# MASSDOT - HIGHWAY DIVISION
Project Initiation Form

Proponent: Mr. Eric Eby Title: City Traffic Engineer
Municipality/Organization: Lowell, MA

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**Part I – General Information**

Project Location: Lowell, MA – Thorndike Street from north of Fletcher Street to south of Hale Street, Middlesex Street and Appleton Street over Thorndike Street (known as the Lord Overpass)

**Project Need:** Briefly restate the primary project need or goal as developed in the Project Need Form (e.g. rehabilitate a roadway, improve safety at an intersection, reduce corridor congestion, improve pedestrian facilities, or provide bike accommodation).

As part of the off-site mitigation for the Hamilton Canal District (HCD redevelopment) project, roadway/traffic control improvements and structural improvements are proposed on Thorndike Street, Middlesex Street, Appleton Street (the Lord Overpass), and Jackson Street Extension.

Improvements along Thorndike Street are needed to alleviate existing and projected future congestion and safety concerns at the four study area intersections:

- Thorndike Street/Dutton Street at Fletcher Street/Jackson Street Extension
- Thorndike Street at Gallagher Terminal
- Thorndike Street at Highland Street
- Thorndike Street at Hale Street

The proposed Jackson Street Extension will address long standing circulation and access issues for Hamilton Canal District and the Fletcher Street neighborhoods and would allow both pedestrians and vehicles approaching the district from the Acre and Lower Highlands neighborhoods to have a direct connection to the Hamilton Canal District. The proposed Jackson Street Extension will also reduce project related traffic impacts at the Broadway and Dutton Street intersection and the Lord Overpass by allowing traffic to bypass these intersections to gain direct access to Thorndike Street upon exiting the HCD. The proposed Jackson Street Extension will also provide enhanced access to the new Jackson Appleton Middlesex (JAM) public parking garage and the Division of Capital Asset Management (DCAM)'s proposed Lowell Trial Court site, both of which are located on Jackson Street. The project also provides a key link in the Lowell National Historical Park's network of canal side recreational pathways.

The Lord Overpass is a grade separated interchange located between the project site and the Charles A. Gallagher Transportation Center. The Lord Overpass is formed by the Thorndike Street northbound and southbound on/off-ramps, Middlesex Street and Appleton Street/Chelmsford Street. The Lord Overpass is comprised of four closely spaced, signalized intersections connected by the Middlesex Street Bridge and the Appleton Street/Chelmsford Street Bridge over Thorndike Street. A one-way counter clockwise circulation pattern is established around the square, which prior to the installation of the four existing traffic signals, used to function like a rotary. Sidewalks are provided on both sides of the roadways forming the square, with raised traffic islands provided at two of the four intersections.

The Lord Overpass was originally constructed in 1959 and is now City owned. The overpass consists of two bridges. Bridge No. L-15-063 carries Middlesex Street over Thorndike Street, and Bridge L-15-064 carries Appleton/Chelmsford Street over Thorndike Street. According to the most recent MassDOT

Bridge List, the Lord Overpass bridge L-15-064 has an American Association of State Highway and Transportation Officials (AASHTO) Bridge Sufficiency Rating of 23.6, and the bridge No L-15-063 rating is 52.6. The AASHTO Bridge Sufficiency Rating is a measure of the structural adequacy and safety essential for public use, serviceability and functional obsolescence. The AASHTO sufficiency rating ranges from 0 to 100, with 100 representing the best condition that is "Fully Sufficient" and 0 representing the worst condition "Fully Insufficient". The Lord Overpass bridge L-15-064 was not found to be structurally unsafe, but was determined to be functionally obsolete and would therefore be eligible for Federal Aid.

The Lord Overpass currently experiences significant delays and long vehicle queues on the Middlesex Street westbound approach and the Chelmsford Street eastbound approach during the weekday morning and evening commuter peak hours, respectively. The traffic delays are a result of inefficient traffic flow through the four signalized intersections that comprise the Lord Overpass, and the relatively short distance between these intersections, as vehicles queues spill back from one intersection and impede traffic flow at the adjacent intersection. The existing Lord Overpass also presents a confusing pedestrian environment, with missing pedestrian crosswalks between the sidewalks on the perimeter of the Lord Overpass and the sidewalk in the center of the Lord Overpass.

The intersection capacity analysis of the projected 2017 Build (with project) peak hour traffic volumes indicate that without improvement the Middlesex Street westbound approach to the Lord Overpass will operate above capacity (with a volume to capacity ratio greater than 1.0). While the Highway Capacity Manual (HCM) results indicates that remaining intersection approaches would continue to operate below capacity, the SimTraffic traffic simulations show that the limited vehicle queuing storage between the four signalized intersections that comprise of the Lord Overpass (a distance of approximately 150 to 200 feet) would result in vehicle queues spilling back from adjacent signalized intersections resulting in potential grid lock at the Lord Overpass during the peak hour traffic conditions analyzed.

The existing three-way intersection of Thorndike Street, Dutton Street, and Fletcher Street currently experiences long delays and vehicle queues for northbound left-turn movements from Thorndike Street to Fletcher Street. The intersection does not currently allow vehicles to turn left from Fletcher Street onto Dutton Street and does not accommodate pedestrian crossings of Thorndike and Dutton streets.

**Regional Benefit:** Describe any regional benefits that would be realized should the Project Need be met.

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**Part II – Project Costs and Responsibilities**

**Estimated Costs:** Provide available cost estimates or estimated cost ranges in current-year dollars and attach any cost estimate work sheets or summaries.

| Estimated Construction Costs: | | Estimated Other Costs: | |
|---|---|---|---|
| Construction Items: | | Planning/Design: | |
| Contingencies (10%): | | Right-of-way: | |
| Other Constr. Costs (10%): | | Environmental Mitigation: | |
| **Total Construction Cost:** | 13,756,801.20 | **Total Other Costs:** | |

| **Anticipated Funding Program:** | | | | | | |
|---|---|---|---|---|---|---|
| Indicate all potential sources of funding that may apply to the project | STP | | CMAQ | | HSIP | |
| | TAP | | NHPP | | HPP | |
| | NFA | | Other | | | |

| Project Responsibilities: | MassDOT | Community | Other (specify) |
|---|---|---|---|
| **Project Management** | | X | |
| **Design** | | X | |
| **Permitting** | | X | |
| **Right of Way** | | X | |

**Part III: Project Description**

**A. Proposed Improvements to Facility**

**1. Scope of Work:** Describe the proposed improvements including limits of work, length of the project, major improvements, proposed cross-section, improvements to secondary assets, and related work. The description of proposed improvements to secondary assets should include improvements to curbing, sidewalks, traffic signals, signs, lighting, landscaping, drainage, walls, etc. The scope of work for a multi-use path should also identify at-grade crossing treatments.

To alleviate both existing and projected future congestion and safety concerns, a series of roadway and traffic control and bridge improvements have been proposed at these intersections.

Improvements to the Lord Overpass bridges are currently being evaluated. The roadway/traffic control improvements along Thorndike Street have progressed to a 25 percent design stage. The design of the Jackson Street Extension, a proposed section of roadway that will connect the existing limit of Jackson Street with the intersection of Thorndike Street at Fletcher and Dutton Street is at the PS&E level. In addition to extending Jackson Street to the intersection of Thorndike Street/Dutton Street and Fletcher Street, geometric improvements will be made at the study intersections as outlined below:

**ROADWAY IMPROVEMENTS**

Thorndike Street/Dutton Street at Fletcher Street/Thorndike Street Extension

- Construct the new Jackson Street Extension to form the fourth leg (westbound approach) of the intersection, including a dedicated left-turn lane and a shared through/right-turn lane;
- Widen and realign the northbound approach of Thorndike Street to provide two left-turn lanes and a through travel lane;
- Reconstruct the northbound approach of the Thorndike Street Northbound Down-Ramp to provide a through lane and a channelized right-turn lane to the new Jackson Street Extension, and construct a new sidewalk along the eastern side of the ramp where none presently exists;
- Reconstruct the southbound approach of Thorndike Street to provide a wider pedestrian refuge island;
- Reconstruct and realign the Fletcher Street eastbound approach to align with the new Jackson Street Extension and provide a right-turn lane and a shared through/left-turn lane.

Thorndike Street at Gallagher Terminal

- Restripe Thorndike Street within the available right of way to provide additional lane width in the left through lane on the northbound approach. This would allow for extra space for a northbound through vehicle to bypass a vehicle turning left into the Gallagher Terminal.
- Add a crosswalk across Thorndike Street on the north side of Gallagher Terminal.
- Improve sidewalks and handicap ramps to comply with ADA standards.

Jackson Street Extension

- Construct 600 feet of the Jackson Street Extension, from Jackson Street to Fletcher Street.
- the roadway cross section is one-12 foot lane in each direction, sidewalks on both sides of the street, lighting, parking, and stormwater will be included as part of the construction.
- A retaining wall is required along the Hamilton Canal on Jackson Street from Station 94+50 to Station 95+50, lt.

In addition to the roadway geometric improvements, traffic control improvements will be made at the study

area intersection as described below:

**TRAFFIC CONTROL IMPROVEMENTS**

Thorndike Street/Dutton Street at Fletcher Street/Thorndike Street Extension

- Install a new, fully actuated traffic signal to accommodate the Jackson Street Extension. The new traffic signal will provide concurrent pedestrian crossings at this intersection.
- Existing signs and pavement markings will also be upgraded where necessary to meet with the proposed design.

Thorndike Street at Gallagher Terminal

- Modify traffic signal timing and phasing. . Upgrade the traffic signal controller and cabinet assembly to accommodate GPS and implement vehicle coordination with the intersections of Thorndike Street at Highland Street and Thorndike Street at Hale Street

Thorndike Street at Highland Street

- Modify traffic signal timing. . Upgrade the traffic signal controller and cabinet assembly to accommodate GPS and implement vehicle coordination with the intersections of Thorndike Street at Gallagher Terminal and Thorndike Street at Hale Street
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Thorndike Street at Hale Street

- Modify traffic signal timing and phasing. . Upgrade the traffic signal controller and cabinet assembly to accommodate GPS and implement vehicle coordination with the intersections of Thorndike Street at Gallagher Terminal and Thorndike Street at Highland Street

Middlesex Street at Thorndike Street Northbound On-Ramp, and Southbound Off-ramp

- Construct fully actuated traffic signals at both locations, which will include new mast arms, signal heads, countdown ped signal heads, ada push buttons, new conduit and GPS coordination

Appleton Street at Thorndike Street Northbound Off-Ramp, and Southbound On-ramp

- Construct fully actuated traffic signals at both locations, which will include new mast arms, signal heads, countdown ped signal heads, ada push buttons, new conduit and GPS coordination

**BRIDGE IMPROVEMENTS**

Lord Over Pass - Bridge Nos. L-15-063(2BX) ST 3A/Middlesex Street and L-15-064(2BY) ST 110/ Appleton Street over Thorndike Street

The existing bridges are over 50 years old and do not meet state and federal current standards. The current condition is fair to satisfactory and the bridges are currently posted with load restrictions. The proposed bridge improvements include:

- Upgrade the existing bridge capacity for the current HL-93 vehicle loading in accordance with current standards.
- Replace existing bridge deck and superstructures to repair current deficiencies and upgrade the existing bridges to current MassDOT bridge design standards.
- Replace existing bridge railings on the bridges and adjacent retaining walls to current crash loading standards.
- Replace existing bridge bearings with new elastomeric bearings.
- Evaluate and modify existing substructures as required to accommodate superstructure replacement.

- Improve roadway clearance over Thorndike Street.

Bridge No. L-15-053(87L) Thorndike Street over Pawtucket Canal
The proposed intersection modifications at Fletcher, Dutton, Thorndike and Jackson street require modifications to the configuration of existing bridge over the canal. The proposed bridge improvements include:

- Modify Span 1 by extending the existing north abutment and pier 1 to the west, and adding a steel superstructure with concrete deck adjacent to the existing.
- Replace the west sidewalk to accommodate the new intersection.
- Add a new sidewalk on the east side of the bridge.
- Replace existing bridge railings to current crash loading standards.
- Repair or strengthen the exiting bridge structure to accommodate the new roadway configuration.
- Inspect and repair the exiting substructure to upgrade deficiencies.
- Construct a new retaining wall on the south bank of the channel from the east end of the south abutment extending about 80 feet to the east.

**2. Proposed pavement rehabilitation:** Describe the proposed rehabilitation methods that are being considered. Keep in mind that the final pavement improvements will be identified through the development of a pavement design submitted as part of the project design process.

The pavement on Thorndike Street is adequate in locations where the roadway geometry will not be modified. In locations where the geometry will be changed, full depth pavement construction is proposed. Pavement rehabilitation will be required on the Lord Overpass bridge approaches, and full depth pavement construction is proposed on the Jackson Street Extension.

**3. Pedestrian Accommodations:** Describe how the improvements are addressing pedestrian accommodation according to ADA/AAB requirements, through improving existing facilities, improving safety and traffic calming, as well as proposing new or expanded facilities.

The intersection and roadway improvements noted above include incorporating pedestrian crossing intervals in traffic signal timings and upgrading sidewalks and wheelchair ramps to be compliant with ADA/AAB. Understanding that in order to construct sidewalks along Thorndike Street under the Lord Overpass would require that the bridge abutment reconstruction, an accessible sidewalk will be constructed along the northbound on, and off ramps and over the lord overpass. Jackson Street will have sidewalks along both sides of roadways, and sidewalks will be reconstructed on Fletcher Street within the project limits.

Consideration will be given throughout to the project area to improving the perceived safety and comfort of the pedestrian accommodations to further enhance walkability. This may include additional pedestrian scale lighting, street trees and other plantings, and reasonable narrowing of travel lanes to slow speeds adjacent to pedestrian areas without compromising delays. Components of the treatments already introduced along the east side of Thorndike Street south of the Lord Overpass and along the northbound Up-ramp from Thorndike Street may prove a model for incorporating walkability into the design.

**4. Bicycle Accommodations:** Describe how the improvements are addressing bicycle accommodation through improving existing facilities, as well as proposing new or expanded facilities.

Although there is insufficient right-of-way available to incorporate designated bicycle lanes, where feasible, sharrows will be introduced to connect to existing bicycle lanes and sharrows on adjacent roadways, including Chelmsford Street and Fletcher Street.

**5. Design Exceptions:** Identify whether any exceptions to MassDOT design criteria are anticipated.

Lord Over Pass - Bridge Nos. L-15-063(2BX) ST 3A/Middlesex Street and L-15-064(2BY) ST 110/ Appleton Street over Thorndike Street

The existing clearance over Thorndike Street is about 14'-3"feet. It is anticipated that the new superstructure design will provide improved vertical clearance. However, due to the configuration of the roadways around the overpass, it is unlikely that the standard 16'-6" will be attained.

**6. Alternatives Analysis:** Identify any alternatives that have been considered. Attach any pertinent information related to that analysis.

As part of the Environmental Impact Report for the Hamilton Canal District (EOEEA No. 14240), several alternatives for both the Thorndike Street corridor and the Lord Overpass Bridges were considered. A copy of the DEIR has been attached to this PIF for your consideration.

**7. Retention of Existing Infrastructure:** Identify efforts to retain/preserve existing Infrastructure, e.g. reuse of curbing, sidewalk, minimized/targeted vertical or horizontal geometric changes, etc. ● GreenDOT

To reduce the construction costs associated with the reconstruction of the Lord Overpass abutments to allow for the widening of Thorndike Street, the City selected an alternative design for the intersection of Thorndike Street, with Dutton Steet, Fletcher Street and Jackson Street that would allow for adequate traffic operations, without the need to provide additional lanes on Thorndike Street. See attached memo outlining the modifications recommended to the City as part of the evaluation of the traffic analysis proposed as part of the MEPA process

**8. Potential Impacts to Utilities:** Identify any anticipated impacts or complications the proposed improvements will have on utilities.

Utilities that are currently hung within the bridge deck of both the Middlesex Street and Appleton Street bridges will need to be reconstructed as part of the bridge rehabilitation. The utilities include Telephone, traffic signal conduit, electric, gas, fiber.

## B. Mobility Improvements

1. Describe how the proposed improvements will impact mobility. Include any traffic analysis, including LOS (Level of Service) data, if available. ● GreenDOT

Detailed level of service improvements can be found in the attached FDR, and EIR.

Thorndike Street/Dutton Street at Fletcher Street/Thorndike Street Extension

Under 2019 conditions, with these improvements in place, this intersection is expected to operate at an overall LOS C (V/C=0.96) during the weekday morning peak hour, LOS C (V/C=0.85) during the evening peak hour and LOS B (V/C=0.75) during Saturday midday peak hour. Additionally, extending Jackson Street to form the fourth leg of the intersection of Thorndike Street/Dutton Street at Fletcher Street will provide the desired direct access to the Hamilton Canal District.

Thorndike Street at Gallagher Terminal

Under 2019 conditions, with these improvements in place, this intersection is expected to operate at an overall LOS C (V/C=0.87) during the weekday morning peak hour, LOS C (V/C=0.85) during the evening peak hour and LOS B (V/C=0.70) during Saturday midday peak hour.

Thorndike Street at Highland Street

Under 2019 conditions, with these improvements in place, this intersection is expected to operate at an overall LOS B (V/C=0.76) during the weekday morning peak hour, LOS C (V/C=0.94) during the evening peak hour and LOS B (V/C=0.84) during Saturday midday peak hour.

Thorndike Street at Hale Street

Under 2019 conditions, with these improvements in place, this intersection is expected to operate at an overall LOS C (V/C=0.76) during the weekday morning peak hour, LOS C (V/C=0.83) during the evening peak hour and LOS B (V/C=0.61) during Saturday midday peak hour.

The Lord Overpass

The Lord Overpass currently experiences significant delays and long vehicle queues on the Middlesex Street westbound approach and the Chelmsford Street eastbound approach during the weekday morning and evening commuter peak hours, respectively. The traffic delays are a result of inefficient traffic flow through the four signalized intersections that comprise the Lord Overpass, and the relatively short distance between these intersections, as vehicles queues spill back from one intersection and impede traffic flow at the adjacent intersection. The existing Lord Overpass also presents a confusing pedestrian environment, with missing pedestrian crosswalks between the sidewalks on the perimeter of the Lord Overpass and the sidewalk in the center of the Lord Overpass.

The intersection capacity analysis of the projected 2017 Build (with project) peak hour traffic volumes indicate that without improvement the Middlesex Street westbound approach to the Lord Overpass will operate above capacity (with a volume to capacity ratio greater than 1.0). While the Highway Capacity Manual (HCM) results indicates that remaining intersection approaches would continue to operate below capacity, the SimTraffic traffic simulations show that the limited vehicle queuing storage between the four signalized intersections that comprise of the Lord Overpass (a distance of approximately 150 to 200 feet) would result in vehicle queues spilling back from adjacent signalized intersections resulting in potential grid lock at the Lord Overpass during the peak hour traffic conditions analyzed.

2. Identify whether the proposed improvements will impact connectivity or access along the corridor or to facilities. If this is a new connections, include existing and proposed travel times. ● GreenDOT

The intersections of Thorndike Street at Gallagher Terminal, Highland Street, and Hale Street are not currently connected to each other. To better accommodate traffic volumes (both existing and future, and provide optimal traffic flow throughout the Thorndike Street corridor, a coordinated traffic signal system is recommended. See the attached FDR for additional information.

3. Identify how the project will impact mobility for pedestrians, bicyclists and transit users. ● GreenDOT

The intersection of Thorndike Street, Dutton Street, and Fletcher Street does not currently accommodate pedestrian crossings of Thorndike Street/Dutton Street. In general, pedestrian connectivity to the Gallagher Terminal (which includes the Lowell Commuter Rail Station) is poor from the north and there are no bicycle accommodations within the project limits. The project proposes to address this by incorporating sidewalks, crosswalks, and sharrows where none exist today and will emphasize improving the overall walkability of an auto-centric area throughout the design development.

The proposed Jackson Street Extension will address long standing circulation and access issues for Hamilton Canal District and the Acre neighborhoods and would allow both pedestrians and vehicles approaching the district from the Lower Highlands neighborhood to have a direct connection to the Hamilton Canal District. The project will also provide a vital link in the Lowell National Historical Park's network of canalside recreational trails.

**C. Safety and Security Improvements**

1. Describe any improvements that are expected to reduce the crash potential. Provide any highway safety analysis that has been completed.

Crash data can be found in the attached FDR. The intersection of Thorndike Street and Highland Street currently exceeds the MassDOT statewide crash rate of 0.78 crashes per million entering vehicles. The crash rate at the intersection is 1.47 and includes a fatality. The majority of crashes at all four study intersections are rear-end collisions, generally indicative of inadequate signal timing. Additionally, the majority of crashes occur outside of the peak and midday hours, which may suggest that speeding along Thorndike Street is an issue.

The traffic signal timing, phasing, and coordination changes noted above, in conjunction with the proposed roadway changes and addition of turn lanes are intended to address the observed safety issues.

2. Describe any improvements that are expected to improve safety for other multi-modal users such as pedestrians, bicyclists, persons with disabilities, transit riders, trucks, school children, etc. ● GreenDOT

The proposed improvements include incorporation of signalized pedestrian crossings, the addition of new sidewalks and crosswalks, and modified pedestrian refuges are expected to improve mobility for all users and improve connectivity to the Gallagher Terminal. All new features will be compliant with ADA/AAB. In particular the current lack of sidewalks east of Thorndike Street and the complete lack of pedestrian crossing accommodations in the vicinity of Fletcher and Dutton Streets creates an extremely unsafe condition where there is currently significant pedestrian crossing activity that this project will remedy.

3. If the project is on a designated evacuation route or NHS corridor, how will the project impact the route?

There are no known evacuation routes in the project area. However the project is in proximity to the Lowell Connector, I-495, and Route 3.

**D. Economic Development - Problem, Need, or Opportunity**

1. Describe any improvements that improve a business district, business related elements or support proposed economic development opportunities.

The project will support the build-out of the Hamilton Canal District, a commonwealth-designated Growth District and Priority Development Site under M.G.L. Chapter 43D as well as facilitate the implementation of two state approved urban renewal areas (the JAM Plan and the Acre Plan). See attached EIR for more

specific proposed economic development opportunities

2. Identify improved access to services, industry clusters or job creation in the project area. Include the number of jobs to be created, if available. ● GreenDOT

See attached EIR

3. Identify how the improvements reflect Smart Growth Development and Sustainable Development Principles. ● GreenDOT

In addition to the Growth District and urban renewal areas supported by this project, the project will also facilitate additional housing development in the Downtown Lowell Smart Growth Overlay District (approved under M.G.L. Chapter 40R). See attached EIR for additional detail

**E. Environmental Impacts and Improvements**

Describe any improvements or impacts to the resources. Consider any storm water improvements and changes in impervious area. Identify any anticipated permitting that could be problematic.

1. Wetland(s):

To accommodate proposed improvements at the intersection of Thorndike Street, Dutton Street, and Fletcher Street the existing bridge, Thorndike Street Bridge over the Pawtucket Canal (MHD Bridge No. L-15-53), needs to be widened on the west side. The proposed realignment of Fletcher Street will require one, possibly two, of the existing bridge piers to be extended in the westerly direction. This work will require a cofferdam system to be installed at each pier to construct the pier foundation in the dry. The existing clearance under the bridge for highwater will be maintained for the new portion of the superstructure. The cofferdam system will consist of driven sheeting and the water within it will need to be pumped out, treated and then pumped back into the canal. The construction of the new pier(s) will create both temporary and permanent wetland impacts.

On the east side of this bridge, a new retaining wall will be constructed to accommodate the Jackson Street extension. To construct this retaining wall, sheeting at the edge of the canal will be required. This new wall will have temporary and possibly permanent wetland impacts since the sheeting will be at the edge of the canal and fill material will be utilized behind the proposed retaining wall to achieve the proposed profile of the Jackson Street Extension.

2. Water Supply Watershed(s):

N/A

3. Storm Water Improvements/Impaired Waterbodies:

N/A

4. Priority Habitat(s):

N/A

5. Historic/Cultural/Scenic Resource(s):

N/A

6. Air Quality and Greenhouse Gases: Will the improvements impact greenhouse gases through construction methods, operational modifications, and changes in connectivity, access, or travel behavior.
● GreenDOT

N/A

7. Hazardous Materials: Is it anticipated that the proposed work will involve handling hazardous materials within the project limits or on any adjacent properties?

N/A

**F. Community Effects**

1. Identify how much right of way is anticipated to complete the project, including fee takings, permanent and temporary easements.

The construction will be completed completely within City layout. No right of way takings (temporary or permanent) are anticipated.

2. Describe how the project will improve/impact the neighborhood with respect to access to services, jobs, and public transit.

See attached EIR

3. Describe any effect the improvements will have on the existing housing stock or potential for new housing development.

See attached EIR

4. Identify any improvements that involve community planning and equitable sharing of benefits/burden or are particularly targeted within an Environmental Justice area.

The project improves connectivity between the surrounding low-income and high-minority neighborhoods, Downtown Lowell, and the Gallagher Terminal, which increases connections to transit for Environmental Justice populations.

**G. Transportation Enhancements**

1. Identify any transportation enhancements, such as pedestrians, bicyclists and transit accommodations, education; landscaping; scenic/historic acquisition, beautification, preservation, programs, or facilities; outdoor advertising management; archeological planning and research; environmental mitigation or wildlife mortality reduction efforts.

The project improves access and connectivity for all transportation modes and enhances the economic potential of the Hamilton Canal District and the Jackson/Appleton/Middlesex (JAM) area.

2. Are the proposed enhancement elements supported by the MPO?

Yes

**H. Planning and Public Outreach and Support**

1. Describe any additional Public Outreach that has occurred since the PNF was submitted. Include any public informational meetings, local mailings, workshops, planning documents, etc., where the proposed improvements were specifically presented to abutters, businesses and/or the general public. Include information on meeting dates, attendance, concerns, and support.

The entire project was conceived, reviewed, and developed as part of the Hamilton Canal District Vision Sessions, a year-long public planning process that included numerous public meetings and charrette workshops involving several hundred unique community stakeholder participants. In addition, the proposals were presented in conjunction with the public hearings associated with the approval of the attached EIR.

2. Were there any special needs that needed to be accommodated to fully engage the public with respect to public outreach?

**I. Maintenance**

1. Identify any improvements that involve particular long-term or ongoing maintenance implications.

2. Identify any improvements that will improve the environmental sustainability of the facility related to operation and maintenance.

**Thank you for completing this form. Please submit the PIF to the Regional MPO/RPA and the MassDOT Highway Division District office.**