

4.0 TRANSPORTATION

4.1 INTRODUCTION

The EENF and DEIR provided a detailed analysis of the potential transportation impacts associated with the proposed redevelopment of the Hamilton Canal District in Lowell, Massachusetts. It also identified several measures to reduce the project-related transportation impacts and enhance pedestrian accommodations and access to public transportation.

Since the filing of the DEIR, the City of Lowell has secured funding through the Growth District Initiative of the Executive Office of Housing and Economic Development, which has allowed the City of Lowell to proceed with the design of key elements of the proposed on-site and off-site roadway improvements.

This chapter provides an update on transportation related issues identified in the comments on the DEIR, the progress of transportation design, and a summary of the transportation mitigation measures to be implemented as part of the proposed redevelopment of Hamilton Canal District.

4.2 PROPOSED PEDESTRIAN ACCESS PLAN

The proposed pedestrian improvements described in the DEIR will be implemented in phases as part of the proposed intersection improvements. The proposed pedestrian improvements along the site roadways and surrounding area streets are presented in Figure 4-1. The specific parties responsible for implementing the proposed pedestrian improvements are presented in the Draft Section 61 findings and can be found in Appendix D.

4.3 COORDINATION WITH PUBLIC TRANSIT SYSTEM

As discussed in the EENF and DEIR, the project site has excellent access to public transportation with the Charles A. Gallagher Transportation Center located less than one quarter mile from the site. The Gallagher Transportation Center serves as a true intermodal transportation facility, providing access to Massachusetts Bay Transportation Authority (MBTA) commuter rail service to Boston and the Lowell Regional Transit Authority (LRTA) hub for fixed bus route service. The Robert B. Kennedy Bus Transfer Facility provides a convenient connection to the MBTA Commuter Rail and other intercity bus services such as Peter Pan, Trailways, and the Merrimack Valley Regional Transit Authority. A brief

description of the existing public transportation system as well as potential LRTA bus route modifications to enhance public transit access to the site is provided below.

MBTA COMMUTER RAIL

The existing commuter rail service between the Gallagher Terminal in Lowell and North Station in Boston consists of 21 daily inbound trains on weekdays from 5:35 AM to 10:35 PM, with half hour headways running between 5:35 AM and 9:07 AM and hourly service for the remainder of the day. Rail service to Lowell from Boston also consists of 21 daily outbound trains between the hours of 5:45 AM and 11:59 PM, with half hour service during the evening outbound commutes. Weekend and holiday service consists of eight daily inbound and outbound trains serving the same stations as the weekday service. The commuter trains also stop at North Billerica, Wilmington, Anderson Regional Transportation Center, Winchester Center, Wedgemere and West Medford.

LRTA BUS ROUTES

The LRTA provides fixed route bus service to Lowell and the surrounding communities of Chelmsford, Billerica, Tyngsboro, Dracut, and Tewksbury from its hub at the Robert B. Kennedy Bus Transfer Center, located directly adjacent to the Gallagher Terminal. The LRTA operates 18 bus routes, including the express shuttle that provides 10-minute service between Merrimack Street and John Street in Downtown Lowell and the Kennedy Bus Transfer Center. Nine routes (excluding the Express Shuttle) operate within the City of Lowell exclusively, three routes service the town of Chelmsford and single routes cover the Towns of Billerica, Dracut/Tyngsborough (combined), Tewksbury, Andover, and Burlington. The LRTA provides bus service on weekdays from 6:00 AM to 6:00 PM and on Saturday from 7:30 AM to 5:30 PM, with no service on Sundays and holidays.

LRTA Routes 1, 2, 6, 7, 8, and 10 pass by the site via Dutton Street at Broadway Street approximately every 10-15 minutes. The LRTA Routes 12 and 18 (Express Shuttle) travel along Middlesex Street near the site, each hour. The LRTA Bus Routes in the vicinity of the project site are shown in Figure 4-2.

LRTA BUS ROUTE ALTERNATIVES

As discussed in the DEIR, the proposed extension of Jackson Street to create a new four-way intersection with Thorndike Street/Dutton Street and Fletcher Street, and the proposed extension of Revere Street from Jackson Street to Appleton Street coupled with the proposed on-site circulation roadways will provide opportunities for new bus routes through the District.

The project proponent met with the LRTA Administrator and representatives of the Northern Middlesex Council of Governments (NMCOG) responsible for LRTA bus route planning to discuss opportunities to enhance bus service to the project site. One

option discussed was potential modification of the existing LRTA Bus Route 18 Downtown Shuttle. The existing LRTA Bus Route 18 Downtown Shuttle outbound route currently travels along Thorndike Street, under the Lord Overpass and continues along Dutton Street to the intersection of Broadway Street, before making its first stop on Dutton Street east of Broadway. This section of Thorndike Street and Dutton Street provide little opportunity for bus stops due to grade differences and lack of sidewalks under the Lord Overpass. One alternative that LRTA would be willing to consider would be to redirect the Route 18 Downtown Shuttle outbound route through the Hamilton Canal District by traveling up onto the Lord Overpass making a right turn onto either Appleton Street or Middlesex Street connecting to Revere Street and the new Revere Street Bridge through the site and reconnecting to the existing bus route at the intersection of Dutton Street and Broadway Street. In addition, the LRTA Route 18 Downtown Shuttle, inbound route travels on Middlesex Street through the Lord Overpass and back onto Thorndike Street on route back to the Gallagher Terminal. The inbound route could be modified to provide enhanced access to the district by turning right from Middlesex Street onto Revere Street and the left onto Jackson Street Extension and then left again onto Thorndike Street, taking advantage of the proposed four-way intersection of Thorndike Street/Dutton Street Fletcher Street and Jackson Street Extension. These potential route modifications would provide a direct connection to the Hamilton Canal District, Gallagher Terminal, and Downtown Lowell. The potential LRTA Route 18 Downtown Shuttle route modifications are shown in Figure 4-3.

LRTA agreed to review these and other potential route alternatives at the appropriate stage of redevelopment within the Hamilton Canal District.

4.3.1 TROLLEY EXPANSION UPDATE

The project proponent is committed to working with the Lowell National Park Service and the Lowell Plan to bring expanded trolley service to Downtown Lowell. As discussed in the DEIR, the proponent has already committed to accommodating a 14 foot wide dedicated right-of-way through the Hamilton Canal District to allow for a future trolley connection between the existing trolley line terminus on Dutton Street and the Gallagher Transportation Center.

Since the filing of the DEIR, the proponent has also entered into an agreement with the National Park Service and the Lowell Plan to proceed with the next phase of the Trolley expansion planning study. The consulting firm, Trans Systems, Inc., has been selected to head the new study and public outreach initiatives. The study will identify the preferred trolley route linking the existing historic trolley line to the Gallagher Terminal as well as additional trolley service routes throughout Lowell, recommend the type of equipment and other capital requirements to support the expanded trolley

service, and perform a financial feasibility study to evaluate funding opportunities for the capital and operating costs associated with the expanded trolley service.

4.3.2 TRANSPORTATION DEMAND MANAGEMENT

The proponent will develop a Traffic Demand Management (TDM) program to reduce single-occupancy vehicle (SOV) trips to and from the site and encourage the use of alternative modes of transportation. A discussion of the specific measures to be implemented as part of the TDM is presented below.

TRANSPORTATION MANAGEMENT ASSOCIATION (TMA)

The proponent will organize the Hamilton Canal District Transportation Management Association (TMA) to help existing and future area employers to develop and implement incentives that reduce traffic and trips to the worksite. The proponent will encourage all local area business to participate in the Hamilton Canal District TMA to take advantage of a centralized coordinator for making and implementing incentives on an employer's behalf for a reasonable administrative fee.

ON-SITE TRANSPORTATION COORDINATOR

The proponent will encourage future commercial tenants to designate an on-site transportation coordinator to coordinate employee ride-share and carpool programs for the District to reduce vehicle trips to the site. In addition, the coordinator will also monitor truck deliveries.

CARPOOL PROGRAM/PREFERRED PARKING

The proponent will encourage future commercial tenants to provide preferred parking for employees who carpool. As the demand for carpool spaces increases, additional spaces will be provided to encourage additional users.

RIDESHARE-MATCHING PROGRAM

The proponent will encourage future commercial tenants to establish a ride share-matching program to match employees in carpools and/or vanpools. The proponent also could enlist the services of a third party provider to carry out this program.

BICYCLE RACKS

The proponent will provide bicycle racks in secure, sheltered areas on the project site to encourage bicycle use among employees and potential customers. The proponent will also encourage future commercial tenants to install adequate locker room/shower facilities and secure bicycle storage suitable for the various building uses on site to increase bicycle use.

GUARANTEED RIDE HOME PROGRAM

The proponent will encourage future commercial tenants to establish an emergency ride home program for all project employees traveling by carpools/vanpools.

COMMUTER TAX BENEFIT PROGRAM

The proponent will encourage future commercial tenants to provide a Commuter Tax Benefit Program to their employees. This transportation tax benefit program encourages employees to take transit or van pools to work. This program has the added benefit of decreasing taxes for employers and employees.

LOWELL REGIONAL TRANSIT AUTHORITY BUS ROUTES

The proposed extension of Jackson Street to create a new four-way intersection with Thorndike Street/Dutton Street and Fletcher Street, and the proposed extension of Revere Street from Jackson Street to Appleton Street coupled with the proposed on-site circulation roadways will provide new connections through the District. The proponent will explore opportunities with the LRTA to modify existing bus routes and/or provide new buses routes that take advantage of these new roadway connections to enhance access to the public transportation system. As part of this effort, the proponent will also work with LRTA to explore the feasibility of providing new bus stops at the intersection of Dutton Street and Broadway and the intersection of Jackson Street and Revere Street, directly adjacent to the site.

TDM PROGRAM IMPLEMENTATION

The proponent will encourage its tenants to participate in the following transportation demand management measures: provide preferred parking for employees who carpool, implement a rideshare matching program, create a guaranteed ride home program and designate an on-site transportation coordinator.

However, to require tenants to implement these measures as a part a lease agreement is not commercially viable for this project. The commercial space in the Hamilton Canal District will be in direct competition with suburban commercial developments that do not place these requirements upon its tenants. Requiring specific transportation demand measures in leases will put the commercial space in the HDC at a severe disadvantage and will ultimately impact the financial feasibility of the project.

By working with the Lowell Plan and the National Park Service, and incorporating a trolley route into the master plan, the proponent is proactively working to bring trolley service directly through the Hamilton Canal District, which will have a lasting effect on reducing the project's site generated trips. Additionally, the proponent will reach out to the Lowell Plan to play a leadership role in a Transportation Management Association. The project will also commit to providing at least one parking space in the on-site parking garage for a third party vendor, such as ZipCar, to contribute to the

reduction of the project's site trip generation. Finally, the project's proximity to the Gallagher Terminal/MBTA commuter rail station and several bus lines facilitate the use of public transportation. The proponent will also work with the LRTA to modify existing Downtown Shuttle to better serve the project site.

4.4 CITY OF LOWELL DESIGN OF TRANSPORTATION IMPROVEMENTS

Since the filing of the DEIR, the City of Lowell has secured funding through the Commonwealth's Executive Office of Housing and Economic Development Growth District Initiative Program and has proceeded with the design of the key aspects of the on-site and off-site roadway improvements identified in the DEIR.

As part of this effort, the City's design consultant, Vanasse Hangen Brustlin, Inc. (VHB) has conducted a review of the proposed improvements at the proposed four-way intersection of Thorndike Street/Dutton Street/Fletcher Street and Jackson Street Extension intersection to determine what modifications could be made to further minimize the environmental and construction impacts associated with proposed improvement. The current design preserves the key pedestrian and vehicular circulation patterns requested by the Lowell residents in the public review of the project while eliminating the need to reconstruct the Middlesex Street Bridge, by reducing the proposed roadway cross section on Thorndike Street at the new four-way intersection.

VHB prepared a brief technical memorandum (dated March 12, 2009) outlining the analysis methodology and results of the comparative intersection capacity analysis for the currently proposed improvements. A copy of the VHB memorandum is provided in Appendix I Transportation of this report. It is anticipated that a more detailed evaluation will be provided in the functional design reports to be submitted to MassHighway as part of the final design review process. A brief description of the proposed modifications to the previously proposed mitigation measures by the City design consultant is presented below.

4.4.1 THORNDIKE/DUTTON/FLECHTER/JACKSON ST INTERSECTION

As currently proposed, the intersection of Thorndike Street/Dutton Street and Fletcher Street would be reconstructed to create a new four-way intersection, with the proposed Jackson Street Extension forming the fourth-leg of the intersection. The Thorndike Street northbound approach will be widened and realigned to provide two-left-turn lanes and a single through travel lane. A second northbound through travel lane will also be provided for vehicles coming down from the Lord Overpass. This same on-ramp will also provide a separate spur providing a connection to the proposed Jackson Street Extension. The Thorndike Street/Dutton Street southbound approach should be reconstructed to provide two through travel lanes, with a wide

pedestrian refuge island. The Fletcher Street eastbound approach will be reconstructed to provide a separate right-turn lane and a through travel lane. The proposed Jackson Street Extension will form the westbound intersection approach and will be constructed to provide a separate left-turn lane and a shared through right-turn lane. The final design of this improvement will seek to minimize the increased roadway cross section over the Pawtucket Canal. The conceptual intersection layout is presented in Figure 4-4, Conceptual Intersection Improvement Thorndike St. /Dutton St. and Fletcher St. /Jackson St.

4.4.2 LORD OVERPASS

As discussed in the DEIR, 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. 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 conceptual improvements at the Lord Overpass presented in the DEIR had been modified in response to comments from the area residents and businesses to preserve the function of the Chelmsford Street Bridge and the Middlesex Street Bridge. Since the filing of the DEIR, the City of Lowell has secured funding through the Commonwealth's Executive Office of Housing and Economic Development Growth District Initiative Program and has proceeded with the design of the on-site and site roadway improvements. As part of this effort, the proposed four-way intersection of Thorndike Street/Dutton Street/Fletcher Street and Jackson Street Extension has been redesigned to eliminate the need to reconstruct the Middlesex Street Bridge, by reducing the proposed Thorndike Street roadway cross section under the Lord Overpass. Consequently, the currently proposed modifications to the Lord Overpass would maintain the use of the existing Chelmsford Street Bridge and the Middlesex Street Bridge. The conceptual intersection layout is presented in Figure 4-5.

4.5 MITIGATION

The following section describes the proponent's commitment to traffic mitigation measures to improve traffic flow in the study area and provide safe and efficient access to the project site. The capacity analysis indicates that the projected traffic increases associated with general area traffic growth and new traffic associated with the future Full Build out of the Hamilton Canal District can be accommodated on the surrounding roadways with no

significant impact on future traffic operations, provided that the proposed site access and off-site roadway improvements are implemented.

The project proponent is committed to developing a comprehensive mitigation program to enhance future traffic operations and safety in the vicinity of the site. The proponent will also advocate for developing a Transportation Management Association to reduce single-occupancy-vehicle (SOV) trips and encourage the use of alternative transportation modes to minimize peak-hour traffic demand. The proponent will continue to engage the Northern Middlesex Council of Governments (NMCOG), the Lowell Regional Transit Authority (LRTA), and the Middlesex Valley Transit Authority (MVTA) on this issue. A summary of the traffic mitigation measures recommended as part of the proposed project is presented below.

4.5.1 HAMILTON CANAL DISTRICT ACCESS IMPROVEMENTS

The City of Lowell had previously identified several potential roadway improvements to enhance access to the Hamilton Canal District as part of JAM Plan in March of 2000. As part of this effort, the City converted Middlesex Street to two-way operations requiring improvements at the intersections of Middlesex Street and the Lord Overpass and Middlesex Street and Gorham Street.

REVERE STREET EXTENSION

The City had also identified the potential benefit of extending Revere Street to create a new roadway connection between Middlesex Street and Appleton Street. This new roadway would require acquisition of private property. The proposed alignment of the new Revere Street Extension was included in the Middlesex Street/Lord Overpass and Middlesex Street Two-Way Traffic plans (dated May, 2006) prepared by Waterfield Design Group, Inc. However, the Revere Street Extension improvement has not yet been constructed.

The proposed Revere Street Extension will provide an important connection between Middlesex Street and Appleton Street and will help reduce the project's impacts at the Lord Overpass. The proponent recommends the Revere Street Extension between Appleton Street and Middlesex Street be constructed within a proposed 60-foot right of way to provide one 11-foot travel lane per direction with eight-foot sidewalks on both sides of the street. The proposed 60-foot right-of-way will also accommodate a future 14-foot right-of-way for the trolley line expansion.

JACKSON STREET EXTENSION

The proposed extension of Jackson Street to create a new four way intersection with Thorndike Street/Dutton Street and Fletcher Street was developed in response to comments raised during the public planning process for Hamilton Canal District. The proposed Jackson Street Extension will address a long standing circulation and access concern for the Fletcher Street neighborhoods. It will allow both pedestrians and

vehicles approaching the district from the Lower Highlands neighborhood to have a direct connection to the Hamilton Canal District and Downtown Lowell. It will also provide critical access to the Hamilton Canal District, resulting in reduced traffic impacts at the Broadway and Dutton Street intersection and the Lord Overpass. The proposed Jackson Street connection allows traffic to bypass these intersections to gain direct access to Thorndike Street. It will also provide enhanced access to the new public parking garage and proposed Lowell Trial Court site, both of which are located on Jackson Street.

4.5.2 PROPOSED INTERSECTION IMPROVEMENTS

In addition to the proposed Hamilton Canal District access improvements, the following off-site improvements are proposed as part of the proposed project. A description of the specific proposed traffic mitigation measures to be implemented at each of the impacted intersections is presented below.

THORNDIKE ST/DUTTON ST AND FLETCHER ST/JACKSON ST EXTENSION

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 currently accommodate pedestrian crossings of Thorndike and Dutton streets.

The proponent proposes the reconstruction of the intersection to create a new four-way intersection, with the proposed Jackson Street Extension forming the fourth-leg of the intersection. The Thorndike Street northbound approach will be widened and realigned to provide two-left-turn lanes and a single through travel lane. A second northbound through travel lane will also be provided for vehicles coming down from the Lord Overpass. This same on-ramp will also provide a separate spur providing a connection to the proposed Jackson Street Extension. The Thorndike Street/Dutton Street southbound approach will be reconstructed to provide two through travel lanes, with a wide pedestrian refuge island. The Fletcher Street eastbound approach will be reconstructed to provide a separate right-turn lane and a through travel lane. The proposed Jackson Street Extension will form the westbound intersection approach and will be constructed to provide a separate left-turn lane and a shared through right-turn lane. The final design of this improvement will seek to minimize the increased roadway cross section over the Pawtucket Canal. The conceptual intersection layout was presented previously in Figure 4-4, Conceptual Intersection Improvement Thorndike St. /Dutton St. and Fletcher St. /Jackson St.

A portion of the proposed improvements at this location are located within the MassHighway layout and will require plan review and permits from MassHighway.

CHELMSFORD STREET AND WESTFORD STREET

Concurrent with the proposed Hamilton Canal District development, the proponent recommends the Westford Street intersection approach be re-striped to provide a separate left-turn lane and one general purpose lane to allow a double left-turn movement from Westford Street onto Chelmsford Street. In addition, the traffic signal timings and phasing will be modified to optimize traffic flow. The conceptual improvement for the intersection of Chelmsford Street and Westford Street is presented in Figure 4-6.

A portion of the proposed improvements at this location are located within the MassHighway layout and will require plan review and permits from MassHighway.

THORNDIKE STREET AND THE GALLAGHER TRANSPORTATION CENTER DRIVEWAY

Concurrent with the proposed Hamilton Canal District development, the proponent recommends the Thorndike Street northbound approach be widened and re-striped to provide a separate left-turn lane (into the Gallagher Transportation Center) and two through travel lanes. In addition, the traffic signal timings and phasing will be modified to optimize traffic flow. The conceptual improvement for the intersection of Thorndike Street and Gallagher Transportation Center Driveway is presented in Figure 4-7.

The recommended improvement will require additional right-of-way along the South Common Park. The proposed roadway widening and associated right-of-way alterations are presented in Figure 4-8. The proponent will work with the City of Lowell to secure the right-of-way as part of the final design of this improvement. A portion of the proposed improvements at this location are located within the MassHighway layout and will require plan review and permits from MassHighway.

REVERE STREET AND JACKSON STREET (UNSIGNALIZED)

The proponent proposes the intersection be reconstructed to provide a separate left-turn lane and shared through/right-turn lane on the Jackson Street Eastbound approach under all-way stop sign control. The proposed intersection improvements will be tied into the proposed reconstruction of the Revere Street Bridge over the Hamilton Canal and the proposed Hamilton Canal Walk pedestrian improvements. The conceptual improvement to Revere Street and Jackson Street are presented in Figure 4-9.

REVERE STREET/REVERE STREET EXTENSION AND MIDDLESEX STREET (UNSIGNALIZED)

The proposed Revere Street Extension will convert the existing three-way intersection into a new four-way intersection, with Revere Street Extension forming the fourth leg of the intersection. As part of the proposed project, the proponent proposes Middlesex Street eastbound and westbound approaches be re-striped to provide a separate left-turn lane and through/right-turn lane, under a two-way stop control. The conceptual improvement is illustrated in Figure 4-9.

REVERE STREET EXTENSION AND APPLETON STREET (UNSIGNALIZED)

The proposed Revere Street Extension will create a new three-way, T type intersection with Appleton Street. The proponent proposes the intersection be constructed to provide a single lane on the Revere Street Extension southbound approach under stop sign control and that the Appleton Street eastbound approach be re-stripped to provide a separate left-turn lane and through travel lane. The proposed improvement is presented in Figure 4-9.

SOUTH STREET AND APPLETON STREET

The proponent proposes geometric and traffic control improvements be made to address the existing and projected traffic operational deficiencies at this intersection. As part of this effort, the proponent proposes the Appleton Street eastbound and westbound intersection approaches be re-stripped to provide a separate right-turn lane and a shared left-turn/through lane and a new traffic signal be installed. The conceptual improvements to the intersection of South Street and Appleton Street are presented in Figure 4-10.

SOUTH STREET AND MIDDLESEX STREET (UNSIGNALIZED)

The proponent proposes the South Street northbound approach be re-stripped to provide separate left-turn and right-turn lanes and the Middlesex Street westbound approach be re-stripped to provide a separate left-turn lane and through travel lane. The conceptual intersection improvement is presented in Figure 4-10.

DUTTON STREET AND BROADWAY STREET

The proponent proposes the Broadway Street eastbound and westbound approaches be re-stripped to provide a separate left-turn lane and shared through right-turn lanes. In addition, the traffic signal timings and phasing should be modified to optimize traffic flow. To accommodate the additional lane geometry on the Broadway Street Extension westbound approach, the existing sidewalk on the bridge over the Merrimack Canal Bridge will be removed to accommodate proposed increased pavement width. As part of this effort, new six-foot wide sidewalks would be constructed on both sides of the existing Merrimack Canal Bridge. The conceptual improvements for the intersection of Dutton Street and Broadway Street/Broadway Street Extension are presented in Figure 4-11.

DUTTON STREET AND MARKET STREET

The proponent proposes the Market Street eastbound approach be re-stripped to provide a shared left-turn/through travel lane and a shared through/right-turn lane and the Dutton Street southbound approach be re-stripped to provide a shared left-turn/through travel lane and shared through right-turn lane. In addition, the existing traffic signal timings and phasing should be modified to optimize traffic flow. The conceptual intersection improvement for Dutton Street and Market Street is presented in Figure 4-12.

BROADWAY AND FLETCHER STREET

The proponent proposes the Broadway Street eastbound approach to be re-stripped to provide a separate left-turn lane and shared through right-turn lane to match the existing lane geometry on the Broadway westbound approach, the northbound and southbound Fletcher Street approaches be re-stripped to provide a separate left-turn lane and shared through right-turn lane and the traffic signal timing be modified to optimize traffic flow. The conceptual intersection improvement is presented in Figure 4-13.

MERRIMACK STREET, BRIDGE STREET AND PRESCOTT STREET

The proponent proposes the Merrimack Street westbound approach be re-stripped to provide two (2) through travel lanes. In addition, the traffic signal timings should be modified and coordinated with the adjacent signalized intersections of Merrimack Street at Central Street, and Central Street at Prescott Street. The conceptual intersection improvements for the Merrimack Street, Bridge Street, and Prescott Street are presented in Figure 4-14.

CHURCH STREET AND LAWRENCE STREET

The proponent proposes geometric and traffic control improvements be provided to address the existing and projected traffic operational deficiencies at this intersection. As part of this effort the proponent proposes that the Church Street westbound be re-stripped to provide a separate left-turn lane and a shared through travel lane. The Church Street eastbound approach would be restriped to provide a through travel lane and a separate right-turn lane. The conceptual improvements for the intersection of Church Street and Lawrence Street are presented Figure 4-15.

GORHAM STREET AND THE LOWELL CONNECTOR

The intersection of Gorham Street and Lowell Connector currently provides two turn left movements from the Lowell Connector onto Gorham Street merging into one northbound receiving lane immediately north of intersection. The proponent recommends Gorham Street be re-stripped to provide two northbound travel lanes and one southbound travel lane between the Lowell Connector to South Street to address the existing traffic operational deficiency and improvement traffic flow efficiency and traffic safety at the intersection. The conceptual intersection improvement is illustrated in Figure 4-16.

A portion of the proposed improvements at this location are located within the MassHighway Layout and will require plan review and permits from MassHighway.

GORHAM STREET AND HIGHLAND STREET/ELM STREET

The proponent proposes Gorham Street northbound and southbound intersections approach at Elm Street be re-stripped to provide a separate left-turn lane and one shared right-turn/through lane per direction and traffic signal timings be modified to

optimize traffic flow. The conceptual intersection improvement is shown in Figure 4-16.

GORHAM STREET AND SOUTH STREET (UNSIGNALIZED)

The proponent proposes the South Street southbound intersection approach be re-striped to allow for right-turn movements only under yield sign control. This will significantly reduce the commuter peak hour delays associated with vehicles attempting to turn left on to Gorham Street or cross the intersection onto Walnut Street. This conceptual intersection improvement is shown in Figure 4-16.

ROGERS STREET/WAMESIT STREET AND LAWRENCE STREET

Lawrence Street intersects Rogers Street, Abbott Street, and Wamesit Street to form a five legged intersection under traffic signal control. The existing five legged intersection and approach alignments results in inefficient traffic operations results in long vehicle delays during the weekday evening commuter peak hour, despite relatively modest traffic flows. The limited available right-of-way, with developed properties on all five corners of the intersection, precludes lane geometry or intersection approach realignment improvements from addressing the existing traffic operational deficiencies at this location.

The proponent will work with the City of Lowell to develop measures to improve traffic operations at this intersection.

4.5.3 PEDESTRIAN ACCESS IMPROVEMENTS

In addition to the proposed pedestrian pathways that should be implemented as part of the proposed intersection improvements, the proponent believes excellent pedestrian accommodations should be made and enhanced between the Hamilton Canal District and the surrounding neighborhoods including Downtown Lowell and the Gallagher Transportation Center. The proposed pedestrian improvements along the site roadways and surrounding area streets are presented in Figure 4-1 and described below.

PROPOSED SITE ROADWAYS AND BRIDGES

Sidewalks, canal walks, and other pedestrian accommodations should be provided along the project site roadways and bridges. Street lighting should be provided at along public walks and plaza through the site and intersecting streets.

HAMILTON CANAL BRIDGES

One of the existing pedestrian bridges over the Hamilton Canal connecting Jackson Street with the Appleton Mills building will be refurbished to provide public access to a new pedestrian courtyard on the north side of the Appleton Mills building. The other will be restored as a historic remnant. The existing vehicular bridge will be widened to provide two-way traffic flow with six foot wide sidewalks on both sides of

the bridge and a 14-foot dedicated right-of-way for a future trolley connection through the site.

LOWER PAWTUCKET CANAL BRIDGES

A new pedestrian and vehicle bridge should be constructed over the Lower Pawtucket Canal, connecting the northern and southern site peninsulas with six-foot sidewalks on both sides of the bridge.

The existing Swamps Locks Bridge should also be reconstructed to provide six-foot wide sidewalks on both sides of the new bridge as well as a 14-foot dedicated right-of-way for future trolley connection through the site.

MERRIMACK CANAL BRIDGE

The proponent recommends the addition of two new six-foot sidewalks on both sides of the existing bridge.

JACKSON STREET SIDEWALK

The proponent recommends the construction of a new eight-foot sidewalk on the north side of Jackson Street from Marston Street to Center Street. The proposed sidewalk will connect to the proposed Hamilton Canal Walk, as designed by the Lowell National Historic Park. This new sidewalk along the north side of Jackson Street will complete the pedestrian connection from the Revere Street Bridge to Central Street.

THORNDIKE STREET NORTHBOUND ON RAMP SIDEWALK

The proponent recommends the construction of a new eight-foot sidewalk on the east side of the Thorndike Street Northbound on ramp from Middlesex Street to the Proposed Jackson Street Extension.

4.5.4 PHASE ONE PROPOSED IMPROVEMENTS

The proposed Hamilton Canal Phase One development will have a negligible impact on future traffic operations at the study area intersections through the projected 2012 Phase One Build peak hour traffic conditions. However, the project proponent has identified measures to address existing traffic operational deficiencies as part of the proposed Phase One Development. The proposed Phase One roadway improvements are described in the following section of this report.

LORD OVERPASS PHASE ONE IMPROVEMENTS

As discussed in previous sections of this report, the Lord Overpass currently experiences significant delays during the commuter peak hours, with long vehicle queues on the Middlesex Street westbound approach. Independent of the proposed Hamilton Canal Development, the delays at the Lord Overpass will increase due to traffic increases associated with general area background traffic growth. The

intersection capacity analysis indicates that there are short term improvements that could be implemented at the Lord Overpass to improve traffic flow. The suggested short-term improvements include widening and restriping the Middlesex Street westbound approach to provide two westbound through travel lanes through the Lord Overpass, and retiming the existing traffic signals to optimize traffic flow. The proponent proposes the implementation of these short-term traffic improvements as part of the Phase One of the Hamilton Canal District development. The conceptual Phase One traffic improvement is presented in Figure 4-17.

Upon implementation of the proposed roadway improvements, the Phase One development traffic can be accommodated on the surrounding area roadways with no noticeable impact on future traffic operations.

REVERE STREET BRIDGE

The existing Revere Street Bridge over the Hamilton Canal cannot accommodate the anticipated construction vehicles and equipment needed to complete the Phase One Development. As part of the Phase One development, a new temporary, two-lane, two-way bridge will be constructed over the Hamilton Canal approximately 30-feet east of the existing Revere Street bridge. The Existing Revere Street Bridge will then be demolished and replaced with a new permanent two-lane, two-way bridge. The new permanent bridge will include eight-foot sidewalks on both sides of the bridge and provide an additional 14-foot wide right-of-way to accommodate the future trolley.

NEW SITE ROADWAYS

As part of the Phase One development, a new site roadway will be constructed to serve the Phase One development. Revere Street will be extended over the new Revere Street Bridge to provide access to the mill yard on the southern peninsula of the Hamilton Canal District. The new, 22-foot wide, two-lane, two-way roadway will continue north from the Revere Street Bridge for a distance of approximately 200 feet and then turn eastward for a distance of 500 feet. The roadway will include sidewalks on both sides of the street and a 14-foot right-of-way for the future trolley on the 200-foot segment.

HAMILTON CANALWALK/JACKSON STREET SIDEWALK

To further enhance pedestrian accommodations for Phase One of the Hamilton Canal District, the proponent is coordinating with the City and NPS to schedule their construction of a portion of the planned Hamilton Canalwalk, located on the north side of Jackson Street, from the new Revere Street Bridge to Marston Street, along with, a new sidewalk to be constructed on the north side of Jackson Street from Marston Street to Central Street to complete the pedestrian connection to downtown Lowell.