

Appendix B: Study Framework

Purpose

The Study Framework Tech Memo outlines the GHMS process and context. GHMS is a PEL study and is built upon the extensive planning and engineering work performed to date on multiple initiatives in the region. The PEL expanded on these initiatives and identified additional potential improvements by taking a holistic approach to improve mobility for all modes of travel spanning the Connecticut River from Hartford to East Hartford and throughout the region.

Key Components

The tech memo focuses on the following topics:

1. PEL Study Process and Milestones
2. Review and Summary of Relevant Previous Studies
3. Study Vision and Goals
4. Planning Tools, Methods, and Performance Measures

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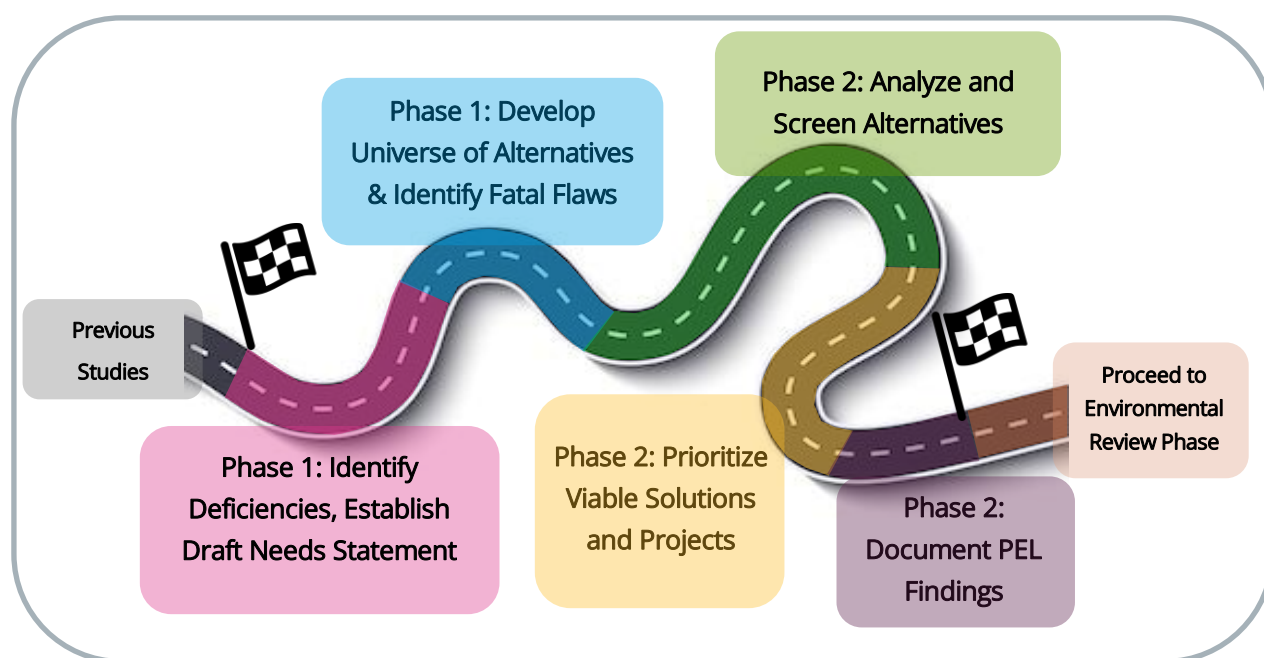
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Study Process

GHMS is a *Planning and Environmental Linkage (PEL)* study that has facilitated simultaneous consideration of planning vision, economic goals, community goals and environmental goals by an early and ongoing coordination with the public, local agencies/stakeholders, and appropriate resource agencies. With multiple transportation initiatives currently in various phases of analysis and/or implementation in the greater Hartford region, the GHMS PEL has provided a holistic approach to assess these initiatives and other potential multimodal mobility improvement opportunities with an integrated and overarching regional planning study. The study was completed in two phases. Phase 1 focused on assessing existing and future base conditions, identifying deficiencies, establishing draft needs statement, and developing a universe of alternatives to analyze further.

PEL represents a collaborative and integrated approach to transportation decision-making that considers benefits and impacts proposed transportation system improvements to the environment, community, and economy during the transportation planning process.
-FHWA

Figure 1: Overview of the GHMS PEL Process



Phase 2 assessed these alternatives in detail and utilized appropriate performance-based screening criteria that are aligned with the overall vision. Phase 2 also established an implementation plan to advance appropriate recommendations through the subsequent National Environmental Policy Act (NEPA) and Connecticut Environmental Policy Act (CEPA) requirements, as applicable. An overview of the GHMS PEL process is provided in Figure 1 above.

The PEL process improves information sharing and early consultation among State and Federal transportation and resource agencies. This reduces or eliminates duplication of work in planning and NEPA processes and assists with streamlined project delivery. For GHMS, CTDOT, as the lead agency¹, has been working with appropriate local and federal stakeholders and/or agencies to collaborate on the study's draft purpose and need, identified universe of alternatives, and process used to eliminate unreasonable alternatives. CTDOT has also been implementing ongoing public involvement and

¹ Pursuant to 23 U.S.C. 168(a)(2), the term "lead agency" is defined by 23 U.S.C. 139(a)(4) as the Department of Transportation

stakeholder engagement processes and has documented planning decisions through PEL. A Public Involvement Plan (PIP) and Agency Coordination Plan (ACP) have been developed for GHMS to establish a coordination strategy. These plans have been updated based on the identified challenges and opportunities as the study progressed.

The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) planning regulations have included provisions on PEL practices and authorities since 2007.² Congress enacted a new authority³ for PEL in 2012 in MAP-21 and amended it in 2015 through the Fixing America's Surface Transportation Act (FAST Act) that supports efforts to streamline project delivery and includes integration of planning and environmental review (Section 1305).

The focus of GHMS is improving mobility for all modes and all people in the Greater Hartford region. The PEL process has supported this focus by initiating a planning process for considering possible implementation of study recommendations to advance different modal solutions as separate projects with independent utility.

The PEL process was used to identify transportation priorities in the greater Hartford region and advance prioritized individual projects with independent utility into the **NEPA** process, as applicable. The PEL process has also identified early action projects/improvements that may qualify for "Categorical Exclusion" environmental review category under NEPA or CEPA and thus, can be advanced and implemented quickly as the study progressed. Figure 2, following, illustrates the GHMS's integrated approach for transportation decision-making. Projects and/or alternatives that did not meet the identified needs and/or subsequent evaluation criteria have been documented but not advanced further, saving the cost of further environmental and engineering analysis.

The adoption of the GHMS PEL Study into the NEPA process will be subject to determination by the federal agencies such as FHWA, FTA and FRA. The authority, 23 U.S.C. 168 (Section 168), provides a process by which these agencies may incorporate GHMS by reference as the planning product to use during the environmental review process, to the maximum extent practicable and appropriate. The degree to which analyses, conclusions, or recommendations from the GHMS can be incorporated into the NEPA processes will depend upon how well they meet certain standards established by NEPA regulations and guidance. GHMS has focused on meeting the following conditions to advance appropriate study recommendations into NEPA and minimize duplication of efforts:

The **National Environmental Policy Act (NEPA)** assures that proper consideration is given to the environment prior to undertaking any major federal action that significantly affects the environment. The PEL process is being used by GHMS to link transportation planning to subsequent NEPA actions.

1. The GHMS planning process has been conducted pursuant to applicable federal laws.
2. GHMS has been developed in consultation with the appropriate federal and state resource agencies.
3. GHMS has included broad multidisciplinary consideration of systems-level transportation needs and potential effects, including feasibility, cost-benefit considerations, engineering considerations and effects on the human and natural environment.
4. GHMS planning process has included public notice that the resulting planning decisions and/or analyses may be adopted during a subsequent environmental review process in accordance with Section 168.

If the NEPA and transportation planning processes are not well coordinated, the NEPA process may require additional and/or updated planning analyses. PEL facilitates appropriate coordination between the planning and NEPA phases to minimize additional and/or duplication of efforts during the NEPA phase. In accordance with Executive Order 13807, USDOT and other Federal departments signed a memorandum of understanding in April 2018 to implement a process that delivers environmental reviews and authorization decisions for major infrastructure projects as One Federal Decision

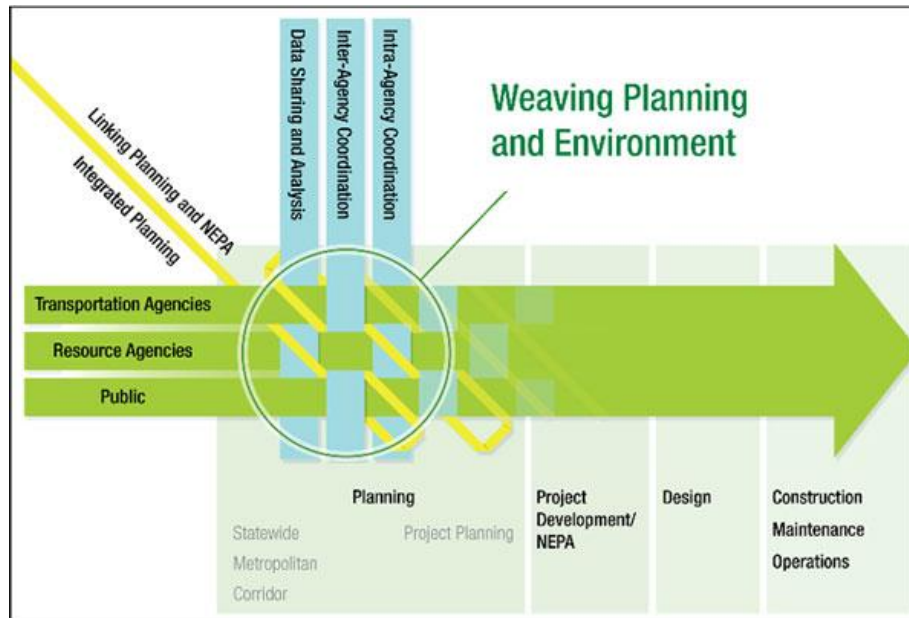
² Reference: FHWA - 23 CFR 450.212 and 450.318.

³ Reference: FHWA - 23 U.S.C. 168(b)(1)(A) and associated regulations at 23 CFR 450.212(d) and 450.318(e).

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(OFD). A key goal of OFD is to reduce the average time to complete environmental review processes to one year for Environmental Assessment (EA) and two years for Environmental Impact Statement (EIS) category review (unless a senior agency official of the lead agency approves a longer period in writing and establishes a new timeline⁴). The GHMS PEL process will facilitate meeting this accelerated timeline to efficiently advance appropriate projects through NEPA.

Figure 2: Integrated Approach for Transportation Decision-Making



Source: FHWA

The following considerations have been closely followed throughout GHMS:

1. Identified alternatives/improvements reflect a credible and articulated planning rationale founded on recent and reliable data from industry standard data sources and should support an overarching planning vision for the region.
2. Funding availability and/or priorities should inform the timeline for advancing appropriate improvement projects into NEPA and should govern the extent to which each identified project/alternative with independent utility should be analyzed during the GHMS PEL study. This is particularly important because if significant time has passed since the completion of GHMS before a project is advanced into NEPA, most of the analyses completed during GHMS require updates resulting in duplication of costs and efforts. The PEL process provided flexibility to develop different projects at different levels of detail based on potential implementation timeline.
3. Future year policy assumptions related to land use, economic development, transportation costs and network expansion should be consistent among various identified alternatives/projects.

Review of Relevant Previous Studies

The study team identified and reviewed previous studies, reports and plans prepared by CTDOT, other agencies, and groups (see Appendix B-1) that can help provide a planning framework for GHMS to identify an overarching mobility context for the region. These previous studies focused on all modes of transportation as well as relevant environmental and land-use aspects within the GHMS study area. Appropriate recommendations, concepts and/or alternatives from these previous studies, with potential for supporting multimodal mobility enhancements for the Greater Hartford region,

⁴ <https://www.ecfr.gov/current/title-40/chapter-V/subchapter-A/part-1501/section-1501.10>

have been considered as a part of the universe of alternatives identified at the end of Phase 1 of GHMS and studied further in detail in Phase 2 of this study, as needed.

The study team developed a study review template for concisely summarizing the relevance of each study to GHMS, year of study completion, mobility related goals, types of analyses and recommendations, as well as extent of public, stakeholder, and agency involvement. A review of these aspects helped establishing the study framework for the GHMS.

Table 1, following, shows the study completion timeline for the summarized studies. While all these relevant studies provide a planning context for GHMS, the studies completed after 2019 or the ones that are currently ongoing also provided some relevant and recent data. When findings of a PEL study are transitioned into subsequent environmental review/NEPA process, it is important that analyses are based on recent data (usually within a 5-year period) and information used for PEL planning analyses is still relevant and valid.

See Appendix B-1 for the list of summarized studies. The detailed summaries included an overview of mobility related goals from these previous studies. Most of these studies have goals that support provision of viable transportation options with improved infrastructure, improved access to integrated transportation choices and enhanced circulation, mobility, and connectivity for an efficient movement of people and goods in the greater Hartford region. These goals focus on multimodal improvements and safely and reliably support region's economic development potential.

These summaries also identify public, stakeholder, and agency involvement undertaken for these studies as well as the key planning context these studies provide for GHMS. Extensive public and stakeholder involvement have been accomplished as a part of these independent efforts, which has provided a sound platform for identifying strategic public and stakeholder outreach requirements for GHMS, a key aspect of a PEL study. Several of these previous studies have also initiated resource agency coordination efforts and GHMS has built upon these efforts to establish a succinct Agency Coordination Plan to seek ongoing resource agency input and support at various key milestones throughout the execution of GHMS.

Appendix B-2 provides a list of CTDOT internal coordination meetings and workshops undertaken to help establish the study framework.

Table 1: Timeline for Previous Studies/Plans (Years Completed)

Study Primary Focus	2010 and Earlier	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Ongoing/ Not Completed	Not Started
Multimodal													
M01 - CRCOG Metropolitan Transportation Plan (MTP)													
M02 - I-84 Hartford - Multimodal Station Plan													
M03 - CT2030 Plan													
M04 - Let's Go CT Plan													
Traffic/Highway/Bridge													
HT01 - I-84 Hartford Project (Viaduct)													
HT02 - I-84 Hartford Capitol Gateway Plan													
HT03 - CRCOG I-84 Viaduct Hub Study													
HT04 - I-84/I-91 Interchange Study													
HT05 - I-84 Corridor Congestion Relief Study													
HT06 - Silver Lane Corridor Study													
HT07 - CT State Freight Plan													
HT08 - CT River Flood Control													
HT09 - Other CTDOT Initiates													
HT10 - Route 5 (East Windsor) Corridor Study													
HT11 - CT Statewide Rest Area and Service Plaza Study													
Rail													
R01 - I-84 Hartford Project - Basis of Design Plans and Track Schematic													
R02 - CT State Rail Plan													
R03 - Hartford Rail Alternatives Analysis													
R04 - New Heaven Line Capacity and Speed Analysis Draft Report													
R05 - Efforts to Convert Griffin Line to BRT/LRT													
Bus													
B01 - Ctfastrak East													
B02 - CRCOG Comprehensive Transit Service Analysis													
B03 - GHTD Union Station Master Plan													
B04 - NW Corridor Study (All 3 Parts)													
B05 - Downtown Hartford Transit Circulation and Through Routing Study													
B06 - CRCOG Transportation Safety and Improvement Study - Uconn Hartford													
B07 - Bradley Airport Master Plan													
B08 - Silver Lane Corridor Study													
B09 - CRCOG's Transit Priority Corridor Implementation Strategy													
Bike/Ped/Complete Streets													
BP01 - City of Hartford Bicycle Master Plan													
BP02 - CRCOG Capitol Region Complete Streets Plan													
BP03 - Connecticut Active Transportation Plan													
BP04 - East Coast Greenway Study													
BP05 - Hartford Parking Study													
BP06 - East Hartford Main Street Road Safety Audit													
BP07 - City of Hartford - Re-imagining Main Street													
Environmental													
E01 - CRCOG Regional POCD													
E02 - Capitol Region Green Clearinghouse													
E03 - CRCOG Building Corridors of Opportunity - Best Practices													
E04 - CRCOG Metro Hartford Future													
E05 - CRCOG Metro Hartford Comprehensive Economic Development Strategy													
E06 - Capitol Region Natural Hazard Mitigation Plan Update													
E07 - Connecticut Riverfront Recapture													
E08 -East Harford POCD													
E09 -West Harford POCD													
E10 - Harford POCD / Hartford 400													
E11 -Wethersfield POCD													
E12 -Bloomfield POCD													
E13 - Windsor POCD													
E14 - NEC Future													

Study Vision and Goals

The GHMS has focused on identifying opportunities for successful implementation of a future transportation system that supports regional and state growth. A Vision Statement was developed for the purpose of creating a lens through which future transportation decision-making can be viewed. Projects that are defined by this study should be consistent with the Vision Statement, which is as follows:

The Greater Hartford Mobility Study's Vision is to improve mobility by planning an integrated, resilient, multimodal transportation system in the Greater Hartford Region thereby enhancing the quality of life, economic vitality, and opportunity in the region.

The Vision is a high-level expression that is further defined by a set of Study Goals. The following five goals have been established:

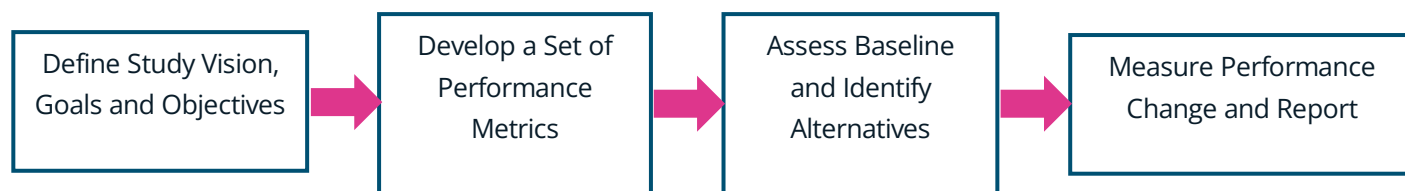
1. Improve the movement of people and goods.
2. Increase transportation options, accessibility, reliability, and safety.
3. Accommodate future needs and emerging technologies.
4. Prioritize social equity.
5. Minimize environmental impacts.

Performance Measures

A key feature of the Moving Ahead for Progress in the 21st Century Act (MAP-21) is the establishment of a performance- and outcome-based transportation program. The objective of this program is for states to invest resources in projects that will collectively make progress toward the achievement of the national goals⁵. One of the key aspects of the environmental review/NEPA process is to determine if planning study recommendations are based on performance-based planning and align with the appropriate federal guidance and regional planning context established by relevant Long-Range Transportation Plans (LRTP).

A key for establishing a framework for assessing progress is to determine potential quantifiable performance measures and key performance indicators (KPIs). Figure 3 outlines the process used for creating such performance measurement framework.

Figure 3: Performance Measurement Framework Process



Accordingly, the study team established a framework to conduct performance-based planning for GHMS for each mode of travel using a scenario planning tool that was developed from the industry standard travel demand model used by the

⁵ Reference: FHWA

Capitol Region Council of Governments (CRCOG) for the Greater Hartford region. The study team coordinated with various CTDOT departments as well as with external stakeholders/agency partners such as CRCOG and Connecticut FHWA Office to seek feedback on the preliminary list of performance measures to be used in the scenario planning tool. The project team updated the KPI list (see Technical Document Appendix G: Scenario Planning Baseline Memo for the KPI list) through Phase 1 of GHMS based on inputs received from the study partners and/or availability of data required to quantitatively assess system performance. These KPIs were then used to determine performance of various future condition build scenarios aligned with implementation timeframes in Phase 2 of GHMS to quantitatively compare performance of various scenarios, relative to one another as well as in comparison with the existing and future base scenarios.

Contributions and Coordination

The study team sought and incorporated the input of several technical groups within CTDOT as well as FHWA and the regional planning agency, CRCOG into the study framework elements presented in this technical memorandum. These efforts included a PEL workshop with CTDOT staff and follow-up meetings to focus on specific technical aspects. Kickoff meetings were held with CRCOG and FHWA. A full documentation of these coordination efforts is included as Appendix B-2: Study Framework Coordination Summary (ROMs).

Appendix B-1: List of Summarized Previous Studies

Previous Studies Summarized
MULTIMODAL
M01 - CROG Metropolitan Transportation Plan (MTP)
M02 - I-84 Hartford - Multimodal Station Plan
M03 - CT2030 Plan
M04 - Let's Go CT Plan
TRAFFIC/HIGHWAY/BRIDGE
TH01 - I-84 Hartford Project (Viaduct)
TH02 - I-84 Hartford Capitol Gateway Plan
TH03 - CROG I-84 Viaduct Hub Study
TH04 - I-84/I-91 Interchange Study
TH05 - I-84 Corridor Congestion Relief Study
TH06 - Silver Lane Corridor Study
TH07 - CT State Freight Plan
TH08 - CT River Flood Control
TH09 - Other CTDOT Initiates
RAIL
R01 - I-84 Hartford Project - Basis of Design Plans and Track Schematic
R02 - CT State Rail Plan
R03 - Hartford Rail Alternatives Analysis
R04 - New Heaven Line Capacity and Speed Analysis Draft Report
R05 - Efforts to Convert Griffin Line to BRT/LRT
BUS
B01 - CTfastrak East
B02 - CROG Comprehensive Transit Service Analysis
B03 - GHTD Union Station Master Plan
B04 - NW Corridor Study (All 3 Parts)
B05 - Downtown Hartford Transit Circulation and Through Routing Study
B06 - CROG Transportation Safety and Improvement Study - UConn Hartford
B07 - Bradley Airport Master Plan
BIKE/PEDESTRIAN/COMPLETE STREETS
BP01 - City of Hartford Bicycle Master Plan
BP02 - CROG Capitol Region Complete Streets Plan
BP03 - Connecticut Active Transportation Plan
BP04 - East Coast Greenway Study
BP05 - Hartford Parking Study
ENVIRONMENTAL
E01 - CROG Regional POCD
E02 - Capitol Region Green Clearinghouse
E03 - CROG Building Corridors of Opportunity - Best Practices
E04 - CROG Metro Hartford Future
E05 - CROG Metro Hartford Comprehensive Economic Development Strategy
E06 - Capitol Region Natural Hazard Mitigation Plan Update

Previous Studies Summarized
E07 - Connecticut Riverfront Recapture
E08 - East Harford POCD
E09 - West Harford POCD
E10 - Harford POCD / Hartford 400
E11 - Wethersfield POCD
E12 - Bloomfield POCD
E13 - Windsor POCD
E14 - NEC Future

Appendix B-2: List of CTDOT Study Framework Coordination Meetings

Meeting Subject	Meeting Date
GHMS CTDOT - CRCOG Coordination Meeting	April 30, 2020
GHMS PEL Virtual Workshop	August 4, 2020
GHMS Planning Meeting	August 11, 2020
GHMS Planning Meeting	August 13, 2020
GHMS Traffic Highway PEL Workshop Follow-Up	August 18, 2020
GHMS CTDOT Office of Rail to review takeaways on Vision and Goals, Corridors of Significance and Performance Measures for Rail	August 18, 2020
GHMS Transit Meeting	August 25, 2020
GHMS Rail Lead review of Performance Measures for Rail with CTDOT Office of Rail GHMS Liaison	August 26, 2020
GHMS Transit Meeting	September 22, 2020