Appendix H: Needs Statement

GREATER HARTFORD MOBILITY STUDY

CONNECTICUT DEPARTMENT OF TRANSPORTATION

Purpose

The Needs Statement discusses the needs identified for the overall Study Area and for each Corridor of Significance and identified their alignment with the established study goals. These needs were identified based on the existing conditions assessment completed for the GHMS, feedback received from stakeholders and the general public, and recommendations from relevant previous studies.

Key Components

The Needs Statement focuses on the following topics:

1. Needs Identification Process
2. Summary of Identified Needs from Previous Studies
3. Summary of Public and Stakeholder Input on Transportation System Needs
4. Summary of Needs Identified from Existing Conditions Analysis
5. Overall Study Area Needs Statement
6. Individual Corridor of Significance Needs Statement

TABLE OF CONTENTS

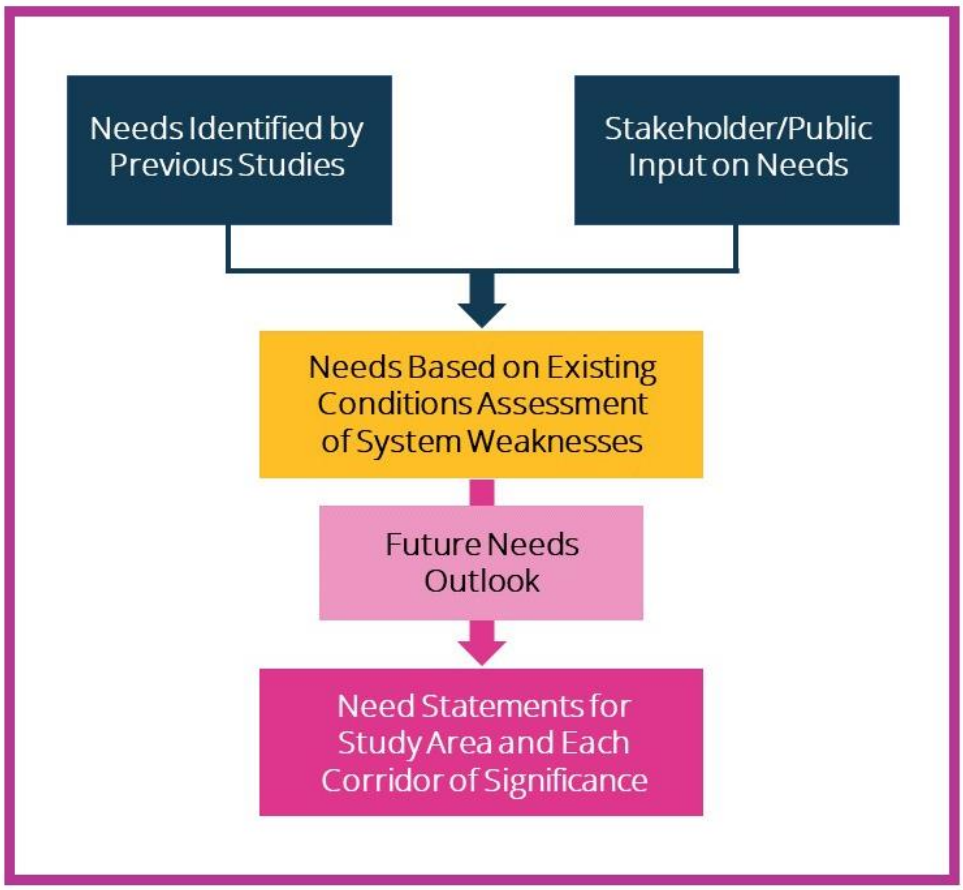
LIST OF FIGURES

Needs Identification Process

The needs identification process considered several aspects and was based on four key components as follows:

1. **Previously identified needs:** GHMS builds upon the extensive planning and engineering work performed to date on multiple initiatives in the region and took into consideration various needs identified through these earlier and/or ongoing work efforts (see Appendix H-1).
2. **Needs assessed based on public input:** The GHMS study team established an interactive website and a collaboration portal to seek input from stakeholders and the general public on transportation issues, needs and potential solutions for the Greater Hartford area (see Appendix H-2).
3. **Needs identified based on existing conditions technical analysis:** The existing conditions assessment conducted as a part of the GHMS was used to identify current multimodal transportation system weaknesses. These weaknesses were then translated into system needs to meet the study vision and goals. These needs were categorized by transportation mode and location (Corridor of Significance) within the Study Area (see Appendix H-3). This assessment also verified the relevance of needs identified from previous studies and input received from the general public based on the current conditions.
4. **Future needs outlook:** One of the GHMS goals focused on accommodating future needs. It is difficult to exactly predict future needs, especially considering the rapid transformations in travel behaviors and choices influenced by the COVID 19 pandemic and uncertainties about the "new normal" in the post-pandemic conditions. A broader outlook for potential future needs was considered based on opportunities for supporting economic vitality of the region and emergence of future transportation technologies.

Figure 1: Needs Identification Process



Study Area Needs Statement

The identified needs for the Study Area were broadly categorized into three key themes of Network, Quality, and Equity, as described below:

1. **Network - deficiencies in the multimodal network:** Needs identified under this theme were mostly focused on identifying physical infrastructure deficiencies and were aligned with the following GHMS study goal:

   Goal 1: Improve the movement of people and goods.

2. **Quality – deficiencies in the quality of user experience:** Needs identified under this theme were mostly focused on identifying issues with the quality of service provided to users of the multimodal transportation system. These needs were aligned with the following GHMS goals:

   Goal 2: Increase the transportation options, accessibility, reliability, and safety.

   Goal 3: Accommodate future needs and emerging technologies.

3. **Equity - lack of equity:** Needs identified under this theme were mostly focused on achieving social equity by making active transportation and public transportation options more competitive for local trips to reduce reliance on auto travel. The needs were aligned with the following GHMS goal:

   Goal 4: Prioritize social equity.

The fifth and equally important goal of the GHMS is to minimize environmental impacts. An overarching emphasis was given to achieve this fifth study goal as transportation solutions were identified to address needs belonging to these three themes.

The following section outlines identified needs in the overall study area by theme. It should be noted that some needs aligned with more than one theme and have been cross-referenced accordingly:

Multimodal Network Needs – Contributing Factors

- Roadway geometry and aging infrastructure that do not meet current standards, contribute to congestion issues and cause operational constraints (also belongs to the "Quality" theme)
- Traffic congestion in the Study Core
- Traffic flow throughout the Study Area is constrained by a lack of network redundancy and several bottlenecks where demand exceeds capacity
- Economic development opportunities in the Study Area are limited by lack of mobility and access to employment centers
- Bus travel is not competitive with other modes (also belongs to the "Equity" theme)
- Rail travel is not competitive with other modes (also belongs to the "Equity" theme)
- Active transportation mode networks are incomplete and lack access to key transit nodes (also belongs to "Quality" and "Equity" themes)
- Lack of east-west connections across the Connecticut River and the Study Core
- Safe and convenient options for truck parking is desired by freight providers (also belongs to the "Quality" theme)
- Lack of focus on maximizing use of non-highway freight modes (rail, barge, air/intermodal)
- There are numerous gaps in the multimodal transportation network
- Concerns with infrastructure resiliency (also belongs to the "Quality" theme)

Quality of User Experience Needs – Contributing Factors

- Lack of system redundancy (lack of alternate routes) limits choices for users (also belongs to the "Network" theme)
- Limited implementation of Transportation Demand Management strategies results in demand exceeding capacity (also belongs to "Network" theme)
- Speeding issues along certain corridors due to lack of traffic calming measures
- Frequency and/or span of service for bus and rail transit is insufficient for mode competitiveness and quality of service
- Station/stop amenities are not attractive to customers and have maintenance issues (also belongs to the "Network" theme)
- Deficiencies in multimodal connectivity and accessibility
- Lack of a comprehensive plan to accommodate emerging technologies such as connected and automated vehicles, real-time traffic/transit updates, app-based transportation interfaces, automated freight delivery options and others
- Transportation facilities are lacking resiliency to potential impacts of climate change
- Active transportation facilities do not consistently meet current safety standards

Equity Needs – Contributing Factors

- Non-auto modes are underutilized as sustainable transportation options to address climate change and resiliency challenges
- Lack of access for some populations creating inequitable barriers to jobs, amenities, and transportation options (also belongs to "Quality" theme)

Figure 2: Pavement Marking for Bike Lane

Individual Corridor of Significance Needs Statements

The needs identification process also defined multimodal needs by Corridor of Significance within the Study Area. Of the three themes (Network, Quality and Equity) discussed earlier, needs related to ensuring equity in transportation were universal to the overall Study Area as well as all Corridors of Significance and are described in the Section 5.1 below. Needs related to Network and Quality were more specific to the individual Corridors of Significance and are highlighted in the sub-sections (Section 5.2 through 5.8) for each corridor.

Figure 3: Word Cloud of Corridor Needs

Universal Equity Needs

Ensuring equity in transportation is a priority at the state and federal levels. At the state level, CTDOT understands that equity is key to building a healthy and viable transportation network. It is fully committed to ensuring that its policies, plans, projects, and public engagement processes are inclusive and promote equity and inclusion. At the federal level, USDOT is undertaking a comprehensive approach to advance racial equity for all, including individuals who have been historically underserved and adversely affected by persistent poverty, income inequality or transportation decision-making.

The lack of equity in transportation is highlighted by limitations in transportation access and mobility options available to specific users and demographic groups. Disadvantaged and low-income populations are not served well by a highway-focused approach to transportation, as these populations exhibit lower rates of access to motor vehicles. This population is most affected when non-auto modes lack availability, frequency, time of service and geographic reach. Competitive rail, bus, and bike networks can eliminate barriers to competitive jobs and affordable housing, and spur new local development, particularly in areas currently underserved by these modes.

Equity

- Inadequate competitiveness of public transit (bus, rail) and bicycle/pedestrian modes, particularly for certain populations
- Overdependency on the personal vehicle that is reinforced by existing land use
- Transportation infrastructure rehabilitation, relocation and replacement projects often do not consider potential for economic development

Study Core

Highway modal needs highlight key congestion hotspots for freight and passenger vehicles along major corridors, local connections and access across the Connecticut River, and geometric deficiencies.

Multimodal needs focus on rail and transit infrastructure and service, station and stop facilities, better accommodation and provision of bicycle/trail facilities and micro-mobility considerations to access key transit hubs and nodes.

Other needs focus on promoting economic development and quality of life through improved access to the Connecticut River, continued promotion of active transportation options within the Study Core and consideration of transportation policies focused on reducing auto dependency.

Network

- Limited number of east-west connections across the Connecticut River
- Significant congestion on major thoroughfares, especially in peak hours
- Geometric deficiencies on the highway network that contribute to poor operations and elevated crash rates
- Limited local street network redundancy
- Lack of station amenities and bicycle access to key transit nodes
- Key components of the rail and highway infrastructure network are structurally deficient and in need of rehabilitation or replacement
- Lack of multimodal network redundancy
- Rail and highway infrastructure is vulnerable to flood events

Quality

- Access to the Connecticut River is limited due to transportation and flood control infrastructure obstructions
- Bus transit and rail modes are uncompetitive with the personal vehicle
- Mobility-as-a-Service (MaaS) lacks cohesion
- Emerging technologies will likely alter dynamics of transportation and are not being addressed holistically
- Lack of bicycle infrastructure inhibits safety and comfort for bicyclists

Northwestern Corridor of Significance

Needs for this corridor focused on Network and Quality themes are identified below.

Network

- Lack of network redundancy or bypass increases the traffic burden on the study core
- Limited east-west redundancy results in increased congestion on key corridors, Routes 4 and 44 in particular
- Gaps in the multimodal transportation network including active transportation modes
- Absence of network redundancy across the Metacomet Ridge

Quality

- Emerging technologies will likely alter the dynamics of transportation and are not being addressed holistically
- Lack of multimodal connections to offer transportation options other than the personal vehicle
- Limited evening service, frequency, duration of service and service areas limits the ability of transit to serve employment and residential centers
- Lack of bus stop amenities

Northern Corridor of Significance

Needs for this corridor focused on Network and Quality themes are identified below.

Network

- Shortage of safe and convenient options for truck parking
- Congestion hotspots along I-91
- Lack of directional connectivity at the I-91 interchange with Day Hill Road
- Limited bicycle/pedestrian network
- Shortage of station amenities and dearth of bicyle access to key transit nodes
- Multimodal access to Bradley International Airport is limited in its reach and effectiveness
- Rail infrastructure deficiencies that prevent the Hartford Line service from meeting its operational goals

Quality

- Emerging technologies will likely alter the dynamics of transportation and are not being addressed holistically
- Scarcity of pedestrian and bicycle infrastructure inhibits safety and comfort for bicyclists and pedestrians
- Limited evening service, frequency, duration of service and service areas limits the ability of transit to serve employment and residential centers
- Lack of bus stop amenities
- Mobility-as-a-Service (MaaS) lacks cohesion

Northeastern Corridor of Significance

Needs for this corridor focused on Network and Quality themes are identified below.

Network

- Short weave length contributes to congestion on I-84 eastbound between Interchanges 63 and 64
- Shortage of safe and convenient options for truck parking
- Lack of a cohesive bicycle/pedestrian network

Quality

- Emerging technologies will likely alter the dynamics of transportation and are not being addressed holistically
- Poor bus travel time competitiveness when compared with personal vehicles
- Limited evening service, frequency, duration of service and service areas limits the ability of transit to serve employment and residential centers
- Lack of bus stop amenities

Southeastern Corridor of Significance

Needs for this corridor focused on Network and Quality themes are identified below.

Network

- Short distances between Route 2 interchanges lead to peak hour congestion and elevated crash rates
- Geometric deficiencies on Route 2 in the vicinity of the Route 17 interchange
- Lack of a cohesive bicycle/pedestrian network
- Putnam Bridge is nearing the end of its service life and is in need of a long term replacement or rehabiliation strategy

Quality

- Emerging technologies will likely alter the dynamics of transportation and are not being addressed holistically
- Limited evening service, frequency, duration of service and service areas limits the ability of transit to serve employment and residential centers
- Lack of bus stop amenities
- Mobility-as-a-Service (MaaS) lacks cohesion

Southern Corridor of Significance

Needs for this corridor focused on Network and Quality themes are identified below.

Network

- Demand overwhelming current available capacity on I-91 southbound contributes to congestion
- Shortage of safe and convenient options for truck parking
- Insufficient network redundancy created by incomplete system interchanges or interchanges between freeways and principal arterials
- Lack of a cohesive bicycle/pedestrian network
- Inconsistent station amenities and bicycle/pedestrian access to key transit nodes
- Rail infrastructure deficiencies that prevent the Hartford Line service from meeting its operational goals

Quality

- Emerging technologies will likely alter the dynamics of transportation and are not being addressed holistically
- Limited evening service, frequency, duration of service and service areas limits the ability of transit to serve employment and residential centers
- Lack of bus stop amenities

Southwestern Corridor of Significance

Needs for this corridor focused on Network and Quality themes are identified below.

Network

- I-84 interchanges with Park Road/Trout Brook and Routes 4, 6, and 9 are incomplete and lack lane balance and continuity, negatively affecting safety and operations
- Limited east-west local street network redundancy
- Shortage of safe and convenient options for truck parking
- Lack of bicycle/pedestrian access to key transit nodes
- Lack of a cohesive bicycle/pedestrian network

Quality

- Emerging technologies will likely alter the dynamics of transportation and are not being addressed holistically
- Limited evening service, frequency, duration of service and service areas limits the ability of transit to serve employment and residential centers
- Lack of bus stop amenities
- Mobility-as-a-Service (MaaS) lacks cohesion

Next Steps

The study team then identified a Universe of Alternatives to address the identified needs for the Study Area as well as each individual Corridor of Significance. The Universe of Alternatives includes:

- Improvements recommended by prior studies;
- Improvement concepts recommended by various entities;
- Improvement concepts identified by the Study Team; and
- Improvement ideas received from the general public and other stakeholders.

Based on the study vision and goals, the study team established high-level screening criteria to screen the identified Universe of Alternative for potential critical flaws. The alternatives retained through this critical flaw screening advanced to the Phase 2 of GHMS for detailed alternatives evaluation, transportation program development and implementation planning using performance-based planning and programming approach.

Appendix H-1: Summary of Identified Needs/Relevance to GHMS Based on Previous Studies' Review

Summaries of Previous Studies

Study Primary Focus	Public / Stakeholder Involvement?	Local Agency Coordination?	Resource Agency Coordination?	Relevance to GHMS / Need Identification
Multimodal				
M01 - CRCOG Metropolitan Transportation Plan (MTP)	Yes	Yes	Yes	Provides regional planning context for GHMS Recommendations related to transit priority corridors, Bradley Airport access, new Hartford Line rail station Guidance on integration of all modes Considerations of new technologies and innovations to address congestion issues
M02 - I-84 Hartford - Multimodal Station Plan	Yes	Yes	Yes	Multimodal station/hub focus as critical element in pursuing better mobiity for all modes
M03 - CT2030 Plan	Unknown	Unknown	Unknown	10-year vision to upgrade transportation facilities Identifies deficient corridors and transit related upgrades in the GHMS study area
M04 - Let's Go CT Plan	Yes	Yes	Unknown	Identifies deficient corridors and transit related upgrades in the GHMS study area
Traffic/Highway/Bridge				
HT01 - I-84 Hartford Project (Viaduct)	Yes	Yes	Yes	Preferred alternative to be considered as a part of the overarching GHMS study Consider required rail viaduct improvements as a part of GHMS study
HT02 - I-84 Hartford Capitol Gateway Plan	Yes	Yes	No	Considerations for relocation/reconstruction of Union Station, rail/bus services and I-84 improvements
HT03 - CRCOG I-84 Viaduct Hub Study	Yes	Yes	No	Predecessor to I-84 Viaduct Study and provides planning context
HT04 - I-84/I-91 Interchange Study	Yes	Yes	Yes	Key role of I-84/I-91 interchange in region's mobility considerations; potential improvement opportunities
HT05 - I-84 Corridor Congestion Relief Study	Yes	Yes	Yes	Assess potential for introducing toll revenue stream to fund multimodal improvement projects
HT06 - Silver Lane Corridor Study	Yes	Yes	No	Improve multimodal connectivity in East Hartford
				Eliminate gap in the East Coast Greenway within the study area
HT07 - CT State Freight Plan	Yes	Yes	Unknown	Focus on priority freight corridors and mobility considerations
HT08 - CT River Flood Control	N/A	N/A	N/A	Potential seepage in the area of I-84/I91 interchange and resiliency considerations
HT09 - Other Relevant CTDOT Initiates	N/A	N/A	N/A	For consideration in GHMS technical analyses
HT10 - Route 5 (East Windsor) Corridor Study	Yes	Yes	No	Parallel corridor to GHMS primary corridor; acts as a bypass during incidents/congestion on I-91
HT11 - CT Statewide Rest Area and Service Plaza Study	Yes	Yes	Yes	Safety issue - truck parking on shoulders within GHMS study area, parking management
Rail				
R01 - I-84 Hartford Project - Basis of Design Plans and Track Schematic	Yes	Yes	Yes	Potential relocation of railroad alignment and its impacts on access, circulation and mobility
R02 - CT State Rail Plan	Limited	Yes	Yes	Ensure goals and objectives consistency
R03 - Hartford Rail Alternatives Analysis	Unknown	Unknown	Yes	Importance of integration of the rail viaduct project with the prior I-84 Hartford project
R04 - New Heaven Line Capacity and Speed Analysis Draft Report	Yes	Yes	No	Service enhancement recommendations on the Hartford Line
R05 - Efforts to Convert Griffin Line to BRT/LRT	No	Limited	No	Connectivity to the airport from Hartford Line
Bus				
B01 - Ctfastrak East	Yes	Yes	No	Expand transit options east of Connecticut River Enhance local bus service in East Hartford Provide transit service for Buckland Hills commercial area
B02 - CRCOG Comprehensive Transit Service Analysis	Yes	Yes	No	Public transit service improvement opportunities
B03 - GHTD Union Station Master Plan	Yes	Yes	No	Enmphasis on center-based development and transit service improvements Improve and promote multimodal connectivity at this key transportation hub Understand implications for modified pedestrian flows and multimodal circulation
B04 - NW Corridor Study (All 3 Parts)	Yes	Yes	No	Encourage mode shift to reduce congestion on key highways
				Focus on key trip generators and/or attractors
				Improve multimodal mobility
				Improve Union Station as primary hub of intermodal travel and TOD development
B05 - Downtown Hartford Transit Circulation and Through Routing Study	Yes	Yes	No	Consolidate bus service within downtown Hartford Improve Union Station as primary hub of intermodal travel
B06 - CRCOG Transportation Safety and Improvement Study - Uconn Hartford	Yes	Yes	No	Identify opportunities for incorporating UConn related recommended imrovements
B07 - Bradley Airport Master Plan	Yes	Yes	No	Improve accessibility
B08 - Silver Lane Corridor Study	No	Yes	Yes	Multimodal connectivity and mobility improvements for key corridor in the City of Hartford
B09 - CRCOG's Transit Priority Corridor Implementation Strategy	No	Yes	Yes	Transit priority implementation opportunities along six key transit corridors in City of Hartford
Bike/Ped/Complete Streets				
BP01 - City of Hartford Bicycle Master Plan	Yes	Yes	No	Enhance bicycle facilities within the City of Hartford
BP02 - CRCOG Capitol Region Complete Streets Plan	Yes	Yes	No	Establish typical complete streets treatments
				Prioratize corridors for complete streets improvements
BP03 - Connecticut Active Transportation Plan	Yes	Yes	Yes	Framework for provision of active transportation
BP04 - East Coast Greenway Study	N/A	N/A	N/A	Recommendation for off-street ECG route within GHMS study area
BP05 - Hartford Parking Study	Yes	Yes	No	Recommendations for downtown Hartford parking
BP06 - East Hartford Main Street Road Safety Audit	Yes	Yes	Yes	Address bicycle pedestrian safety and access issues in GHMS study area
BP07 - City of Hartford - Re-imagining Main Street	No	Yes	Yes	Recommendations for Hartford Main Street redesign

Summaries of Previous Studies (continued)

Study Primary Focus	Public / Stakeholder Involvement?	Local Agency Coordination?	Resource Agency Coordination?	Relevance to GHMS / Need Identification
Environmental / Land Use				
E01 - CRCOG Regional POCD	Limited	Yes	Yes	More housing and transportation choices, closer to jobs Economic development - revitalize Hartford as core of the region Improve inter-regional and interstate transportation
E02 - Capitol Region Green Clearinghouse	Limited	Yes	Yes	Promote multi-modal access and mobility
E03 - CRCOG Building Corridors of Opportunity - Best Practices	Yes	Yes	Yes	Promote better access, mobility, and smart growth principles
E04 - CRCOG Metro Hartford Future	Yes	No	No	Promote better access, mobility, and smart growth principles
E05 - CRCOG Metro Hartford Comprehensive Economic Development Strategy	Yes	Yes	No	Access and mobility vital to economic development Supports multi-modal transportation investments
E06 - Capitol Region Natural Hazard Mitigation Plan Update	Yes	Yes	Yes	Improve resiliency for transportation infrastructure
E07 - Connecticut Riverfront Recapture	N/A	N/A	N/A	Provide multi-modal access to Hartford and East Hartford riverfronts
E08 -East Harford POCD	Yes	Yes	No	More housing and transportation choices, closer to jobs
				Mixed use development for economic vitality
E09 -West Harford POCD	Yes	Yes	No	Promote complete Streets Improve multi-modal access and mobility
E10 - Harford POCD / Hartford 400	Yes	Yes	No	Improve multi-modal accessibility and connectivity
				Reduce congestion
				Invest in bike infrastructure and public spaces
E11 -Wethersfield POCD	Yes	Yes	No	Desire for more walkable community
E12 -Bloomfield POCD	Yes	Yes	No	Support public transportation and rail improvements
				Support traffic calming with complete streets principles
E13 - Windsor POCD	Yes	Yes	No	Expand public transit options (new rail station, bus service improvements etc. Integrate transportation modes
E14 - NEC Future	Yes	Yes	Yes	Improve connectivity between intercity and regional rail service
				CRCOG and PVPC requested to consider inland routes and high speed rail connection

Appendix H-2: Summary of Public Input on Transportation System Improvements to Address Needs

Top Transportation Priorities: Public Feedback

Transportation Priority Focus	Public Response Count	% of Overall Responses
Safety	68	63.0%
Walking	68	63.0%
Access to Employment	65	60.2%
Public Transit	64	59.3%
Bicycling	63	58.3%
Hartford Line	63	58.3%
Travel Time	59	54.6%
Congestion	55	50.9%
Amtrak	52	48.1%
Travel Options	51	47.2%
Connections to Bradley Airport	50	46.3%
Buses	48	44.4%
Future Transportation Technology	48	44.4%

Source: GHMS Collaboration Portal Public Feedback on www.hartfordmobility.com (as of Aug 24, 2021)

Feedback from Public - Corridor of Significance: Study Core

Public Comment / Feedback	Corridor of Significance	Mode	Aligns with Need(s) Identified Based on Existing Condition Assessment and/or Future Needs Outlook?
Add some limited Hartford stops to the 55x route	Core	Bus	Yes
Make buses faster and more convenient by adding dedicated lanes, more shelters, and signal priority	Core	Bus	Yes
Eliminate 3 lanes eastbound. Convert 3rd lane to a bus lane.	Core	Bus	Yes
Consider a point to point transit system instead of a hub and spoke.	Core	Bus	Yes
Consider making Tolland Street part of CTFastrak.	Core	Bus	Yes
Consider adding a CTFastrak route from Wethersfield Ave to the Silas Deane Hwy.	Core	Bus	Yes
Have express bus 55X run all day.	Core	Bus	Yes
Consider a trackless tram for Farmington ave. between West Hartford Center and Downtown Hartford.	Core	Bus	Yes
Consider a "trackless tram" for Silas Deane Highway/Wethersfield Ave. from Townline Road to Downtown Hartford.	Core	Bus	Yes
Consider a trackless tram from Farmington Ave to WH Center to Downtown Hartford.	Core	Bus	Yes
Consider a trackless tram from New Britain Ave to Washington Street.	Core	Bus	Yes
Consider a trackelss tram from Maple Avenue.	Core	Bus	Yes
Make bicycling safer in the city	Core	Bicycle/Ped	Yes
Make bicycling safer. Especially in WeHa along Quaker, Flatbush, Hillside and Park St	Core	Bicycle/Ped	Yes
Improve bike and bus routes in Downtown Hartford near the Colt Building.	Core	Bicycle/Ped	Yes
Improve bike facilities and pedestrian walkways from the West End to Downtown Hartford	Core	Bicycle/Ped	Yes
Consider safer bike route between West Hartford Center and Downtown Hartford.	Core	Bicycle/Ped	Yes
Continue riverfront trails to Glastonbury Boathouse.	Core	Bicycle/Ped	Yes
Build more bike/ped transit bridges.	Core	Bicycle/Ped	Yes
Consider switching bike lanes & off street parking to provide a buffer from traffic. Paint bike lanes so they stand out	Core	Bicycle/Ped	Yes
Improve access to park by adding bike/ped trail.	Core	Bicycle/Ped	Yes
Consider adding walking and bike paths along river.	Core	Bicycle/Ped	Yes
Improve walk connections to Dunkin Ballpark and Riverfront	Core	Bicycle/Ped	Yes
Morgan Street under I-84 needs to accommodate pedestrians	Core	Bicycle/Ped	Yes
Fix poor sidewalk segment on Albany Avenue near senior center	Core	Bicycle/Ped	Yes
Maintain sidewalks by the Broad Street area that connects Capital & Farmington Ave.	Core	Bicycle/Ped	Yes
Consider widening sidewalks and make sidewalks ADA compliant on Broad Street.	Core	Bicycle/Ped	Yes
Law enforcement should use caution at this intersection as there is heavy pedestrian traffic and children.	Core	Bicycle/Ped	Yes
In addition to riverfront development build a new pedestrian bridge.	Core	Bicycle/Ped	Yes
Would like to connect easier on the sidewalk of the Buckley Bridge.	Core	Bicycle/Ped	Yes
Reconsider design of pedestrian bridge overpass over I 91.	Core	Bicycle/Ped	Yes
Consider a path through Hartford HS and Warrenton Ave.	Core	Bicycle/Ped	Yes
Consider adding a pedestrian trail along the river by Brainard Airport	Core	Bicycle/Ped	Yes
Install a sidewalk from Jordan Lane to Silas Deane Hwy.	Core	Bicycle/Ped	Yes

Feedback from Public - Corridor of Significance: Study Core (Continued)

Public Comment / Feedback	Corridor of Significance	Mode	Aligns with Need(s) Identified Based on Existing Condition Assessment and/or Future Needs Outlook?
Calm fast traffic	Core	Auto/Highway	Yes
Increase I-84 eastbound and westbound through Hartford from 2 to 4 lanes	Core	Auto/Highway	Yes
Fix lane drops in I-84 in/out of Hartford	Core	Auto/Highway	Yes
Address congestion from downtown to the north end during rush hour	Core	Auto/Highway	Yes
Reduce side street access along Albany Ave in WeHa to improve speed and capacity	Core	Auto/Highway	Yes
Fix congestion points at I-91 N/I-84 merge and I-91 exits to HFD	Core	Auto/Highway	Yes
Reconstruct the I-84/I-91 Interchange and reconstruct I-84 through Hartford and reconstruct the I-84/Route 2 "East	Core	Auto/Highway	Yes
Consider a beltway highway around the City of Hartford	Core	Auto/Highway	Yes
Consider restoring brownstone bridge to its original form. Make the bridge local traffic only. Add bike lanes and pedestrian	Core	Auto/Highway	Yes
Address congestion and improve lane changes on I-84, I-91, and in Downtown Hartford. Especially, the Sisson Street exit.	Core	Auto/Highway	Yes
Improve traffic flow where Farmington Avenue and Asylum Street connect. Make access to the train and bus station easier.	Core	Auto/Highway	Yes
Consider returning the Bulkeley Bridge to Connecticut Boulevard. Reconnect East Hartford with Downtown Hartford.	Core	Auto/Highway	Yes
Consider congestion of I-84 interchange going North and I 291.	Core	Auto/Highway	Yes
Redesign thru traffic lanes to eleviate 91 SB congestion.	Core	Auto/Highway	Yes
Consider adding an alternative route to south meadows.	Core	Auto/Highway	Yes
Make it possible to go Northbound onto Wethersfield Ave from route 5 & 15 exit ramp.	Core	Auto/Highway	Yes
Eliminate 4 way signals in Downtown Hartford.	Core	Auto/Highway	Yes
Build local bridge from Airport Road in Hart to Brewer Street in E Hart	Core	Auto/Highway	Yes
Consider adding train and CTfastrak service to Bradley Airport.	Core	Auto/Highway	Yes
Provide more capacity for trucks, especially at the I-84/I-91 interchange	Core	Auto/Highway	Yes

Feedback from Public - Corridor of Significance: Northwest

Public Comment / Feedback	Corridor of Significance	Mode	Aligns with Need(s) Identified Based on Existing Condition Assessment and/or Future Needs Outlook?
Provide dedicated bike lane from WHC to Capitol/Bushnell Park	NW	Bicycle/Ped	Yes
Make bike connections along Farmington Ave into Hartford less scary	NW	Bicycle/Ped	Yes
Add bike lane or parallel trail to Route 44	NW	Bicycle/Ped	Yes
Provide protected bike facilities from WeHa to Hart	NW	Bicycle/Ped	Yes
Connect Central NE Rail trail to Farmington Trail.	NW	Bicycle/Ped	Yes
Would like to see grant money for bike paths be regional and not allocated town by town.	NW	Bicycle/Ped	Yes
Reconsider design from West Hartford Center to Capital Ave for bike safety.	NW	Bicycle/Ped	Yes
Provide a bus only lane along Farmington Avenue	NW	Bus	Yes
Build Route 9 through Bloomfield	NW	Auto/Highway	Yes
Calm traffic speed on Route 44	NW	Auto/Highway	Yes
Fix Albany Ave intersections near Hart/WeHa line	NW	Auto/Highway	Yes
Install clearer signage to city streets (from I-84) when travelling into Hartford	NW	Auto/Highway	Yes
Consider improving traffic on Route 4 in Farmington (traveling to and from Hartford)	NW	Auto/Highway	Yes
Address congestion issues on Rt.4, Rt. 10, and 4. Consider lowering speed in this area.	NW	Auto/Highway	Yes
Reevaluate traffic congestion over Talcott Mountain.	NW	Auto/Highway	Yes
Consider adding sidewalks by bus stops.	NW	Bicycle/Ped	Yes

Feedback from Public - Corridor of Significance: North

Public Comment / Feedback	Corridor of Significance	Mode	Aligns with Need(s) Identified Based on Existing Condition Assessment and/or Future Needs Outlook?
Add signage for the bike path In East Hartford.	N	Bicycle/Ped	Yes
Add a definied bike path on Rt. 5 in East Hartford.	N	Bicycle/Ped	Yes
Improve and extend the bike path from Windsor to Hartford.	N	Bicycle/Ped	Yes
Consider adding a "rail trail" style multi-use path from Windsor Center to Downtown Hartford along the CT River	N	Bicycle/Ped	Yes
Consider turning the riverfront into a long park with a multi-use path and business development opportunities.	N	Bicycle/Ped	Yes
State roads are the shortest distance, but there is little to no protection from cars driving from 40-60 miles an hour	N	Bicycle/Ped	Yes
Provide BRT service along I-91 north of Hartford	N	Bus	Yes
Provide better bus connection to Bradley. Integrate with Windsor Locks Station	N	Bus	Yes
Provide later buses (6:30 or 7:00) leaving Hartford	N	Bus	Yes
Increase bus service in towns to major hubs.	N	Bus	Yes
Should have additional outbound bus that run later than 5:30, perhaps one 7:30 pm Bus.	N	Bus	Yes
Consider reducing congestion on 91/84 through Hartford.	N	Auto/Highway	Yes
Consider adding an alternate route between West Hartford to Windsor that does not have many traffic lights.	N	Auto/Highway	Yes
Increase frequency and duration of train service from Windsor Locks Station to Hartford. Especially during events	N	Auto/Highway	Yes
Extend Ct Rail to Worchester	N	Auto/Highway	Yes
Consider direct train connection from South Windsor and East Windsor to Worcester.	N	Auto/Highway	Yes
Restrict truck access on Chapel Road between Rt. 5 and Tolland Tpke. Encourage trucks to use 291, as Chapel Street is a signed bike lane road.	N	Auto/Highway	Yes

Feedback from Public - Corridor of Significance: Northeast

Public Comment / Feedback	Corridor of Significance	Mode	Aligns with Need(s) Identified Based on Existing Condition Assessment and/or Future Needs Outlook?
Improve bike facilities in the Manchester area	NE	Bicycle/Ped	Yes
Increase bike facilities near Manchester Community College.	NE	Bicycle/Ped	Yes
Consider paving the rail trail in Bolton. Consider connecting the trail to Rhode Island for the East Coast Greenway.	NE	Bicycle/Ped	Yes
Bring Fastrak service to Downtown Manchester.	NE	Bus	Yes
Better bus schedules starting from east of Main St and Middle Turnpike in Manchester to Constitution Plaza and from State House Sq to Asylum Ave just west of Union Station.	NE	Bus	Yes
Reevaluate frequency of buses from Manchester to Hartford.	NE	Bus	Yes
Ease congestion on I-84 east from exit 50 on.	NE	Auto/Highway	Yes
Consider adding sidewalks in East Hartford. Make sidewalks ADA compliant on Silver Lane and Spencer Street. Improve I-84 on ramps and off ramps in East Hartford and near the Buckland Hills Mall area.	NE	Bicycle/Ped	Yes
Add more sidewalks in Manchester near Buckland Hills.	NE	Bicycle/Ped	Yes
Increase train service to Hartford, New Haven, and Boston.	NE	Auto/Highway	Yes

Feedback from Public - Corridor of Significance: Southeast

Public Comment / Feedback	Corridor of Significance	Mode	Aligns with Need(s) Identified Based on Existing Condition Assessment and/or Future Needs Outlook?
Would like a bike connection between Marlborough and Glastonbury.	SE	Bicycle/Ped	Yes
Consider using money to open Putnam Bridge pedestrian/bike lane.	SE	Bicycle/Ped	Yes
Provide more public transit options into the city	SE	Bus	Yes
Improve frequency of bus service	SE	Bus	Yes
Adress PM peak congestion along Route 2 approaching Rt2/3 interchange.	SE	Auto/Highway	Yes
Fix congestion on Route 2 EB that slows due to Route 17 traffic	SE	Auto/Highway	Yes
Lengthen the Route 2 bridge over Griswold Street to allow for a center lane for EB Griswold St traffic to access Rt 2 on-ramp. Also include wider shoulders to allow for bicycle lanes on Griswold	SE	Auto/Highway	Yes
Consider creating a connection from I-91 to Rt. 2 to Windsor.	SE	Auto/Highway	Yes
Would like the Putnam Bridge sidewalk to open.	SE	Bicycle/Ped	Yes

Feedback from Public - Corridor of Significance: South

Public Comment / Feedback	Corridor of Significance	Mode	Aligns with Need(s) Identified Based on Existing Condition Assessment and/or Future Needs Outlook?
Improve bike facilities and pedestrian walkways along the Silas Deane Highway in Wethersfield	S	Bicycle/Ped	Yes
Consider changing the freight rail line in Wethersfield to a multi-use trail for bike commuters between Hartford, Wethersfield, Rocky Hill, Cromwell, and Middletown.	S	Bicycle/Ped	Yes
Area along CT River in Hartford to Wethersfield Nature Preserve should be developed for walking, biking, etc. Riverwalk should extend and be reimagined as a waterfront	S	Bicycle/Ped	Yes
Consider bike trails along CT River.	S	Bicycle/Ped	Yes
Expand bus service returning to Hartford into evenings	S	Bus	Yes
Improve bus service between Hartford and Middletown.	S	Bus	Yes
Consider a trackless tram from Silas Deane Hwy.	S	Bus	Yes
Improve safety of the I-691/I-84/I-91 interchange ???	S	Auto/Highway	Yes
Address traffic congestion approaching Middletown on Route 9	S	Auto/Highway	Yes
Address congestion along Route 9 in Middletown	S	Auto/Highway	Yes
Reevaluate traffic on Route 175.	S	Auto/Highway	Yes
Create an entrance ramp to 91 S from Route 3 N.	S	Auto/Highway	Yes
Overhaul on and off ramps on highway for pedestrian and bike safety.	S	Bicycle/Ped	Yes
Add sidewalks to 372 in Cromwell .	S	Bicycle/Ped	Yes

Feedback from Public - Corridor of Significance: Southwest

Public Comment / Feedback	Corridor of Significance	Mode	Aligns with Need(s) Identified Based on Existing Condition Assessment and/or Future Needs Outlook?
Use Flatbush train station as an alternative for a bus hub.	SW	Bus	Yes
Extend interchange North to Route 4.	SW	Auto/Highway	Yes
Consider making Cedar Street Station more pedestrian friendly	SW	Bicycle/Ped	Yes
Extend Waterbury line via Bristol.	SW	Rail	Yes

Appendix H-3: Needs Identification Based on Existing Conditions Analysis

Goal and Location Indices:

Goal Index	Description
#1	Improve movement of people and goods
#2	Increase transportation options, accessibility, reliability and safety
#3	Accommodate future needs and technologies
#4	Prioritize social equity
#5	Minimize environmental impacts

Location Index	
C	Study Core
NE	Northeast Corridor
N	North Corridor
NW	Northwest Corridor
SW	Southwest Corridor
S	South Corridor
SE	Southeast Corridor

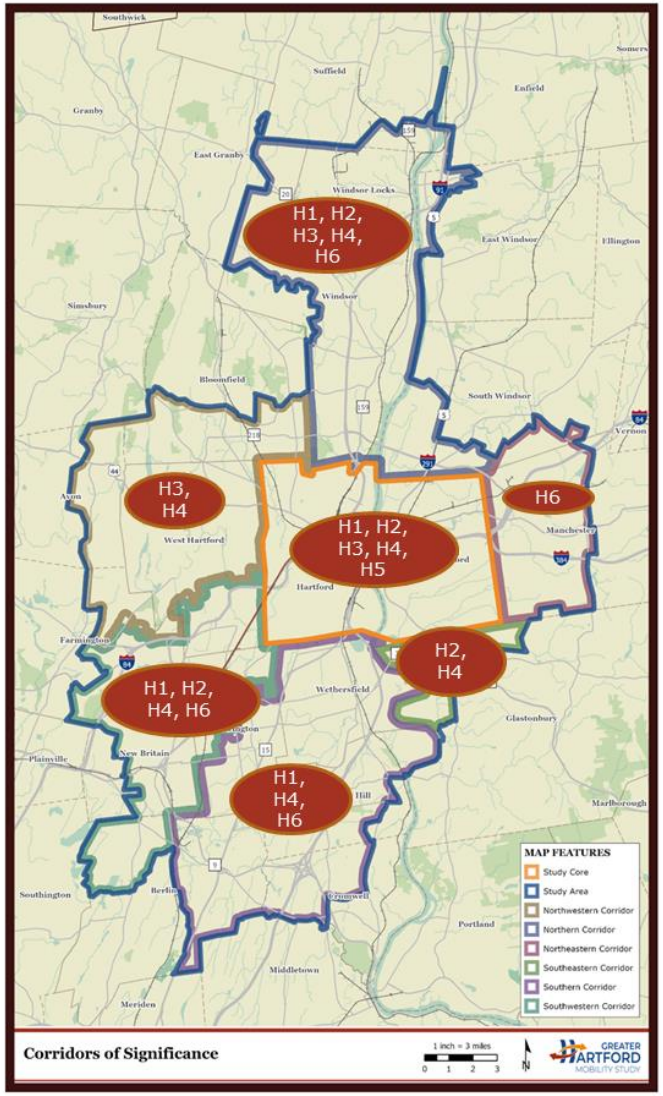
System Weakness-Transportation Need Matrix

		Need																																																					
		Address identified locations of peak hour congestion and other operating issues associated with aging and functionally obsolete infrastructure								Improve east-west connections across Connecticut River and through Hartford								Increase mobility options within and through the Study Area								Address gaps in multimodal transportation network								Improve competitiveness of the transit, rail, and bicycle/pedestrian networks within the Study Area								Improve connectivity between high-density population and employment centers								Provide redundant connections to employment centers							
	Alignment of Identified Need(s) with GHMS Goal (by #)	1	2	3	4	5	6	7		1	2	3	4	5	6	7		1	2	3	4	5	6	7		1	2	3	4	5	6	7		1	2	3	4	5	6	7		1	2	3	4	5	6	7		1		2	3	4	5	6	7
Mode / Topic Area	Weakness	Corridor(s) of Significance																																																					
		C	NW	N	NE	SE	S	SW	SA	C	NW	N	NE	SE	S	SW	SA	C	NW	N	NE	SE	S	SW	SA	C	NW	N	NE	SE	S	SW	SA	C	NW	N	NE	SE	S	SW	SA	C	NW	N	NE	SE	S	SW	SA	C	NW	N	NE	SE	S	SW	SA
Bus	Service is slower than ideal, limiting ridership growth.																																																						
	Reliability of local routes, especially heavier traveled routes, could be better.																																																						
	Evening service is often infrequent.																																																						
Rail	Limited and aging equipment hinder system performance.																																																						
	Incomplete track and infrastructure work limits service density and freight movement.																																																						
	Frequency, Service and Improved Connections																																																						
	No on-road bicycle amenities in downtown Hartford hurts last mile connections.																																																						
Bike & Pedestrian	Limited bicycle infrastructure throughout study area with few facilities in proximity to I-84/I-91 interchange.																																																						
	Gaps in sidewalk network or lack of sidewalk network along bus transit routes in outlying areas of study area.																																																						
Auto/Highway	The I-84 corridor west of Hartford is extremely complex and carries heavy traffic volumes. Morning and evening peak periods exhibit significant delays – both recurring and non-recurring.																																																						
	Large portions of I-84 and Route 2 were designed and constructed before modern highway design standards were developed.																																																						
	Route 2 has several closely spaced interchanges in East Hartford. This close ramp spacing has deleterious effects on traffic flow and safety.																																																						
	The freeway network is tightly interwoven with railroad tracks and Hartford's flood control system.																																																						
	Many bridges were built over 50 years ago and are functionally obsolete.																																																						
	Current funding sources are inadequate to cover both maintenance of existing assets and major capital improvements.																																																						

		Need																																																					
		Address identified locations of peak hour congestion and other operating issues associated with aging and functionally obsolete infrastructure								Improve east-west connections across Connecticut River and through Hartford								Increase mobility options within and through the Study Area								Address gaps in multimodal transportation network								Improve competitiveness of the transit, rail, and bicycle/pedestrian networks within the Study Area								Improve connectivity between high-density population and employment centers								Provide redundant connections to employment centers							
	Alignment of Identified Need(s) with GHMS Goal (by #)	1	2	3	4	5	6	7		1	2	3	4	5	6	7		1	2	3	4	5	6	7		1	2	3	4	5	6	7		1	2	3	4	5	6	7		1	2	3	4	5	6	7		1		2	3	4	5	6	7
	Weakness																									Corridor(s) of Significance																															
Mode / Topic Area		C	NW	N	NE	SE	S	SW	SA	C	NW	N	NE	SE	S	SW	SA	C	NW	N	NE	SE	S	SW	SA	C	NW	N	NE	SE	S	SW	SA	C	NW	N	NE	SE	S	SW	SA	C	NW	N	NE	SE	S	SW	SA	C	NW	N	NE	SE	S	SW	SA
Environmental	Prevalence of zero-vehicle households and transit-dependent populations.																																																								
	Regulatory constraints associated with natural resources, historic resources and contaminated properties.																																																								
Land Use	Lack of population growth limits economic growth due to constrained workforce (many residents are lost each year to other places offering competitive quality of life). CRCOG Economic Development policy emphasizes transit-oriented development and broader mobility options as key strategies to attract & retain workforce.																																																								
	Parking needs of car-dependent workforce impose higher real estate costs on businesses, developers, & public sector, and reduce land available for development, constraining economic development.																																																									
	Residential areas have inequitable access to jobs, amenities, transportation options.																																																								
	Dispersed job and housing concentrations require significant commutes and are hard to connect via transit corridors.																																																								
	Many priority locations for compact, transit-oriented development have development challenges such as brownfields cost premiums, disinterested ownership, placemaking / repositioning needs, infrastructure needs.																																																								
	Different municipalities may have economic development motivations that differ from land use approaches that would support the region best as whole																																																								
Multimodal Connectivity	There are few bicycle accommodations around Union Station.																																																								
	There is currently no rail service to Bradley International Airport.																																																								
	The Bradley Flyer is poorly equipped to serve travelers heading to and from the airport.																																																								

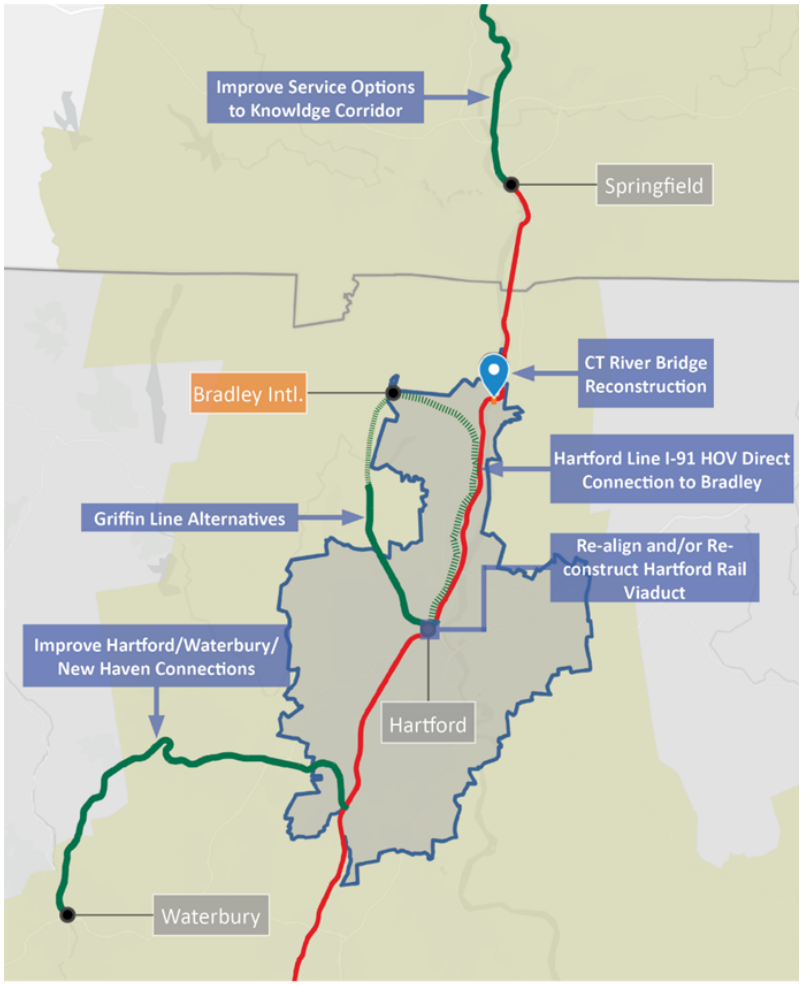
MODE: Auto/Highway

Need #	Description (Alignment with Goal #)	Location Applicability
H1	**Address congestion hotspots (#1)**	C, N, S, SW
H2	**Improve lane balance and lane continuity (#1, #2)**	C, N, SW, SE
H3	**Consider bypass options for through traffic (#1, #2, #3, #5)**	NW, N
H4	**Provide system redundancy - especially options for crossing the river (#1, #2, #3)**	C, N, S, SE, NW, SW
H5	**Improve access to riverfront (#3, #5)**	C
H6	**Provide additional truck parking**	N, NE, S, SW, E



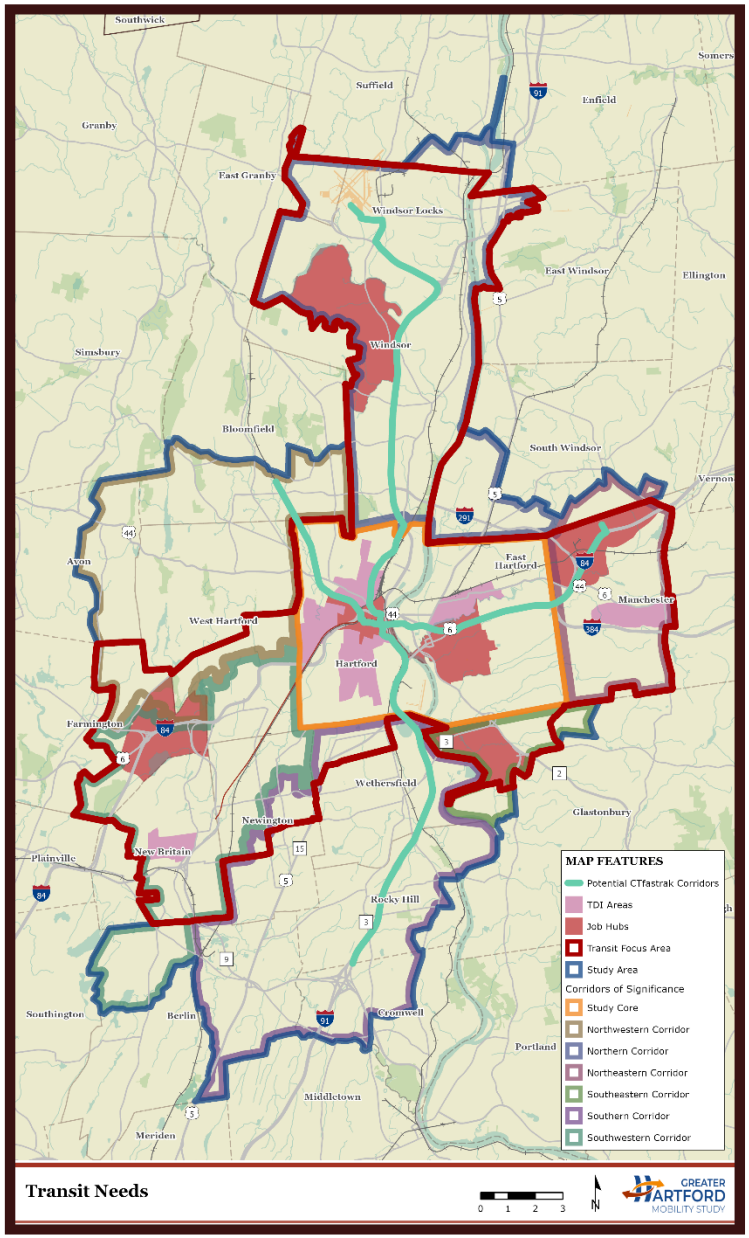
MODE: Rail

Need #	Description (Alignment with Goal #)	Location Applicability
R1	Upgrade aging infrastructure that creates operational constraints	SW, C, N
R2	Expand station amenities and station access (#1, #2, #3)	SW, C, N
R3	Address climate and resiliency needs through leveraging the rail network as sustainable transportation option (#1, #3, #4, #5)	SW, C, N
R4	More efficient and effective service (#1, #2, #3, #4, #5)	SW, C, N
R5	Improved connections within the study area and the broader region (#1, #2, #4)	SW, C, N
R6	Leverage the Connecticut rail system as an economic development tool (#1, #4)	SW, C, N
R7	Big thinking to meet future rail needs (#1, #2, #3, #4, #5)	SW, C, N
R8	Reduce barriers to access by improving by creating a more equitable user experience (#1, #2, #4)	SW, C, N



MODE: Bus

Need #	Description (Alignment with Goal #)	Location Applicability
B1	**Relieve congestion and its externalities (#1)**	C
B2	**Upgrade physical infrastructure to reduce operational constraints (#1, #2, #3)**	C, NE
B3	**Incorporate emerging technologies (#1, #2, #3)**	All sectors
B4	**Enhance operational parameters – evening service, frequency, duration of service, service areas etc. (#1, #2, #4)**	All sectors
B5	**Enhance bus stop/maintenance facilities (#1, #2, #3, #4)**	All sectors
B6	**Improve mode competitiveness (#1, #2, #4)**	All sectors
B7	**Improve first/last mile connections (#1, #2, #4)**	All sectors



MODE: Bicycle/Pedestrian

Need #	Description (Alignment with Goal #)	Location Applicability
BP1	**Improve east-west connections across Connecticut River and through Hartford #1, #4**	N, C, S, SE
BP2	**Increase mobility options within and through the Study Area #1, #2, #4, #5**	All
BP3	**Address gaps in multimodal transportation network #1, #2, #4, #5**	N, C, S, SW, NW
BP4	**Improve competitiveness of the transit, rail, and bicycle/pedestrian networks within the Study Area #1, #2, #3, #4, #5**	N, C, S, SW, NW
BP5	**Improve connectivity between high-density population and employment centers #1, #2, #4**	C
BP6	**Provide redundant connections to employment centers #1, #2, #4**	C