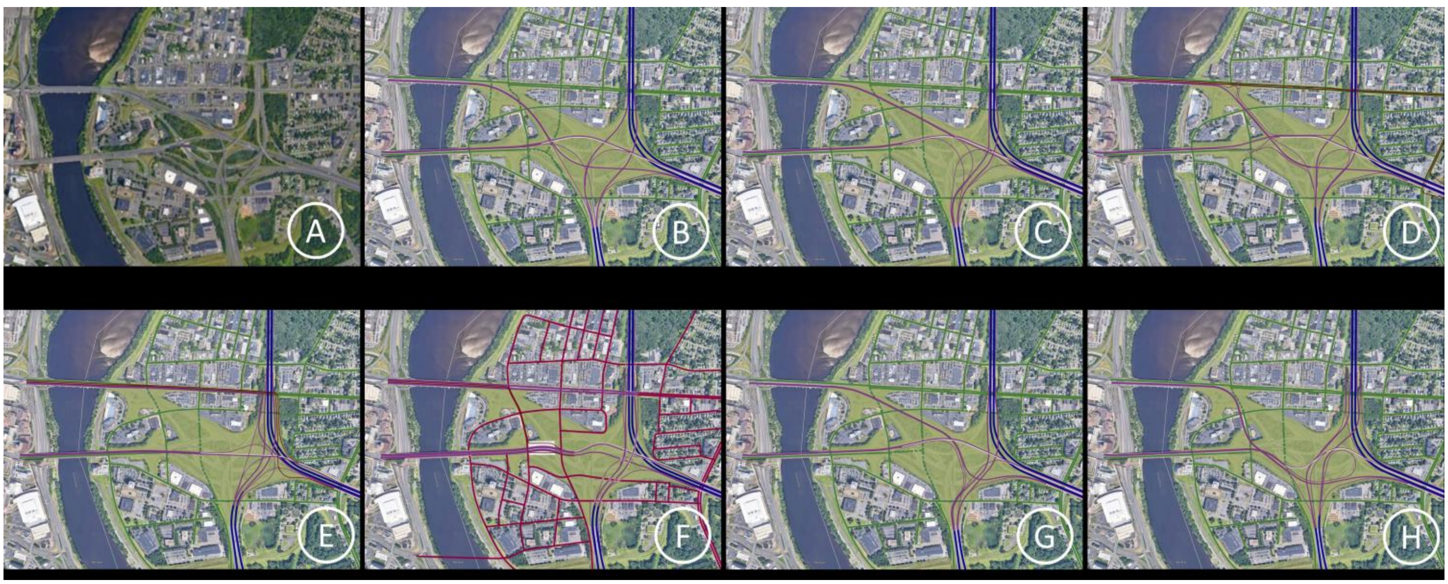
I-84/Route 2 Interchange Improvements

Detailed Project Description

This alternative would consolidate the existing Route 2/I-84 interchange in East Hartford. Multiple preliminary concepts have been developed that need further review to develop a preferred alternative which will be carried through NEPA. The alternative could include the reduction of ramps, improved safety, increase in land development opportunities, and increased local road mobility.

This alternative has been included in the implementation plan as a component of Founders Gateway.

Alternative Map



Implementation Timeframe

Timeframe

From environmental review to completed construction this alternative would require 10-12 years to complete.

Project Development Process

A preliminary feasibility analysis was completed as a part of the I-84/I-91 Interchange Study. Concept design (10%) will be required for moving this alternative forward.

Project Phasing

This alternative can be completed in sequential phasing dependent upon the ultimate concept design but would require the northern interchange to be completed to have consistent utility.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

By reducing access points and creating separation between throughway and local Hartford traffic, the route would become more reliable for users and reduce idling in traffic due to congestion at the original location.

Access and Connectivity – Moderate Benefit

Although no new connections are made, this alternative would provide local users with improved access to their destinations.

Travel Options and End User Convenience - Moderate Benefit

Both local Hartford and throughway traffic would be improved by creating separation; however, users are left with less “in the moment” decision making opportunities when choosing to continue the Interstates rather than travelling by local roads.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

This alternative would not impact EJ communities; however, it may improve multimodal connections across the Connecticut River, allowing residents access to more jobs that would otherwise require a personal motor vehicle.

Safety – Moderate Benefit

This alternative may support moderate improvements to KPIs by reducing the overall VMT of users and potentially decreasing the number of crossing and opposite travel interactions between vehicles.

Resiliency and Sustainability – Low Benefit

The increased lane capacity will have the potential for minor VMT increases, but the reclaimed land at the interchange may be able to support resilient design practices.

Environment – Low Benefit

Protected open space resources and Natural diversity habitats are present throughout the Project Corridor. Aquatic resources associated with the Connecticut River are located in the eastern portion of the Project Corridor. Built resources, including historic districts and structures are present in the western portion of the Project Corridor. Moderate presence of minority and low-income populations. Environmental impacts are anticipated to be moderate but mitigable.

Technology - Neutral

Due to the limited milage of EVs, this alternative improves mobility for them along this route.

Public Support – Low Benefit

People have mixed feelings about this alternative. Some view it as an opportunity to move traffic outside of Hartford, while other's do not think this will continue the traffic problem.

Overarching Criteria

Economic Opportunity – High Benefit

By separating the throughway traffic from local, users may be encouraged to travel through Downtown Hartford more frequently, improving overall economic opportunity for Downtown. Further, users may be more willing to commute to employment opportunities that previously seemed too cumbersome due to commuter traffic.

Feasibility/Complexity –High Benefit

This alternative would not require additional ROW and it is relatively standard in terms of complexity.

System Compatibility – High Benefit

This alternative can function with independent utility and overall improve systems and traffic flow.

Overall Assessment of Benefits/Impacts

Overall efficiency of the highway system is improved by this alternative. It does compete with Northern and Southern Alignment, I-84 Southern Alignment, and I-84 Lowered Highway but is compatible with Creating a New Connection between Route 2 and I-91.

Order of Magnitude Cost

This alternative totals at approximately $13B (2022), including the design, environmental, demolition and construction.

High Level Benefit-Cost Outlook

The costs of this alternative are in alignment with the benefits. Although this alternative's magnitude of cost is significant, it is providing an entirely new connection across the Connecticut River and mitigating throughway traffic from Downtown Hartford.

I-84 Southern Alignment, Hartford

Detailed Project Description

This alternative involves the construction of a tunnel from I-84 in the Parkville neighborhood to I-91 in the Coltsville neighborhood, both in Hartford. By using this tunnel, the Charter Oak Bridge, and the current Route 15 in East Hartford, I-84 through traffic could bypass the most congested parts of the freeway in Hartford and East Hartford. Relocating much of the I-84 traffic might allow portions of the existing I-84, such as the Bulkeley Bridge, to be reconfigured to serve local traffic.

In order to serve traffic traveling between I-84, I-91, and Route 2, a pair of interchanges would need to be constructed – one connecting I-84 and I-91 at the southwest end of the Charter Oak Bridge, and the other connecting I-84 and Route 2 at the bridge's northeast end.

Alternative Map

Implementation Timeframe

Timeframe

From environmental review to completed construction this alternative would require 20-30 years to complete.

Project Development Process

This long-term alternative would require preliminary engineering, environmental screening, right-of-way acquisition, and design before it could be constructed. Due to the substantial number of property and environmental impacts, it is likely that these activities would be lengthy, lasting at least ten years. For the construction of this alternative, the act of tunneling approximately two miles of tunnel in each direction would take about two years, assuming two tunnel boring machines were used concurrently. The bulk of the construction duration would be staged construction, building two new freeway interchanges while maintaining traffic flow on existing roads. It is likely that this construction would take at least two decades.

Project Phasing

This project could potentially be split into segments of independent utility: the tunnel itself, the widening of Route 15 in East Hartford, and any revisions to the geometry of the current I-84 in Hartford.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

Much of the traffic operational benefit of this alternative would depend on specifics such as ramp geometry and what treatment is used on the existing I-84 corridor. It is likely that travel time would be improved for I-84 through traffic due to the more direct path from west Hartford to East Hartford.

Access and Connectivity – Neutral

While this alternative would provide a new east-west connection, the reconfiguration of interchanges, including the size of the two interchanges astride the Charter Oak Bridge, would complicate local road access.

Travel Options and End User Convenience - Low Benefit

Travel convenience would be mixed, with through trips prioritized and local trips unchanged or impeded. The tunnel itself would present a new travel option for some users but would not necessarily improve the travel experience. Tunnels create challenges for freight traffic and emergency services in particular.

Criteria Supporting Other Study Goals

Equity – Moderate Impact

This alternative would have heavy property impacts in the Coltsville and Parkville neighborhoods of Hartford, as well as portions of East Hartford surrounding Main Street. These impacts would not produce significant benefits for citizens of these neighborhoods, who may experience diminished freeway access as a result. The primary beneficiaries of this alternative would be through travelers in surrounding, generally wealthier towns.

Safety – Moderate Benefit

This alternative may support moderate improvements to KPIs by reducing the overall VMT of users and potentially decreasing the number of crossing and opposite travel interactions between vehicles.

Resiliency and Sustainability – Moderate Impact

The proposed project and tunnel infrastructure include elements that can impact infrastructure resiliency negatively and potentially increase regional VMT.

Environment – Low Benefit

Moderate presence of many natural and built resources associated with the Connecticut River, Hockanum River, and downtown Hartford. Moderate presence of minority and low-income population on both sides of the Connecticut River. Tunnel portal interchanges would be located in the wetlands and significant watersheds. Environmental impacts are anticipated to be moderate but mitigable.

Technology - Neutral

Due to the limited milage of EVs, this alternative improves mobility for them along this route.

Public Support – Low Benefit

Overall, comments are not supportive of this alternative. A few comments are supportive. People provided additional solutions, such as a tunnel connecting routes to Newington. There is a theme that people are concerned this alternative encourages more car traffic and would be expensive.

Overarching Criteria

Economic Opportunity – Critical Flaw

This alternative would have a long-term adverse impact on economic opportunity. The sheer cost, essentially double its primary alternative, is expected to detract from the state's ability to invest elsewhere in the region. The cost-benefit-ratio is less than competing alternatives as the additional freeway capacity provides marginal benefits, but the cost is substantially higher. Additionally, this alternative prioritizes traffic bypassing Hartford, potentially harming the city's continued economic growth.

Feasibility/Complexity – Critical Flaw

This alternative would require one of the longest bored highway tunnels in the country in challenging geotechnical conditions. This alternative carries higher risks than competing alternatives due to its reliance on subsurface construction. ROW impacts will include disadvantaged areas near Coltsville and the Sheldon/Charter Oak and in East Hartford. These are areas that competing alternatives would not affect.

System Compatibility – Critical Flaw

This alternative relies on additional freeway capacity to provide traffic key performance indicators marginally better than other competing alternatives. It would require substantial reconstruction of the Charter Oak Bridge to accommodate the additional demand, devaluing the state's recent $240M improvement project. Fundamentally, it is incompatible with the study's vision to balance mobility needs with urban design and economic development.

Overall Assessment of Benefits/Impacts

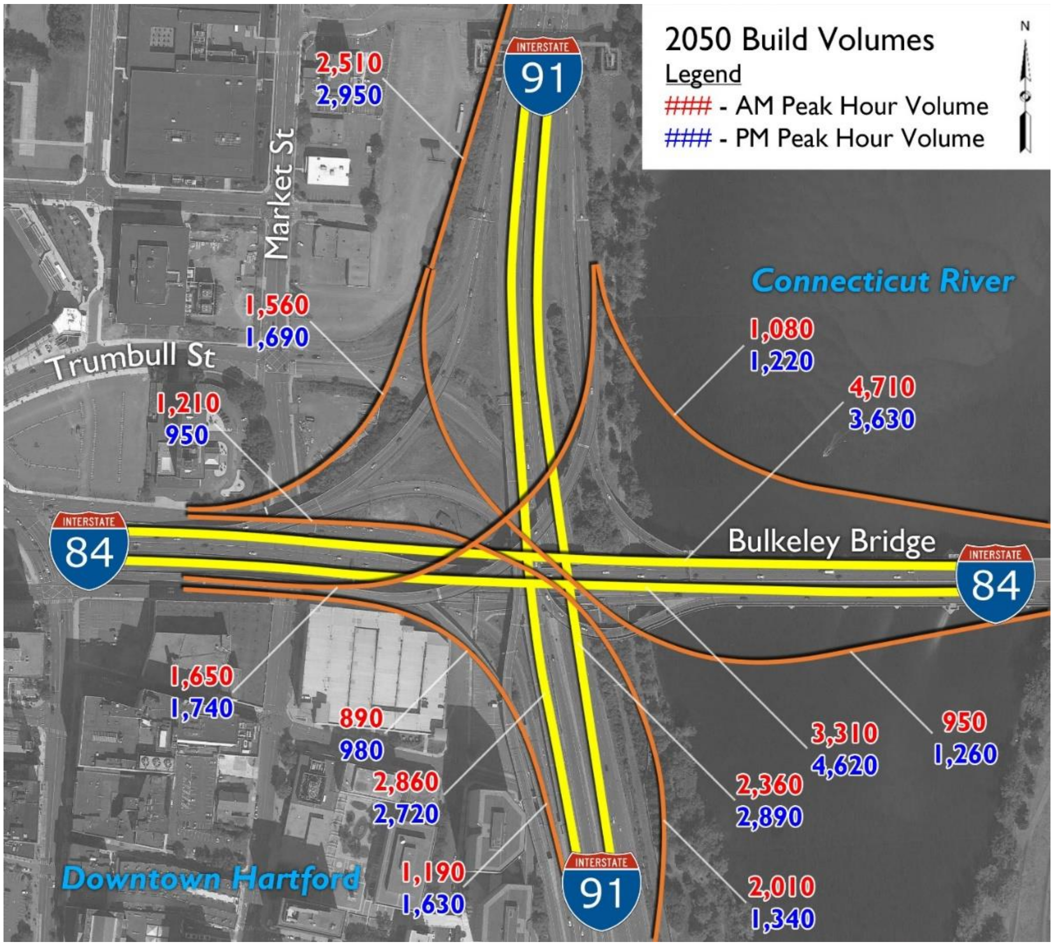
Due to this project's extremely high costs and the potential economic harm involved with construction, combined with only modest potential benefits to mobility, this alternative has been removed from consideration.

I-84/I-91 Interchange – Existing Location

Detailed Project Description

This alternative would complete the interchange between I-84 and I-91 in its existing location within Downtown Hartford. Currently, I-84 westbound does not connect to I-91 southbound and this would require the addition of a new flyover connection. The second missing connection is the I-91 northbound to I-84 eastbound, which would require an off ramp directly connecting on the Bulkeley Bridge.

Alternative Map



Implementation Timeframe

Timeframe

From environmental review to completed construction this alternative would require 10-15 years to complete.

Project Development Process

A preliminary feasibility analysis was completed as a part of the I-84/I-91 Interchange Study. Concept design (10%) will be required for moving this alternative forward.

Project Phasing

This alternative can be completed in phases of independent utility with each interchange completion segment.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative would slightly reduce some users travel times and by eliminating the disruptions to local traffic to complete interchanges congestion hotspots may also be reduced.

Access and Connectivity – High Benefit

This alternative provides users with new connections and improves overall access between the I-84/I-91 interchange.

Travel Options and End User Convenience - High Benefit

This alternative provides users with redundant travel options that allow them to utilize local and interstate roads, while also improving overall convenience throughout the system.

Criteria Supporting Other Study Goals

Equity – No Change

This alternative would not impact EJ communities, nor would it provide new opportunities.

Safety – Neutral

This alternative would overall reduce users VMT and conflicts for users trying to make the interchange connections this alternative addresses but does not have any significant benefits to safety.

Resiliency and Sustainability – Low Impact

The increased lane capacity will have the potential for minor VMT increases but little or no negative impacts on network resiliency and sustainability.

Environment – Low Impact

Protected open space resources and Natural diversity habitats are present throughout the Project Corridor. Aquatic resources associated with the Connecticut River. Built resources, including historic districts and structures are present mostly in the western portion of the Project Corridor, west of the Connecticut River.

Technology - Neutral

No considerations for future technologies considered in this alternative.

Public Support – Moderate Impact

This alternative received a lot of feedback. A lot of the comments included a desire to move the interchange out of Downtown. There is a strong desire to use a lot of the land where the interchange is for Riverfront development. Comments also mention that widening would only exacerbate traffic and that preferred alternative is relocation.

Overarching Criteria

Economic Opportunity – Low Impact

No new economic opportunity is provided to the region.

Feasibility/Complexity – Critical Flaw

This alternative would require additional ROW and is relatively complex in terms of existing highway geometry. Although the I-84 westbound to I-91 southbound connection can be made by utilizing the Morgan Street to Main Street connections there is no feasible way to connect I-91 northbound to I-84 eastbound due to the short length of the historic Bulkeley Bridge.

System Compatibility – High Benefit

This alternative does have independent utility and would benefit the overall Interstate system.

Overall Assessment of Benefits/Impacts

This alternative has a critical flaw due to the existing geometry and constraints with the bridge length. Users are currently able to access I-91 southbound from I-84 westbound via exiting to Morgan Street and essentially U-turning through Main Street back to I-91 southbound; however, the connection from I-91 northbound to I-84 eastbound at this interchange is entirely unfeasible.

Order of Magnitude Cost

This alternative has been determined to have a critical flaw; therefore, no assessments have been conducted for capital or operation and maintenance costs.

High Level Benefit-Cost Outlook

No benefit-cost outlook has been conducted for this alternative since it has been determined to have a critical flaw.

New Connecticut River Bridge - Cromwell

Detailed Project Description

This alternative would require the construction of a new bridge to connect the Town of Cromwell to Portland, via Route 9 and Route 17. Currently, mobility between the two communities causes unnecessary congestion in Middletown and the Main Street Bridge due to it being the nearest access point for crossing the Connecticut River.

Alternative Map

Implementation Timeframe

Timeframe

From environmental review to completed construction this alternative would require 10-15 years to complete.

Project Development Process

This alternative would require significant concept design and an assessment of feasibility due to the environmental regulations required to start the project. The additional ROW acquisition would also be significant and may require a significant timeline.

Project Phasing

There is no ability to complete this alternative in phases of independent utility.

Environmental Review

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

The Connecticut River is a significant barrier to mobility in the region. The addition of the Portland to Cromwell Bridge would improve travel time for those crossing the Connecticut River. The Main Street Bridge that connect Portland and Middletown currently experiences congestion from throughway traffic attempting to access Route 9 or Route 17 from the opposing side of the river; however, this bridge and surrounding roads were designed to carry local traffic, not throughway.

Access and Connectivity – High Benefit

This alternative creates a new connection between two major roadways and improves overall ease of access for users.

Travel Options and End User Convenience - High Benefit

Users are provided a second, more direct opportunity for accessing connections between Route 9 and Route 17 which improves overall user convenience and convenience for those who utilize the Main Street Bridge for local travel.

Criteria Supporting Other Study Goals

Equity – Moderate Impact

This alternative would result in ROW access being necessary within EJ communities and increase the health impacts experienced from living near a high-volume roadway. No benefits to the EJ communities would be realized, as this connection would be more heavily utilized by through traffic.

Safety – High Benefit

This alternative may support the decrease of KPIs by reducing the overall VMT of users and potentially decreasing the number of crossing and opposite travel interactions between vehicles.

Resiliency and Sustainability – Moderate Impact

The increased lane capacity will have the potential for minor VMT increases but little or no negative impacts on network resiliency and sustainability.

Environment – Critical Flaw

This alternative would require the bridge be built over the Quarry View Historic Park and Campground, Riverfront Park, or active farmlands.

Technology - Neutral

No considerations for future technologies considered in this alternative.

Public Support – Neutral

There is medium support for this alternative. There is a dislike for building more expressways. The comments that do support the idea suggest continuing the route to Manchester, building a bridge at Route 160, and protecting farmland.

Overarching Criteria

Economic Opportunity – No Change

Although this alternative has the ability to reduce overall commute time for users crossing the Connecticut River Bridge, there is no significant economic opportunity being realized by this alternative.

Feasibility/Complexity – Critical Flaw

Significant ROW will be required within established neighborhoods and nature-based amenities, including disproportionate impact on EJ communities.

System Compatibility – High Benefit

Completion of this alternative would have independent utility and support the overall highway systems.

Overall Assessment of Benefits/Impacts

This alternative has been determined to have a critical flaw due to environmental criteria flaws. Additionally, the residents of Portland where construction of the bridge would occur are within EJ communities – resulting in disproportionate impacts to them.

Order of Magnitude Cost

This alternative has been determined to have a critical flaw; therefore, no assessments have been conducted for capital or operation and maintenance costs.

High Level Benefit-Cost Outlook

No benefit-cost outlook has been conducted for this alternative since it has been determined to have a critical flaw.

Putnam Bridge Replacement

Detailed Project Description

The aging Putnam Bridge is no longer efficient and needs to be replaced to maintain infrastructure and accommodate modern design standards. Further, the possibility of extending these improvements to the I-91/Route 3 Interchange would improve the overall user experience through the Southern Corridor and Southeastern Corridor.

Alternative Map

Implementation Timeframe

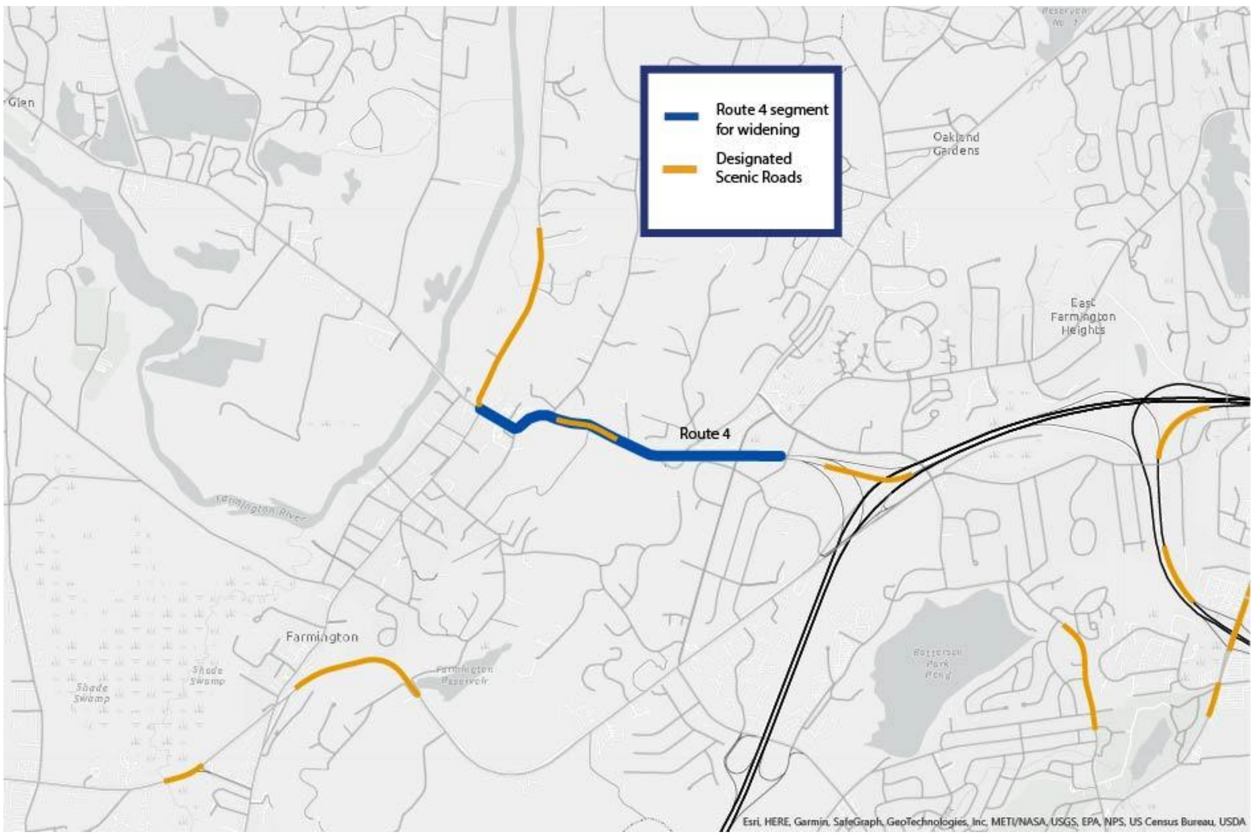
This alternative is already underway with CTDOT and design will be complete in early 2025.

Route 4 Farmington Improvements

Detailed Project Description

To improve traffic flow between Farmington and Hartford, widening of lanes and intersection improvements along Route 4 between Route 10 and I-84 would address impacts in the Northwestern and Southwestern Corridors. Currently, adjacent sections of Route 4 are being studied and restriping for capacity has occurred at the Route 4/Route 10 intersection.

Alternative Map



Implementation Timeframe

The Town of Farmington has enacted legislation requiring that no modifications or widening of streets or highways may occur on scenic roads. The section of Route 10 south of the intersection has been designated a scenic road; therefore, it has been taken out of consideration – critically flawed - since it is unlikely the Town will approve of widening modifications to this site.

I-84 Ramp Closures at High Street and Trumbull Street

Detailed Project Description

I-84 has nine full or partial interchanges within Hartford, a distance of less than four miles. This greatly exceeds the national guideline of one interchange per mile in urban areas, maximum. Ramp closure and consolidation was studied as part of the I-84 Hartford Project. In particular, the four ramps serving the central business district were noted to carry proportionally less traffic than other ramps, and so were considered to be good candidates for consolidation. These ramps are:

- I-84 Eastbound off-ramp to High St (signed as Ann Uccello St, Exit 49)
- I-84 Eastbound off-ramp to Trumbull St (signed as Main St, Exit 50)
- I-84 Westbound on-ramp from Trumbull St
- I-84 Westbound on-ramp from High St

Upon further examination, the best candidates for consolidation, and removal, are I-84 Eastbound off-ramp to Trumbull St and the I-84 Westbound on-ramp from High Street.

Alternative Map

Implementation Timeframe

Timeframe

This alternative is anticipated to take approximately 1-3 years.

Project Development Process

This alternative requires a traffic impact study and FHWA approval; however, the actual implementation of the alterative is relatively straight forward.

Project Phasing

This project can be phased in segments of independent utility via eastbound and westbound segments.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Low Benefit

The existing system permits and encourages overuse of the system, making its reliability and consistency less effective. Closing two of the nine on and off ramps in this area would overall reduce the congestion directly downtown at High Street and Trumbull Street.

Access and Connectivity – Neutral

Although access is being reduced along this stretch of highway, the existing configuration is not conducive to safe and effective traffic flow. Further, due to the existing high access within the alternative area, there are no reduced impacts to overall access and connectivity.

Travel Options and End User Convenience - Neutral

This alternative does not increase travel options or user convenience.

Criteria Supporting Other Study Goals

Equity – Neutral

This alternative does not have any impact or particular benefits for EJ communities.

Safety – High Benefit

The number of ramps along this stretch of highway far exceeds the recommended national guidelines of one interchange per mile. Further, the curvature of the interstate paired with the nearly concurrent on- and off-ramps leads to dangerous user behaviors - the I-84 Hartford Project found that the segments to the west of High Street had a crash rate which was greatly elevated above the statewide average for freeways. A review of crash data from the preceding three years (2020-2022) shows this trend continuing, with 695 crashes involving 1,316 vehicles. By eliminating these two ramps user conflicts would be reduced.

Resiliency and Sustainability – Low Benefit

Congestion resulting from the constant stop and go traffic experienced due to the high concentration of on and off ramps would be reduced.

Environment – Low Benefit

This alternative would not negatively impact the environment, but the reclaimed space may be able to be repurposed as a small green space.

Technology - Neutral

No considerations for future technologies considered in this alternative.

Public Support – High Impact

No direct public support was collected for this alternative as it was explored after Phase 1's development of the Universe of Alternatives.

Overarching Criteria

Economic Opportunity – Neutral

No long-term economic opportunity is created for the region.

Feasibility/Complexity – High Benefit

The engineering is standard and straightforward, additionally this alternative requires no additional ROW or excessive agency coordination.

System Compatibility – Neutral

This alternative would benefit the entire system.

Overall Assessment of Benefits/Impacts

This alternative has a quick implementation timeframe, with no impacts and improves overall user safety by bringing this stretch of highway closer to todays standards.

Order of Magnitude Cost

This alternative is anticipated to cost $15M (2022) including traffic studies, demolition, and the establishment of turf and abutting sidewalks.

High Level Benefit-Cost Outlook

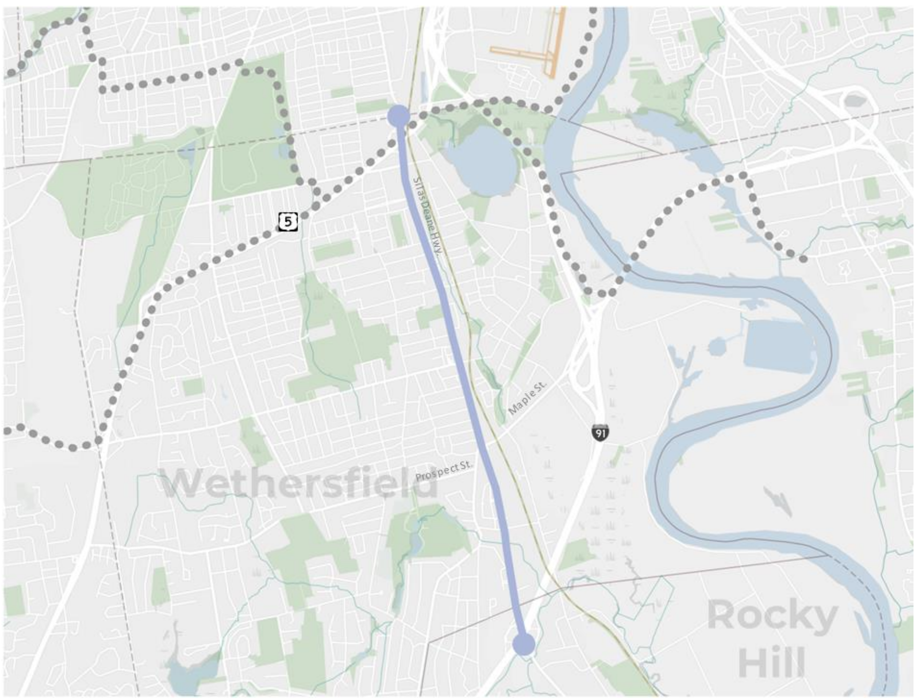
The low cost and quick turnaround of the alternative provide a high benefit that far outweighs the cost.

Silas Deane Highway (Route 99) Corridor Study, Wethersfield

Detailed Project Description

This alternative would investigate the corridor of Silas Deane Highway (Route 99) between Wethersfield and Rocky Hill. This section of road is generally four lanes wide and carries over 30,000 vehicles per day. When I-91 is congested, Route 99 becomes a major alternate route for traffic headed to or from Hartford. The study would assess safety, operational, and multimodal changes on this section of Route 99, as well as evaluating potential realignments and reconfigurations of side roads that could improve intersection safety operations.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take approximately 3 years to complete.

Project Development Process

The Towns of Wethersfield and Rocky Hill would need to release an RFP or request CRCOG complete a study to assess the existing conditions, best uses, concept alternatives, and next steps.

Project Phasing

This study cannot be split into phases of independent utility. Recommendations from the study could foreseeably be split into multiple segments of independent utility, with early actions such as sidewalk construction done before roadway work.

Environmental Review Process

Not Applicable (NA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative investigates improvements to travel reliability by reducing left lane blockages and crash rates.

Access and Connectivity – High Benefit

This alternative investigates improvements to non-motorized access between Wethersfield, Rocky Hill, and Hartford.

Travel Options and End User Convenience – Moderate Benefit

This alternative would investigate the end user experience for all users of Route 99.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The potential for environmental impacts to minority and low-income populations are likely to be outweighed by the access, safety, and mobility opportunities created.

Safety – High Benefit

The corridor study would seek to examine and recommend safer conditions for automobiles, particularly at the interchange with Route 15 where high crash rates currently exist. In addition, recommendations would be to improve the experience for non-motorized users.

Resiliency and Sustainability – Low Benefit

The alternative may recommend improvements that would support minor modal shifts to non-auto modes and provide little improvements to network resiliency and sustainability aspects.

Environment – Moderate Benefit

No environmental impacts are anticipated; however, providing safe, multimodal opportunities may support mode shift.

Technology – Moderate Benefit

This study would consider improvements that take into consideration the performance of autonomous vehicles by providing a more consistent driving environment.

Public Support – Moderate Benefit

The public generally supports improvements to this corridor with key themes, including the need for safe bike and pedestrian facilities and roadway improvements.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative would investigate improvements to the CT*fastrak* Cedar Street Station, making underdeveloped parcels nearby more desirable, and improve travel time reliability for through traffic.

Feasibility/Complexity – Neutral

Based upon recommendations there would likely be some additional right-of-way required, but engineering complexity would not be particularly high.

System Compatibility – High Benefit

This alternative has independent utility and would also enhance connections between different modes.

Overall Assessment of Benefits/Impacts

The assessment of this alternative is overwhelmingly positive with no significant impacts.

Order of Magnitude Cost

This alternative is estimated to cost approximately $500,000 (2022) for a corridor study.

High Level Benefit-Cost Outlook

This alternative would provide numerous benefits to users of all modes and act in a synergistic manner with other mobility alternatives. The benefits of the study are expected to outweigh its anticipated cost. Additionally, it is anticipated that its conclusions will determine a high cost-benefit ratio for the eventual construction of the project.

Develop and Implement Local Complete Streets Plans

(Formerly Calm Fast Traffic)

Detailed Project Description

This alternative recommends that municipalities within the study area conduct, develop, update and/or maintain Complete Streets plans. Complete Streets plans guide the development of bicycle and pedestrian facilities and prioritize the development of those facilities. The purpose of this is to encourage and support the improvement and expansion of bicycle and pedestrian networks throughout the study area and will ensure a local commitment to accommodating bicyclists and pedestrians. Communities within the study area, such as Windsor, East Hartford, and Wethersfield lack Complete Streets plans. Local jurisdictions that have completed plans include the City of Hartford and the Town of West Hartford.

Alternative Image

Implementation Timeframe

Timeframe

This alternative would take approximately 1-2 years to complete.

Project Development Process

CRCOG would need to release an RFP for the development of Complete Streets Guide.

Project Phasing

This guide cannot be split into phases of independent utility. Recommendations from the study could foreseeably be split into multiple segments of independent utility amongst the municipalities.

Environmental Review Process

Not Applicable (NA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative does not improve travel time or reliability for motor vehicles, in fact by reducing travel speeds, travel time may increase; however, reliability for non-motorized users and travel times will improve.

Access and Connectivity – High Benefit

This alternative investigates improvements to safe, non-motorized access amongst the study area.

Travel Options and End User Convenience – High Benefit

This alternative intends to expand travel options and provide solutions to first/last mile problems experienced by transit users.

Criteria Supporting Other Study Goals

Equity – High Benefit

The mobility opportunities created, would expand travel options for all users and the development of a guide would work to ensure all areas are equally accommodated.

Safety – High Benefit

This guide would seek to examine and recommend safer conditions for automobiles, transit, and non-motorized users.

Resiliency and Sustainability – Low Benefit

The alternative may recommend improvements that would support minor modal shifts to non-auto modes and provide little improvements to network resiliency and sustainability aspects.

Environment – Moderate Benefit

No environmental impacts are anticipated; however, providing safe, nonmotorized opportunities may support mode shift.

Technology – Moderate Benefit

This alternative is unlikely to substantially rely upon or utilize technology.

Public Support – Moderate Benefit

This alternative is expected to be supported by the public as it would expand transportation options for all users.

Overarching Criteria

Economic Opportunity – Neutral

This alternative is unlikely to provide an economic benefit.

Feasibility/Complexity – Neutral

Since this is the development of a guide, feasibility and complexity would be analyzed by the implementing communities on a case-by-case basis.

System Compatibility – High Benefit

This alternative has independent utility and would also enhance consistency throughout the study area.

Overall Assessment of Benefits/Impacts

The assessment of this alternative is overwhelmingly positive with no significant impacts.

Order of Magnitude Cost

This alternative is estimated to cost approximately $300,000-$500,000 (2022) for the development of a guide.

High Level Benefit-Cost Outlook

The benefits far outweigh the costs for this alternative.

Commuter Parking Policies Assessment

Detailed Project Description

This alternative recommends the development of a regional Travel Demand Management strategy to help reduce the portion of single occupant vehicle commutes to major employment centers within the GHMS study area. This alternative would commission a study to develop specific strategies and conduct outreach activities with business leaders to reduce single occupant vehicle use. Strategies could include incentives for taking transit, carpooling, walking/biking, or reducing parking availability.

Alternative Image

Implementation Timeframe

Timeframe

This alternative would take approximately 2-4 years to complete.

Project Development Process

CTDOT would need to release an RFP for the development of the study and subsequent recommendations.

Project Phasing

This alternative would be split into two phases, with a first phase to conduct the study and develop the strategies, and a second phase to implement the proposed strategies.

Environmental Review Process

Not Applicable (NA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This alternative has the potential to improve both travel times and reliability be reducing the number of single occupancy vehicle trips during peak commuting hours.

Access and Connectivity – High Benefit

This alternative intends to develop strategies which incentivize transit trips, carpooling and alternate modes choices for commuters.

Travel Options and End User Convenience – High Benefit

This alternative intends to improve the ease of access for transit trips and alternate modes when commuting. The strategies developed by this alternative expand commuting options and making choices other than a single occupant vehicle.

Criteria Supporting Other Study Goals

Equity – High Benefit

The mobility opportunities created, would expand travel options for all users and likely improve access to jobs by transit and alternate modes.

Safety – Neutral Benefit

This alternative does not directly address safety.

Resiliency and Sustainability – Low Benefit

The alternative may recommend improvements that would support minor modal shifts to non-auto modes and provide little improvements to network resiliency and sustainability aspects.

Environment – Moderate Benefit

No environmental impacts are anticipated; however, providing alternate mode opportunities may support mode shift.

Technology – Moderate Benefit

This alternative may leverage technology to connect people alternate modes.

Public Support – Moderate Benefit

Public support for this alternative is not well defined at this time.

Overarching Criteria

Economic Opportunity – Neutral

This alternative is unlikely to provide an economic benefit.

Feasibility/Complexity – Neutral

This alternative has a high degree of feasibility and limited complexity. The complexity associated with developing the alternative will be in the implementation phase following the initial study.

System Compatibility – High Benefit

This alternative has independent utility and would also enhance improved commuting opportunities in the study area.

Overall Assessment of Benefits/Impacts

The assessment of this alternative is overwhelmingly positive with no significant impacts.

Order of Magnitude Cost

This alternative is estimated to cost approximately $500,000 (2022) for the development of a guide.

High Level Benefit-Cost Outlook

The benefits far outweigh the costs for this alternative.

Off-Street Parking Reconfiguration

Detailed Project Description

This alternative would conduct a study to investigate Hartford's parking needs and make recommendations to reduce off-street parking capacity. The intent would to right-size Hartford's parking capacity and encourage infill development within the city's downtown. A parking study performed in 2000 found that parking spaces accounted for more than 8% of the City of Hartford's total land area. Considered another way, there were enough parking spaces for each of the 106,000 workers in Hartford, plus 20,000 additional parking spaces (McCahill & Garrick, 2010).

Alternative Image

Implementation Timeframe

Timeframe

This study would take approximately 2 years to complete.

Project Development Process

The City of Hartford would need to initiate an RFP to solicit a consultant study.

Project Phasing

This alternative would be split into two phases, with a first phase to conduct the study and develop the strategies, and a second phase to implement the proposed strategies.

Environmental Review Process

Not Applicable (NA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral Benefit

This alternative will not directly address travel time and reliability.

Access and Connectivity – Neutral Benefit

This alternative will not directly address access and connectivity but may reduce a sense of connectivity for auto trips into the city.

Travel Options and End User Convenience – Neutral Benefit

This alternative will not directly address travel options and end user convenience.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

This alternative would help reprioritize land uses within downtown Hartford could improve opportunities for all residents.

Safety – Neutral Benefit

This alternative does not directly address safety.

Resiliency and Sustainability – Neutral Benefit

This alternative does not directly address safety, however the resulting right-sizing of parking within the city may lead to denser more sustainable development within the city.

Environment – Moderate Benefit

No environmental impacts are anticipated; however, the possible elimination impervious parking service may provide stormwater quality benefits.

Technology – Moderate Benefit

This alternative does not directly address technology, but smart parking strategies may be recommended to dynamically control pricing with demand.

Public Support – Moderate Benefit

Public support for this alternative is not well defined at this time.

Overarching Criteria

Economic Opportunity – Moderate Benefit

This alternative has the potential open-up land for redevelopment.

Feasibility/Complexity – Neutral Benefit

This alternative has a high degree of feasibility and limited complexity. The complexity associated with developing this alternative is related to the private ownership of many parking lots and will come following the strategy development phase.

System Compatibility – High Benefit

This alternative has independent utility and could create a more vibrant Hartford downtown.

Overall Assessment of Benefits/Impacts

The assessment of this alternative is overwhelmingly positive with few significant impacts.

Order of Magnitude Cost

This alternative is estimated to cost approximately $500,000 (2022) for commissioning a of parking management study.

High Level Benefit-Cost Outlook

The benefits outweigh the costs for this alternative.

RAIL ALTERNATIVES

GREATER HARTFORD MOBILITY STUDY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

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Hartford Line Upgrades (NHHS EA)

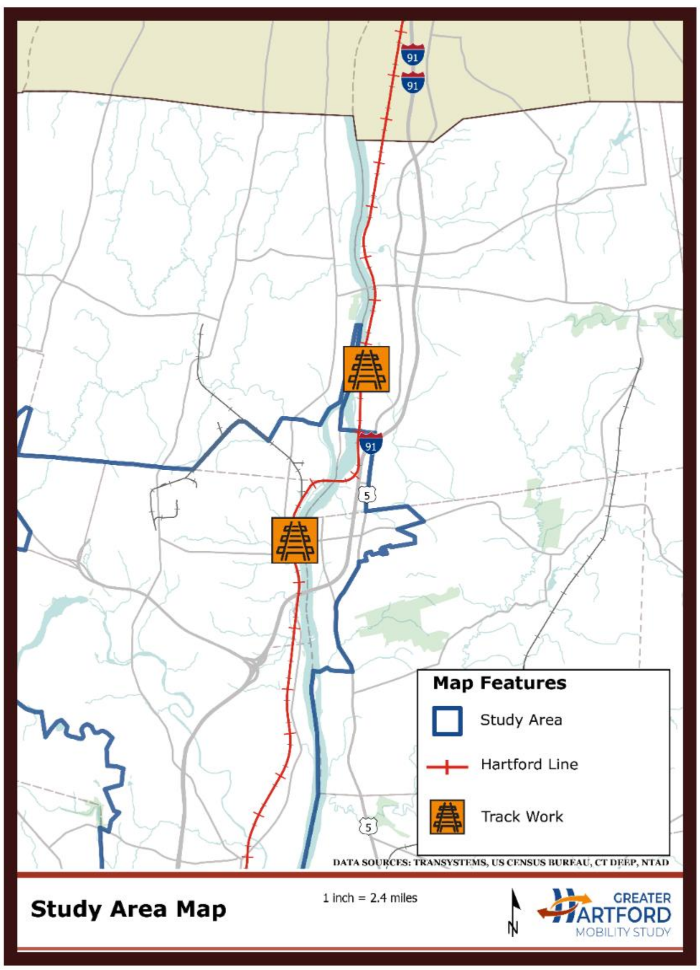
Detailed Project Description

The Hartford Line was first launched in 2018 and the necessary capital investments required to allow the service were implemented. Five years later, several capital investments identified in the original Hartford Line plan remain outstanding including the following:

- double tracking portions of the line between Mile Posts 46 and 49 and Mile Posts 50 and 55; and
- new train equipment.

The State of Connecticut is prepared to allocate different levels of funding for each project, though it also seeks federal support. This alternative seeks to enhance Hartford Line service through securing funding for and constructing these outstanding measures, an act that will expand current ridership and fully realize the service's vision.

Alternative Map



Implementation Timeframe

Timeframe

From concept to completion implementation of all upgrade phases would take 10-20 years to complete with the following timelines for doubletracking and equipment:

- Using estimates based on a similar project on Long Island and current scheduling, it is anticipated that the doubletrack construction process will take approximately three to four years.
- A base order for new passenger rail car equipment is anticipated to take four years to complete.

Project Development Process

Each of these projects requires different steps and nearly all start with securing Federal funding.

- In August of 2012, the Connecticut Department of Transportation (CTDOT) received a signed Finding of No Significant Impact (FONSI) and Programmatic Agreement from the Federal Railroad Administration (FRA) for the New Haven – Hartford – Springfield Rail Program. These proposed track improvements are part of this original evaluation and following design approval, construction will commence.
- To procure rail cars, CTDOT will issue an RFP that stipulates conditions for new cars, manufacturers will have the option to submit a response, and if selected, will enter a contract that establishes the specifications for equipment. The manufactures will then produce the cars. A similar process could be used for locomotives.

Project Phasing

The entire New Haven-Hartford-Springfield (NHHS) program consisted of four phases and these projects are part of Phase 3. CTDOT has already broken this alternative up into separate projects and both are active:

- Second track design is ongoing and on pace to be complete in 2023. Construction of some second track portions between Windsor and Springfield is anticipated to be complete in the Spring/Summer of 2025.
- CTDOT released an RFP for new rail cars in 2022 and the RFP scope anticipates that, following a Notice To Proceed (NTP), it will take approximately four years to deliver the base order. A similar process will likely take place for locomotives.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High

The double-tracking project will improve service capacity, through creating conditions that allow for local and express trains, as well as higher frequencies. Additionally, new cars will break down at a lower rate compared to the existing, 30-year-old fleet.

Access and Connectivity – Moderate

The travel time savings associated with these improvements will allow for improved regional connectivity as individuals will have fewer travel barriers between New England cities.

Travel Options and End User Convenience - High

The infrastructure investments will allow additional frequencies and headways, improving both travel options and convenience for users.

Criteria Supporting Other Study Goals

Equity - Moderate

There could be a potential for environmental impacts in disadvantaged communities, particularly where double tracking would occur. However, improved accessibility and mobility within the region would outweigh potential impacts and would be particularly advantageous to zero-auto households.

Safety - Neutral

These safety benefits will allow CTDOT to maintain safety on the line. While there is a slight safety benefit in new cars that break down less frequently, it isn't a significant benefit compared to existing cars.

Resiliency and Sustainability - Moderate

The proposed alternative would have the potential to encourage modal shift along the I-91 corridor while improving upon a sustainable transportation alternative in the region.

Environment - Moderate

There is a moderate presence of natural resources within the project corridor; and minimal adjacent to the CT*rail* Hartford Line right-of-way. Moderate minority and low-income populations are located within the Project Corridor, particularly within the southwest (SW) corridor and Study Core. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

These improvements largely rely on existing proven technology.

Public Support - High

This alternative has strong support. Public comments include general desire for rail being a major mode of mobility for the region. Comments also include desire for double-tracking and quicker service.

Overarching Criteria

Economic Opportunity - High

The decreased travel times and opportunities for increased frequencies create economic benefits as it makes rail a cost-effective option for travel, compared to drive-alone commuting or other similar modes.

Feasibility/Complexity - High

These phases have already been planned-for and CTDOT has conducted similar projects throughout the State.

System Compatibility - High

Double tracking will align with the existing right-of-way meaning there will be minimal disruptions. New rail cars will be more compatible with existing services on other lines.

Overall Assessment of Benefits/Impacts

The overall service benefits associated with this alternative are that they allow CTDOT to provide enhanced rail service that removes single-occupant vehicles form Connecticut's roads. More tracks also allow new service combinations that better align with travel demand. Additionally, other alternatives are complimentary to this alternative:

- Proposals for additional rail stations along the Hartford Line
- Connecticut River Bridge improvements
- Dual-mode locomotives

Order of Magnitude Cost

Estimated costs for these additional Hartford Line upgrades vary:

- The CTDOT 2022 – 2026 Rail Capital Plan and CTDOT Office of Rail anticipate that the cost of doubletracking is approximately $260M, with an inflated estimate of approximately $430M at the time of implementation.
- The 2022 – 2026 Connecticut State Rail Plan estimates that it will cost approximately $940M to upgrade the CT*rail* fleet.

High Level Benefit-Cost Outlook

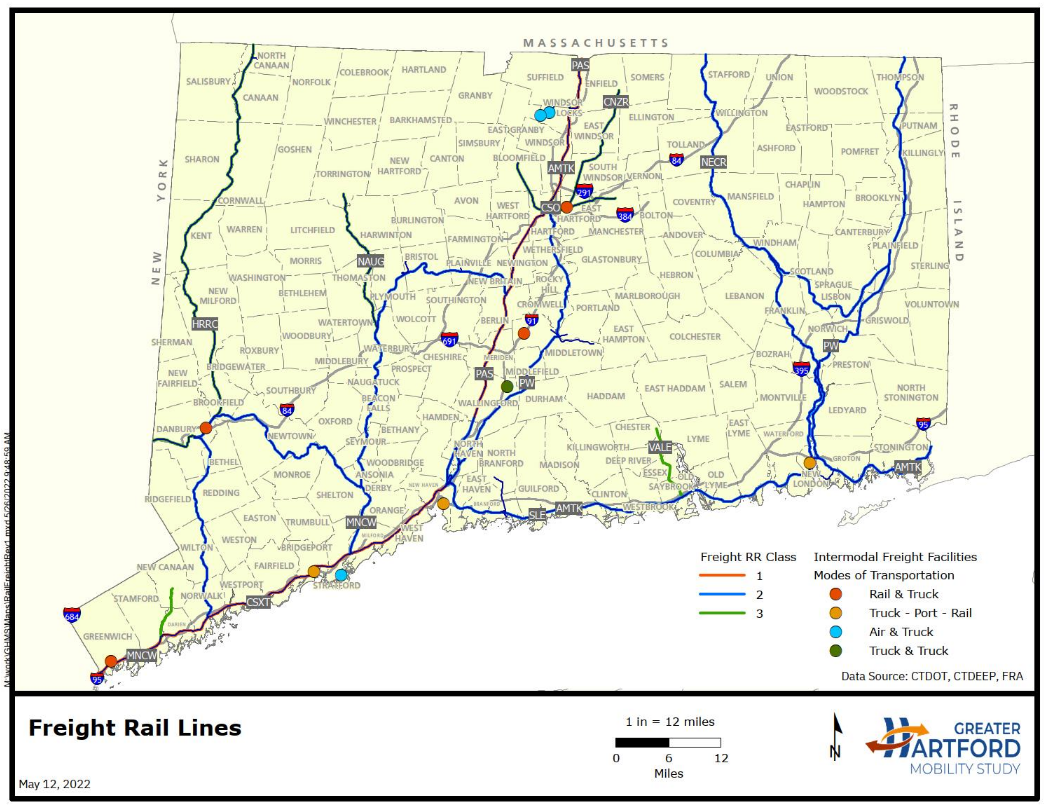
The Hartford Line Upgrades scores high in almost every analysis category and while they are associated with high costs, they bring significant value, including the full realization of the initial Hartford Line Plan.

286K Freight Rail Capacity Upgrades

Detailed Project Description

The movement of freight throughout the state is critical. In Connecticut, most freight is moved by truck, with a substantially smaller portion being moved by rail freight. Rail freight in the state is in part limited by the lack of continuity with the national freight system due to weight restrictions on track within the GHMS study area. Under the NHHS Rail Program the track infrastructure (ties, ballast, and track) was upgraded to meet the 286K standards. However certain bridges and culvert structures were not included as part of the NHHS rail program, meaning the line is not 286K compliant. This alternative focuses on conducting a comprehensive study that identifies how Connecticut can meet the 286K standard, including the Warehouse Point bridge over the Connecticut River.

Alternative Map



Implementation Timeframe

Timeframe

It is anticipated that a comprehensive 286K study would take approximately 18 months.

Project Development Process

1. Conduct a comprehensive study on upgrading rail lines to 286K

2. Develop an Environmental Impact Statement
3. Develop 35% conceptual engineering designs
4. Advance project to a design-build phase
5. Where appropriate, acquire or secure ROW agreements
6. Construction

Project Phasing

This project could be broken up into several phases, with the first being a comprehensive study that examines how and where to implement upgrades, followed by the actual work of upgrading the corridors.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

Upgrading freight infrastructure to 286K can improve freight travel times as routes that previously needed to skip the Hartford area, could now pass through or stop in it.

Access and Connectivity – High

This alternative brings significant benefits in terms of connecting Connecticut's freight railroads to the larger North American system. Having 286K capacity allows current and new customers access to markets throughout North America. The improvements allow users with 286K requirements access to Connecticut freight lines.

Travel Options and End User Convenience - High

This improvement improves access to new markets and improves connectivity through increasing possible shipping routes for Connecticut's freight companies. Current routes do not allow for 286K capacity, meaning such goods need to take roundabout routes or arrive by alternative modes altogether.

Criteria Supporting Other Study Goals

Equity - Low Benefit

The equity benefits associated with 286K capacity primarily exist in terms of reducing freight truck traffic on Connecticut roads; many of which travel, or idle during congested periods in disadvantaged communities.

Safety - Low Benefit

The 286K improvements indirectly improve safety as such improvements would require upgrades to existing infrastructure including the Connecticut River Bridge and Hartford Viaduct, two pieces of infrastructure outliving their useful life.

Resiliency and Sustainability - Moderate

The infrastructure improvements would have the potential to shift freight traffic to non-auto modes and utilizing a more sustainable mode of transportation.

Environment - Low Benefit

There is a moderate presence of natural resources within the project corridor; and minimal adjacent to the CT*rail* Hartford Line right-of-way. Existing bridges may have historic significance. Moderate minority and low-income populations are located within the Project Corridor, particularly within the SW corridor and Study Core. Any bridge or viaduct replacement would have moderate but mitigable impacts on the built environment.

Technology - Moderate

The 286K rating is the freight industry standard and upgrading the line will allow it to align with other major railroads in North America.

Public Support - High

Generally, public comments support this alternative. Suggestions in addition to the primary alternative include the consideration of multi-use trails along the railroad tracks, thoughtful development of rail line placement, and the possibility of reducing truck emissions with a mode shift as a result of freight rail improvements.

Overarching Criteria

Economic Opportunity - High

This brings significant economic opportunity as it would open new shipping routes for regional and international customers.

Feasibility/Complexity - High

This would generally take place within the existing right-of-way. Additionally, 286K has become an industry standard meaning CTDOT likely has the capacity to manage such a project.

System Compatibility - High

This alternative aligns with the goals of Connecticut's 2022-2026 State Rail Plan and improves overall system compatibility.

Overall Assessment of Benefits/Impacts

This alternative brings significant benefits in the manner of freight improvements that open Greater Hartford's economy to companies and freight operators throughout North America. It also allows existing freight consumers an opportunity to remain competitive with other markets. Additionally, it brings Connecticut's infrastructure to a state of good repair by ensuring it aligns with industry standard.

Order of Magnitude Cost

The cost of a comprehensive study for evaluating freight lines in the GHMS study area is approximately $400,000. This is reflective of similar efforts to study other rail corridors and infrastructure upgrades.

High Level Benefit-Cost Outlook

Removing barriers to increased or efficient rail freight in the state is important and allocating planning dollars to fully identify these bottlenecks will substantially contribute towards addressing the need. This alternative score's high and moderate for most screening criteria.

New Rail Station in Newington

Detailed Project Description

This alternative has been removed from screening, as it is now being planned for in the Capital Plan.

Dual-Mode Locomotives and Fleet Upgrades

Detailed Project Description

An additional option for Hartford's future is a new rail fleet that both addresses the needs of today and aligns with future rail plans, like electrification. A dual-mode locomotive is a type of locomotive powered by either diesel or electricity. In the Hartford Line context, dual-mode locomotives could be implemented sooner than line electrification because the line already supports their power source. Additionally, the electric-power option allows new Hartford Line routes, such as direct service to Grand Central terminal in New York City or a future, electrified overland route. Compared to the existing push-pull locomotives, the new trains will be more reliable, emit fewer emissions, and allow for faster service.

Many of the other GHMS rail alternatives support dual-mode locomotive procurement, including a possible new storage yard for the Hartford Line.

Alternative Image

Implementation Timeframe

Timeframe

The process for procuring new cars might take approximately 10-15 years. CTDOT is already in the process of procuring separate, unpowered passenger cars that could be powered by dual-mode locomotives.

Project Development Process

CTDOT has already begun a car procurement process and recently issued a new rail car request for proposal (RFP) that reflects the input gathered from two years of engagement with a customer advisory panel. The RFP requests proposals for single-level, push-pull trailer cars and cab cars, meaning dual-mode units (DMU) are not part of the latest procurement. This noted, dual-mode locomotives could work with these cars.

Project Phasing

Locomotives would likely be procured on a rolling basis, meaning the new fleet of vehicles will slowly be built up.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This could improve travel times and reliability. New locomotives would likely be more reliable than the existing Hartford Line fleet meaning fewer breakdowns and delays. Additionally, DMUs can accelerate and decelerate at faster rates, compared to the current push/pull systems.

Access and Connectivity – Moderate Benefit

This could improve connectivity as it allows service on non-electrified lines while permitting trains to “switch” to electric power on electrified lines. Hartford Line trains have been retrofitted to already allow this, though the existing design only allows electric power once in New York. Pending a design decision, trains could better integrate into the CT*rail* System.

Travel Options and End User Convenience – Moderate Benefit

This could improve user convenience through reducing travel times via a reduction in delays. Additionally, new cars could have modern amenities such as charging ports, Americans with Disabilities Act (ADA) improvements and improved bathrooms.

Criteria Supporting Other Study Goals

Equity – Low Benefit

The proposed alternative could likely have some environmental impacts to EJ communities, particularly where trains would operate under diesel power. However, the effects would be outweighed by access and mobility opportunities attributed to improved rail service.

Safety – Neutral

This alternative is being built to applicable design and safety standards but does not directly address significant safety improvements.

Resiliency and Sustainability – Moderate Benefit

New rail equipment would be designed to better handle current and future infrastructure needs. Additionally, the new equipment would use electric propulsion, meaning they would contribute to more sustainable rail travel. DMUs would still rely on diesel-power in areas where electric power is not provided, even if it aligns with DMUs using "clean diesel" technology. Trains will continue to produce particulate matter and greenhouse gases in these areas.

Environment – High Benefit

Dual-mode units will be able to use electric power, eliminating many emissions. Additionally, the DMUs will be equipped with "clean diesel" technology that is more environmentally friendly than other diesel modes, as they emit less particulate matter, NOx and CO2 than a locomotive. Environmental impacts are anticipated to be moderate but mitigable.

Technology – Moderate Benefit

DMU technology that permits multiple modes will allow CTDOT the opportunity to quickly improve service while also taking on more systemic projects, like electrification.

Public Support – Moderate Benefit

There is a public desire for a move to electric service and DMUs align with this general goal.

Overarching Criteria

Economic Opportunity – Neutral

These new cars, on their own, will not generate any significant change in economic opportunity. If paired with other improvements, this could change.

Feasibility/Complexity – Neutral

DMUs are a semi-common type of rail car, more common in Europe. It is unlikely that any additional or uncommon engineering practices would be needed. This noted, some designs might run afoul with FRA guidance and require a waiver.

System Compatibility – High Benefit

CTDOT recently announced an RFP for single-level, push-pull trailer cars and cab cars. If DMU locomotives units were to be procured, they would be able to work with this set of cars, allowing integration on multiple commuter and intercity lines.

Overall Assessment of Benefits/Impacts

Given that CTDOT is currently procuring new, single-level, push-pull trailer cars and cab cars, this alternative has potential to bring benefits and impacts as it serves current needs but also allows for using electric infrastructure, should it be constructed in the future. Additionally, the Hartford Rail Line Upgrades alternative is complimentary to this alternative.

Order of Magnitude Cost

Capital costs largely depend on a variety of factors such as car design and availability of materials. In July 2020, NJtransit, a commuter rail service in New Jersey, purchased 8 DMUs for $70.5 million. Adjusted to August 2022 inflation, that is approximately $80.7 million.

High Level Benefit-Cost Outlook

Given the current fleet procurement status, the benefits of procuring DMUs provide short- and mid-term benefits. Short- and mid-term benefits allow CTDOT the opportunity to be ready to adapt to electrification, should it occur.

Expand Yard Storage and Maintenance Facilities

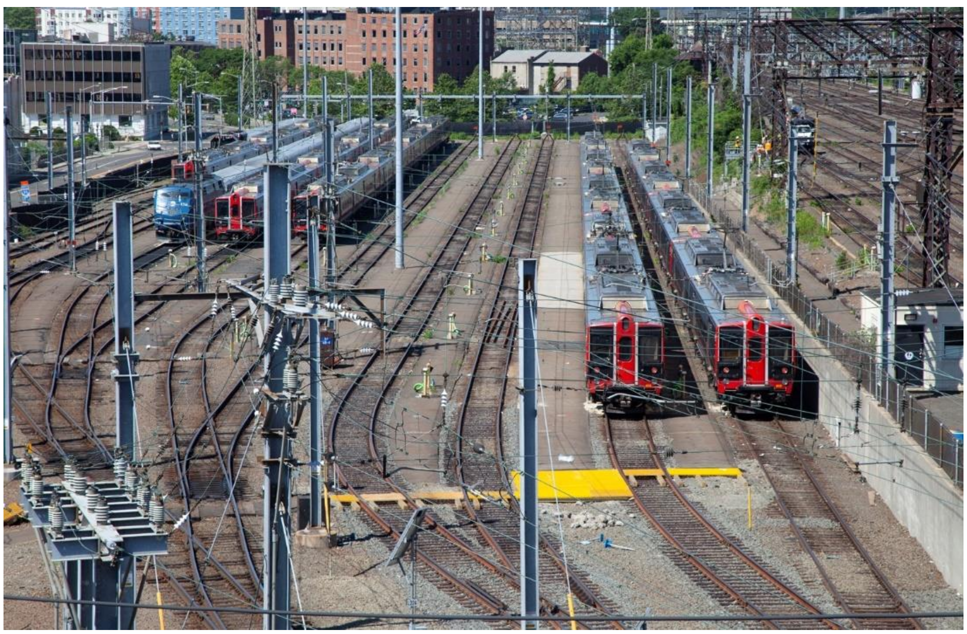
Detailed Project Description

The Hartford Line uses 28 revenue vehicles (12 locomotives, 12 coaches/4 cab control cars) for revenue service, and all are stored at the CTrail New Haven Yard. Presently, the CTrail yard operates at capacity and unless addressed, there will be limits on future Hartford Line service or fleet expansions. To support future Hartford Line service increases or new vehicles, this alternative proposes an additional site on the Hartford Line dedicated to vehicle storage. This facility would accomplish two regional rail goals:

- Creating a yard that removes some limits on future Hartford Line service expansion; and
- Opening additional yard space in New Haven for non-Hartford Line services.

An effective yard needs to meet several criteria including proximity to an active rail line, land ownership, and access to utilities. CTDOT officials are actively conducting research on new, potential yard site alternatives for the Hartford Line.

Alternative Image



Implementation Timeframe

Timeframe

This would take approximately 7-15 years.

Project Development Process

Steps to developing the yard include conducting a feasibility analysis relative to both the Hartford Line and larger rail system, developing a concept, acquiring properties (as needed), and designing/constructing the yard.

Project Phasing

Hartford Line storage could continue to temporarily take place in other existing yards, though this is only a short-term solution. The Hartford yard could be slowly built out, first only constructing the yard to meet today's capacity needs, then built out further at a later point in time to meet future demands.

Environmental Review Process

Categorical Exclusion (CE) or Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

A new storage yard on the Hartford Line increases capacity and opportunities for higher frequencies, faster service, and more schedule flexibility. In order to increase service and improve the travel experience, CTDOT needs to have space to store trains in-between revenue service. Without a new yard, CTDOT cannot increase service as identified in the High Frequency Regional Rail alternative.

Access and Connectivity – Neutral

This facility primarily brings benefits in terms of rail operations and does not improve connections between locations.

Travel Options and End User Convenience – Neutral

This yard will improve the user experience through creating capacity for additional new cars and relieving congestion near New Haven.

Criteria Supporting Other Study Goals

Equity – Low Impact

Expansion of New Haven Yard or a new rail yard for Hartford Line services would likely be sited close to the line or other passenger or freight rail facilities. Although disadvantaged communities would benefit from increased service as a result of additional storage, the site will likely be in or adjacent to disadvantaged communities due to their proximity to industrial corridors.

Safety – Low Benefit

The construction of a new yard will create a more modern facility that is safer for employees, though this benefit is minimal at a larger, regional scale.

Resiliency and Sustainability – High Benefit

A potential new yard improves resiliency through creating redundancy and additional capacity within the New Haven Line System, meaning there are more facilities to service and accommodate the overall passenger rail operation within the state. It improves sustainability through allowing the laydown and service space needed to increase passenger rail service options, making it more competitive with car-alternatives.

Environment – Moderate Benefit

A future Hartford Yard will preferably be constructed near an existing rail or industrial facility meaning the environmental impacts will be minimal. This will be offset by the general improvement in passenger rail service and associated mode shift potential that will help reduce greenhouse gases generated from single-occupant vehicle miles traveled. Environmental impacts are anticipated to be minimal and mitigable if located in an existing rail or industrial area, which is the preference of CTDOT.

Technology – Moderate Benefit

A new yard can be designed to meet the needs of Connecticut's future rail fleet, including electrification or other newly procured vehicles.

Public Support – Neutral

A new yard is largely outside the public consciousness, though coordination with freight operators will be required in future steps.

Overarching Criteria

Economic Opportunity – High Benefit

The construction of a new yard will create construction jobs and improve service on a rail line that serves the region. This will result in local and regional economic benefits.

Feasibility/Complexity – Neutral

Constructing and operating rail yards is a common part of rail operations and CTDOT has the capabilities to do so. A potential challenge could be any property acquisitions or right-of-way agreements with freight companies. It is too early to assess at this time.

System Compatibility – High Benefit

This will improve system capacity through relieving congestion and generating new space in New Haven. Additionally, a new yard will reduce track congestion and supports other regional and state-wide rail improvements.

Overall Assessment of Benefits/Impacts

A new Hartford Yard brings regional benefits as it will create capacity that improves Connecticut's Rail System. These benefits are largely realized in operational improvements that, while generally invisible to the public, will improve quality of life for Hartford Line and other passenger and freight rail users. This is complementary to several other alternatives including:

- Dual-mode locomotives
- Hartford Rail Line Upgrades
- High Frequency Regional Rail

Order of Magnitude Cost

A future Hartford Yard cost estimate is currently being evaluated in a separate study, though estimates on possible land acquisitions for other yard projects in Connecticut were approximately $15 million per parcel. This alternative will need to be studied further; therefore, approximately $400,000-$440,000 have been dedicated to a study.

High Level Benefit-Cost Outlook

While the cost of constructing a yard is very high, the operation benefits will exceed the cost as the new yard creates opportunities for other GHMS-related and non-GHMS related projects. This includes additional fleet procurement and general system capacity improvements.

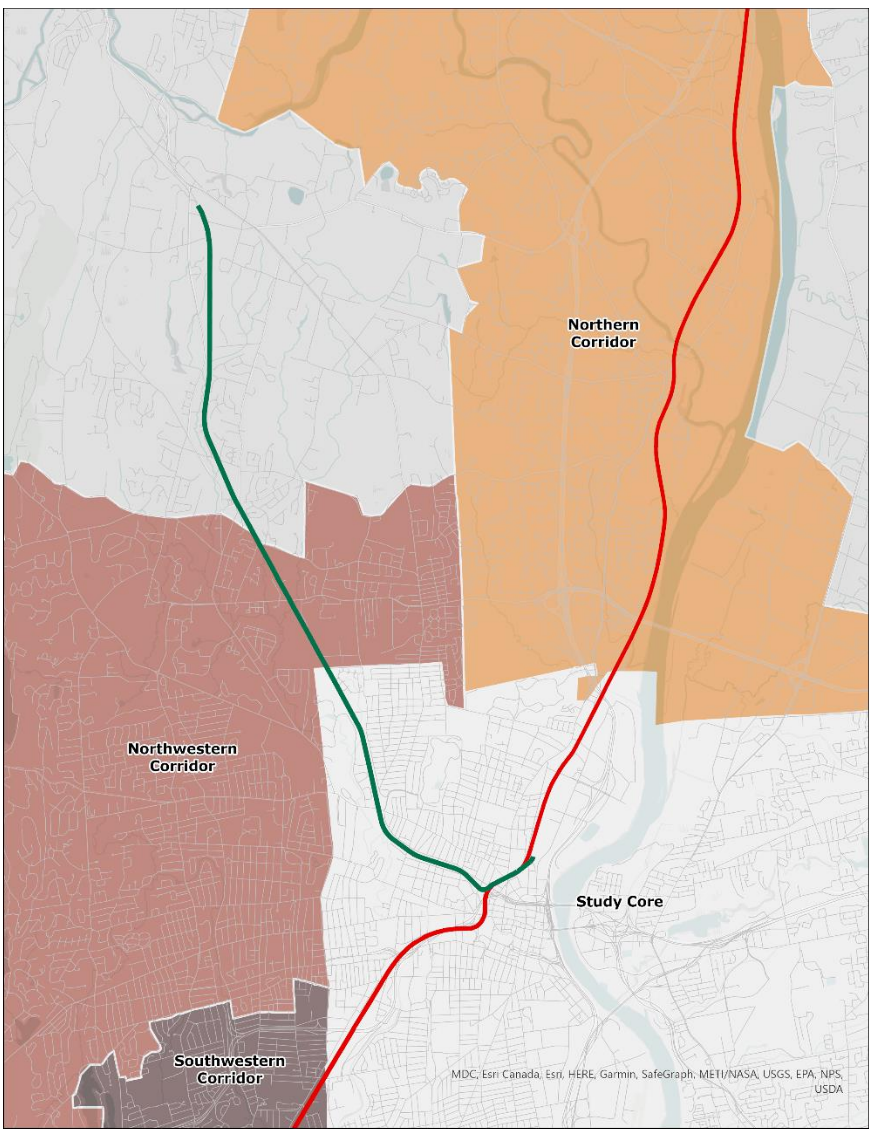
Griffin Line - Multimodal Alternatives

Detailed Project Description

The Griffin Line is a freight rail spur which diverges from the Hartford Line just north of the Union Station rail viaduct and extends northwest into Bloomfield. The total length of the line is approximately 8.5 miles. As part of the GHMS, there was an investigation into potential alternatives that would reimagine the use of the corridor, to include rail with trail, a light rail passenger corridor, and a dedicated bus rapid transit (BRT) alignment. In addition to the three distinct alternatives, combinations of multiple modes along the corridor, dependent on physical site limitations, and with or without the continued operation of the freight rail are being considered.

The rail with trail or multi-use path alternative would work to establish a multi-use path within the ROW of the freight alignment and connect to the Bloomfield Greenway Multi-Use Trail at Tunxis Ave in the north and downtown Hartford at the southern end. This alternative was the preferred alternative for the future of the Griffin Line.

Alternative Map



Implementation Timeframe

Timeframe

Detailed concept planning would be within the 1–3-year timeframe while the design and construction timeframe would be an additional 3-7 years depending on staging of work.

Project Development Process

This alternative would need additional review and a more formal feasibility/alternatives assessment to better understand ROW constraints, liability concerns, environmental constraints, and constructability.

Project Phasing

This alternative could theoretically be broken into several segments and developed overtime. Logical breaks could include downtown Hartford to University of Hartford, University of Hartford to Bloomfield, and Bloomfield to the Bloomfield Greenway Multi-Use Trail multi-use path.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This alternative would establish a new connection between downtown Hartford and the Bloomfield Greenway Multi-Use Trail in Bloomfield. The new connection would serve as both a transportation and recreation asset and could help alleviate some congestion along the corridor, particularly closer into Hartford.

Access and Connectivity – High Benefit

This alternative will improve access to transportation facilities in addition to improving connectivity between key destinations in the corridor, including downtown Hartford and the University of Hartford.

Travel Options and End User Convenience – High Benefit

The alternative would establish a new transportation asset and establish a redundant connection along the corridor. Additionally, a multi-use path would enhance user experience by creating a safer bike/pedestrian connection between key destinations along the Griffin Line corridor.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility and mobility within the region would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety – Neutral

This alternative is being built to applicable design and safety standards but does not directly address significant safety improvements.

Resiliency and Sustainability – Moderate Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment – Moderate Benefit

There is a minimal presence of aquatic and terrestrial resources within the Project Corridor and immediately adjacent to the representative alternative. There is a moderate presence of built resources, immediately adjacent to the representative alternative, particularly in the southern section of the proposed alternative in Hartford and West Hartford. There is a moderate presence of minority and low-income populations located within the Project Corridor, particularly in Hartford. The environmental impacts are anticipated to be mitigable.

Technology – Moderate Benefit

Alternate modes, including multi-use paths, supports sustainable transportation solutions including e-bikes and cargo bikes. E-bikes and cargo bikes represent a rapidly emerging technology and mode which can replace car trips. Dedicated and separated bike facilities support expanded bike use as a transportation mode by providing a safe and efficient corridor that allows users to access goods and services.

Public Support – Moderate Benefit

There is moderate support for this alternative. Some comments indicated a preference for rail trail to take priority over busses and rail, but others questioned how useful the trail would be in comparison to transit alternatives.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative would likely spur economic development along the corridor through the added bike/pedestrian connections that would be established. This would include opportunities for both residential and commercial development that would be created from recreational and purpose-based trips. In addition to direct benefits, proximity to a multi-use trail is associated with higher property values, increased wellbeing/reduced healthcare costs, and new economic opportunity. In short, a multi-use trail is a desirable asset and will serve to attract new residents and new investment in the corridor.

Feasibility/Complexity – Neutral

This alternative will likely only require minimal ROW acquisition as the Griffin Line is owned by the State of Connecticut and the majority of the work will take place within the state ROW. However, this alternative may have a higher degree of engineering complexity than a standard multi-use path due to it occurring within an active rail ROW and in close proximity to a rail line.

System Compatibility – High

This alternative has independent utility through creating a new transportation asset/option in the corridor and would also support the broader network of modal transportation options in the region.

Overall Assessment of Benefits/Impacts

Despite the complexities associated with developing a multi-use trail within an active rail corridor this alternative would provide significant benefits to the community.

This alternative is one of several alternatives proposed for the Griffin Line. The other alternatives suggested for the corridor includes Griffin Line BRT and Griffin Line Passenger rail. The BRT alternative includes a multi-use path as part of its overall vision.

Order of Magnitude Cost

Costs for multi-use paths vary by materials used and the complexities of the trail design but can range between $500,000 to $1,000,000 per mile. Given that the trail is proposed as a rail with trail it assumed that these complexities will push the cost per mile to the higher end of this range. In addition, the project would require fencing to protect the two independent uses within the ROW therefore it should be assumed the cost of the trail would be towards the higher end of the range. At 8.5 miles in length that would place a high-end cost of $8,500,000, with a total implementation cost of $18.9M including estimated inflation.

High Level Benefit-Cost Outlook

Despite the costs and logistical complexity with creating a rail with trail the benefits will very likely exceed costs. Multi-use trails are economic drivers in terms of development and housing as well as improving the health of users which positively impacts healthcare costs.

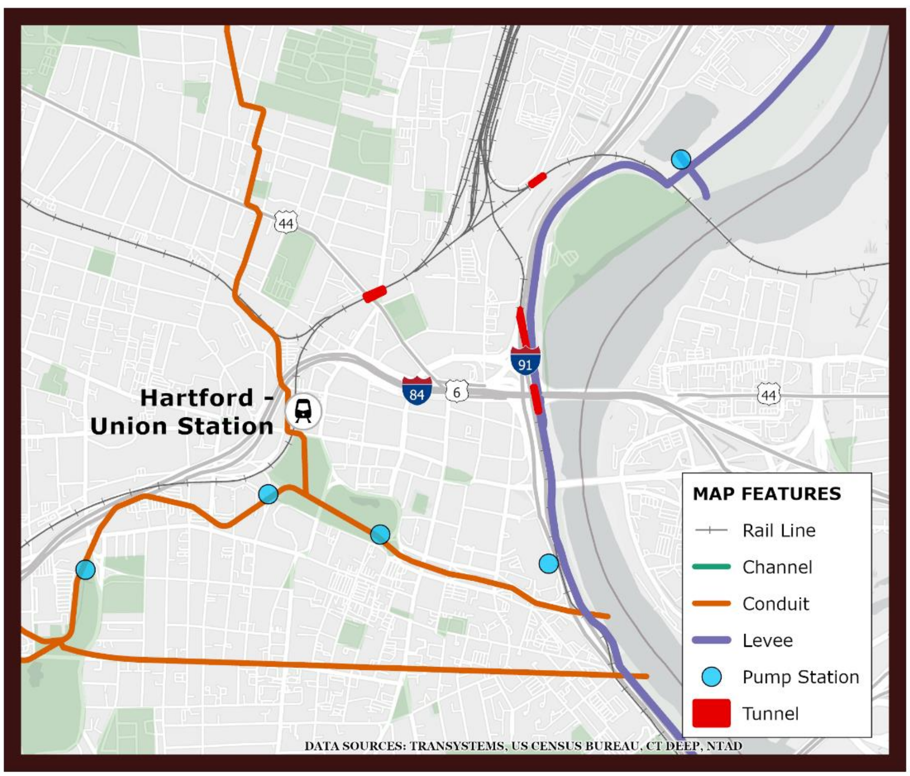
Infrastructure Hardening to Address Drainage and Flooding Vulnerabilities

Detailed Project Description

Drainage is key to the safe operation of a rail line. Whether from the ponding or flow of water over tracks, rail systems are vulnerable to inundation and flooding. Flood water or ponding may damage switches, lead to erosion, or generate premature wear to ties and tracks. The NHHS rail program made significant efforts to address these vulnerabilities. This alternative emphasizes the need to address locations where ponding concerns continue to exist as well as work to secure existing flooding control systems within the study area and review whether additional protection is needed.

The Connecticut River experiences seasonal flooding and occasional flooding associated with extreme weather events and tropical storms. Portions of the Hartford Line and freight alignments are protected by a system of flood control infrastructure, primarily through downtown. The flood control system was installed between 1938 and 1944 following catastrophic flooding. Additional work to install conduits and pumping stations was completed over the following decades, with the existing system being fully completed in 1981.

Alternative Map



Implementation Timeframe

Timeframe

This alternative includes two primary aspects, one to address track drainage and a second to address Hartford's flood control infrastructure. The first stage of this alternative would be to conduct a comprehensive study to understand the concerns to be addressed and would be conducted as an early action project.

Project Development Process

- A comprehensive review of the existing infrastructure/vulnerabilities to define the scope of the work that is required.
- Base-year and future conditions modeling to understand future precipitation and flood trends.
- Preliminary design and permitting to meet modeled future needs.

Project Phasing

This alternative could be split between the drainage aspects and the hardening of flood control infrastructure.

Environmental Review Process

Current recommendations are for a study, environmental review requirement for subsequent construction phases will be determined at a later date.

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Low Benefit

This alternative will help improve the reliability of passenger and freight rail infrastructure be reducing the likelihood for service outages or slow orders due to ponding on the tracks or more significant inundation. The alternative will additionally work to ensure that communities continue to be protected by the region's flood control systems.

Access and Connectivity – Neutral

This alternative does not address access or connectivity and is primarily concerned with the reliability of service options.

Travel Options and End User Convenience – Low Benefit

This alternative would work to improve user experience of the passenger rail system by ensuring that users can trust there will be consistent and reliable operations on the Hartford Line.

Criteria Supporting Other Study Goals

Equity – Low Benefit

Depending on the location, effects on EJ communities in the Study Core may be undesirable; however, opportunities associated with access and mobility and increased reliability will provide benefits.

Safety – Low Benefit

This alternative may support minor safety improvements by reducing the likelihood of slow orders or unexpected ponding on tracks. Additionally, the hardening of flood control systems may reduce the likelihood of neighborhood inundation.

Resiliency and Sustainability – High Benefit

The hardening of rail infrastructure and potential for increased reliability may support passenger and freight modal shifts within the region. The improvements would also increase resiliency of an already sustainable mode of transportation.

Environment – Moderate Benefit

There is a moderate presence of natural resources within the project corridor; and minimal adjacent to the CT*rail* Hartford Line ROW. Moderate minority and low-income populations are located within the Project Corridor, particularly within the SW corridor and Study Core. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Neutral

This alternative does not directly address future technologies beyond ensuring the safe and continued operation of the rail system.

Public Support – High Benefit

Strong support was shown for this alternative and related policy. Comments include recognizing importance of maintenance and climate preparedness in improving resiliency and longevity.

Overarching Criteria

Economic Opportunity – Neutral

This alternative does not address economic opportunity in the region.

Feasibility/Complexity – High Benefit

This alternative would not require additional ROW acquisition with minimal engineering complexity required to address drainage and flooding concerns.

System Compatibility – High Benefit

This alternative has independent utility by ensuring the safe and reliable operation of the existing rail lines as well as being critical for supporting future passenger and freight operations.

Overall Assessment of Benefits/Impacts

The alternative will overall provide a high degree of benefits to the Hartford Line as well as the broader Hartford area by ensuring the continued safe operation of the rail line as well as reenforcing existing flood control infrastructure.

Order of Magnitude Cost

No order of magnitude costs were developed for this alternative because it needs further study to determine the scope of the required work. As a result, the suggested next step is to conduct a planning level study to better understand what improvements may be required. A conservative estimate of this type would be $400,000-$500,000.

High Level Benefit-Cost Outlook

For this alternative, benefits will exceed costs. While initial upfront costs could be high, particularly for the flood control portions, the impacts if there is system failure would likely be significantly greater.

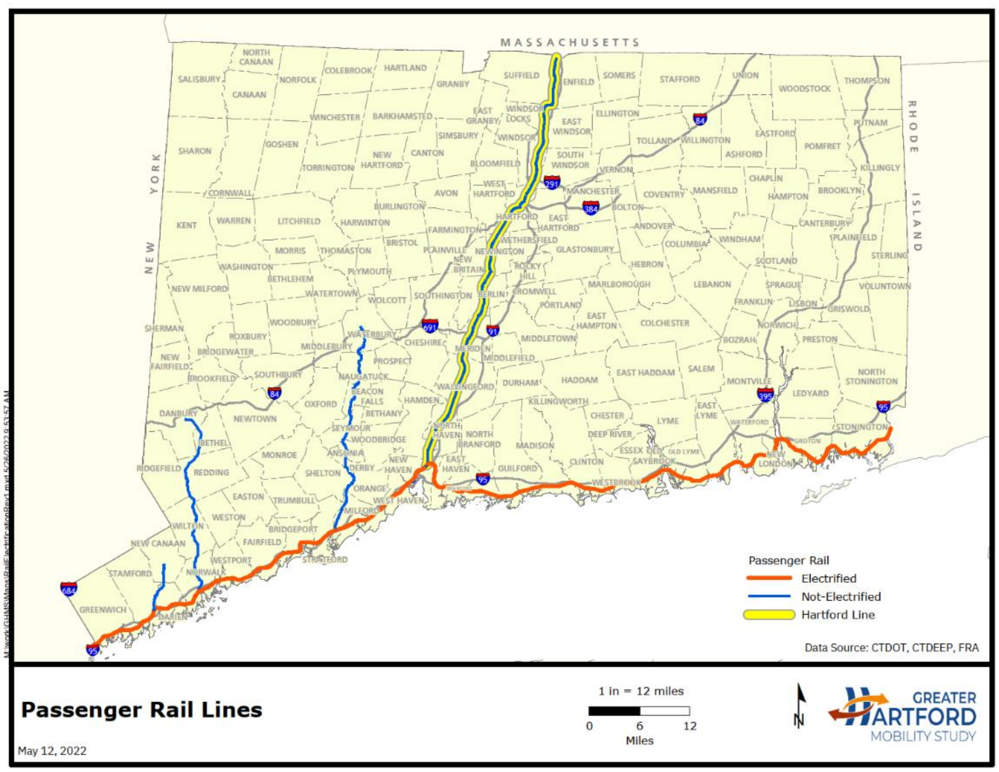
Electrify the Hartford Line

Detailed Project Description

The Hartford Line is not electrified, and electrification is an opportunity to speed up service, improve air quality, and reduce operations and maintenance costs. Compared to the current Hartford Line Diesel locomotives, electric trains accelerate and decelerate at a faster pace. Hartford Line on-time performance (OTP) hovers around 90% and faster electric trains could increase OTP above current levels, increasing reliability for riders. Electric trains do not generate local greenhouse gasses, meaning there are social and climate justice benefits for communities along the line and the greater Hartford region as a whole.

The long-term plan for High-Speed Rail service and infrastructure improvements in the NHHS rail corridor contemplates potential electrification of the line so that electric multiple units could be used in lieu of diesel locomotives. Additionally, present electrification studies are already in the works with CTDOT planning to review electrification options on the Hartford, Waterbury, and Danbury Lines. In the Hartford Line context, that study will review current conditions and develop conceptual electrification criteria for the line. Recognizing the need for regional connectivity, this study will likely look at options for extending existing New Haven Line electric infrastructure towards Springfield, including developing conceptual electric infrastructure plans.

Alternative Map



Implementation Timeframe

Timeframe

Assuming funding is secured, this will likely take 10 – 15 years.

Project Development Process

1. Complete currently programmed study on electrification
2. Develop an Environmental Impact Statement
3. Develop 35% conceptual engineering designs
4. Advance project to a design-build phase
5. Construction

Project Phasing

Electrification could take place on any portion of the line, and a potential beginning would be to electrify the line from New Haven to Hartford, with a second phase electrifying the line north of Hartford.

Environmental Review Process

EIS

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

Trains using electric power typically break down at a lower rate, improving system reliability and travel times. Additionally, electric trains accelerate and decelerate at a faster rate, improving travel speeds and decreasing passenger travel times.

Access and Connectivity – High Benefit

Electrifying the Hartford Line improves connectivity with the New Haven Line and larger Amtrak Northeast Corridor (NEC) as these lines have electric power. This creates opportunities for new destinations and decreased travel times between existing ones.

Travel Options and End User Convenience – Moderate Benefit

This alternative would increase travel options through allowing Hartford Line trains the chance to travel anywhere on the New Haven Line or Shore Line East, potentially creating one-seat riders to a variety of locations. Additionally, electric trains break down at a lower rate than diesel trains, improving system reliability and decreasing travel delays.

Criteria Supporting Other Study Goals

Equity – High Benefit

Electrification services EJ communities hosting the Hartford Line through reducing the volume of local greenhouse gasses and particulate matter emitted by the current diesel fleet.

Safety – Neutral

This alternative is being built to applicable design and safety standards but does not directly address significant safety improvements.

Resiliency and Sustainability – High Benefit

Electric-powered trains are more reliable, making train travel more competitive with other modes. Additionally, electric-powered trains emit fewer localized greenhouse gasses than their diesel-powered counterparts.

Environment – High Benefit

Installation of electric infrastructure within the existing ROW should result in limited to no resource impacts. The shift to electric power from diesel fuel will result in a high benefit to the natural and man-made environment by eliminating greenhouse gas emissions. There would be no impacts on the natural or built environment.

Technology – Moderate Benefit

Electric infrastructure is a proven technology that operates more effectively and efficiently than diesel technology. Additionally, electric infrastructure can be further improved as power generation and the nation's energy grid switches to more renewable sources.

Public Support – High Benefit

Overall, people are very supportive of electrifying the Hartford Line. Comments suggest that people think this would improve efficiency, safety, and help support efforts against climate change.

Overarching Criteria

Economic Opportunity – High Benefit

Electrification creates new destinations and increases speeds. Previous locations deemed to be inaccessible by electrified rail service can now host businesses or longer-distance commuters, spurring the local economy and property values in the process.

Feasibility/Complexity – High Benefit

Portions of Connecticut's passenger rail system are already electrified, meaning such a project is feasible and well-within CTDOT's capabilities.

System Compatibility – High Benefit

The existing New Haven Line and Shore Line East corridors are electrified, meaning that electric-powered trains on the Hartford Line would better integrate into the larger passenger rail system. This would allow for more standardized rolling stock across Connecticut, amongst other elements.

Overall Assessment of Benefits/Impacts

Electrification is one of the most beneficial rail investments as it improves emissions, increases reliability, decreases travel time, and permits CTDOT opportunities to procure new fleets. Electrification is a systemic improvement that will be a multi-decade improvement for the system. It will also complement other alternatives including High Frequency Regional Rail.

Order of Magnitude Cost

This project costs vary depending on factors such as design and availability of labor and materials. The current estimate is approximately $2.67 billion. This estimate is based on a 2021 construction cost, adjusted for 2022 inflation, for Caltrain electrification, an electrification project on an approximate 51-mile commuter rail line. This includes all costs associated with the construction. Outside of the United States, there are other examples including an electrification project in Israel costing approximately $2.4 million ($2.2 million in 2021 dollars) per route mile.

High Level Benefit-Cost Outlook

Electrification has a transformative impact, linking the Hartford Line to the larger NEC electric network, amongst other actions. The CalTrain electrification project in California determined that electric trains improve performance, increase capacity, reduce fuel costs, improve air quality, reduce greenhouse gasses, and generate positive economic benefits for the region. Additionally, an electrification study for GO Transit in Canada found electrification had a benefit-cost outlook ranging from 1.3 to 1.8. Given these many benefits, it is likely that there is a positive benefit-cost ratio for a similar project in Hartford.

Double Tracking into Union Station

Detailed Project Description

Please see Hartford Rail Realignment, as this alternative has been integrated into that one.

Griffin Line – Rail Alternatives

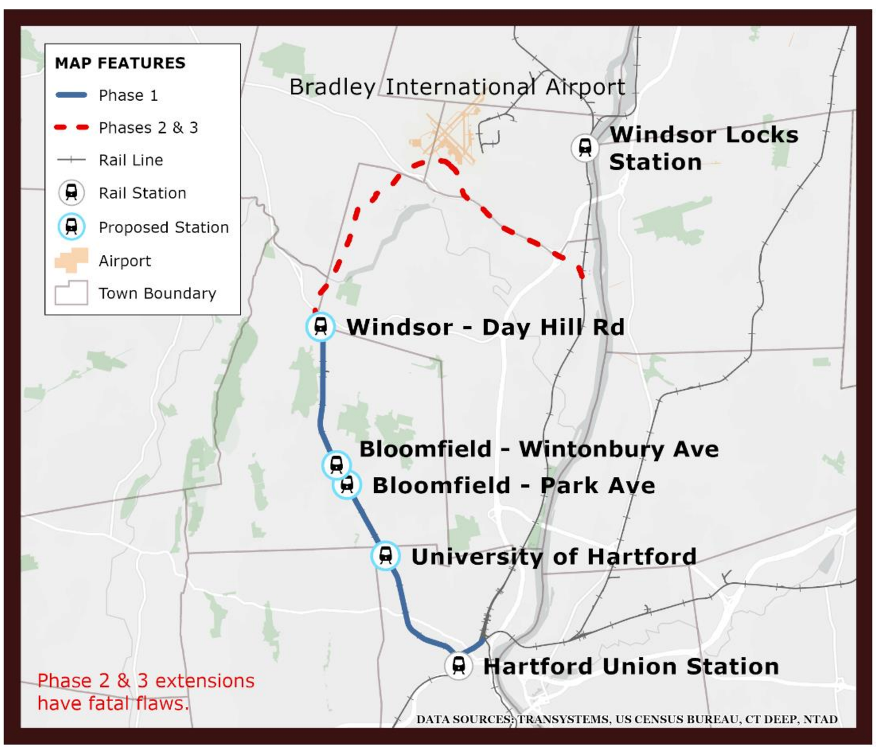
Detailed Project Description

The Griffin Line is a freight rail spur which diverges from the Hartford Line just north of the Union Station rail viaduct and extends northwest into Bloomfield. The total length of the line is approximately 8.5 miles. As part of the GHMS, the Study Team was directed to investigate potential alternatives that would reimagine the use of the corridor, to include rail with trail, a light rail passenger corridor, and a dedicated BRT alignment. In addition to the three distinct alternatives, combinations of multiple modes along the corridor, dependent on physical site limitations, and with or without the continued operation of the freight rail, are being considered.

This rail alternative would investigate developing passenger rail along the Griffin Line in three phases: (1) rail along the existing alignment, (2) an extension of rail operations to Bradley International Airport, and (3) a connection back to the Hartford Line. Once complete, service could be operated bidirectionally to offer rail connections to the airport from the north and south. Under this alternative, freight operations on the line would be maintained and passenger service would be facilitated through the use of passing sidings where needed. Possible stations could include the University of Hartford, Park Avenue or Wintonbury Avenue, and Day Hill Road. Station ideas have not been developed for Phase 2 and 3 but could include the industrial parks off of International Drive and adjacent to Route 20 east of the airport, and Bradley International Airport.

NOTE: Phases 2 and 3 of this alternative were scored to have a fatal flaw due to the ROW requirements that would be needed to connect to Bradley International Airport and again back to the Hartford Line.

Alternative Map



Implementation Timeframe

Timeframe

Phase 1 of this alternative would be 5-10 years with Phases 2 and 3 an additional 5-10 years each (see below for a description of potential phases).

Project Development Process

This alternative would require significant planning across all three phases to refine the concepts including service models, ridership, alignment alternatives for phases 2 and 3, and detailed environmental review. In addition to the planning stages of project development the alternative would require significant preliminary/final design and equipment procurement/reallocation.

Project Phasing

This alternative could be split into three phases, with the (1) first phase between downtown Hartford to the end of the existing rail alignment in Bloomfield, (2) the second phase between the end of the existing terminus in Bloomfield to Bradley International Airport, and (3) the third phase from Bradley International Airport back to the Hartford Line. Both Phase 2 and 3 would be new ROWs.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

The level of congestion in this corridor is uncertain, however a passenger rail mode would provide for more consistent travel times in the corridor.

Access and Connectivity – High Benefit

This alternative would a establish a new transit connection in the corridor that could provide access to the University of Hartford, Bloomfield, and the Day Hill Road corporate parks from Union Station in Hartford during an initial phase. Benefits for Phase 2 and 3 would include direct access to Bradley International Airport and subsequent access back to the Hartford Line. These subsequent phases would establish a loop that could provide bi-directional service through the region.

Travel Options and End User Convenience – High Benefit

This alternative would provide redundancy for many of the key destinations on the existing Griffin Line corridor, through both the local road network as well as existing transit routes (#50, 52, 54, 56, 76, and 153). This alternative would also improve the end user experience by providing service with increased amenities compared to existing bus services.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The potential effects to EJ populations are outweighed by the mobility and accessibility opportunities associated with the alternative. There is a moderate presence of EJ populations in the Study Core. The construction/increased noise from new rail operations may cause some impacts to these populations. A new rail connection would benefit transit dependent population by increasing their access to transportation options and expanding possible origins/destinations.

Safety – Low Benefit

Per mile, user risk of injury is significantly higher when relying on a personal motor vehicle compared to rail due to the fact that most personal motor vehicle crashes are a result of human errors (distraction, misjudgment, etc.). Since rail relies on separate facilities from other modes a majority of the time has a set route, and only has a single driver, the overall risk of error and conflict resulting in injuries or fatalities is reduced.

Resiliency and Sustainability – Moderate Benefit

The proposed alternative would encourage modal shift while improving upon a sustainable and resilient transportation alternative in the region.

Environment – (Phase 1) High Benefit; (Phase 2 & 3) Moderate Benefit

Phase 1: There is a minimal presence of aquatic and terrestrial resources within the Project Corridor and immediately adjacent to the alternative. There is a moderate presence of built resources, immediately adjacent to the alternative, particularly in the southern section of the proposed alternative in Hartford and West Hartford. Moderate presence of minority and low-income populations located within the Project Corridor, particularly in Hartford. Environmental impacts are anticipated to be minimal and mitigable.

Phase 2 and 3: The scope of the ROW requirements for Phase 2 and 3 of this alternative would likely have a significant impact on environmental resources in the corridors that would be difficult to mitigate. Environmental impacts are anticipated to be moderate to severe and would not be able to be mitigated.

Technology – Neutral

This alternative would not directly provide consideration for future technology beyond supporting a new transit connection.

Public Support – Moderate Benefit

There is moderate support for this alternative. Some comments indicated a preference for rail trail to take priority over busses and passenger rail, but others questioned how useful the trail would be in comparison to transit alternatives.

Overarching Criteria

Economic Opportunity – High Benefit

A new rail service on the Griffin Line corridor would likely spur additional development including in and around Bloomfield and the University of Hartford. Phase 2 and 3 of this project could spur additional economic opportunity through the proposed connection to the airport.

Feasibility/Complexity – (Phase 1) High Benefit; (Phase 2 & 3) Critical Flaw

Phase 1: Phase 1 of the alternative would not likely require additional ROW acquisition and would generally provide for a high degree of engineering feasibility.

Phase 2 and 3: Due to the significant amount of new ROW required by these additional phases it is likely there will be significant impacts on existing residential neighborhoods and farmlands, and a low degree of engineering feasibility. Engineering complexities include creating a new alignment over the Farmington River, development of direct connection/transfer at the airport, and new alignment over/under I-91.

System Compatibility – High Benefit

Phase 1 would have independent utility by establishing a transit connection in corridor as well as contributing to the state's overall rail and transit network. Additionally, unlike the BRT option, it would allow the continued operated of the existing freight rail service in the corridor.

Overall Assessment of Benefits/Impacts

For Phase 1 of this alternative benefits would exceed impacts, however this alternative competes with both the BRT alternative and rail with trail alternative which may provide similar benefits but at a lower cost.

Order of Magnitude Cost

The current corridor serves as an active unsignalized freight railroad. The proposed enhancements involve upgrades to the existing tracks to accommodate passenger service, signalization of the corridor, integration of passing sidings, improvements to grade crossings, and the establishment of passenger stations. The estimated costs are as follows: track improvements spanning 45,000 linear feet at a rate of $100 per linear foot, totaling $4.5 million; a 2,000 linear foot passing siding, complete with two track switches, amounting to $0.85 million; installation of Centralized Traffic Control (CTC) and Positive Train Control (PTC) systems, covering 8.5 miles for CTC ($2.13 million) and 8.5 miles for PTC ($1.7 million); enhancement of five grade crossings at a cost of $0.25 million each, resulting in $1.25 million; construction of three passenger stations, each priced at $15 million, summing up to $45 million. Consequently, the construction costs amount to $55.43 million. Additional expenses encompass $5.54 million for design, $13.86 million for design and construction support (FA), $8.31 million for the owner, culminating in $27.71 million. With a contingency fund of $24.94 million factored in, the total estimated project cost is $108.09 million. It is pertinent to note that alternatives (2) and (3) were omitted from estimation due to identified critical issues.

High Level Benefit-Cost Outlook

Phase 1: For this alternative the costs would likely exceed the benefits given the high initial capital costs associated with track improvements, station construction and vehicle procurement, in addition to ongoing operational costs. Additionally, the ridership that would be generated from a service in this corridor is uncertain.

Hartford Land Reclamation

Detailed Project Description

Since the construction of I-91 and I-84, resident access between neighborhoods and to the Connecticut River waterfront has been limited. To restore connectivity between the neighborhoods within the Study Core, this alternative proposes lowering I-84, I-91, and rail infrastructure along this pathway. The result would not only assist in the reduction of through traffic impeding on local traffic in the Downtown Hartford, but it would also improve the economy, environment, and quality of life for residents. The reclaimed land, potentially more than 80 acres, could improve access to and the number of green spaces and pedestrian facilities in the area. Other possible benefits of this alternative are:

- Reduce noise pollution in Downtown Hartford;
- Expand greenspace; and
- Create new areas ripe for transit-oriented development (TOD).

Alternative Image

Implementation Timeframe

Timeframe

This alternative would take 15-20 years to implement due to the complexities of lowering the existing Interstate and Rail.

Project Development Process

This alternative would require significant environmental review along with preliminary engineering and design. After completion of the lowered interstate and rail, the land and air rights will need to be negotiated amongst the Federal DOT and the City of Hartford before any development plans can be moved forward.

Project Phasing

There is the ability to do most of the preliminary work in phases of independent utility, such as undergrounding rail infrastructure, I-84 west of Trumbull Street, and segments north and south of the I-84/I-91 intersection; however, limited interruption to the utility of other segments will occur during the construction of the I-84/I-94 interchange. Any TOD, green spaces, economic development, or bike and pedestrian paths will be reliant on the completion of the existing infrastructure being lowered and therefore does not have independent utility.

Environmental Review Process

Environmental Impact Assessment (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Low Benefit

Since the rail is already separated from other modes, it is unlikely for any significant benefits to be realized from this alternative. Some reliability benefits may be realized from tunneling the rail during times of extreme winter weather.

Access and Connectivity – High Benefit

Safe, multimodal transportation options are expanded by the reclamation of surface level land for local Downtown Hartford travelers.

Travel Options and End User Convenience – Neutral

This alternative does not create a new travel opportunity or improve end user convenience for those using the rail system.

Criteria Supporting Other Study Goals

Equity – Low Benefit

Potential construction effects on EJ communities in the Study Core would be disruptive and disproportionate to EJ communities as the improvements would occur in the Study Core. However, the longer-term opportunities associated with access and mobility as well as improved air and noise quality, safe pedestrian-oriented green spaces, and economic development will provide benefits.

Safety – Low Benefit

The lowering of the rail facilities may reduce overall Key Performance Indicators (KPIs) by reducing overall interactions, as local and throughway traffic across modes would be separated. Further, the likelihood of non-flooding weather-based incidents may decrease; however, an investigation of design resulting in flooding will need to be conducted.

Resiliency and Sustainability – Moderate Benefit

The alternative would provide the opportunity to incorporate resilient and sustainable infrastructure improvements not currently part of the existing highway and rail system. Additional transit options for users on the surface level would also permit for more sustainable travel options, such as public and active transportation, overall reducing greenhouse gas emissions related to transportation.

Environment – Low Benefit

The presence of natural resources in the study area is limited due to its urban setting. Historic resources and sensitive land uses adjacent to the alternative are prevalent. Low-income and disadvantaged populations are prevalent throughout the immediate project corridor, and will be negatively affected, particularly during construction. Overall environmental impacts are anticipated to be moderate but mitigable.

Technology – Neutral

This alternative will be built to design standards; however, it does not have specific technology advancements within its design.

Public Support – High Benefit

There is strong support for the ideas in this alternative. Comments include concerns about expense, but reconnection of Hartford neighborhoods and access to Riverfront is desired. Methods expressed by the public include cut and cover of I-84 and realigning the rail line.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative promotes significant economic opportunity, by transforming the existing land uses into housing, commercial business space, office space, and other mixed-use development opportunities easily connected to a variety of transit options; therefore, facilitating economic opportunities.

Feasibility/Complexity – Neutral

This alternative will require additional ROW and potentially temporary easements, in addition to the possible displacement of some residents or businesses. Engineering complexity is relatively standard.

System Compatibility – High Benefit

This alternative improves overall system compatibility by allowing local traffic systems to more seamlessly interact and this alternative has independent utility.

Overall Assessment of Benefits/Impacts

This alternative has significant benefits to overall mobility and expansion of transportation options (Goal 1), particularly those related to sustainability (Goal 3), while benefiting safety and the economy (Goal 2). Unfortunately, this alternative would have moderate impacts on existing EJ residents during the period of construction but would ultimately benefit long term equity in the region (Goal 4).

This alternative competes with the relocation of the Hartford rail viaduct and Union Station as well as the highway alternatives addressing alignment changes to I-84 and I-91 in Hartford (*I-84 Northern Alignment, I-84 Southern Alignment, and I-84 Lowered Highway*). Coordination between modes would be required.

Order of Magnitude Cost

This alternative is being rolled into the City Link concept which includes multiple sections of capping through this corridor in addition to moving the rail station and rail alignment and has an estimated cost of $5.5 million.

High Level Benefit-Cost Outlook

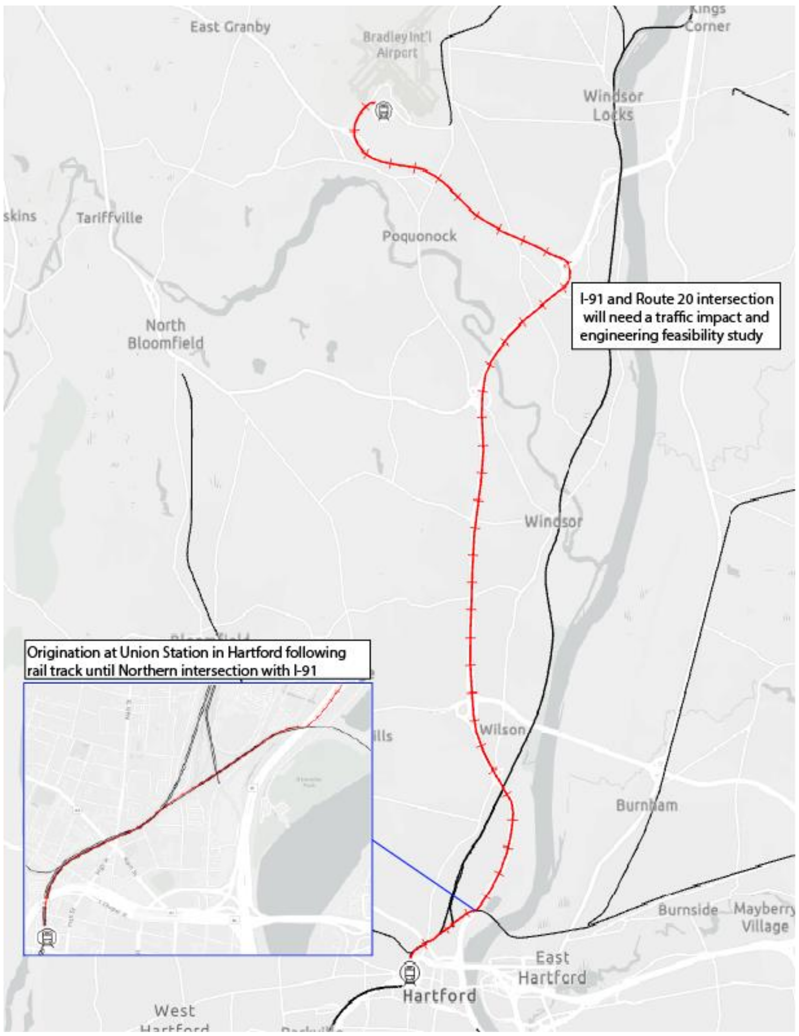
Although this alternative requires significant capital investment and temporary impacts on residents, the finished result would highly benefit residents of Hartford and the Region due to the mobility, environmental, and economic benefits, and opportunities.

Hartford Line – Downtown to Bradley

Detailed Project Description

This alternative investigates the establishment of a direct rail connection between Downtown Hartford to Bradley International Airport to increase the rail mode share of rides by airport workers and travelers. This alternative would utilize the existing I-91 northbound and southbound high occupancy vehicle (HOV) lanes as a rail path. In order to simplify access to and from the HOV, the station in Hartford should be Union Station and utilize the existing rail until its intersection with I-91 near Meadow Brook. Aligning the rail along Route 20 to/from Bradley International Airport appears to be the best path due to its minimal milage and ease of ROW access.

Alternative Map



Implementation Timeframe

Timeframe

10+ years for implementation.

Project Development Process

Preliminary alignment and design (10%) will be necessary to help determine ROW access to and from the I-91 HOV lanes.

Project Phasing

Since this alternative only has a single origin/destination pairing, there is no feasible way to split the project into independent utility phases.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

Currently, the options for travel to and from the Bradley International Airport are limited to using a personal motor vehicle or rideshare for a 20-minute ride, dependent upon traffic, or over 75-minutes by bus with at least 50 stops regardless of the route taken. By providing a rail alternative, overall travel time is reduced due to the direct origin/destination path and reliability is improved by removing the unpredictability of traffic via separated infrastructure.

Access and Connectivity – High Benefit

The Bradley International Airport is the second busiest in New England, with over 200 flights per day arriving and departing, and provides residents of Western New England with connections to the rest of the United States. By providing this new rail alternative, access to these facilities is improved and more easily pair its users to Downtown Hartford and the multitude of mobility options available.

Travel Options and End User Convenience – High Benefit

This alternative provides users with an additional option to driving a personal vehicle, ridesharing, or using the bus system. Further, end user convenience is improved by reducing travel time and the need to transfer to another bus or pay a premium for Airport parking or ridesharing.

Criteria Supporting Other Study Goals

Equity – High Benefit

Outside of improving the overall cost and time to travel to and from the airport for passengers using the facilities, this alternative provides residents of EJ communities with additional access to jobs via transit.

Safety – Low Benefit

Per mile, user risk of injury is significantly higher when relying on a personal motor vehicle compared to rail due to the fact that most personal motor vehicle crashes are a result of human errors (distraction, misjudgment, etc.). Since rail relies on separate facilities from other modes a majority of the time, has a set route, and only has a single driver the overall risk of error and conflict resulting in injuries or fatalities is reduced.

Resiliency and Sustainability – Moderate Benefit

The proposed alternative would encourage modal shift while improving upon a sustainable and resilient transportation alternative in the region. Additional resilient infrastructure components could be incorporated into the repurposing of the existing HOV lanes.

Environment – Moderate Benefit

There is a minimal presence of natural resources immediately adjacent to the representative alternative. There is a moderate presence of built resources, immediately adjacent to the representative alternative, particularly in the southern section of the proposed alternative in Hartford and West Hartford. A moderate presence of minority and low-income populations are located within the Project Corridor, particularly in Hartford. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Low Benefit

A key consideration in the design and engineering for any new stations in the region will ensure that technology at all levels can be integrated seamlessly – from small technological improvements, such as real time tracking, to larger undertakings, including electrification – in accordance with CT*rail* planning horizons.

Public Support – High Benefit

Comments are generally supportive of this alternative. Comments include desire for Bradley International Airport to be a transit hub and would address parking concerns many residents have about traveling to the Airport.

Overarching Criteria

Economic Opportunity – High Benefit

By providing residents of the Study Core with the opportunity to access the Bradley International Airport with more ease, particularly for those who do not own a personal motor vehicle, additional working opportunities would be opened up for residents. Further, the direct and predictable path to access Hartford from the Airport may entice more tourists to visit the City, particularly for those who were previously deterred by the need to rent a car.

Feasibility/Complexity – Critical Flaw

Most of the ROW access would require repurposing the existing I-91 HOV lane. Difficulties with the ROW for this alternative also exist with the path from Downtown Hartford to the existing I-91 HOV lane and off the HOV lane to the Airport. Ultimately, a BRT system would be a more efficient and cost-effective solution to enhance service in this corridor.

System Compatibility – N/A

No overall assessment of system compatibility has been conducted for this alternative since it has been determined to have a critical flaw.

Overall Assessment of Benefits/Impacts

No overall assessment of benefits/impacts has been conducted for this alternative since it has been determined to have a critical flaw.

Order of Magnitude Cost

This alternative has been determined to have a critical flaw; therefore, no assessments have been conducted for capital or operation and maintenance costs.

High Level Benefit-Cost Outlook

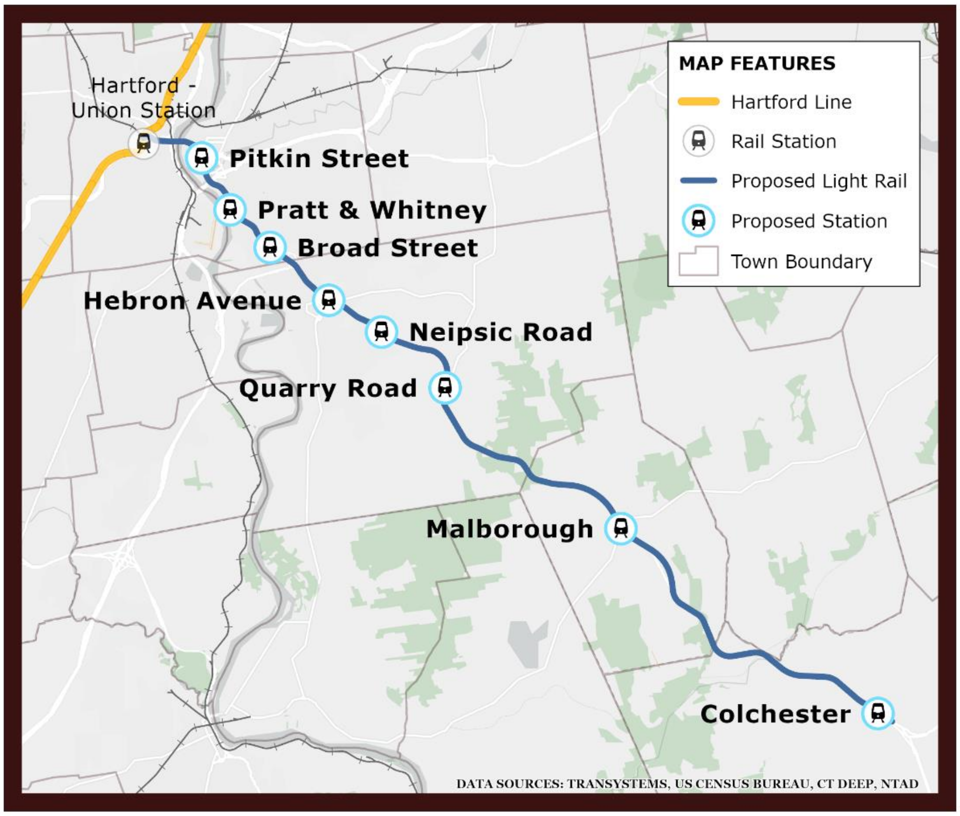
No benefit-cost outlook has been conducted for this alternative since it has been determined to have a critical flaw.

Light Rail from Colchester

Detailed Project Description

This alternative would investigate the development of a light rail system that would generally follow the Route 2 corridor between Colchester and Downtown Hartford. Seven intermediate stops were proposed between Union station and Colchester, with decreasing stop density the further out from Union Station the service goes. The goal of the alternative is to determine whether need for this service is supported by projected ridership and congestion along Route 2.

Alternative Map



Implementation Timeframe

Timeframe

Given the length of the alignment and the significant amount work required to develop the track infrastructure, stations, and procurement of equipment this is a long-term alternative that would likely be at least 10 years out.

Project Development Process

This alternative would require a detailed alternatives analysis and feasibility study to address potential ridership, service concepts, and station locations. These investigations would precede any detailed design.

Project Phasing

Given the length of the alignment the alternative could be constructed in segments radiating out from Hartford which would allow service to begin and expand as each segment is completed. Logical phasing would be determined at a more advanced phase.

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This alternative would establish a new transit connection in the Route 2 corridor and could help improve travel time and travel reliability in the corridor.

Access and Connectivity – Moderate Benefit

This alternative would improve connectivity between residential area southeast of Hartford and Hartford itself.

Travel Options and End User Convenience – High Benefit

This alternative would establish both a redundant travel option in the corridor as well as improving user experience. A rail trip in the corridor would allow riders to relax during their trip or allow for added productivity with onboard Wi-Fi.

Criteria Supporting Other Study Goals

Equity – Moderate Benefits

There could be a potential for environmental impacts in disadvantaged communities associated with station and right-of-way improvements, particularly in Hartford and East Hartford. These potential impacts are outweighed by the access and mobility opportunities associated with the new, more equitable mode of transportation between Hartford and Colchester and improved access to jobs within the Study Area.

Safety – Neutral

This alternative may support moderate safety benefits as it provides a safer travel option in corridor and will reduce congestion on Route 2 which may lessen the likelihood of crashes in the corridor.

Resiliency and Sustainability – Moderate Benefit

The proposed alternative would encourage modal shift while improving upon a sustainable and resilient transportation alternative in the Region. Resilient infrastructure improvements could be incorporated into existing adjacent infrastructure components.

Environment – Moderate Benefit

Presence of resources is minimal within Project Corridor but are found mostly adjacent to representative alignment which is an existing transportation corridor. Presence of natural resources are more moderate further from the City of Hartford while presence of built resources is more moderate closer to the City. Moderate presence of minority and low-income populations is located within the Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Neutral

This alternative does not directly provide consideration for future technology.

Public Support – Neutral

Overall, people seem neutral about the idea of adding light rail between Hartford and Colchester. Some say it is not worth evaluating. An overarching theme of the comments is that BRT should be considered as part of this alternative.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative could generate economic opportunity and TOD style developments around stations areas in the corridor.

Feasibility/Complexity – Critical Flaw

The high degree of engineering complexity couple with very high capital cost and uncertain level of ridership for rail contribute to a feasibility/complexity critical flaw. This alternative would require the construction of a new rail alignment within a potentially constrained corridor, particularly closer to Hartford.

System Compatibility – N/A

No overall assessment of system compatibility has been conducted for this alternative since it has been determined to have a critical flaw.

Overall Assessment of Benefits/Impacts

No overall assessment of benefits/impacts has been conducted for this alternative since it has been determined to have a critical flaw.

Order of Magnitude Cost

This alternative has been determined to have a critical flaw; therefore, no assessments have been conducted for capital or operation and maintenance costs.

High Level Benefit-Cost Outlook

No benefit-cost outlook has been conducted for this alternative since it has been determined to have a critical flaw.

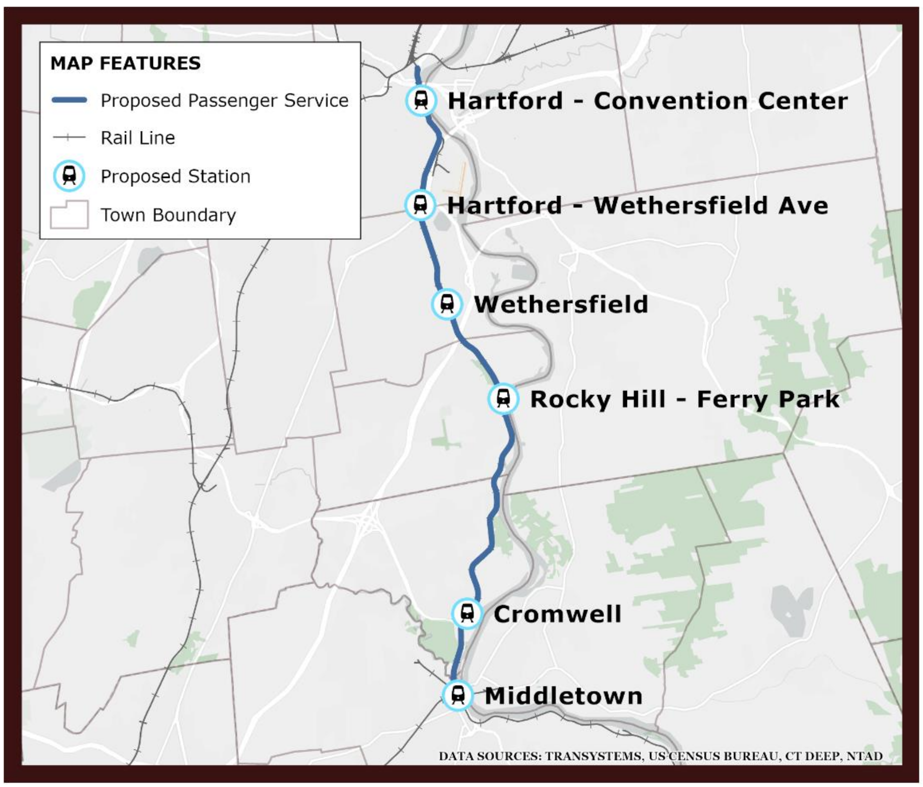
Middletown to Hartford Rail Service

Detailed Project Description

This alternative would develop a new north-south rail passenger rail service between Middletown and Hartford using the existing freight corridor north of Middletown, with the potential for a southern terminus at Old Saybrook. Recent work by freight operators on track sections just north of Middletown spurred interest from members of the public that a passenger rail section could also be established. The connection would link the state's capital and a regional midsized city (Middletown). This alternative would likely require significant passenger rail track work in addition to track work being administered by the freight operators to bring the alignment to a state of good repair and to establish a connection to the Hartford Line. The procurement of rolling stock to be operated on the line will also be needed.

This alternative would create an additional rail connection that could relieve traffic along Route 9 and create a sustained mode shift in the corridor. The sustained mode shift would lead to reduced greenhouse gas emissions and reduction of other externalities associated with travel on Route 9.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would be implemented over a longer-term time frame (>10 years).

Project Development Process

This alternative would require separate and detailed alternatives analysis as well as a feasibility study to access whether the ridership exists to support this alignment or if there are other more practical alternatives including BRT or an expanded express bus. Depending on the findings of the more detailed alternatives analysis and feasibility study the alternative would require a detailed design process for both the track and signal work as well as stations prior to construction.

Project Phasing

This alternative could be developed in phases opening segments as they become operational. However, because the primary connection is the full extent of the alternative (Middletown to Hartford) it may be best to complete all work prior to opening the line.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This alternative establishes a new transportation solution along a major commuting corridor. If constructed the rail service may provide travel time benefits over Route 9/I-91 and provide for more consistent and reliable travel times.

Access and Connectivity – High Benefit

This alternative expands access to transportation facilities and improves connectivity between Middletown and Hartford (as well as intermediate stations).

Travel Options and End User Convenience – High Benefits

This alternative would provide a redundant travel option to Route 9/I-91 as well as existing fixed route bus service. Additionally, a rail option in the corridor would provide users an improved travel experience with increased amenities. Modern rail service can allow for a more relaxing commute or trip in addition to amenities like Wi-Fi.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities associated with station and right-of-way improvements, particularly in Middletown and Hartford. The potential for impacts is outweighed by the access and mobility opportunities associated with the new, more equitable mode of transportation between Hartford and Middletown and improved access to jobs within the Study Area.

Safety – Low Benefit

This alternative would indirectly improve safety by providing a safer transportation option in corridor over Route 9/I-91. Per mile, user risk of injury is significantly higher when relying on a personal motor vehicle compared to rail due to the fact that most personal motor vehicle crashes are a result of human errors (distraction, misjudgment, etc.). Since rail relies on separate facilities from other modes a majority of the time, has a set route, and only has a single driver the overall risk of error and conflict resulting in injuries or fatalities is reduced.

Resiliency and Sustainability – Moderate Benefit

The proposed alternative would encourage modal shift while improving upon a sustainable and resilient transportation alternative in the region. Resilient infrastructure improvements could be incorporated into existing rail infrastructure components.

Environment – Low Benefit

Natural resources of concern are located near the Connecticut River, which is on the east side of the Project Corridor and representative alignment of the alternative. There are also sensitive land uses adjacent to the alternative in Hartford. Low-income and disadvantaged populations are prevalent throughout project corridor in particularly in Middletown and Hartford. Environmental impacts are anticipated to be moderate but mitigable.

Technology – Moderate Benefit

The creation of new passenger rail service would directly provide consideration for future rail technologies and would also work towards a more transit-centric future.

Public Support – Low Benefit

Overall, this alternative received mixed opinions. Some comments favor Middletown to Hartford passenger rail, while others suggest creating a multi-use path or utilizing a tram system.

Overarching Criteria

Economic Opportunity – High Benefit

The creation of a new passenger rail would support regional economic development by acting as catalyst for development around the proposed station locations.

Feasibility/Complexity – Neutral

The fixed guideway infrastructure would likely not require additional acquisition, however the work to bring the existing infrastructure to state-of-good - repair would likely be significant, including the addition of new passing sidings to support increased train density. There would also be required ROW acquisition to facilitate new station acquisition.

System Compatibility – High Benefit

This alternative has independent utility by establishing a new transit connection between Middletown and Hartford as well as supporting the growth of the State's broader rail network.

Overall Assessment of Benefits/Impacts

The benefits of this alternative exceed its impacts. There is an existing ROW and new ROW acquisition for stations or passing siding wouldn't likely be excessive given the scope of the alternative.

There are no directly competing alternatives, however this alternative competes with existing regional bus services.

Order of Magnitude Cost

This alternative is estimated to cost between $200M-$250M.

High Level Benefit-Cost Outlook

Due to the capital costs, a bus or BRT alternative would be more cost-effective option.

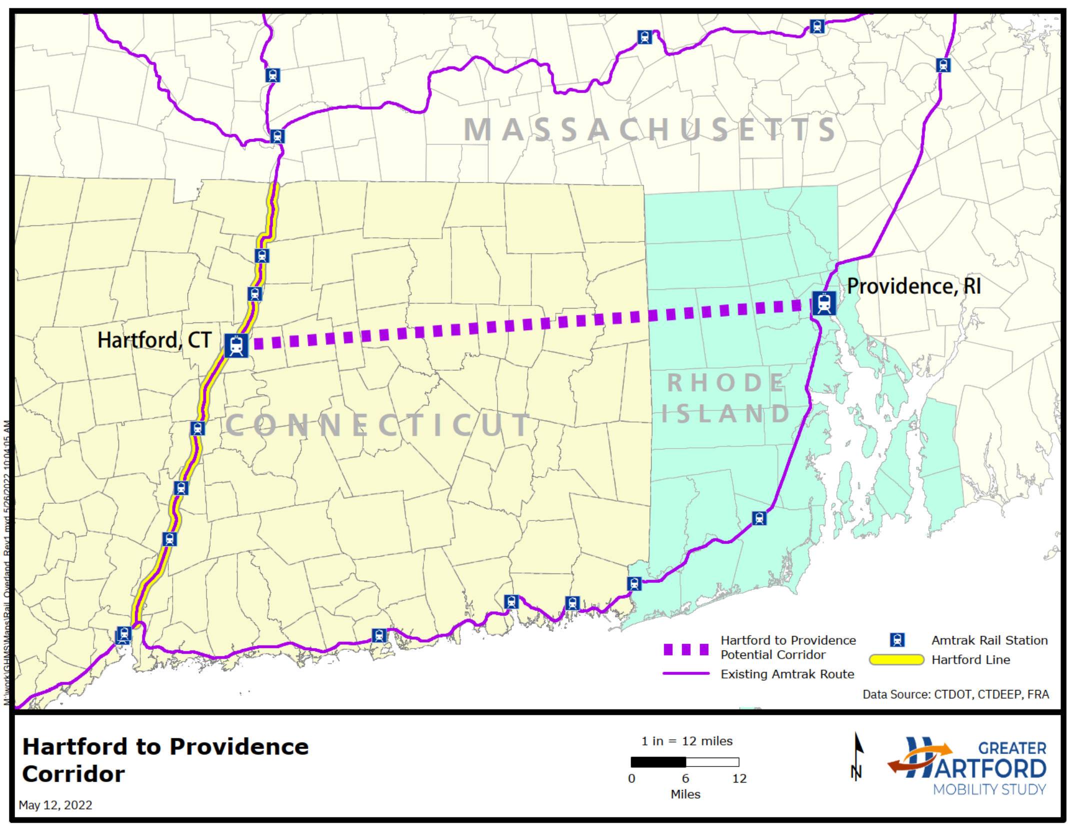
Providence Rail Access through Hartford

Detailed Project Description

Greater Hartford is unique in that it is situated in the middle between New York and Boston, giving residents access to economic and recreational opportunities in two of the nation's largest cities. While there are currently effective options for travel southwest towards New York, there is unmet demand for transit options northeast towards Providence and Boston as efficient options do not currently exist. Connecting Hartford to Providence provides Connecticut residents access to more than 420,00 jobs in Providence. Additionally, as the COVID-19 pandemic changes people's home-to-work distance preferences, the Greater Hartford region could see an increase in residents who occasionally commute northeast towards Providence/Boston.

Future analysis needs to be conducted, but one potential option for a northeast connection is a route through Eastern Connecticut along existing or former rail alignments.

Alternative Map



Implementation Timeframe

Timeframe

Using the Massachusetts Bay Transportation Authority (MTBA) South Coast Rail Project as an estimate, it is likely that his project would likely take 25-30 years to complete.

Project Development Process

Implementing this route would be a complex process involving an alternatives analysis, NEPA process, as well as design and construction processes.

Project Phasing

This project could be partially split and start through using a combination of existing freight and shared use path corridors, though the route and travel time might be inefficient to bring value.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This route, if designed in a manner that allows high speeds, could improve travel times on the NEC. Connecticut's portion of the NEC includes several locations where track geometry limits speeds. Given that the overland route does not include these tracks, there is a chance to improve travel times. Additionally, there are resiliency and reliability benefits as an inland route is less susceptible to coastal flooding and rising sea levels.

Access and Connectivity – High Benefit

This route would provide rail access and connectivity to a variety of communities currently lacking intercity transportation. Additionally, the route would create a direct rail link between Hartford and Providence, as well as Boston.

Travel Options and End User Convenience – High Benefit

This route would provide Greater Hartford communities direct passenger rail access to Boston. It would improve convenience through improving travel times and capacity on the NEC.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The potential for impacts in disadvantaged communities are outweighed by opportunities created for disadvantaged populations. This line would give access to many communities that lack intercity services.

Safety – Neutral

This alternative doesn't have a safety component, aside from reducing the risks associated with driving.

Resiliency and Sustainability – Moderate Benefit

The proposed alternative would have the potential to encourage modal shift within and beyond the GHMS Study Area while improving upon a sustainable transportation alternative in the region and beyond. Additionally, an inland route provides resilience, a growing need as much of the existing NEC route relies on coastal infrastructure exposed to climate change and sea level rise.

Environment – Low Benefit

Environmental impacts are anticipated to be moderate but mitigable. A new alignment would likely result in moderate impacts to natural and man-made resources. In urban areas, most impacted resources would most likely be man-made. In rural areas, most impacted resources would most likely be natural resources. Environmental impacts are anticipated to be moderate but mitigable.

Technology – Neutral

This line features a service proposal and there are minimal-to-no technology elements. Technology used on the line would largely be dependent on costs and other factors.

Public Support – Moderate Benefit

There was overall support and excitement about this concept. There is support for additional connections to Worcester, Storrs (to meet the needs of the University of Connecticut), and Boston. Some comments suggested addressing other priorities first such as a connecting to Springfield since this line already exists and provide the improvement of electrifying that line.

Overarching Criteria

Economic Opportunity – High Benefit

This service would effectively link greater Hartford to the Boston and Providence markets in the same way that it is linked to Southern Connecticut and New York markets.

Feasibility/Complexity – Neutral

This project would involve significant right-of-way impacts as it potentially involves building a new rail corridor. Beyond land acquisition, engineering would be like other railroad extension and construction projects.

System Compatibility – Neutral

This involves building a new line and there is an opportunity to ensure it is compatible with existing and proposed system needs. This noted, with Massachusetts Department of Transportation's (MassDOT) potential East-West rail expansion, the inland route could become obsolete as users could travel from Boston to Hartford, via Springfield.

Overall Assessment of Benefits/Impacts

This route has the potential to bring regional benefits in terms of connectivity to other employment centers and potential travel time savings, depending on route alignment. However, the concept is largely unstudied and there needs to be more information before fully evaluating the alternative.

Order of Magnitude Cost

This route has largely been unstudied, though a MassDOT East-West Rail Study that examined service on an existing parallel rail corridor estimates a route of approximately that length could cost approximately $1.5 billion. Given that this route involves a new rail line, the cost could be in excess of $4.5 billion.

High Level Benefit-Cost Outlook

While this project contains benefits, it also includes many variables that need to be further researched. This element, relative to the total cost and other services in Massachusetts and Southern Connecticut, means it likely has a positive-but-low cost-benefit outlook.

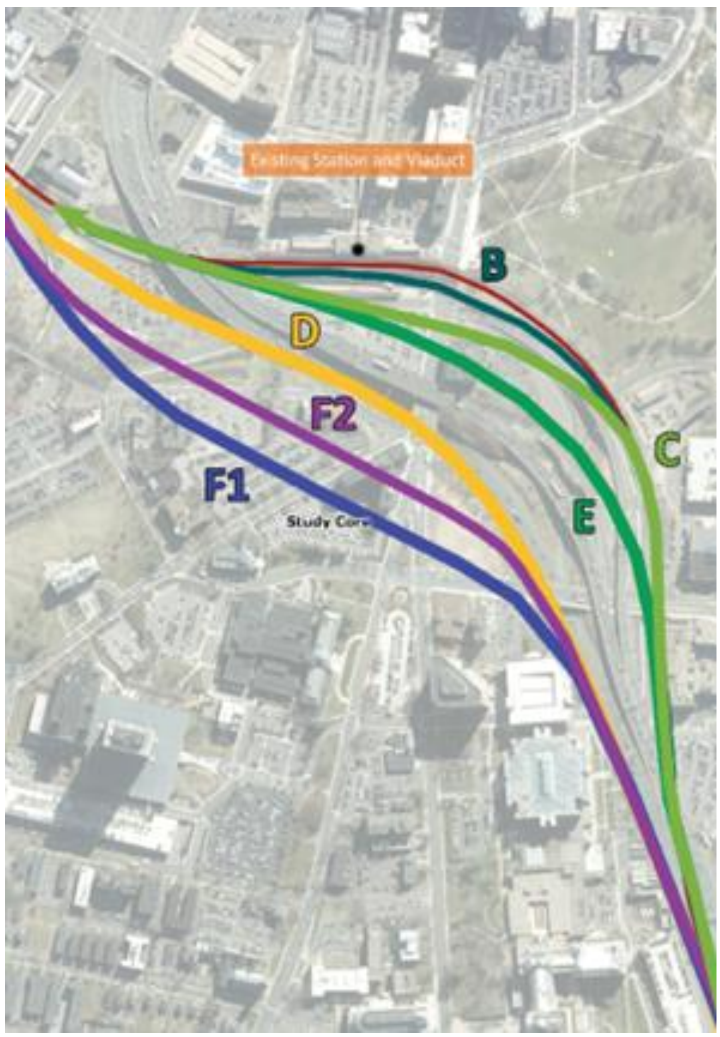
Hartford Rail Viaduct Realignment and/or Reconstruction

Detailed Project Description

The segment of track running through downtown Hartford/Union Station is elevated (known as 'the Viaduct'). The Viaduct is reaching the end of its useful life and will need to be either replaced or substantially retrofitted soon. There are multiple different approaches to address its deficiencies: replace/retrofit the station or move/realign to the west to achieve operational improvements from the straightening of the rail alignment.

This alternative was studied in depth as part of the Hartford Rail Alternatives Analysis, with seven alternatives discussed. The map below depicts the alignments of the alternatives. Additional alternatives may be discussed as needed. Relocation and station concepts were advanced as part of preliminary engineering and NEPA for the I-84 Hartford Project.

Map



Implementation Timeframe

Timeframe

The retrofit in place concept is intended to meet shorter term needs with a 3–5-year time frame while the relocation concept is a longer-term item in the 10+ year horizon.

Project Development Process

This alternative will require more detailed assessment to determine if both concepts are required or if the existing viaduct is structurally sufficient to last through the construction of the relocation concept.

Project Phasing

This project would have to be completed in conjunction with the relocation/reconstruction of I-84.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative does not directly address travel time or reliability. Addressing the state of good repair concerns will ensure that future train operations are not impacted while the addition of a second track will allow for increased service through the corridor.

Access and Connectivity – Moderate Benefit

This alternative, particularly the relocate concept would improve access into and out of the station for surrounding neighborhoods as well through establishing TOD opportunities directly around the station site.

Travel Options and End User Convenience – Moderate Benefit

This alternative would improve the user experience at Hartford Union Station improving the amenities available at the site.

Criteria Supporting Other Study Goals

Equity – Moderate Impact

The project is likely to require property takings that will reduce the number of affordable housing units and require relocation of residents. The long-range benefits of both projects are likely to be positive, but there will likely be community concern for needed relocation of residents. Particular care will be needed to ensure that impacts are appropriately mitigated, and community concerns are heard. The Uniform Relocation Assistance and Real Property Acquisition Act works to protect owners and tenants and ensure that impacts from property taking are not unduly burdensome.

Safety – Neutral

This alternative does not directly address safety.

Resiliency and Sustainability – Moderate Benefit

The proposed alternative would have the potential to encourage modal shift within the GHMS Study Area while improving upon a sustainable transportation alternative in the region.

Environment – Moderate Impact

The presence of natural resources in the study area is limited due to its urban setting. Historic resources and sensitive land uses adjacent to the alternative are prevalent. Low-income and disadvantaged populations are prevalent throughout the immediate Project Corridor, and will be negatively affected, particularly during construction. The project is likely to require property takings that will reduce the number of affordable housing units and require relocation of residents. In combination with the potential lowering of I-84 in this same corridor, the long-range benefits of both projects are likely to be positive, but the short- and mid-range effects are concerning. Environmental impacts are anticipated to be moderate and unmitigable.

Technology – Neutral

This alternative would not directly provide consideration for future technologies however it would, at a minimum, establish a renewed useful life for the current infrastructure and add a second track. The concept for relocating the station to the west will take these benefits further by establishing a modern TOD-centric transit facility.

Public Support – Moderate Benefit

People provided a large amount of feedback on this alternative. Comments include a desire for more than just a single track. Questions about what happens to the properties that run along the proposed track system and the desire for upgrades in rail service to make the region more viable.

Overarching Criteria

Economic Opportunity – High Benefit

The relocation of the rail viaduct and station west of its current location will allow for increased service by restoring a second track through the Hartford area. It will additionally open new land for redevelopment surrounding the new viaduct and station as well as at the former Union Station site.

Feasibility/Complexity – Neutral

The multiple concepts under this alternative increase in complexity and ROW impacts. The retrofitting concept will have the lowest ROW needs while the concept for a relocation to the west will require significant ROW acquisition and engineering complexity. It will further need coordination with any modifications to the alignment of I-84.

System Compatibility – High Benefit

This alternative has independent utility. The existing viaduct only supports a single track and is nearing the end of its useful life. Each concept being considered under this alternative would resurrect the second track and restore it to a state of good repair. The addition of a second track would support a further expansion of rail service.

Overall Assessment of Benefits/Impacts

Despite potential environmental impacts and impacts to adjacent communities both concepts within this alternative would be a net positive for the City of Hartford and broader region. It is likely that significant new development would result from the relocated station.

This alternative is being rolled into the City Link concept which includes relocating the rail viaduct in addition to a lower and realigned I-84 through Hartford.

Order of Magnitude Cost

This alternative is being rolled into the City Link concept which includes multiple sections of capping through this corridor in addition to moving the rail station and rail alignment and has an estimated cost of $2.5 billion.

High Level Benefit-Cost Outlook

Benefits will likely exceed costs particularly for the relocation concept which promotes TOD development in and around the new station area and would be implemented in conjunction with the realignment of I-84.

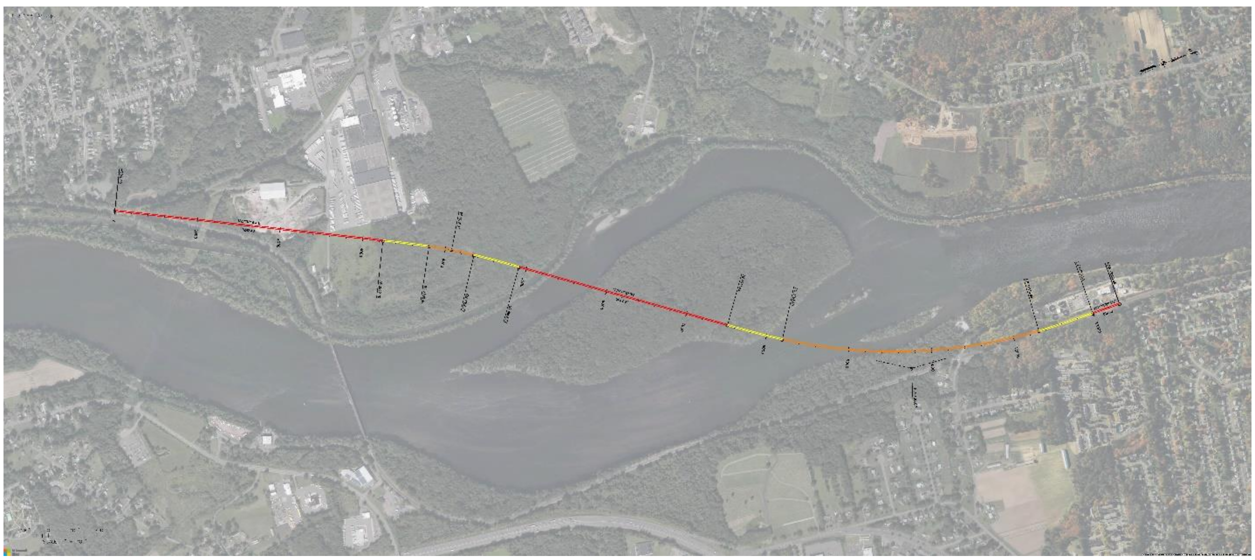
Connecticut River Rail Bridge

Detailed Project Description

The rail bridge across the Connecticut River between Windsor Locks and Enfield is beyond its useful life and needs significant rehabilitation or replacement. The bridge is a bottleneck for freight traffic and for the line's high-speed regional rail vision. This alternative addresses the benefits resulting from the rehabilitation or replacement of the bridge. This alternative works to improve operating conditions for both freight and passenger rail systems and return the asset to a state of good repair. The bridge is currently a barrier to rail mobility.

Three concepts are being considered under this alternative: retro-fit of the existing bridge to a state-of-good-repair (including the addition of a second track), replacement of the bridge 'in-place' with minor geometric improvements, and replacement of the bridge with significant geometric improvements to maximize travel speeds.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take 10+ years with the possibility of implementing intermediate steps earlier.

Project Development Process

This alternative will require more detailed assessment/alternatives analysis to determine the extent to which the state wishes to pursue a high-speed alignment. A high-speed alignment would require major environmental review work. Within GHMS three different concepts were developed to address potential future directions.

Project Phasing

If a high-speed alignment is determined to be the preferred alternative, retrofit of the existing structure may be considered while the high-speed alignment is in progress to achieve shorter term benefits prior to the new alignment becoming operational.

Environmental Review Process

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This alternative will improve both the travel time and reliability of Hartford Line service. In addition to speed improvements from geometric modifications, the alternative will bring back a second track over the segment which will allow for increase train capacity on the line.

Access and Connectivity – Neutral

This alternative does not impact access or connectivity of the rail line.

Travel Options and End User Convenience – Moderate Benefit

This alternative will improve the user experience by allowing for increased service on the Hartford Line and potentially increased operating speeds. All three of the proposed concepts will seek to complete double-tracking over the segment.

Criteria Supporting Other Study Goals

Equity – Neutral

This alternative is unlikely to impact EJ populations in the immediate vicinity of the rail corridor.

Safety – Low Benefit

This alternative may indirectly support minor safety improvements by bringing the bridge up to the state-of-good-repair which will reduce the likelihood of derailments or other issues.

Resiliency and Sustainability – High Benefit

The alternative is essential to maintain / sustain freight service in the region and will contribute to resilient and sustainable rail network infrastructure.

Environment – Moderate Benefit

The presence of natural resources within the study area corridor is associated with the Connecticut River and its shoreline areas and attributes. Environmental impacts are anticipated to be minimal and mitigable. The anticipated impacts and potential benefits are contingent upon the ability to avoid or minimize work in and impacts to the river and its adjacent resources.

Technology – Neutral

This alternative would not directly provide consideration for future technology but does include double-tracking over the alignment and geometric modification to allow for higher speed operations through the area.

Public Support – High Benefit

There was strong support for rehabilitating or replacing the tracks.

Overarching Criteria

Economic Opportunity – Neutral

This alternative will not directly provide for new economic activity, rather it is part of a large suite of corridor improvements that would generate new regional economic opportunity.

Feasibility/Complexity – Neutral

Depending on the chosen concept the required ROW acquisition and engineering complexity will vary significantly from minimal to significant. The concept calling for significant geometric modification may require new ROW acquisition and will likely involve significant engineering complexity to span the new alignment. The concepts for retrofitting or reconstructing in place (with minimal geometric improvements) will likely require minimal new ROW acquisition and will involve significantly less engineering complexity.

System Compatibility – High Benefit

This alternative has independent utility and will also support increase service along the Hartford Line.

Overall Assessment of Benefits/Impacts

This alternative will provide significant benefits to the continued safe operation of the Hartford Line as well as supporting service expansion and possibility for faster service over the segment. Environmental impacts will be greater as the geometric modifications increase with Concepts 2 and 3.

Order of Magnitude Cost

Order of magnitude costs were developed for the 110mph alignment and are estimated to be $250M-$300M. Based on alignment and level of effort the 110mph and 130mph alignment would cost similar amounts while the rehab alignment would cost substantially less.

High Level Benefit-Cost Outlook

Benefits will likely exceed costs. This alternative aligns with state and regional goals for a high-speed rail system and additionally helps build redundancy to the coastal NEC alignment.

Station Parking Redevelopment to Further Support TOD

This alternative has been combined with the Bus alternative, please see the detail sheet in the bus section.

New Rail Station in West Hartford

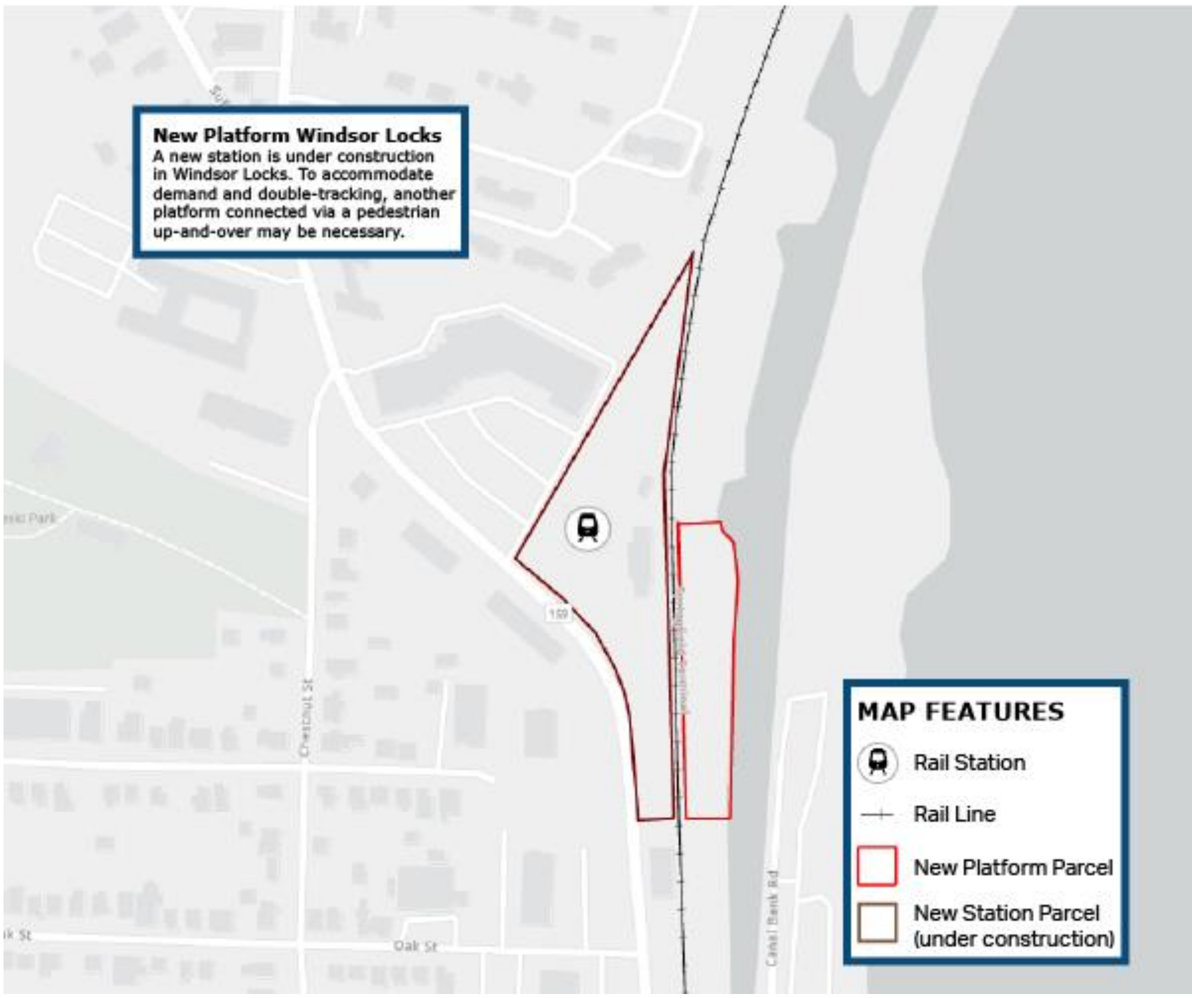
This alternative has been removed from screening, as it is now being planned for in the Capital Plan.

New Rail Station in Windsor Locks

Detailed Project Description

Currently, the Windsor Locks Station is being relocated and construction is slated to begin within the coming months; however, the current design only includes a single high-level platform and a Bradley International Airport direct bus transfer. This alternative would explore the expansion of this station to include a second high level platform via an up-and-over to accommodate the 63,600 (CT*rail*) and 24,500 (Amtrak) forecasted annual users in 2050. This alternative also can include a second track to accommodate for increased service.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take 3-5 years to implement.

Project Development Process

The main Windsor Locks Station is set to break ground in late 2022. This alternative will require design (10%) that pair well with the existing plans for the new station, as well as plans to mitigate construction disruptions.

Project Phasing

Currently, the design and construction plans are already operating in phases of independent utility for the overall construction of the new Windsor Locks station which includes a single platform and bus transfer location. The second phase of the Windsor Locks Station would include the design for this alternative, followed by construction that would have a limited impact on the functionality of the first phase.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

The addition of second platform with a new second track would accommodate increased service and reduce overall track delays from two-way traffic utilizing the same rail.

Access and Connectivity – High Benefit

This alternative significantly improves users access and connectivity to other rail lines and bus routes intersecting at Union Station (Hartford) by improving service and convenience.

Travel Options and End User Convenience – Moderate Benefit

Although this alternative does not provide a redundant travel option, the overall end user experience is improved by providing the opportunity to increase service and allow users to select a more convenient departure time for their travel needs.

Criteria Supporting Other Study Goals

Equity – High Benefit

This alternative has no negative impacts on EJ communities as the construction would take place on undeveloped parcels within the business district. This alternative, and the station under construction, provides better opportunity for those abutting the station, EJ Block Group (2, CT 4761), to access transit.

Safety – Neutral

This alternative is being built to applicable design and safety standards. However, it does not directly address significant safety improvements as it only supports a potential modal shift for users.

Resiliency and Sustainability – Moderate Benefit

The new station and expanded access to CT*rail* would have the potential to support modal shifts to non-auto modes while utilizing a more sustainable mode of transportation.

Environment – Moderate Benefit

There is a moderate presence of natural resources within the Project Corridor mostly associated with the Connecticut and Farmington Rivers. Diversity habitats are present around edges of the Project Corridor. Historic resources are associated with Downtown Windsor. Minimal low-income populations located on the west side of the Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Moderate Benefit

A key consideration in the design and engineering for new stations will ensure that technology at all levels can be integrated seamlessly – from small technological improvements, such as real time tracking, to larger undertakings, including electrification – in accordance with CT*rail* planning horizons.

Public Support – No Input

Public comment for this specific alternative has not been identified, as the initial rounds of community input only referenced the general creation of new rail stations.

Overarching Criteria

Economic Opportunity – Moderate Benefit

The plans for TOD at the new station in Windsor Locks is already anticipated to bring forward a significant amount of economic opportunity. This alternative would boost the overall effects and efficiency of the transit and development opportunities. It has been modeled that there will be 63,600 (CT*rail*) and 24,500 (Amtrak) forecasted annual users by 2050.

Feasibility/Complexity – High Benefit

This alternative would not require any additional ROW and second platforms with up and over connections are relatively standard.

System Compatibility – High Benefit

The addition of a second platform and passing track would be highly beneficial to improving overall system efficiency.

Overall Assessment of Benefits/Impacts

Overall, this alternative would improve the movement of people and goods (Goal 1) and transit reliability and safety (Goal 2) as evidenced by the high benefits in the core mobility criteria. By improving the efficiency of this rail and encouraging a modal shift through TOD, the environment and existing residents will also benefit (Goal 4 and Goal 5).

This alternative is compatible with overall system efficiency.

Order of Magnitude Cost

This alternative would cost in the range of $10-$15 million depending on final design. This estimate is generated based upon the CTDOT FY22-26 Capital Plan Projects, which includes $2 million for design and $60 million for high level platform construction along the Waterbury Line.

High Level Benefit-Cost Outlook

The cost of this alternative is relatively standard and may provide users with improved service by reducing waiting times through the addition of a second track and platform. However, this station will need to be studied for demand following the completion of the new station before committing to further design.

New Rail Station in Enfield

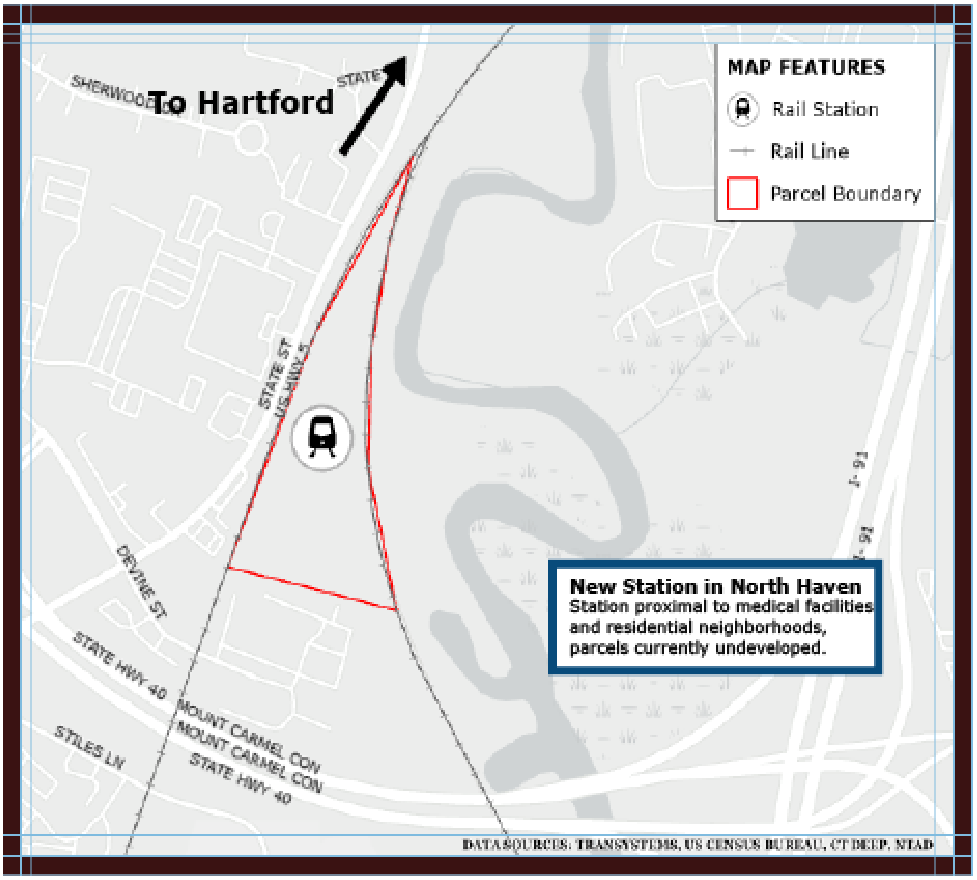
This alternative has been removed from screening, as it is now being planned for in the Capital Plan.

New Rail Station in North Haven

Detailed Project Description

This alternative would serve the residents and employees of North Haven with direct transit access to Hartford. Currently, users must travel northbound to Wallingford Station or southbound to State Street Station in New Haven, which limits opportunities for effectively commuting by transit.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take 5-7 years to implement.

Project Development Process

A rough site for the new station has already been identified, but preliminary design (10%) and feasibility assessments will be necessary to move the project forward.

Project Phasing

Since this is a single origination/destination alternative the only way to phase the project in independent utility is if the final design includes two platforms – the first phase may be a single platform construction which will have independent utility until the second platform construction.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

The existing travel options from North Haven to Hartford require that users either drive to Wallingford Station, State Street Station (New Haven), or take the 950 Meriden-New Haven Express Bus. Unfortunately, the 950 Express' travel time of at least 100 minutes is not competitive with that of traveling by car at 30 minutes, assuming there is no travel time to access the 950 and no heavy traffic along the path of the 950. Further, the dual mode of personal vehicle to existing station encourages excessive VMT for those driving southward to State Street Station, while those who must travel to Wallingford may ultimately find it more efficient to complete their trip by personal vehicle, dependent upon their destination. Adding the station to North Haven would eliminate the extensive travel times for rail users originating in North Haven and aid in establishing reliability for commuters due to separation from unpredictable roadway traffic.

Access and Connectivity – High Benefit

The addition of this new rail station would improve users access to the already existing rail and overall reduce VMT from origin to Hartford by inducing mode shift.

Travel Options and End User Convenience – High Benefit

By the addition of this new station in North Haven those originating or terminating their trips in the town have the option of selecting the travel mode that is most convenient for them between bus, driving personal motor vehicles, or taking the Hartford Line, which becomes more convenient now that overall travel time to Hartford is reduced.

Criteria Supporting Other Study Goals

Equity – Neutral

The City of North Haven does not have any EJ communities encompassed within its borders. There are two EJ Block Groups, BG 2 (CT 1660.01) and BG 5 (CT 1660.02), 2 miles west of the anticipated station location. The proposed station in this alternative may benefit travelers for northbound trips on the Hartford Line.

Safety – Low Benefit

Per mile, user risk of injury is significantly higher when relying on a personal motor vehicle compared to rail due to the fact that most personal motor vehicle crashes are a result of human errors (distraction, misjudgment, etc.). Since rail relies on separate facilities from other modes a majority of the time, has a set route, and only has a single driver the overall risk of error and conflict resulting in injuries or fatalities is reduced.

Resiliency and Sustainability – Moderate Benefit

The new station and expanded access to CT*rail* would have the potential to support modal shifts to non-auto modes while utilizing a more sustainable mode of transportation.

Environment – Moderate Benefit

There is a minimal to moderate presence of natural and man-made resources within the Project Corridor. There is a minimal presence of natural resources immediately adjacent to the alternative. Environmental impacts are anticipated to be minimal and mitigable.

Technology – High Benefit

A key consideration in the design and engineering for new stations will ensure that technology at all levels can be integrated seamlessly – from small technological improvements, such as real time tracking, to larger undertakings, including electrification – in accordance with CT*rail* planning horizons.

Public Support – No Input

Public comment for this specific alternative has not been identified, as the initial rounds of community input only referenced the general creation of new rail stations.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative would provide regional users with access to employment opportunities within North Haven, particularly within the sectors of Health Care and Social Assistance, Educational Services, and Manufacturing, while reducing the automobile reliance of North Haven residents and allowing them to access their employment through affordable, timely transit opportunities. It is predicted with the addition of this station and a station at Enfield there would be 294,700 on and offs (Amtrak) by 2050. Although property values do not inherently increase with the addition of transit opportunities, the project team cannot rule out that homeowners could benefit from this.

Feasibility/Complexity – Neutral

This alternative would result in additional ROW requirements; however, the complexity of engineering and design are relatively standard.

System Compatibility – High Benefit

The completion of this station would have independent utility, as the rail line already runs through the community and would not have adverse impacts on the existing transit systems.

Overall Assessment of Benefits/Impacts

The core mobility criteria for this alternative are all addressed with high benefits to the movement of people and goods (Goal 1) through a variety of safe and accessible transit options (Goal 2). Although equity is not addressed, there are no impacts on EJ residents, and the environment may be benefitted (Goal 5).

There are no competing alternatives.

Order of Magnitude Cost

The CTDOT 2022-2026 Capital Plan has estimated that the cost for a new station at North Haven would be $50M-$70M. The final cost will be dependent upon final design and availability of materials. Operating costs for this alternative have not been estimated.

High Level Benefit-Cost Outlook

This cost is relatively standard for new station construction in Connecticut. The benefits certainly outweigh the investment particularly since there are no moderate or significant impacts on EJ communities or sustainability and resiliency.

Strengthen Regional Identity with Branding and Wayfinding

Detailed Project Description

This alternative would implement a well-designed regional wayfinding system, made up of easy-to-understand signage and other elements that would help the public navigate the Hartford region by foot, by bike, on transit, rail, and/or in a car. This alternative goes hand in hand with the mobility hub alternative given that an important function of the wayfinding elements will be to help people navigate easily from one mode to another.

A key part of this alternative is the branding of the wayfinding signage and other wayfinding elements. This branding should be used at mobility hubs, transit stops and stations, and other places to communicate the cohesive identity of the Hartford region's mobility system to the public.

This alternative aims to help existing multimodal users navigate between modes but also encourage those who primarily drive alone to try other modes.

Alternative Image

Implementation Timeframe

Timeframe

This alternative would take 2-4 years to implement.

Project Development Process

The first step is to research best practices and work with project stakeholders to develop a plan that includes:

- Existing conditions (existing wayfinding/branding)
- Regional branding for different types of wayfinding elements
- Itemized cost estimates
- Proposed locations for wayfinding signage
- Phased installation timeline
- Plan for marketing/rollout of the regional branding and wayfinding
- Funding ideas

Following the finalized of a plan funding would need to be identified. Once funded the project would go out for bid and the wayfinding signage would be installed. Lastly, market and publicize the rollout of the branding/wayfinding using all stakeholders to assist in various modes of communication.

Project Phasing

The wayfinding and branding plan will break the installation of wayfinding and branding into phases, with priority going to areas with the most activity, such as rail stations and high-traffic bus stops.

Environmental Review Process

Not Applicable (NA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefits

A robust wayfinding system will help people improve their travel times by clarifying and facilitating travel across the region, especially at mobility hub locations.

Access and Connectivity – High Benefit

A robust wayfinding system helps ensure access and connectivity by providing necessary guidance to the travelling public so that they can effectively get where they need to go. Even if excellent multimodal connections exist, without easy-to-understand wayfinding, the system is not accessible and cannot provide true connectivity especially between modes.

Travel Options and End User Convenience – High Benefit

Effective wayfinding and branding help travelers identify and choose how they will get to where they need to go. They enable travelers to understand their travel options and make taking a multimodal trip possible and convenient.

Criteria Supporting Other Study Goals

Equity – High Benefit

This alternative will create no adverse EJ impact and helps create opportunities for disadvantaged populations, by facilitating travel within the region on multiple modes.

Safety – High Benefit

This alternative provides a positive safety benefit by helping reduce pedestrian and bike fatal and serious injury crashes by identifying for active transportation users clear and safe ways to travel across the region.

Resiliency and Sustainability – High Benefit

A robust, branded, wayfinding system, together with other GHMS alternatives that improve pedestrian and bike facilities as well as transit and rail infrastructure and service, will enable people who entirely or mostly drive alone in their own vehicles to use alternative modes. This supports major VMT reduction and makes the region's transportation system more sustainable.

Environment – High Benefit

This alternative has no impact on the built or natural environment.

Technology – High Benefit

Different technology can be integrated into the regional wayfinding system, including electronic, changeable signage.

Public Support – Moderate Benefit

Public comments are generally supportive of this alternative.

Overarching Criteria

Economic Opportunity – High Benefit

A branded regional wayfinding system will positively impact economic opportunity in the region by facilitating the increased, robust use of multiple modes in the region. Urban areas that have excellent pedestrian, bike, transit, rail, and road networks that work together to help get people where they need to go draw new residents, businesses, and economic development.

Feasibility/Complexity – High Benefit

This alternative requires no additional ROW or complex engineering to accomplish.

System Compatibility – High Benefit

While this alternative has amplified value when implemented in concert with bike/ped, transit, and rail improvements, it has independent value and would therefore positively impact the region even on its own.

Overall Assessment of Benefits/Impacts

This project will provide a high level of benefits.

Order of Magnitude Cost

This alternative calls for developing a regional wayfinding plan and installing wayfinding signage that focuses on rail, transit, active modes, and the places they come together like mobility hubs. This alternative has an order of magnitude cost of between $1 to $10 million (i.e., moderate cost on the low end with the potential to be in the low-end of the moderately high-cost category). The City of Portsmouth, New Hampshire, which is relatively the same size as the City of Hartford, developed a plan to install 80 signs across the city. The cost was approximately $500,000 for fabrication and installation. Given that this cost estimate was developed in 2015 and this plan calls for developing and implementing a regional wayfinding signage plan in a region with a more complex transportation system, the cost would likely be considerably more.[1]

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[1] https://files.cityofportsmouth.com/files/planning/Pressrelease_WayfindingPhase2.pdf

High Level Benefit-Cost Outlook

This alternative is relatively low-cost but will be highly beneficial for the Hartford region. It will help residents as well as people employed in or traveling within the region efficiently assist them in getting where they need to go and access the full potential of Hartford region's transportation network including pedestrian, bike, transit, rail, and other modes.

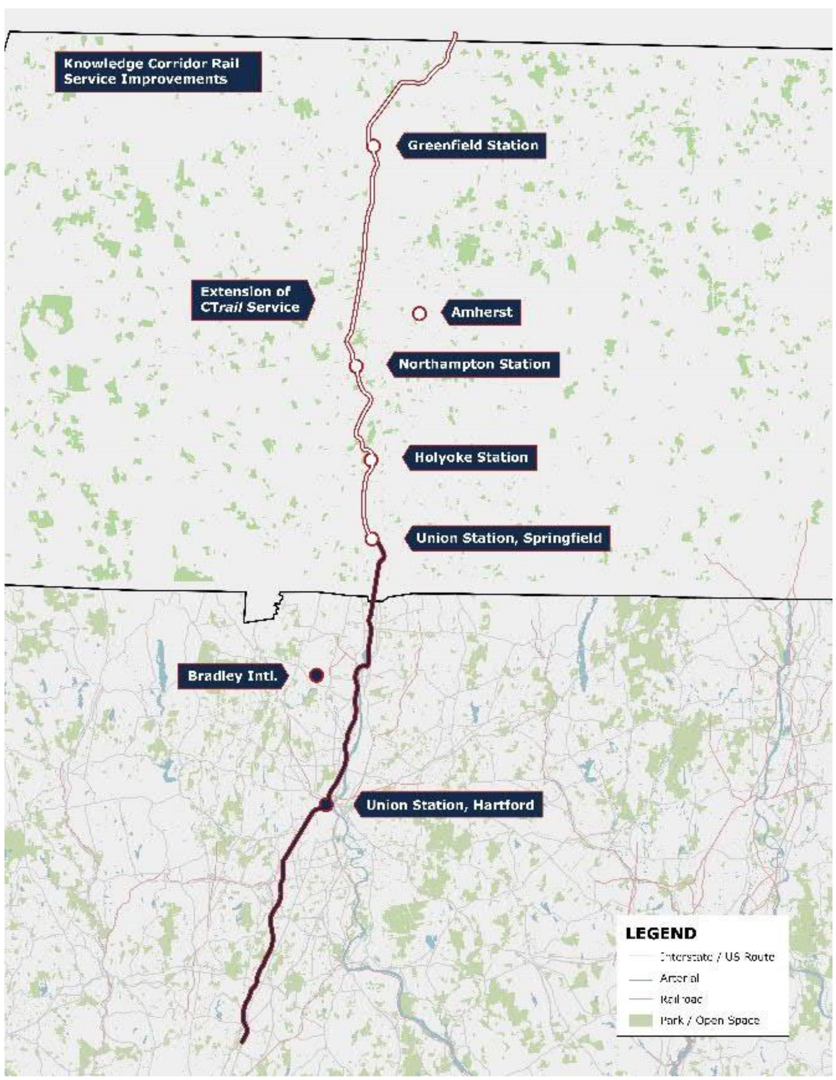
Improve Service Options to the Knowledge Corridor

Detailed Project Description

Hartford Line operations increased service to the lower half of the Knowledge Corridor (New Haven, CT to Springfield, MA). However, rail service to the northern half is limited to regional Amtrak operations in the Valley Flyer and Vermonter. This alternative investigates the northern expansion of CT*rail* Hartford Line service from its current terminus in Springfield, MA to Greenfield, MA through collaboration with MassDOT.

This alternative would expand rail options to the northern portion of a connected regional economy which includes a high density of residential, employment and educational institutions. This alternative would additionally expand reasonable commuting distances to better align with a hybrid work model where people may ultimately reside further away from their place of employment.

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take 5-10 years to implement.

Project Development Process

Currently there are three Amtrak trips daily between Springfield and Greenfield (one (1) Vermonter trip in the afternoon and two (2) Valley Flyer trips at night). To extend Hartford Line service from Springfield to Greenfield, the following steps would need to be taken:

- Study demand for this service to determine possible schedule options and how these would integrate with the Vermonter and Valley Flyer services
- Identify funding
- Develop an implementation timeline
- Create marketing plan for launch of service
- Launch service

Project Phasing

The segment from Springfield to Greenfield is not long, but service could first be extended to Holyoke, then Northampton, and then Greenfield.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative would reduce travel time between the southern and northern parts of the Knowledge Corridor by providing a one-seat ride and eliminating the need to change trains in Springfield.

Access and Connectivity – High Benefit

Knowledge Corridor Rail Service Improvements would provide better access by removing a transfer at Union Station in Springfield, making the connection between the southern and northern parts of the corridor easier for travelers.

Travel Options and End User Convenience – High Benefit

When Hartford Line service is paired with the Vermonter and Valley Flyer services, travelers will have more options. Riders who are traveling from the southern to the norther parts of the corridor, or vice versa, will have a one-seat rider, making the trip more convenient.

Criteria Supporting Other Study Goals

Equity – High Benefit

This alternative would provide additional, regional rail service from Springfield to Greenfield, MA. For zero-vehicle households—which have higher concentrations in Springfield, Greenfield, and other communities.

Safety – Moderate Benefit

This alternative could shift some trips from the highway to rail, therefore taking cars off the road and improving roadway safety by reducing congestion.

Resiliency and Sustainability – Moderate Benefit

This alternative would have the potential to encourage modal shift from driving to rail, which would reduce greenhouse gas emissions and other pollution.

Environment – High Benefit

There would be no impacts on the natural or built environment.

Technology – Neutral

This line features a service proposal and there are minimal-to-no technology elements. Technology used on the line would largely be dependent on costs and other factors.

Public Support – Moderate Benefit

Public comments indicate support for additional rail service in this corridor, linking zero-car households and providing convenient, pleasant rail service for all, from Greenfield to Hartford and points south.

Overarching Criteria

Economic Opportunity – High Benefit

The additional rail service that this alternative would provide would bolster economic opportunity by providing more rail service (and a one seat ride) from Connecticut to points north of Springfield. This additional service will link people to more employment and other opportunities.

Feasibility/Complexity – High Benefit

No additional ROW is needed to run this additional rail service.

System Compatibility – Critical Flaw

This alternative requires coordination with other states; however, this alternative is not a priority for other states at this time, so it is not compatible with the existing system.

Overall Assessment of Benefits/Impacts

No overall assessment of benefits/impacts has been conducted for this alternative since it has been determined to have a critical flaw.

Order of Magnitude Cost

This alternative has been determined to have a critical flaw; therefore, no assessments have been conducted for capital or operation and maintenance costs.

High Level Benefit-Cost Outlook

No benefit-cost outlook has been conducted for this alternative since it has been determined to have a critical flaw.

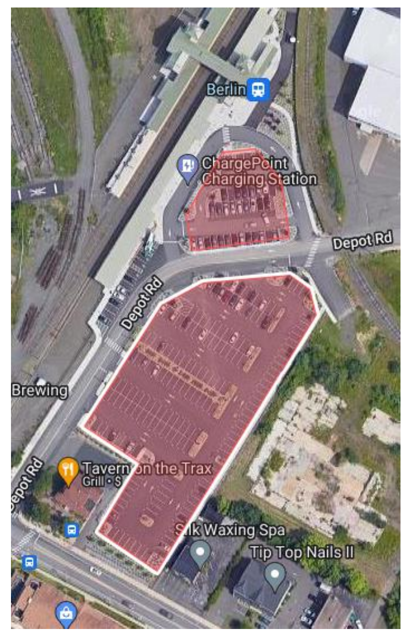
Rail Station Solar Canopies

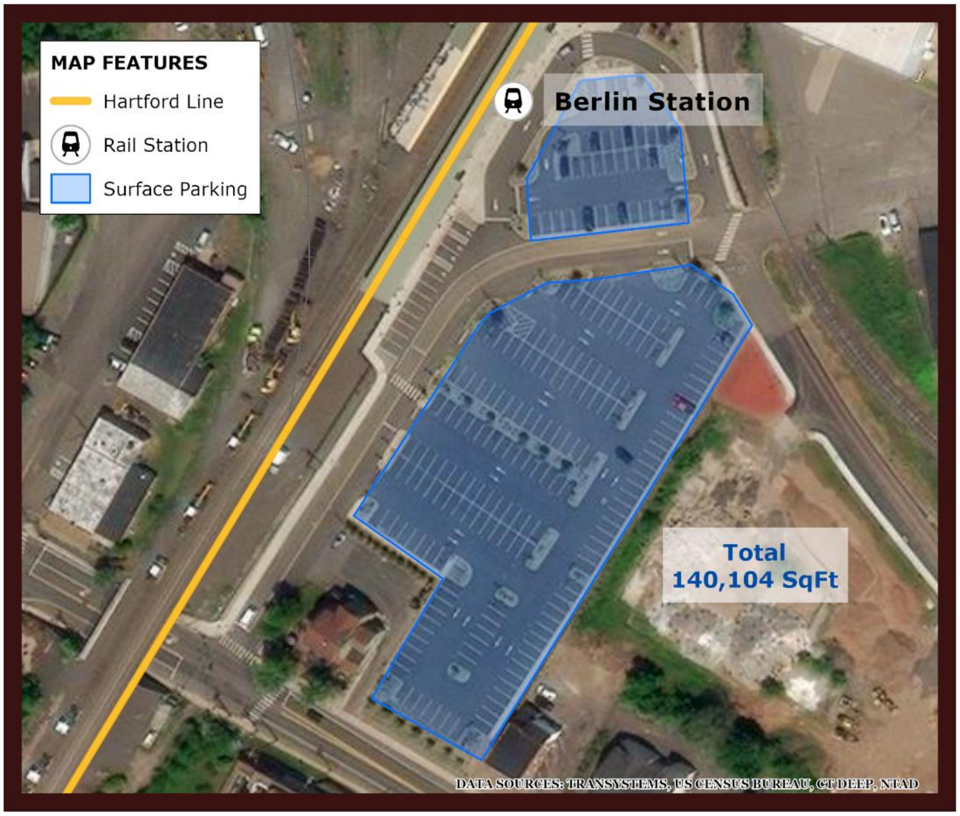
Detailed Project Description

Connecticut has been working to broaden the adoption of alternative energy sources in the state and solar will, across multiple scales, be an important component of this effort. Currently most larger scale solar projects occur on undeveloped land, farmland, or previously forested areas. However, this placement method increases stress on vulnerable and limited natural resources which provide beneficial ecosystem services. The deployment of solar canopies at rail stations within the study area would contribute to a more efficient use of surface parking while establishing multiple co-benefits.

Over the past decade the University of Massachusetts at Amherst has been a regional leader in the deployment of solar, including the co-location of surface parking and solar. This includes a 590-kW array covering approximately 4.3 acres of Lot 25 and 1.79-MW array covering approximately 6.1 acres. Existing Hartford Line rail stations provide more than 4.5 acres of surface parking which could contribute meaningful renewable capacity to the state grid.

Alternative Image and Map





Implementation Timeframe

Timeframe

This alternative is a mid-term goal and could be implemented in the 3-5-year time horizon.

Project Development Process

Implementation of this alternative would require additional research, planning and coordination to better understand how solar canopies could be deployed. The alternative is identified as a policy-level alternative to reflect the existing ambiguity and complexity of the alternative. Specific items which need further consideration are:

- Determine ownership framework (state-owned, P3, private lease, etc.)
- Determine funding sources exist that could be leveraged for this type of project.
- Determine where the generation will be deployed (will the energy be used on site or sold into the grid)
- Decide if it be applied on a case-by-case basis or universally at stations in the project area.
- Decode if the focus is on retroactive implementation or integration with new station construction.

Project Phasing

This alternative cannot be implemented in phases of independent utility.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative does not directly address travel time or reliability.

Access and Connectivity – Neutral

While this alternative supports a sustainable transportation system and may better support electric vehicle (EV) adoption within the state, it does not directly address access and connectivity.

Travel Options and End User Convenience – Moderate Benefit

This alternative would work to improve the user experience at stations. Covered parking would work to keep weather off of vehicles as well as shade vehicles from extreme heat. The solar aspect of the station could better support EV charging opportunities at stations making it easier for user to commute to and from stations.

Criteria Supporting Other Study Goals

Equity – No Change

This alternative does not directly address equity.

Safety – Neutral

This alternative does not directly address any improvements to system safety.

Resiliency and Sustainability – Moderate Benefit

This alternative supports statewide sustainability goals through promoting/expanding the renewable energy in the state. Additionally, the covered aspect of the solar canopies would work to reduce urban heat island in the vicinity of the station areas.

Environment – High Benefit

This alternative has no impact on the environment and provides a sustainable method of providing the station with electricity.

Technology – High Benefit

This alternative provides consideration for future technology by supporting a renewable energy transition and EV adoption. It further provides resiliency by addressing urban heat island concerns.

Public Support – Moderate Benefit

Comments suggest that the canopies themselves are not as appealing as an alternative as the idea of promoting energy efficiency while promoting TOD. Some comments point out that canopies may prioritize driving, therefore, if this concept is considered, it should be part of TOD. One comment suggested making minimum density zoning mandatory within the walkshed of Hartford Line stations.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative has the potential to support economic growth in the region by deploying renewable energy and improving the station amenities.

Feasibility/Complexity – High Benefit

This alternative would require no additional ROW and has a high degree of engineering feasibility. The alternative does have a degree complexity in terms of developing the implementation and ownership framework of the solar arrays.

System Compatibility – High Benefit

This alternative has independent utility and would integrate well with the current system.

Overall Assessment of Benefits/Impacts

Benefits will exceed impacts. The structures will be constructed on previously developed land in current use for parking. There will be no additional impervious surface.

Order of Magnitude Cost

On average, solar canopies run $2.6M per acre of coverage. This alternative will need to undergo further analysis through a study to determine the total extent of costs, this would be approximately $250k.

High Level Benefit-Cost Outlook

Benefits will exceed costs in terms of the value ecosystem services being contributed as well as through energy savings associated with net metering.

Implement Rail Station Amenities

Detailed Project Description

Ease of access to Hartford Line stations is critical for the continued success of the line, particularly as the state works to further decarbonize transportation systems and move towards broader integration of alternative modes. The purpose of this alternative is to improve station accessibility across modes with the goal of improving conditions for pedestrians and bicyclists.

Options for improving accessibility include:

- Covered and secured bike parking at stations.
- Increased deployment of bikeshare/e-scooters in high demand locations to create a regional network.
- Regional bike facility and pedestrian connections to stations.
- Car-share at strategic rail stations.
- Fully accessible walkways throughout station areas.

Location: Northern Corridor, Study Core, and Southwestern Corridor.

Alternative Image

Implementation Timeframe

Timeframe

This alternative would take 0-5 years to implement.

Project Development Process

The first step for this alternative will be an existing conditions assessment of each of the Hartford Line's nine (9) stations. This step will catalog existing bicycle and pedestrian facilities in and within a half mile of the stations. Next, a basic Implementation Plan should be created that summarizes the amenities that each station is lacking and prioritizes the stations/station areas for improvement construction. Each station will need concept-level, preliminary design, and final design before construction. Other considerations include coordination with other roadway/construction projects/alternatives in this plan as well as funding.

Project Phasing

Implementation of this alternative could be split, but the Implementation Plan should be consulted to prioritize station/station area improvements.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

By making sure that each Hartford Line station has robust and accessible bicycle and pedestrian facilities not only internally, but also within ½ mile, travelers of various abilities will be able to navigate to stations more efficiently.

Access and Connectivity – High Benefit

By providing safe, comfortable, and convenient pedestrian and bicycle facilities that connect to and help travelers navigate Hartford Line stations, this alternative will improve access as well as connectivity between modes.

Travel Options and End User Convenience – High Benefit

By improving conditions for those who choose to, want to, or must walk and/or bike to Hartford Line stations travelers will have the option of having multiple, safe, accessible modes to choose from to get to and from stations.

Criteria Supporting Other Study Goals

Equity – High Benefit

Providing safe, efficient, and accessible bicycle and pedestrian options is critical to providing lower income and/or people of color communities with ways to access opportunities because these populations are more likely to be zero car households.

Safety – High Benefit

When rail stations lack efficient and accessible bicycle and pedestrian facilities, people will take unsafe routes or in some cases will not be able to use the stations at all. This is especially true for people with disabilities, lower income, and zero car households.

Resiliency and Sustainability – High Benefit

By providing safe and effective active transportation options for accessing Hartford Line stations, more riders will be able to use these zero emission-options to access the train. The resulting mode shift will reduce the VMT generated by travelers.

Environment – High Benefit

This alternative will have a positive impact on the built and natural environments by 1) providing quality bike/pedestrian facilities where none currently exist or by enhancing the functionality and safety of existing facilities and 2) providing accessible and quality active transportation options to get to stations, fewer people will choose to drive, therefore reducing GHG emission. An effort should also be made to include green infrastructure in these improvements.

Technology – Low Benefit

Options for integrating technology into this alternative include:

- Bike/scooter share options at stations
- Integration of green infrastructure at station/within ½ mile radius of station areas

Public Support – High Benefit

People are favorable of this alternative. Comments include suggestions about including car and e-scooter shares at rail stations and improving bike/pedestrian facilities and safety surrounding rail stations.

Overarching Criteria

Economic Opportunity – High Benefit

When an area has updated, well-maintained public infrastructure like sidewalks, bike lanes, etc. the area attracts investment. For this reason, the bike/pedestrian facility investments called for by this alternative would positively impact economic opportunity. By providing better access to the Hartford Line, especially for people who cannot afford to drive their own cars, this alternative would provide many with access to economic opportunities.

Feasibility/Complexity – High Benefit

While it is possible that there could be some complexity and minor ROW acquisition needed at some of the stations, it is not anticipated that most of the bike/pedestrian facility improvements called for would require it. Some of the stations currently need some sidewalk/walkway redesign and certainly new and improved facilities are needed within the ½ mile station areas, but ROW for these is already available.

System Compatibility – High Benefit

This alternative has independent utility as it would add tremendous benefit to the Hartford Line as it currently exists.

Overall Assessment of Benefits/Impacts

This alternative would be highly beneficial to the community with no negative impacts.

Order of Magnitude Cost

Costs for the items recommended in this alternative will vary significantly, reflecting the varied deployment of existing station amenities. Individual costs estimates are not included.

High Level Benefit-Cost Outlook

Benefit overwhelmingly exceeds cost, by improving the accessibility of rail stations by foot, on bike, micro mobility, and other modes, this alternative provides a large benefit to the region.

Unified Fare Collection

Detailed Project Description

This alternative has been consolidated into Mobility as a Service (MaaS).

Mobility as a Service (MaaS)

Detailed Project Description

Mobility as a Service (MaaS) uses digital application technology to give travelers an easy way to plan, book and pay for transportation. It's a one-stop shop incorporating all travel modes, including transit, rideshare, and micro-mobility options for easy trip planning. A successful MaaS platform gives users a custom tailor-made travel plan based on their input. It provides flexibility for transit operators and gives accurate up-to-date data on trips.

Alternative Image

Implementation Timeframe

Timeframe

Development of a MaaS program requires the coordination between several providers, both public and private, as well as community stakeholders.   Based on an example from the City of Pittsburgh, implementing a MaaS program could take 2-to-3 years.

Project Development Process

There are several ways to implement a MaaS program:

- Integration of information, which allows users to find the best trip, regardless of mode.
- Integration of booking and payment. This can be built out on an already existing platform, to include a trip planner, and ability to book and pay for trips, such as a carshare, scooter, or taxi.
- Continued buildout of the previous model and incorporating transit passes and bundles.

A first step to a MaaS is to build out a Unified Fare Program between CT*transit* and CT*rail*. This would allow riders to chain trips either from bus to train or train to bus and expand travel options. This would require both bus and train fares to be integrated.

Project Phasing

This alternative can be developed in phases of independent utility, with each new iteration building off of the past one.

Environmental Review Process

Not Applicable (NA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

Transit riders using a pre-paid trip on the MaaS application will decrease dwell time at stops and improve overall travel time and will help with reliability by providing real time information to help make informed choices.

Access and Connectivity – High Benefit

The ability to use micro mobility options like scooters and the ability to plan trips using multiple modes will increase both access to transportation and solve last-mile problems. Additional connectivity can be achieved with strategic placement of shared transportation at high volume transit stops.

Travel Options and End User Convenience – High Benefit

Users will be able to choose the travel options best suited to their needs, for example, local bus, bike or carshare. The application can also display preferences of the user, such as lowest cost or least carbon emissions.

Criteria Supporting Other Study Goals

Equity – High Benefit

Transportation providers can offer reduced fares or discount programs for low-income riders through the MaaS app to address social equity issues. CT*transit* already offers discounted fares for older adults and people with a qualifying disability. Superpedestrian, the shared scooter program in Hartford, offers LINK-Up, a reduced fare program for qualifying riders.

A program in Pittsburgh also subsidizes trips for households that meet income criteria.

Safety – Neutral

MaaS will not directly impact or improve safety.

Resiliency and Sustainability – Low Benefit

MaaS has the potential to reduce VMT and could enable additional shifts towards transit, biking/walking and ridesharing which are more sustainable modes of transit.

Environment – Neutral

Since this is a primarily web-based application, there will be no impact on the environment. Public transportation and other shared mobility services use less energy and emit fewer emissions than other forms of motorized transportation. Associated construction, if any, would have minimal impact on the natural and/or built environment and would be mitigable.

Technology – High Benefit

App-based technology is already widely used by a majority of the population. Approximately 85 percent of Americans have a smartphone; 76 percent of people whose income is below $30,000.[2] In addition, people are used to planning transit trips and booking rideshare trips either on their smartphones or online.

Public Support – Low Benefit

There was general support for this alternative policy. Comments included a desire for streamlined method to payment for services.

Overarching Criteria

Economic Opportunity – Neutral

MaaS does not create any significant change in economic opportunity in the Hartford region.

Feasibility/Complexity –Neutral

There are no ROW impacts with MaaS. However, implementing MaaS at this point in time would be a complex undertaking given the many different systems, policies, and organizations that would need to be integrated.

System Compatibility – High

MaaS could provide significant systemic enhancements to the public transit system in the Hartford region and would support additional integration of modes and services. MaaS could be implemented independently if desired. Overall Assessment of Benefits/Impacts

Overall Assessment of Benefits/Impacts

This alternative will provide substantial benefits to users by making the states transit system easier to use and access. This includes by facilitating trip planning and single-source payment and ticketing.

Order of Magnitude Cost

Costs for this alternative would include capital costs associated with developing or purchasing the app-based infrastructure to integrate the multiple systems. There is limited publicly available data on the development costs. It is estimated that initial costs could be $2M-$5M.

High Level Benefit-Cost Outlook

Despite the higher costs of developing an integrated system, the benefits associated with this alternative will exceed costs.

[2] https://www.pewresearch.org/internet/fact-sheet/mobile/

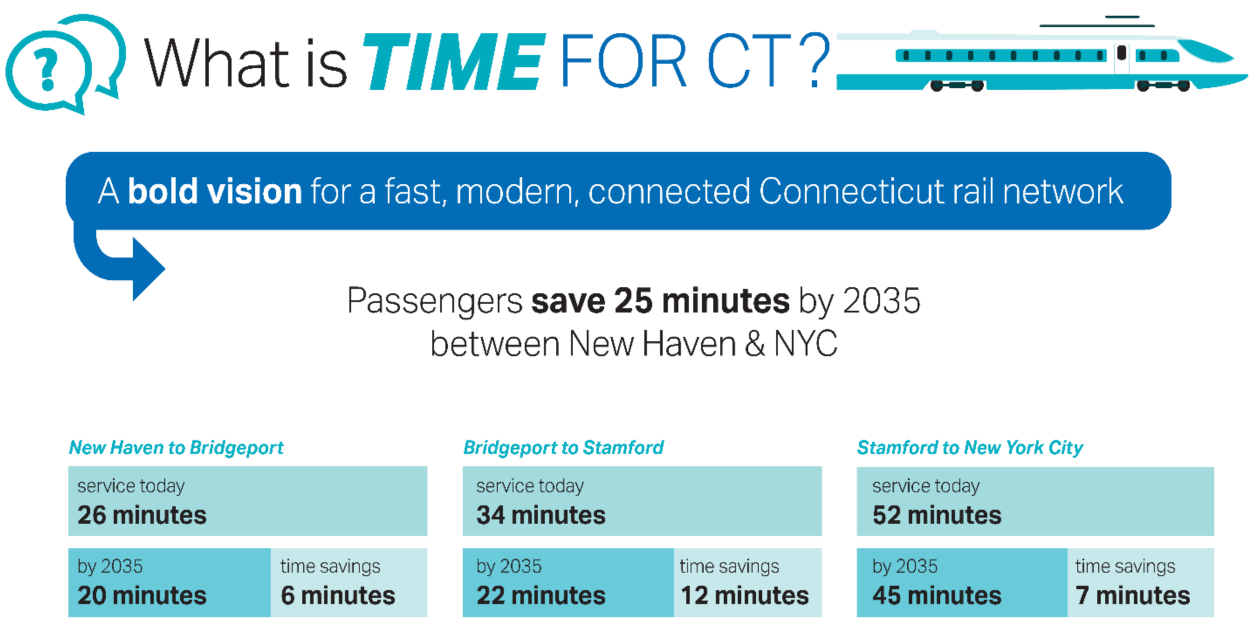
High Frequency Regional Rail

Detailed Project Description

Regional rail is an approach to service that prioritizes frequent service over a more traditional peak/off-peak, pulse service model. The core principle is that frequency is freedom and a regional rail model in the GHMS area improves mobility through increasing transit access to job centers in Bridgeport, New Haven, Hartford, Stamford, and New York City. Running a regional rail service level requires several elements addressed in other rail alternatives, including a large fleet that can support service levels, space to store the fleet, and electrification.

CTDOT has a contiguously connected railroad network, including the Hartford Line, that can be modified in a manner that supports inter-urban, regional rail. Prior to the COVID-19 pandemic, CTDOT already began rethinking its approach to service and began identifying strategies for providing faster passenger rail and the regeneration of an interurban/regional rail system that provides connections to job centers in Connecticut and New York. Future studies, in conjunction with other investments like electrification, could apply this service philosophy to the Hartford Line.

Alternative Image



Implementation Timeframe

Timeframe

Building out a regional-rail service model begins within the next two years, with a Hartford Line Express service to NYC in development. Additionally, a more regional service model that integrates the Hartford Line into a larger inter-urban/regional rail network is visioned to occur around 2035.

Implementation steps for the Hartford Line Express involves the following actions:

- Developing an operating schedule for a crew and necessary equipment (trains), and
- Adjusting existing train storage plans to stable trains when not in operation.

Project Development Process

The implementation steps for a full CTDOT regional rail model in 2035 are more complex as each line, including the Hartford Line, needs incremental investments that allow them to function differently within the larger system. Some steps, including bridge and tracks repairs, car procurement and signal installations have already begun. Additionally, there will be a need for new and expanded storage yards. This process will likely involve an environmental impact assessment and acquiring land.

Project Phasing

There are opportunities to split a regional rail service project into several pieces. This is already occurring with the development of the Hartford Line Express service. Additionally, the different infrastructure projects that create conditions for regional rail will incrementally improve service. CTDOT's Track Improvement and Mobility Enhancement (TIME) projects will package track and bridge enhancements together, and, once complete, will allow for 90-110 mph train speeds and reduced travel times.

In addition to infrastructure improvements, there are also opportunities to phase in a regional rail model that first provides fast, frequent connections between urban cores (Hartford, New Haven, Stamford, Bridgeport, New York, etc.) before then expanding to other stations on the lines.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

A regional rail service model will improve travel times though reducing headways between revenue trains. This increases the ability for travelers to move within the system quickly and efficiently. Reliability will increase as there will be less of a dependence on a single train. For example, an individual will not need to plan their day around a single departure time as a change in their schedule will simply mean catching a subsequent train departing shortly after their intended train.

Access and Connectivity – High Benefit

In ways similar to reliability, a regional rail model that prioritizes service throughout the day improves connectivity through reducing the gap between trains. This means that destinations only functionally accessible in the AM and PM peak will now be accessible throughout the day. Additionally, this means that schedules also work better for those not traveling during traditional peak periods.

Travel Options and End User Convenience – High Benefit

A regional rail model operates under the notion that frequency is freedom, meaning that frequent trains throughout the day improve travel options by reducing the need to build a travel schedule around a certain train.

Criteria Supporting Other Study Goals

Equity – High Benefit

Changes in service patterns to better match post COVID travel behavior would improve mobility, potentially providing new travel options that better fit schedules and needs of disadvantaged populations.

Safety – Neutral

This mode focuses more on service and doesn't specifically improve or hinder safety. One tertiary impact is that increased frequencies mean lower crowds on individual trains. Additionally, it could result in shorter wait times on platforms, meaning less public interaction for those concerned with COVID-19 exposure or other needs. Additionally, this project will advance safety by reducing auto-dependence, removing opportunities for road-related danger.

Resiliency and Sustainability – High Benefit

This alternative would support VMT reductions through retaining existing ridership and attracting new riders who can rely on high frequencies that meet their individual travel flexibilities and needs. The need for a comprehensive regional rail model will grow as census data indicates individuals are traveling longer distances to work. In a current- and post-COVID world, individuals might only commute a few days a week, meaning rail service could be alternative to driving. Additionally, the capital investments required to achieve this service will modernize infrastructure and ensure it is in a state-of-good-repair.

As individuals begin returning to workspaces, new rail service patterns might encourage residents and workers to use transit instead of driving.

Environment – Moderate Benefit

Capital improvements could have minor impacts on the environment during construction, though the long-term benefit would negate these and reduce emissions.

Technology – Moderate Benefit

A regional rail model that requires frequent service also requires modern technology such as electrification and new train cars. This aligns with other alternatives.

Public Support – High Benefit

There is public support for service that is faster and more frequent. Additionally, many have expressed a desire for re-orienting service from a peak/off-peak model to a more balanced, all-day model.

Overarching Criteria

Economic Opportunity – High Benefit

A regional rail model transforms how people travel throughout Connecticut, opening up numerous economic opportunism opportunities for individuals and businesses. Regional rail also becomes a transportation tool that the state can leverage to help improve efficiency of the state’s labor force and to help keep the state’s economy competitive on the global stage.

Feasibility/Complexity – Neutral

While individual projects are technically feasible, the overall scope of projects needed to achieve a regional rail model is large and requires detailed management of multiple projects that could compete for resources.

System Compatibility – High Benefit

This is a transformative approach that requires investments on all Connecticut railroads. Compatibility will be required and, in many instances, this involves updating existing equipment and standardizing it across the different lines.

Overall Assessment of Benefits/Impacts

Regional rail is transformative and would dramatically improve how people travel through Connecticut from both a time and quality-of-life perspective.

This project does not conflict with any other rail projects, though a regional rail model would be enhanced by the completion of nearly all other rail alternatives, especially electrification.

Order of Magnitude Cost

Instituting a regional rail service model, including all the associated projects that will bring the line up to speed will cost approximately $1 - $2 billion. Additionally, a regional rail model requires various projects to be included outside of the study area on other lines. Collectively, this could be as high as $8.8 billion in overall rail investment in Connecticut.

High Level Benefit-Cost Outlook

While the cost of a regional rail service model is high, the benefit is a transformative approach to travel that would position the Hartford area for a more sustainable future that is less dependent on single-occupant vehicle travel.

BUS ALTERNATIVES

GREATER
HARTFORD
MOBILITY STUDY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

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Support Micro-Transit Initiatives

Detailed Project Description

Micro-transit is a demand-responsive shuttle in which riders can request pickups and drop-offs at any destination within a defined geographic zone. This service would enable riders to request a ride and specify the destination within the defined zone. The service's routing software would then generate a dynamic route in response to the aggregated demand from all riders at that moment in time within the zone. Micro-transit service can be priced in several different ways, from being a free transfer connection to having an additional fare for use of the service.

This type of service is effective in serving areas where fixed-route service is difficult to justify in terms of cost and passenger volume. Within the Hartford region, this service could connect commuters to and from employment hubs and transit services as well as other destinations within the zone. Increases in demand and local density may suggest that a transition to fixed-route service is appropriate.

Integrating micro-transit with bus transit helps increase the reach of transit service and helps to solve first/last mile travel challenges. It would open more jobs and housing to those who rely on transit including those who are differently abled or have low incomes. It would also provide a more practical way than fixed route transit service to serve low density suburban and rural areas.

Micro-transit service would be best focused on underserved portions of the employment hubs and areas of mobility need. They are also well-suited for areas surrounding any new mobility hubs that connect with areas not well-served by fixed-route transit.

The Hartford Grocery Access Micro-transit is a unique service intended to connect City residents with full-service grocery stores in other neighborhoods and nearby suburbs in order to help overcome food stamp and food desert issues in certain parts of Hartford. This service would use special mini-buses equipped with grocery bag racks operating during key shopping times and limited to trips beginning or ending at a full-service supermarket. The goal would be to make grocery shopping easy and convenient for people who do not have access to healthy food in their own neighborhoods.
Micro-transit can be operated by the transit agency or by one or more private transportation providers. It would require staff from the transit agency to coordinate the program and to monitor/supervise if using third party. Transit agencies may also choose to take on customer services themselves to improve service quality and consistency. The agency would have to take up all the operation costs (similar to paratransit) if the service is operated in-house.
Depending on the level of subsidy, users may use the service for free, for a fixed cost, or for discounted cost up to a certain threshold. Cost may also be incurred in the form of monthly/annual subscription fees. Free or discounted services are supported by advertising and/or government subsidies.

Alternative Image

Implementation Timeframe

Timeframe

Support for micro-transit could be implemented within the short-term (1 to 3 years) timeframe. Depending upon the desired approach and available resources, micro-transit service could be operational anywhere between a few months to a couple of years. If the transit agency has the appropriate vehicles available, a small pilot could be launched with a few months of planning (selecting the pilot zone and setting the initial service parameters). If new vehicles are required, or the service is to be contracted out to a vendor and requires a bidding process, then it may take 1-2 years to launch a new service.

Project Development Process

Potential next steps could include:

- Determining who will oversee and operate a micro-transit service.
- Identifying the desired service zone(s) and operational parameters, such as fare amount and collection methods, hours of service, booking requirements, etc.
- Soliciting additional information or bids from vendors that can provide shared mobility services.
- Conduct a small-scale pilot to better understand how micro-transit can work in the Hartford region.

Project Phasing

Different routes can be established with independent utility.

Environmental Review Process and Next Steps

Some locations require a Categorical Exclusion, while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

Depending upon the nature and scale of the micro-transit service provided, this alternative can improve travel time and/or reliability by providing new mobility options that do not currently exist. It can be particularly effective when paired with other fixed-route transit services.

Access and Connectivity – High Benefit

Micro-transit improves access to transportation services and also provides connections to key destinations that are not easily reachable via the current fixed-route transit system.

Travel Options and End User Convenience – High Benefit

Provides a redundant travel option where people would otherwise have too long of a walk or would have to drive a personal vehicle. Micro-transit also improves the user experience by connecting additional mobility options that make it easier to reach one's final destination.

Criteria Supporting Other Study Goals

Equity – High Benefit

Creates new travel opportunities for disadvantaged populations without impacting EJ populations. If provided in disadvantaged communities, the benefits are maximized.

Safety – Moderate Benefit

Safety improvements could be achieved by more people traveling via alternative modes of transport, thereby potentially reducing the incidence of car crashes. Improved first/last mile service also provides a safer means of travel when compared to overly long walking distances that may be required of those who do not drive.

Resiliency and Sustainability – Moderate Benefit

The addition of new micro-transit services provides an alternative to driving and helps to make transit a more viable travel alternative, thereby reducing the need for driving and allowing residents to feasibly switch from personal cars to transit.

Environment – High Benefit

The potential for effects on environmental resources would likely be minimal and within the public right of way with little to no taking of property. Public transportation and other shared mobility services use less energy and emit fewer emissions that other forms of motorized transportation. There would be no impacts on the natural or built environment. Associated construction, if any, would have minimal impact on the natural and/or built environment and would be mitigable.

Technology – Moderate Benefit

New technology could be employed through MaaS to ease the user experience in traveling via multiple modes of transit.

Public Support - Moderate Benefit

Public comments on the project website are supportive of this alternative. Comments recommend linking key areas with high density, such as connecting rail lines to airports (airport buses) and connecting airports to each other. This concept is seen as important in regard to issues of creating jobs and expanding access.

Overarching Criteria

Economic Opportunity – High Benefit

Creates economic opportunity by providing additional travel modes and improved connections to better access jobs or amenities in areas not well-served by fixed-route transit.

Feasibility/Complexity – High Benefit

No additional ROW is required to implement and operate micro-transit, and it can be done with minimal complexity.

System Compatibility – High Benefit

Micro-transit will provide utility and improvement to the transportation system independent of other improvements. However, they will also help support enhancements to other services such as bus transit and mobility hubs.

Overall Assessment of Benefits/Impacts

Overall, supporting micro-transit initiatives in key areas will have a strong benefit to the region, providing new travel options, particularly in areas that are primarily or entirely dependent upon personal vehicles. There are no negative impacts, and the alternative shows moderate to high benefit on nearly every screening criterion.

Order of Magnitude Cost

The cost to implement and operate a micro-transit service will depend upon a number of factors that will need to be determined, such as the type of vehicles, size of the service zone, and the hours of operation. While all those factors are unknown at this time, and therefore costs could change, a simple high-level operating cost estimate was developed using the 2020 Operating Expenses per Vehicle Revenue Hour as reported to the National Transit Database. Micro-transit service could take on several different forms. For example, there could be one zone served by a single vehicle for eight hours a day (Monday-Friday), or two vehicles could serve the zone to provide better service. Alternatively, service could be implemented in two different zones with one or two vehicles in operation for each zone. Cost estimates for these scenarios are presented in the table below. The low-end estimate is based on the cost to operate on-demand transit as reported by the Greater Hartford Transit District, while the high-end estimate is based on the cost to operate traditional bus service as reported by CTtransit. These estimates show that micro-transit service could operate for less than $1 million per year, depending upon the scale of service offered.

Micro-transit Cost Estimates for Weekday Operations per Service Zone

Daily Hours of Operation	Annual Hours of Operation	Annual Cost of Service (low-end)	Annual Cost of Service (high-end)
8	2,000	$144,720	$273,160
16	4,000	$289,440	$546,320
32	8,000	$578,880	$1,092,640

Source: National Transit Database

Capital costs mainly consist of purchasing suitable vehicles for the service if the transit agency opted to operate the service themselves. Usually there is little to no capital cost for transit agencies if the service is provided by a third party. This alternative will be implemented in a first phase as a study, totaling $500k.

High Level Benefit-Cost Outlook

Overall, the benefits of micro-transit likely outweigh the costs. However, it may be worthwhile to conduct a pilot program to determine the demand for micro-transit. Assuming sufficient demand in areas not well-served by fixed-route transit, then micro-transit can be a cost-effective way to provide alternative transportation options. The benefits of the study alone far outweigh the costs.

Mobility as a Service (MaaS)

Detailed Project Description

Mobility as a Service (MaaS) uses digital application technology to give travelers an easy way to plan, book and pay for transportation. It's a one-stop shop incorporating all travel modes, including transit, rideshare, and micro-mobility options for easy trip planning. A successful MaaS platform gives users a custom tailor-made travel plan based on their input. It provides flexibility for transit operators and gives accurate up-to-date data on trips.

Alternative Image

Implementation Timeframe

Timeframe

Development of a MaaS program requires the coordination between several providers, both public and private, as well as community stakeholders. Based on an example from the City of Pittsburgh, implementing a MaaS program could take 2-to-3 years.

Project Development Process

There are several ways to implement a MaaS program:

- Integration of information, which allows users to find the best trip, regardless of mode.
- Integration of booking and payment. This can be built out on an already existing platform, to include a trip planner, and ability to book and pay for trips, such as a carshare, scooter, or taxi.
- Continued buildout of the previous model and incorporating transit passes and bundles.

A first step to a MaaS is to build out a Unified Fare Program between CT*transit* and CTrail. This would allow riders to chain trips either from bus to train or train to bus and expand travel options. This would require both bus and train fares to be integrated.

Project Phasing

This alternative can be developed in phases of independent utility, with each new iteration building off of the past one.

Environmental Review Process and Next Steps

NA (Not Applicable)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

Transit riders using a pre-paid trip on the MaaS application will decrease dwell time at stops and improve overall travel time and will help with reliability by providing real time information to help make informed choices.

Access and Connectivity – High Benefit

The ability to use micro mobility options like scooters and the ability to plan trips using multiple modes will increase both access to transportation and solve last-mile problems. Additional connectivity can be achieved with strategic placement of shared transportation at high volume transit stops.

Travel Options and End User Convenience – High Benefit

Users will be able to choose the travel options best suited to their needs, for example, local bus, bike or carshare. The application can also display preferences of the user, such as lowest cost or least carbon emissions.

Criteria Supporting Other Study Goals

Equity – High Benefit

Transportation providers can offer reduced fares or discount programs for low-income riders through the MaaS app to address social equity issues. CT*transit* already offers discounted fares for older adults and people with a qualifying disability. Superpedestrian, the shared scooter program in Hartford, offers LINK-Up, a reduced fare program for qualifying riders.

A program in Pittsburgh also subsidizes trips for households that meet income criteria.

Safety – Neutral

MaaS will not directly impact or improve safety.

Resiliency and Sustainability – Low Benefit

MaaS has the potential to reduce VMT and could enable additional shifts towards transit, biking/walking and ridesharing which are more sustainable modes of transit.

Environment – Neutral

Since this is a primarily web-based application, there will be no impact on the environment. Public transportation and other shared mobility services use less energy and emit fewer emissions than other forms of motorized transportation. Associated construction, if any, would have minimal impact on the natural and/or built environment and would be mitigable.

Technology – High Benefit

App-based technology is already widely used by a majority of the population. Approximately 85 percent of Americans have a smartphone; 76 percent of people whose income is below $30,000.2 In addition, people are used to planning transit trips and booking rideshare trips either on their smartphones or online.

Public Support – Low Benefit

There was general support for this alternative policy. Comments included a desire for streamlined method to pay for services.

Overarching Criteria

Economic Opportunity – Neutral

MaaS does not create any significant change in economic opportunity in the Hartford region.

Feasibility/Complexity – Neutral

There are no ROW impacts with MaaS. However, implementing MaaS at this point in time would be a complex undertaking given the many different systems, policies, and organizations that would need to be integrated.

System Compatibility – High Benefit

MaaS could provide significant systemic enhancements to the public transit system in the Hartford region and would support additional integration of modes and services. MaaS could be implemented independently if desired. Overall Assessment of Benefits/Impacts

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MaaS could provide significant systemic enhancements to the public transportation system in the Hartford region and would support additional integration of modes and services. MaaS could be implemented independently if desired. Overall Assessment of Benefits/Impacts

Order of Magnitude Cost

Costs for this alternative would include capital costs associated with developing or purchasing the app-based infrastructure to integrate the multiple systems. There is limited publicly available data on the development costs. It is estimated that initial costs could be $2-$5 million.

High Level Benefit-Cost Outlook

Despite the higher costs of developing an integrated system, the benefits associated with this alternative will exceed costs.

Support for TOD

TOD (transit-oriented development) is mid- to high-density mixed-use development concentrated around high-quality transit service. Successful TOD is often associated with rail service, but high-quality BRT service also has the potential to support TOD. TOD makes transit more accessible to people who live, work, attend school, shop, or socialize at locations within or between TOD sites. Providing more affordable housing near public transit helps people by lowering their housing and transportation costs, as compared to driving. TOD supported by either rail or bus service in the GHMS region is likely to lean toward mid-rise multi-family housing incorporated within an existing mixed-use mid- to higher-density district where transit service provides improved accessibility to downtown Hartford or another high-density mixed-use location. Existing and potential new or relocated Hartford Line rail stations have potential to support TOD. Each of the BRT alternatives (Griffin, Northeast, North, and South) also has some potential to support TOD. BRT alternatives—such as the Griffin Corridor— that incorporate a dedicated busway, similar to the New Britain to Hartford CTfastrak BRT system, have generally greater potential to support TOD over BRT transit options that utilize existing highway HOV lanes.

Alternative Image

Implementation Timeframe

Timeframe

Near to mid-term implementation (1-10 years) around existing transit stations; Long-term timeframe for implementation 10+ years around future BRT corridors.

Project Development Process

TOD will be advanced in many phases through the efforts of multiple project proponents and will be funded through private-sector investment and/or through public-private partnerships.

Project Phasing

This alternative can be implemented at different sites with independent utility.

Environmental Review Process and Next Steps

Some locations require a Categorical Exclusion (CE), while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

TOD will result in travel time and reliability benefits for transit users due to increased proximity to transit nodes.

Access and Connectivity – High Benefit

TOD improves public access to transit and enables better connectivity between land use pairs such as home and work locations.

Travel Options and End User Convenience – High Benefit

TOD makes transit a more convenient travel option that can improve the overall travel experience as a result of simplified access to key trip generators.

Criteria Supporting Other Study Goals

Equity – High Benefit

TOD that serves EJ and disadvantaged populations, such as affordable housing or employment opportunities, can increase transit access and mobility for these communities.

Safety – Low Benefit

Would reduce some dependence on personal vehicle use resulting in increased use of transit which is generally safer than driving. TOD also provides closer access to trip origins and destinations, which may help improve safety, or at least perceived safety, for those traveling at night.

Resiliency and Sustainability – Moderate Benefit

TOD can encourage a modal shift to a non-auto mode and a moderate reduction in VMT.

Environment – Moderate Benefit

Contributes to increased use of transit, reduction in VMT, and a more efficient use of land that limits sprawl and greenfield development.

Technology – Neutral

TOD would have neither negative nor positive benefits in supporting future technologies.

Public Support – No Input

Public support has not been assessed and will likely vary depending on local community sentiment and specific TOD proposals.

Overarching Criteria

Economic Opportunity – High Benefit

Mid- to high-density mixed-use TOD can support job creation and enhance tax revenues. TOD provides improved transit access for people who do not own personal motor vehicles or those who prefer not to drive.

Feasibility/Complexity – Neutral

Feasibility and complexity will vary greatly by transit station and community.

System Compatibility – High Benefit

This alternative would support increased use of transit and would be supportive of many other transit-related improvements.

Overall Assessment of Benefits/Impacts

Overall, TOD would have a largely positive impact on the Greater Hartford region, scoring moderate to high on most criteria and with no negative impacts.

Order of Magnitude Cost

Given the wide range of variables associated with TOD across the GHMS region, it is difficult to determine order of magnitude cost. Most of the cost associated with TOD, however, is borne by the private-sector developers. Public costs will vary greatly by station area and may include infrastructure development that supports TOD or allocation of public land to accommodate TOD. These public costs may be offset by increased tax revenues associated with TOD.

High Level Benefit-Cost Outlook

Public benefits of TOD typically outweigh public cost.

Improve Evening Service in Transit Priority Areas

Bus service on select routes in the transit priority area would see increased frequency during the evening service period (6pm-9pm), after the traditional PM peak period (i.e., after 6pm). In some cases, bus service would operate later in the day than currently occurs.

The routes selected for improved service are the top 15 routes by average weekday boardings that have current average evening headways greater than 20 minutes (see Table 1). Several additional routes were added to ensure coverage of the previously identified areas of mobility need. The select routes and proposed improvements are shown below.

Improved evening service will help transit be a reliable option for workers outside of traditional commuting hours and position transit as a viable mode for non-work evening trips, such as social outings.

Regarding evening headways for the selected routes, it was noted that there is a steep decline in frequency from the first hour of the evening service until the last hour evening service. As such frequency was determined for each hour of the evening service window to obtain a more detailed understanding of the current service operations.

It is recommended to have a minimum of 2 trips per hour for entire evening period for each route. For hours on any route that currently have more than 2 trips per hour the current service level will remain unchanged. This policy headway approach will help standardize service for these routes and ease transfers between routes.

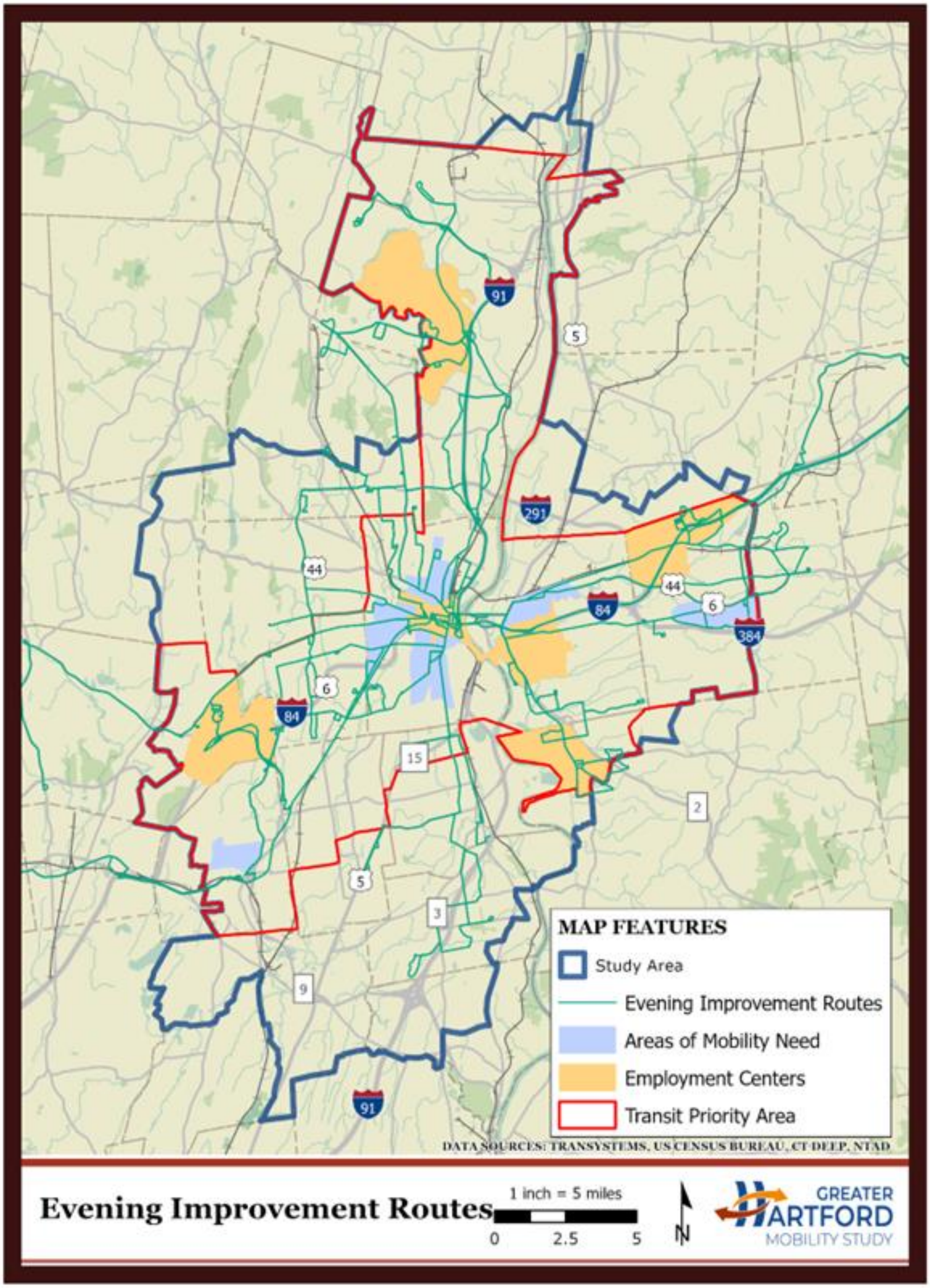
Regarding the service span, most routes operate well into the night, so minimal changes are currently proposed. For any routes that end service prior to 10pm it is proposed that they extend their service hours until 10pm.

Current and Proposed Evening Service Frequency (One-Way)

Route	Current Trips per Hour				Proposed Trips per Hour				Average Weekday Boardings
	6-7 pm	7-8 pm	8-9 pm	Total	6-7 pm	7-8 pm	8-9 pm	Total	
50-54	5	1.5	1	7.5	5	2	2	9	3,942
60-66	4	3	1	8	4	3	2	9	3,593
31-33	4.5	1.5	1	7	4.5	2	2	8.5	2,975
47	3.5	1	1	5.5	3.5	2	2	7.5	2,300
128	3	2	1	6	3	2	2	7	1,937
82-84	1	1.5	0.5	3	2	2	2	6	1,752
37-39	2.5	1.5	1	5	2.5	2	2	6.5	1,699
83	1.5	1	1	3.5	2	2	2	6	1,684
88	2	1.5	1	4.5	2	2	2	6	1,683
121	2	1.5	1	4.5	2	2	2	6	1,334
102	1.5	1	1	3.5	2	2	2	6	1,294
46	2	1	1	4	2	2	2	6	1,219
76	2.5	1.5	1	5	2.5	2	2	6.5	1,144
95	1.5	1	1	3.5	2	2	2	6	1,128
913	1	1	0	2	2	2	2	6	941
30*	0.5	1	1	2.5	2	2	2	6	579
36*	0.5	0.5	0.5	1.5	2	2	2	6	542
72*	1.5	1	1	3.5	2	2	2	6	528
32*	1.5	0.5	0	2	2	2	2	6	372
44*	1	0	0	1	2	2	2	6	316
34*	1	0	0	1	2	2	2	6	296

* Route incorporated to ensure coverage of areas of mobility need.

Alternative Map



Implementation Timeframe

Timeframe

This alternative could have a short implementation timeline (1 to 3 years) as it would not require any capital planning or spending. The primary drivers of the timeline would include service planning and potentially hiring additional bus drivers to deliver the new service. No major planning or design considerations are required.

Project Development Process

The first action would be to conduct a more detailed service plan for the recommended routes, with implementation of the service plan following.

Project Phasing

If desired, service improvements could be phased a few routes at a time, with initial implementation focused on five priority routes. This could help make implementation more feasible as staff and operating costs become available.

Improved evening service can be implemented independent of other improvements, and it would be complementary to the other options rather than competing. There are no necessary capital improvements that could conflict with infrastructure enhancements, and the moderate increase in frequency is another boost to making transit more attractive and supportive of the other transit alternatives.

Environmental Review Process and Next Steps

NA (Not Applicable)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative improves travel time by reducing wait times with increased service frequency, and thereby supports a reduction in VMT as the additional service makes the bus a viable evening mobility option.

Access and Connectivity – High Benefit

Improved evening bus service expands access to a key transportation service as well as providing connections to key destinations.

Travel Options and End User Convenience – High Benefit

Provides a redundant travel option by making the bus a viable evening travel option and improves the user experience by significantly reducing wait times.

Criteria Supporting Other Study Goals

Equity – High Benefit

Creates new travel opportunities for disadvantaged populations without impacting EJ populations.

Safety – Low Benefit

Minor safety improvements could be achieved by more people traveling via bus than car, thereby potentially reducing the incidence of car crashes. Further, more frequent service would reduce wait times at night which could have a safety and security benefit for transit riders.

Resiliency and Sustainability – Moderate Benefit

Making transit a viable alternative for evening travel reduces the need for driving and allows residents to feasibly switch from personal cars to transit.

Environment – High Benefit

Public transportation uses less energy and emits fewer emissions that other forms of motorized transportation. Service would not require any new construction that impacts the built or natural environment. There would be no impacts on the natural or built environment.

Technology – Neutral

Likely no new technology would be employed, though future consideration could be given to using zero emission buses to provide the additional service.

Public Support – Moderate Benefit

Strong support for this concept. Comments include large cut off in transit opportunities on weekends and nights and could help accommodate residents who don't work a 9 to 5 and expanding opportunities for residents who work late. Overarching Criteria

Economic Opportunity – High Benefit

Creates economic opportunity by making bus transit a viable mode to better access jobs or amenities in the evening hours. Makes commuting after a late shift easier for workers, opening up new job opportunities.

Feasibility/Complexity – High Benefit

Will provide utility and improvement to the transportation system independent of other improvements.

System Compatibility – High Benefit

Improving evening service can be done independently of other enhancements and will create benefits regardless of any other improvements.

Overall Assessment of Benefits/Impacts

Overall, improving evening service hours has a strong benefit to the community. There are no negative impacts, and the alternatives shows medium to high benefit on nearly every screening criterion.

Order of Magnitude Cost

Improved evening service will result in an increase in operating costs for CTtransit, such as additional labor costs for bus drivers and additional vehicle operating costs (e.g., fuel, bus maintenance), due to the increased number of trips in the evening. A cost estimate was developed by determining the approximate amount of additional travel time for the new trips and multiplying that by CTtransit's average operating expense per vehicle revenue hour ($136.58 for bus and $237.21 for BRT, per the National Transit Database). This process resulted in a cost estimate of just over $12,000 per weekday, for an annual estimate of approximately $3 million (assuming 250 non-holiday weekdays). There is no expected increase in capital costs.

High Level Benefit-Cost Outlook

Additional operating costs may be partially offset by an increase in bus ridership and the attendant fare collection. The Hartford region would also achieve indirect savings by reducing VMTs, thereby reducing the harm done by air pollution and vehicle crashes.

Enhance Service Frequency in Transit Priority Areas

Bus service on select routes in the transit priority area would see increased frequency during the midday service period (9am-3pm), between the traditional AM peak period (6-9am) and PM peak period (3-6pm).

The routes selected for improved service are the top 15 routes by average weekday boardings that have current average midday headways greater than 20 minutes. Several additional routes were added to ensure coverage of the previously identified areas of mobility need. The select routes and proposed improvements are shown in Table 1.

Improved midday service will help transit serve as a reliable option for workers outside of traditional commuting hours and position transit as a viable mode for non-work daytime trips, such as shopping or health appointments.

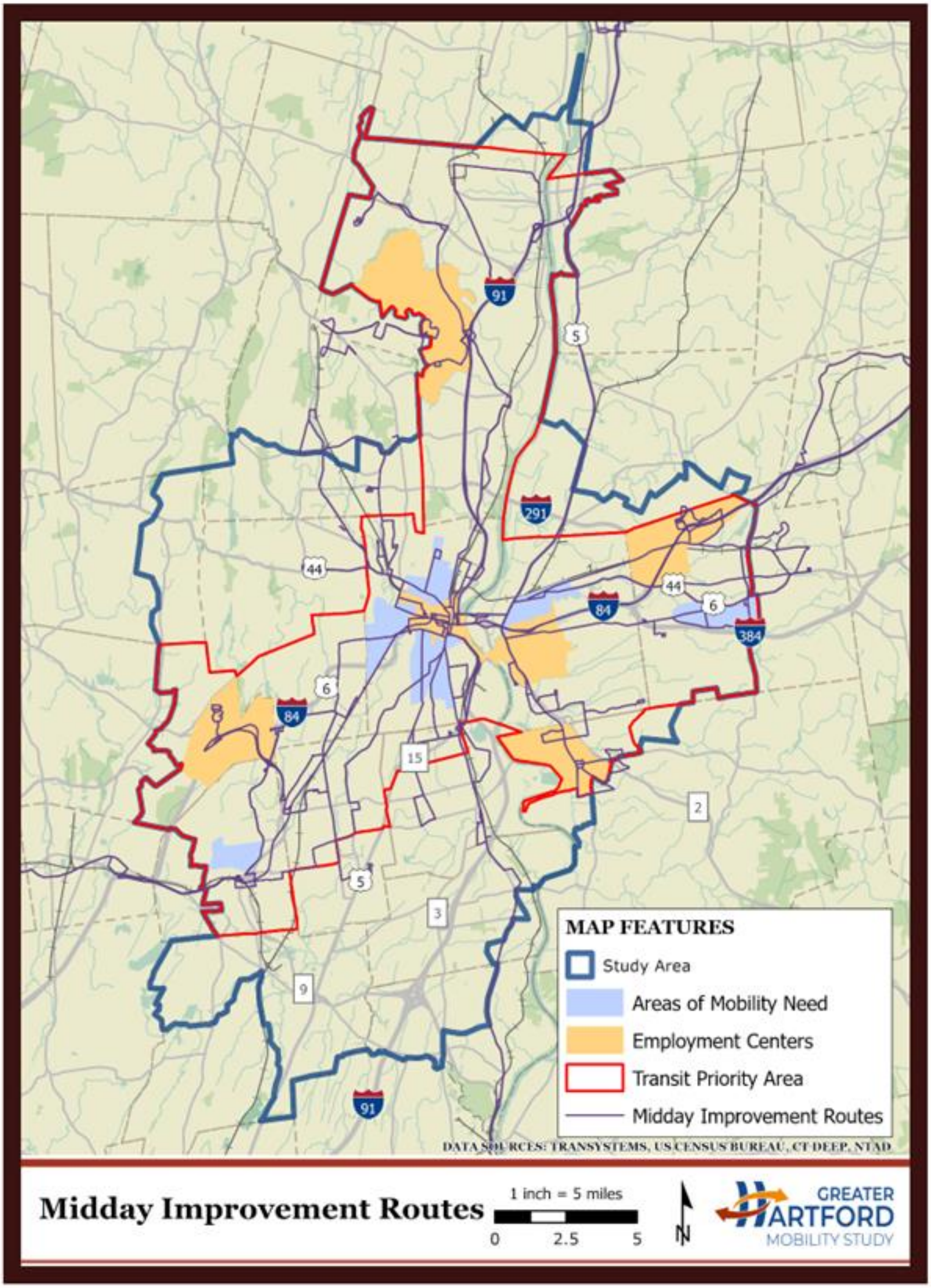
It is recommended to have a minimum of 2 trips per hour for the entire midday period for each route. For selected routes that already have 2 trips per hour the proposed improved service level is 3 trips per hour. Two of the selected routes (905 and 34) have very minimal midday service and are therefore only suggested to move to 1 trip her hour. The current and proposed frequencies are shown in Table 3.

Current and Proposed Midday Service Frequency (One-Way)

Route	Type	Current Trips per Hour	Proposed Trips per Hour	Current Headway	Proposed Headway	Average Weekday Boardings
128	CTfastrak	2.0	3	30	20	1,937
82-84	Local	2.0	3	30.2	20	1,752
83	Local	1.9	3	31.5	20	1,684
88	Local	2.0	3	30	20	1,683
121	CTfastrak	1.9	3	31.5	20	1,334
102	CTfastrak	1.2	2	51	30	1,294
76	Local	2.0	3	30	20	1,144
95	Local	2.0	3	30	20	1,128
913	Express	1.0	2	60	30	941
74	Local	1.4	2	42.5	30	714
53	Local	1.0	2	60	30	704
55	Local	1.0	2	60	30	696
61	Local	2.1	3	29	20	686
905	Express	0.3	1	270	60	684
69	Local	2.0	3	30	20	595
56*	Local	1.0	2	60	30	555
36*	Local	1.0	2	60	30	542
58*	Local	1.1	2	55.5	30	469
41*	Local	2.0	3	30	20	451
43*	Local	2.0	3	30.5	20	395
44*	Local	1.0	2	60	30	316
34*	Local	0.1	1	180	60	296

* Route incorporated to ensure coverage of areas of mobility need.

Alternative Map



Implementation Timeframe

Timeframe

This alternative could have a short implementation timeline (1 to 3 years) as it would not require any capital planning or spending.

Project Development Process

The primary drivers of the timeline would include service planning and potentially hiring additional bus drivers to deliver the new service. No major planning or design considerations are required.

Project Phasing

Improved midday service can be implemented independent of other improvements, and it would be complementary to the other options rather than competing. There are no necessary capital improvements that would conflict with infrastructure enhancements, and the moderate increase in frequency is another boost to making transit more attractive and supportive of the other transit alternatives.

Environmental Review Process and Next Steps

Not Applicable (NA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative improves travel time by reducing wait times with increased service frequency, and thereby supports a reduction in VMT as the additional service makes the bus a viable midday mobility option.

Access and Connectivity – High Benefit

Improved midday bus service improves access to a key transportation service as well as providing connections to key destinations.

Travel Options and End User Convenience – High Benefit

Provides a redundant travel option by making the bus a viable midday travel option and improves the user experience by significantly reducing wait times.

Criteria Supporting Other Study Goals

Equity – High Benefit

Creates new travel opportunities for disadvantaged populations without impacting EJ populations.

Safety – Low Benefit

Minor safety improvements could be achieved by more people traveling via bus than car, thereby potentially reducing the incidence of car crashes. Further, more frequent service would reduce wait times which could have a safety and security benefit for transit riders.

Resiliency and Sustainability – Moderate Benefit

Making transit a viable alternative for midday travel reduces the need for driving and allows residents to feasibly switch from personal cars to transit and potentially shift to non-auto modes.

Environment – High Benefit

Public transportation uses less energy and emits fewer emissions that other forms of motorized transportation. Service would not require any new construction that impacts the built or natural environment. There would be no impacts on the natural or built environment.

Technology – Neutral

Likely no new technology would be employed, though future consideration could be given to using zero emission buses to provide the additional service.

Public Support – Moderate Benefit

Suggestions include improving the frequency of bus service during evening, weekends, and middle of the day in locations where people live, not on the highway. Suggestions also include improvements to bus amenities such as shelters. See Bus Stop Enhancements and Evening Transit Service Improvements.

Overarching Criteria

Economic Opportunity – High Benefit

Creates economic opportunity by making bus transit a viable mode to better access jobs or amenities in the midday hours. Makes commuting outside of traditional AM/PM peak periods easier for workers, opening up new job opportunities.

Feasibility/Complexity – High Benefit

Will provide utility and improvement to the transportation system independent of other improvements.

System Compatibility – High Benefit

Improving midday service can be done independently of other enhancements and will create benefits regardless of any other improvements.

Overall Assessment of Benefits/Impacts

Overall, improving midday service frequency has a strong benefit to the community. There are no negative impacts, and the alternatives shows medium to high benefit on nearly every screening criterion.

Order of Magnitude Cost

Improved midday service will result in an increase in operating costs for CTtransit, such as additional labor costs for bus drivers and additional vehicle operating costs (e.g., fuel, bus maintenance), due to the increased number of trips during the day. A cost estimate was developed by determining the approximate amount of additional travel time for the new trips and multiplying that by CTtransit's average operating expense per vehicle revenue hour ($136.58 for bus and $237.21 for BRT, per the National Transit Database). This process resulted in a cost estimate of about $31,000 per weekday, for an annual estimate of approximately $7.7 million (assuming 250 non-holiday weekdays). There is no expected increase in capital costs.

High Level Benefit-Cost Outlook

Additional operating costs may be partially offset by an increase in bus ridership and the attendant fare collection. The Hartford region would also achieve indirect savings by reducing VMT, thereby reducing the harm done by air pollution and vehicle crashes.

Serve Major Employment Centers

This alternative would improve bus service to the major employment centers located outside of downtown Hartford. Doing so would enable increased access to a greater number of jobs for Greater Hartford residents, providing new opportunities for low-income residents and those who are differently abled.

The primary service benefits planned for routes serving the major employment centers would be increased frequency of service, particularly outside the traditional AM and PM peak service periods. These traditional commuting periods typically have good service already, and by improving midday and evening service jobs with non-traditional work hours will be more easily accessible for current and potential bus riders.

CT*transit* currently serves all major employment centers but expanded fixed route and innovative transit services would improve access to jobs. Many of the routes suggested for improvement in the midday and evening service frequency alternatives also serve the identified employment centers. Consideration was also given to routes serving areas of mobility need and potential mobility hubs. The routes listed in Table 1 have been identified for enhanced service to the employment centers. The new trips will be concentrated in the midday (9:00am-3:00pm) and evening (6:00pm-9:00pm) service periods to provide more consistent, extended service throughout the day. This schedule will better accommodate flexible and diffuse working hours that have increased as a result of the Covid-19 pandemic.

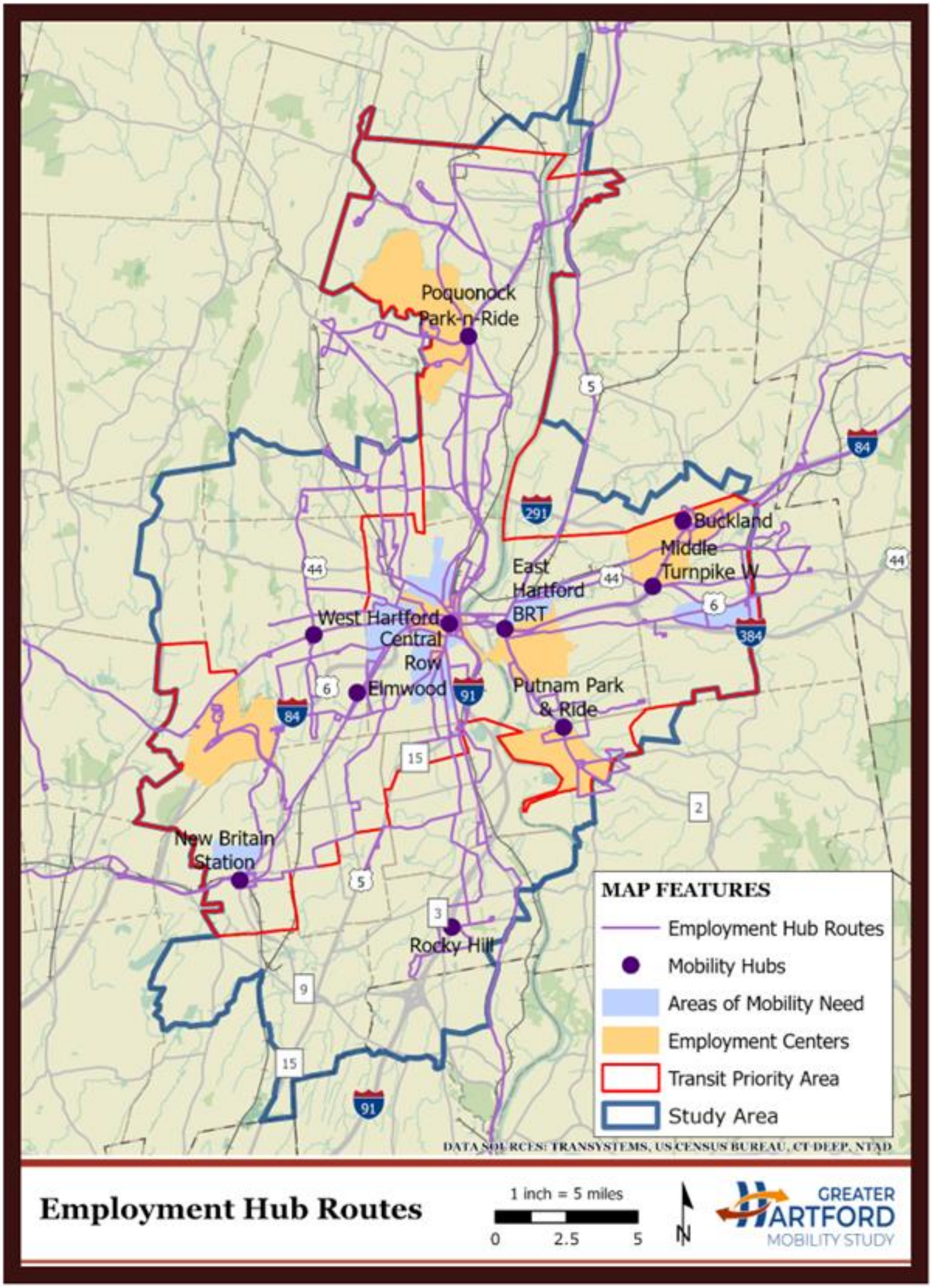
It is recommended to have a minimum of 2 trips per hour for the entire midday and evening service periods for each route. For selected routes that already have 2 trips per hour the proposed improved service level is 3 trips per hour. Two of the selected routes (905 and 34) have very minimal midday service and are therefore only suggested to move to 1 trip her hour. This policy headway approach will help standardize service for these routes and ease transfers between routes.

Other service improvements could also be in the form of micro-transit or micro-mobility services that enable easier connections from bus stops and/or mobility hubs to reach the full extent of a given employment center. Additional infrastructure improvements could include enhanced pedestrian and bicycle infrastructure, such as improved crosswalks, sidewalk connections, and bike lanes.

Employment Hub Routes for Enhanced Frequency

Employment Hub Route	Total Current Midday & Evening Trips	Increase in Midday & Evening Trips	Average Weekday Boardings
50-54	7.5	3	3,942
60-66	8	2	3,593
31-33	7	3	2,975
47	5.5	4	2,300
128	36	14	1,937
82-84	30	18	1,752
37-39	5	3	1,699
83	30	18	1,684
88	33	15	1,683
121	32	16	1,334
102	21	15	1,294
76	34	15	1,144
95	31	17	1,128
913	16	20	941
74	20	16	714
53	17	19	704
55	14	22	696
905	7	17	684
30	15	21	579
36	15	21	542
72	25	11	528
41	32	16	451
43	26	22	395
32	15	21	372
34	3	21	296

Alternative Map



Implementation Timeframe

Timeframe

This alternative would take 1-3 years to implement.

Project Development Process

Bus service improvements could have a short implementation timeline (1 to 3 years) as it would not require any capital planning or spending. The primary drivers of the timeline would include service planning and potentially hiring additional bus drivers to deliver additional fixed-route service. No major planning or design considerations are required.

The next step would be to conduct a more detailed service plan for the recommended routes. If desired, service improvements could be phased a few routes at a time, with initial implementation focused on several priority routes. This could help make implementation more feasible as staff and operating funding become available.

Phasing

Improved service to employment centers can be implemented independent of other improvements, and it would be complementary to the other options rather than competing. As there is significant overlap with the midday and evening service frequency alternatives, there would be a compounding benefit to implement this option. There are no necessary capital improvements that could conflict with infrastructure enhancements, and the moderate increase in frequency is another boost to making transit more attractive and supportive of the other transit alternatives.

For micro-transit or bike/ped improvements that will serve the major employment centers, please refer to those alternatives for implementation details.

Environmental Review

NA (Not Applicable)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

Enhanced transit service will enable shorter travel times for transit riders and increase reliability by adding additional service and decreasing wait times.

Access and Connectivity – High Benefit

This will both improve access to transportation facilities located within major employment centers and improve connectivity between compatible land uses (such as connecting areas of mobility need to job sites).

Travel Options and End User Convenience – High Benefit

Provides a redundant travel option by making the bus a more viable transportation option throughout the day and improves the travel experience by reducing wait times for bus service.

Criteria Supporting Other Study Goals

Equity – High Benefit

Creates new travel opportunities for disadvantaged populations without impacting EJ populations. By connecting with areas of mobility need and providing better service for those who cannot drive, the benefits are maximized.

Safety – Low Benefit

Minor safety improvements could be achieved by more people traveling via bus than car, thereby potentially reducing the incidence of car crashes. Further, more frequent service would reduce wait times which could have a safety and security benefit for transit riders.

Resiliency and Sustainability – Moderate Benefit

Making transit a viable alternative for commuting to work reduces the need for driving and allows residents to feasibly switch from personal cars to transit.

Environment – High Benefit

Public transportation uses less energy and emits fewer emissions that other forms of motorized transportation. Service would not require any new construction that impacts the built or natural environment. There would be no impacts on the natural or built environment.

Technology – Neutral

Likely no new technology would be employed, though future consideration could be given to using zero emission buses to provide the additional service.

Public Support – Moderate Benefit

Strong support for this alternative-policy. Comments include improved bus service on weekdays after 6:00 pm and on weekends.

Overarching Criteria

Economic Opportunity – High Benefit

Creates economic opportunity by improving transit to better access jobs in areas not as well-served by current transit options.

Feasibility/Complexity – High Benefit

No additional ROW is required to implement and operate improved service to major employment centers, and it can be done with minimal complexity.

System Compatibility – High Benefit

Improving service to major employment centers can be done independently of other enhancements and will create benefits regardless of any other improvements.

Overall Assessment of Benefits/Impacts

Overall, improving bus service to major employment centers outside downtown Hartford will have a strong benefit to the region, making the bus a more viable commuting option. There are no negative impacts, and the alternative shows moderate to high benefit on nearly every screening criterion.

Order of Magnitude Cost

Improved service to employment hubs will result in an increase in operating costs for CTtransit, such as additional labor costs for bus drivers and additional vehicle operating costs (e.g., fuel, bus maintenance), due to the increased number of trips throughout the day. A cost estimate was developed by determining the approximate amount of additional travel time for the new trips and multiplying that by CTtransit's average operating expense per vehicle revenue hour ($136.58 for bus and $237.21 for BRT, per the National Transit Database). This process resulted in a cost estimate of just over $41,000 per weekday, for an annual estimate of approximately $10.3 million (assuming 250 non-holiday weekdays). There is no expected increase in capital costs.

High Level Benefit-Cost Outlook

Additional operating costs may be partially offset by an increase in bus ridership and the attendant fare collection. The Hartford region would also achieve indirect savings by reducing VMT, thereby reducing the harm done by air pollution and vehicle crashes. Further, focusing on routes that connect people to better employment opportunities can provide a boost to the regional economy.

Mobility Hubs

Detailed Project Description

Mobility hubs are intermodal stations that provide seamless connections between bus routes and other mobility services such as micro-transit, bike share, or car share, providing comprehensive service for all throughout the region.

These hubs will allow for bus riders to complete the first or last mile portion of their journey in a convenient, equitable, and accessible manner and will extend the reach of bus service beyond walking distance.

Mobility hubs can be particularly beneficial at locations with destinations that are spread out and difficult to connect via efficient fixed-route transit, or stations at or near the end of a bus line to help extend travel options for those who cannot or choose not to use a vehicle.

In addition, there may be potential retail opportunities depending on the size and location of the hub.

The usefulness of a mobility hub will depend, in part, on which services are implemented and it may be that a mobility hub comes in a second phase of improvement as other improvements shape the needs and preferences of local transit riders.

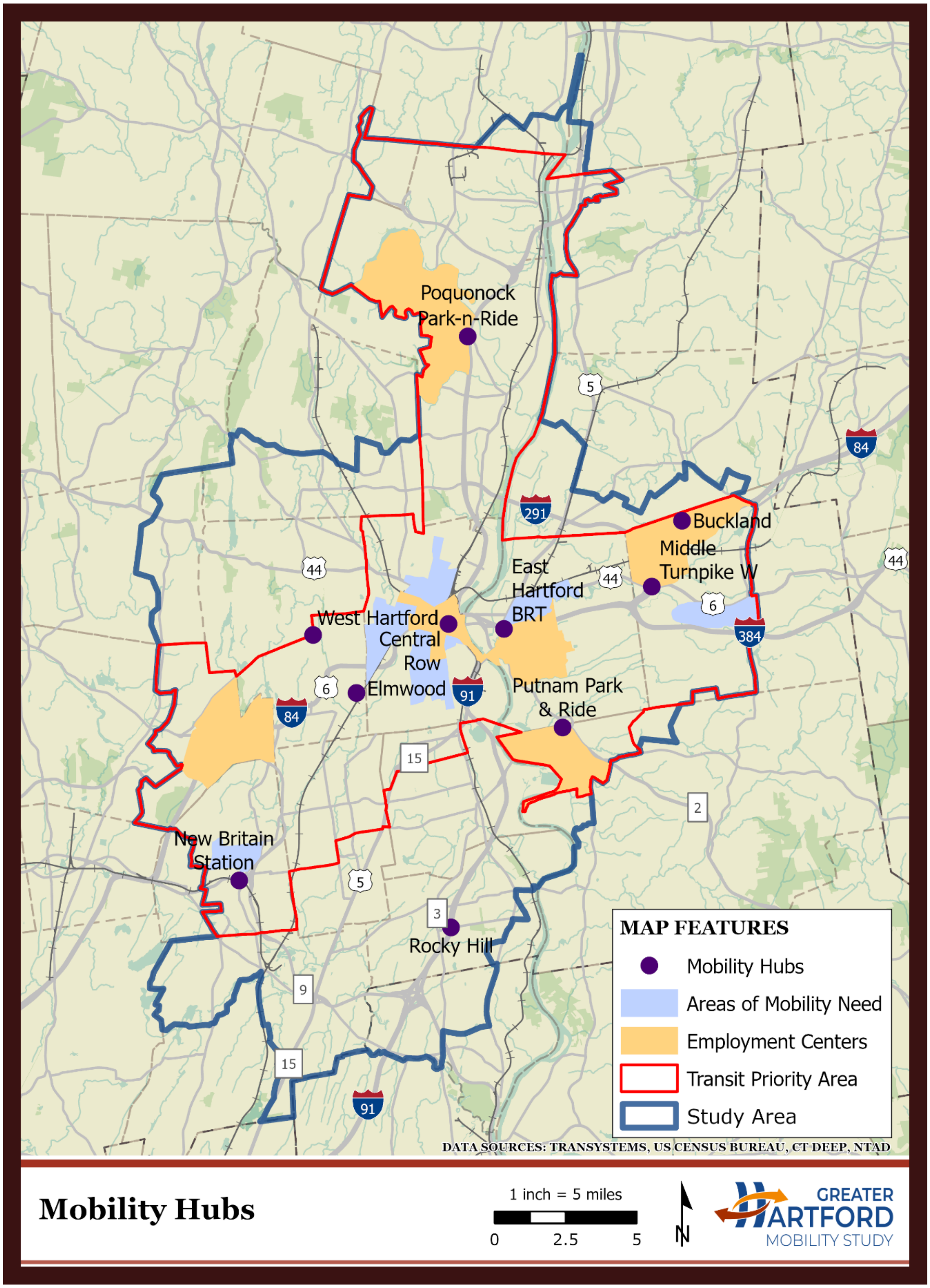
Amenities and/or services could include:

- Bike share, scooter share, and/or car share
- Connections to on-demand transit services
- Secure bike parking
- Ride hail pick-up and drop-off space
- Park & Ride facilities
- Electric vehicle charging
- Shelters or other facilities
- Clear branding, wayfinding, and real-time mobility information
- Inviting public space with lighting and safety measures
- Community amenities and integrated services such as retail, childcare, markets, etc.

Ten potential mobility hubs are proposed for the Greater Hartford area:

- Poquonock Park & Ride
- Buckland
- Rocky Hill
- Elmwood
- West Hartford
- Middle Turnpike W
- Putnam Park & Ride
- East Hartford BRT
- New Britain Station
- Central Row

Alternative Map



Implementation Timeframe

Timeframe

The mobility hubs alternative could be implemented in either the short term (1 to 3 years) or medium term (3 to 10 years), depending upon the scale and services provided. A service with a larger capital investment will take up to several years to implement if it requires designing and constructing physical infrastructure (such as a large hub serving multiple bus routes and other complementary services or requires procuring new vehicle types to run on-demand transit services). However, smaller-scale mobility hubs that integrate some combination of bike share, scooter share, and car share could be implemented in less than three years.

Project Development Process

- More detailed analysis to identify a priority hub to focus on and to determine specific modes and service characteristics to implement at that hub.
- Soliciting additional information or bids from vendors that can provide shared mobility services.
- Conduct a pilot project at a priority hub to learn more about how mobility hubs might work in Greater Hartford.

Project Phasing

Mobility hubs can be implemented independently of other improvements under consideration and still be quite useful. Depending upon the location of a hub, it may be more effective if it is paired with other transit enhancements, such as enhanced transit service and support for micro-transit and Mobility-as-a-Service (MaaS).

Environmental Review Process and Next Steps

Some locations require a Categorical Exclusion, while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

Depending upon the nature and scale of service provided at a given hub, this alternative can improve travel time and/or reliability by providing new mobility options that do not currently exist.

Access and Connectivity – High Benefit

Mobility hubs improve access to transportation services and also provide connections to key destinations that are not easily reachable via the current fixed-route transit system.

Travel Options and End User Convenience – High Benefit

Provides a redundant travel option by adding new transportation services at a hub and improves the user experience by providing seamless connections to additional mobility options that make it easier to reach one's final destination.

Criteria Supporting Other Study Goals

Equity – High Benefit

Creates new travel opportunities for disadvantaged populations without impacting EJ populations. If sited in disadvantaged communities, the benefits are maximized.

Safety – Low Benefit

Minor safety improvements could be achieved by more people traveling via alternative modes of transport, such as bus or bike, thereby potentially reducing the incidence of car crashes. More activity at the hubs will also help to create a safer environment around these stations.

Resiliency and Sustainability – Moderate Benefit

The addition of new shared mobility services provides an alternative to driving and helps to make transit a more viable travel alternative, thereby reducing the need for driving and allowing residents to feasibly switch from personal cars to transit which could reduce regional VMT.

Environment - High

Improvements would largely be within the public right-of-way with little to no acquisition of property outside the right-of-way required. Public transportation and other shared mobility services use less energy and emit fewer emissions that other forms of motorized transportation. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Moderate

New technology could be employed through MaaS to enhance and simplify the user experience in traveling via multiple modes of transit.

Public Support - Moderate

Overall support for this idea. Suggestions include incorporating safe bicycle and pedestrian improvements, and priority over first-mile/last-mile connections.

Overarching Criteria

Economic Opportunity - High

Creates economic opportunity by providing additional travel modes and improved connections to better access jobs or amenities in areas not well-served by nearby bus stops. Larger mobility hubs may provide opportunities for additional development or retail/commercial prospects.

Feasibility/Complexity - Neutral

Standard complexity and feasibility. May require a small amount of additional ROW depending upon the nature of services offered at a given hub.

System Compatibility - High

Mobility hubs will provide utility and improvement to the transportation system independent of other improvements. However, they will also help support enhancements to other services such as bus transit.

Overall Assessment of Benefits/Impacts

Mobility hubs will provide utility and improvement to the transportation system independent of other improvements. However, they will also help support enhancements to other services such as bus transit.

Order of Magnitude Cost

The cost to implement and maintain a mobility hub will vary substantially based upon the size of the hub and the services offered. In Kansas City, the Mid-America Regional Council produced the Smart Moves 3.0 regional plan that developed several mobility hub typologies and associated cost estimates. These estimates ranged from $250,000 for a local hub on the outer fringe of the metro area to $10,000,000 for a destination hub downtown, as shown the table below. Some hubs may cost more if they are incorporating larger features such as a parking garage or residential or commercial development. Costs in Greater Hartford will likely be higher due to inflation and higher costs in the Northeast relative to the Midwest.

Mobility Hub Capital Cost Estimates for Kansas City (Smart Moves 3.0)

Mobility Hub Type	CBD	Urban Core	Urban Edge	Suburban		Outer Fringe	
				w/ Park-n-Ride	w/o Park-n-Ride	w/ Transit Connection	w/o Transit Connection
Destination	$10M	$8M	$5M	$2M	N/A	N/A	N/A
Junction	N/A	$6M	$3M	$1.5M	N/A	N/A	N/A
Gateway	N/A	N/A	$2M	$1M	$500K	N/A	N/A
Local	N/A	N/A	N/A	N/A	N/A	$500K	$250K

Source: http://www.kcsmartmoves.org/

High Level Benefit-Cost Outlook

The cost-benefit outlook will vary depending upon the type of mobility hub and services offered. Overall, however, the costs for many hub types are favorable compared to the new services offered. This may particularly be if hubs are built as part of other projects and leverage new development. The Hartford region would also achieve indirect savings by reducing VMTs, thereby reducing the harm done by air pollution and vehicle crashes.

Enhance Bus Stop Amenities

Detailed Project Description

Introduction/General Characteristics

In order to improve the user experience for those utilizing the Hartford region's bus transit system, and in accordance with the support for improved bus stop amenities in CRCOG's *Comprehensive Transit Service Analysis*, the Greater Hartford Transit District (GHTD) recently began a Bus Shelter Enhancement Program to improve bus stops at major destinations and transfer points. This alternative supports the implementation of this program. An initial enhancement for standard bus stops, identified only with signage, would be to construct shelters at priority locations, with a program designated to add shelters to other stops as needed. For stops that already feature shelters, there are potential opportunities to upgrade these stops further. There are many features that could enhance these improved shelters beyond standard bus stop signage and standalone shelters. These enhancements could include, but are not limited to, elements such as seating, lighting, real-time transit information, green roofs, solar panels and solar glass, heated sidewalks, USB charging, hand sanitizer, Amazon package drop off boxes, bike repair tools, and other amenities. These amenities can help customers feel safer and more comfortable while waiting for the bus and vastly improve the user experience. Many of these features are particularly important to those riders who are differently abled. These features can also encourage those who were uncomfortable using bus stops under existing conditions to use the system by providing an environment that is welcoming, comfortable, and accessible.

Potential Locations for Enhanced Facilities

The top 20 locations that already feature existing shelters were identified. These stops could be candidates for enhanced facilities that were already deemed candidates for implementation of bus stop shelters. While these stops already feature shelters and benches, their high ridership levels (based on pre-COVID numbers) and early investment in bus infrastructure warrant consideration for advanced amenities such as real time bus information, heating components, enhanced lighting, and landscape improvements to improve the comfortability and customer satisfaction of these station. The list below includes the highest ridership locations around the Hartford region that already have shelters and could warrant further investment. This list does not include CT*fastrak* stations, which feature some of the most advanced enhancements and amenities in the system.

Stop	Ridership (Oct. 2019)	Stop	Ridership
Main St. & 750 Main St	132,358	Park St. & Washington St.	16,453
Main & Travelers	96,746	Asylum St. & Trumbull St.	15,938
Main St. & Asylum St.	90,462	Main St. & Bushnell Plaza	15,683
Market St. & Constitution Plaza	73,889	Buckland & Buckland Park & Ride Stop A	12,892
Central Row & O S H	64,378	Pearl St. & Lewis St.	12,405
Main St. & Gold St.	49,732	Connecticut Blvd. & Main St.	12,104
Main St. & Pearl St.	47,093	Asylum St. & Opp Union Pl.	11,660
Central Row & Travelers	35,379	Park St. & Broad St	10,746
Westfarms Mall & Macy's	27,309	State St. & The Phoenix	10,116
Albany Ave. & Garden St.	20,226	Market St. & Talcott St.	9,386

Potential Locations for Initial New Shelters

In order to identify potential bus stop locations for new, improved amenities, locations with existing bus stop shelters and other expanded features were identified and filtered out. To ensure financial responsibility and ensure a return on investment, bus stops were sorted based on expected daily riders. By implementing improvements at stops which exhibit high ridership, the benefits will be more widely seen and could encourage support for improvements at lesser utilized locations, albeit those that would also benefit from improved amenities. The table below lists the Top 20 stop locations in terms of ridership that do not already have some sort of shelter infrastructure present.

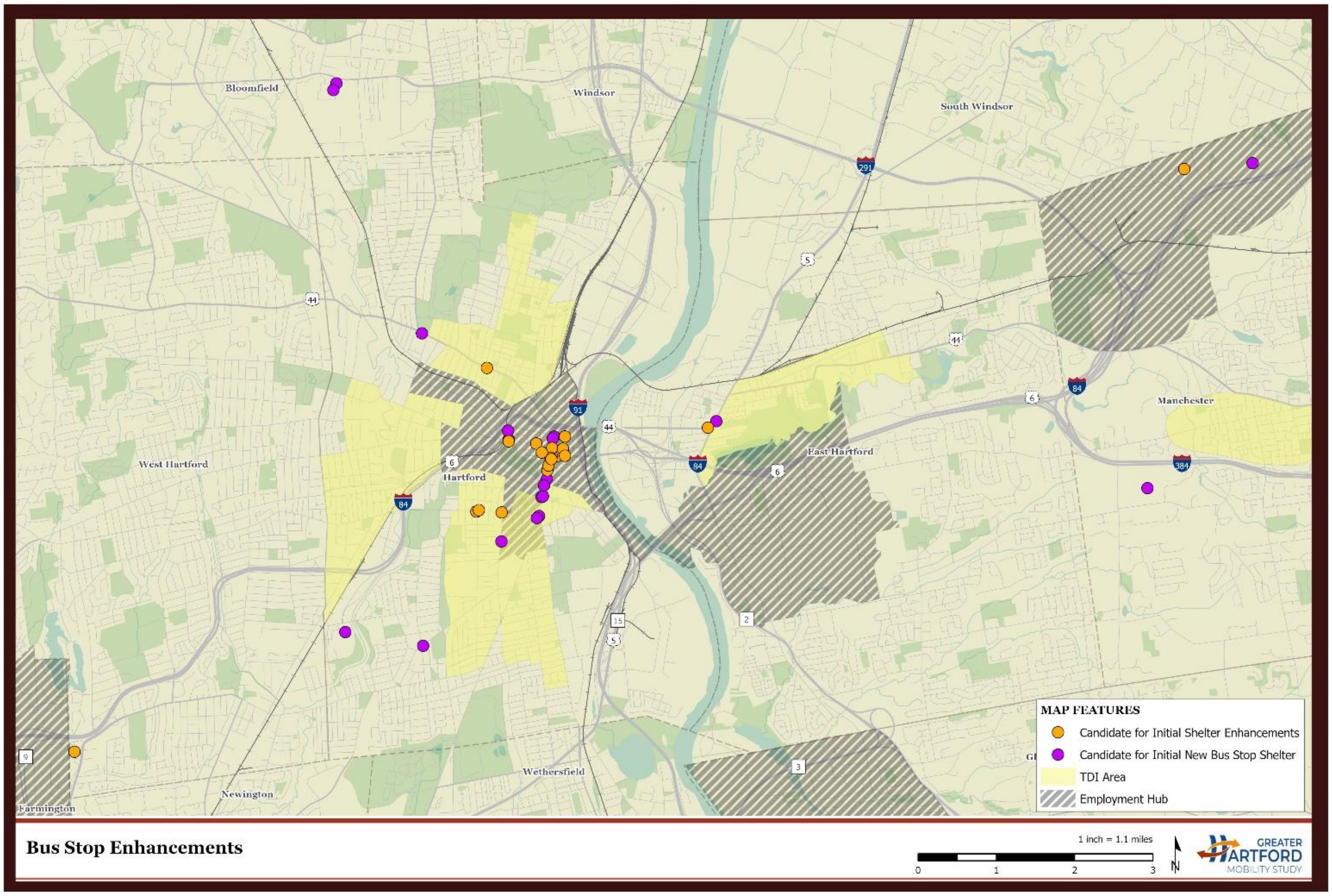
Stop Location	Ridership (Oct. 2019)	Recommendation
Main St. & Pratt St. (Hartford)	58,391	Add shelter and enhancements.
Main St. & Opp Church St.	30,389	Existing ROW may be insufficient for enhanced infrastructure.
Main St. & Park St.	26,656	Add shelter and enhancements.
Buckland Mall & Pavilion Dr.	18,788	Coordinate with Buckland Hills Mall to improve existing stop, including shelter and other amenities.
Manchester Community College	14,925	Add shelter and enhancements.
McDonald's & Copaco (Bloomfield)	12,284	Add shelter and enhancements.
Stop & Shop & Copaco (Bloomfield)	11,445	Largely covered from elements by existing infrastructure on private property – no implementation recommended.
Main St. & Charter Oak Ave.	9,332	Add shelter and enhancements.
Main St. & Arch St.	8,314	Add shelter and enhancements.
Charter Oak Market & Wal-Mart	8,250	Existing infrastructure for an adjacent stop could be expanded and improved to provide coverage for both stops.
Main St. & Buckingham St.	8,171	Existing ROW appears to be insufficient to support expanded infrastructure.
Union Pl. & Church St.	7,691	Located adjacent to Union Station, recommend focus improvements elsewhere.
Storrs Rd. & Whitney Hall	7,567	Mirror shelter from paired stop and perhaps expand amenities such as heating or RTS. Would require coordination with UConn.
Albany Ave. & 1229 Albany Ave.	7,204	Limited ROW due to building frontage – investigate feasibility of adding a shelter in buffer area.
Main St. & Linden Pl.	6,994	Add shelter and enhancements.
Asylum St. & Union Pl.	6,871	Located proximate to Union Station – may provide sufficient amenities in proximity, though distance may warrant consideration.
New Britain Ave. & Hillside Ave.	6,552	Limited ROW availability due to proximate businesses. May have to relocate stop or work with property owners to implement.
Main St. & Save A Lot	6,430	Existing benches could be supplemented with a shelter and other amenities.
Park St. & Main St.	6,260	A desktop review yielded uncertain results as to if this location has the ROW availability to support transit improvements. Latest imagery shows ongoing/recent construction adjacent to the stop. Could benefit from improvements at Park & Main (above).
Washington St & Opp Lincoln St.	6,230	Add shelter and enhancements.

Other Considerations

While the locations listed above were identified primarily based on ridership, other locations could warrant investigation for improved transit amenities. As mentioned previously, CTDOT is investigating and implementing improvements at major destinations and transfer hubs, and these locations could be supplemented based on community driven factors and input from riders in the coming years. In this way, the bus system in the region can better serve its customers and provide a welcoming, safe, and comfortable environment for all users.

Alternative Map

The concept map below outlines the location of the 20 potential initial stops for each 1) a potential new shelter (purple), or 2) enhancements to an existing shelter (orange).



Implementation Timeframe

Timeframe

Implementation of bus stop enhancements would be a short-term (1-3) alternative, depending upon the complexity of enhancements to be implemented. Minimal environmental effort is expected. For example, a new shelter, benches, and other enhancements at a bus stop without existing infrastructure would require a longer design timeline than retrofitting a station with an existing shelter and other amenities with landscaping, technology, or other improvements.

Project Development Process

The alternative would require action from CT*transit* with the likely first steps being the creation of an implementation plan for each site and the enhancements presented.

Project Phasing

Enhancements could be implemented in phases, beginning with initial high priority, high ridership locations, culminating with regional stops with fewer riders and fewer demand for improvements. These improvements could also be complementary of other alternatives, including improving stops on a transit priority corridor, implementation of crosstown routes, or improving access to major employment centers. These improvements could be coordinated as part of these other improvement processes. A standard could also be established for any new stops moving forward, that certain enhanced features must be included in initial design.

Environmental Review Process and Next Steps

Not Applicable (NA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

The potential enhancements and improvements would occur at existing bus stop locations and as such, would not impact the efficiency of mobility in the region, with no expected benefits or impacts to travel time or reliability of the bus system.

Access and Connectivity – Moderate Benefit

Bus stop enhancements would improve access to transportation facilities by making existing bus stops more accessible, comfortable, and safe. While it is anticipated that no connectivity benefits will be realized, the improved access to high quality stops will provide a moderate benefit to the system overall.

Travel Options and End User Convenience – Moderate Benefit

Implementation of stop enhancements will improve the end user travel experience for riders utilizing the high ridership locations (as well as other stops in the future) and make bus connections more comfortable and convenient for all users.

Criteria Supporting Other Study Goals

Equity – High Benefit

Many of the locations slated for bus stop enhancements are in known disadvantaged communities. Implementation of these enhancements would directly improve the user experience of these community members. There are no expected adverse impacts to environmental justice communities, and the proposed enhancements will improve existing infrastructure.

Safety – Low Benefit

While not the primary benefit of bus stop enhancements, safety benefits can certainly be achieved by improved infrastructure. Adding shelters and other dedicated infrastructure for those waiting for the bus would delineate a clear stop waiting area and would protect riders from elements such as wind and precipitation.

Resiliency and Sustainability – Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including public transit, walking, and bicycling.

Environment – Moderate Benefit

Depending on the location, an enhanced bus facility could result in minor but mitigable impacts to resources within the project corridor. The alternative may require additional space outside the street right-of-way for additional amenities. The potential impacts would offset by supporting alternative modes of transportation. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Moderate Benefit

Implementation of bus stop enhancements could provide the opportunity for increased technology at bus stops in the region in the future. As an initial basis for future advanced technology, real-time bus information and up to date bus status updates could be implemented at high ridership locations and would pave the way for increased coordination in the future.

Public Support – High Benefit

Comments suggest there is a strong need for bus stop enhancements. The main desire is for bus shelter improvements to protect people from snow and rain elements. Participants suggested the following:

- Wood composite to keep rain and snow elements out.
- Heated bus shelters – concern for commuters waiting during the snow or weather.
- More accessibility for the disabled.
- Real time bus schedule.

Overarching Criteria

Economic Opportunity – Neutral

There are no significant expected benefits or negative impacts to economic opportunity associated with implementation of improved bus stop infrastructure. However, digital advertising could potentially be integrated at enhanced stops and help to offset bus stop maintenance costs.

Feasibility/Complexity – High Benefit

Implementation of bus stop enhancements can be modeled after existing enhancements elsewhere in the system and other model improvements, requiring minimal complexity with high engineering feasibility. It is expected that ROW takings would be minimal at most locations, and where they would be required would have few to no negative impacts on surrounding land uses.

System Compatibility – High Benefit

Bus stop enhancements can roll out in waves and be utilized by many different routes and service types across the region. Enhanced bus stop infrastructure improves the overall quality of the system and can support improved service and provide comfortability and safety across the system.

Overall Assessment of Benefits/Impacts

Overall, implementing bus stop enhancements will have a moderate to high positive impact on mobility in the greater Hartford region. There are minimal, if any, negative impacts associated with enhanced bus stop infrastructure outside of potential small scale ROW impacts. Implementation of enhancements at initial key stops with high ridership would pave the way and set the standard for other stops moving forward in terms of comfortability, safety, and efficiency, creating a high-quality transit system that serves customers regionwide.

Order of Magnitude Cost

It is estimated that bus stop enhancements would be a relatively low overall cost when compared to other alternatives. A recent CRCOG study estimated that bus stop costs could range anywhere from $22,000 to $80,000 per unit depending on the type and complexity of the stop. Additional amenities would alter the cost depending on the types of features that are included. A 'worst case' assumption for the initial 40 stops identified would be $3.2 million for the 20 new shelters and 20 enhanced shelter amenities mentioned previously.

High Level Benefit-Cost Outlook

The relatively low overall cost and moderate to high benefits associated with the improvements, as well as the capacity to tailor enhancement implementation on a case-by-case basis, poses a high benefit to cost outlook. Ultimately, it is anticipated that the benefits would exceed the costs associated with this alternative.

Provide Transit Priority Infrastructure

Detailed Project Description

In 2017, the Capitol Region Council of Governments (CRCOG), in coordination with the Connecticut Department of Transportation (CTDOT) and CT*transit*, completed a *Comprehensive Service Analysis* (CSA). The resulting *Metro Hartford RapidRoutes Transit Priority Corridors Study* recommended that infrastructure improvements be made in six major transit corridors to make service faster, more reliable, and more convenient and comfortable.

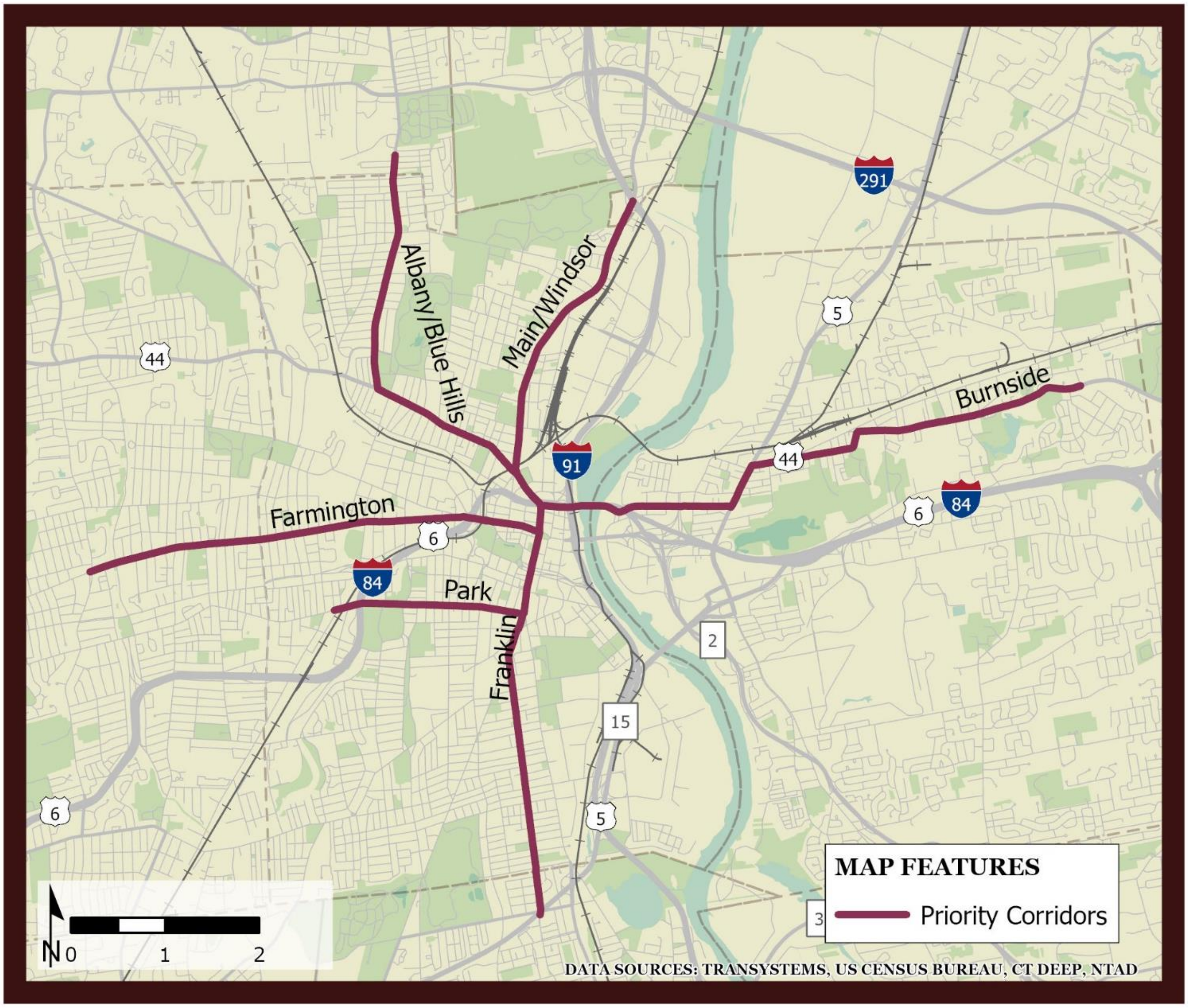
Proposed Transit Priority Corridors

- Albany Avenue/Blue Hills Avenue in Hartford and Bloomfield
- Burnside Avenue in East Hartford
- Farmington Avenue in Hartford and West Hartford)
- Franklin Avenue in Hartford and Wethersfield
- Main Street/Windsor Avenue in Hartford
- Park Street in Hartford
- Thirty-four exiting bus routes operate in these six Transit Priority Corridors.

Infrastructure Improvements

- High quality bus stations/bus stops with shelters and access enhancements for the disabled. Level boarding at bus stops would improve access for riders with disabilities and reduce dwell times. Offboard fare collection would further reduce dwell time and facilitate all-door boarding. Real-Time Passenger Information (RTPI) signs at stations would provide passengers at stations with wait-times. Areas surrounding these bus stops would have improved sidewalks and bike lanes for improved access.
- Bus stop spacing optimization would improve ridership by placing stops in more convenient locations and improve bus travel times by improving spacing between stops.
- Transit signal priority (TSP) would reduce traffic signal bus delays by either truncating the red-light time or extending the green time when a bus is approaching an intersection.
- Bus-only lanes and Business Access and Transit (BAT) lanes would separate buses from delays associated with general traffic congestion, improving transit speed and reliability. Three main types of bus-only lanes include median (center running), curbside, and offset (adjacent to a parking lane). In suburban commercial environments with a high density of driveways other vehicles are permitted to use curbside BAT lanes to access businesses. Additionally, queue jumps and short segments of bus-only lanes may be used at intersection approaches to bypass general traffic. These treatments are proposed in some locations on all corridors except Park Street.

Alternative Map



Transit Improvement Corridors

Albany Avenue/Blue Hills Avenue

- The Albany Avenue/Blue Hills Avenue corridor is three miles long and runs from Main Street in Hartford to the intersection of Blue Hills Avenue and Brookline Avenue at the Bloomfield border. The corridor is served by up to six bus routes that serve over 5,800 passengers per weekday.
- The corridor has 58 total stops: averaging 10 stops per mile, contributing to slow bus speeds.
- AM peak period headways are 10 minutes or less.
- Stops along Blue Hills Avenue have minimal amenities, often with only a bus stop sign or a bus stop sign and a shelter.
- Recently installed curb extensions at Albany Avenue crossings limit the potential for bus queue jump lanes and curbside running bus lanes.
- The corridor has 19 signalized intersections.
- The PM peak is congested with traffic operating at LOS D in both directions.

Burnside Avenue

The Burnside Avenue corridor runs 4.6 miles from Market Street in downtown Hartford to the intersection of Burnside Avenue and Mary Street in East Hartford. The corridor is served by 10 bus routes that serve over 6,100 passengers per weekday.

- The corridor has 70 total stops: an average of 11 stops per mile, contributing to slow bus speeds.
- AM peak period headways are 15 minutes or less.
- Most bus stops have only a bus stop sign.
- High potential feasibility for bus lanes on western half (Connecticut Boulevard, Main Street).
- Bus lanes on Burnside Avenue would require the removal of curbside parking.
- Closely spaced intersections on Connecticut Boulevard / Main Street and clustered intersections on Burnside Avenue may benefit from TSP.
- The corridor has 16 signalized intersections.
- The PM peak is congested with traffic operating at LOS D in both directions.

Farmington Avenue

- The Farmington Avenue corridor runs almost four miles from the intersection of Main Street and Asylum Street in Hartford to the intersection of Main Street and Farmington Avenue in West Hartford. The corridor is served by seven bus routes that serve over 5,200 passengers per weekday.
- AM peak period headways are 8 minutes or less.
- Bus speeds are moderate across corridor.
- There are 64 total bus stops with an average spacing of eight stops per mile.
- Farmington Avenue has more bus shelters throughout the corridor than any of the other corridors examined in this study. However, the shelters vary widely in size, material color, roof type, and many shelters have been vandalized with graffiti.
- Two travel lanes in both directions east of Sigourney Street provide potential opportunities for queue jump lanes and bus lanes.
- Segments west of Sigourney Street have one travel lane per direction, which limits bus lane potential Curbside running bus lanes and/or queue jump lanes would generally require parking restrictions.
- The corridor has 21 signalized intersections.
- Traffic is generally slowest throughout the corridor in the midday and evening peak hours and lighter in the morning.

Franklin Avenue

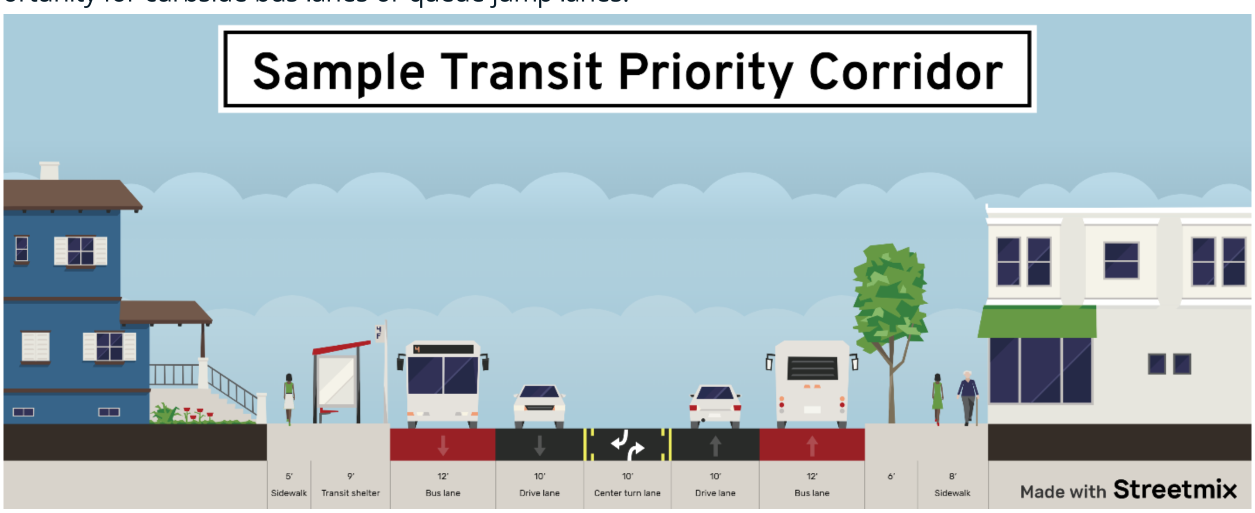
- The Franklin Avenue corridor runs three miles from the intersection of Main Street and Asylum Street in Hartford to the intersection of Wolcott Hill Road and Jordan Lane at the Wethersfield border. The corridor is served by 10 bus routes that serve nearly 6,000 passengers per weekday.
- AM peak period headways are 8 minutes or less with headways as low as 2 minutes in the busiest segment.
- The corridor has 48 total stops, averaging 10 stops per mile, contributing to slow bus speeds.
- Franklin Avenue has the fewest shelters among all corridors; there are no shelters between Capitol Avenue and Jordan Lane.
- Franklin Avenue is predominantly one travel lane per direction; curbside bus lanes and/or queue jump lanes would generally require peak period parking restrictions or parking removal.
- Main Street north of Jefferson Street to/from downtown Hartford has two travel lanes per direction, which presents opportunities for bus lanes and queue jump lanes without displacing curbside parking.
- Traffic is generally slowest throughout the corridor in the midday and evening peak hours and lighter in the morning.
- The corridor has 16 signalized intersections.

Main Street

- The Main Street corridor runs 3.5 miles from Asylum Street in downtown Hartford to I-91 in Windsor. The corridor is primarily served by six bus routes that transport over 7,600 passengers per weekday.
- AM peak period headways are 20 minutes or less.
- Bus speeds range from fast to slow, with speeds reducing based on proximity to downtown.
- The corridor has 52 total stops: averaging seven stops per mile.
- Some bus shelters are new, and some appear slightly outdated. There is a long segment of the corridor with no bus shelters from Pleasant Street to Cleveland Avenue.
- Most of the Main Street corridor has two travel lanes per direction, which presents opportunities for bus lanes and queue jump lanes without displacing curbside parking.
- The corridor has 20 signalized intersections.

Park Street

- The Park Street corridor runs 1.5 miles through Hartford between Main Street and Orange Street. The corridor is served by two bus routes that serve around 2,700 passengers per weekday.
- AM peak period headways are 10 minutes.
- The corridor has 27 total stops that are closely spaced at nine stops per mile.
- There is a new shelter in excellent condition that connects to the CTfastrak Parkville Station, but many shelters have been vandalized with graffiti.
- Park Street has one travel lane per direction with on-street parking; curbside bus lanes and/or queue jump lanes would require peak period parking restrictions or parking removal.
- Existing curb extensions are present at crosswalks along most of the western half of Park Street and would limit opportunity for curbside bus lanes or queue jump lanes.



Implementation Timeframe

Timeframe

This alternative could have a short implementation timeline of one to three years depending on the treatment.

Project Development Process

The primary drivers of the timeline would include service planning, signal design, and civil design of bus-only lanes. Implementation of bus-only lanes once designed can be done fast when no additional right-of-way is required. Removal of closely spaced bus stops could be done quickly once appropriate locations have been determined. TSP generally requires additional hardware to be added to traffic signals, but the construction can be done in less than 18 months.

Designing, placing, and constructing a uniform systemwide bus shelter program may take up to three years for planning, design, and construction.

Project Phasing

This alternative can be completed in phases of independent utility based upon each corridor and further segmented with independent utility upon further design and construction phasing.

Environmental Review Process and Next Steps

Some locations require a Categorical Exclusion, while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

This alternative improves speed and reliability as shown in the table below. Additionally, all segments with bus-only lanes would be very reliable as general traffic congestion would be separated from bus routes.

Proposed Infrastructure Improvements

Treatment	**Speed Increase**
Transit signal priority	**8%-40%**
Bus-only lanes	**12%-23%**
Stop optimization	**2%-6%**
Level boarding	**1%**

Source: Survey Conducted by Nelson\Nygaard, via CRCOG's Transit Priority Corridors Study

Access and Connectivity – High Benefit

Improved bus service expands access to a key transportation service as well as providing better connections to key destinations. While bus stop optimization may result in fewer bus stops and longer walking access times for some riders, the overall improvement in service offsets the stop reduction with improved bus travel times. These improved travel times and service reliability leads to transit service that more quickly travels to key connection points and accesses important destinations. Further, bus stop optimization would only occur where appropriate, such as stops with very low ridership or unsupportive surrounding land use.

Travel Options and End User Convenience – High Benefit

Provides a redundant travel option by making the bus a viable travel option and improves the user experience by significantly reducing wait times and increasing comfort. Improved amenities at transit stops (such as lighting, benches, bus shelters, and RTPI signs) have been shown to improve user experience by reducing perceived wait times.

Criteria Supporting Other Study Goals

Equity – High Benefit

Creates new travel opportunities for disadvantaged populations without impacting EJ communities.

Safety – High Benefit

Amenities at bus stops such as shelters and illumination have demonstrated benefits for reducing crime at or near bus stops. Bus-only lanes would minimize conflicts with general traffic vehicles. Improved bicycle and pedestrian amenities would increase visibility and safety.

Resiliency and Sustainability – High Benefit

Making transit a viable alternative allows residents to feasibly switch from auto to transit which is a more sustainable mode of transportation and could support reductions in VMT.

Environment – High Benefit

The proposed routes are located within the City of Hartford which has a minor presence of natural resources and a moderate presence of built resources. There is a moderate presence of minority and disadvantaged populations within the City. Most improvements would occur within existing rights-of-ways. Public transportation uses less energy and emits fewer emissions than other forms of motorized transportation. Service would not require any new construction that impacts the environment. There would be no impacts on the natural or built environment.

Technology – Moderate Benefit

Buses would use TSP where feasible; GPS bus tracking could provide apps and RTPI signs at stations to provide passengers with wait-time information. Based on the timeframe of the project, buses would likely be fully electric for the corridor.

Public Support – Moderate Benefit

There is general support for this alternative with lots of suggestions regarding how the alternative should evolve. Participants noted that a history of poor traffic enforcement may impact implementation. There were also suggestions regarding how bus could be incorporated into the existing fabric.

Overarching Criteria

Economic Opportunity – High Benefit

Creates economic opportunity by making bus transit a viable mode to better access jobs or amenities. This makes it easier for residents obtain good jobs and provides a boost to the overall economy by helping people become more fully employed and providing them with greater spending power.

Feasibility/Complexity – High Benefit

Will provide utility and improvement to the transportation system independent of other improvements.

System Compatibility – High Benefit

The various infrastructure improvements can be implemented independently of other enhancements and will create benefits regardless of any other improvements.

Overall Assessment of Benefits/Impacts

Overall, providing transit priority infrastructure has a strong benefit to the community. There are no negative impacts, and the alternatives shows medium to high benefit on nearly every screening criterion.

Order of Magnitude Cost

The May 2022 CRCOG report using a combination of recent costs incurred by CT*transit*, CDOT, other transit systems, and the specific treatments and elements, capital costs, in 2022 dollars, would be approximately $36.4 million. Costs would include:

- Bus Stops: There would be 189 total bus stops in the six corridors, which will be a combination of Signature Stops, Enhanced Stops, Regular Stops, and Basic Stops.
- Transit Signal Priority: TSP would be installed at 106 intersections. Some additional CT*transit* buses may need to be fitted with emitters to trigger the TSP.
- Bus-only Lanes: A total of 12.5 miles of bus lanes would be developed in five of the six corridors. These will include curbside and offset bus lanes, bus-bike lanes, queue jumps.

High Level Benefit-Cost Outlook

Additional operating costs may be partially offset by an increase in bus ridership and the attendant fare collection. The Hartford region would also achieve indirect savings by reducing VMTs, thereby reducing the harm done by air pollution and vehicle crashes.

Bus Rapid Transit (BRT) Expansion: Griffin Corridor

Detailed Project Description

The Griffin Corridor BRT alternative would link downtown Hartford and the Albany Avenue neighborhood with the University of Hartford, the employment center along Day Hill Road, and Bradley International Airport.

Any planning process to fund transit improvements in the Griffin corridor would likely include rail and bus alternatives. The ROW is generally 60 to 80 feet wide which would allow both a transit alternative and a mixed-use trail. It may not accommodate a transit alternative, freight rail tracks, and a mixed-use trail altogether, however. There are several locations where the ROW is even more constrained, and it may be difficult to overcome these situations.

The alternative provides fast new connections between low income and minority neighborhoods in Hartford and suburban jobs.

Connecting to the proposed Mobility Hub at the Poquonock Park & Ride could be a way to serve some of the various employers strung along Day Hill Road and thereby reduce the number of stops on this segment.

The busway section of the BRT route would be equipped for automated operation to test and implement innovative new technologies.

Proposed Route

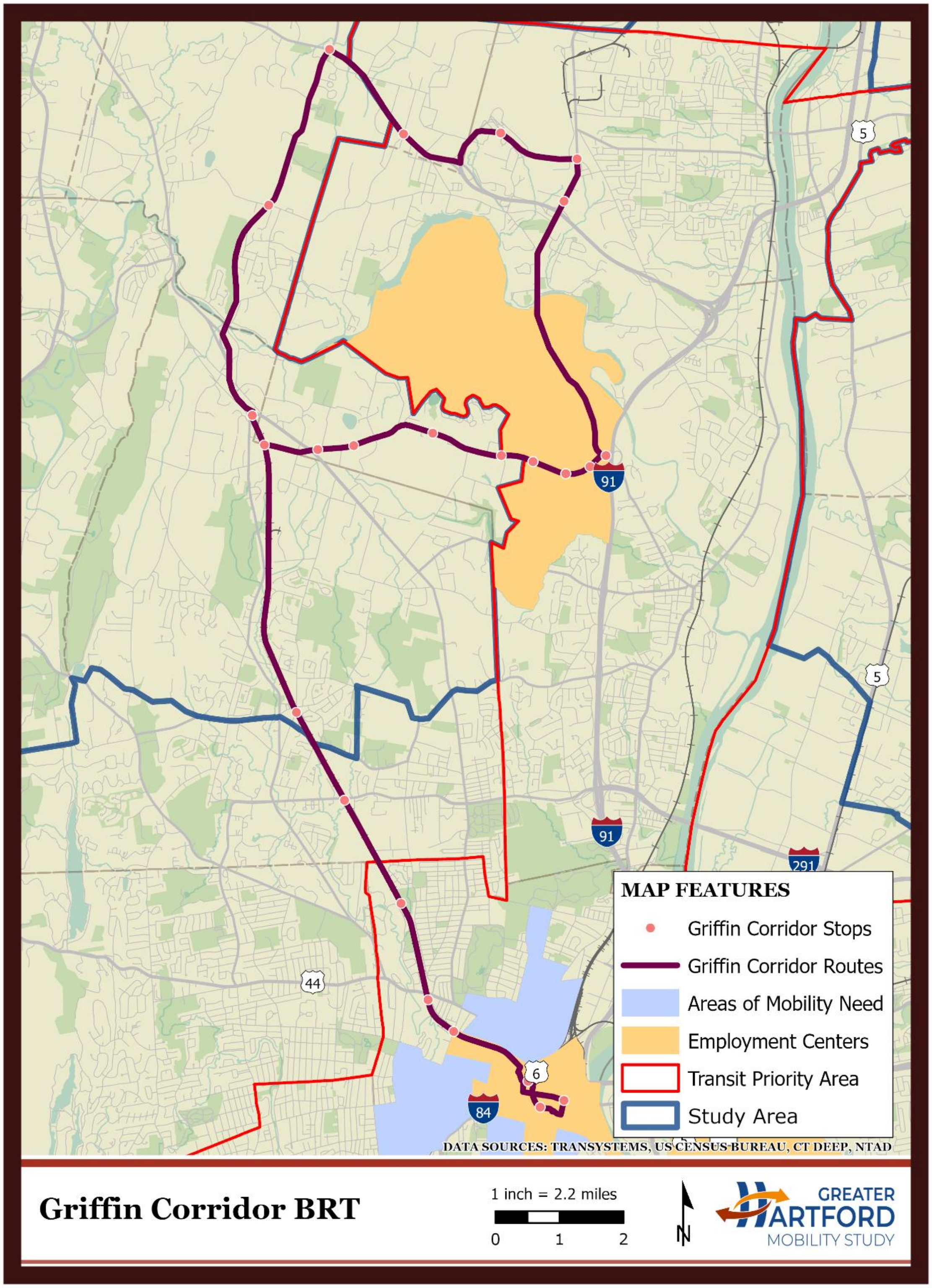
- The route would travel to/from Downtown Hartford, using the Griffin rail corridor to connect with the employment centers along Day Hill Road and onto Bradley International Airport.
- The Griffin corridor busway has its northern terminus between Day Hill Road and Blue Hills Avenue. Service north of this point would travel on-street.
- In Downtown Hartford, the route would travel along the existing CTfastrak route.
- An alternative to the northern loop may be service along Day Hill Road and Poquonock Avenue, skipping stops at Seymour Road and East Granby Town Center.
- The busway would be built to a similar design as the Hartford to New Britain busway, including a two-lane, two-way bus only roadway, a mixed-use trail, and the existing Griffin freight rail line.
- The length of the busway portion of the route would be approximately 8.5 miles.

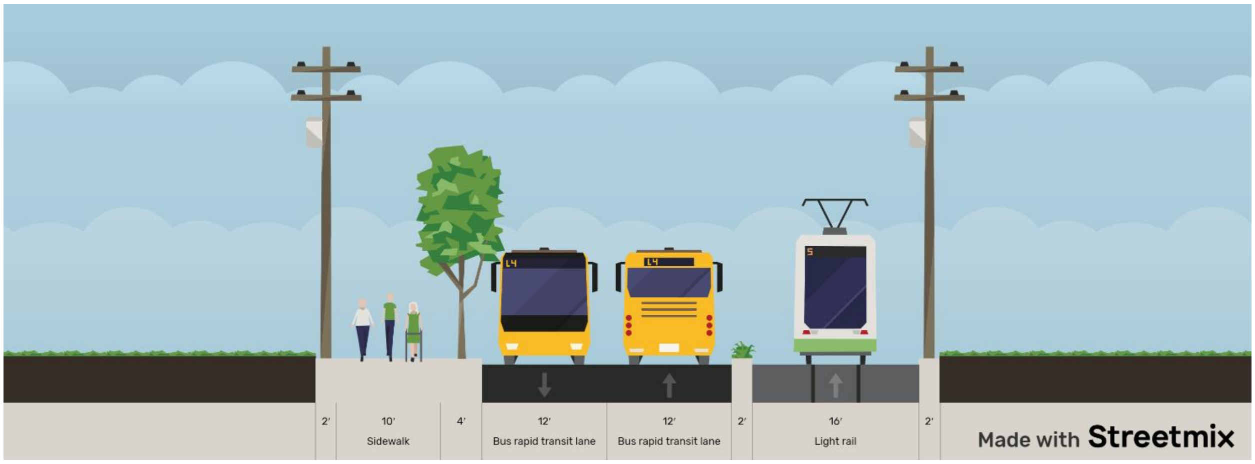
Station Determination

Potential BRT stations were determined by reviewing the proposed BRT corridor for:

- Transit connections
- Key activity centers and job hubs
- Population density and TDI
- Major roads and Park & Ride potential
- Existing ridership

Alternative Map





The following assumptions were considered for creating the cross-section:

- The ROW varies along the corridor, but the average was approximately 60', therefore that is used here.
- Utility lines are present along most of the corridor so 2' is allocated on each side to account for that needed space.
- 10' is standard width for a mixed-use trail.
- Included a 4' planting buffer between the trail and the buses and a 2' buffer between the BRT and train ROWs. The dedicated ROW for the existing track is at the bare minimum approximately 16' to fit within the 60' width. This may be narrower than applicable standards and needs to be confirmed.

Proposed Stations

Downtown Hartford

- Downtown job hub and activity center
- Connections to multiple bus routes

Bushnell Park

- Downtown job hub and activity center
- Connections to multiple bus routes

Hartford Union Station

- Downtown job hub and activity center
- Connections to multiple other transit routes, including the Hartford Line and Amtrak services

Woodland Street

- Near Saint Francis hospital
- Moderate to High TDI and population density
- Nearby somewhat dense residential (Hartford Housing Authority, some apartments, closely spaced single family homes)
- Connects with local bus routes 74 and 76

Albany Avenue

- Moderate to High TDI and population density
- Major cross street
- Adjacent to Handel Performing Arts Center
- Nearby somewhat dense residential (closely spaced single family homes, some apartments to the north)
- Connects with local bus routes 56, 58, 74

University of Hartford

- Tower Avenue
- Moderate to High TDI
- Moderate population density
- Near campus housing and walking connection to the heart of campus
- Adjacent to Weaver High School and near University High School of Science and Engineering

Cottage Grove Road (Hwy 218)

- Several medical and lab facilities nearby
- Low to Moderate TDI
- Major cross street
- Connects with local bus route 50 and CTfastrak route 153
- May have Park & Ride potential, though this would require significant tree removal

Wintonbury Mall

- Large shopping destination
- Connects with local bus routes 50, 56
- Sacred Heart Park & Ride (across Wintonbury Ave from the Mall)

Day Hill Road / Blue Hills Avenue Extension

- Likely choose one stop either between the roads or adjacent to one of these roads
- Serves west end of an employment hub, including Eversource Energy and Waterside Crossing
- Mobility hub could be located here to provide connections to micro-transit and other modes to access the low-density employment locations in this area
- May have Park & Ride potential, depending upon exact station location
- Possible connections to local bus routes 36 and 54, depending upon stop location

Seymour Road

- Major cross street
- Most logical location for a stop in a long stretch
- Low development density and activity
- Potential for micro-transit connections east to employment hub on International Drive; could also connect to local bus route 34

East Granby Town Center

- Small town center with shops and restaurants
- Potential for Park & Ride, perhaps sharing space with existing parking lots

International Drive

- Provide access to the employment sites along this stretch of Rainbow Road
- Could connect to local bus route 34, depending upon stop location

Bradley International Airport

- Airport service for both travers and employees
- Connections with local bus routes 24 and 30 could help connect to the car rental sites along Schoephoester Road

Ella Grasso Turnpike / Airport Commercial Center

- Choose between one of these two, somewhere along Ella Grasso Turnpike
- Provides service to hotels and restaurants
- Connections with local bus routes 24 and 30 could help connect to the hotels along this stretch
- If the stop is located closer to Highway 20 (Bradley International Airport Connector) there may be Park & Ride potential

[there is about a 3-mile segment without stops along Poquonock Avenue]

- This segment is lined by low-density residential and scattered small-scale commercial
- No clear location for a stop, but perhaps one or the other side of the Farmington River if one is desired; otherwise, bus route 24 provides local transit service

Poquonock Park & Ride / Marriott Hartford/Windsor Airport

- Park & Ride location is easily accessible via I-91
- Cluster of large hotels centered on Day Hill Road and Lamberton Road
- May need to choose between one of these two as they are about ¼ mile apart
- There are no pedestrian connections between the Park & Ride facility and hotel cluster, first-last mile improvements are required
- Mobility Hub could be located at the Park & Ride, which could provide connecting micro-transit services to reach the hotels
- Connections to local bus routes 36 and 54, which would help serve the job sites further south on Lamberton Road

Addison Road

- Provides service to Permasteelisa North America

Northfield Drive

- Could connect to route 36 to provide service to Voya and other employers along Northfield Drive
- May be too close to nearby stops

Day Hill Village Shoppes

- Serves nearby large employers, such as Spencer Turbine, Konica Minolta, etc.
- Could connect to route 36 to provide service to large employers along Marshall Phelps Road, along with local service on Day Hill Road

Amazon

- Could connect to route 36 and 54 to provide service to the Amazon Distribution Center south on Iron Ore Road
- Also serves the cluster of employers on the north side of Day Hill Road

General Electric

- Provides service to GE and other employers on the south side of Day Hill Road
- Would also serve new residential apartment complex, *The Preserve at Great Pond*, on the north side of Day Hill Road
- Connects with bus routes 36 and 54

The Hartford

- Large employment center
- May want to combine with GE stop for better stop spacing

Implementation Timeframe

Timeframe

This alternative has a long-term implementation timeframe, likely more than 10 years due to the complexity of the project and the probable need for an EIS. The Hartford – New Britain busway, or CTfastrak, took almost 18 years to plan, design, and build.

Project Development Process

Implementation steps would include Concept Development, Feasibility Assessment, Design Considerations, Environmental Review, Preliminary and Final Design, and Construction.

Project Phasing

While the busway itself does not lend itself to quick action, an early action item in this corridor could be the improvement in service on the 54 Blue Hills Avenue or 56 Bloomfield Avenue, or both, CT*transit* bus routes. This would consist of improved frequencies, extension of route 56 to Day Hill Road, and the construction of a mobility hub at the proposed end of the busway near Day Hill Road and Tunxis Avenue, which both routes could serve.

Another potential sub-alternative would be to construct a shorter busway, from Union Station to Albany Street, for instance, and use surface streets from there to the north end of the line. This would provide a dedicated facility for the most congested part of the route providing some mobility benefits at a lower total cost. This concept would not reduce the implementation timeframe significantly, however, since all of the same steps would have to be followed as for the full implementation of the corridor.

Environmental Review Process and Next Steps

Some locations require an Environmental Assessment (EA), while others will require an Environmental Impact Statement (EIS).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

The Griffin Corridor Busway would provide significantly improved travel time and reliability for transit riders in the corridor. The introduction of the New Britain – Hartford busway in that corridor cut transit travel time nearly in half, from 52 minutes to 28 minutes and the dedicated transitway completely removes transit service from traffic that leads to delays.

Access and Connectivity – High Benefit

Access to high performance transit will be expanded to all of the neighborhoods along the Griffin Corridor Busway. Connections between low-income neighborhoods in Hartford to the major employment centers along Day Hill Road and near Bradley Airport will be improved. Faster connections will also be possible between these neighborhoods and downtown and to places that can be reached from there by transferring to other transit routes including CTfastrak and the Hartford Line.

Travel Options and End User Convenience – High Benefit

The Griffin Corridor Busway would provide a new high performance, high-capacity transportation facility parallel to existing roadways in the corridor, providing an attractive redundant means of travel. The fast, frequent service provided by the busway will improve end user experience, both by reducing waiting and travel time and through a smoother, more comfortable ride.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

Widening of the Griffin corridor to allow for the parallel BRT facility may result in direct impacts to properties within EJ communities. However, the alternative would likely benefit disadvantaged communities, providing additional mobility options between employment centers that does not rely on personal vehicle travel.

Safety – Moderate Benefit

The Griffin Corridor Busway would isolate bus operations from general traffic, resulting in fewer accidents and a safer environment. In general, bus transit is safer than driving so riders attracted to the busway would result in fewer crashes over time.

Resiliency and Sustainability – Moderate Benefit

The alternative would have the potential to reduce VMT while improving a sustainable transportation mode in the region. A new ROW would provide additional resiliency benefits as opposed to lane conversions.

Environment – Moderate Benefit

There is minimal to moderate presence of the various mapped environmental resources within the project corridor, and minimal presence immediately adjacent to the project. The existing Griffin Line corridor travels through several zones scoring moderate to high on the EPA Demographic Index. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Moderate Benefit

Busway BRT can be used as a proving ground for autonomous vehicle implementation.

Public Support – Neutral

This alternative did not receive much public feedback.

Overarching Criteria

Economic Opportunity – High Benefit

BRT service can be a driver of economic growth and development along the corridor and helps to better connect people to jobs.

Feasibility/Complexity – Neutral

There is a moderate level of complexity in segments of this corridor, but nothing that is excessively complicated or has disproportionate impacts on disadvantaged populations.

System Compatibility – High Benefit

The BRT would provide connections to key destinations, existing local routes, and park and rides, delivering independent utility regardless of other improvements. It would also further enhance the utility of the transit system through these connections.

Overall Assessment of Benefits/Impacts

Overall, the Griffin Corridor BRT presents a largely positive alternative to improve transportation in the Hartford region. The primary challenge will be managing a moderate amount of complexity given some constraints along the corridor.

Order of Magnitude Cost

The Hartford region has a relatively recent experience in building a project similar to the Griffin corridor BRT line, the New Britain – Hartford CTfastrak line. Like the Griffin corridor this project involved building a two-lane bus only roadway and a mixed-use trail directly next to an active railroad. New Britain – Hartford CTfastrak cost $570 million for a 9.4-mile busway in 2015, or just over $60 million per mile. Using the same figure for 8.5 miles yields a total Griffin Corridor project cost of $515 million. Adjusted for inflation to 2022 that would be $635 million. This includes capital costs only. Another possible option is to remove the freight rail to enable an easier accommodation of BRT, but the rail tracks are regularly used to transport lumber. Such an alternative could be explored in a further phase of study.

High Level Benefit-Cost Outlook

Although the capital cost of this alternative is relatively high, the benefits are also high in terms of travel time savings for individuals, operational efficiencies for CTtransit, economic development for the municipalities it runs through, improved safety, and, perhaps most importantly, greater transportation equity for disadvantaged groups.

Bus Rapid Transit (BRT) Expansion: North Corridor

Detailed Project Description

The North Corridor BRT alternative would add a new route to CT*transit's* successful New Britain to Hartford corridor CT*fastrak* BRT system. BRT in the North Corridor would use the HOV lanes on I-91. Service would link downtown Hartford with Bradley Airport. The alternative provides fast new connections between low income and minority neighborhoods in central Hartford and airport jobs using existing ROW in the I-91 HOV lanes. Connecting to the proposed Mobility Hub at the existing Poquonock Park & Ride could be a way to serve the employment center in Windsor.

Proposed Route

The 14.7-mile route, with 6.5 miles on I-91 in the existing HOV lanes, would follow the existing alignment of the CT*transit* 30 (Bradley Flyer). Bus routes would travel both on the HOV lanes and to locations off the HOV lanes via surface streets.

Station Determination

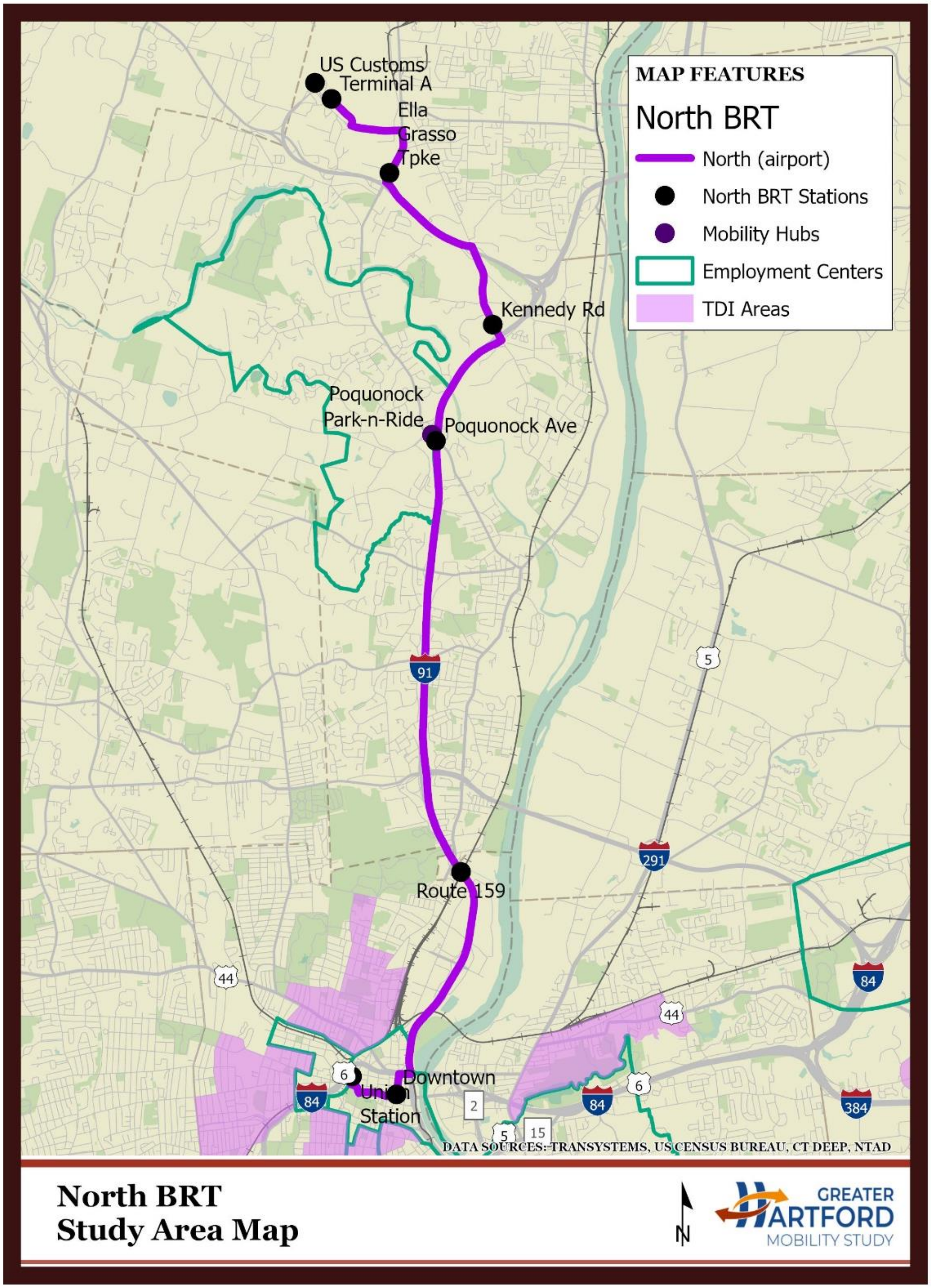
Potential BRT stations were determined by reviewing the proposed BRT corridor for:

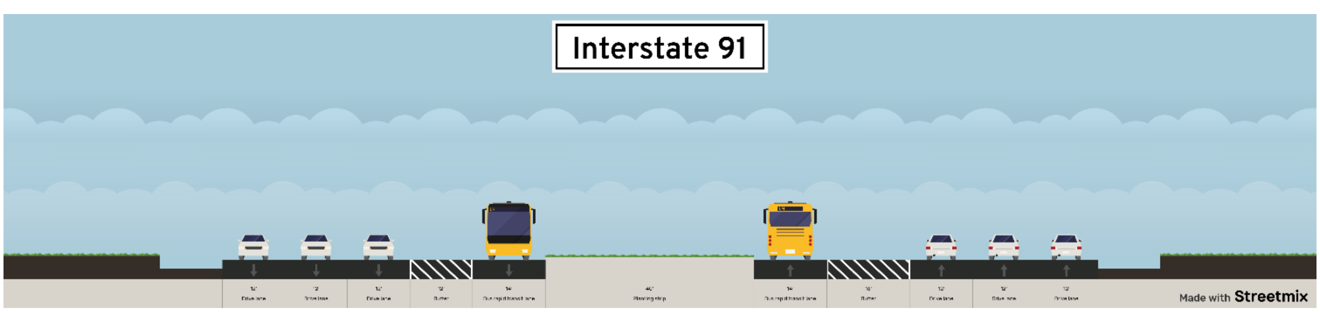
- Transit connections
- Key activity centers and job hubs
- Population density and TDI
- Major roads and Park & Ride potential
- Existing ridership

Additional Considerations: In some locations, improved pedestrian connections may be required to connect to nearby destinations.

Alternative Map

The North Corridor is shown below, the I-91 segment would run in HOV lanes for 6.5 miles between Jennings Road in Hartford and the Farmington River.


MAP FEATURES
North BRT
North (airport)
North BRT Stations
Mobility Hubs
Employment Centers
TDI Areas
US Customs
Terminal A
Ella Grasso Tpke
Kennedy Rd
Poquonock Park-n-Ride
Poquonock Ave
Route 159
Downtown
Union Station
DATA SOURCES: TRANSYSTEMS, US CENSUS BUREAU, CT DEEP, NTAD
North BRT
Study Area Map
N
GREATER HARTFORD MOBILITY STUDY


Interstate 91
Made with Streetmix

Proposed Stations

Hartford Union Station

- Downtown job hub and activity center
- Connections to multiple other transit routes, including the Hartford Line and Amtrak services

Bushnell Park

- Downtown job hub and activity center
- Connections to multiple bus routes

Downtown Hartford

- Downtown job hub and activity center
- Connections to multiple bus routes

Hartford Main Street/Windsor Avenue/CT Route 159

- Nearby residential and job corridor along Main Street
- Potential connections with local bus routes 32, 34, 36, 40,43, 92
- Would require a new freeway station and appropriate pedestrian paths for first-last mile access
- Nearby vacant land to the west of Windsor Avenue may be suitable for a parking garage or surface parking lot

Poquonock Avenue

- Job hub including the airport hotels
- Connections to local bus routes 24 and 34
- Would require a new freeway station and widening of the existing sidewalk for first-last mile access

Kennedy Road

- Access to job locations along Kennedy Road
- Potential to connect to the Windsor Park and Ride
- Connections to local bus route 34

Ella Grasso Turnpike

- Would serve the neighboring commercial and activity center to the north and some residences to the south
- Connections to local bus routes 24, 30 and 34

Bradley Airport

- Connection to flights for travelers
- Airport job center

Implementation Timeframe

Timeframe

Medium-term timeframe for implementation (3-10 years).

Project Development Process

Implementation steps would include Concept Development, Feasibility Assessment, Design Considerations, Environmental Review, Preliminary and Final Design, and Construction.

Project Phasing

The project has potential to be split into multiple segments of independent utility, specifically the mobility hub at the Poquonock Park and Ride could precede the BRT.

Environmental Review Process and Next Steps

Some locations require an Environmental Assessment (EA), while others will require an Environmental Impact Statement (EIS).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

The alternative would improve reliability and travel time through use of HOV lanes and direct-access freeway flyer stations. Additionally, travel time could be further improved if the HOV lane on I-91 is changed from a minimum of two passengers per vehicle to three passengers per vehicle.

Access and Connectivity – High Benefit

The concept would add connectivity between important land use pairs, provide redundant transportation, and improve the user travel experience.

Travel Options and End User Convenience – High Benefit

The alternative would improve convenience with improved mobility hubs and improved pedestrian connectivity that would provide access to nearby destinations.

Criteria Supporting Other Study Goals

Equity – High Benefit

The alternative would provide a high-quality transportation service for all users, including those without cars. I-91 travels through several zones scoring moderate to high on the EPA Demographic Index. The alternative would likely benefit disadvantaged communities by providing an additional mobility option between employment centers that does not rely on personal vehicle travel.

Safety – Moderate Benefit

HOV lanes would minimize conflicts with general traffic but there would be potential conflicts with HOV vehicles.

Resiliency and Sustainability – Low Benefit

The alternative and expansion of the BRT network may encourage a shift to non-auto modes. However, an HOV lane conversion would provide little resiliency and sustainability benefits when compared to a dedicated BRT facility and would still be subject to congestion and breakdowns in peak periods. Further steps by CTDOT to change the HOV designation from two passengers per vehicle to three passengers per vehicle would improve sustainability of the project.

Environment – Moderate Benefit

There is minimal to moderate presence of the various mapped environmental resources within the project corridor, and minimal presence immediately adjacent to the project. I-91 travels through several zones scoring low to moderate on the EPA Demographic Index. The project is likely to result in a benefit to these disadvantaged communities by providing an additional mobility option between employment centers that does not rely on personal vehicle travel. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Moderate Benefit

Buses would use TSP where feasible; GPS bus tracking could provide apps and Real-Time Passenger Information (RTPI) signs at stations to provide passengers at stations with wait-time information. Based on the timeframe of the project, buses would likely be fully electric for the corridor.

Public Support – Moderate Benefit

Outreach would need to be completed for this criterion but in general those who have tried BRT like the service and support its expansion. Comments were generally positive on the project website, but some members of the community were concerned about how pedestrian access would work along the freeway section of the route. Further outreach would be necessary during the concept development to educate the public about pedestrian bridges and freeway flyer stations.

Overarching Criteria

Economic Opportunity – High Benefit

The BRT may encourage economic development along the corridor.

Feasibility/Complexity – Neutral

The HOV is already in use for private vehicles but freeway flyer stations and associated direct-access ramps would need to be constructed. Construction may disrupt HOV lanes and potentially mainline I-91 traffic operations.

System Compatibility – High Benefit

The BRT would provide connections to existing local routes and park and rides.

Overall Assessment of Benefits/Impacts

The overall screening outcome shows a medium/high positive benefit for the North Corridor BRT.

Order of Magnitude Cost

Freeway flyer stations are not common in the region. The I-405 BRT in the Puget Sound Region implemented several freeway flyer stations for cost comparison. Typical freeway flyer stations cost about $60 million; however, very complicated designs can exceed $300 million. Using the $60 million figure for more standard/typical I-405 BRT stations for two stations on I-91 would yield a minimum North Corridor project cost of $120 million. Mobility hubs and pedestrian bridges would add to the costs. It should be noted that costs of design and construction services would likely be less in Hartford, as the cost of living in the Seattle Metro Area is estimated to be between 30% and 80% more than Greater Hartford.

Based on newly constructed parking garages in central Hartford including a 1,007-stall garage at Buckingham Street and Washington Street ($34 million) and a 411-stall garage Capitol Avenue ($16 million), the price per stall for a parking garage would be between $34,000 and $39,000. Construction is generally more expensive in downtown environments with a high density of infrastructure and utilities thus freeway adjacent parking garages should be expected to cost less. Additionally, depending on available space and demand surface parking lots may be sufficient at some of these locations.

High Level Benefit-Cost Outlook

High benefit-cost benefit outlook as the BRT would use the existing HOV lane. While there would be potential high costs of freeway flyer stops this route would only need two of these stations. Benefits would include reduced travel time, improved reliability, increased ridership and mode shift, and lower operational costs.

Bus Rapid Transit (BRT) Expansion: Northeast Corridor

Detailed Project Description

The Northeast Corridor BRT alternative would add a new route to CT*transit's* successful New Britain to Hartford corridor CT*fastrak* BRT system. BRT in the Northeastern Corridor would use the HOV lanes on I-84. Service would link downtown Hartford and downtown East Hartford with the Buckland Park and Ride (proposed Buckland Mobility Hub), and the employment center in Northwest Manchester with a fast and frequent busway-based service. The alternative provides fast new connections between low income and minority neighborhoods in Hartford and suburban jobs using existing ROW in the I-84 HOV lanes. Connecting to the proposed Mobility Hub at the Buckland Park and Ride could be a way to serve some of the various employers along I-84.

Proposed Route

The 8.5-mile route, with 6.1 miles on I-84 in the existing HOV lanes, would follow the existing alignment of the CT*transit* 903 (Buckland-Vernon Express) and 913 (Buckland Storrs Express). Bus routes would travel both on the busway and to locations off the busway via surface streets. The exact route through downtown East Hartford will depend upon what alternative is chosen for the reconfigured Mixmaster highway interchange.

A second 9.7-mile route, with 3.2 miles on the existing I-84 HOV lanes would depart the freeway at Middle Turnpike W, following US-44/US-6/Center Street to central Manchester.

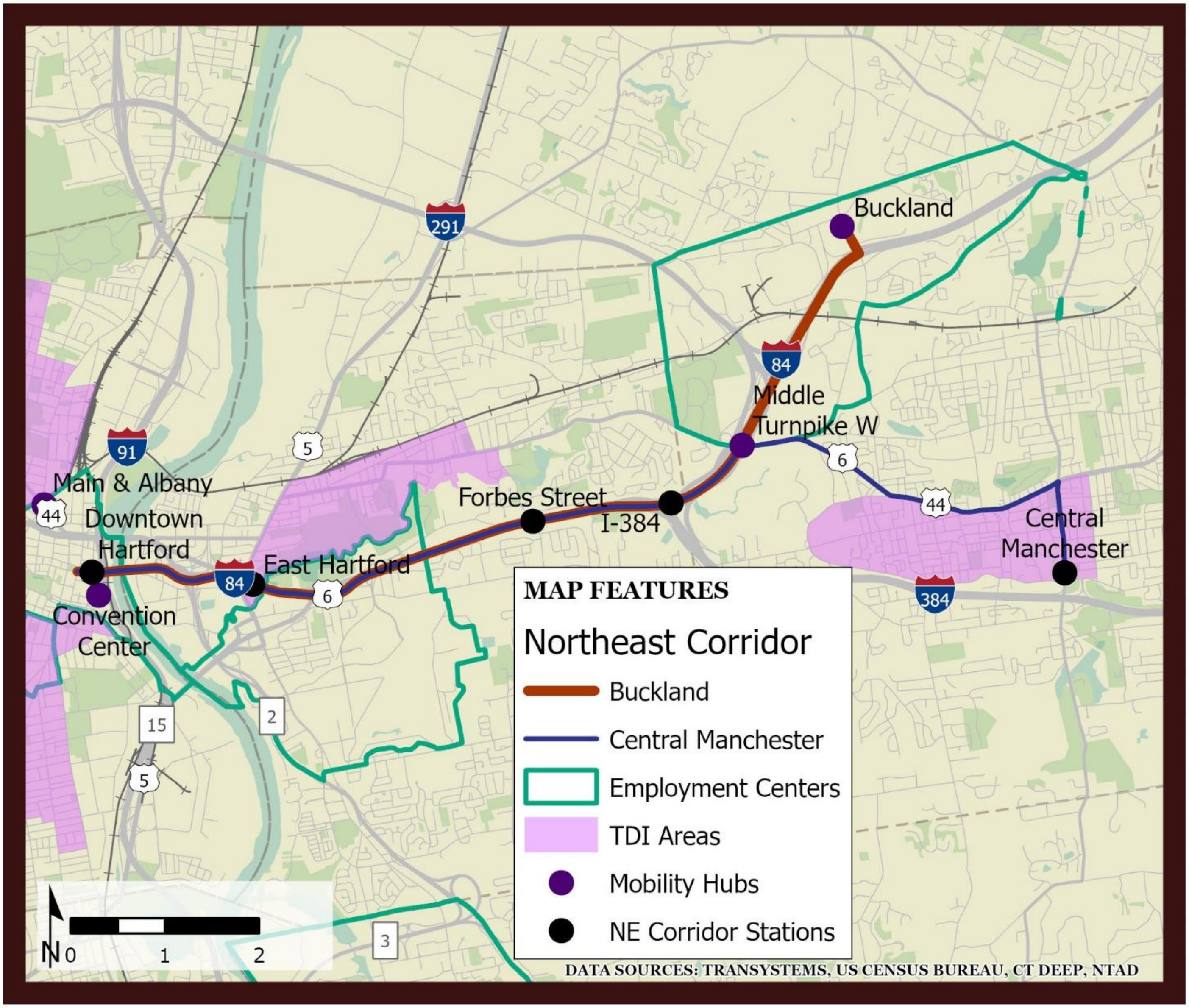
Station Determination

- Potential BRT stations were determined by reviewing the proposed BRT corridor for:
- Transit connections
- Key activity centers and job hubs
- Population density and TDI
- Major roads and Park & Ride potential
- Existing ridership

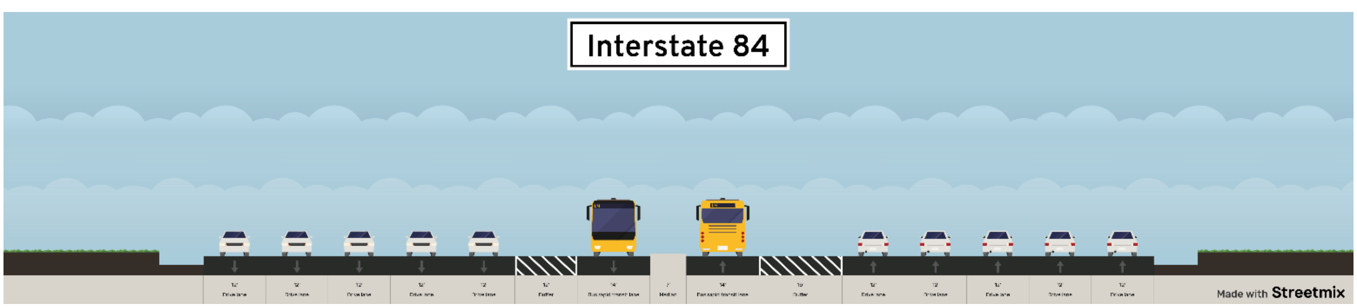
Additional Considerations: In some locations, improved pedestrian connections may be required to connect to nearby destinations.

Alternative Map

The Northeast Corridor is shown below, depicts the full I-84 segment would run in HOV lanes.



The BRT would use existing right-of-way in the existing I-84 HOV lane as shown in the image below.



Proposed Stations

Hartford Union Station

- Downtown job hub and activity center
- Connections to multiple other transit routes, including the Hartford Line and Amtrak services

Bushnell Park

- Downtown job hub and activity center
- Connections to multiple bus routes
- Downtown Hartford
- Downtown job hub and activity center
- Connections to multiple bus routes

East Hartford

- Moderate TDI and population density
- Moderate employment center
- Nearby somewhat dense residential (closely spaced single family homes, some apartments)
- Potential connections with local bus routes 80, 82, 83, 84, 85, 86, 87, 88, 91, 95, 96, 121

Forbes Street

- Would serve the neighborhood surrounding the station area including the Charter Oak Mall
- Connections to local bus routes 86 and 91
- Would require a new freeway station and appropriate pedestrian paths for first-last mile access
- A small park-and-ride could be located here

I-384 Interchange Area

- Potential to connect to the Spencer Street Park and Ride and adjacent shopping center
- Would require a new freeway station and approximate 2,000-foot pedestrian path
- Mobility hub could be located here to provide connections to micro-transit and other modes to access the Park and Ride, Manchester Community College, employment locations in this area
- Possible connections to local bus routes 83 and 121, depending upon stop location

Middle Turnpike (US Route 44/US Route 6)

- Would serve the neighborhood surrounding the station area including Wickham Park
- Connections to local bus routes 88 and 91
- Some BRT buses would leave the HOV lanes here to serve Manchester including the TDI area located there
- Would require a new freeway station, ramp access to Middle Turnpike, and appropriate pedestrian paths for first-last mile access
- A Park and Ride could be located here

Buckland Park and Ride

- Connection to 80, 82, 83, 84, and 91 local bus routes
- Suburban job and activity center
- Large existing Park and Ride lot
- A new circulator/flex micro-transit service in the Buckland Hills area would increase access

Central Manchester Mobility Hub

Manchester TDI

- Suburban job and activity center
- Mobility hub could be located here to provide connections to micro-transit and other modes to access residential areas within the TDI
- Connection to the 88 local bus route

Implementation Timeframe

Timeframe

Medium term timeframe for implementation (3-10 years). Use of existing HOV lanes will reduce the time needed for design and construction.

Project Development Process

Implementation steps would include Concept Development, Feasibility Assessment, Design Considerations, Environmental Review, Preliminary and Final Design, and Construction. Minimal environmental effort expected. CATEX / CE checklist, state environmental review request, EIE, local permitting.

Project Phasing

The project has potential to be split into multiple segments of independent utility, specifically the mobility hubs at Buckland Park and Ride and Spencer Street Park and Ride could precede the BRT.

Environmental Review Process and Next Steps

Some segments require a Categorical Exclusion (CE), while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

The alternative would improve reliability and travel time through use of HOV lanes and direct-access freeway flyer stations. Additionally, travel time could be further improved if the HOV lane on I-84 is changed from a minimum of two passengers per vehicle to three passengers per vehicle.

Access and Connectivity – High Benefit

The concept would add connectivity between important land use pairs, provide redundant transportation, and improve the user travel experience.

Travel Options and End User Convenience – High Benefit

The alternative would improve convenience with improved mobility hubs and improved pedestrian connectivity that would provide access to nearby destinations.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The alternative would provide a high-quality transportation service for all users, including those without cars. I-84 travels through several zones scoring moderate to high on the EPA Demographic Index. The alternative would likely benefit disadvantaged communities by providing an additional mobility option between employment centers that does not rely on personal vehicle travel.

Safety – Moderate Benefit

HOV lanes would minimize conflicts with general traffic but there would be potential conflicts with HOV vehicles.

Resiliency and Sustainability – Low Benefit

The alternative and expansion of the BRT network may encourage a shift to non-auto modes. However, an HOV lane conversion would provide little resiliency and sustainability benefits when compared to a dedicated BRT facility and would still be subject to congestion and breakdowns in peak periods. Further steps by CTDOT to change the HOV designation from two passengers per vehicle to three passengers per vehicle would improve sustainability of the project.

Environment – Moderate Benefit

There is minimal to moderate presence of the various mapped environmental resources within the project corridor, and minimal presence immediately adjacent to the project. Given that the alternative is proposed to use the existing I-84 HOV lanes, the potential impacts are near-zero if the project occurs within the existing highway right-of-way. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Moderate Benefit

Buses would use TSP where feasible; GPS bus tracking could provide apps and Real-Time Passenger Information (RTPI) signs at stations to provide passengers at stations with wait-time information. Based on the timeframe of the project, buses would likely be fully electric for the corridor.

Public Support – Moderate Benefit

Outreach would need to be completed for this criterion but in general those who have tried BRT like the service and support its expansion. Comments were generally positive on the project website, but some members of the community were concerned about how pedestrian access would work along the freeway section of the route. Further outreach would be necessary during the concept development to educate the public about pedestrian bridges and freeway flyer stations.

Overarching Criteria

Economic Opportunity – High Benefit

The BRT may encourage economic development along the corridor.

Feasibility/Complexity - Neutral

The HOV is already in use for private vehicles but freeway flyer stations and associated direct-access ramps would need to be constructed. Construction may disrupt HOV lanes and potentially mainline I-84 traffic operations.

System Compatibility – High Benefit

The BRT would provide connections to existing local routes and park and rides.

Overall Assessment of Benefits/Impacts

The overall screening outcome shows a medium/high benefit of the Northeast Corridor BRT.

Order of Magnitude Cost

Freeway flyer stations are not common in the region. The I-405 BRT in the Puget Sound Region implemented several freeway flyer stations for cost comparison. Typical freeway flyer stations cost about $60 million; however, very complicated designs can exceed $300 million. Using the $60 million figure for more standard/typical I-405 BRT stations for four stations on I-84 would yield a minimum Northeast Corridor project cost of $240 million. Mobility hubs and pedestrian bridges would add to the costs. It should be noted that costs of design and construction services would likely be less in Hartford, as the cost of living in the Seattle Metro Area is estimated to be between 30% and 80% more than Greater Hartford.

Based on newly constructed parking garages in central Hartford including a 1,007-stall garage at Buckingham Street and Washington Street ($34 million) and a 411-stall garage Capitol Avenue ($16 million), the price per stall for a parking garage would be between $34,000 and $39,000. Construction is generally more expensive in downtown environments with a high density of infrastructure and utilities thus freeway adjacent parking garages should be expected to cost less. Additionally, depending on available space and demand surface parking lots may be sufficient at some of these locations.

It should be noted that in locations similar to the Middle Turnpike, with an existing overpass and pedestrian access, the I-405 BRT project was able to successfully design stairs and elevators from the existing structure to obviate the need to construct additional pedestrian crossings. This will be adjusted for inflation once more is known about when the project might be implemented.

High Level Benefit-Cost Outlook

This alternative has a medium benefit-cost outlook as the BRT would use the existing HOV lane but there would be potential high costs of freeway flyer stops and pedestrian bridges. Benefits would include reduced travel time, improved reliability, increased ridership and mode shift, and lower operational costs.

Bus Rapid Transit (BRT) Expansion: South Corridor

Detailed Project Description

The South Corridor BRT alternatives would add a new route to CT*transit's* successful New Britain to Hartford corridor CT*fastrak* BRT system.

One alternative for the South Corridor/I-91 BRT would be to use existing right-of-way on I-91; potentially using freeway shoulders (bus on shoulder or BOS) to bypass heavy congestion in peak periods. Service would link downtown Hartford with the proposed Rocky Hill Mobility Hub. The alternative provides fast new connections between low income and minority neighborhoods in Hartford and suburban jobs along I-91. Connecting to the proposed Rocky Hill mobility hub would help serve the various auto-oriented employment centers along I-91.

A second alternative, which could be implemented separately or as a complementary service to the I-91 alternative, would travel along Route 2, Route 3, and I-91, also potentially using freeway shoulders on all three facilities as all generally have shoulder widths above the standard 10-foot threshold. This would serve the major employment centers in East Hartford and Glastonbury.

Proposed Route

The 9.3-mile I-91 route, would generally follow the existing alignment of the CT*transit* 910 (Rocky Hill Express), terminating at the proposed Mobility Hub on West Street (Route 411) and I-91, avoiding local stops in Rocky Hill. Micro-transit service could potentially replace the existing local stops if BRT on I-91 replaces the Rocky Hill Express. The route would also run parallel to the 906, 919, 921, and 950 Express routes which could also utilize the peak hour shoulder bus lanes. Successful implementation of the service could lead to southward expansion in later phases. AM peak period travel times from Rocky Hill to downtown Hartford on the I-91 alignment currently range from 9-12 minutes.

A second 12.3-mile route alternative could follow Route 2 to Route 3 to I-91 also terminating at the proposed Rocky Hill Mobility Hub. The route would serve employment hubs in East Hartford and Glastonbury but result in a longer total travel time with AM peak travel times inbound to downtown Hartford from Rocky Hill ranging from 16-22 minutes.

Station Determination

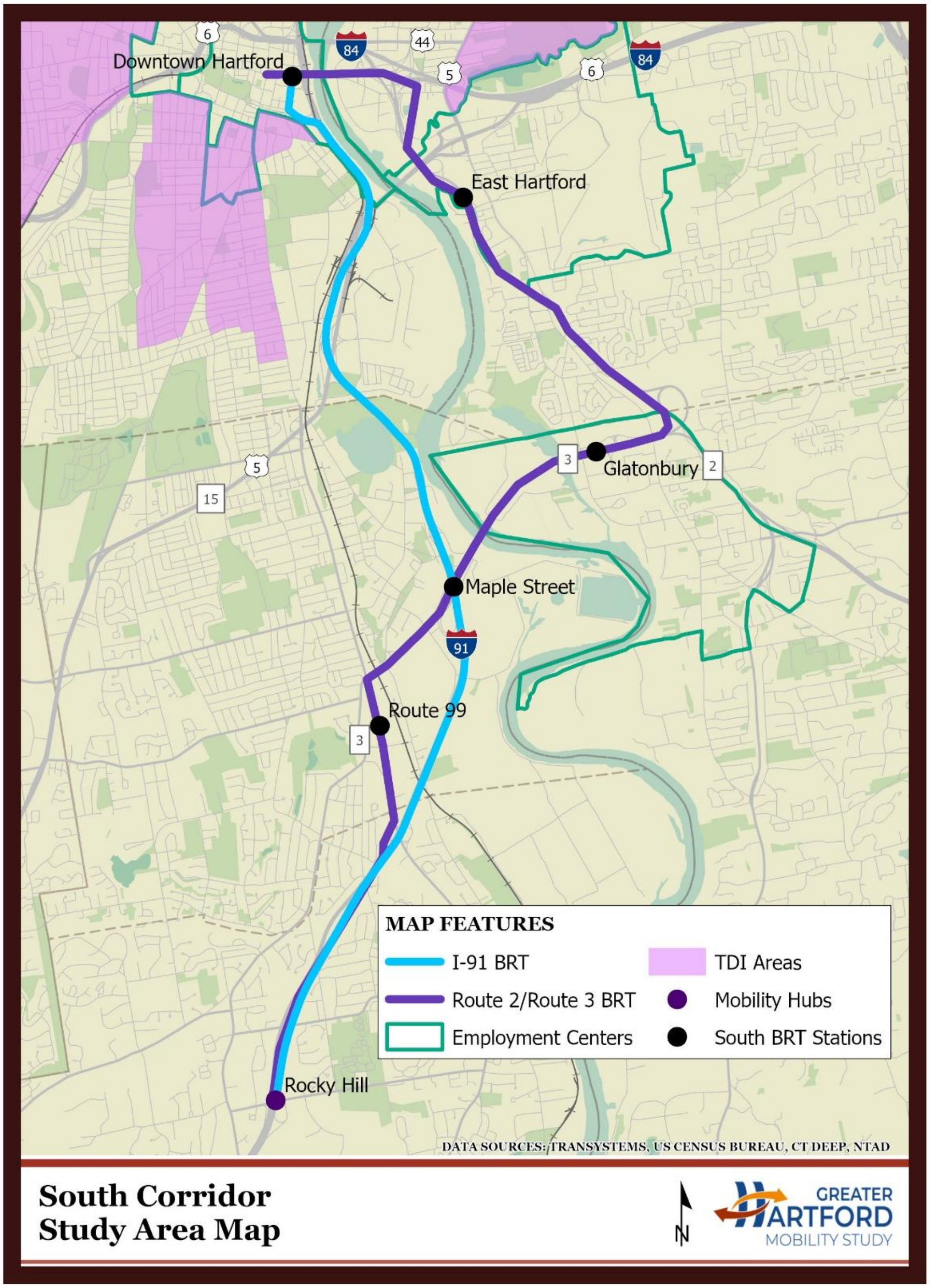
Potential BRT stations were determined by reviewing the proposed BRT corridor for:

- Transit connections
- Key activity centers and job hubs
- Population density
- Major roads and Park & Ride potential
- Existing ridership

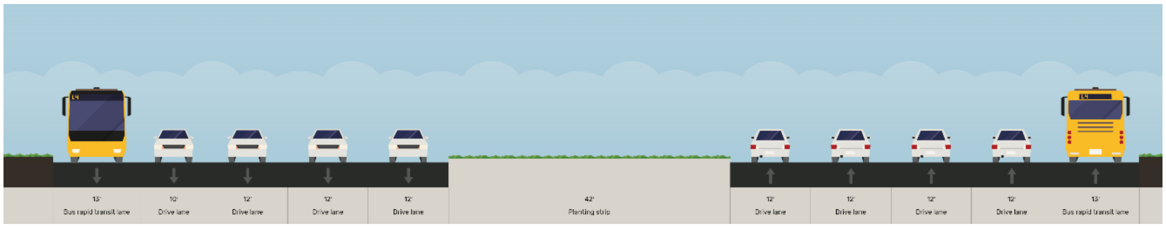
Additional Considerations: In some locations, improved pedestrian connections may be required to connect to nearby destinations.

Alternative Map

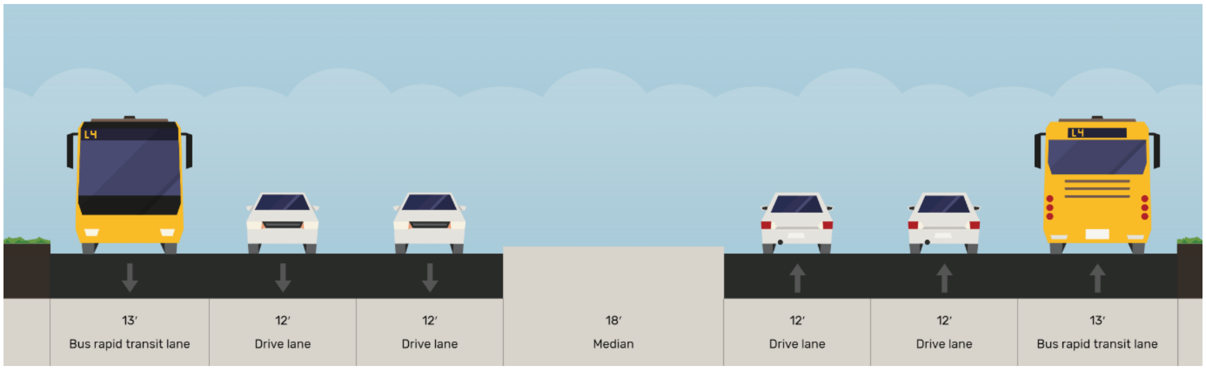
The South Corridor alignments are shown in below, all freeway segments with appropriate width (ten feet or greater) on I-91, Route 2, and Route 3 are potential candidates for bus on shoulder application to allow buses to bypass general purpose traffic in periods of heavy congestion.

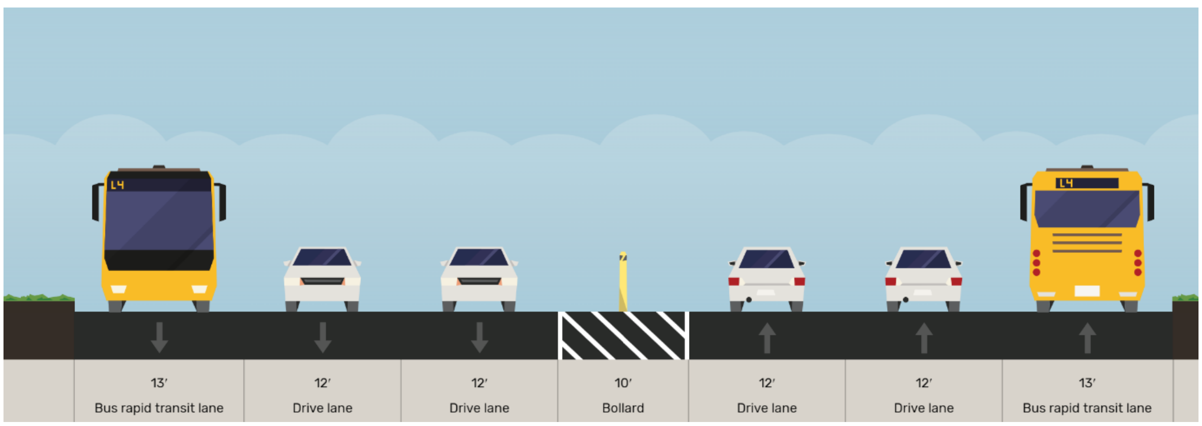


The I-91 BRT would use existing right-of-way in travel lanes and shoulders during congested peak hours as shown above.



The Route 2/Route 3 BRT would use existing right-of-way in travel lanes and shoulders during congested peak hours as shown in the figures below.





Proposed Stations – I-91 BRT

Hartford Union Station

- Downtown job hub and activity center
- Connections to multiple other transit routes, including the Hartford Line and Amtrak services

Bushnell Park

- Downtown job hub and activity center
- Connections to multiple bus routes

Downtown Hartford

- Downtown job hub and activity center
- Connections to multiple bus routes

Maple Street/Route 3

- Micro-transit could connect the station to Silas Deane Highway/Route 99 commercial corridor
- If both alignments are pursued in tandem, the Route 2/Route 3 BRT could obviate the need for micro-transit service
- Would require a new freeway ramp stations and appropriate pedestrian paths for first last mile access

- A park-and-ride could be located here

Rocky Hill Mobility Hub/Route 411

- Suburban job and activity center
- Mobility hub could be located here to provide connections to micro-transit and other modes to access commercial and residential areas
- Connection to the Route 47 local bus
- A park-and-ride could be located here

Proposed Stations – Route 2/Route 3 BRT

Hartford Union Station

- Downtown job hub and activity center
- Connections to multiple other transit routes, including the Hartford Line and Amtrak services

Bushnell Park

- Downtown job hub and activity center
- Connections to multiple bus routes

Downtown Hartford

- Downtown job hub and activity center
- Connections to multiple bus routes

East Hartford

- Moderate employment center
- Nearby somewhat dense residential (closely spaced single family homes, some apartments)
- Potential connections to the 87 and 95 local bus routes

Glastonbury

- Moderate employment center
- Nearby somewhat dense residential (closely spaced single family homes, some apartments)
- Potential connections to the 91 and 95 local bus routes
- A park-and-ride could be located here

Maple Street/Route 3

- Connection to I-91 express and/or BRT services
- Would require a new freeway ramp stations and appropriate pedestrian paths for first last mile access
- A park-and-ride could be located here

Silas Deane Highway/Route 99

- Commercial and residential area
- Connection to 47, 53, 55, and 91 local routes
- Low-cost station that would only require an enhanced branded bus shelter and raised curb for level boarding
- A park-and-ride could be located here

Rocky Hill Mobility Hub/Route 411

- Suburban job and activity center

- Mobility hub could be located here to provide connections to micro-transit and other modes to access commercial and residential areas
- Connection to the Route 47 local bus
- A large, structured park-and-ride could be located here

Implementation Timeframe

Timeframe

Medium term timeframe for implementation (3-10 years). Use of bus on shoulder lanes would reduce the lead time for implementation.

Project Development Process

Implementation steps would include Concept Development, Feasibility Assessment, Design Considerations, Environmental Review, Preliminary and Final Design, and Construction.

Project Phasing

The project has potential to be split into multiple segments of independent utility, specifically the mobility hub in Rocky Hill could precede the BRT. Either BRT alternative could be pursued separately.

Environmental Review Process and Next Steps

Some segments require a Categorical Exclusion (CE), while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

The alternatives would improve reliability and travel time through use of shoulder lanes and freeway ramp stations. The shoulder transit lane would provide less reliability than a dedicated busway as the BRT line would have to depart the shoulder when a vehicle is stopped in the shoulder and during highway maintenance. Generally, traffic enforcement has minimal need to stop vehicles for speed violations during congested periods and maintenance crews can be scheduled to avoid peak commuter demand; however, vehicle breakdowns will occasionally make the shoulder unusable. The I-91 BRT would be preferred for speed and reliability.

Access and Connectivity – High Benefit

The concept would add connectivity between important land use pairs, provides redundant transportation, and improves the user travel experience.

Travel Options and End User Convenience – High Benefit

The alternative would improve convenience with improved mobility hubs and improved pedestrian connectivity that would provide access to nearby destinations.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The BRT would provide a high-quality transportation service for all users, including those without cars. However, neither of the alignments would pass through a TDI area. The Route 2/Route 3 BRT would be the preferred alternative for equity as it would serve more employment hubs.

The project is likely to result in a benefit to disadvantaged communities in the north end of the Project Corridor by providing an additional mobility option between employment centers that does not rely on personal vehicle travel.

Safety – Moderate Benefit

Sheltered/branded BRT stations would increase visibility of transit users.

Resiliency and Sustainability – Low Benefit

The alternative transit option and expansion of the BRT network may encourage a shift to non-auto modes. However, an HOV lane conversion would provide little resiliency and sustainability benefits and would still be subject to congestion and breakdowns in peak periods.

Environment – Moderate Benefit

There is minimal to moderate presence of the various mapped environmental resources within the project corridor, and moderate presence immediately adjacent to the project. Given that the alternative is proposed adjacent to I-91, the alternative could cross through some resource areas adjacent to the existing highway right-of-way. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Moderate Benefit

Buses would use TSP where feasible; GPS bus tracking could provide apps and Real-Time Passenger Information (RTPI) signs at stations to provide passengers at stations with wait-time information. Based on the timeframe of the project, buses would likely be fully electric for the corridor.

Public Support – Moderate Benefit

In general, those who have tried BRT like the service and support its expansion. However, there are concerns from some participants that Rocky Hill is very car-centric, and that land-use and zoning changes would be needed to support BRT.

Overarching Criteria

Economic Opportunity – High Benefit

The BRT may encourage economic development along the corridors.

Feasibility/Complexity – High Benefit

The bus would travel in existing infrastructure.

System Compatibility – High Benefit

The BRT would provide connections to existing local routes and park and rides.

Overall Assessment of Benefits/Impacts

The overall screening outcome shows a high benefit of both South Corridor BRT alternatives.

Order of Magnitude Cost

Freeway ramp stations have a cost similar to stations with bus shelters but generally require access improvements to separate pedestrians from traffic. Capital cost for a Signature Bus Stop is estimated at $2.5 million. Mobility hubs and pedestrian bridges would add to the costs.

Shoulder transit use on freeways can vary from only the cost of striping and signage to new asphalt when existing shoulders are not built to full depth. A 2018 WSDOT/Sound Transit estimated total cost assuming shoulders have not been constructed to full depth to be less than $1 million per mile.

Based on newly constructed parking garages in central Hartford including a 1,007-stall garage at Buckingham Street and Washington Street ($34 million) and a 411-stall garage Capitol Avenue ($16 million), the price per stall for a parking garage would be between $34,000 and $39,000. Construction is generally more expensive in downtown environments with a high density of infrastructure and utilities thus freeway adjacent parking garages should be expected to cost less. Additionally, depending on available space and demand surface parking lots may be sufficient at some of these locations.

Assuming five stations, each with one stop in each direction and a 500-space parking garage, and 24 miles of shoulder transit lanes (12 in each direction), the estimated cost for the project would be approximately $190 million.

High Level Benefit-Cost Outlook

High benefit-cost outlook as the BRT would use the existing general traffic lanes and existing shoulder but there would be potential higher costs of pedestrian bridges. Benefits would include reduced travel time, improved reliability, increased ridership and mode shift, and lower operational costs.

Bus Rapid Transit (BRT) Expansion: Connecticut River Crossing

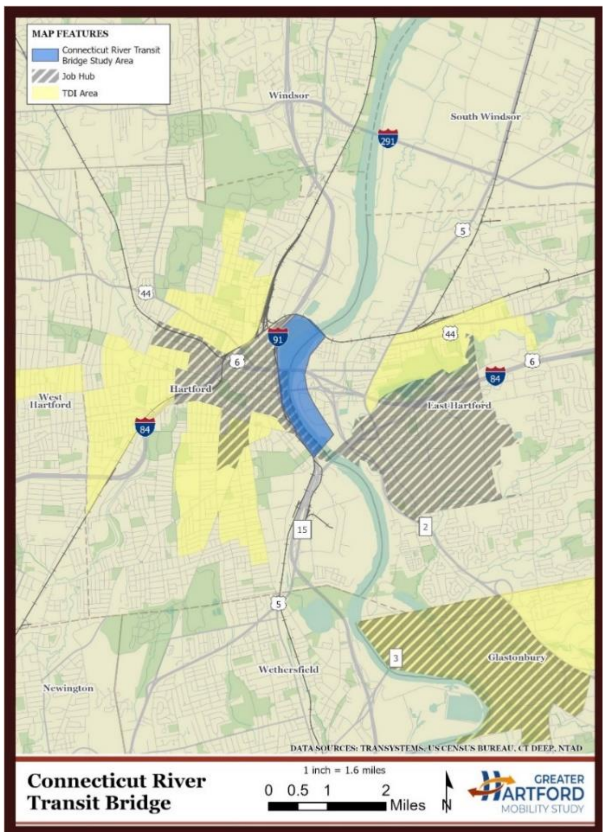
Detailed Project Description

The construction of a new transit only bridge across the Connecticut River from downtown Hartford to East Hartford would dramatically improve transit's competitiveness against the private auto by making transit faster and more reliable. The new crossing could take two forms:

- New transit only lanes on a reconfigured Bulkeley and/or Founders bridge.
- A completely new structure either north of the Bulkeley Bridge or south of the Founders Bridge.

Either way the crossing would include two lanes, one in each direction, for bus transit, both local buses and any new BRT lines that might be implemented in the corridor, and a mixed-use trail for pedestrians and bicyclists. The crossing would connect with the main transit routes in downtown Hartford on Main and Asylum Streets, and with Connecticut Boulevard in East Hartford. A precise location cannot be determined within the scope of this study.

Alternative Map



Implementation Timeframe

Timeframe

Given the complexity and scope of the project it will take more than 10 years to complete, from EIS/EA to construction.

Project Development Process

Since it is a new project, the process would begin with a feasibility study or preliminary alternatives analysis and the selection of a locally preferred alternative, which would allow the project to enter New Starts, if that funding source is used. This would be followed by the NEPA process, preliminary and final engineering, and finally construction.

Project Phasing

This project does not lend itself to be broken into phases. The entire crossing needs to be complete before it can be used.

Environmental Review Process and Next Steps

Environmental Impact Statement (EIS)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

A new transit-only crossing would eliminate transit delay currently caused by general traffic congestion on the Bulkeley and Founders Bridges, reducing total travel time for bus riders. Transit services would also become more reliable.

Access and Connectivity – High Benefit

Transit connectivity between the east and west sides of the river would be improved, as would access, although likely not in the sense of new connections but rather faster, more reliable, and more convenient connections that people will likely use more regularly. Areas of high transit dependency on the west side of the river would be better connected with job hubs on the East side of the river.

Travel Options and End User Convenience – High Benefit

The new crossing would provide improved end user convenience by making transit faster and more comfortable. More efficient operation could lead to improvements in headways on routes using the crossing, or the addition of new routes, although this would be a secondary effect.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

The new crossing would improve travel for bus riders who tend to be minorities, younger and older people, and those who have lower incomes. This convenience would have a direct effect on their ability to take and hold jobs, make important errands, and attend school and college. Minor EJ impacts would be outweighed by the opportunities associated with the Alternative.

Safety – Moderate Benefit

Transit tends to be safer than auto travel and better transit service would encourage more people to use it.

Resiliency and Sustainability – Moderate Benefit

The alternative would have the potential to encourage a modal shift in travel across the Connecticut River while improving a sustainable transportation mode in the region.

Environment – Moderate Benefit

Natural resources of concern are near Connecticut River, which bisects the project corridor and representative alignment of the alternative. Sensitive land uses are present adjacent to the alternative on the west side of the Connecticut River in Downtown Hartford. There is a moderate presence of low-income and disadvantaged populations throughout project corridor in Hartford and East Hartford. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Moderate Benefit

This alternative does not have a significant direct effect on the implementation of new technology in the study area but could be equipped for future CV or AV implementation.

Public Support – High Benefit

People support this alternative and feel it would be beneficial in providing access across the river. Suggestions include a BRT in downtown Hartford to travel east of the river and expansion of the CTfastrak route.

Overarching Criteria

Economic Opportunity – High Benefit

A new bridge across the Connecticut River would improve the performance of the entire transportation system by directly improving the speed and efficiency of public transit and by attracting more people to public transit and helping more people move throughout the region. This in turn would make the entire economy of the Hartford region more efficient and more competitive.

Feasibility/Complexity – Neutral Benefit

A new crossing would be a complex project from both a transportation standpoint, in terms of how it is connected to the existing transportation system on both sides of the river, and an environmental standpoint, due to impacts within or near the river.

System Compatibility – High Benefit

A new crossing would, by itself, have significant positive impacts on the existing transit system, by making the many existing local bus routes faster and more reliable. It could also provide benefits for potential future BRT lines to the East of the River, contributing to the expansion of the regional transit system.

Overall Assessment of Benefits/Impacts

Overall, this alternative scores at the medium to high benefit level. It would provide a significant improvement to transit speed and reliability, helping all users but especially transit dependent populations. It would improve the performance of the transportation system as a whole by encouraging more people to use transit, reducing congestion. It would also improve safety.

Order of Magnitude Cost

Construction costs of similar bridges around the United States in recent years vary widely. The Crown Point Bridge over Lake Champlain, Portland LRT bridge of the Willamette River, and others were considered. A rough estimate of the cost of a new transit-only Connecticut River crossing is between $100 million and $200 million.

High Level Benefit-Cost Outlook

Given the wide variation in the cost of recent bridge construction, it is difficult to estimate a benefit/cost figure. However, if the cost of the crossing comes in close to the average for new bridges, the benefits, in terms of CT*transit* operating cost savings and travel time saving for existing ridership, would put the benefit/cost ratios close to break even. Including other less direct cost savings, like environmental savings, would likely put it into the positive range, unless construction costs move into the higher range.

New Crosstown Routes to Provide Circulation around Hartford

Detailed Project Description

Crosstown service is designed to provide service to riders that links key corridors and major regional destinations through routing that bypasses major downtown areas. This type of service aims to improve speed and efficiency by limiting travel through downtown core areas and the congested conditions that are often experienced along those routes. These routes are often regional in nature and could provide service to lower income residents who rely on transit for jobs and recreation and whose travel needs do not include routes that provide service through the downtown core. A Comprehensive Service Analysis Report (CSA Report), completed by CRCOG in 2017, noted that while Hartford and its downtown functions as the most prominent economic center in the region, there is "a desire for more and better regional connections and more crosstown service, or direct connections between suburban destinations" and that much of the ridership demand has shifted away from a traditional radial transit model, with routes beginning and ending in downtown commercial centers. As such, the report proposed several new crosstown routes that could serve these ridership patterns that would provide benefits to regional mobility and connectivity and support the goals set forth by the Greater Hartford Mobility Study.

Proposed Routes

The CSA Report identified several potential new crosstown routes that could be implemented in the Greater Hartford region to improve the reliability, efficiency, and speed of service for its riders by providing regional routes to major commercial centers, job hubs, and areas of transit dependency. These routes include:

- Route 20: Crosstown service between Copaco Center and West Hartford Place via Blue Hills Avenue and Hillside Avenue.
- Route 61: Crosstown service between Jordan Lane Shopping Center (Wethersfield) and Windsor Shopping Center (Windsor) via Maple Avenue, Broad Street, Garden Street, Tower Avenue, and Windsor Avenue.
- Route 95: Crosstown service between Glastonbury High School and the Buckland Hills Mall (Manchester) via East Hartford.

Route 20

The proposed Route 20 would operate every 30 minutes between 5AM and 10PM between Bloomfield and West Hartford, serving several key destinations including commercial centers like Copaco Shopping Center and Charter Oak Marketplace, institutional centers such as Mt. Sinai Hospital, St. Francis Hospital, and Blue Hills Library, as well as multimodal connections to CTfastrak at Sigourney Street Station and Flatbush Station. This route provides access to several known transit dependent communities, particularly in eastern West Hartford, outlying neighborhoods in Hartford, and Bloomfield. According to the CSA report, the proposed Route 20 crosstown route would absorb ridership from several existing routes including Routes 37, 39, 50, 52, 54, 63, and 76, and would serve an estimated 2,042 riders, an approximately 13% increase over existing conditions.

Route 61

The proposed Route 61 would operate every 30 minutes between 6AM and 6PM, with hourly service in the early morning (5AM – 6AM) and in the evening (6PM – 9PM). Route 61 would provide connections between Wethersfield and Windsor via outlying communities in North and South Hartford. The major destinations that would be served by this crosstown route would include institutional entities such as Trinity College and the Connecticut Department of Social Services, as well as major mobility connections via Union Station and commercial corridors such as North Main Street, Albany Avenue, Farmington Avenue, and others. This route would provide transit access for potential riders in known employment hubs such as Windsor, as well as transit dependent communities in the west and northern neighborhoods of Hartford. According to the CSA report, the proposed Route 61 crosstown route would absorb ridership from existing Routes 40 and 42 and would serve an estimated 1,242 riders. As part of the GHMS, public comment and review periods have seen resident support for a crosstown route generally following this routing.

Route 95

As defined in the CSA report, a proposed Route 95 route would operate every 30 minutes between 6AM and 6PM, and hourly from 5AM-6AM and 6PM-11PM, traveling between Glastonbury High School and the Buckland Hills Mall in Manchester. The route would bypass downtown Hartford and operate primarily on Main Street and Park Avenue and supplement Routes 82 and 84 service in East Hartford while reducing system redundancy on Burnside Avenue. The route provides crosstown service to major residential centers and retail and employment centers in Manchester and Glastonbury. This route would provide transit access in several transit dependent communities in East Hartford, as well as major employment hubs in Glastonbury, East Hartford, and Manchester. According to the CSA report, the proposed Route 95 crosstown route would absorb ridership from several existing routes including Routes 94, 95, and 96, and would serve an estimated 1,832 riders, an approximately 11% increase over existing conditions.

Potential Alternative Crosstown Routes

Beyond the routes recommended in the CSA Report, several other options exist for crosstown routes that could be implemented. One such opportunity is connecting the transit dependent areas proximate to New Britain, with the job hub located within Farmington and West Hartford Center. While not proximate to downtown Hartford this potential crosstown route could potentially bypass downtown New Britain and provide service supplemental to CTfastrak service, linking residents of New Britain to employment and commercial centers elsewhere in the region.

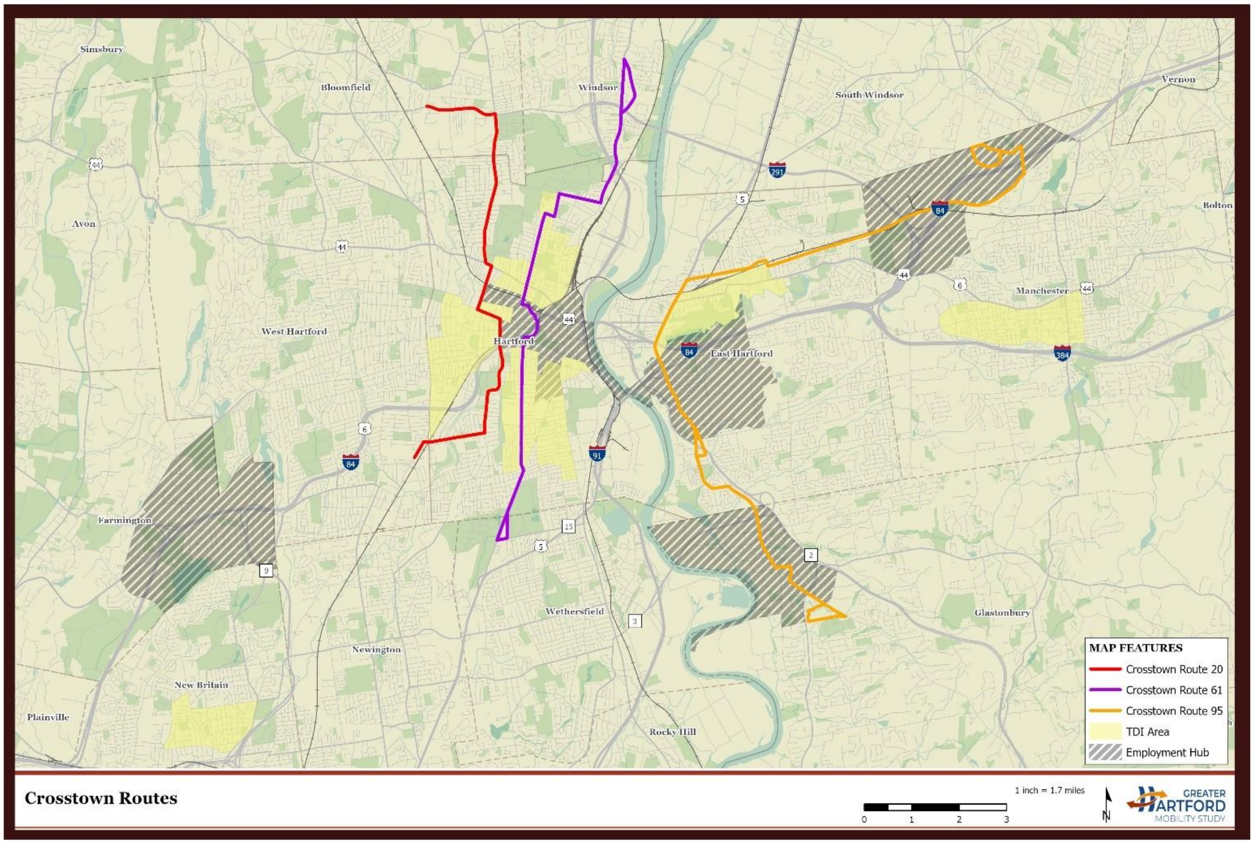
Crosstown Route Impacts

The implementation of the proposed crosstown routes would strive to serve an emergent market of transit riders who do not live or work in downtown core areas, and whose needs are not met by traditional radial service in which routes run to and from downtown cores. These crosstown routes will save riders time by avoiding the condensed downtown areas such as Hartford or New Britain in which congestion and delays are likely. Instead, these crosstown routes could provide the opportunity for riders to travel between residential hubs and employment centers outside of the dense downtown communities. This will improve access for these riders to critical jobs and housing markets outside of regional hubs such as downtown Hartford.

These routes would not only provide standalone value but be major components of the larger bus network in the region and improve the overall mobility of the Greater Hartford area. These routes would operate along, and provide additional access to, potential future enhanced transit corridors such as Albany Avenue, Park Street, and Farmington Avenue in Hartford, Burnside Avenue in East Hartford, and the Buckland Hills Area in Manchester, among others, providing improved regional and local access along major transit corridors. They would also supplement a robust network of Radial, Connector, and CTfastrak routes.

Alternative Map

The concept map below outlines the location of the potential crosstown routes as well as TDI and employment hubs that could provide opportunities for future potential routes.



Implementation Timeframe

Timeframe

Implementation of new crosstown routes would be a short-term (1 to 3 year) alternative.

Project Development Process

The routes will need to be planned and scheduled, with the implementation of new infrastructure where appropriate, and the CT*transit* would need to ensure sufficient staffing or hiring is feasible.

Project Phasing

The potential routes could be established on a case-by-case basis based on demand and community support for these routes.

Environmental Review Process and Next Steps

Some segments require a Categorical Exclusion (CE), while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – High Benefit

It is expected that the implementation of crosstown bus service would improve both travel time and reliability. By taking routes out of downtown, it is expected that congestion hot spots will be avoided within the City of Hartford. By bypassing one of the most congested areas in the bus system in the Hartford region, passengers can expect more reliable levels of service while reducing overall travel time.

Access and Connectivity – Moderate Benefit

Implementation of new crosstown service would primarily improve connectivity between job hubs and major regional destinations outside of downtown Hartford. Connecting population centers with non-downtown employment hubs would improve opportunities for those living outside the urban core, but who still rely upon transit for access to critical jobs and commerce areas.

Travel Options and End User Convenience – High Benefit

The primary benefit for users of crosstown service would be to improve the overall experience by limiting idle time or traffic time for routes stuck in traffic within the downtown core. By avoiding these congested areas, it is expected that crosstown routes would flow more efficiently, reducing the wait times for riders making regional trips.

Criteria Supporting Other Study Goals

Equity – High Benefit

Many of the potential crosstown routes would serve environmental justice communities and offer more reliable, regional service and improved access to jobs outside the urban core, opening up job markets that may have been previously inaccessible without these route options.

Safety - Neutral

Implementation of crosstown routes are not expected to impact safety KPIs in either a negative or positive way.

Resiliency and Sustainability – Moderate Benefit

Making transit a viable transportation alternative reduces the need for driving and allows residents to feasibly switch from personal cars to transit.

Environment – High Benefit

Public transportation uses less energy and emits fewer emissions that other forms of motorized transportation. Service would not require any new construction that impacts the built or natural environment. There would be no operational impacts on the natural or built environment.

Technology – Moderate Benefit

Implementation of crosstown routes would support consideration for future technologies including, but not limited to, real time bus information, fleet electrification, and other potential technological advancements.

Public Support – High Benefit

There is strong support for this concept. Some suggestions include a Broad Street - Garden Street route. Two suggestions are made for Bus #161: extend a stop to Park (street?), add a bus shelter to the start of the route, reduce the 20-minute waiting period at Connecticut Children's Medical Center.

Overarching Criteria

Economic Opportunity – High Benefit

As mentioned previously, implementation of crosstown routes could potentially open up commercial and employment hubs to individuals who may not otherwise be able to efficiently access these areas, including transit reliant households. Additionally, crosstown routes that bypass the downtown core may incentivize existing or new transit users to increasingly use these services for a variety of trips to the economic centers, increasing economic opportunity of these areas.

Feasibility/Complexity – High Benefit

Implementation of crosstown routes would operate on existing roadways, many of which feature existing local routes. As such, no additional ROW is expected to be required, and existing roads likely have the capacity to support bus service. The feasibility of crosstown routes is expected to be high with minimal complexities that may negatively affect the roadway environment.

System Compatibility – High Benefit

Crosstown routes would improve the regional bus system by providing alternatives to downtown routes, thus freeing up capacity for those who use the buses for downtown travel. Implementation of crosstown service would benefit users who rely on bus service outside of the downtown core and could be coordinated with existing and future improvements.

Overall Assessment of Benefits/Impacts

No impacts are assumed with this alternative and significant benefits are expected, particularly among equity and the overarching criteria.

Order of Magnitude Cost

Utilizing the "Move New Haven Transit Mobility Study", completed in 2019, as a sample, the project team estimated the initial capital cost investment as well as the annual operating and maintenance budget of the three aforementioned crosstown routes (Routes 20, 61, and 95). It is estimated that initial start-up capital costs would be approximately $1.35 million for infrastructure upgrades and purchase of additional buses to support the new routes, as needed. Annual operating costs were estimated based on the estimations made by CT*transit* for the potential sample crosstown routes in the 2019 New Haven study. Using these estimates, the project team estimated annual O&M costs for the potential crosstown routes to be as follows: Route 20 - $1.6 million; Route 61 - $1.8 million; and Route 95 - $2.8 million. Actual capital and O&M costs may vary.

High Level Benefit-Cost Outlook

The relatively low overall cost and moderate to high benefits create a high benefit to cost outlook. Ultimately, it is anticipated that the benefits would exceed the costs associated with this alternative.

Enhance Airport Service along CTtransit Route #30

Detailed Project Description

The Airport Service Enhancements alternative would continue the incremental improvements that have been made to the CT*transit* Route 30 over the past few years. It would include further reductions in headways, to every 30 minutes during the day, seven days a week. It would also include improvements to marketing and branding of the service, including a dedicated fleet of battery electric buses equipped with luggage racks and painted in a special airport service livery displaying a distinct brand. This would increase the route's appeal to airline passengers who might not be familiar with how public transit service operates.

Alternative Map

Implementation Timeframe

Timeframe

This alternative could be implemented in a short timeframe (1 to 3 years).

Project Development Process

The main activities that would need to be completed would be the purchase of four new dedicated buses for the service, which would likely take about 12 to 18 months including both procurement and delivery. The alternative could be considered an early action step toward the North Corridor BRT alternative.

Project Phasing

This alternative can be completed in phases of independent utility, based upon the implementation of different routes.

Environmental Review Process and Next Steps

Not Applicable (NA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Low Benefit

The alternative would provide some improvements to travel time and reliability by reducing the waiting time of potential riders.

Access and Connectivity – Moderate Benefit

The enhanced service would improve connectivity from the airport to downtown Hartford and Union Station by reducing headways on the main transit route connecting those points.

Travel Options and End User Convenience – High Benefit

Travel convenience would be improved by reducing headways and therefore waiting time for riders. Reduced headways and improved branding would make the service easier to use for airline passengers.

Criteria Supporting Other Study Goals

Equity – High Benefit

Improved transit service from high transit dependency residential areas to major employment centers like the Day Hill Road corridor and the Bradley International Airport area provide significant benefits for disadvantaged communities.

Safety – Low Benefit

Improved transit service will attract new riders to public transit which is generally safer than private automobiles.

Resiliency and Sustainability – Moderate Benefit

Making transit a viable alternative for midday travel reduces the need for driving and allows residents to feasibly switch from personal cars to transit.

Environment – Moderate Benefit

There is minimal to moderate presence of the various mapped environmental resources within the project corridor, and minimal presence immediately adjacent to the representative alternative. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Moderate Benefit

Implementation of crosstown routes would support consideration for future technologies including, but not limited to, real time bus information, fleet electrification, and other potential technological advancements.

Public Support – Moderate Benefit

There was a general support for the Airport Service, but people frequently expressed that they either did not know about it and/or that it needs substantially better advertising and signage.

Overarching Criteria

Economic Opportunity – High Benefit

Improved connections between Bradley International Airport and downtown Hartford, as well as connections to other rail and bus services, will provide economic benefits for the region. Feasibility/Complexity – High Benefit

This alternative is relatively easy to implement with minimal complexity, minimal engineering, and no additional ROW required.

System Compatibility – High Benefit

The enhancement of transit service between Bradley International Airport and downtown Hartford has independent utility and also supports systemic enhancements by providing connections to other bus and rail services at Union Station and park-and-ride linkages at the Poquonock Park-and-Ride facility.

Overall Assessment of Benefits/Impacts

No impacts are assumed with this alternative and significant benefits are expected, particularly among equity and the overarching criteria.

Order of Magnitude Cost

Overall, the order of magnitude cost for the Route 30 Airport Service Enhancements alternative will be relatively low. The purchase of four new battery electric buses would be approximately $1 million each or $4 million in total. The reduction in service headways will require one more bus to be in service for 12 hours per day, seven days a week. At CTtransit's 2020 cost per revenue service hour this works out to approximately $600,000 per year.

High Level Benefit-Cost Outlook

The moderate benefits and low cost of the alternative results in a high benefit-cost outlook.

Fare-Free Transit

Detailed Project Description

All CT*transit* Hartford Division local bus services would be free. No fares would be charged, in order to encourage more people to use public transportation, reducing congestion, speeding up service, decreasing environmental impacts, and reducing inequality in our transportation system.

Alternative Image

Implementation Timeframe

Timeframe

This alternative could be implemented in a in a short timeframe (1 to 3 years).

Project Development Process

The main activities that would need to be completed would be the allocation of operational funding for a continuation of the COVID-19 fare-free transit program.

Project Phasing

This alternative can be completed in phases of independent utility, based upon the implementation of different routes.

Environmental Review Process and Next Steps

Not Applicable (NA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

No travel time or reliability improvements.

Access and Connectivity – Neutral

No access or connectivity improvements.

Travel Options and End User Convenience – Moderate Benefit

No travel options are increased, but end user convenience is improved by users not needing to carry fares or reload their transit cards.

Criteria Supporting Other Study Goals

Equity – High Benefit

Residents without access to personal vehicles, particularly within the study core would experience significant benefits for disadvantaged communities.

Safety – Low Benefit

Free transit service will attract new riders to public transit which is generally safer than private automobiles.

Resiliency and Sustainability – Moderate Benefit

Making transit a viable alternative for midday travel reduces the need for driving and allows residents to feasibly switch from personal cars to transit.

Environment – Moderate Benefit

There is minimal to moderate presence of the various mapped environmental resources within the project corridor, and minimal presence immediately adjacent to the representative alternative. Environmental impacts are anticipated to be minimal and mitigable.

Technology – Neutral

No additional technology for fare collection will be needed on buses and the system will not need to be maintained.

Public Support – Moderate Benefit

Overall, the general public supported this alternative, particularly those who took advantage of the COVID-19 fare-free bus program.

Overarching Criteria

Economic Opportunity – High Benefit

Improved access to jobs and amenities throughout the region will improve economic conditions for all.

Feasibility/Complexity – Moderate Impact

This alternative is has a significant operational cost that cannot be supported by the State's current operational budget and fiscal climate.

System Compatibility – High Benefit

This alternative would enhance the overall system performance and compatibility with rail travel.

Overall Assessment of Benefits/Impacts

Although there are benefits to this alternative, the current operational budget would make it difficult to implement.

Order of Magnitude Cost

The COVID-19 fare-free program cost $2.7M per month or approximately $33M per year.

High Level Benefit-Cost Outlook

This alternatives costs are significant and a study would be required to actually determine the cost benefits.

BICYCLE AND PEDESTRIAN ALTERNATIVES

GREATER HARTFORD MOBILITY STUDY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

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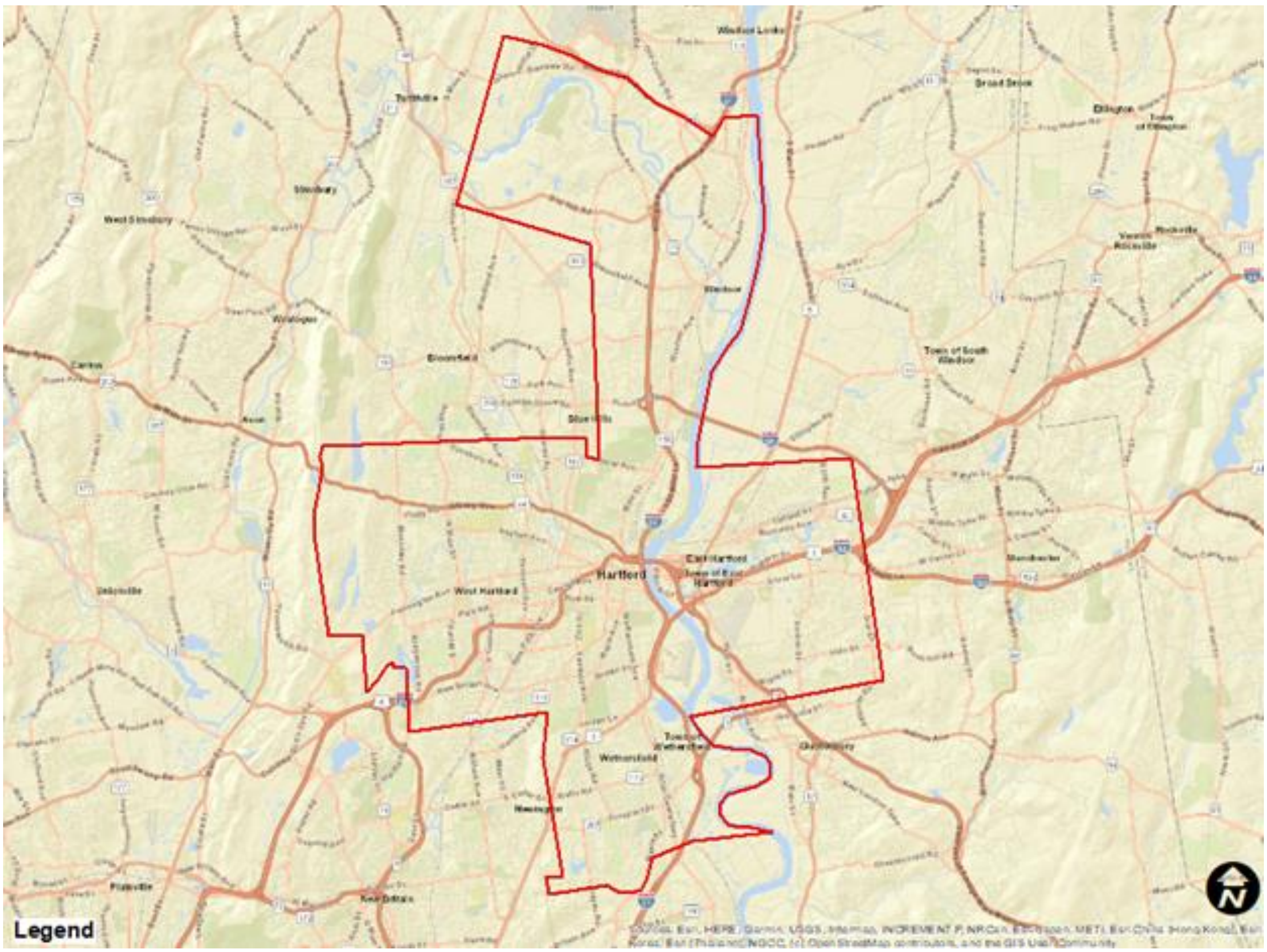
Enhance Snow Clearing of Sidewalks Across the Region

Detailed Project Description

This alternative recommends the development of a regional policy for snow clearing that is intended to assure more consistent and responsive clearing of snow from sidewalks abutting both public and private parcels. The alternative recommends the development of a best practices guide in conjunction with the policy that provides guidance on snow removal techniques and property owner communication and enforcement measures. The purpose of this alternative is to improve pedestrian mobility and safety in the region.

Alternative Map



Implementation Timeframe

Timeframe

This concept is feasible in the near term as it does not require the construction of facilities or other infrastructure; however, if there is policy opposition the project may be delayed.

Project Development Process

This is a policy recommendation that would require individual communities to adopt policies and practices that ensure adequate snow removal from pedestrian facilities. This effort should be coordinated by the Capitol Region Council of Governments (CRCOG) which should convene a meeting of City, Town, and CTDOT officials to discuss a standard policy, practice, and approach towards snow removal in the study area.

Project Phasing

This project cannot be advanced in phases of independent utility since it is a policy recommendation.

Environmental Review Process

Not Applicable (N/A)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Low Benefit

No impact to travel time is expected. Travel reliability will likely be improved for pedestrians during and after snow events.

Access and Connectivity – Moderate Benefit

This alternative would improve access for pedestrians during and after snow events.

Travel Options and End User Convenience - Low Benefit

This alternative would improve convenience for pedestrians during and after snow events. It does not expand travel options.

Criteria Supporting Other Study Goals

Equity - High Benefit

There would be no impact to disadvantaged communities as a result of the implementation of the policy. The uniform policy would help maintain safe and accessible transportation network during and after snow events.

Safety - High Benefit

The timely and adequate removal of snow from sidewalks will greatly improve safety for pedestrians who could otherwise risk a slip and fall or exposure to traffic if sidewalks are impassable.

Resiliency and Sustainability - Neutral

This alternative does not have resiliency or sustainability impacts or benefits.

Environment - Neutral

This alternative does not present environmental impacts or benefits.

Technology - Neutral

This alternative is unlikely to rely upon or utilize technology.

Public Support - High Benefit

This alternative is expected to be supported by the public, especially those that are reliant upon walking as the preferred or sole means of transportation.

Overarching Criteria

Economic Opportunity - Neutral

This alternative is unlikely to provide an economic benefit other than improving access to business during and after snow events.

Feasibility/Complexity - High Benefit

This alternative has high feasibility and is not technically complex.

System Compatibility - Neutral

This alternative is compatible with other modalities and systems.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Operational and maintenance costs may be increased but user benefit is expected to outweigh costs.

Order of Magnitude Cost

The implementation of standards and best practices under CRCOG would be approximately $300,000. The cost of snow removal and maintenance is expected to occur as part of municipal operational and enforcement budgets.

High Level Benefit-Cost Outlook

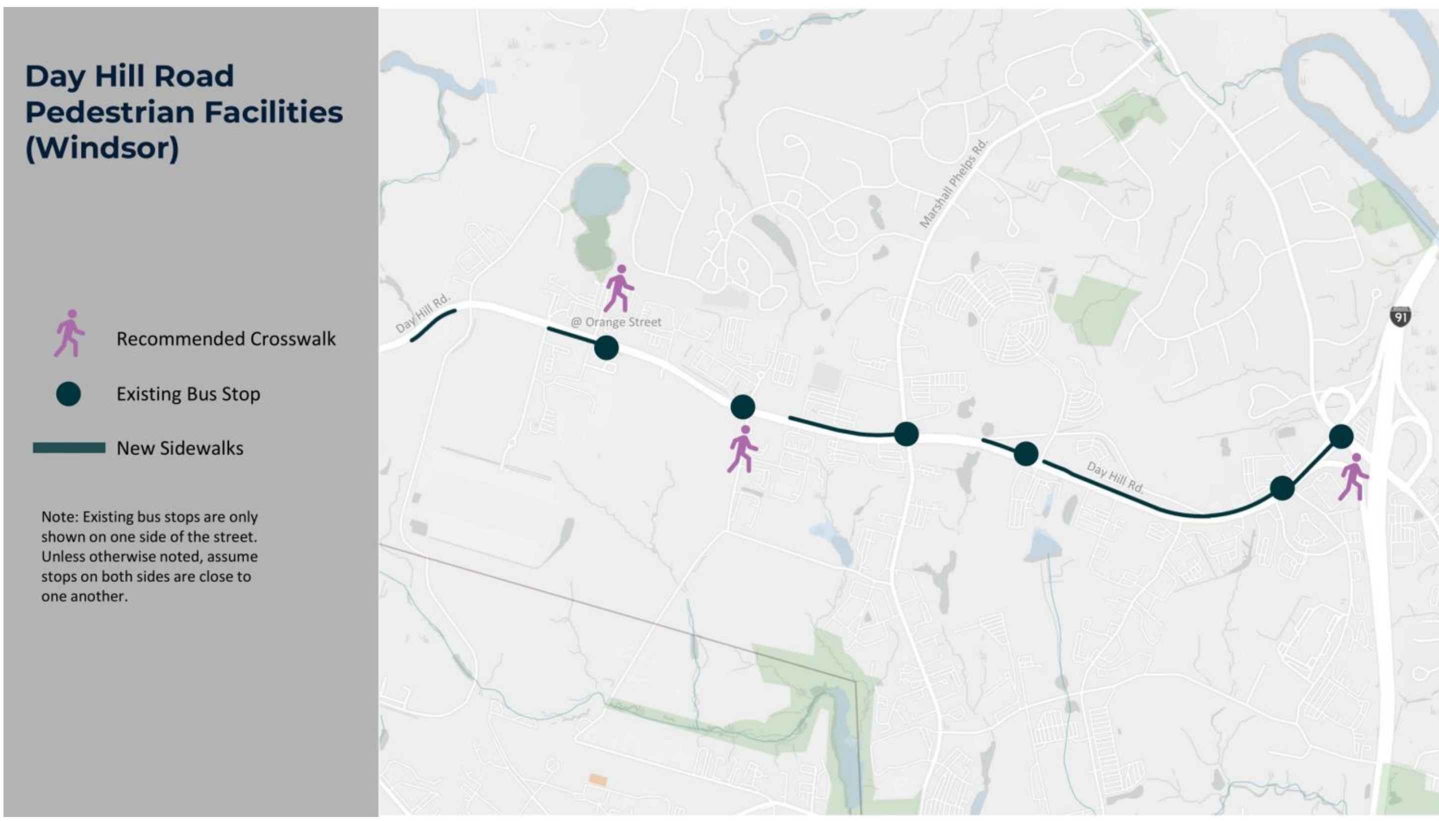
The alternative is expected to provide a high level of benefit relative to cost.

Complete Pedestrian Facilities along Day Hill Road, Windsor

Detailed Project Description

This concept provides complete and continuous pathways for pedestrians and bicyclists along Day Hill Road in Windsor which is serviced by transit (CT Transit buses). Approximately half of the corridor currently has pathways although there are sizeable gaps in the network, particularly at the eastern end of the corridor. The concept includes new marked crosswalks and bus stop waiting and loading areas at existing bus stops that currently lack facilities. The concept also provides a bicycle and pedestrian connection between Day Hill Road and Route 75. The purpose of the concept is to improve access to and from bus stops and improve pedestrian safety. The concept may support a modal shift to transit use. This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map



Implementation Timeframe

Timeframe

The construction of pathways and installation of bus stop facilities and marked crosswalks is a short-term implementation item that is not contingent upon other modal improvements. Improvements are feasible for implementation within a three-year period.

Project Development Process

Improvements may be contingent upon right-of-way acquisition or procurement of easements, which could add time to the implementation process.

Project Phasing

Although there is independent utility by segmenting the improvements, it is recommended that improvements be made as a whole, as part of one project to maximize the utility of the network.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the last mile connections between transit and major employers along Day Hill Road would be beneficial to connectivity in this part of Windsor and may encourage transit ridership.

Travel Options and End User Convenience - High Benefit

This alternative would improve user comfort and will enable pedestrians and bicyclists to travel the length of Day Hill Road on a separated facility providing them with access to CT Transit bus stops along Day Hill Road and to major employers along Day Hill Road. A continuous pathway network provides intermodal options including transit, walking, and bicycling.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for minor environmental impacts in disadvantaged communities. However, improved accessibility to CTtransit services would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing a separate facility that will move pedestrians and bicyclists off of the roadway and by providing marked crosswalks that would provide access to existing bus stops.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Minimal presence of natural resources within the project corridor. Diversity habitats are present on east end of Project Corridor and representative alternative. Minimal built resources within the project corridor. No presence of historic districts or public schools. Minimal minority and low-income populations within the Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology beyond crosswalk signals.

Public Support - Moderate Benefit

Concept seen as a priority for pedestrian access. There is public support for expanding bicycle and pedestrian accommodations and access to transit. That support is moderate in non-residential and low-density residential areas such as Day Hill Road.

Overarching Criteria

Economic Opportunity - High Benefit

The proposed improvements would improve access to jobs and expand the labor force of local employers. The improvements would also improve access of patrons and customers to local businesses.

Feasibility/Complexity - High Benefit

This alternative requires only low-cost improvements with a sizeable share of those improvements located in existing rights-of-way.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including CT Transit, a CTDOT park and ride lot on Route 75, and existing sidewalks and shared-use pathways that currently serve bicyclists and pedestrians.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would be mostly limited to pavement installation, crosswalk markings, and pedestrian signals as required. Operations and maintenance are expected to cost a few thousand dollars a year. As a result, the benefit to cost ratio would be very high.

Order of Magnitude Cost

The concept includes 1.5 miles of new asphalt sidepath. Approximate cost for the construction of sidepaths is $500,000 per mile. Total cost of the sidepath would be $750,000. Crossing enhancements at intersections cost approximately $50,000 per intersection, which includes pedestrian signal enhancements and marked crossings. The concept proposes crossing enhancements at three intersections for a total cost of $150,000 for crossing enhancements. The total project cost is therefore approximately $900,000. This cost estimate excludes the potential cost of land acquisition that may be required to expand the existing right-of-way to accommodate a sidepath if easements cannot be procured.

High Level Benefit-Cost Outlook

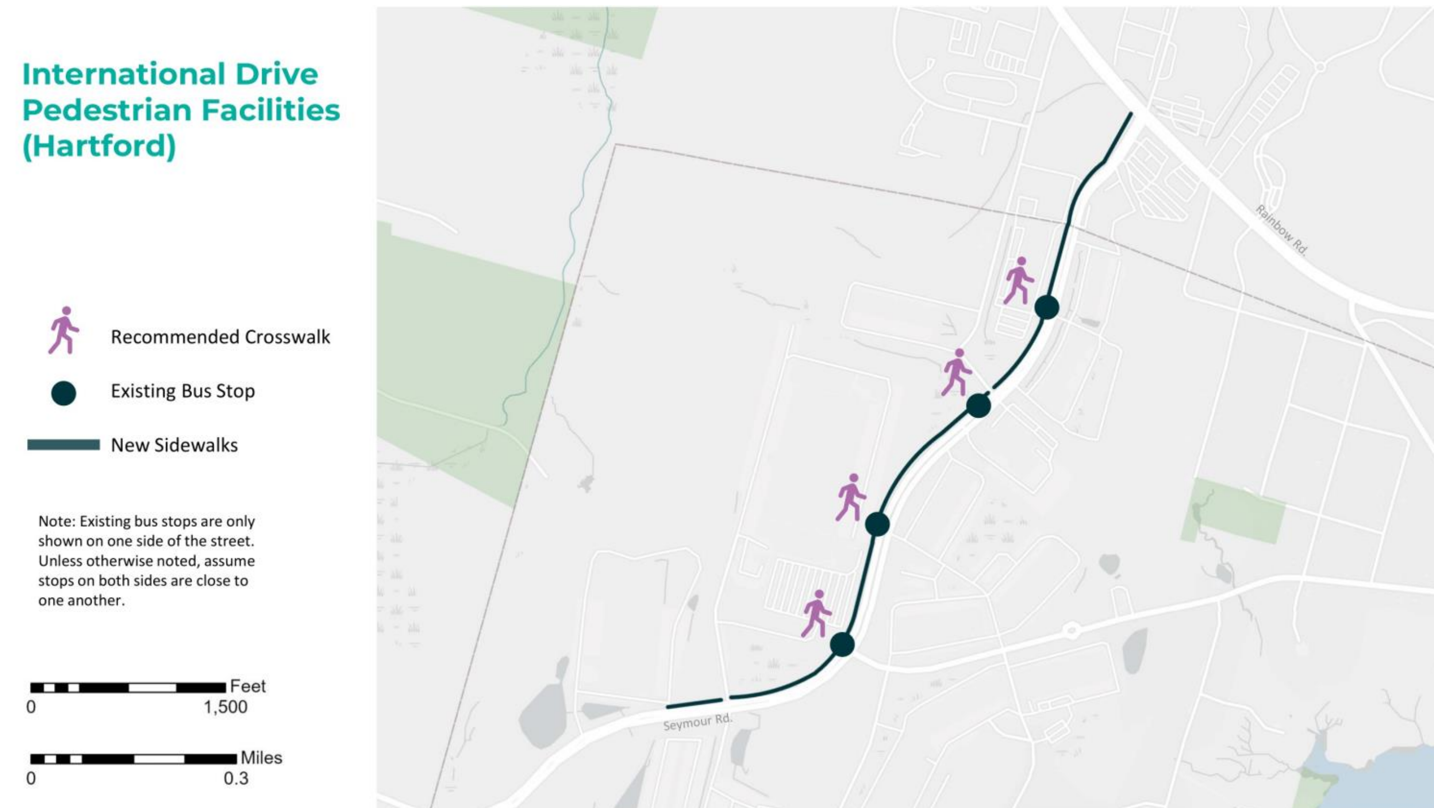
Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to exceed project costs.

Complete Pedestrian Facilities along International Drive, Windsor

Detailed Project Description

This concept provides complete and continuous sidewalks along International Drive in Windsor which is serviced by transit (CT Transit buses). There are currently no sidewalks along the corridor and bus stops lack facilities such pavement and shelters. The concept includes new marked crosswalks with RRFB crosswalk signage and bus stop waiting and loading areas at bus stops. The concept also provides a pedestrian connection between major employers on International Drive and Route 20 in Windsor Locks. The purpose of the concept is to improve access to and from bus stops and improve pedestrian safety. The concept may support a modal shift to transit use. This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map



Implementation Timeframe

Timeframe

The construction of pathways and installation of bus stop facilities and marked crosswalks is a short-term implementation item that is not contingent upon other modal improvements. Improvements are feasible for implementation within a three-year period.

Project Development Process

Improvements may be contingent upon right-of-way acquisition or procurement of easements, which could add time to the implementation process.

Project Phasing

Although there is independent utility by segmenting the improvements, it is recommended that improvements be made as a whole, as part of one project to maximize the utility of the network.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability –Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the last mile connections between transit and major employers along International Drive would be beneficial to connectivity in this part of Windsor and may encourage transit ridership.

Travel Options and End User Convenience - High Benefit

This alternative would improve user comfort and will enable pedestrians to travel the length of International Drive off of the roadway providing them with access to CT Transit bus stops along International Drive and to major employers along International Drive. A continuous pathway network provides intermodal options including transit, walking, and bicycling.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for minor environmental impacts in disadvantaged communities. However, improved accessibility to CTtransit services would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing sidewalks that will move pedestrians off of the roadway and by providing marked crosswalks that would provide access to existing bus stops.

Resiliency and Sustainability - Moderate Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Minimal presence of natural resources within the project corridor. Diversity habitats are present throughout the Project Corridor and representative alternative. Minimal built resources within the project corridor. No presence of historic districts or public schools. Minimal minority and low-income populations within the Project Corridor.

Technology - Neutral

The concept does not employ technology beyond RRFB crosswalk signage.

Public Support - Low Benefit

Comments suggest reducing car lanes in this corridor. Comments suggest there are other higher priority improvements in this area. There is public support for expanding pedestrian accommodations and access to transit. That support is low in non-residential and low-density residential areas such as International Drive.

Overarching Criteria

Economic Opportunity - Moderate Benefit

Enhancing mobility options would be beneficial with respect to providing access to jobs and expanding the labor force that employers would have access to due to expanded mobility options of that workforce.

Feasibility/Complexity - High Benefit

This alternative requires only low-cost improvements with a sizeable share of those improvements located in or adjacent to existing rights-of-way.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including CT Transit.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would be mostly limited to pavement installation, crosswalk markings, and RRFB signs and signals. Operations and maintenance are expected to cost a few thousand dollars a year. As a result, the benefit to cost ratio would be very high.

Order of Magnitude Cost

The concept includes 1.2 miles of new concrete sidewalk and bus stop pads. Approximate cost for the construction of the sidewalks is $500,000 per mile. Total cost of sidewalks would be $600,000. Crossing enhancements at intersections cost approximately $10,000 per intersection, which includes RRFB signs/signals and marked crossings. The concept proposes crossing enhancements at four locations for a total cost of $40,000 for crossing enhancements. The total project cost is therefore approximately $650,000. This cost estimate excludes the potential cost of land acquisition that may be required to expand the existing right-of-way to accommodate a sidewalk if easements cannot be procured.

High Level Benefit-Cost Outlook

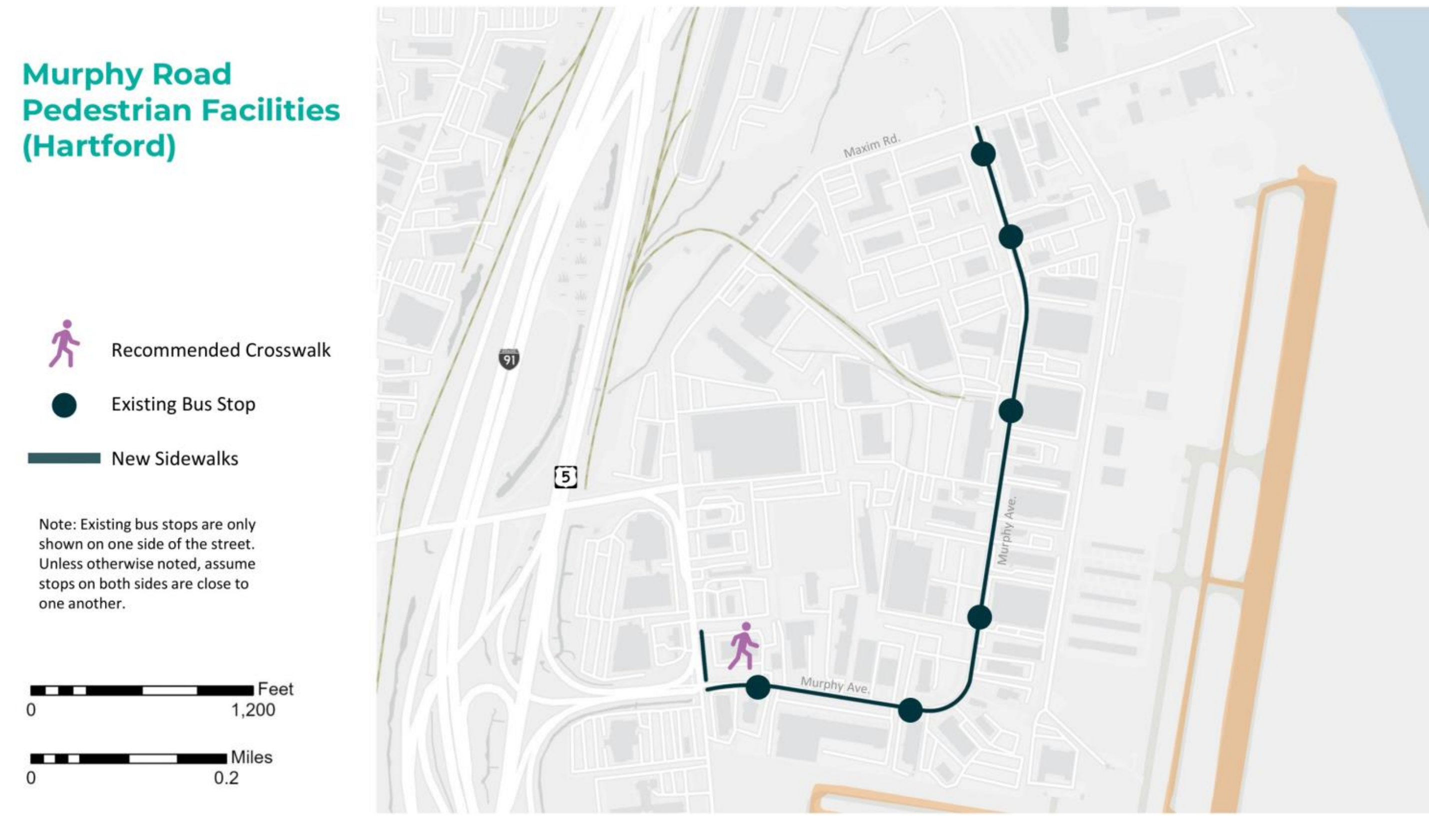
Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to exceed project costs.

Complete Pedestrian Facilities along Murphy Road, Hartford

Detailed Project Description

This concept provides complete and continuous sidewalks along Murphy Road in Hartford, which is serviced by transit (CT*transit* buses). There are currently no sidewalks along the corridor and bus stops lack facilities such pavement and shelters. The concept includes new sidewalks and bus stop waiting and loading areas at bus stops. The concept provides a pedestrian connection between major employers on Murphy Road and provides off-street access to CT Transit bus stops along the corridor. Included within the concept is a marked crosswalk with pedestrian signals at the intersection of Murphy Road and Brainard Road. The proposed sidewalks would connect to existing sidewalks on Brainard Road that connect to sidewalks on Airport Road, connecting to the south end of Hartford. The purpose of the concept is to improve access to and from bus stops and improve pedestrian safety. The concept may support a modal shift to transit use. This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map



Implementation Timeframe

Timeframe

The construction of pathways and installation of bus stop facilities and marked crosswalks is a short-term implementation item that is not contingent upon other modal improvements. Improvements are feasible for implementation within a three-year period.

Project Development Process

Improvements may be contingent upon right-of-way acquisition or procurement of easements, which could add time to the implementation process.

Project Phasing

Although there is independent utility by segmenting the improvements, it is recommended that improvements be made as a whole, as part of one project to maximize the utility of the network.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the last mile connections between transit and major employers along Murphy Road would be beneficial to connectivity in this part of Hartford and may encourage transit ridership.

Travel Options and End User Convenience - High Benefit

This alternative would improve user comfort and will enable pedestrians to travel the length of Murphy Road off of the roadway providing them with access to CT Transit bus stops along Murphy Road and to major employers along Murphy Road. A continuous sidewalk network provides intermodal options by encouraging walking and transit use.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for minor environmental impacts in disadvantaged communities. However, improved accessibility to CT*transit* services would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing sidewalks that will move pedestrians off of the roadway and by providing marked crosswalks that would provide access to existing bus stops.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Moderate presence of natural resources within the project corridor mostly associated with the Connecticut River. Diversity habitats are present throughout the Project Corridor and representative alternative. Minimal built resources within the project corridor. Minority and low-income populations located on the east side of the Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology beyond RRFB crosswalk signage.

Public Support - Moderate Benefit

Alternative has strong public support. Comments demonstrate a significant portion of industrial park workers are from low or zero card households. Comments express adding sidewalk will increase safety and incentivize transit use.

Overarching Criteria

Economic Opportunity - Moderate Benefit

Enhancing mobility options would be beneficial with respect to providing access to jobs and expanding the labor force that employers would have access to due to expanded mobility options of that workforce.

Feasibility/Complexity - High Benefit

This alternative requires only low-cost improvements with a sizeable share of those improvements located in or adjacent to existing rights-of-way.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including CT Transit.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would be mostly limited to pavement installation and crosswalk markings. Operations and maintenance are expected to cost a few thousand dollars a year. As a result, the benefit to cost ratio would be very high.

Order of Magnitude Cost

The concept includes 0.9 miles of new concrete sidewalk and bus stop pads. Approximate cost for the construction of the sidewalks is $500,000 per mile. Total cost of the sidewalks would be $450,000. The crossing enhancement at the Murphy Road and Brainard Road intersection would cost approximately $25,000. The total project costs are anticipated to be $700,000.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to exceed project costs.

Complete Pedestrian Facilities along Main Street, East Hartford

Detailed Project Description

This concept provides complete and continuous sidewalks along Main Street in East Hartford, which is serviced by transit (CTtransit buses). There are currently significant gaps in the sidewalk network along the corridor and bus stops lack facilities such pavement and shelters. The concept includes new sidewalks and bus stop waiting and loading areas at bus stops. The concept provides a pedestrian connection from residences on Main Street to existing sidewalks on Route 5 and to Norris Elementary School and McAuliffe Park, which are located east of the Main Street and Route 5 intersection. The purpose of the concept is to improve access to and from bus stops and improve pedestrian safety. The concept may support a modal shift to transit use. This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map

Implementation Timeframe

Timeframe

The construction of pathways and installation of bus stop facilities and marked crosswalks is a short-term implementation item that is not contingent upon other modal improvements. Improvements are feasible for implementation within a three-year period.

Project Development Process

Improvements may be contingent upon right-of-way acquisition or procurement of easements, which could add time to the implementation process.

Project Phasing

Although there is independent utility by segmenting the improvements, it is recommended that improvements be made as a whole, as part of one project to maximize the utility of the network.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability –Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the last mile connections between transit and residences along Main Street would be beneficial to connectivity in this part of East Hartford and may encourage transit ridership.

Travel Options and End User Convenience - High Benefit

This alternative would improve user comfort and will enable pedestrians to travel the length of Main Street off of the roadway providing them with access to CT Transit bus stops along Main Street. A continuous sidewalk network provides intermodal options by encouraging walking and transit use.

Criteria Supporting Other Study Goals

Equity – Moderate Benefit

There could be a potential for minor environmental impacts in disadvantaged communities. However, improved accessibility to CTtransit services would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing sidewalks that will move pedestrians off of the roadway and would provide access to bus stops.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Moderate presence of natural resources within the project corridor mostly associated with the Connecticut and Podunk Rivers. Diversity and critical habitats are present throughout the Project Corridor and representative alternative. Minimal built resources within the project corridor. Moderate minority and low-income populations located on the east side of the Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology.

Public Support - Low Benefit

There is public support for expanding pedestrian accommodations and access to transit. That support is low in low-density residential areas such as Main Street. There is a desire to see bike and pedestrian paths a standard part of roadways.

Overarching Criteria

Economic Opportunity - Neutral

Enhancing access to transit would be beneficial to a small number of local residents on Main Street who need access to jobs but do not own a vehicle or cannot afford to drive.

Feasibility/Complexity – High Benefit

This alternative requires only low-cost improvements with a sizeable share of those improvements located in or adjacent to existing rights-of-way.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including CT Transit.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would be mostly limited to pavement installation. Operations and maintenance are expected to be relatively low cost as routine maintenance such as snow removal would be conducted by adjacent property owners. As a result, the benefit to cost ratio would be very high.

Order of Magnitude Cost

The concept includes 0.7 miles of new concrete sidewalk and bus stop pads. Approximate cost for the construction of the sidewalks is $500,000 per mile. Total cost of the sidewalks would be $350,000. This cost estimate excludes the potential cost of land acquisition that may be required to expand the existing right-of-way to accommodate a sidewalk if easements cannot be procured.

High Level Benefit-Cost Outlook

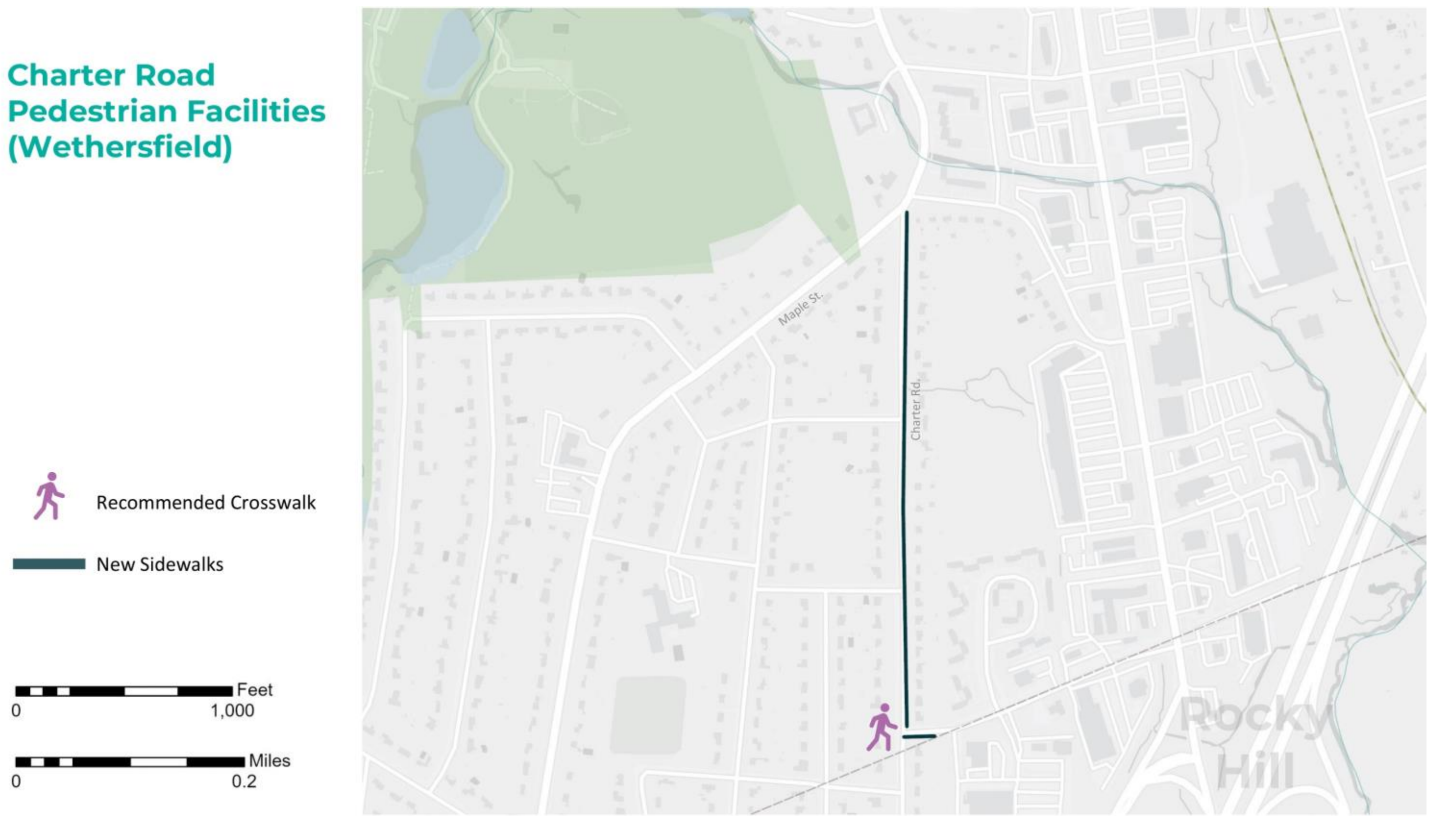
Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to exceed project costs.

Complete Pedestrian Facilities along Charter Road, Wethersfield

Detailed Project Description

This concept provides complete and continuous sidewalks along Charter Road in Wethersfield, which is serviced by transit (CT Transit buses). There are currently no sidewalks along the corridor and no designated bus stops. The concept includes a new sidewalk and crosswalk at Town Line Road that would connect sidewalks on Town Line Road to sidewalks on Maple Street. The purpose of the concept is to improve access to the bus route and improve pedestrian safety. The concept may support a modal shift to transit use. This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map



Implementation Timeframe

Timeframe

The construction of pathways and installation of bus stop facilities and marked crosswalks is a short-term implementation item that is not contingent upon other modal improvements. Improvements are feasible for implementation within a three-year period.

Project Development Process

Improvements may be contingent upon right-of-way acquisition or procurement of easements, which could add time to the implementation process.

Project Phasing

Although there is independent utility by segmenting the improvements, it is recommended that improvements be made as a whole, as part of one project to maximize the utility of the network.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability –Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity –Moderate Benefit

Improving the last mile connections between transit and residences along Charter Road would be beneficial to connectivity in this part of Wethersfield and may encourage transit ridership.

Travel Options and End User Convenience - High Benefit

This alternative would improve user comfort and will enable pedestrians to travel the length of Charter Road off of the roadway providing them with access to CT Transit bus stops along Charter Road. A continuous sidewalk network provides intermodal options by encouraging walking and transit use.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for minor environmental impacts in disadvantaged communities. However, improved accessibility to CTtransit services would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing sidewalks that will move pedestrians off of the roadway and would provide access to bus stops.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Natural resources within the project corridor mostly associated with the Connecticut River and Goff Brook. Diversity habitats are present around edges of the Project Corridor. Minimal built resources within the project corridor. Minimal low-income populations located on the west side of the Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology.

Public Support - Low Benefit

People unanimously support this alternative. Safety improvements are considered a high priority.

Overarching Criteria

Economic Opportunity - Neutral

Enhancing access to transit and improving walking conditions would be beneficial to those who do not own a vehicle or cannot afford to drive.

Feasibility/Complexity - High Benefit

This alternative requires only low-cost improvements with a sizeable share of those improvements located in existing rights-of-way.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including CT Transit.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would be mostly limited to pavement installation. Operations and maintenance are expected to be relatively low cost as routine maintenance such as snow removal would be conducted by adjacent property owners. As a result, the benefit to cost ratio would be very high.

Order of Magnitude Cost

The concept includes 0.5 miles of new concrete sidewalk. Approximate cost for the construction of the sidewalks is $500,000 per mile. Total cost of the sidewalks would be $250,000. Crosswalk markings at the Charter Road/Town Line Road intersection, which is a stop-controlled intersection, would cost approximately $1,000. Total cost of improvements are estimated to be $251,000.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to exceed project costs.

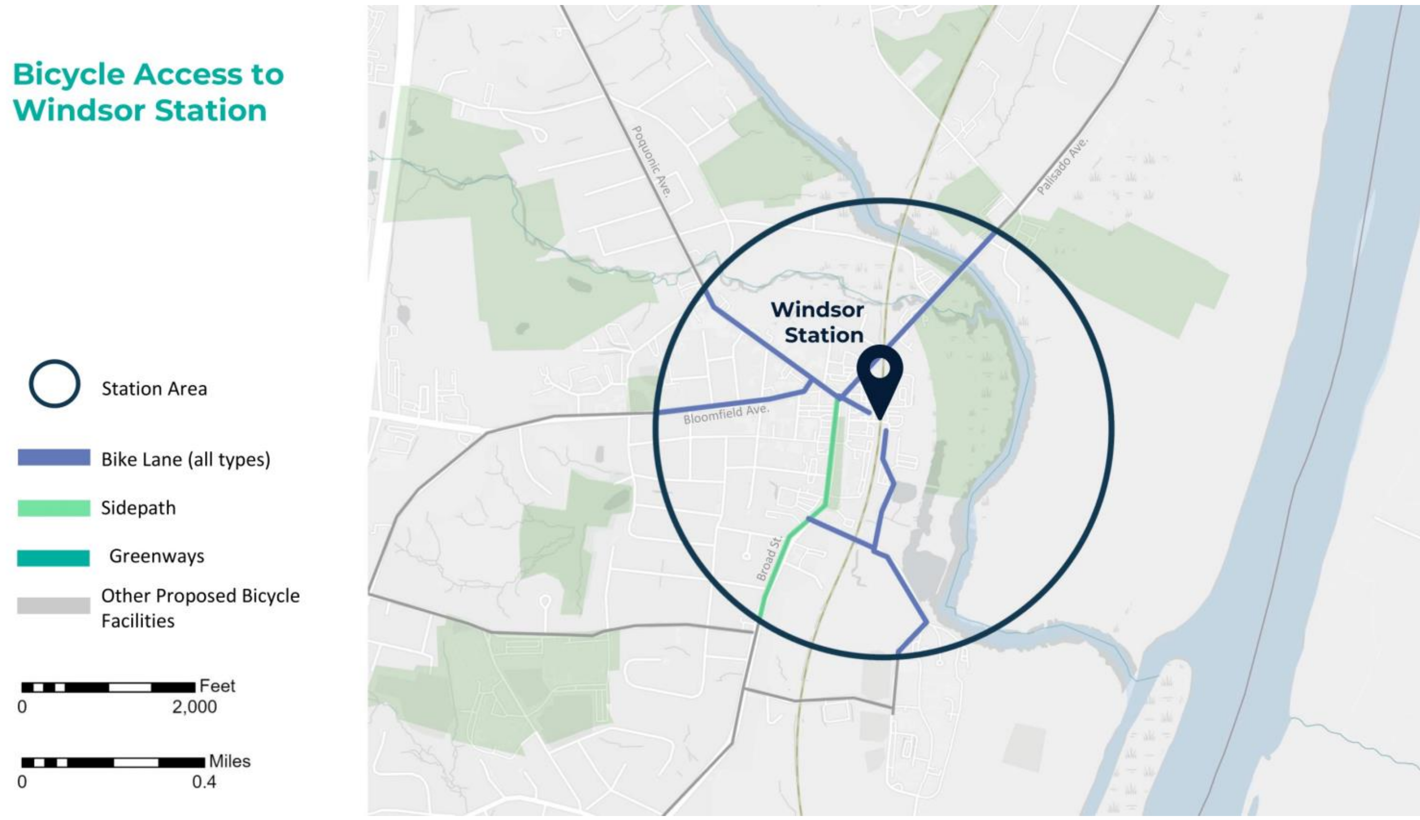
Provide Bicycle Network Serving Windsor Station

Detailed Project Description

This concept provides dedicated bicycle facilities (bike lanes and pathways) approaching and in proximity of the Windsor Station. The purpose of the concept is to improve access to Windsor Station and improve bicycle safety. The recommended buffered bike lane and sidepath on Poquonock Avenue (Route 75) would connect to recommended sidepaths on Day Hill Road. In addition to buffered bike lanes and sidepaths, bike lanes are a recommended facility type. The recommended bicycle facilities would provide bicycle connections between neighborhoods near Windsor Center to the station. The bicycle facilities would also connect Loomis Chaffee School and Windsor High School to the train station.

The concept may support a modal shift to transit use. This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map



Implementation Timeframe

Timeframe

The installation of bicycle facilities is a short-term implementation item that is not contingent upon other modal improvements. Improvements are feasible for implementation within a three-year period.

Project Development Process

The project would next proceed to routing and facility selection, which would confirm or modify the recommendations of this concept. Following routing and facility selection, projects would proceed to design and engineering and then to procurement of bids and construction.

Project Phasing

This concept will likely be implemented in multiple phases. Improvements that require only pavement marking, signage improvements, and minor traffic modifications and minor roadway reconstruction would proceed first. Improvements that would require major roadway or pedestrian area reconstruction, traffic signal improvements, and traffic operations modifications would occur in later phases.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the last mile connections between transit and residences in Windsor Center would be beneficial to connectivity in this part of Windsor and may encourage transit ridership.

Travel Options and End User Convenience - High Benefit

This alternative would improve user comfort and will enable bicyclists to travel in Windsor Center and to Windsor Station along a dedicated bicycle facility. A bicycle facility network encourages bicycling and transit use.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for minor but mitigable environmental impacts in disadvantaged communities. However, improved accessibility to rail services would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing bicycle facilities that will separate bicyclists from traffic.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Moderate presence of natural resources within the project corridor mostly associated with the Connecticut and Farmington Rivers. Diversity habitats are present around edges of the Project Corridor. Historic resources are associated with downtown Windsor. Minimal low-income populations located on the west side of the Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology.

Public Support - Low Benefit

The comments support the Windsor Road diet and subsequently, bicycle access to Windsor as part of the diet.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing access to transit and providing mobility options such as bicycling would expand access to jobs and expand the labor force available to employers. These improvements would also expand access of customers and patrons to local businesses.

Feasibility/Complexity - High Benefit

This alternative requires relatively low-cost improvements with a sizeable share of those improvements located in or adjacent to existing rights-of-way.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including Hartford Line Rail Service.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Impacts may include the removal of on-street parking from some roadways to accommodate bicycle facilities and potential impacts to trees and landscapes adjacent to private properties to accommodate off-street facilities. Initial costs would be mostly limited to pavement installation, roadway restriping, and signage installations. Operations and maintenance are expected to be relatively low cost as routine maintenance such as snow removal on sidepaths would be conducted by adjacent property owners. As a result, the benefit to cost outlook would be high.

Order of Magnitude Cost

The concept includes 3.8 miles of bike lane, 2.3 miles of buffered bike lanes, and 1.4 miles of sidepath. Approximate cost for the construction of the bike lanes is $50,000 per mile which includes pavement markings, signage, and a limited amount of pavement expansion. Based upon this unit price, the installation of bike lanes as recommended in this concept would cost $190,000. The approximate cost of buffered bike lanes varies based upon whether roadway widening is needed to accommodate the facilities. The recommended buffered bike lanes on Bloomfield and Windsor Avenues would require pavement widening and is therefore estimated to cost $250,000 per mile. Based upon this unit price, the installation of buffered bike lanes as recommended in this concept would cost $575,000. The approximate cost of sidepath construction is $500,000 per mile. Based upon this unit price, the installation of sidepaths as recommended in this concept would cost $700,000.

Total cost of providing the bicycle facilities recommended by this concept is estimated to be $2,000,000. This cost estimate excludes the potential cost of land acquisition that may be required to expand the existing right-of-way to accommodate bicycle facilities if required or if easements cannot be procured.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to exceed project costs.

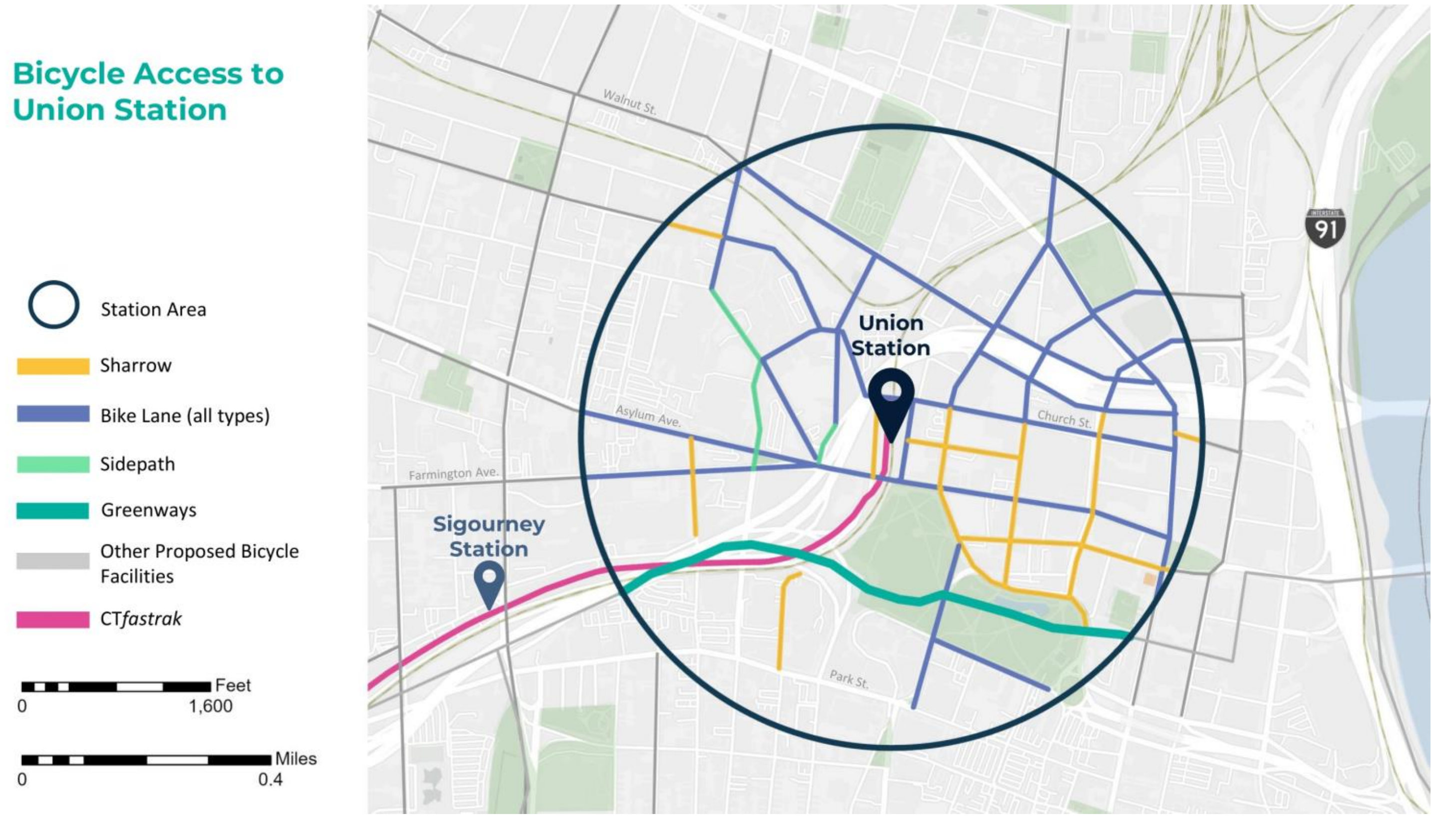
Provide Bicycle Network Serving Hartford Union Station

Detailed Project Description

This concept provides dedicated bicycle facilities (shared roadways, bike lanes, buffered bike lanes, separated bike lanes, and sidepaths) approaching and in proximity of the Union Station. The purpose of the concept is to improve access to the station and improve bicycle safety. The recommended bicycle facilities would connect the station to existing bicycle facilities within proximity of the station.   These improvements are shared with recommended facilities surrounding the Sigourney Street CT*fastrak* Stations.

The concept may support a modal shift to transit use. This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map



Implementation Timeframe

Timeframe

The installation of bicycle facilities is a short-term implementation item that is not contingent upon other modal improvements. Improvements are feasible for implementation within a three-year period.

Project Development Process

The project would next proceed to routing and facility selection, which would confirm or modify the recommendations of this concept. Following routing and facility selection, projects would proceed to design and engineering and then to procurement of bids and construction.

Project Phasing

This concept will likely be implemented in multiple phases. Improvements that require only pavement marking, signage improvements, and minor traffic modifications and minor roadway reconstruction would proceed first. Improvements that would require major roadway or pedestrian area reconstruction, traffic signal improvements, and traffic operations modifications would occur in later phases.

Environmental Review Process

Some segments require a Categorical Exclusion, while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the last mile connections between transit, residences, and places of employment would be beneficial to connectivity in this part of Hartford and may encourage transit ridership.

Travel Options and End User Convenience – High Benefit

This alternative would improve user comfort and will enable bicyclists to travel in proximity of Union Station along a dedicated bicycle facility. A bicycle facility network encourages bicycling and transit use.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There would be no adverse environmental justice impacts, and the improvement of access between residences, places of employment, and Union Station would be advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing bicycle facilities that will separate bicyclists from traffic.

Resiliency and Sustainability - Low Benefit

Facilitating a modal shift away from single-occupant vehicles and towards bicycling and transit use is a sustainable improvement.

Environment - Low Benefit

Minimal presence of natural resources within the project corridor and are mostly located on the west side of the project corridor. Diversity habitats are present around edge of the Project Corridor and in Bushnell Park. Moderate presence of Historic resources within the Project Corridor. Moderate low-income populations located on the west side of the Project Corridor. Environmental impacts are anticipated to be moderate but mitigable.

Technology - Neutral

The concept does not employ technology.

Public Support - Low Benefit

There is public support for expanding bicycle accommodations and access to transit. The public support for expanding bicycle facilities is relatively low.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing access to transit and providing mobility options such as bicycling would expand access to jobs and expand the labor force available to employers. These improvements would also expand access of customers and patrons to local businesses.

Feasibility/Complexity - Neutral

This alternative requires relatively low-cost improvements with a sizeable share of those improvements located in or adjacent to existing rights-of-way.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including CT*fastrak* Service and Hartford Line Rail.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would include pavement expansion, roadway restriping, intersection enhancements, and signage installations. Operations and maintenance are expected to be relatively low cost with routine maintenance such as snow removal occurring as part of routine roadway maintenance. As a result, the benefit to cost outlook would be high.

Order of Magnitude Cost

Proposed bicycle facilities directly contributing to Union Station includes 3.2 miles of shared roadways, 3.1 miles of bike lanes, 3.1 miles of buffered bike lanes, 3.4 miles of separated bike lanes, and 0.5 miles of sidepaths. The approximate cost of shared roadways is $10,000 per mile, which includes pavement markings and signage. The cost of implementing shared roadways in the Union Station area is therefore $32,000. Approximate cost for the construction of the bike lanes is $50,000 per mile which includes pavement markings, signage, and a limited amount of pavement expansion. Based upon this unit price, the installation of bike lanes as recommended in this concept would cost $155,000. The approximate cost of buffered bike lanes is $100,000 per mile, with a total estimated cost of $310,000. The approximate cost of separated bike lanes is $1,000,000 per mile, hence a total estimated cost of $3,400,000. The approximate cost of sidepaths is $500,000 per mile with a total estimated cost of $250,000 for those facilities.

The total cost of providing the bicycle facilities specific to the Union Station area recommended by this concept is estimated to be $6,000,000. This cost estimate excludes the potential cost of land acquisition that may be required to expand the existing right-of-way to accommodate bicycle facilities if required or if easements cannot be procured.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be in alignment with project costs.

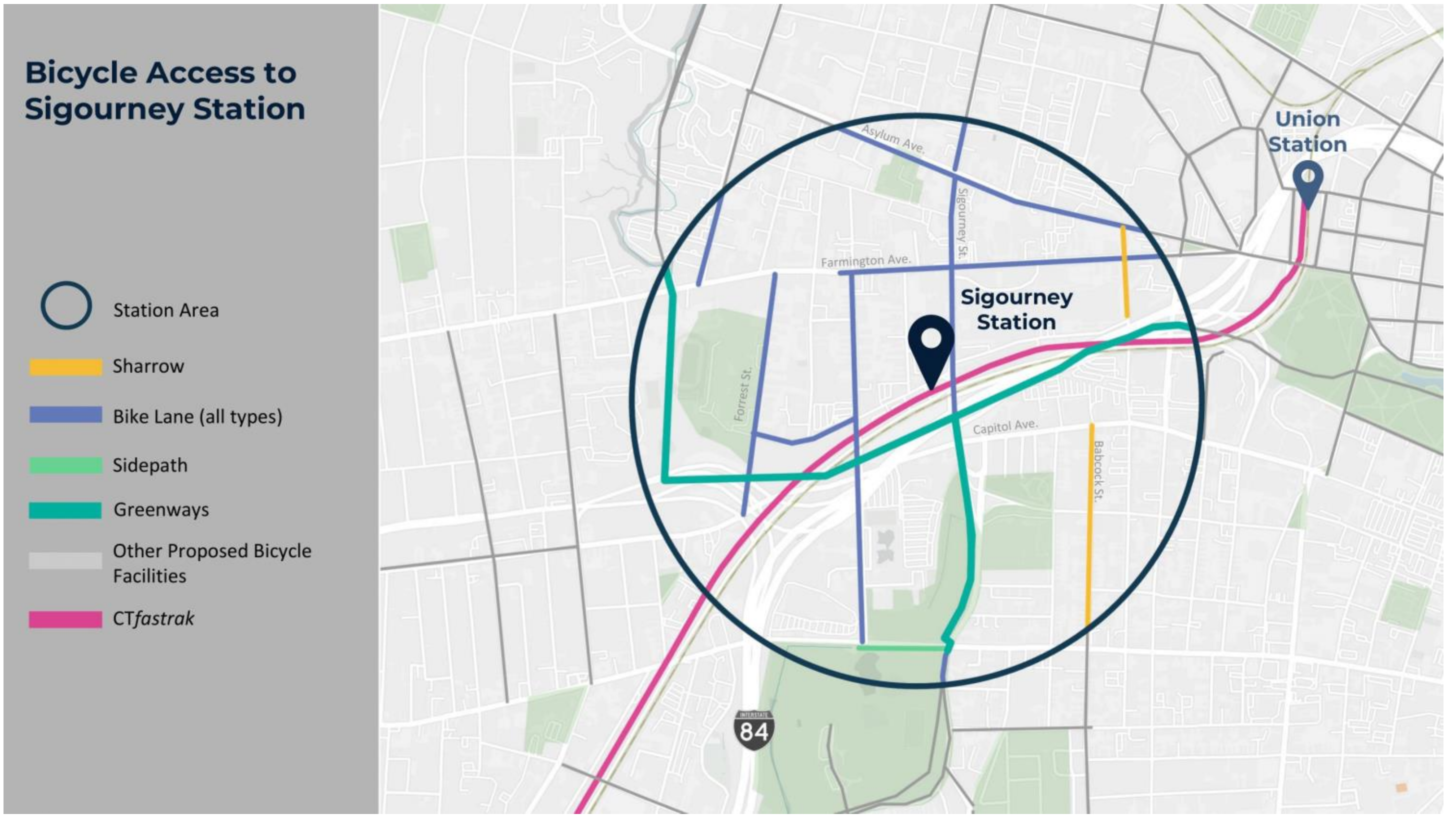
Provide Bicycle Network Serving Sigourney Street CTfastrak Station

Detailed Project Description

This concept provides dedicated bicycle facilities (shared roadways, bike lanes, buffered bike lanes, and sidepaths) approaching and in proximity of the CT*fastrak* Sigourney Street Station. The purpose of the concept is to improve access to the *Fastrak* station and improve bicycle safety. The recommended bicycle facilities would connect the station to existing bicycle facilities within proximity of the station. These improvements are shared with recommended facilities surrounding the Sigourney Street and Union Station CT*fastrak* Stations.

The concept may support a modal shift to transit use. This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map



Implementation Timeframe

Timeframe

The installation of bicycle facilities is a short-term implementation item that is not contingent upon other modal improvements. Improvements are feasible for implementation within a three-year period.

Project Development Process

The project would next proceed to routing and facility selection, which would confirm or modify the recommendations of this concept. Following routing and facility selection, projects would proceed to design and engineering and then to procurement of bids and construction.

Project Phasing

This concept will likely be implemented in multiple phases. Improvements that require only pavement marking, signage improvements, and minor traffic modifications and minor roadway reconstruction would proceed first. Improvements that would require major roadway or pedestrian area reconstruction, traffic signal improvements, and traffic operations modifications would occur in later phases.

Environmental Review Process

Some segments require a Categorical Exclusion, while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the last mile connections between transit, residences, and places of employment would be beneficial to connectivity in this part of Hartford and neighboring West Hartford and may encourage transit ridership.

Travel Options and End User Convenience - High Benefit

This alternative would improve user comfort and will enable bicyclists to travel in proximity of Sigourney Street Station along a dedicated bicycle facility. A bicycle facility network encourages bicycling and transit use.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There would be no adverse environmental justice impacts, and the improvement of access between residences, places of employment, and Sigourney Station would be advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing bicycle facilities that will separate bicyclists from traffic.

Resiliency and Sustainability - Low Benefit

Facilitating a modal shift away from single-occupant vehicles and towards bicycling and transit use is a sustainable improvement.

Environment - Low Benefit

Minimal presence of natural resources within the project corridor. Moderate presence of historic and other built resources within the Project Corridor. Moderate low-income populations located on the west side of the Project Corridor. Environmental impacts are anticipated to be moderate but mitigable.

Technology - Neutral

The concept does not employ technology.

Public Support - Low Benefit

There is some uncertainty about this concept. The main concerns are about how this concept relates to the Sigourney Street Cycle Track. The Sigourney Street Cycle Track design does not connect to the busway and has limited bicycle parking and that seems to be an issue. There is public support for expanding bicycle accommodations and access to transit. The public support for expanding bicycle facilities is relatively low.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing access to transit and providing mobility options such as bicycling would expand access to jobs and expand the labor force available to employers. These improvements would also expand access of customers and patrons to local businesses.

Feasibility/Complexity - High Benefit

This alternative requires relatively low-cost improvements with a sizeable share of those improvements located in or adjacent to existing rights-of-way.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including CT*fastrak* Service.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would be mostly limited to pavement expansion, roadway restriping, and signage installations. Operations and maintenance are expected to be relatively low cost with routine maintenance such as snow removal occurring as part of routine roadway maintenance. As a result, the benefit to cost ratio would be high.

Order of Magnitude Cost

Proposed bicycle facilities directly contributing to Sigourney Street station includes 0.3 miles of shared roadways, 1.3 miles of bike lanes, and 0.45 mile of separated bike lanes. The approximate cost of shared roadways is $10,000 per mile, which includes pavement markings and signage. The cost of implementing shared roadways in the Sigourney Street station area is therefore $3,000. Approximate cost for the construction of the bike lanes is $50,000 per mile which includes pavement markings, signage, and a limited amount of pavement expansion. Based upon this unit price, the installation of bike lanes as recommended in this concept would cost $65,000. The separated bike lanes recommended for Sigourney Street are currently planned for construction and will be funded by CTDOT, therefore the cost of that facility is not included within this estimate.

Total cost of providing the bicycle facilities recommended by this concept is estimated to be $80,000. This cost estimate excludes the potential cost of land acquisition that may be required to expand the existing right-of-way to accommodate bicycle facilities if required or if easements cannot be procured.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to exceed project costs.

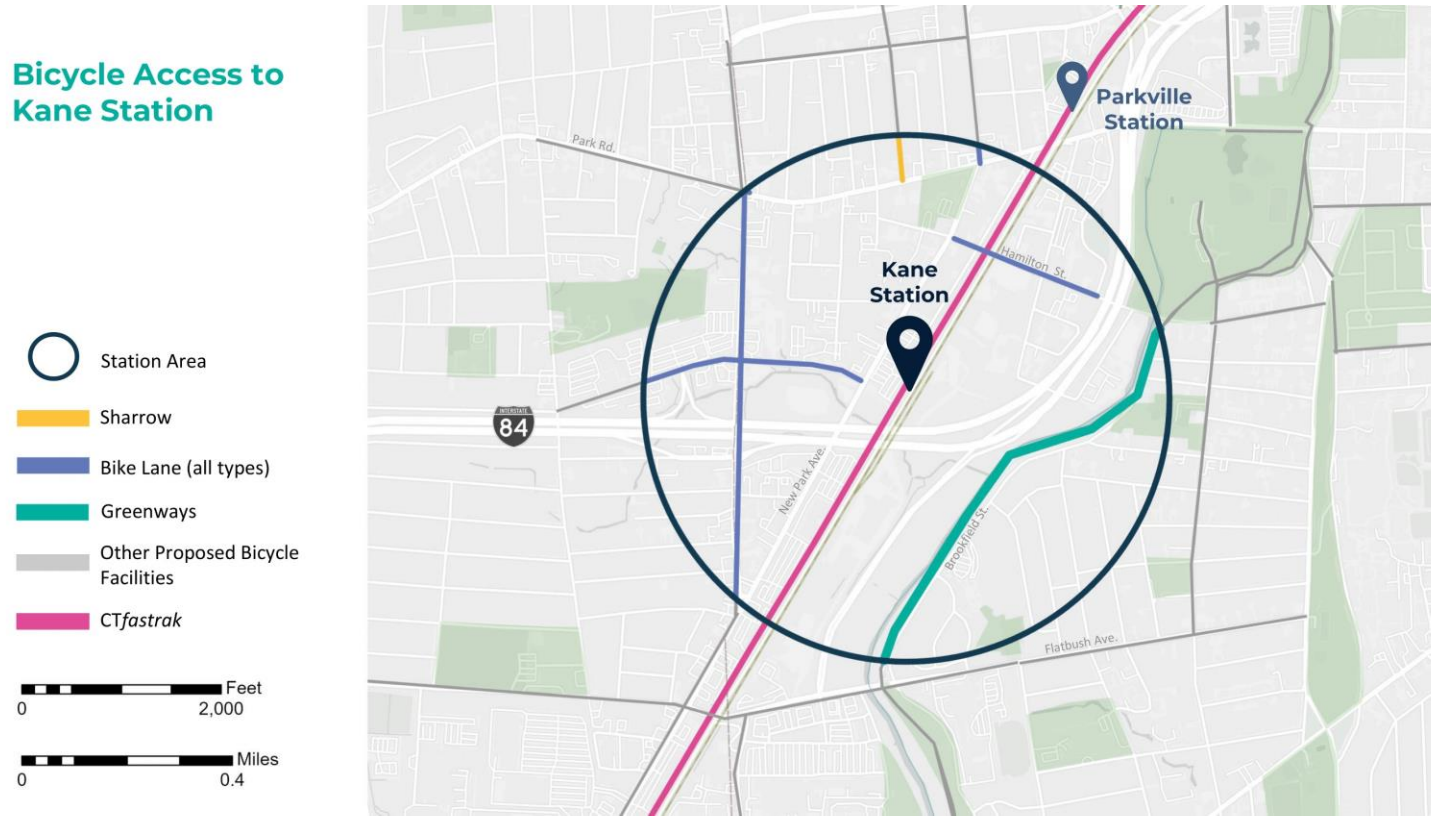
Provide Bicycle Network Serving Kane Street CTfastrak Station

Detailed Project Description

This concept provides dedicated bicycle facilities (bike lanes and a buffered bike lane) approaching and in proximity of the CT*fastrak* Kane Street Station. The purpose of the concept is to improve access to the *Fastrak* station and improve bicycle safety. The recommended bicycle facilities would connect the station to existing bicycle facilities within proximity of the station including Oakwood Avenue. A combination of bike lanes and buffered bike lanes are recommended as part of this concept. These improvements are shared with recommended facilities surrounding the Flatbush and Park Street CT*fastrak* Stations.

The concept may support a modal shift to transit use. This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map



Implementation Timeframe

Timeframe

The installation of bicycle facilities is a short-term implementation item that is not contingent upon other modal improvements. Improvements are feasible for implementation within a three-year period.

Project Development Process

The project would next proceed to routing and facility selection, which would confirm or modify the recommendations of this concept. Following routing and facility selection, projects would proceed to design and engineering and then to procurement of bids and construction.

Project Phasing

This concept will likely be implemented in multiple phases. Improvements that require only pavement marking, signage improvements, and minor traffic modifications and minor roadway reconstruction would proceed first. Improvements that would require major roadway or pedestrian area reconstruction, traffic signal improvements, and traffic operations modifications would occur in later phases.

Environmental Review Process

Some segments require a Categorical Exclusion, while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the last mile connections between transit, residences, and places of employment would be beneficial to connectivity in this part of Hartford and neighboring West Hartford and may encourage transit ridership.

Travel Options and End User Convenience - High Benefit

This alternative would improve user comfort and will enable bicyclists to travel in proximity of Kane Street Station along a dedicated bicycle facility. A bicycle facility network encourages bicycling and transit use.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility to CTtransit services would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing bicycle facilities that will separate bicyclists from traffic.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Minimal presence of natural resources within the project corridor. Moderate presence of historic and other built resources within the Project Corridor. Moderate low-income populations located on the west side of the Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology.

Public Support - Low Benefit

There is public support for expanding bicycle accommodations and access to transit. The public support for expanding bicycle facilities is relatively low.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing access to transit and providing mobility options such as bicycling would expand access to jobs and expand the labor force available to employers. These improvements would also expand access of customers and patrons to local businesses.

Feasibility/Complexity - High Benefit

This alternative requires relatively low-cost improvements with a sizeable share of those improvements located in or adjacent to existing rights-of-way.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including CT*fastrak* Service.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would be mostly limited to pavement expansion, roadway restriping, and signage installations. Operations and maintenance are expected to be relatively low cost with routine maintenance such as snow removal occurring as part of routine roadway maintenance. As a result, the benefit to cost ratio would be high.

Order of Magnitude Cost

The concept includes 0.6 miles of bike lanes and 0.8 miles of buffered bike lanes (of those located exclusively within the Flatbush Avenue Station area). Approximate cost for the construction of the bike lanes is $50,000 per mile which includes pavement markings, signage, and a limited amount of pavement expansion. Based upon this unit price, the installation of bike lanes as recommended in this concept would cost $30,500. The approximate cost of buffered bike lanes varies based upon whether roadway widening is needed to accommodate the facilities. The approximate cost of a buffered bicycle lane on Prospect Avenue would be approximately $250,000 per mile as buffered bicycle lanes could be accommodated with a road diet and minimal expansion of roadway width along this corridor. Based upon this unit price, the installation of buffered bike lanes on New Park Avenue as recommended in this concept would cost $200,000.

Total cost of providing the bicycle facilities recommended by this concept is estimated to be $250,000-$300,000. This cost estimate excludes the potential cost of land acquisition that may be required to expand the existing right-of-way to accommodate bicycle facilities if required or if easements cannot be procured.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to exceed project costs.

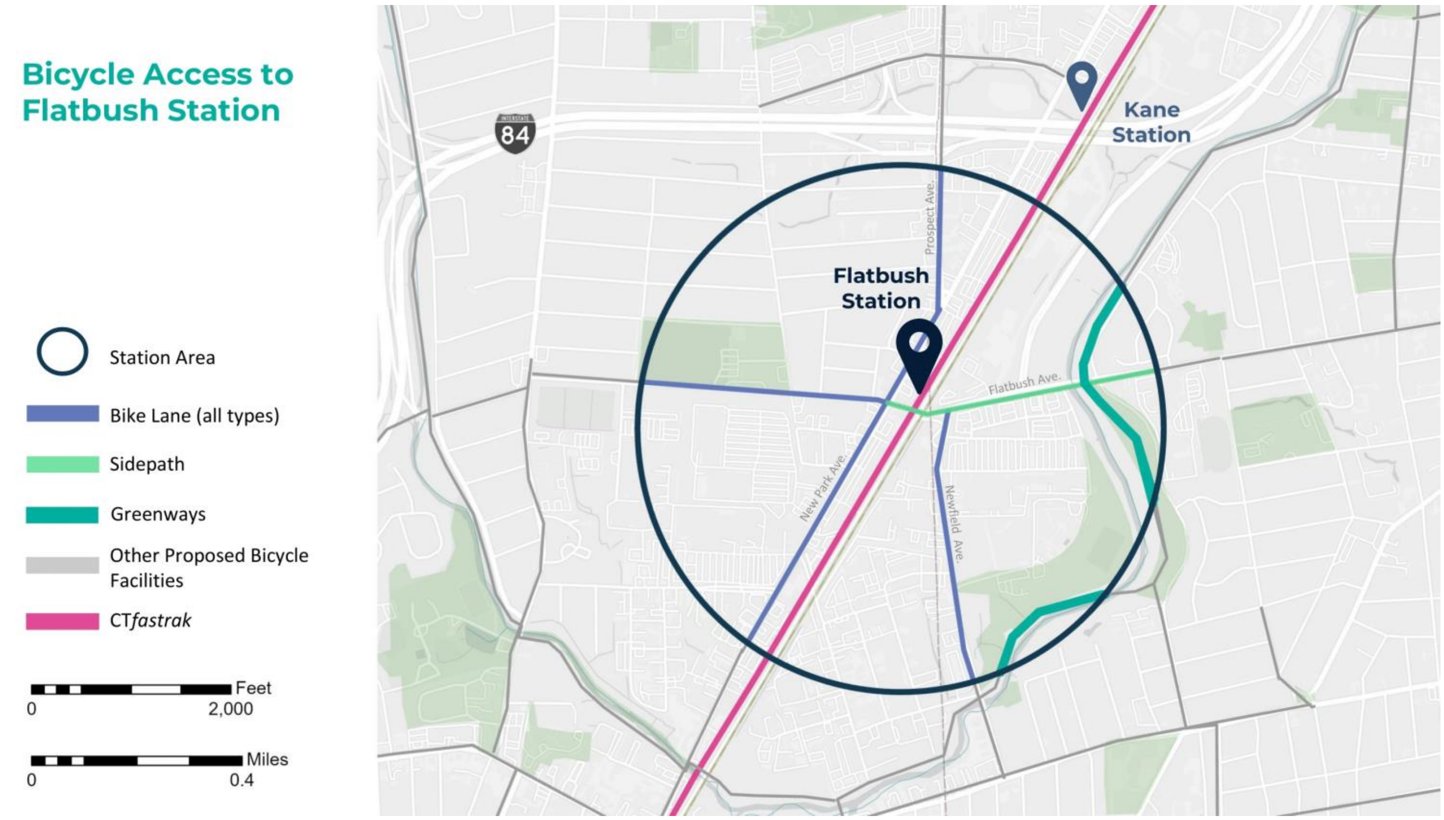
Provide Bicycle Network Serving Flatbush Avenue CTfastrak Station

Detailed Project Description

This concept provides dedicated bicycle facilities (bike lanes and a pathway) approaching and in proximity of the CT*fastrak* Flatbush Avenue Station. The purpose of the concept is to improve access to the *Fastrak* station and improve bicycle safety. The recommended bicycle facilities would connect the station to existing bicycle facilities within proximity of the station including the Trout Brook Trail and the South Branch Park River Greenway. A combination of buffered bike lanes, bike lanes, and a sidepath are recommended as part of this concept. Many of these improvements are shared with recommended facilities surrounding the Elmwood and Kane Street CT*fastrak* Stations.

The concept may support a modal shift to transit use. This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map



Implementation Timeframe

Timeframe

The installation of bicycle facilities is a short-term implementation item that is not contingent upon other modal improvements. Improvements are feasible for implementation within a three-year period.

Project Development Process

The project would next proceed to routing and facility selection, which would confirm or modify the recommendations of this concept. Following routing and facility selection, projects would proceed to design and engineering and then to procurement of bids and construction.

Project Phasing

This concept will likely be implemented in multiple phases. Improvements that require only pavement marking, signage improvements, and minor traffic modifications and minor roadway reconstruction would proceed first. Improvements that would require major roadway or pedestrian area reconstruction, traffic signal improvements, and traffic operations modifications would occur in later phases.

Environmental Review Process

Some segments require a Categorical Exclusion, while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the last mile connections between transit, residences, and places of employment would be beneficial to connectivity in this part of West Hartford and neighboring Hartford and may encourage transit ridership.

Travel Options and End User Convenience – High Benefit

This alternative would improve user comfort and will enable bicyclists to travel in proximity of Flatbush Avenue Station along a dedicated bicycle facility. A bicycle facility network encourages bicycling and transit use.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility to CTtransit services would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing bicycle facilities that will separate bicyclists from traffic.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Minimal presence of natural resources within the project corridor. Moderate presence of historic and other built resources within the Project Corridor. Moderate low-income populations located on the west side of the Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology.

Public Support - Low Benefit

This concept is seen as long overdue. There is strong support from a small group of advocates for dedicated bicycle lanes complimentary to CT*fastrak*. New Park Avenue is seen as lacking in bicycle and pedestrian facilities. There is a desire for dedicated bicycle lanes.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing access to transit and providing mobility options such as bicycling would expand access to jobs and expand the labor force available to employers. These improvements would also expand access of customers and patrons to local businesses.

Feasibility/Complexity - Neutral

This alternative requires relatively low-cost improvements with a sizeable share of those improvements located in or adjacent to existing rights-of-way.

System Compatibility – High Benefit

This alternative would be synergistic with other modalities including CT*fastrak* Service.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would be mostly limited to pavement expansion, roadway restriping, and signage installations. Operations and maintenance are expected to be relatively low cost as routine maintenance such as snow removal would occur as part of routine roadway maintenance. As a result, the benefit to cost ratio would be high.

Order of Magnitude Cost

The concept includes 1.25 miles of bike lanes, 0.9 miles of buffered bike lanes, and 0.6 miles of sidepath (of those located exclusively within the Flatbush Avenue Station area). Approximate cost for the construction of the bike lanes is $50,000 per mile which includes pavement markings, signage, and a limited amount of pavement expansion. Based upon this unit price, the installation of bike lanes as recommended in this concept would cost $62,500. The approximate cost of buffered bike lanes varies based upon whether roadway widening is needed to accommodate the facilities. The approximate cost of buffered bicycle lane on New Park Avenue would be $250,000 per mile as buffered bicycle lanes could be accommodated with a road diet and minimal expansion of roadway width along this corridor.

Based upon this unit price, the installation of buffered bike lanes on New Park Avenue as recommended in this concept would cost $225,000.   The development of sidepaths is estimated to cost $500,000 per mile, the 0.6 miles of sidepath on Flatbush Avenue would therefore cost approximately $300,000.

Total cost of providing the bicycle facilities recommended by this concept is estimated to be $700,000. This cost estimate excludes the potential cost of land acquisition that may be required to expand the existing right-of-way to accommodate bicycle facilities if required or if easements cannot be procured.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to exceed project costs.

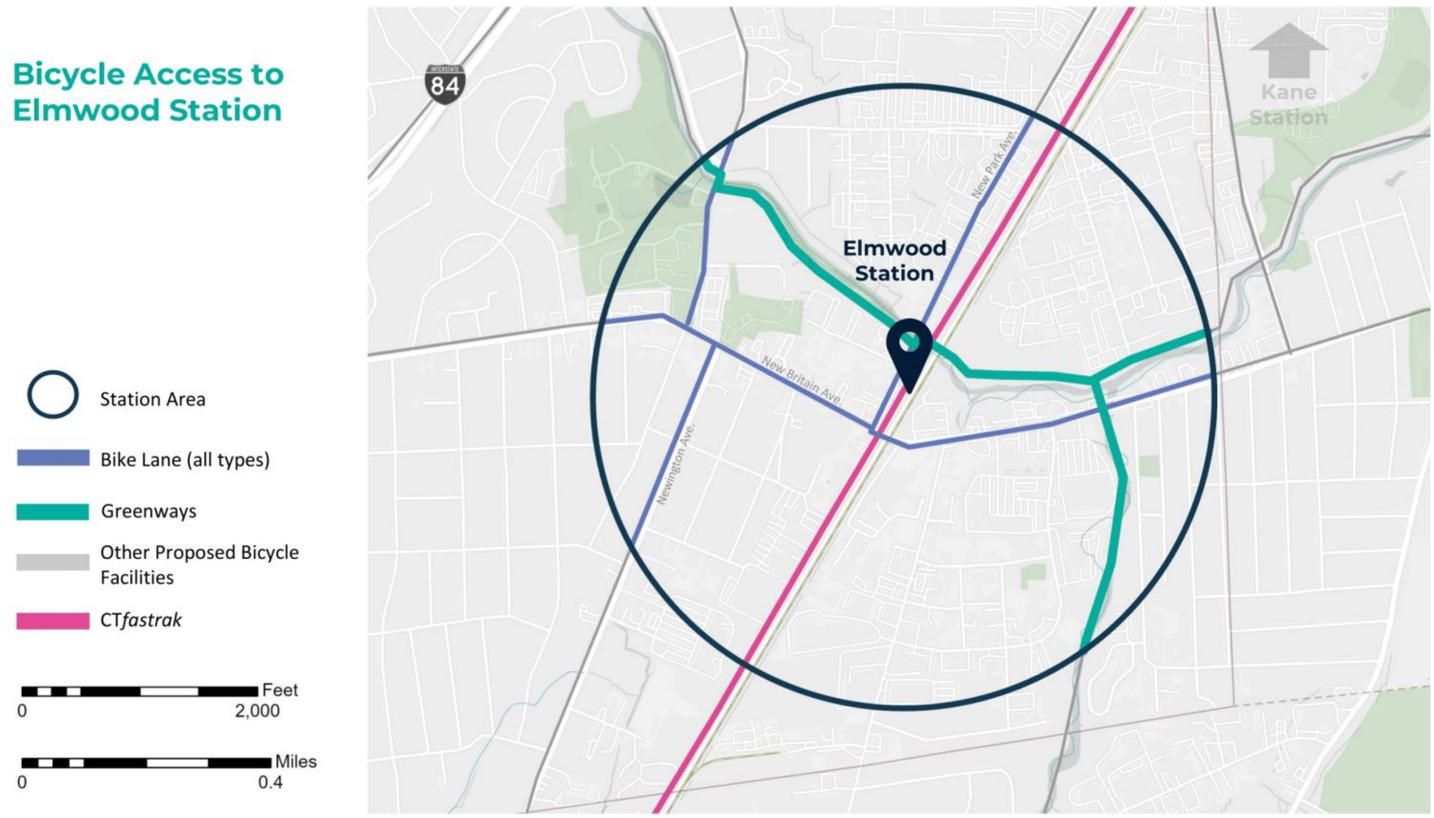
Provide Bicycle Network Serving Elmwood CTfastrak Station

Detailed Project Description

This concept provides dedicated bicycle facilities (bike lanes and buffered bike lanes) approaching and in proximity of the CT*fastrak* Elmwood Station. The purpose of the concept is to improve access to the *Fastrak* station and improve bicycle safety. The recommended bicycle facilities would connect the station to existing bicycle facilities within proximity of the station including the Trout Brook Trail and the South Branch Park River Greenway. The recommended bicycle facilities would also connect Elmwood Station to nodes such as Corbin's Corner. Many of these improvements are shared with recommended facilities surrounding the Flatbush Avenue CT*fastrak* Station.

The concept may support a modal shift to transit use. This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map



Implementation Timeframe

Timeframe

The installation of bicycle facilities is a short-term implementation item that is not contingent upon other modal improvements. Improvements are feasible for implementation within a three-year period.

Project Development Process

The project would next proceed to routing and facility selection, which would confirm or modify the recommendations of this concept. Following routing and facility selection, projects would proceed to design and engineering and then to procurement of bids and construction.

Project Phasing

This concept will likely be implemented in multiple phases. Improvements that require only pavement marking, signage improvements, and minor traffic modifications and minor roadway reconstruction would proceed first. Improvements that would require major roadway or pedestrian area reconstruction, traffic signal improvements, and traffic operations modifications would occur in later phases.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the last mile connections between transit, residences, and places of employment would be beneficial to connectivity in this part of West Hartford and neighboring Hartford and may encourage transit ridership.

Travel Options and End User Convenience - High Benefit

This alternative would improve user comfort and will enable bicyclists to travel in proximity of Elmwood Station along a dedicated bicycle facility. A bicycle facility network encourages bicycling and transit use.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility to CTtransit services would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing bicycle facilities that will separate bicyclists from traffic.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Minimal presence of natural resources within the project corridor. Minor presence of built resources within the Project Corridor. Moderate low-income populations located on the west side of the Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology.

Public Support - Low Benefit

Support for building bicycle network improvements to spur economic development from a small group of advocates. Comments suggest that improvements should connect to local commerce, bicycle shops, and other useful amenities. Safety of lanes, such as having raised, and parking protected lanes was noted as essential. There is public support for expanding bicycle accommodations and access to transit. The public support for expanding bicycle facilities is relatively low.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing access to transit and providing mobility options such as bicycling would be beneficial to those who do not own a vehicle or cannot afford to drive.

Feasibility/Complexity - High Benefit

This alternative requires relatively low-cost improvements with a sizeable share of those improvements located in or adjacent to existing rights-of-way.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including CT*fastrak* Service.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would be mostly limited to pavement expansion, roadway restriping, and signage installations. Operations and maintenance are expected to be relatively low cost as routine maintenance such as snow removal would occur as part of routine roadway maintenance. As a result, the benefit to cost ratio would be high.

Order of Magnitude Cost

The concept includes 1.5 miles of bike lanes and 4.8 miles of buffered bike lanes (of those located exclusively within the Elmwood Station area). Approximate cost for the construction of the bike lanes is $50,000 per mile which includes pavement markings, signage, and a limited amount of pavement expansion. Based upon this unit price, the installation of bike lanes as recommended in this concept would cost $75,000. The approximate cost of buffered bike lanes varies based upon whether roadway widening is needed to accommodate the facilities. The recommended buffered bike lanes on New Britain Avenue and Newington Road would require pavement widening and is therefore estimated to cost $500,000 per mile. Based upon this unit price, the installation of buffered bike lanes as recommended in this concept on those corridors would cost $2,150,000. The approximate cost of buffered bicycle lane on New Park Avenue would be less ($250,000 per mile) as buffered bicycle lanes could be accommodated with a road diet and minimal expansion of roadway width.   Based upon this unit price, the installation of buffered bike lanes on New Park Avenue as recommended in this concept would cost $125,000.

Total cost of providing the bicycle facilities recommended by this concept is estimated to be $3,000,000. This cost estimate excludes the potential cost of land acquisition that may be required to expand the existing right-of-way to accommodate bicycle facilities if required or if easements cannot be procured.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to exceed project costs.

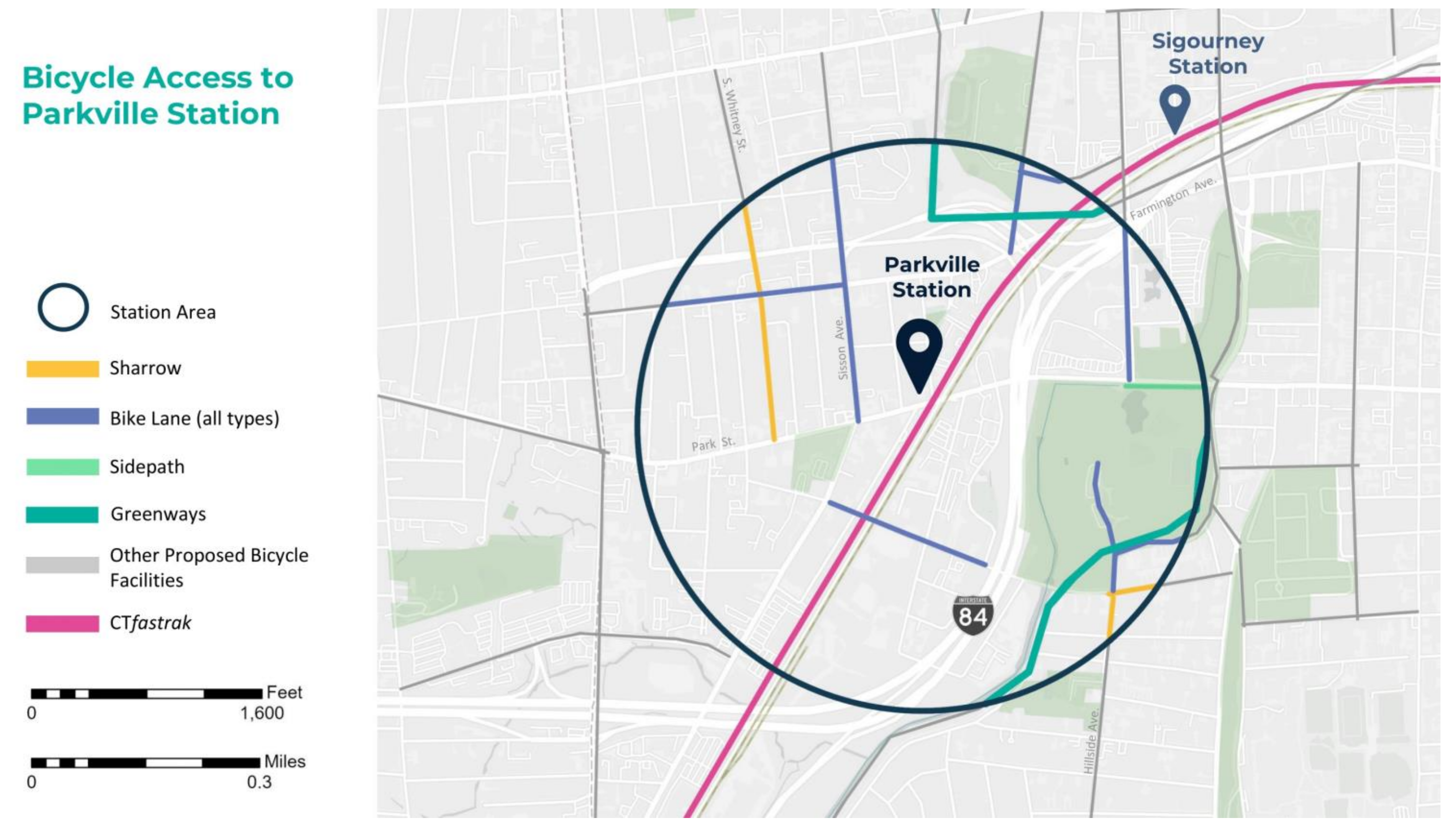
Provide Bicycle Network Serving Parkville CTfastrak Station

Detailed Project Description

This concept provides dedicated bicycle facilities (shared roadways, bike lanes, buffered bike lanes, and sidepaths) approaching and in proximity of the CT*fastrak* Park Street Station. The purpose of the concept is to improve access to the *Fastrak* station and improve bicycle safety. The recommended bicycle facilities would connect the station to existing bicycle facilities within proximity of the station. These improvements are shared with recommended facilities surrounding the Kane Street and Sigourney Street CT*fastrak* Stations.

The concept may support a modal shift to transit use. This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map



Implementation Timeframe

Timeframe

The installation of bicycle facilities is a short-term implementation item that is not contingent upon other modal improvements. Improvements are feasible for implementation within a three-year period.

Project Development Process

The project would next proceed to routing and facility selection, which would confirm or modify the recommendations of this concept. Following routing and facility selection, projects would proceed to design and engineering and then to procurement of bids and construction.

Project Phasing

This concept will likely be implemented in multiple phases. Improvements that require only pavement marking, signage improvements, and minor traffic modifications and minor roadway reconstruction would proceed first. Improvements that would require major roadway or pedestrian area reconstruction, traffic signal improvements, and traffic operations modifications would occur in later phases.

Environmental Review Process

Some segments require a Categorical Exclusion, while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity –Moderate Benefit

Improving the last mile connections between transit, residences, and places of employment would be beneficial to connectivity in this part of Hartford and neighboring West Hartford and may encourage transit ridership.

Travel Options and End User Convenience - High Benefit

This alternative would improve user comfort and will enable bicyclists to travel in proximity of Parkville Station along a dedicated bicycle facility. A bicycle facility network encourages bicycling and transit use.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility to CTtransit services would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing bicycle facilities that will separate bicyclists from traffic.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Minimal presence of natural resources within the project corridor. Moderate presence of historic and other built resources within the Project Corridor. Moderate low-income populations located on the west side of the Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology.

Public Support - Low Benefit

There was support for this alternative. Participants noted that a separated, protected, or off-street bicycle facility would be best. There were also suggestions to investigate Hartford Ave as an alternative.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing access to transit and providing mobility options such as bicycling would expand access to jobs and expand the labor force available to employers. These improvements would also expand access of customers and patrons to local businesses.

Feasibility/Complexity - High Benefit

This alternative requires relatively low-cost improvements with a sizeable share of those improvements located in or adjacent to existing rights-of-way.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including CT*fastrak* Service.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would be mostly limited to pavement expansion, roadway restriping, and signage installations. Operations and maintenance are expected to be relatively low cost as routine maintenance such as snow removal would occur as part of routine roadway maintenance. As a result, the benefit to cost ratio would be high.

Order of Magnitude Cost

Proposed bicycle facilities directly contributing to Parkville Station includes 1.2 miles of shared roadways, 1.95 miles of bike lanes, 1.05 miles of buffered bike lanes, and 0.4 miles of sidepaths. The approximate cost of shared roadways is $10,000 per mile, which includes pavement markings and signage. The cost of implementing shared roadways in the Parkville Station area is therefore $12,000. Approximate cost for the construction of the bike lanes is $50,000 per mile which includes pavement markings, signage, and a limited amount of pavement expansion. Based upon this unit price, the installation of bike lanes as recommended in this concept would cost $97,500. The approximate cost of buffered bike lanes is $100,000 per mile, with a total estimated cost of $105,000. The approximate cost of sidepaths is $500,000 per mile with a total estimated cost of $200,000 for those facilities.

The total cost of providing the bicycle facilities specific to the Parkville Station area recommended by this concept is estimated to be $500,000. This cost estimate excludes the potential cost of land acquisition that may be required to expand the existing right-of-way to accommodate bicycle facilities if required or if easements cannot be procured.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to exceed project costs.

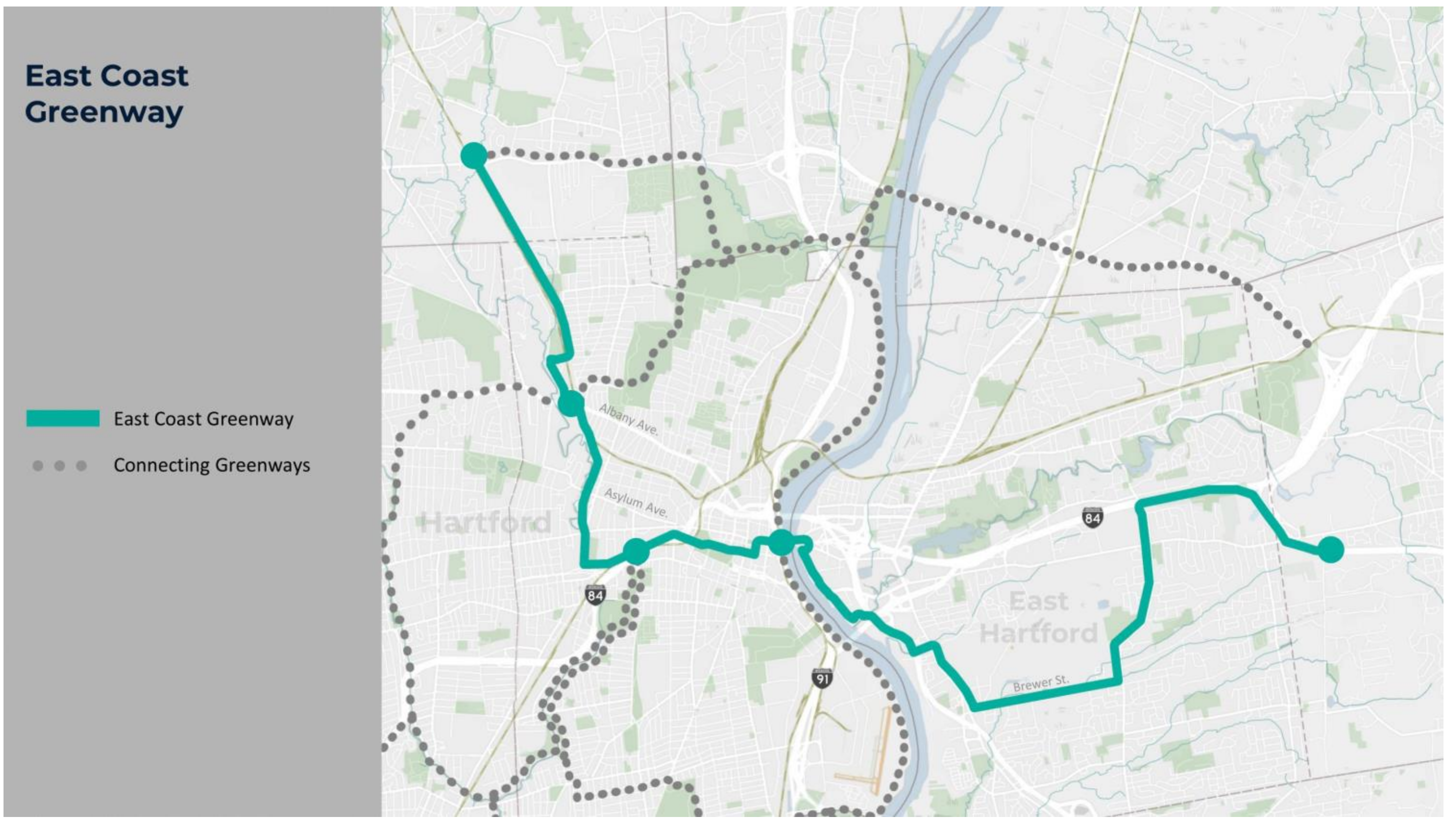
East Coast Greenway

Detailed Project Description

This concept provides a dedicated route for the East Coast Greenway that maximizes the use of off-street facilities and provides direct connections to key destinations. The concept links existing trails and greenway routes and provides separated (removed from traffic) facilities that can accommodate local bicycle and pedestrian trips and longer-range bicycle trips. The route currently exists but is located primarily on roads through the study area. CRCOG is currently initiating a routing study to identify a preferred route and improvements needed to accommodate users on that route. Given that this work is currently being initiated the project described herein assumes adoption and development of the route as recommended by CRCOG's study, the alignment and cost of which may vary considerably. The screening assessment that follows is based upon the broad goals of a dedicated route and the approximate length of the route between Bloomfield and East Hartford.

This type of improvement is identified in the CRCOG Regional Complete Streets Plan.

Alternative Map



The concept map above shows the existing route of the East Coast Greenway. A study recently launched by CRCOG will identify a preferred route through this area.

Implementation Timeframe

Timeframe

The construction of improvements, acquisition of right-of-way, and the procurement of easements is likely to occur over a long timeframe with some improvements or segments being brought online before completion of the entire route. It is likely that development of the full route along a dedicated facility, or hybrid of facilities, would take at least 10 years to complete. Segments within the core GHMS area, if collocated with other modal improvements associated with the project, may be conducted concurrent with those other modal improvements.

Project Development Process

Not Applicable (N/A)

Project Phasing

The project is likely to occur in multiple phases. The ongoing CRCOG study will identify potential phasing. On-street segments and segments routed along existing pathways are likely to be included in the first phase of improvements. Segments requiring the construction of new pathways, particularly those located in environmentally sensitive areas such as along the North Branch of the Park River are likely to be constructed as later phases of implementation.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – High Benefit

The project would provide a regional, cross-town connection for bicyclists and pedestrians, connecting many neighborhoods, commercial areas, open space, and institutions, and would therefore provide a high benefit with respect to access and connectivity.

Travel Options and End User Convenience - High Benefit

The project would provide travel options for bicyclists and pedestrians and would provide convenience by providing a facility that is intended to be off-road or separated from traffic, providing user comfort and convenience.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility and mobility within the region would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing a separated facility that will move pedestrians and bicyclists off of the roadway.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Minimal presence of natural resources within the project corridor. Moderate presence of built resources within the Project Corridor. Moderate -to-high presence of disadvantaged populations located adjacent to the alternative, particularly in Hartford. The concept does require the installation of impervious surface. Adverse impacts of additional impervious surface are offset by the concept supporting alternative modes of transportation. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept is unlikely to incorporate technology beyond traffic signalization.

Public Support - High Benefit

There is public support for expanding bicycle and pedestrian accommodations, particularly dedicated facilities. The East Coast Greenway is strongly supported by a large community across the East Coast. Comments include desire for connectivity through Hartford neighborhoods and bike-ped access network throughout Hartford.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing access to commercial areas and jobs would be highly beneficial to those who do not own a vehicle or cannot afford to drive. It is not yet clear that the route alignment will travel through commercial areas.

Feasibility/Complexity - Neutral

This project is complex and will likely span three towns – Bloomfield, Hartford, and East Hartford, covering approximately 15 miles. Given the support for the project, the project is likely feasible, but will be high cost. The project may require right-of-way acquisition and procurement of easements and may require extensive permitting, particularly if routed through naturalized areas.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities and would complement, rather than replace existing and on-street bicycle facilities and sidewalks.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with impacts mostly limited to complexity and cost. Operations and maintenance would also be costly, requiring maintenance of pavement, trail heads (if required), areas along the pathway, signage and pavement markings, debris removal (such as leaves and sand), and potentially snow removal. Private organizations and volunteer groups often sponsor and conduct maintenance of greenways.

Order of Magnitude Cost

The project may cost $24M. This estimate is based upon a potential cost of $1 million per mile. The cost may vary widely based upon the route alignment, facility type (shared-use path, sidepath, separated bike lane, or on-street facilities), and potential cost of right-of-way acquisition. CRCOG's study is expected to provide a cost estimate of alignment options.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be in alignment with project costs.

Riverfront Greenway

Detailed Project Description

This alternative would provide a continuous greenway along the Connecticut River that will provide a north/south bicycle and pedestrian route that is separated from traffic. The greenway would link existing trails and greenway routes and provide separated (removed from traffic) facilities that can accommodate local bicycle and pedestrian trips and longer-range bicycle trips. Multiple segments of this corridor currently have paved pathways, but significant gaps remain in the North Meadows and South Meadows areas of Hartford. The Greenway could connect Glastonbury, Wethersfield, Hartford, Windsor, South Windsor, and East Hartford along and crossing the Connecticut River via the Putnam Bridge and Bissell Bridge.

Existing segments include the Captain John Bissell trail which travels from Windsor to South Windsor and East Hartford, and a segment between Riverside Park and Charter Oak Landing in Hartford. This segment intersects the East Coast Greenway. Improvements are currently being planned by the City of Hartford to existing trails between Riverside Park and the Bissell Trail that would complete the gap in the trail system. There is no dedicated pathway in Hartford south of Charter Oak Landing or in Wethersfield. The Putnam Bridge, which has a recently constructed sidewalk, lacks approaching sidewalks or pathways on both the Wethersfield and Glastonbury sides. CTDOT is currently planning to provide connecting sidewalks or pathways to allow for use of the bridge by bicyclists and pedestrians.

The Riverfront Greenway alternative is comprised of multiple segments, several of which currently exist. From north to south these segments include:

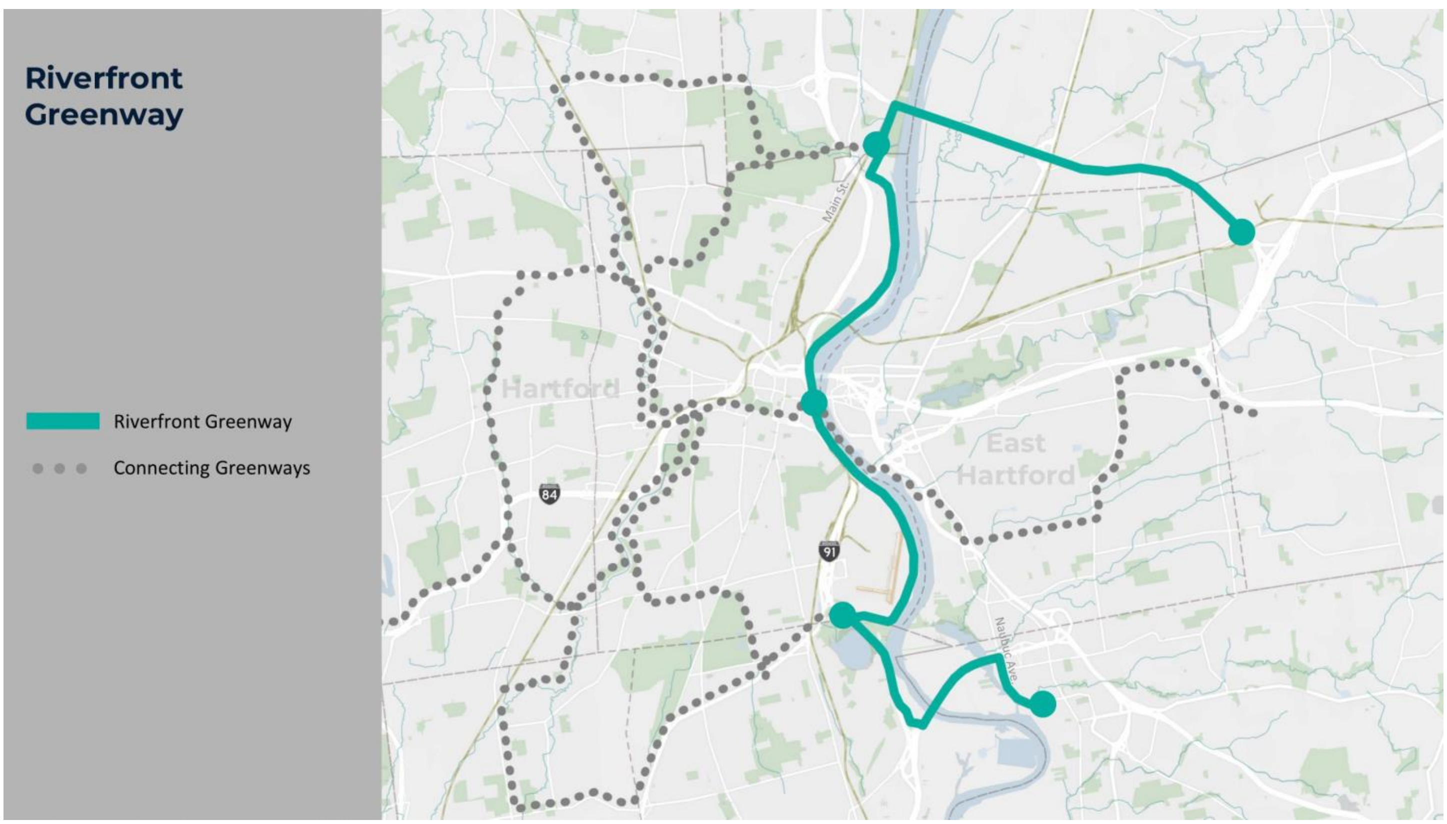
Captain John Bissell Trail (East Hartford, South Windsor, Windsor): This segment is complete.

Hartford Riverfront (Riverside Park to Bissell Trail): This segment is 2.7 miles along the riverfront, some areas of which are occupied by unpaved pathways. This segment is currently being planned and designed by the City of Hartford.

Hartford Riverfront (Charter Oak Landing to Putnam Bridge): This segment is 3.5 miles, travelling along the riverfront and adjacent to MIRA's trash to energy plant (which is soon to be shut down) and Brainard Airport. This segment would require a bridge over Folly Brook at the Wethersfield Cove. This segment of the greenway is expected to be a long-term improvement due to construction cost, property ownership, and other logistical challenges.

Putnam Bridge: Approaches to the recently constructed bridge sidewalk are currently be planned and designed by CTDOT. Approximately 0.1 mile of pathway is required on the Wethersfield side to connect to the bridge. The Glastonbury side requires a 1.1-mile segment of pathway to provide a connection between the bridge and Glastonbury Boulevard.

Alternative Map



Implementation Timeframe

Timeframe

The development of greenways is expected to occur over a five to ten-year period (a near to long-term time frame).

- Captain John Bissell Trail (East Hartford, South Windsor, Windsor): This segment is complete.
- Hartford Riverfront (Riverside Park to Bissell Trail): Given current planning and design work, implementation of this segment is expected in the near term.
- Hartford Riverfront (Charter Oak Landing to Putnam Bridge): Additional study is required to establish a preferred route and project feasibility. Improvement is likely to occur over the long term (10+ years).
- Putnam Bridge: Given the current planning and design work, implementation of this segment is expected in the near term.

Project Development Process

The project would next proceed to routing and facility selection, which would confirm or modify the recommendations of this concept. Following routing and facility selection, projects would proceed to design and engineering and then to procurement of bids and construction.

Project Phasing

This concept will likely be implemented in multiple phases. Improvements that require only pavement marking, signage improvements, and minor traffic modifications and minor roadway reconstruction or improvement of existing pathways would proceed first. Improvements that would require major roadway or pedestrian area reconstruction, traffic signal improvements, and traffic operations modifications, new pathway construction, and pathways requiring new bridge construction would occur in later phases.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative may improve travel time for bicyclists and pedestrians travelling north/south along the riverfront across Hartford. The alternative will also improve travel time for bicyclists and pedestrians travelling between Wethersfield and Glastonbury by providing access across the Putnam Bridge.

Access and Connectivity – High Benefit

The project would provide a regional, cross-town connection for bicyclists and pedestrians, connecting many neighborhoods, commercial areas, open space, and institutions, and would therefore provide a high benefit with respect to access and connectivity.

Travel Options and End User Convenience - High Benefit

The project would provide travel options for bicyclists and pedestrians and would provide convenience by providing a facility that is intended to be off-road or separated from traffic, providing user comfort and convenience.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility and mobility within the region would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing a separated facility that will move pedestrians and bicyclists off of the roadway.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Low Benefit

Significant presence of natural resources within the project corridor. Moderate presence of built resources within the Project Corridor. Moderate -to-high presence of disadvantaged populations located adjacent to the alternative, particularly in Hartford. Project travels through and adjacent to major habitat and floodplain areas due to its proximity to the Connecticut River. Adverse impacts of additional impervious surface are offset by the concept supporting alternative modes of transportation. Environmental impacts are anticipated to be moderate but mitigable.

Technology - Neutral

The concept is unlikely to incorporate technology beyond traffic signalization.

Public Support – High Benefit

There is public support for expanding bicycle and pedestrian accommodations, particularly dedicated facilities, and for improving access to the Connecticut River. Generally, the theme of comments are concerns about flooding along the riverfront. Flooding should be considered if this alternative advances. Some people feel there are other transportation priorities.

Overarching Criteria

Economic Opportunity - Neutral

Enhancing access along the riverfront and across the river would be highly beneficial to those who do not own a vehicle or cannot afford to drive. The greenway also provides access to commercial areas where jobs are located such as Hartford's South Meadows and Glastonbury Town Center. The use of this facility is likely to be primarily recreational in nature.

Feasibility/Complexity - Neutral

This project is complex and will span three towns – Bloomfield, Hartford, and Windsor covering approximately 4 miles. Given the support for the project, the project is likely feasible, but will be high cost. The project may require right-of-way acquisition and procurement of easements and may require extensive permitting, particularly if routed through naturalized areas.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities and would complement, rather than replace existing and on-street bicycle facilities and sidewalks. It would also connect to multiple other greenways including the East Coast Greenway.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with impacts mostly limited to complexity and cost. Operations and maintenance would also be costly, requiring maintenance of pavement, trail heads (if required), areas along the pathway, signage and pavement markings, debris removal (such as leaves and sand), and potentially snow removal. Private organizations and volunteer groups often sponsor and conduct maintenance of greenways.

Order of Magnitude Cost

The project may cost approximately $9 million. This estimate is based upon a potential cost of $1 million per mile for the 7.4 miles of greenway that does not yet exist, which is estimated to cost $7.4 million. Construction of a bridge over Folly Brook may cost $2 million. The cost may vary widely based upon the route alignment and potential cost of right-of-way acquisition and potential environmental impacts and mitigation that maybe required.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be in alignment with project costs.

South Branch Park River Greenway

Detailed Project Description

This alternative would provide a continuous greenway along the South Branch of the Park River that would connect the existing Trout Brook Trail and CT*fastrak* pathway to the current East Coast Greenway route. The alternative will link existing trails and greenway routes and provide separated (removed from traffic) facilities that can accommodate local bicycle and pedestrian trips and longer-range bicycle trips. Limited segments of greenway currently exist along the South Branch and additional segments are currently being planned by the City of Hartford. The greenway would extend from the CT*fastrak* pathway at Newington Junction to Capitol Avenue in Hartford. The greenway shares the same route as the Hartford Parks Greenway alternative between Brookfield Street and Park Street.

The Greenway is comprised of several segments including the following:

Pope Park: The greenway primarily utilizes existing pathways in Pope Park. A 0.1-mile segment of pathway would need to be constructed at the southwest corner of the park.

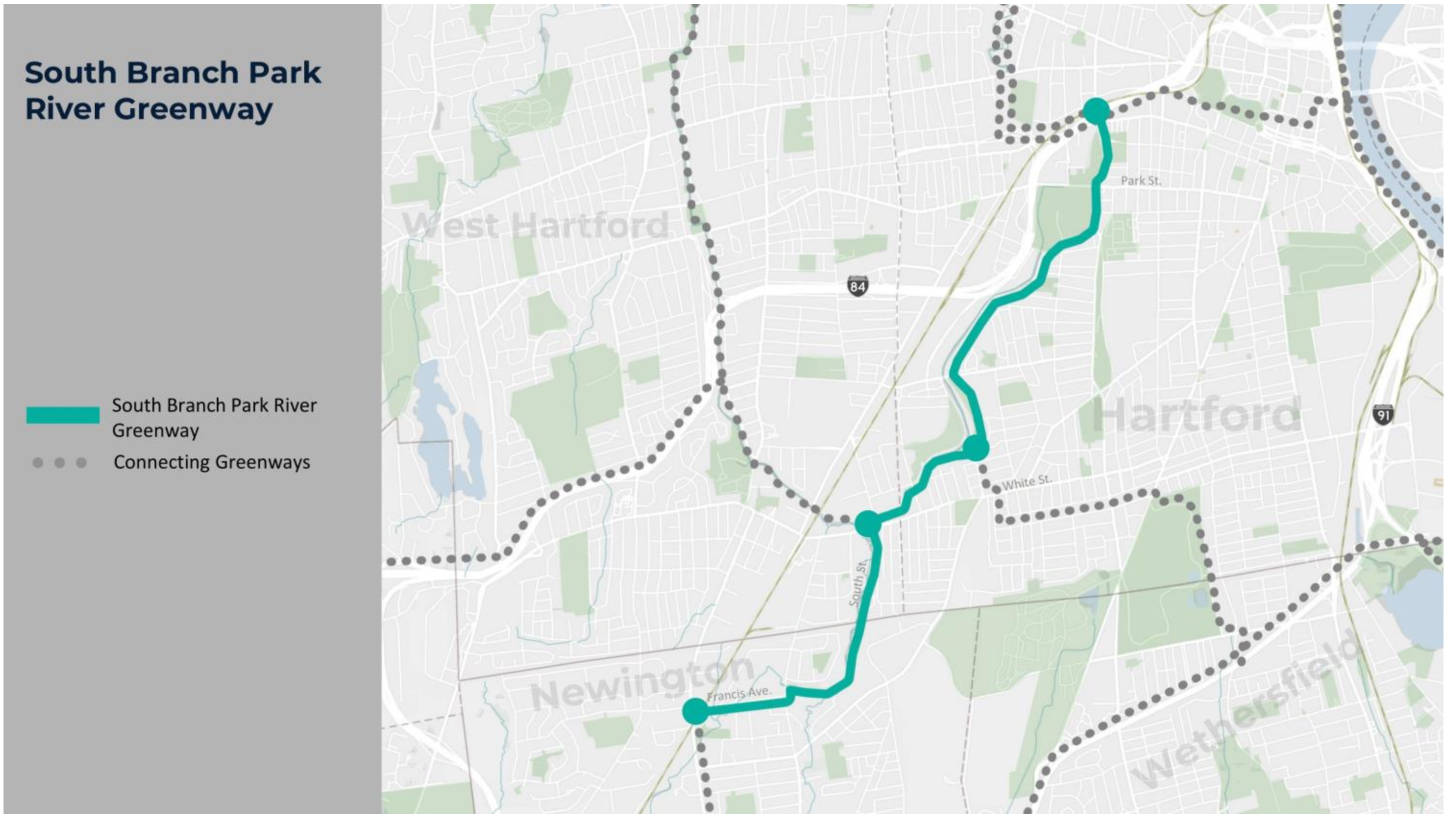
Brookfield Street: The greenway would require construction of 0.9 miles of shared-use pathway along Brookfield Street between Pope Park and the existing pathway across from Prince Tech High School.

South Branch Park River: This 2.4-mile segment would follow the South Branch of the Park River between the existing Brookfield Street shared-use pathway and the Trout Brook Trail in West Hartford. The City of Hartford is currently conducting planning and design work for a section of this segment. Implementation is complicated by pathway routing through floodplain and wetland areas. This segment may also require acquisition of right-of-way or procurement of easements.

Piper Brook: This 1.2-mile segment would follow the Piper Brook between New Britain Avenue and Main Street in Newington. Implementation is complicated by pathway routing through floodplain and wetland areas. This segment may also require acquisition of right-of-way or procurement of easements.

Francis Avenue: This 0.8-mile segment would connect the Piper Brook segment to the terminus of the CT*fastrak* pathway at Newington Junction by way of a sidepath on Francis Avenue.

Alternative Map



Implementation Timeframe

Timeframe

The development of greenways is expected to occur over a five to ten-year period (a mid to long term time frame).

- Pope Park: Implementation could occur in the short-term.
- Brookfield Street: Implementation could occur in the short-term.
- South Branch Park River: Implementation is likely to occur over a mid-term time frame.
- Piper Brook: Implementation is likely to occur over a mid-term time frame.
- Francis Avenue: Implementation could occur in the short-term.

Project Development Process

The project would next proceed to routing and facility selection, which would confirm or modify the recommendations of this concept. Following routing and facility selection, projects would proceed to design and engineering and then to procurement of bids and construction.

Project Phasing

This concept will likely be implemented in multiple phases. Improvements that require only pavement marking, signage improvements, and minor traffic modifications and minor roadway reconstruction or improvement of existing pathways would proceed first. Improvements that would require major roadway or pedestrian area reconstruction, traffic signal improvements, and traffic operations modifications, new pathway construction, and pathways requiring new bridge construction would occur in later phases.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative may improve travel time for bicyclists and pedestrians travelling north/south in the southwest area of Hartford and to and from Newington Junction.

Access and Connectivity – High Benefit

The project would provide connections for bicyclists and pedestrians, connecting neighborhoods, commercial areas, open space, and CT*fastrak* stations and would therefore provide a high benefit with respect to access and connectivity.

Travel Options and End User Convenience - High Benefit

The project would provide travel options for bicyclists and pedestrians and would provide convenience by providing greenway segments that are off-road or separated from traffic, providing user comfort and convenience.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

Moderate -to-high presence of disadvantaged populations located adjacent to the alternative, particularly in Hartford. There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility and mobility within the region would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - Moderate Benefit

This concept would likely provide a high safety benefit by providing segments of separated bicycle facilities that will move pedestrians and bicyclists off of the roadway.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Minimal presence of natural resources within the project corridor. Moderate presence of built resources within the Project Corridor. The project will likely require the construction of new impervious surface, the environmental impact of which may be partially offset by a reduction of automobile trips in favor of bicycle or pedestrian trips along the greenway. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept is unlikely to incorporate technology beyond traffic signalization.

Public Support - Moderate Benefit

There is public support for expanding bicycle and pedestrian accommodations, particularly dedicated facilities, and for extending the CT*fastrak* pathway into Hartford. Overall, comments seem supportive of this alternative. Suggestions include linkages to additional greenways and neighborhood connections and planning for flooding events.

Overarching Criteria

Economic Opportunity - Neutral

Enhancing bicycle and pedestrian facilities in the southwest corner of Hartford with connections to CT*fastrak* and commercial areas along New Britain Avenue will provide more convenient access to jobs from surrounding neighborhoods.

Feasibility/Complexity - Neutral

The project is moderate complexity. The location of the pathway along the South Branch of the Park River and the Piper Brook adds complexity due to wetland and floodplain regulations and restrictions and property ownership along the route. The project is likely to require substantial environmental permitting.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities and would complement, rather than replace existing and on-street bicycle facilities and sidewalks. It would also connect to multiple other greenways including the existing Trout Brook Trail and the proposed Hartford Parks Greenway and Newington to Wethersfield Greenway.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with impacts mostly limited to complexity and cost. Operations and maintenance would also be costly, requiring maintenance of pavement, trail heads (if required), areas along the pathway, signage and pavement markings, debris removal (such as leaves and sand), and potentially snow removal. Private organizations and volunteer groups often sponsor and conduct maintenance of greenways.

Order of Magnitude Cost

The project spans 4.9 miles in total. Of this, 0.8 miles of pathway currently exists, hence 3.1 miles of pathway would need to be constructed through multiple areas that are in wetland and/or floodplains. Estimated cost is $1 million per mile and the total estimated cost of the project is estimated to be $3.5 million. This cost estimate does not account for property acquisition that may be required for the greenway.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be in alignment with project costs.

Newington to Wethersfield Greenway

Detailed Project Description

This alternative provides a greenway from Newington Junction to Wethersfield Cove that would connect the CT*fastrak* pathway, Newington Center, and a potential riverfront greenway at Wethersfield Cove. The alternative would link existing trails and greenway routes and provide separated (removed from traffic) facilities that can accommodate local bicycle and pedestrian trips and longer-range bicycle trips. The greenway would travel from the Wethersfield Cove to Newington Junction as a sidepath along existing roadways. It would connect the proposed Connecticut Riverfront Greenway to the proposed South Branch Park River Greenway.

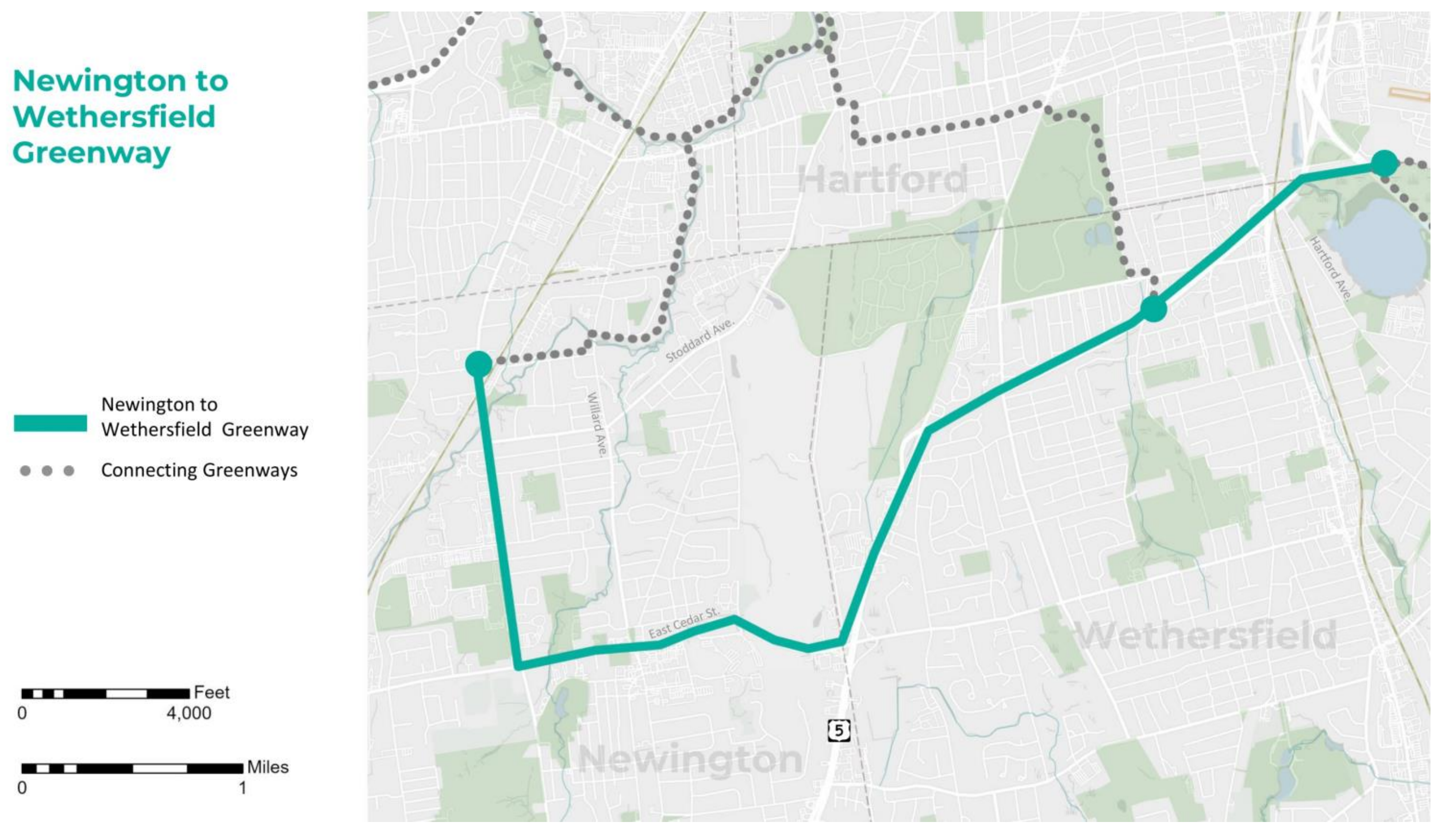
The greenway is comprised of the following segments:

Route 5/15: This 3.2-mile segment would be aligned within the Route 5/15 right-of-way and would require the construction of a shared-use pathway within the right-of-way and the construction of pathways on bridges along the corridor.

Route 175: This 1.1-mile segment would be constructed as a sidepath and would travel within the Route 175 right-of-way between Route 5/15 and Willard Avenue.

Willard Avenue: This 1.4-mile segment would likely be constructed as a sidepath within the Willard Avenue right-of-way.

Alternative Map



Implementation Timeframe

Timeframe

The development of greenways is expected to occur over a five to ten-year period (a mid- to long-term time frame).

a. Route 5/15: Due to the cost and complexity of constructing this segment within the right-of-way, this project is a long-term improvement.

b. Route 175: This improvement is likely to be a mid-term improvement.

c. Willard Avenue: This improvement is likely to be a mid-term improvement.

Project Development Process

The project would next proceed to routing and facility selection, which would confirm or modify the recommendations of this concept. Following routing and facility selection, projects would proceed to design and engineering and then to procurement of bids and construction.

Project Phasing

This concept will likely be implemented in multiple phases. Improvements that require only pavement marking, signage improvements, and minor traffic modifications and minor roadway reconstruction or improvement of existing pathways would proceed first. Improvements that would require major roadway or pedestrian area reconstruction, traffic signal improvements, and traffic operations modifications, new pathway construction, and pathways requiring new bridge construction would occur in later phases.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability –Moderate Benefit

This alternative may improve travel time for bicyclists and pedestrians travelling east/west across Wethersfield and to and from Newington Junction.

Access and Connectivity – High Benefit

The project would provide connections for bicyclists and pedestrians, connecting neighborhoods, commercial areas, open space, and CT*fastrak* stations and would therefore provide a high benefit with respect to access and connectivity.

Travel Options and End User Convenience - High Benefit

The project would provide travel options for bicyclists and pedestrians and would provide convenience by providing greenway segments that are off-road or separated from traffic, providing user comfort and convenience.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility and mobility within the region would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing a separated facility that will move pedestrians and bicyclists off of the roadway.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Minimal presence of natural resources within the project corridor. Minimal presence of built resources within the Project Corridor. Moderate presence of disadvantaged populations located adjacent to the alternative. Adverse impacts of additional impervious surface are offset by the concept supporting alternative modes of transportation. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept is unlikely to incorporate technology beyond traffic signalization.

Public Support - Moderate Benefit

There is public support for expanding bicycle and pedestrian accommodations, particularly dedicated facilities, and for extending the CT*fastrak* pathway beyond its terminus at Newington Junction.

Overarching Criteria

Economic Opportunity - Neutral

Enhancing bicycle and pedestrian facilities in Wethersfield and Newington and connections to CT *fastrak* and Newington Center will provide improved access to jobs, however, the use of this facility is likely to be primarily recreational in nature.

Feasibility/Complexity - Neutral

The project is moderate complexity. The location of the pathway along Route 5/15 is the most challenging given that the corridor is currently a limited access highway and bridges along this corridor lack sidewalks. The Route 175 and Willard Avenue corridors are more feasible but will still require substantial coordination with adjacent property owners. This project may require environmental permitting.

System Compatibility – High Benefit

This alternative would be synergistic with other modalities and would complement, rather than replace existing and on-street bicycle facilities and sidewalks. It would also connect to other greenways including the existing the proposed South Branch Park River Greenway and Connecticut River Greenway.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with impacts mostly limited to complexity and cost. Operations and maintenance would also be costly, requiring maintenance of pavement, trail heads (if required), areas along the pathway, signage and pavement markings, debris removal (such as leaves and sand), and potentially snow removal. Private organizations and volunteer groups often sponsor and conduct maintenance of greenways.

Order of Magnitude Cost

The project spans 5.5 miles in total. Estimated cost of the segment between Wethersfield Cove and Route 175 is likely to cost $1 million per mile with a cost of $3.2 million for this 3.2-mile segment. The Route 175 and Willard Avenue segments span 2.3 miles. Construction costs along these segments are likely to cost less as they do not require significant bridge enhancements. Assuming an estimated cost of $500,000 per mile, this segment would cost $1.15 million. Total cost of the project is estimated to be $6 million. This cost estimate does not account for property acquisition that may be required for the greenway.

High Level Benefit-Cost Outlook

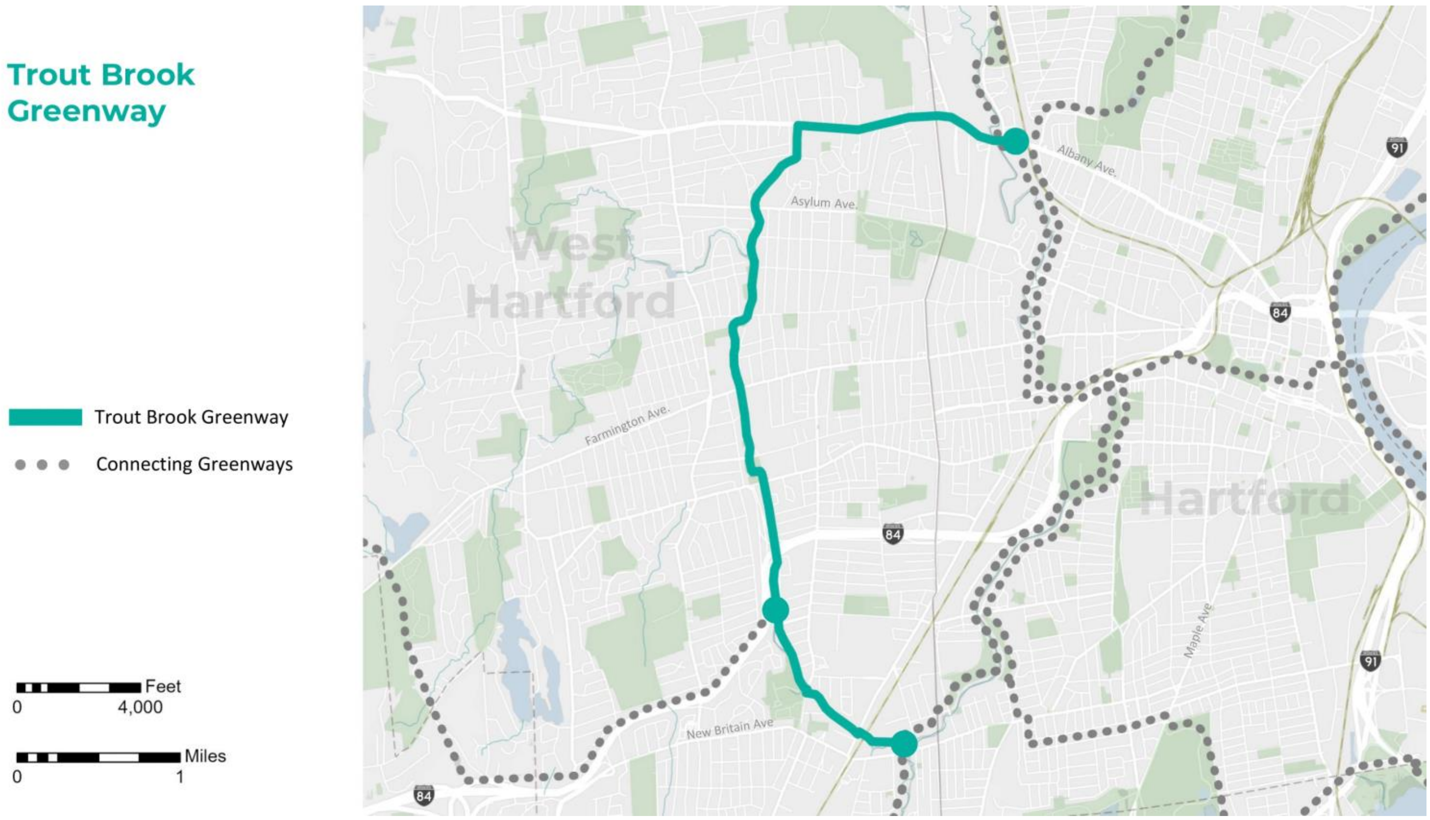
Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be in alignment with project costs.

Trout Brook Greenway

Detailed Project Description

The Trout Brook Greenway expands upon the existing Trout Brook Trail in West Hartford. The 4.9-mile greenway would complete segments of the trail and extend the trail north to Route 44 and to the existing East Coast Greenway route and south to the potential South Branch Park River Greenway. The greenway would link existing trails and greenway routes and provide separated (removed from traffic) facilities that can accommodate local bicycle and pedestrian trips and longer-range bicycle trips. Limited segments of the trail currently exist in West Hartford and the Town has plans to complete segments within the town.

Alternative Map



Implementation Timeframe

The Riverfront Greenway alternative is comprised of multiple segments, several of which currently exist. From north to south these segments include:

Albany Avenue: This 1.0-mile segment would take the form of a sidepath along Albany Avenue (Route 44) and would be located within the right-of-way.

St. Josephs: This 0.6-mile segment would be constructed on the west side of the Saint Joseph's University campus.

Asylum Street to Fern Street: This 0.7-mile segment would be constructed along the Trout Brook.

Fern Street to Park Road: This 1.1-mile segment is an existing segment of the trail.

Park Road to Trout Brook Drive: This 0.7-mile segment would be constructed along the Trout Brook.

Trout Brook Drive to New Park Avenue: This 0.5-mile segment is an existing segment of the trail.

New Park Avenue to Piper Brook: This 0.3-mile segment would cross New Park Avenue from the terminus of the existing Trout Brook Trail at that location. It would extend to the Piper Brook where the Trout Brook Greenway would meet the proposed South Branch Park River Greenway. This segment is obstructed by the CT *fastrak* and Hartford Line rail bridges over the Trout Brook and would likely require routing around the Elmwood Fastrak Station via New Britain Avenue.

Timeframe

All sections of this alternative can be completed over a time period of 4-10 years.

Project Development Process

Each segment will require coordination with adjacent property owners and ROW acquisition or easements before final design and construction can be completed.

Project Phasing

This alternative can be completed in phases of independent utility based upon each segment.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative may improve travel time for bicyclists and pedestrians travelling north/south through West Hartford. The alternative will also improve travel time access to the Elmwood CT *fastrak* station.

Access and Connectivity – High Benefit

The project would provide a regional, cross-town connection for bicyclists and pedestrians, connecting many neighborhoods, commercial areas, open space, and institutions, and would therefore provide a high benefit with respect to access and connectivity.

Travel Options and End User Convenience - High Benefit

The project would provide travel options for bicyclists and pedestrians and would provide convenience by providing a facility that is intended to be off-road or separated from traffic, providing user comfort and convenience.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility and mobility within the region would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing a separated facility that will move pedestrians and bicyclists off of the roadway.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Low Benefit

Minimal presence of natural resources within the project corridor. Minimal presence of built resources within the Project Corridor. Moderate presence of disadvantaged populations located adjacent to the alternative. The project will likely require the construction of new impervious surface, the environmental impact of which may be partially offset by a reduction of automobile trips in favor of bicycle or pedestrian trips along the greenway. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept is unlikely to incorporate technology beyond traffic signalization.

Public Support - Moderate Benefit

There is public support for expanding bicycle and pedestrian accommodations, particularly dedicated facilities, and for completing the Trout Brook Trail in West Hartford.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing access along the Brook would be highly beneficial to those who do not own a vehicle or cannot afford to drive. The greenway would also improve access to employment areas in West Hartford such as West Hartford Center, Park Road, and Elmwood.

Feasibility/Complexity - Neutral

This project is relatively complex in that it is located along a waterway and the routing may traverse floodplain and/or wetland areas. The project may require right-of-way acquisition and procurement of easements and may require extensive permitting, particularly if routed through naturalized areas.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities and would complement, rather than replace existing and on-street bicycle facilities and sidewalks. It would also connect to multiple other greenways including the East Coast Greenway and South Branch Park River Greenway.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with impacts mostly limited to complexity and cost. Operations and maintenance would also be costly, requiring maintenance of pavement, trail heads (if required), areas along the pathway, signage and pavement markings, debris removal (such as leaves and sand), and potentially snow removal. Private organizations and volunteer groups often sponsor and conduct maintenance of greenways.

Order of Magnitude Cost

This alternative would require the construction of 1.0 miles of sidepath along Albany Avenue at a probable cost of $500,000 per mile. The balance of the greenway is comprised primarily of 3.3 miles of shared use pathway with a probable cost of $1 million per mile. The total cost of the project is therefore estimated to be $4 million. The cost may vary based upon the route alignment and potential cost of right-of-way acquisition.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be in alignment with project costs.

Bloomfield to Windsor Greenway

Detailed Project Description

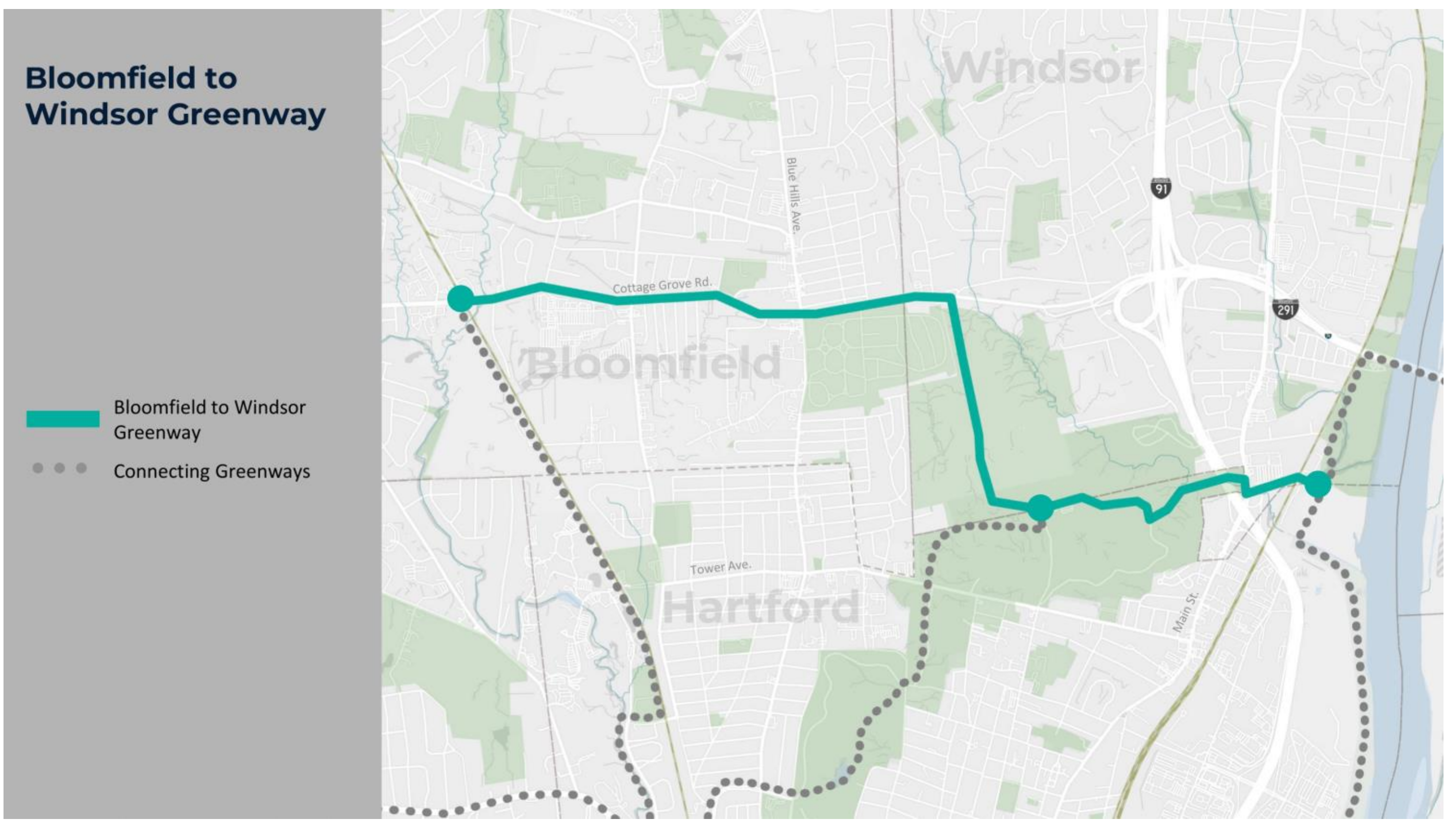
The Bloomfield to Windsor Greenway alternative would connect the existing East Coast Greenway route to the potential Riverfront Greenway route via Route 218 and Keney Park. The greenway would be accommodated by a sidepath along Route 218 in Bloomfield between the East Coast Greenway at Granby Street and Keney Park. Within Keney Park, the greenway would be routed along existing trails and would require improvement of those trails to be adequate for greenway function. The greenway will provide separated (removed from traffic) facilities that can accommodate local bicycle and pedestrian trips and longer-range bicycle trips. There are currently no pathway segments along the potential route (with exception of unimproved trails within Keney Park).

The greenway has two primary segments. These include:

Route 218 Sidepath: This segment would be constructed as a sidepath along Route 218 with the south side of the corridor preferred due to fewer driveway conflicts. Development of the sidepath could likely occur within the Route 218 right-of-way, which would improve feasibility, contain cost, and increase the likelihood of construction over a mid-term timeframe.

Keney Park Pathway: The greenway segments through Keney Park would likely seek to follow existing trail alignments and would require improvement of those trails to shared-use paths to accommodate the greenway. Construction of this segment could potentially occur in the short-term given City of Hartford of ownership of the park and the existing trails in the park. An alignment study would next need to be conducted to identify a preferred route through the park.

Alternative Map



Implementation Timeframe

Timeframe

The Bloomfield to Windsor Greenway is expected to be implemented over a two to five-year time frame.

Project Development Process

Short term improvements might include the designation of a route on existing pathways and roadways through Keney Park through use of signage and pavement markings.

Project Phasing

Short term improvements can be completed in phases of independent utility while the final design and ROW access for complete implementation is determined.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative may improve travel time for bicyclists and pedestrians travelling east/west between Bloomfield and Windsor and would improve access to Keney Park and the Captain John Bissell Trail.

Access and Connectivity – High Benefit

The project would provide a regional, cross-town connection for bicyclists and pedestrians, connecting many neighborhoods, commercial areas, open space, and institutions, and would therefore provide a high benefit with respect to access and connectivity.

Travel Options and End User Convenience - High Benefit

The project would provide travel options for bicyclists and pedestrians and would provide convenience by providing a facility that is intended to be off-road or separated from traffic, providing user comfort and convenience.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility and mobility within the region would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing a separated facility that will move pedestrians and bicyclists off of the roadway.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate

Minimal presence of natural resources within the project corridor. Minimal presence of built resources within the Project Corridor. Moderate presence of disadvantaged populations located adjacent to the alternative. Adverse impacts of additional impervious surface are offset by the concept supporting alternative modes of transportation. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept is unlikely to incorporate technology beyond traffic signalization.

Public Support - High Benefit

There is public support for expanding bicycle and pedestrian accommodations, particularly dedicated facilities, and for improving access to parks and the Connecticut River. Comments include suggestions about evaluating bike routes that connect people to jobs and destinations, and connections to attractions at Keney Park. There is support for expansion of the East Coast Greenway.

Overarching Criteria

Economic Opportunity - Neutral

Enhancing bicycle and pedestrian access along and to Route 218 will improve access to a small number of businesses and associated jobs along this corridor but is unlikely to drive economic development.

Feasibility/Complexity - Neutral

This project is complex and will span three towns – Bloomfield, Hartford, and Windsor covering approximately 4 miles. Given the support for the development of regional greenways, the project is likely feasible, but will be high cost. The project is largely located within rights-of-way and within Hartford's Keney Park. Right-of-way acquisition and procurement of easements may be required by is unlikely. Extensive permitting may be required for segments of the route travelling through Keney Park that may be located in floodplain or wetland areas.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities and would complement, rather than replace existing and on-street bicycle facilities and sidewalks. It would also connect to multiple other greenways including the East Coast Greenway and the existing Captain John Bissell Trail.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with impacts mostly limited to complexity and cost. Operations and maintenance would also be costly, requiring maintenance of pavement, trail heads (if required), areas along the pathway, signage and pavement markings, debris removal (such as leaves and sand), and potentially snow removal. Private organizations and volunteer groups often sponsor and conduct maintenance of greenways.

Order of Magnitude Cost

The project may cost approximately $3.1 million. This estimate is based upon a potential cost of $1 million per mile for the 2.2 miles of greenway routed through Keney Park, which is estimated to cost $2.2 million. Sidepath segments along Route 218 and Meadow Road in Windsor are estimated to cost $0.5 million per mile. With 1.8 miles of sidepath along these corridors, the cost of sidepaths would be $0.9 million.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be in alignment with project costs.

Hartford Parks Greenway

Detailed Project Description

The alternative would connect several of the City's parks to the East Coast Greenway and would be comprised of on- and off-street facilities. It would link the City's parks to existing trails and greenway routes and provide separated (removed from traffic) facilities and limited on-road bicycle facilities paired with sidewalks that can accommodate local bicycle and pedestrian trips and longer-range bicycle trips. The greenway would provide a north/south bicycle and pedestrian connection on the west side of the City. Elements of this concept are identified in the City's Parks Plan and Bicycle Plan.

The greenway is comprised of multiple segments, some of which currently exists as pathways for on-street bicycle facilities. From north to south these include:

Keney Park: This segment would travel from the Hartford/Windsor line in Keney Park, along existing trails in the park, and would emerge from the park at Westbourne Parkway. This segment is 1.8 miles long. 0.8 miles of this segment has pathways that can accommodate the greenway. Implementation could occur in the short-term.

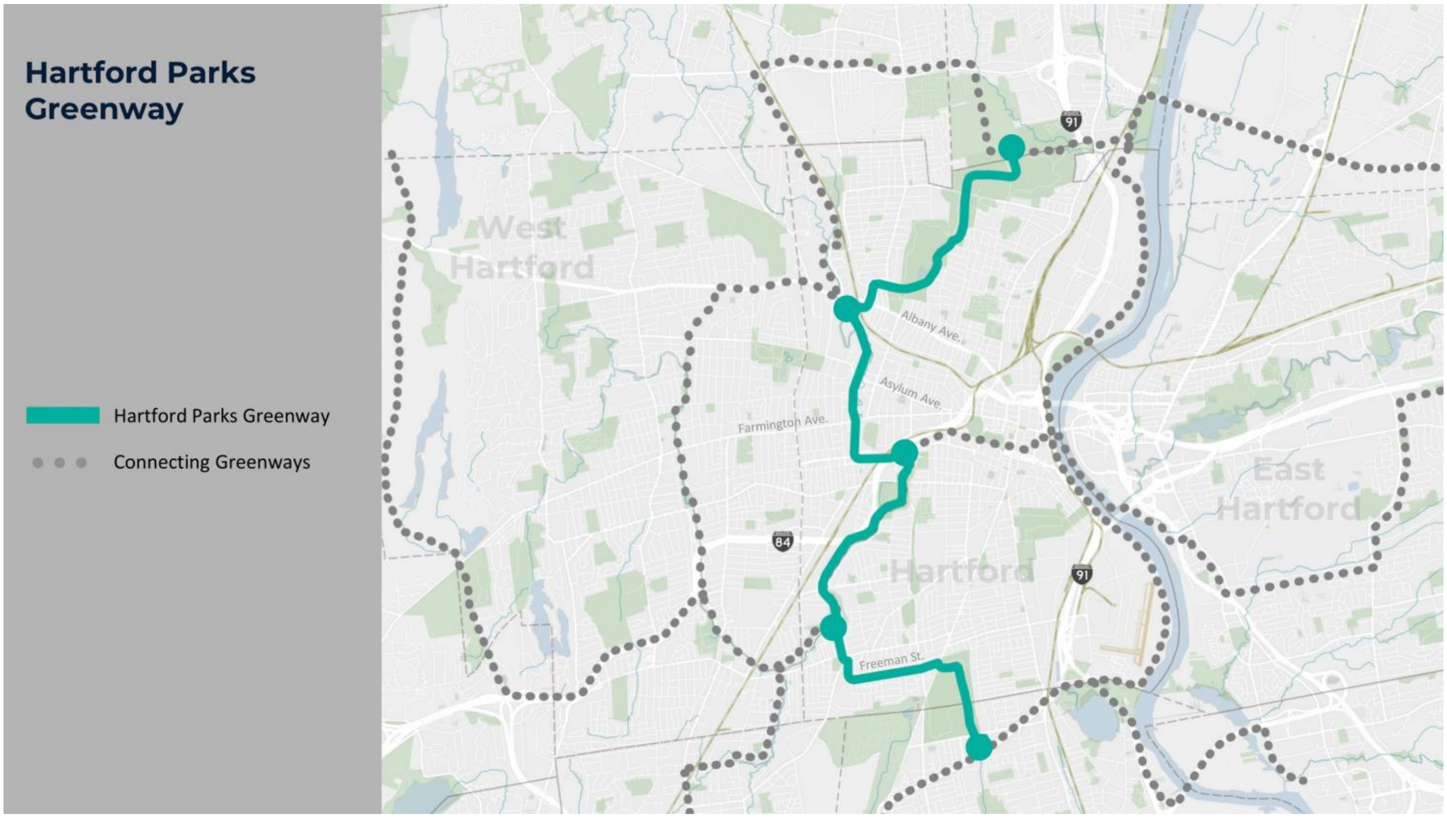
Keney Park to Pope Park: This 3.3-mile segment travels along multiple streets, many of which have on-street bicycle facilities and all of which have sidewalks. Improvements to accommodate bicyclists are needed at Albany Avenue, and at Whitney and South Whitney Streets where bicycle facilities are currently lacking. Implementation could occur in the short-term.

Pope Park: This segment would use existing pathways in Pope Park.

Pope Park to Goodwin Park: This 3.0-mile segment would be routed along Brookfield Street and through local streets in Hartford's Southwest neighborhood. This segment would use an existing greenway along Brookfield Street near Prince Tech High School. The concept recommends expansion of the existing greenway path north to Pope Park. The greenway would take the form of on-street bicycle facilities paired with sidewalks in the Southwest neighborhood. Implementation could occur in the short-term.

Goodwin Park: This segment would use existing pathways in Goodwin Park.

Alternative Map



Implementation Timeframe

Timeframe

The development of greenways is expected to occur over a five to ten-year period (a mid to long term time frame).

Project Development Process

The project would next proceed to routing and facility selection, which would confirm or modify the recommendations of this concept. Following routing and facility selection, projects would proceed to design and engineering and then to procurement of bids and construction.

Project Phasing

This concept will likely be implemented in multiple phases. Improvements that require only pavement marking, signage improvements, and minor traffic modifications and minor roadway reconstruction or improvement of existing pathways would proceed first. Improvements that would require major roadway or pedestrian area reconstruction, traffic signal improvements, and traffic operations modifications, new pathway construction, and pathways requiring new bridge construction would occur in later phases.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative may improve travel time for bicyclists and pedestrians travelling north/south between some of Hartford's larger parks.

Access and Connectivity – High Benefit

The project would provide cross-town connections for bicyclists and pedestrians, connecting many neighborhoods, commercial areas, open space, and institutions, and would therefore provide a high benefit with respect to access and connectivity.

Travel Options and End User Convenience - High Benefit

The project would provide travel options for bicyclists and pedestrians and would provide convenience by providing greenway segments that are off-road or separated from traffic, providing user comfort and convenience.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility and mobility within the region would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing segments of separated bicycle facilities that will move pedestrians and bicyclists off of the roadway.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Moderate presence of many natural and built resources associated with Park River and the City of Hartford. Moderate presence of minority and low-income population on both sides of the Connecticut River. The alternative would share right-of-way with Officially Designated Connecticut Greenways. Adverse impacts of additional impervious surface are offset by the concept supporting alternative modes of transportation. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept is unlikely to incorporate technology beyond traffic signalization.

Public Support - High Benefit

There is public support for expanding bicycle and pedestrian accommodations, particularly dedicated facilities, and for improving access to and between Hartford's parks. Comments about this alternative support East Coast Greenway connections to City parks.

Overarching Criteria

Economic Opportunity - Neutral

Enhancing access across the City provides access not only to parks, but to job opportunities in commercial areas across the west side of the City, however, the use of this facility is likely to be primarily recreational in nature.

Feasibility/Complexity - Neutral

The project is moderate complexity and is heavily comprised of existing pathways and on-street bicycle facilities and sidewalks.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities and would complement, rather than replace existing and on-street bicycle facilities and sidewalks. It would also connect to multiple other greenways including the East Coast Greenway.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with impacts mostly limited to complexity and cost. Operations and maintenance would also be costly, requiring maintenance of pavement, trail heads (if required), areas along the pathway, signage and pavement markings, debris removal (such as leaves and sand), and potentially snow removal. Private organizations and volunteer groups often sponsor and conduct maintenance of greenways.

Order of Magnitude Cost

The project spans 9.2 miles in total. 2.2 miles of the route would require construction of a shared-use pathway at a cost of $1 million per mile. Approximately 4 miles of the route would require the installation of on-street bicycle facilities at an average cost of $200,000 per mile. The total estimated cost of the greenway project is estimated to cost $3 million.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be in alignment with project costs.

Reservoir Greenway

Detailed Project Description

The Reservoir Greenway alternative would connect existing trails and pathways located on MDC reservoir properties to the Trout Brook trail via the I-84 corridor. The purpose of this greenway is to link existing trails and greenway routes and provide separated (removed from traffic) facilities that can accommodate local bicycle and pedestrian trips and longer-range bicycle trips. Several miles of trail and pathway exist within MDC reservoir properties, although no facilities exist south of the Farmington Avenue reservoir in West Hartford.

The greenway is comprised of four distinct segments:

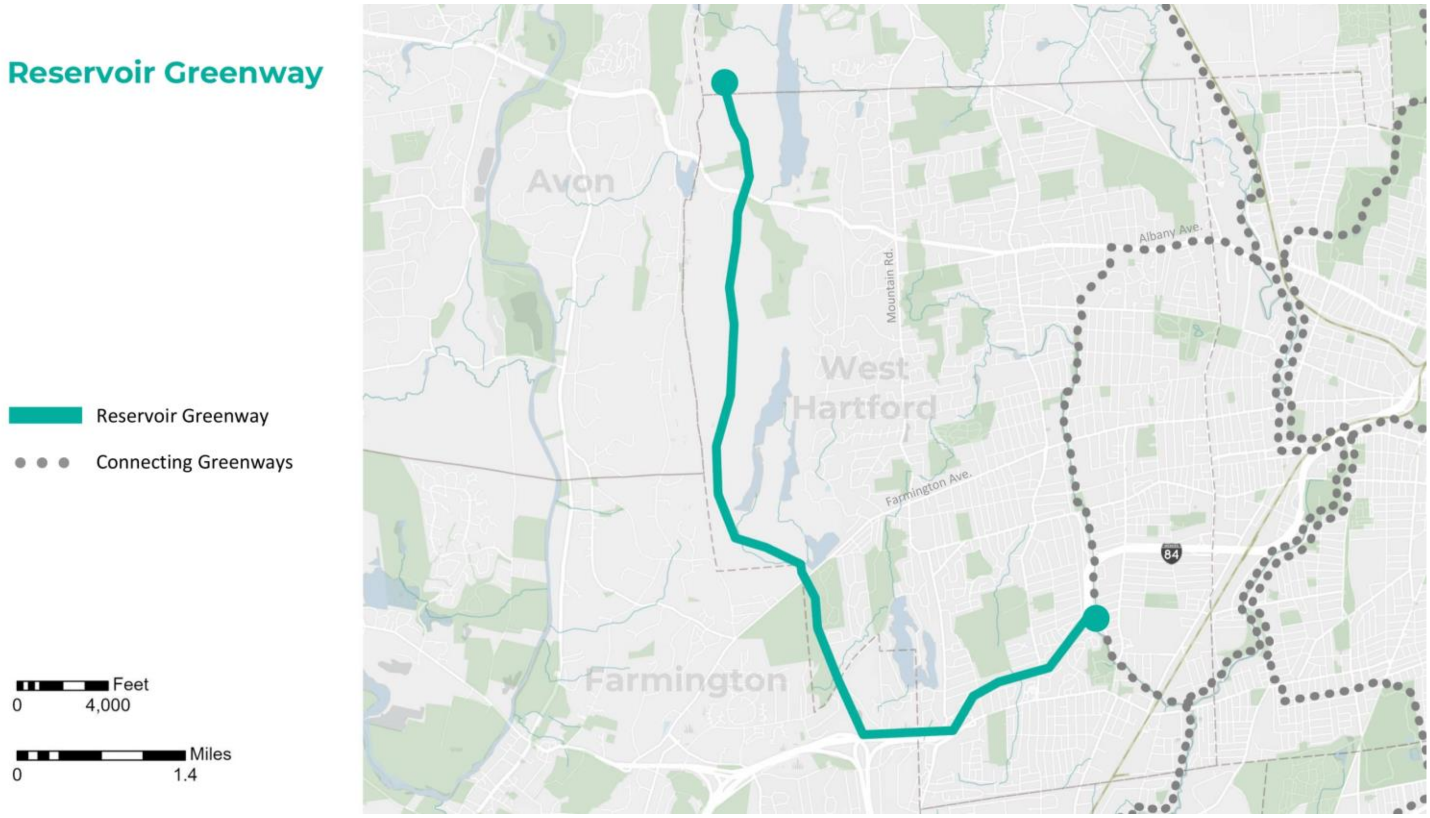
MDC Reservoir Segment: This 4.5-mile segment is located along existing pathways and trails that span from the MDC's Number 6 Reservoir at the West Hartford/Bloomfield town line in West Hartford to the Farmington Avenue Reservoir in West Hartford. No improvements other than wayfinding are recommended for this segment.

Farmington Avenue to Tunxis Road: This 1.0-mile segment would be located across privately held open space and State of Connecticut flood control land. Development of a pathway along this segment would require acquisition of right-of-way or procurement of easements.

Tunxis Road to I-84: This 0.6-mile segment would be located within Route 9 right-of-way and could potentially use an unused Route 9 interchange ramp to traverse this area.

I-84 to Park Road: This 2.0-mile segment would be located within the I-84 right-of-way from the Route 9 interchange to Trout Brook Drive near the Park Road interchange where it would intersect the existing Trout Brook Trail. Development of this segment would occur within an area of I-84 that is currently undergoing highway expansion and reconstruction. The development of a greenway through this segment is challenged by the limited access conditions of I-84 and limited space within the right-of-way.

Alternative Map



Implementation Timeframe

Timeframe

The development of this greenway is expected to occur over a one to ten-year period (a near to long-term time frame).

- MDC Reservoir Segment: Improvements could occur in the near term (1-3 years)
- Farmington Avenue to Tunxis Road: These improvements could occur over a mid-term timeframe (3 to 5 years).
- Tunxis Road to I-84: These improvements could occur over a mid-term timeframe (3 to 5 years).
- I-84 to Park Road: Implementation, if feasible, would likely occur over a long-term time frame (5 to 10 years).

Project Development Process

The project would next proceed to routing and facility selection, which would confirm or modify the recommendations of this concept. Following routing and facility selection, projects would proceed to design and engineering and then to procurement of bids and construction.

Project Phasing

This concept will likely be implemented in multiple phases. Improvements that require only pavement marking, signage improvements, and minor traffic modifications and minor roadway reconstruction or improvement of existing pathways would proceed first. Improvements that would require major roadway or pedestrian area reconstruction, traffic signal improvements, and traffic operations modifications, new pathway construction, and pathways requiring new bridge construction would occur in later phases.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability –Moderate Benefit

This alternative may improve travel time for bicyclists and pedestrians travelling north/south on the west side of West Hartford although its use is expected to be primarily recreational in nature.

Access and Connectivity –Moderate Benefit

This alternative would improve access to the MDC reservoirs for bicyclists and pedestrians, connecting many neighborhoods and the center of West Hartford to open space at the reservoir properties. Access to the reservoirs is currently provided at many locations in West Hartford, therefore this concept would provide a moderate benefit with respect to access and connectivity.

Travel Options and End User Convenience - Moderate Benefit

The project would provide travel options for bicyclists and pedestrians and would provide convenience by providing a greenway connection to the MDC reservoirs. Because access to the greenway would be limited, the concept is expected to only provide a moderate benefit.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility and mobility within the region would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing a separated facility that will move pedestrians and bicyclists off of the roadway.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Minimal presence of natural resources within the project corridor. Minimal presence of built resources within the Project Corridor. Minimal presence of disadvantaged populations located adjacent to the alternative. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept is unlikely to incorporate technology beyond traffic signalization.

Public Support - High Benefit

Alternative is strongly supported. There is public support for expanding bicycle and pedestrian accommodations, particularly dedicated facilities, and for improving access to open space areas such as the MDC's reservoirs. Comments include desired access for recreation but also desire for bike infrastructure to accommodate other uses than recreation-only.

Overarching Criteria

Economic Opportunity - Neutral

This alternative does not provide direct access to commercial areas where jobs would be located.

Feasibility/Complexity – Critical Flaw

This alternative has a high degree of complexity and has low feasibility. The concept is challenged by the need to acquire right-of-way or easements through privately held land, it requires repurposing of Route 9 right-of-way and facilities, and would require the colocation of a pathway along a narrow section of I-84 right-of-way that is currently being reconstructed to improve traffic operations. Alternative routes may need to be identified to make this alternative viable. This may include the use of Farmington Avenue and Boulevard or Tunxis and Sedgwick Roads which could provide the needed connection between the Reservoir and the Trout Brook Trail.

System Compatibility - High Benefit

This alternative would be moderately synergistic with other modalities and would interface with existing trails that are popular with hikers and mountain bikers.

Overall Assessment of Benefits/Impacts

This alternative has a critical flaw; therefore, no overall assessment has been conducted.

Order of Magnitude Cost

This alternative has a critical flaw; therefore, no cost has been determined.

High Level Benefit-Cost Outlook

This alternative has a critical flaw; therefore, no benefit-cost outlook has been conducted.

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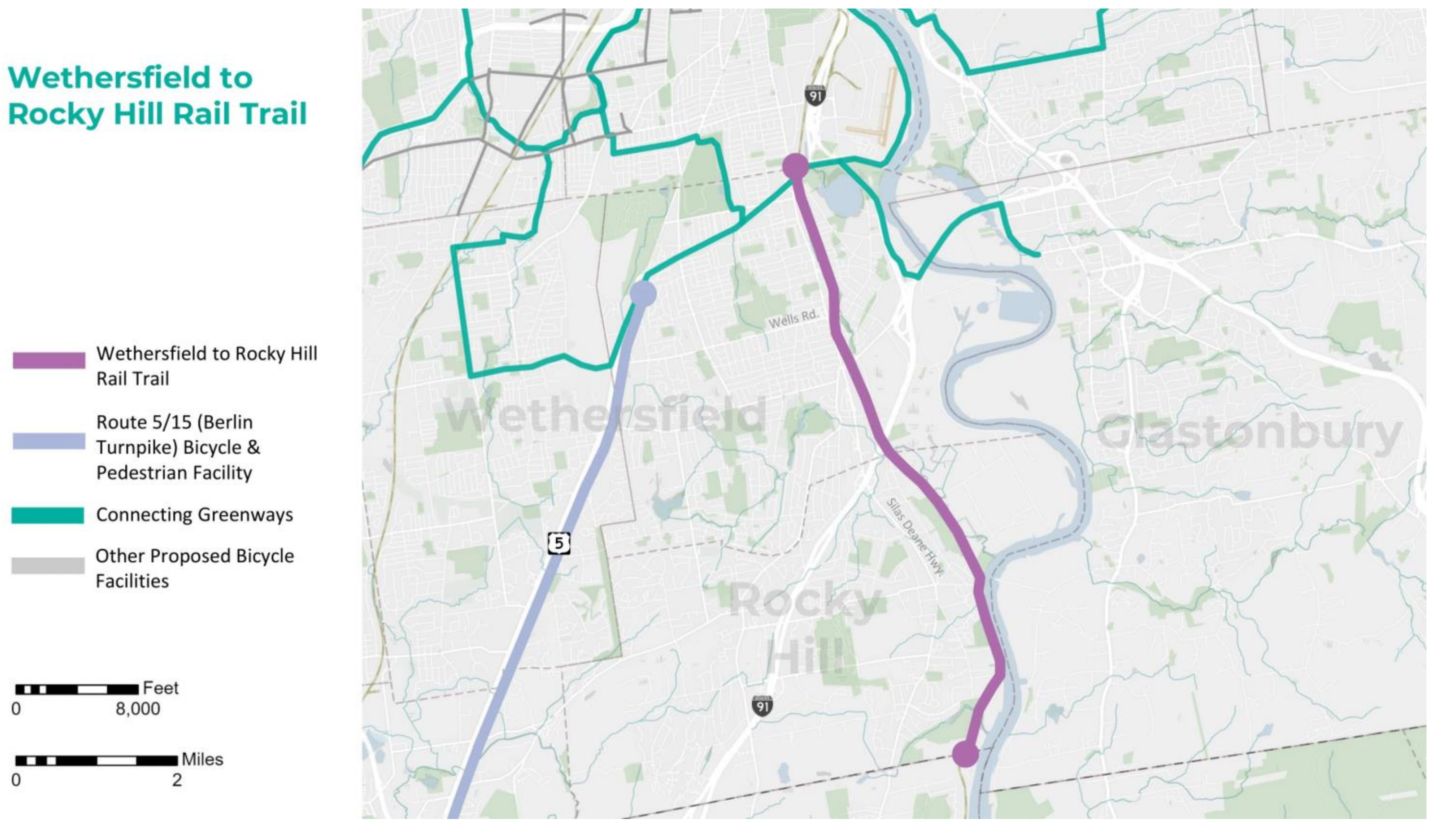
Wethersfield/Rocky Hill Rail Trail

Detailed Project Description

This alternative includes a 10' wide shared-use pathway on the east side of the Genesee and Wyoming Railroad Company with a total length of approximately 6.6 miles extending from the Hartford/Wethersfield city line to the Rocky Hill/Middletown line. The purpose of the pathway is to improve north/south bicycle and pedestrian mobility on the east side of Wethersfield and Rocky Hill. The corridor provides an alternative route to the Silas Deane Highway/ Route 99. A conceptual plan was developed by the Town of Wethersfield for the Wethersfield segment and request to CTDOT for assistance in advancing the concept.

Alternative Map



Implementation Timeframe

Timeframe

The Rail Trail is likely to occur over a mid-term timeframe of three to five years. The project is contingent upon repurposing of the rail corridor for bicycle and pedestrian use.

Project Development Process

This would require coordination with the State, which owns the rail corridor and the rail operator.

Project Phasing

The project could occur in phases with the Wethersfield section built out in one phase and the Rocky Hill section built out in a subsequent phase or vice versa.

Environmental Review Process

Environmental Assessment (EA)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative may improve travel time for bicyclists and pedestrians travelling north/south in Wethersfield and Rocky Hill.

Access and Connectivity – Moderate Benefit

The project would provide a regional, cross-town connection for bicyclists and pedestrians, connecting many neighborhoods and areas across Wethersfield and Rocky Hill.

Travel Options and End User Convenience - High Benefit

The project would provide travel options for bicyclists and pedestrians and would provide convenience by providing a facility that is intended to be off-road or separated from traffic, providing user comfort and convenience.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility and mobility within the region would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing a separated facility that will move pedestrians and bicyclists off of the roadway.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Moderate presence of natural environmental resources adjacent to alternative alignment. Rocky Hill and Wethersfield Meadows are present in vicinity of Connecticut River. Rocky Hill Quarry is adjacent to alternative representative alignment. Moderate presence of built resources in project corridor and adjacent to alternative alignment. Minimal presence of minority and low-income populations within Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept is unlikely to incorporate technology beyond traffic signalization.

Public Support - Moderate Benefit

There is public support for expanding bicycle and pedestrian accommodations, particularly dedicated facilities.

Overarching Criteria

Economic Opportunity - Neutral

Enhancing bicycle and pedestrian access along the corridor may improve access to jobs.

Feasibility/Complexity – Critical Flaw

This corridor was recently reactivated for freight rail. Rail operators and the CTDOT Division of Rail are generally oppositional to the colocation of trails and active rail lines. The proposed shared use pathway would be located on an existing rail corridor that actively serves a small number of industrial properties along the corridor.

System Compatibility - Neutral

This alternative would expand modal options in the two towns but may be competing against rail use of the corridor. There may be potential for colocation of a shared pathway alongside the rail corridor, however there is little to no precedent in Connecticut for the colocation of shared use pathways and active rail lines.

Overall Assessment of Benefits/Impacts

This alternative has been determined to have a critical flaw; therefore, no overall assessment has been conducted.

Order of Magnitude Cost

This alternative has been determined to have a critical flaw; therefore, no cost estimate has been conducted.

High Level Benefit-Cost Outlook

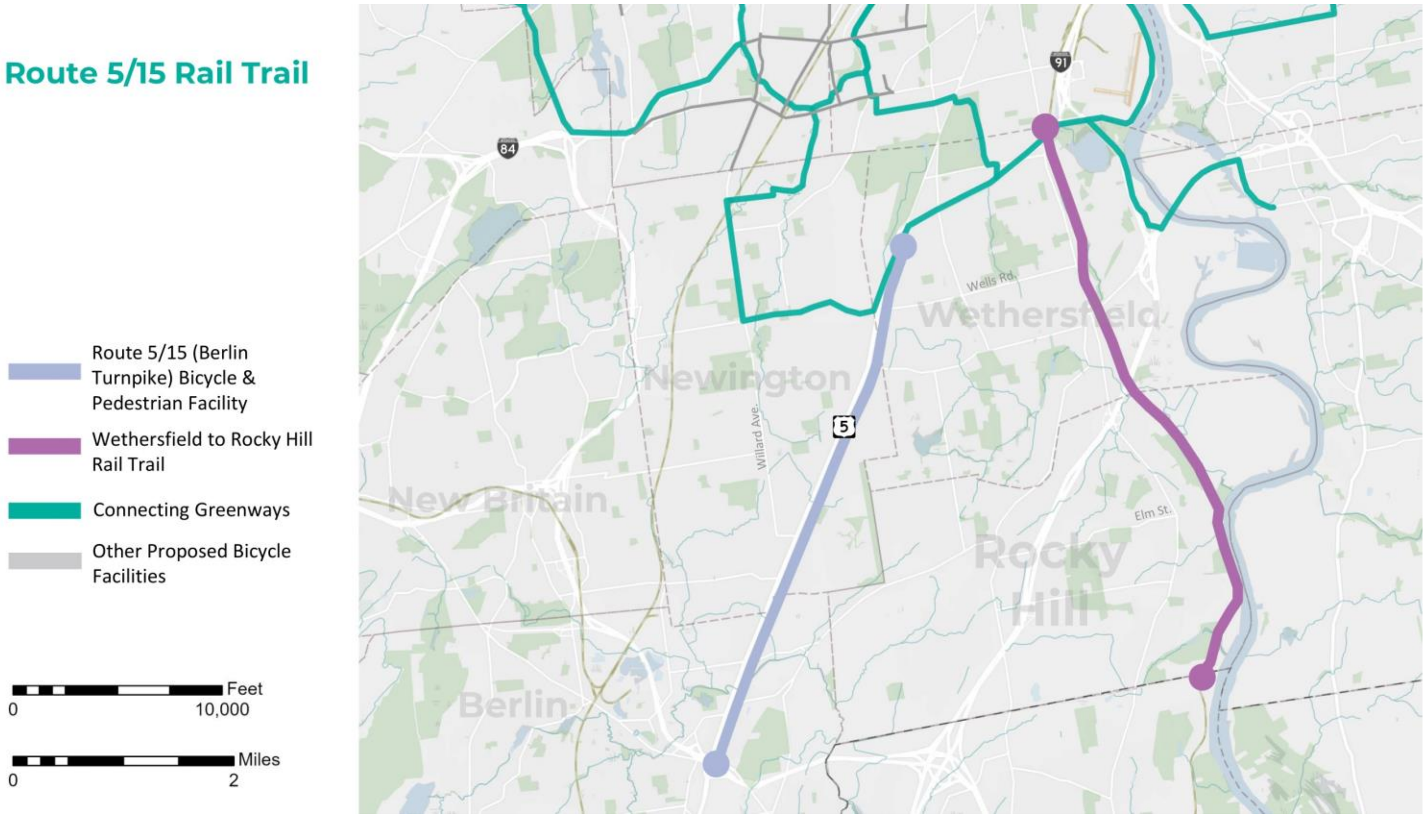
This alternative has been determined to have a critical flaw; therefore, no benefit-cost analysis has been conducted.

Route 5/15 (Berlin Turnpike) Bike and Pedestrian Facilities

Detailed Project Description

This alternative would add bike and pedestrian facilities along the Berlin Turnpike in Wethersfield, Newington, and Berlin in the form of a shared use pathway. The purpose of this alternative is to improve bicycle and pedestrian mobility in Wethersfield, Newington, and Berlin and improve access to destinations on the Berlin Turnpike. No prior planning has been conducted for this alternative.

Alternative Map



Implementation Timeframe

Timeframe

The Berlin Turnpike Bicycle and Pedestrian enhancement concept would be constructed over a three to five-year period, pending ROW complications. Bicycle and pedestrian improvements would span 6.0 miles and would intersect many streets and driveways.

Project Development Process

Next steps in the process would be to conduct a feasibility study to identify whether the project is feasible given physical and right-of-way constraints and identify property acquisition that may be required by the project.

Project Phasing

Next steps in the process would be to conduct a feasibility study to identify whether the project is feasible given physical and right-of-way constraints and identify property acquisition that may be required by the project. After feasibility is determined the

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative may improve travel time for bicyclists and pedestrians travelling north/south along the Berlin Turnpike.

Access and Connectivity –Moderate Benefit

The project would provide a regional, cross-town connection for bicyclists and pedestrians, connecting many commercial areas along the Berlin Turnpike.

Travel Options and End User Convenience - High Benefit

The project would provide travel options for bicyclists and pedestrians and would provide convenience by providing a facility that is intended to be off-road or separated from traffic, providing user comfort and convenience.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There could be a potential for environmental impacts in disadvantaged communities. However, improved accessibility and mobility within the region would outweigh any potential impacts and would be particularly advantageous to zero-auto households.

Safety – High Benefit

This concept would likely provide a high safety benefit by providing a separated facility that will move pedestrians and bicyclists off of the roadway.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Minimal presence of natural resources within the project corridor. Minimal presence of built resources within the Project Corridor. Moderate presence of disadvantaged populations located adjacent to the alternative. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept is unlikely to incorporate technology beyond traffic signalization.

Public Support - Moderate Benefit

There is public support for expanding bicycle and pedestrian accommodations, particularly dedicated facilities, and for improving access to employment opportunities.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing bicycle and pedestrian access along the Berlin Turnpike will improve access to jobs and may improve the access of customers and patrons to businesses. Unlike recreational shared-use trails, these improvements are unlikely to support the economic development of businesses catering to pathway users (café's, ice cream parlors, bicycle shops, and the like).

Feasibility/Complexity - Neutral

This project will span three towns – Wethersfield, Newington, and Berlin. The proposed shared use pathway would intersect multiple streets and driveways. The project may require the acquisition of right-of-way and/or procurement of easements for the pathway.

System Compatibility - High Benefit

This alternative would expand modal options along the Berlin Turnpike and would connect to the proposed Newington to Wethersfield Greenway.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with impacts mostly limited to complexity and cost. Operations and maintenance would also be costly, requiring maintenance of pavement, signage and pavement markings, debris removal (such as leaves and sand), and potentially snow removal.

Order of Magnitude Cost

The project may cost approximately $6.0 million. This estimate is based upon a potential cost of $1 million per mile for the 6.0 miles of shared pathway. This estimate excludes potential cost that may be associated with right-of-way acquisition.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be in alignment with project costs.

Main Street Complete Streets, Hartford

Detailed Project Description

This concept would implement a road diet on Main Street in Hartford to provide separated bike lanes, traffic calming, transit stop enhancements, and streetscape improvements. The configuration would create a roundabout at Main Street and Park Street. The purpose of the project is to improve pedestrian / bicycle safety, experience, and access to destinations on a major transit corridor. The project may support a modal shift to walking, biking, and transit use. This project was planned by the City of Hartford, which completed a study, Reimagining Main Street in 2021. The plan identified a preferred alternative to be advanced to design. The project is not yet funded, and final design has not been conducted.

Alternative Map

Implementation Timeframe

Timeframe

The implementation of complete streets on Main Street requires a complete reconstruction of the street as envisioned by the 2021 Reimagining Main Street plan. Given the extent of proposed improvements, the project is expected to occur over a 5–10-year timeframe.

Project Development Process

The Reimagining Main Street plan recommends separating the 4200-foot corridor into three sections so it can be constructed on a prioritized timetable adaptable to the needs of the corridor, business community, residents, and users. Each segment can be treated as a "stand-alone" project. Those segments include:

- Asylum Street to Elm Street, 0.3 miles including approaches
- Elm Street to Fire Station, 0.3 miles
- Fire Station to Wyllys Street, 0.15 miles

Project Phasing

The Plan recommends the following priorities for phasing with independent utility (presented in order of priority):

1. Construct a one-lane roundabout gateway at Park Street.
2. Upgrade and enhance Barnard Park.
3. Install 10' cycle track with bus platforms from Wyllys to Asylum Streets.
4. Complete road and streetscape improvements from Park Street to Asylum Street.
5. Provide financial incentives to businesses and developers to reinvest along Main Street

Environmental Review Process

.Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

This concept would improve access and connectivity for bicyclists and pedestrians, although bicyclists would benefit most from the improvements.

Travel Options and End User Convenience – High Benefit

This alternative would improve user comfort and will enable bicyclists to travel the length of Main Street in Downtown Hartford with separation from traffic.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

There would be no adverse environmental justice impacts, and the improvement of access for bicyclists would be advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing separated bicycle facilities off of the roadway for most of Main Street within the project limits.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Water resources are present mostly adjacent to the Connecticut River. Protected open space and natural diversity areas, and historic resources are immediately adjacent to representative alternative alignment. Moderate presence of minority and low-income populations are within the Project Corridor. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology outside of traffic signal technology.

Public Support - Moderate Benefit

There is public support for expanding bicycle and pedestrian accommodations and access to transit.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing mobility options be highly beneficial to those who do not own a vehicle or cannot afford to drive.

Feasibility/Complexity - Neutral

This alternatively is relatively complex and will require substantial coordination with adjacent property and business owners before and during implementation.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including CT Transit.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Operations and maintenance are expected to be relatively low cost as routine maintenance such as snow removal is already conducted along the corridor. As a result, the benefit to cost ratio would be very high.

Order of Magnitude Cost

The 2021 Reimaging Main Street plan estimated a cost of $10 million for the recommended complete streets improvements described in this concept.

High Level Benefit-Cost Outlook

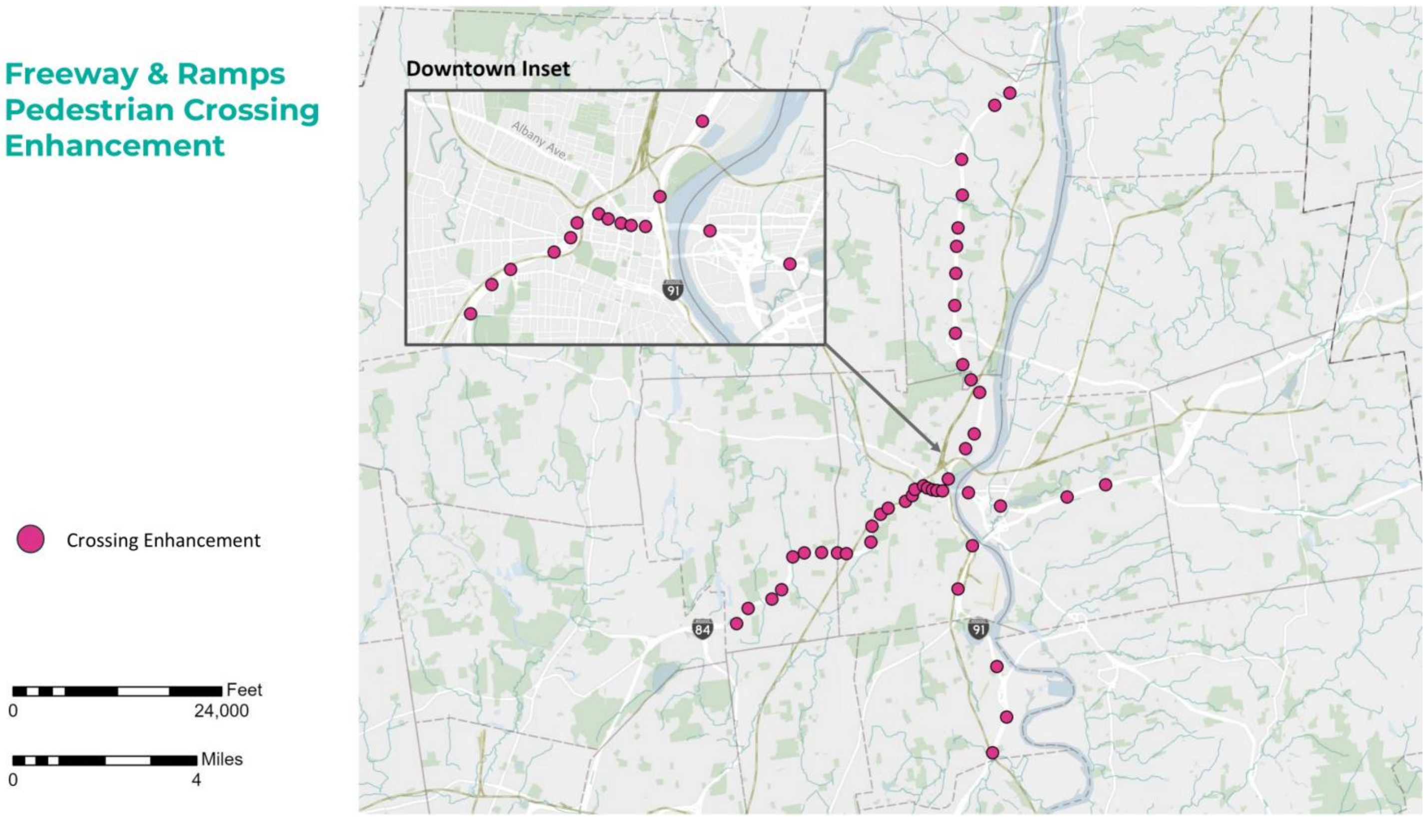
Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be commensurate with project costs.

Enhance Pedestrian Crossings at Freeways and Ramps

Detailed Project Description

This alternative would improve pedestrian connections across freeways ramps throughout the Study Area. This would improve the quality and number of pedestrian connections to maximize pedestrian connectivity in the study area, improve safety at pedestrian crossings, and enhance the comfort and security of pedestrians crossing highways and ramps. In total, 43 specific locations would benefit from enhances sidewalks, crosswalks, and signal enhancements. These ramps provide access and egress from limited access highways such as I-84, I-91, I-291, Route 2, and Route 5/15.

Alternative Map



Implementation Timeframe

Timeframe

Improvements are feasible for implementation within a three-year period.

Project Development Process

The next step would be to conduct design and engineering and procure bids for construction.

Project Phasing

This alternative can be conducted in phases of independent utility based upon each identified site.

Environmental Review Process

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – High Benefit

This project would significantly improve access and connectivity for pedestrians in proximity of ramp locations.

Travel Options and End User Convenience - High Benefit

This project improves the ability of pedestrians to safely walk along roadways near ramp intersections and cross those intersections. As such, it improves travel options and convenience.

Criteria Supporting Other Study Goals

Equity - High Benefit

There would be no adverse environmental justice impacts, and the improvement of pedestrian access and safety in areas surrounding highway ramps would be beneficial to users in those areas, particularly those that walk out of necessity and not choice.

Safety - High Benefit

This project would provide a high safety benefit by providing space off of the roadway for pedestrians to walk and by providing marked roadway crossings, many of which would be supported by a protected pedestrian crossing phase.

Resiliency and Sustainability - Low Benefit

Facilitating pedestrian mobility would support a modal shift away from single-occupant vehicles and towards more sustainable modes including walking and use of public transit.

Environment - Moderate Benefit

Depending on the location, the improvement or conversion of a facility could result in minor but mitigable impacts on resources within the project corridor. The alternative may require additional impervious surface. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology beyond crosswalk signals.

Public Support - Moderate Benefit

People feel strongly about the importance of improving safety and connections for pedestrians in high volume traffic areas, such as freeways and ramps. Suggestions also include adding lighting and artwork along with safety improvements.

Overarching Criteria

Economic Opportunity – High Benefit

This alternative may improve access between residential areas and commercial areas which would be beneficial to workers who need to access jobs.

Feasibility/Complexity - High Benefit

This alternative requires only low-cost improvements with those improvements located in existing rights-of-way.

System Compatibility – High Benefit

This alternative would improve access to transit at multiple locations.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would be mostly limited to pavement installation, crosswalk markings, and pedestrian signals as required. Operations and maintenance are expected to be minimal. As a result, the benefit to cost ratio would be very high.

Order of Magnitude Cost

This concept includes the construction of new sidewalks, curb ramps, marked crosswalks, and/or pedestrian signal enhancements at 43 discrete locations. The cost of improvements per location varies based upon the enhancements needed; however, the total cost of this concept is approximately $4M.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to exceed project costs.

Enhance Cross-River Connections

Detailed Project Description

This concept would improve bicycle and pedestrian connections on existing bridges across the Connecticut River. This includes facilities on the Bissell Bridge, Bulkeley Bridge, Founders Bridge, Charter Oak Bridge, and Putnam Bridge. Currently, only the Founders Bridge has facilities that are wide enough to comfortably accommodate both bicycle and pedestrian traffic. The Putnam bridge has a sidewalk that was appended to the bridge in recent years, however that facility is not currently open to pedestrians or bicyclists due to the lack of sidewalk or pathway connections from the bridge to local streets in Wethersfield and Glastonbury. Other bridges including the Bissell, Bulkeley, and Charter Oak Bridge have sidewalks, and both of those sidewalks are relatively narrow and lack amenities such as pedestrian area lighting.

Recommended improvements include the following:

Bissell Bridge: The pedestrian area of the bridge is 8 feet wide; the adjacent road shoulder is 11 feet wide. Expansion of the pedestrian area by 3 or 4 feet would improve the comfort of both bicyclists and pedestrians who share the space. Additionally, the pedestrian area lacks low level lighting for pedestrians. While roadway lighting is provided, the provision of lower level, more closely spaced lighting would improve user comfort.

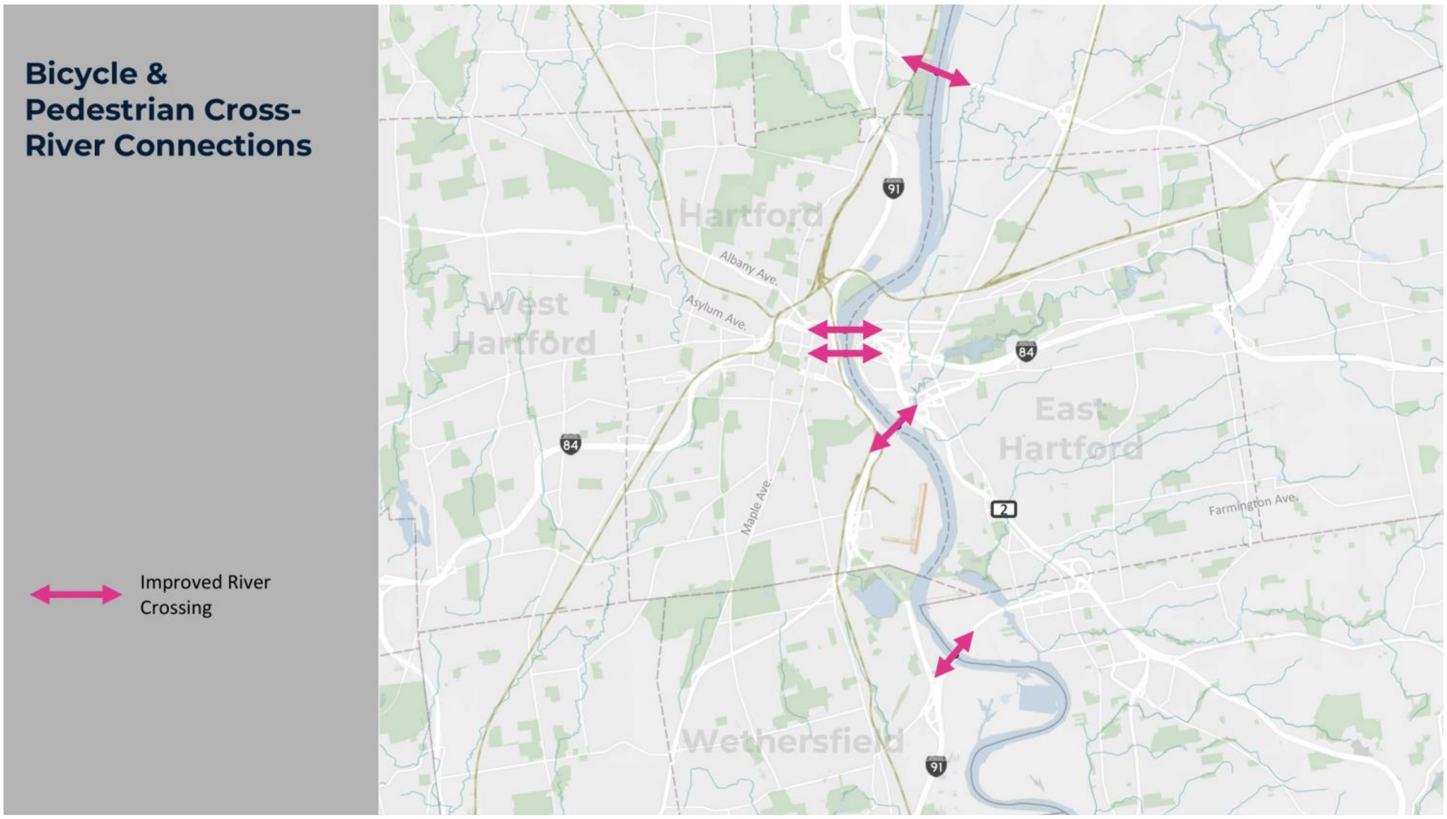
Bulkeley Bridge: The pedestrian area of the bridge is 6 feet wide and lacks low level lighting for pedestrians. This width is prohibitive of bicycling. Roadway lighting is currently provided via posts located within the bridge median. The provision of lower level, more closely spaced lighting would improve user comfort. The approach to the bridge's sidewalk on the Hartford side crosses an I-91 southbound on-ramp and lack a marked crosswalk at that location. A similar condition exists on the East Hartford side where access to Connecticut Boulevard is provided across an I-84 eastbound off-ramp that lacks a marked crosswalk. Because the bridge is a historic structure, it is unlikely that the bridge would be expanded, or additional space appended to the bridge to provide more space for pedestrians and bicyclists. Additionally, the roadway area of the bridge is maximized for traffic and has narrow shoulders that place traffic in close proximity of pedestrians. The pedestrian realm could be expanded if the bridge served local traffic instead of carrying I-84. Lacking that change, the expansion of pedestrian facilities on the bridge is likely not feasible.

Founders Bridge: Pedestrian facilities on the Founders Bridge are wide enough to also accommodate bicycle travel. Bicycle and Pedestrian access to the bridge is good and includes sidewalk, ramps, staircases, and an elevator on the Hartford side. The pedestrian area on the bridge is 20 feet wide and includes river overlook areas for resting. Closely spaced, low level pedestrian lighting is also present on the bridge. While the bridge does not require physical enhancement, because it is the bridge with the best pedestrian facilities in the Downtown area, wayfinding should be provided to direct bicyclists and pedestrians to the bridge.

Charter Oak Bridge: The pedestrian area of the bridge is 8 feet wide; the adjacent road shoulder is 10 feet wide. Expansion of the pedestrian area by 3 or 4 feet would improve the comfort of both bicyclists and pedestrians who share the space. Sidewalks are 8 feet wide and approach the bridge on both the Hartford and East Hartford sides. Sidewalks would need to be expanded to accommodate bicyclists in addition to pedestrians.

Putnam Bridge: The recently constructed pedestrian area of the bridge is 8 feet wide, the adjacent road shoulder is 3 feet wide. Expansion of the pedestrian area by 3 or 4 feet would improve the comfort of both bicyclists and pedestrians who share the space. Expansion may not, however, be feasible as the pedestrian facilities were recently constructed and appended to the bridge. Expansion of the pedestrian area would likely require a complete reconstruction of the pedestrian structure. Sidewalks are 8 feet wide and approach the bridge on both the Wethersfield and Glastonbury sides. Sidewalks would need to be expanded to accommodate bicyclists in addition to pedestrians. The pedestrian area lacks low level lighting for pedestrians. While roadway lighting is provided, the provision of lower level, more closely spaced lighting would improve user comfort. Putnam Bridge Trail Connection project, which provides bicycle and pedestrian facility to the bridge's sidewalk from Wethersfield and Glastonbury is currently under construction by CTDOT. The Putnam Bridge trail connection provides 10 feet wide paved shared use path to accommodate both bicyclists and pedestrians. On the east side in Glastonbury, a 4,000-foot shared use path will connect the Putnam Bridge walkway to local roadways. On the west side in Wethersfield, the trail connection includes a 650-foot ramp that will provide access to the bridge's pedestrian facilities from Great Meadow Road and Exit 25 Off Ramp.

Alternative Map



Implementation Timeframe

Timeframe

Bulkeley and Putnam Bridge improvements can be completed within 4 years, while Bissell and Charter Oak Bridges would require 10+ years and are contingent upon other projects.

Project Development Process

Bulkeley and Putnam Bridge would require design and engineering followed by the construction of the widened pathways and improved lighting conditions.

Other improvements, such as widening of pedestrian areas at the Bissell and Charter Oak Bridges are contingent upon the cost of the projects and the potential to conduct such work along with bridge resurfacing and restoration schedules. The widening of the pedestrian area of the Bulkeley Bridge to accommodate bicycles is contingent upon the relocation of I-84 off of the bridge and the conversion of the bridge to local traffic, which would afford space to pedestrians and bicyclists.

Project Phasing

These alternatives can be completed in phases of independent utility based upon each bridge.

Categorical Exclusion (CE)

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the cross-river connections and enhancing bridge facilities to accommodate bicyclists would be beneficial to both recreational bicyclists and those commuting by bicycle. These improvements would also be beneficial to pedestrians.

Travel Options and End User Convenience - Moderate Benefit

This alternative would improve user comfort of pedestrians and bicyclists and would improve the limited options for crossing the Connecticut River. The provision of wider facilities with safer approaches and better lighting would add to convenience.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

The potential for environmental impacts in disadvantaged communities would outweigh accessibility and mobility improvements within the region.

Safety - Moderate Benefit

This concept would likely provide a moderate safety benefit by improving access and road crossings at existing approaches to bridges.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Moderate Benefit

Depending on the location, the improvement or conversion of a facility could result in minor but mitigable impacts on resources within the project corridor. The alternative may require additional impervious surface and safety lighting. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology beyond pedestrian and bicycle area lighting.

Public Support - Moderate Benefit

There is strong support for this initiative. There is support for the Putnam Bridge trail and complaints that the Charter Oak Bridge project did not include bicycle or pedestrian facilities. There is general support for inclusion of bicycle pedestrian facilities on bridges and exploring options that are pedestrian and/or bicycle only. There was a comment that expressed that North Hartford does not need bike lanes because they are seen as dangerous.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing access across the Connecticut River will improve access to jobs on both sides of the river. This will also expand the workforce available to employers.

Feasibility/Complexity - Neutral

This alternative requires lot to moderate cost improvements that will provide benefit to a relatively small population of users. Improvements are essential for removing barriers for active transportation options across the river.

System Compatibility - High Benefit

This improvement of bicycle and pedestrian facilities on and approaching bridges is complementary with other transportation modes and the system as a whole.

Overall Assessment of Benefits/Impacts

The overall benefit for the bridge improvement concepts would be positive with few impacts other than cost of construction. Operations and maintenance costs are expected to be limited to supplying energy to lighting, and snow and debris removal, much of which is already being conducted. The benefit to cost ratio would be moderate.

Order of Magnitude Cost

Bissell Bridge: The expansion of the pedestrian area on the bridge and the provision of lighting along the 1,800-foot span may cost approximately $900,000 ($500 per linear foot).

Bulkeley Bridge: The expansion of the pedestrian area on the bridge and the provision of lighting along the 1,200-foot span may cost approximately $600,000 ($500 per linear foot).

Founders Bridge: The provision of wayfinding to the bridge could be conducted at a relatively low cost. Sign installation could be conducted within a budget of $20,000.

Charter Oak Bridge: Bissell Bridge: The expansion of the pedestrian area on the bridge and the provision of lighting along the 1,900-foot span may cost approximately $1,450,000 ($500 per linear foot). The expansion of the 1,650 feet of sidewalks approaching the bridge to 10-foot-wide pathways would cost approximately $247,500 ($150,000 per linear foot).

Putnam Bridge: The pathways approaching the bridge is currently under construction by CTDOT. Therefore, no cost estimate is assigned to this concept. The provision of pedestrian lighting on the bridge is estimated to cost $250,000 ($10,000 per fixture, 25 fixtures spaced 100 feet apart).

The total cost of this alternative would be $4M including all preliminary efforts.

High Level Benefit-Cost Outlook

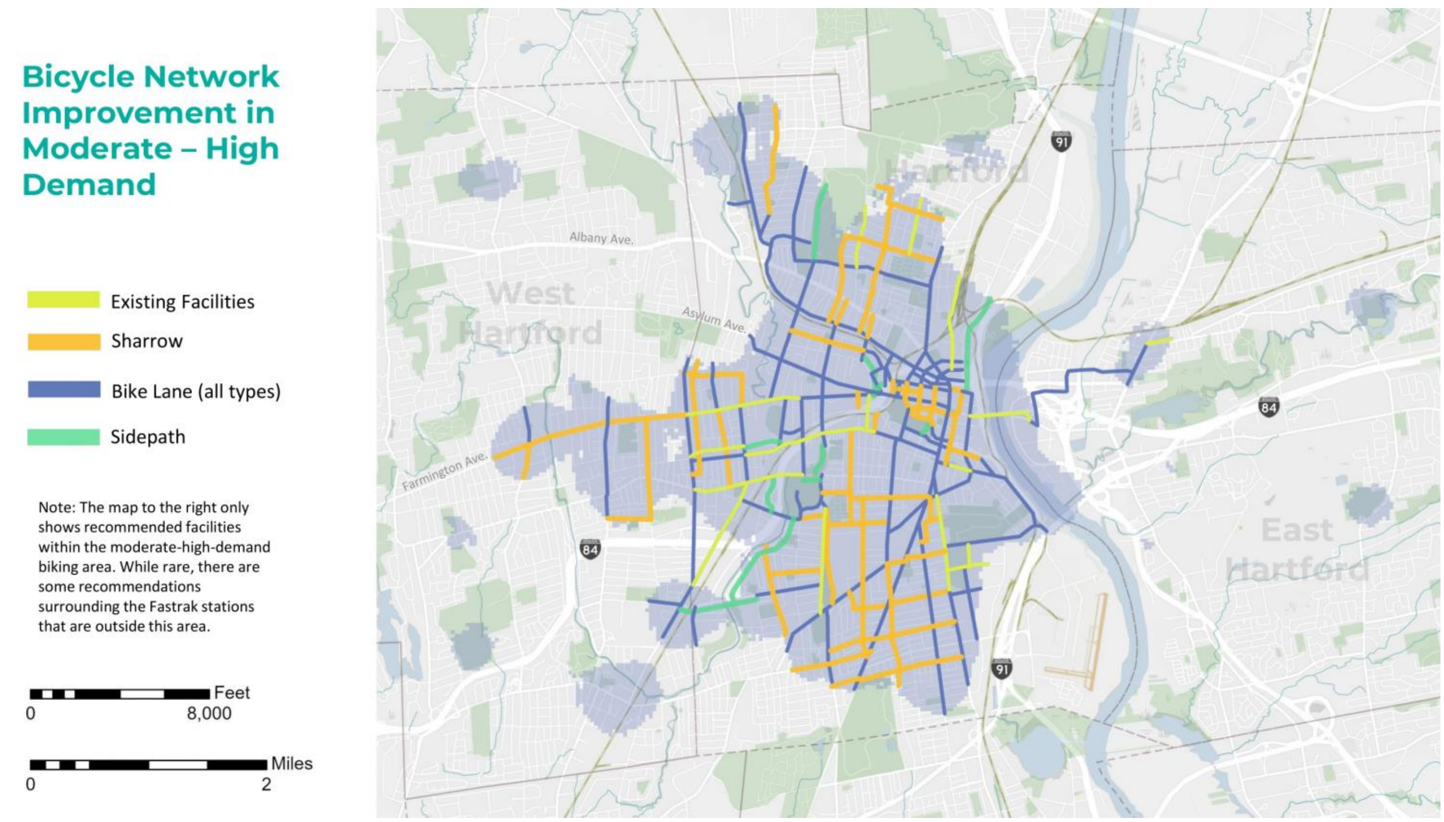
Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be comparable with project costs.

Complete and Improve Bicycle Networks in Moderate and High Demand Areas

Detailed Project Description

The alternative recommends that bicycle networks be built out and improved in high and moderate demand areas such as Downtown Hartford, surrounding neighborhoods, and parts of West Hartford and East Hartford. The purpose of this alternative is to provide facilities to accommodate bicycle trips in areas that have the highest potential demand for trips. This network is built upon West Hartford's and Hartford's bicycle master plans. These recommendations are also consistent with the CRCOG Regional Complete Streets Plan and the State Active Transportation Plan.

Alternative Map



Implementation Timeframe

Timeframe

The installation of bicycle facilities is anticipated to take 5-10 years.

Project Development Process

This alternative requires coordination with roadway improvements scheduling. Design, engineering, and construction can be conducted in tandem with the planned roadway improvements.

Project Phasing

This alternative can be completed in phases of independent utility based upon each roadway segment.

Environmental Review Process

Some segments require a Categorical Exclusion, while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Moderate Benefit

This alternative would not result in a significant change in either travel time or reliability for modes other than bicycle travel.

Access and Connectivity – Moderate Benefit

Improving the last mile connections between transit, residences, schools, institutions, and places of employment would be beneficial to connectivity within the highest demand areas for bicycle trips in the study area.

Travel Options and End User Convenience - High Benefit

This alternative would improve user comfort and will enable bicyclists to travel to multiple destinations along a dedicated bicycle facility. A bicycle facility network encourages bicycling and transit use.

Criteria Supporting Other Study Goals

Equity - High Benefit

There would be no adverse environmental justice impacts, and the improvement of access between residences, places of employment, schools, and other institutions would be advantageous to zero-auto households.

Safety - High Benefit

This concept would likely provide a high safety benefit by providing bicycle facilities that will separate bicyclists from traffic.

Resiliency and Sustainability - Low Benefit

Facilitating a modal shift away from single-occupant vehicles and towards bicycling and transit use is a sustainable improvement.

Environment - Moderate Benefit

Environmental impacts are anticipated to be minor but mitigable. The concept may require the expansion of impervious surface. Adverse impacts of additional impervious surface are offset by the concept supporting alternative modes of transportation. Environmental impacts are anticipated to be minimal and mitigable.

Technology - Neutral

The concept does not employ technology outside of traffic signal improvements, which may be required.

Public Support - Moderate Benefit

Strong support for building bicycle network improvements to spur economic development. Comments suggest that improvements should connect to local commerce, bicycle shops, and other useful amenities. Safety of lanes, such as having raised and parking protected lanes was noted as essential.

There is public support for expanding bicycle accommodations although that support is relatively low with the exception of active bicyclists and advocacy groups.

Overarching Criteria

Economic Opportunity - High Benefit

Enhancing mobility options such as bicycling would be beneficial with respect to providing access to jobs and expanding the labor force that employers would have access to due to expanded mobility options of that workforce.

Feasibility/Complexity - Neutral

This alternative requires extensive improvements with a sizeable share of those improvements located in or adjacent to existing rights-of-way. While the recommendations of this alternative are feasible, the project is complex.

System Compatibility - High Benefit

This alternative would be synergistic with other modalities including transit services.

Overall Assessment of Benefits/Impacts

The overall benefit for this alternative would be positive with few impacts. Initial costs would include pavement expansion, roadway restriping, intersection enhancements, and signage installations. Operations and maintenance are expected to be relatively low cost with routine maintenance such as snow removal occurring as part of routine roadway maintenance. As a result, the benefit to cost ratio would be high.

Order of Magnitude Cost

Proposed bicycle facilities directly contributing to this alternative includes 22 miles of shared roadways, 27 miles of bike lanes, 14.4 miles of buffered bike lanes, 4.8 miles of separated bike lanes, and 6 miles of sidepaths. The approximate cost of shared roadways is $10,000 per mile, which includes pavement markings and signage. The cost of implementing shared roadways in the study area is therefore $220,000. Approximate cost for the construction of the bike lanes is $50,000 per mile which includes pavement markings, signage, and a limited amount of pavement expansion. Based upon this unit price, the installation of bike lanes as recommended in this concept would cost $1,350,000. The approximate cost of buffered bike lanes is $100,000 per mile, with a total estimated cost of $1,440,000. The approximate cost of separated bike lanes is $1,000,000 per mile, hence a total estimated cost of $4,800,000. The approximate cost of sidepaths is $500,000 per mile with a total estimated cost of $3,000,000 for those facilities.

The total cost of providing the bicycle facilities in the high demand area as recommended by this concept is estimated to be $15,000,000. This cost estimate excludes the potential cost of land acquisition that may be required to expand the existing right-of-way to accommodate bicycle facilities if required or if easements cannot be procured.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be in alignment with project costs.

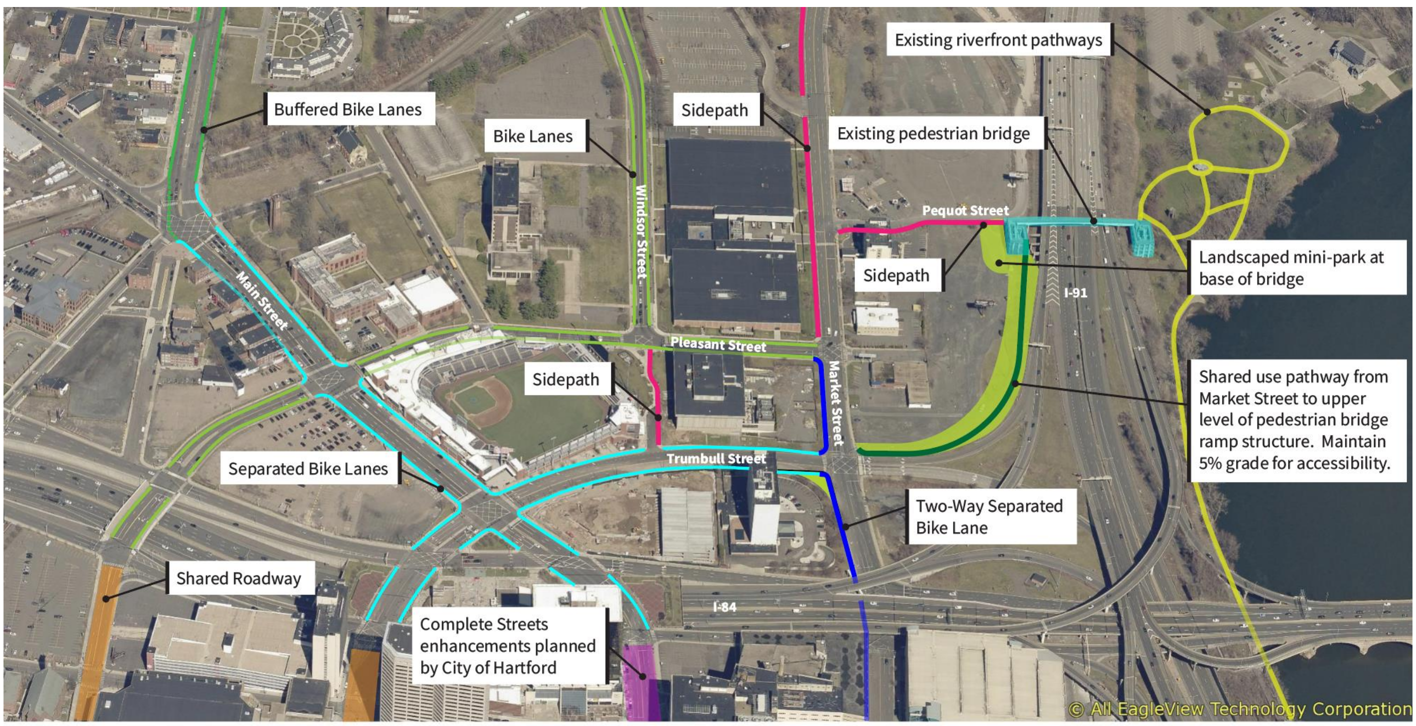
Riverside Park to Downtown North (DoNo) via Riverlink Connection

Detailed Project Description

The project seeks to improve bicycle and pedestrian mobility and connectivity between Downtown Hartford, Downtown North, and the Connecticut riverfront at Riverside Park. The Connecticut Riverfront has limited access from the Downtown North area of Hartford. The existing pedestrian bridge over I-91 is underutilized, the bridge approach is not inviting, and there are no approaching bicycle facilities.

The proposed concepts provide both on-street and off-street bicycle facilities including shared roadways, bike lanes, buffered bike lanes, separated bike lanes, sidepaths, and shared-use pathways. The concept also includes a new connection to the existing pedestrian bridge over I-91 that would provide a gradual ramp along the existing I-91 SB exit ramp that would meet the bridge near the top of the structure. Landscaping enhancements are recommended at the base of the pedestrian bridge on the west side of the highway to improve user comfort and provide a more welcoming approach.

Alternative Map



Connecticut Riverfront Access
Downtown North, Hartford

Implementation Timeframe

Timeframe

The improvement of bicycle and pedestrian connections in this area is expected to be short to mid-term depending on specific elements of the concept. The installation/construction of bicycle facilities is feasible to conduct within a five-year period and may be coordinated with other projects in the area or with pavement restoration projects. The construction of a new approach and ramp to the existing pedestrian bridge or the construction of new bridging connecting to or replacing the bridge is likely to occur over a mid-term (5-10 year) timeframe. Improvements may be made independently.

Project Development Process

This alternative requires coordination with roadway improvements scheduling. Design, engineering, and construction can be conducted in tandem with the planned roadway improvements.

Project Phasing

This alternative can be completed in phases of independent utility based upon each roadway segment.

Environmental Review Process

Some segments require a Categorical Exclusion (CE), while others will require an Environmental Assessment (EA).

Summary of Screening Process

Core Mobility Focus

Travel Time and Reliability – Neutral

This alternative would not result in a significant change in either travel time or reliability.

Access and Connectivity – Moderate Benefit

Improving the cross-highway connections, improving access to the riverfront, and enhancing bridge facilities to accommodate bicyclists would be beneficial to both recreational bicyclists and those commuting by bicycle. Improved access to the existing pedestrian bridge would also be beneficial to pedestrians.

Travel Options and End User Convenience - Moderate Benefit

This alternative would improve user comfort of bicyclists and would enhance the limited options for crossing both I-84 and I-91 in proximity of Hartford's Downtown North.

Criteria Supporting Other Study Goals

Equity - Moderate Benefit

The potential for environmental impacts in disadvantaged communities would outweigh accessibility and mobility improvements within the region.

Safety - Moderate Benefit

This concept would likely provide a moderate safety benefit by improving providing dedicated bicycle facilities and separated bicycle facilities.

Resiliency and Sustainability - Low Benefit

Facilitating non-motorized transportation would support a modal shift away from single-occupant vehicles and towards more sustainable modes of transportation including walking, bicycling, and public transit.

Environment - Neutral

The concept is not expected to result in a positive or negative environmental impact.

Technology - Neutral

The concept does not employ technology other than the need for traffic signal enhancements to accommodate bicyclists at intersections.

Public Support - High Benefit

There is strong support for improving connections between Downtown Hartford and Downtown North and the Connecticut Riverfront. Residential growth in both Downtown Hartford and Downtown North has increased demand for mobility options and improved bicycle infrastructure.

Overarching Criteria

Economic Opportunity - Moderate Benefit

The expansion of mobility options and improvement of access to Downtown Hartford and other employment nodes such as Dunkin Stadium will improve access to jobs and expand the workforce available to employers.

Feasibility/Complexity - Neutral

This alternative requires low to moderate cost improvements that will provide benefit to a relatively small population of users. Improvements are essential for removing barriers for active transportation options across highways in the Downtown Hartford area.

System Compatibility - High Benefit

This provision of bicycle facilities and improved access to existing bicycle and pedestrian facilities is complementary with other transportation modes and the system as a whole.

Overall Assessment of Benefits/Impacts

The overall benefit for the improvements presented in this concept would be positive with few downsides other than cost of construction. Operations and maintenance are expected to be limited to supplying energy to additional lighting that may be needed, and snow and debris removal, much of which is already being conducted. The benefit to cost ratio would be moderate.

Order of Magnitude Cost

The total cost of providing the bicycle facilities recommended by this concept is estimated to be $2,126,000. This cost estimate excludes the potential cost of land acquisition that may be required to expand the existing right-of-way to accommodate bicycle facilities if required or if easements cannot be procured. The concepts may also require infrastructure modifications or enhancements such as curb relocation, drainage structure relocation, traffic signal enhancements, and utility infrastructure relocation that could substantially increase this cost estimate.

The estimated cost of improvements each improvement type is specified below:

Shared Roadways: There are 0.6 miles of shared roadways on Trumbull and Ann Uccello Streets. Pavement marking and signage costs for a shared roadway for these segments is approximately $12,000.

Bike Lanes: There are 0.8 miles of bike lanes on Pleasant and Windsor Streets assuming the Windsor Street bike lane extends north to Canton Street. Typical installation cost is $50,000 per mile thus a cost estimate of $40,000 for the improvements (assuming that installation does not require the modification of curbs or require traffic signal enhancements)

Buffered Bike Lanes: There are 0.4 miles of buffered bike lanes on North Main Street extending to Canton Street. Buffered bike lanes in this area would replace existing parking lanes so no curb modifications would be required. The typical installation cost of the buffered bike lanes in this scenario is $60,000 per mile thus a cost estimate of $24,000 for the improvements.

Separated Bike Lanes: There are 0.6 miles of separated bike lanes on Trumbull Street and Main Street. These improvements require substantial reconstruction of the pedestrian realm of the right-of-way and intersection treatments including signal enhancements. The estimated cost is $1,000,000 per mile hence a cost estimate of $600,000 for the improvements.

Sidepaths: There are 1.1 miles of sidepaths on Market Street, Pequot Street, and on Windsor Street between Pleasant Street and Trumbull Street. Sidepaths would replace existing sidewalks in these areas with an estimated cost of $500,000 per mile hence a cost of $550,000 for the improvements.

Shared-Use Pathway: There are 0.2 miles of shared-use pathway included in this concept that would connect Market Street to the existing pedestrian bridge over I-91. The construction of this pathway would occur within the I-91 right-of-way and would require substantial regrading and improvement of grades to achieve and maintain a 5% grade approaching the pedestrian bridge in order to connect to an elevated section of the structure. Estimated cost of these improvements is $2 million per mile, which is inclusive of regrading and required retaining walls and safety barriers. Total project cost of the pathway is therefore estimated to be $400,000.

Pedestrian Bridge Connections and Enhancements: The new approaches to the existing bridge over I-91will need to be constructed with improved bicycle and ADA access, as well as remediation of the bridge structure, estimated between $20M-$30M.

High Level Benefit-Cost Outlook

Based upon the concept benefits and order of magnitude cost, the concept benefits are expected to be in alignment with project costs.

Route 99 Bike Facilities -Weathersfield

This alternative has been moved to Highway Alternatives under the name Silas Deane Highway (Route 99) Corridor Study, Weathersfield.