



PlanLMRC
Brownfields Area-Wide Plan
April 2017



GROUNDWORK
Lawrence

Acknowledgements

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Abel Vargas – Director of Business & Economic Development

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1 INTRODUCTION



View of Steven's Pond and the Spicket River at the northern end of the corridor.

Introduction

The Lawrence Manchester Rail Corridor (LMRC) right-of-way consists of approximately 13 acres of former rail yards along a 1.5 mile long linear open space adjacent to Lawrence's Broadway commercial corridor and the lower Tower Hill neighborhood. The corridor begins on the south side of the City at Merrimack Street and extends northward where it links with Manchester Street Park, the Methuen Rail Trail, the Spicket River Greenway, and the Arlington Mill District. The rail corridor is a great resource with gorgeous views of the Spicket River and mill buildings at the north end and equally beautiful views of the Merrimack River and mill buildings at the southern end.

The LMRC represents a significant opportunity for the creation of a multi-use linear park that serves as the southern anchor of a 30 mile Rail Trail to Manchester, NH. The dramatic rail crossing over the Merrimack River provides important physical and symbolic connections between the north and south sides of the city and links the path to the planned Riverwalk Path on the south side of the Merrimack River.

At the same time, the LMRC represents a unique opportunity for a land poor community like Lawrence to redevelop land in a densely populated part of the city. The City identified three catalyst sites for the consultant team to consider: the LMRC right-of-way, the Flametech Steel Redevelopment Block, and the Downtown Crossing Redevelopment Block. The 13 acre rail corridor, combined with 14.3 acres of land on the two redevelopment blocks, brings the total land area identified for redevelopment to 27.3 acres. A fourth site, Merrimack Paper, is part of another planning project the City undertook concurrently.

To realize the potential of this corridor the City and its partner, Groundwork Lawrence, received an EPA Brownfields Area-Wide Planning Grant and hired a consultant team to prepare a Brownfields Area-Wide Plan based on findings from a robust community outreach program. The EPA's Brownfields Area-Wide Planning Program assists communities in responding to local brownfield challenges, particularly where multiple brownfield sites are in close proximity, connected by infrastructure, and limit the economic, environmental and social prosperity of their surroundings.

This Plan seeks to realize the placemaking and healthy living opportunities as well as specific strategies and actions to advance the City's overall goals of economic development, job creation, improved quality of life, and fiscal stability.

Public Outreach

This plan has been developed with significant input from community residents, property owners and other stakeholders. Development of the plan was overseen by a Steering Committee which met a number of times over the course of the project to review project analyses, recommendations and progress. Steering Committee Members included:

- > Theresa Park – Planning Director
- > Abel Vargas – Director of Business & Economic Development
- > Jim Barnes – Community Development Director
- > Dan McCarthy – Land Use Planner
- > Brad Buschur – Project Director, Groundwork Lawrence



The May 25, 2016 Community Walk

Public Meetings

A community-wide walk through the Project Area was held to ensure that community members that weren't familiar with the rail corridor (or knew only a portion of it) had a chance to experience the potential of the corridor and to provide input on potential design and programming features at key locations within the corridor.

Three community meetings were held throughout the course of the project:

Meeting 1

The consultant team presented existing conditions information as well as precedent images of other Rail Trails, adjacent development and industrial reuse projects. Breakout groups provided an opportunity for participants to respond to the following questions:

- > How is the Corridor Used Now?
- > How would you use the trail?
- > What are important connections/destinations?
- > What amenities/programming would encourage you to use the trail?
- > What uses would you like to see on the redevelopment parcels?
- > What else do you want us to know?

Meeting 2

REDEVELOPMENT PARCELS



Presentation board with community comments from Meeting 2

The consultant team presented alternative design concepts for the trail as a whole, as well as for key locations along the trail and for the redevelopment blocks. Breakout groups encouraged participants to provide input on the concepts provided as well as to suggest other ideas.

Meeting 3

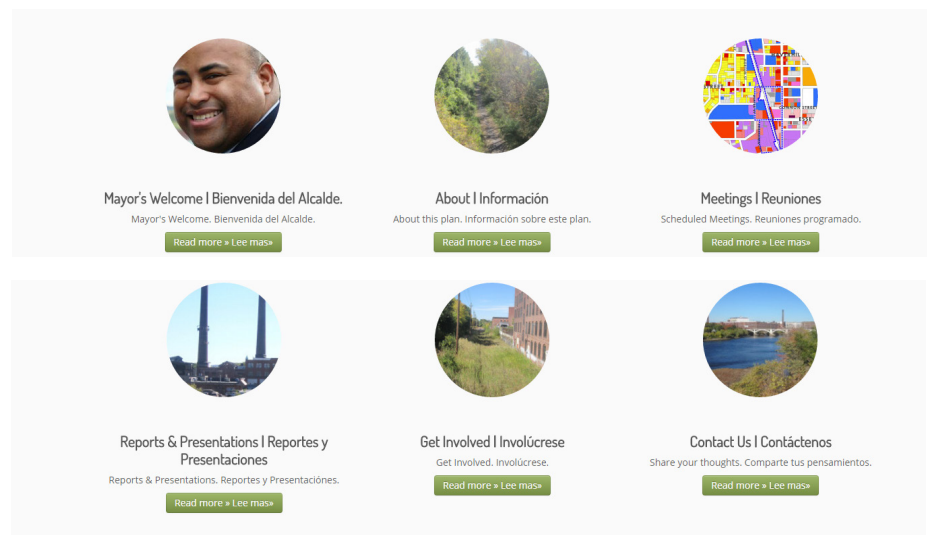
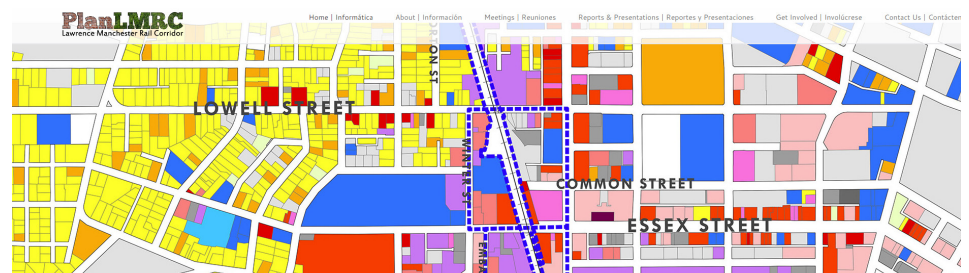
The consultant team presented a draft of the final recommendations and received comments on the plan presented.

Website

A project website was developed to display information about the project, announcements of upcoming meetings, and presentations and comments from the public meetings. Presentations and all items on the website were translated into Spanish to reach a wider audience.

Stakeholder Meetings

The consultant team met with property owners within and adjacent to the redevelopment blocks to better understand any plans which property owners might have for their properties, to gain their insight into the neighborhood, and to solicit their feedback on concept plans as they were developed.



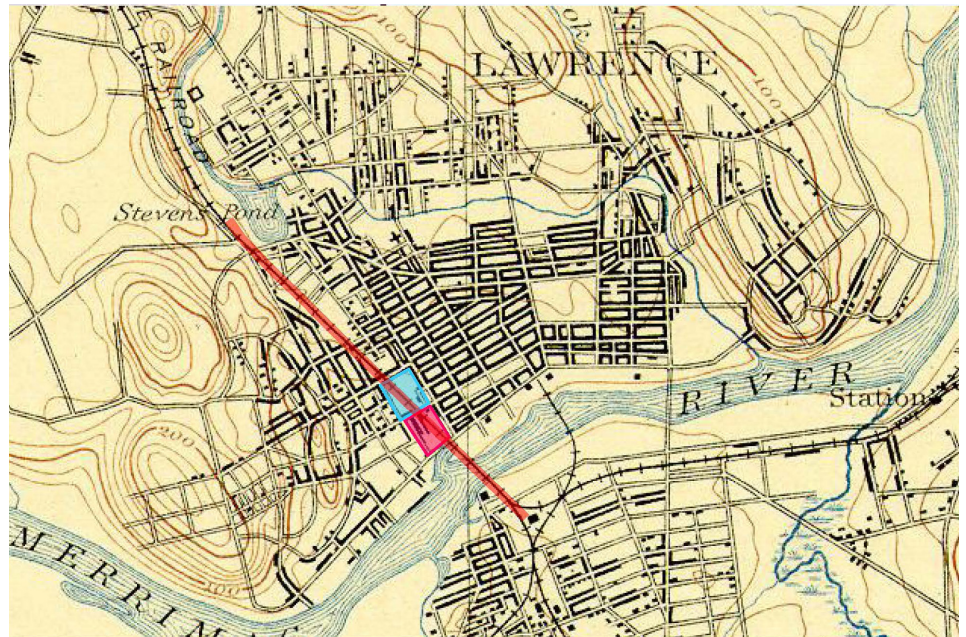
LMRC Website Front Page

The Report

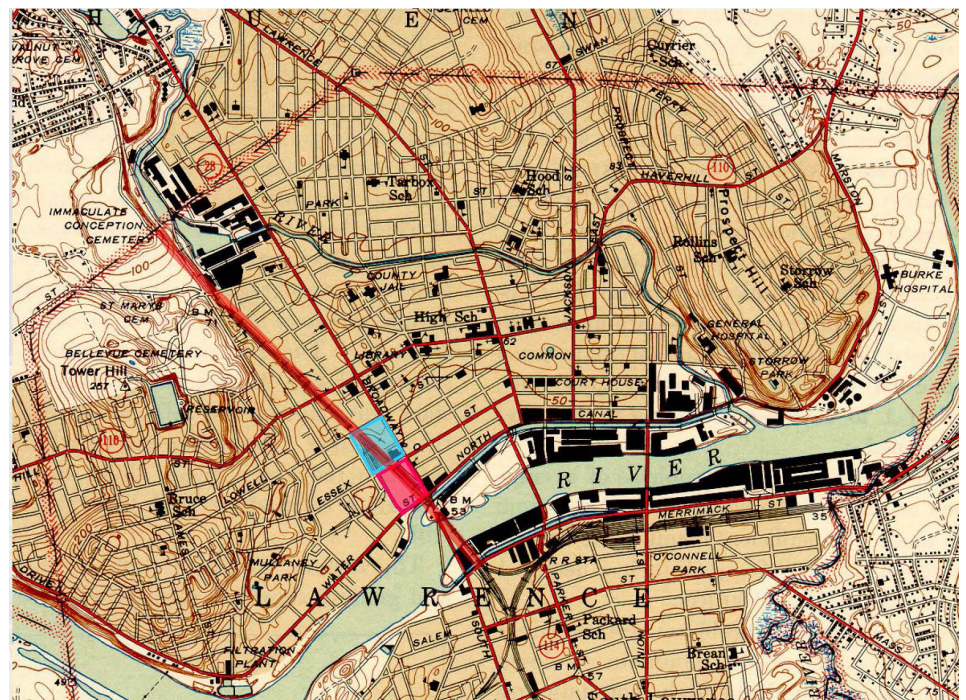
This report documents the analysis, community input, planning and design recommendations and implementation strategies for brownfields assessment, cleanup and reuse of both the rail corridor and two square blocks of adjacent underutilized industrial parcels.



Community members met with Design Team and City officials on the May 25, 2016 site walk.



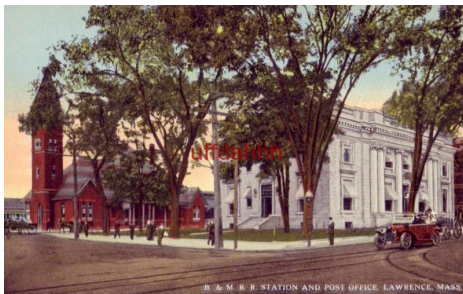
1893 USGS Map with redevelopment blocks and rail corridor highlighted



1944 USGS Map with redevelopment blocks and rail corridor highlighted

2 EXISTING CONDITIONS

Site History



The historic Post Office at the corner of Essex Street and Broadway

Akin to other Gateway Cities¹, Lawrence's built environment has been reshaped by transportation and market forces. In the late 1800s, the Lawrence Manchester Rail Corridor was the hub of downtown Lawrence. A substantial passenger terminal and post office were located at the junction of Broadway and Essex Streets.

The 1893 US Geological Survey map shows that the existing grid pattern was already in place already at that time, although Broadway didn't cross the River. The railroad was clearly the most dominant corridor. The Flametech and Downtown Crossing blocks were lined with commercial buildings, rather than the mills visible at the northern end of the corridor and in other parts of the City.

The block north of the post office had four theaters occupying one city block, locally known as Theater Row. In the early 1900s, the LMRC lost the passenger terminal. By 1944 more roadway bridges had been built, but the railroad was still very important. The western portion of the Downtown Crossing parcel was covered in rail sidings. And, although the mills are all very evident, there are no major buildings shown on either the Flametech Steel or Downtown Crossing parcels.

The post office and theaters were demolished in the 1970s as part of an Urban Renewal Plan.

The Massachusetts Bay Transportation Authority acquired the LMRC in 1977 and in 2001 abandonment of freight service was completed for the corridor north of Manchester Street. A 2009 transportation study evaluated options for the expansion of transit into New Hampshire from Massachusetts and determined the LMRC had too many at grade crossings to provide efficient rail service. The study indicated a preference for other transit options such as extending the Haverhill or Lowell commuter rail lines northward, or implementing a "bus on shoulder" project on I-93.

¹Gateway Cities are midsize urban centers that anchor regional economies around the state. For generations, these communities were home to industry that offered residents good jobs and a "gateway" to the American Dream. Over the past several decades, manufacturing jobs slowly disappeared. Lacking resources and capacity to rebuild and reposition, Gateway Cities have been slow to draw new economy investment." Source: MassINC Gateway Cities Innovation Institute

This policy cleared the way for planners and community organizations in the towns along the LMRC to begin developing shared use paths along the LMRC right-of-way. The communities in New Hampshire were early adopters of this policy and have been fairly successful in removing the rail and installing Rail Trails. More recently, Methuen followed their lead and developed a crushed stone path and will begin paving in 2018. At the same time, Lawrence developed a portion of the LMRC linking Manchester Street Park and the Spicket River Greenway to the Rail Trail in Methuen at the Arlington Mill complex.

To implement this project the City entered into a 99-year lease agreement in 2012 for the reach north of Manchester Street and more recently in 2014 for the remaining right-of-way.

KEY

SCHOOL/INSTITUTION

COMMERCIAL

COMMERCIAL DISTRICT

MBTA STATION

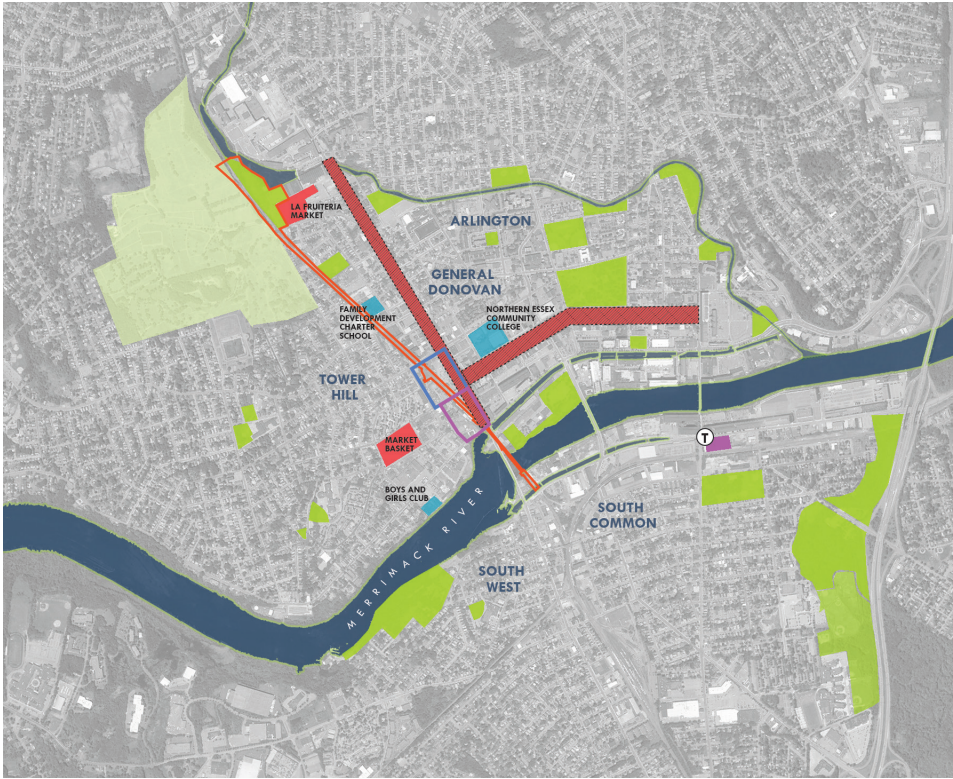
OPEN SPACE

METHUEN RAIL TRAIL

DOWNTOWN CROSSING

FLAMETECH STEEL™

MANCHESTER LAWRENCE RAIL CORRIDOR



The Project Area and surrounding area (the Rail Trail corridor is outlined in orange)

KEY

OPEN SPACE

MERRIMACK RIVER TRAIL-EXISTING

MERRIMACK RIVER TRAIL-EXISTING-ON ROAD

MERRIMACK RIVER TRAIL -PLANNED OFF-ROAD

SPICKET RIVER GREENWAY TRAIL

METHUEN RAIL TRAIL

DOWNTOWN CROSSING

FLAMETECH STEEL

MANCHESTER LAWRENCE RAIL CORRIDOR



The Project Area and surrounding open space (the Rail Trail corridor is outlined in orange)

Open Space Needs

The proposed LMRC Rail Trail will be a City-wide resource, serving both adjacent neighborhoods and residents from around the City. As documented in the 2009 Lawrence Open Space Plan, “In addition, being one of the youngest communities in the Commonwealth, demand in Lawrence for parks, open space and recreational amenities is high. The challenges of many vacant properties, abandoned alleyways, brownfield sites, and underutilized riverfront areas are opportunities for creative and innovative open space development.” While the actual rail corridor and the two redevelopment blocks have virtually no residential population, there is residential development along West, Margin and Railroad Streets adjacent to the corridor.

The population of much of the City surrounding the corridor meets three Environmental Justice criteria: income, minority population and English isolation. The City’s 2014 population of 77,364 had a median household income of \$34,496, compared to the state average of \$67,846; 26.1% of the population was below the poverty level, compared to a state average of 8.3%. Over 40% of the population was under 24 years of age, with a median age of 30.5 years; the state average was 39.4 years.

A 2011 study by the MA Dept. of Public Health analyzed the weight of students in grades 1, 4, 7 and 10. In Lawrence, 17.7% of the students were overweight and 26.9% were obese, for a total of 44.6%; statewide these numbers were 16.7% overweight and 15.7% obese, for a total of 32.3%.

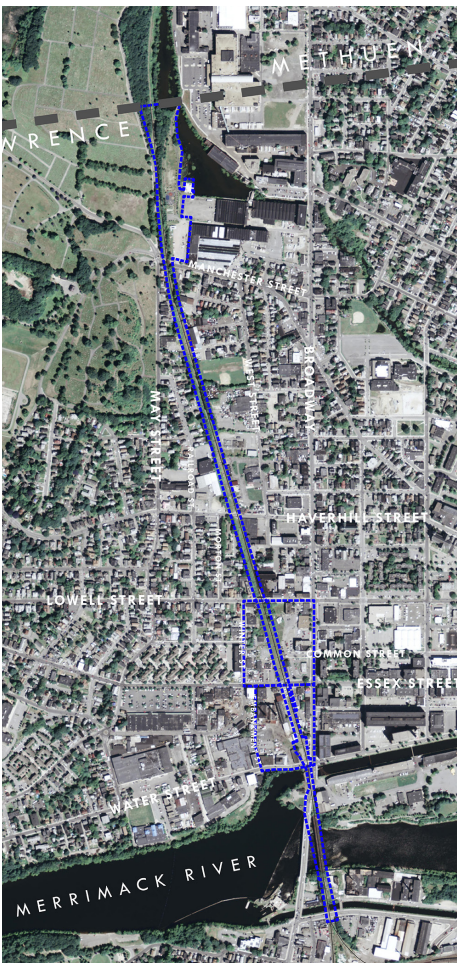
The 2009 Open Space Plan also clearly documented the need for additional parkland. At that time, Lawrence had 3.7 acres of parkland per 1,000 residents, compared to 9.3 acres of parkland per 1000 people in Boston.

Goals from the 2009 Open Space Plan supported by development of a Rail Trail and other recreational amenities on land within the LMRC Project Area include:

- > Decrease dependence and burden on the DPW by encouraging public-private partnerships to protect and maintain public space.
- > Increase activity and attendance in parks by creating and implementing more active in-parks programming.
- > Increase attendance in parks by creating and implementing more passive park elements.
- > Increase pedestrian and biking activity by encouraging walking and biking for exercise and enhancing safety and connectivity between schools, neighborhoods, and parks.
- > Reclaim vacant lots and other abandoned and under-utilized land.
- > Increase access to waterfront resources (i.e. rivers, canals) through enhancement and protection.

The Rail Corridor

The railroad corridor extends 1.4 miles from the Methuen city line on the north to Merrimack Street on the south side of the Merrimack River. It varies in width from 50 feet to 80 feet and encompasses approximately fourteen acres.

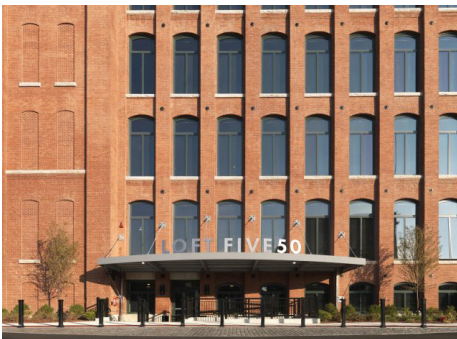


Aerial view of the rail corridor and redevelopment blocks (outlined in blue)

The two redevelopment blocks are located near the southern end of the corridor. The Flametech parcel is bounded by Water Street, Embankment Street, Essex Street and Broadway. The Downtown Crossing parcel is bounded by Essex Street, Winter Street, Lowell Street and Broadway. These blocks, described in more detail in Chapter 5, contain approximately 14 acres of developable land, bringing the acreage under consideration in the Plan to a total of 20 acres.

Ongoing Projects Around the Project Area: What is Happening NOW?

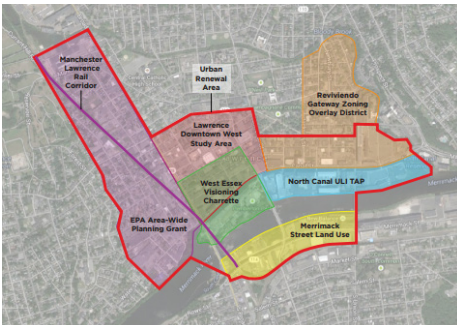
At the same time that this plan for the rail corridor was developed, there were a number of ongoing and recently completed projects within or adjacent to the project area:



Loft Five50



Manchester Street park entrance



Lawrence TBD Urban Renewal Plan area map

- > New playgrounds have been designed/are under construction at Gagnon Park, west of the Project Area and just south of Haverhill Street, and Bourgoin Park on West Street at Hubbard Place. Bourgoin Park is adjacent to the rail corridor.
- > Loft Five50 Housing includes the rehabilitation of historic mill buildings for primarily affordable rental housing at the northern end of the Project Area. This includes 75 units in Phase 1 and 62 units in Phase 2. Phase 3 is currently in design.
- > The Manchester Street Park entrance from Manchester Street and the La Fruteria Grocery Store Parking Lot are being redesigned to provide a more attractive entrance to both the park and La Fruteria. A new small plaza at the western entrance to the parking lot and a path alongside the western edge of the parking lot will provide pedestrians with a safe, attractive connection to the park from Manchester Street. A connecting sloped walk down from the elevated rail corridor will allow pedestrians on the Rail Trail to access both the park and La Fruteria, described further in Chapter 3.
- > The Family Development Charter School is planning to construct a new gym adjacent to the rail corridor. The project is being coordinated with this planning study to increase opportunities for connections from the school to the right-of-way for both recreation and education purposes.
- > Lawrence TBD is an Urban Renewal Plan encompassing downtown Lawrence and Merrimack Street from Broadway to the Duck Bridge. The recently completed Urban Renewal Plan includes both the Flametech and Downtown Crossing redevelopment blocks.
- > Merrimack Street West Land Use Study encompasses a 52-acre area, just east of the LMRC Project Area, along Merrimack Street from Broadway to South Union Street. The recently completed plan calls for development of a Live/Work/Shop/Play district with a mix of commercial, office, hotel, industrial, residential, allied health, aquaculture/agriculture and structured parking uses.

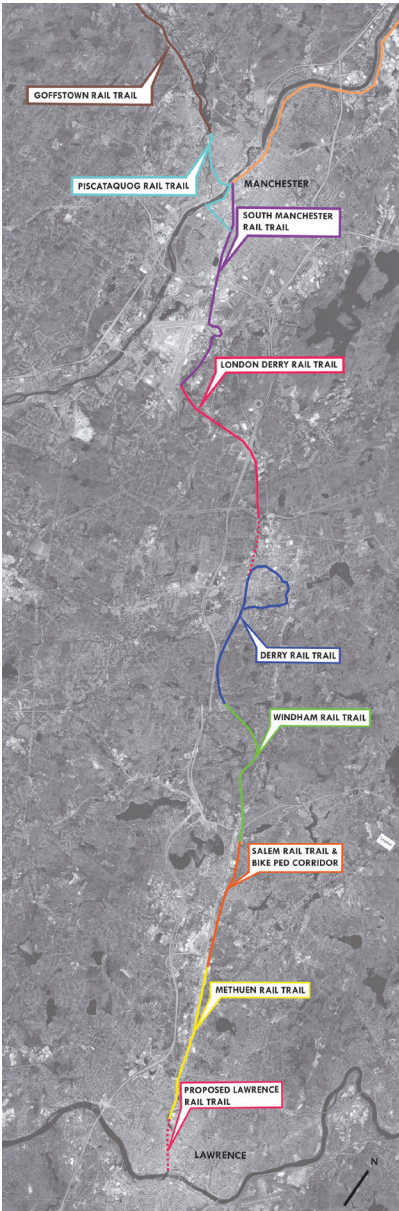
Connections

As shown on the maps on Page 8, the rail corridor provides an incredible opportunity to link to the Spicket River Greenway, the Merrimack River Greenway and Pemberton Park and the Riverfront State Park west of Downtown. This loop connects open spaces on both sides of the river and both sides of downtown, and connects north along the developing Rail Trail to Manchester, NH.

And the Rail Trail will connect residents of a number of neighborhoods to City and state parks as well as to the regional trail network. It can also connect people to major shopping corridors on Essex and Broadway, Market Basket and La Fruteria Market; to schools including the Family Development Charter School on West Street just north of Haverhill Street and the Northern Essex Community College on Common Street east of Broadway; and to the boys and Girls Club on Water Street. It can bring people closer to the Senator Patricia McGovern Transportation Center (serving both MVRTA buses MBTA commuter rail) at Merrimack and South Union Streets. The station is a little over a half mile from the southern end of the corridor.

Land Use

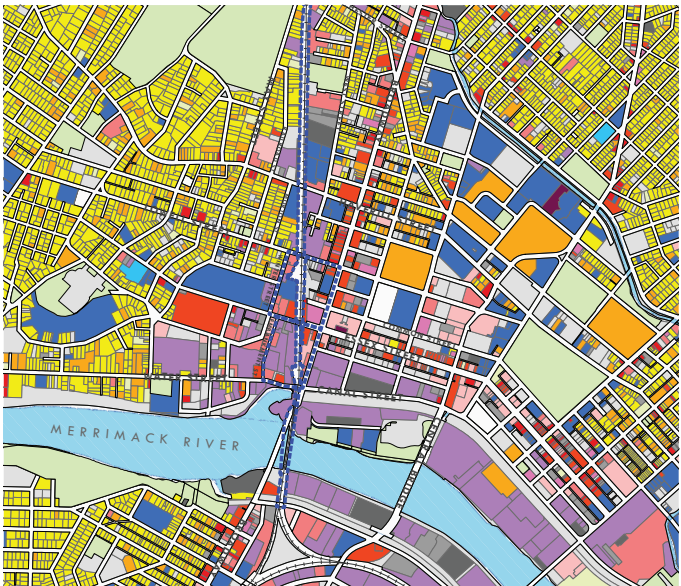
The LMRC is comprised of a nearly contiguous series of brownfields that run through the heart of the project area. As seen on the land use map below, the project corridor includes primarily industrial, institutional and vacant land. The LMRC Project Area is bordered on the east by the Broadway commercial corridor, a predominantly Spanish-speaking business district with small retail, service and fast food establishments as well as numerous auto-related uses. There are also a few larger commercial uses such as CVS and Walgreens. Institutional uses include the Daybreak Shelter on Winter Street and the Oasis Community Center (an adult day health center) on Broadway, both located on the Downtown Crossing redevelopment block; the Family Development Charter School is adjacent to the rail corridor. In addition to the uses described on Broadway, uses within the development blocks include a steel fabrication facility, auto related businesses–



Existing regional Rail Trail network to Manchester, NH

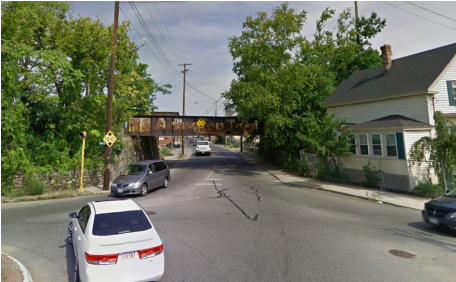
LEGEND

RESIDENTIAL	MULTI-FAMILY RESIDENTIAL	RETAIL	RETAIL- AUTO
FOOD & BEVERAGE	ENTERTAINMENT	OFFICE	COMMERCIAL
HOSPITALITY & CARE	INSTITUTIONAL & PUBLIC SERVICE	OPEN SPACE	INDUSTRIAL & MANUFACT.
UTILITY	PARKING	VACANT	OTHER

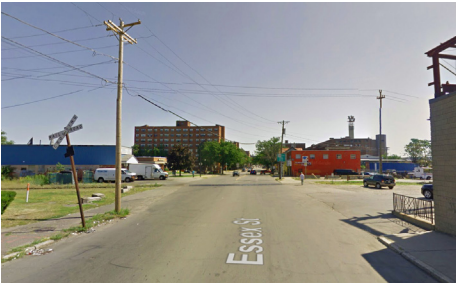




View of at-grade crossing at Broadway



View of elevated Manchester Street Bridge



View of at-grade crossing at Essex Street

both repair and used car sales, and parking lots and vacant land. Essex Street connects east into the center of Downtown. To the west of the Project Area is the Tower Hill neighborhood, one of the City's more stable neighborhoods. To the east are the Arlington and General Donovan neighborhoods. The project area is adjacent to a former incinerator site and an abandoned paper mill, as well as multi-family housing, food manufacturers, parks, and charter schools.

Access, Elevation and Visibility

The rail corridor changes in grade from street grade to below street grade to above street grade; differences in grade affect access to the corridor from adjacent streets and development, visibility to the corridor and visibility of people on the corridor, and safety for pedestrians and cyclists at street crossings.

Starting at the northern end of the Project Area, the rail corridor is slightly above grade and then quickly rises to cross over Manchester Street on a bridge. The rail corridor is at grade with Currant Hill Road to the west. Existing access from the Manchester Street Bridge down to Manchester Street Park is via a long sloped path built on a former railroad spur down to the former rail yard at Manchester Street Park.

Heading south, the corridor is at a higher elevation than Bourgoin Park and adjacent industrial development to the east; the corridor elevation and vegetation greatly reduce visibility to and of the corridor. This section has significant industrial development immediately adjacent on the east, further reducing visibility. There is a wider setback on the west side of the corridor, but visibility from this industrial district is also poor. The corridor slopes down and crosses Haverhill Street at grade. South of Haverhill Street the industrial development is "canyon-like" and provides few "eyes on the street" to help with safety and security.

The corridor slopes down, passing under Lowell Street to enter the Downtown Crossing Block. Except for the area under the bridge, the corridor is very visible from Lowell Street. The low area under the bridge is frequently wet. The grade is relatively flat south of Lowell Street and development south of Lowell Street tends to be closer to the street, creating more space around the rail corridor. Although there is greater visibility in this area, the current development provides few "eyes on the street" in this block.

The corridor then crosses Essex Street at grade and continues at grade across the Flametech Steel Block to an at grade crossing at Water Street. The corridor continues at grade on a bridge across the North Canal, crosses Broadway at grade and then crosses the Merrimack River. South of the river, the corridor is at a slightly higher elevation than adjacent commercial development on Broadway to the west and the recently partially cleared Merrimack Paper site to the east. It continues on another bridge across the South Canal to meet Merrimack Street at grade.

Bridges

There are four bridge crossings along the LMRC that formerly carried railway operations. The limited available plans are dated 1895. The general condition of the structures is adequate for rehabilitation for pedestrian or maintenance vehicle traffic. The structures were designed for freight traffic. All structures will require a thorough inspection and measurement of the substructure and superstructure as part of a rehabilitation effort. No current or past inspection reports have been located by the MBTA. Complete plan sets for the bridges are not available for most locations. A discussion of issues related to individual bridge structures follows.

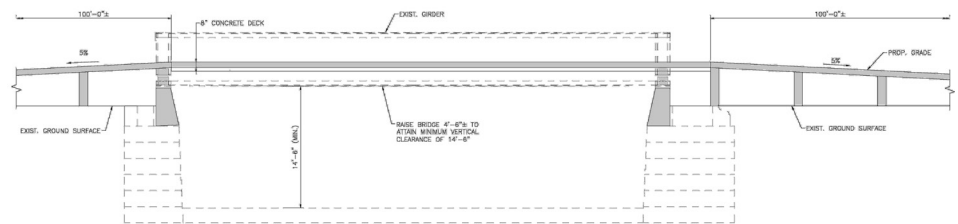


Manchester Street Bridge

B&M Railroad Over Manchester Street

The Manchester Street Bridge is a 62 foot long two-track thru-girder structure with a center girder and two outside girders. The track remains on one side only. The plate girder structure has limited vertical clearance over Manchester Street and shows signs of being hit. There is an approximately 14"x36" punched hole in the web. This damage can be repaired with little cost. The general condition of the three-girder structure, as well as the large granite block abutments, is good.

The City wants to investigate increasing the vertical clearance over Merrimack Street. Raising the existing structure is feasible but ramp structures will be needed to get this added clearance. A longitudinal section showing the bridge lifted approximately 4'-6" to allow 14'-6" vertical clearance is shown at left. Ramps at each end extend down to existing rail level at a 5% slope. Slopes will extend approximately 100 feet on each end of the bridge. Alternatively, a new bridge superstructure, such as a prefabricated truss structure, could be used.



Longitudinal section of raised Manchester Street Bridge



B&M Railroad Bridge over the North Canal

Existing Retaining Wall North of Manchester Street between the Tracks

Running parallel between the two tracks, an existing knee high concrete retaining wall is in poor condition. It has tilted several inches from tree roots and general inadequate footings. During any removal of trees or the rails and ties this wall may be removed and the area regraded.



Merrimack River Bridge

B&M Railroad over North Canal

The North Canal Bridge is an approximately 100 foot long single track supported on a parallel multi-girder steel structure with track and ties in place. The ties are in poor condition. The structure is over the outfall of a dam structure parallel to the track. A minor visual inspection from the track did not indicate an issue with re-use. The substructure could not be observed; however, the masonry work for the adjacent structures was very robust.

B&M Railroad Over Merrimack River

The Merrimack River crossing is a two-track wide (rails for one track still exist) six-span, approximately 540 foot long, deck over truss structure. The bottom chord consists of forged eye-bar tension members and pin connections. The substructure is granite faced masonry piers and abutments likely resting on bedrock. The general condition of the superstructure and substructure appears to be very good based on a visual observation.



B&M Railroad Over South Canal Bridge

The South Canal Bridge is a 65 foot two-track configuration over a parallel multi-girder steel superstructure with a single-track and ties in place. The ties are in poor condition. A minor visual inspection from the track surface and side of structure did not indicate an issue with re-use. The substructure could not be fully be observed; however, the masonry work for the adjacent canal walls was intact.

Lowell Street Bridge

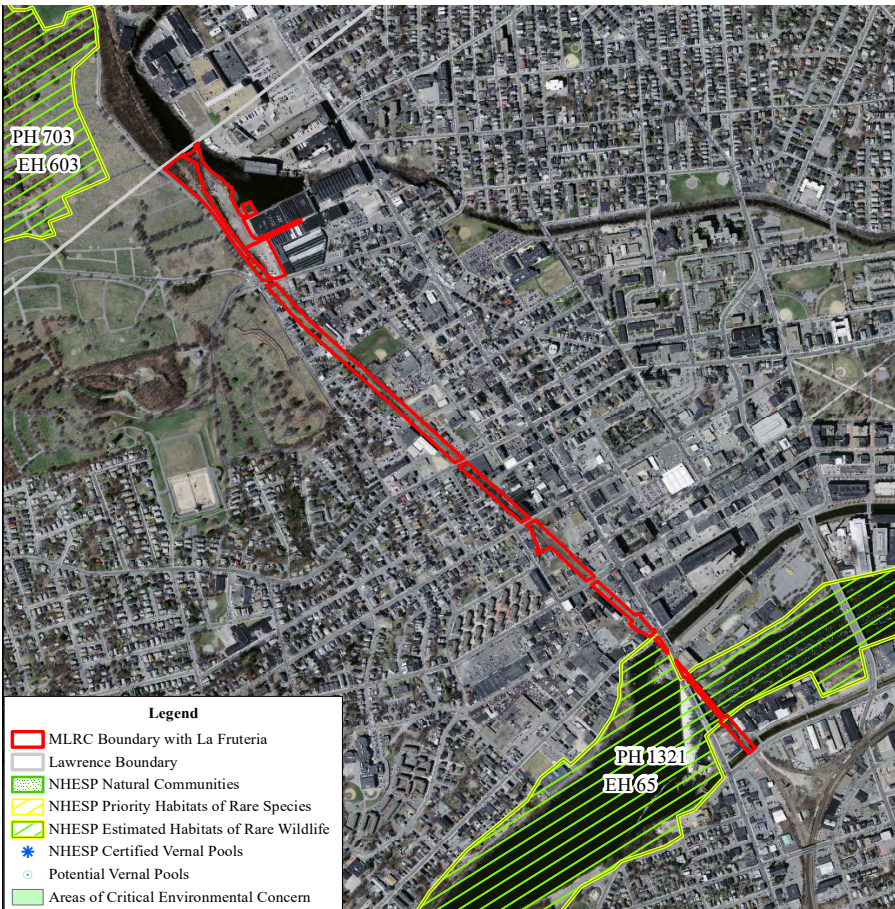
The Lowell Street Bridge crosses over the corridor. The bridge has been designated for replacement by MassDOT and is currently in the design phase.



Lowell Street Bridge

Wetlands

A review of the Massachusetts Department of Environmental Protection (MassDEP) wetlands and United States Geological Survey (USGS) hydrography layers show the presence of wetlands along the banks of the Merrimack and Spicket Rivers, and in the vicinity of Stevens Pond. Wetland associated vegetation also can be found at the Lowell Street overpass.



Natural features. Source: MASSGIS

Natural Heritage and Endangered Species Program (NHESP) and Areas of Critical Environmental Concern (ACEC)

There are no certified or potential vernal pools within the LMRC. Adjacent to the LMRC, northwest of the Manchester Street Park, is the NHESP Priority Habitat of Rare Species #703 and NHESP Estimated Habitat for Rare Wildlife #603. The Merrimack River, located at the southern end of the LMRC, contains NHESP Priority Habitat of Rare Species #1321 and NHESP Estimated Habitat of Rare Wildlife #65. These species include the Shortnose Sturgeon, Bald Eagle, Umber Shadowdragon, the Clubtail Dragonfly, and Cobra Clubtail. There are no ACECs within or adjacent to the LMRC. There are no anticipated impacts to habitat areas from the Rail Trail project, although the trail could function as a wildlife corridor.

Open Space

The MassGIS Open Space datalayer shows the Manchester Street Park, located on Manchester Street south of Stevens Pond, as an area designated as open space within the LMRC. There are no other open space areas within the LMRC boundaries, although Bourgoin Park on West Street abuts the rail corridor.

Surface and Subsurface Drainage

Flooding and standing water have been reported to occur underneath the Lowell Street Bridge within the LMRC, north and south of the bridge. During site walks, observed vegetation indicated the presence of water.

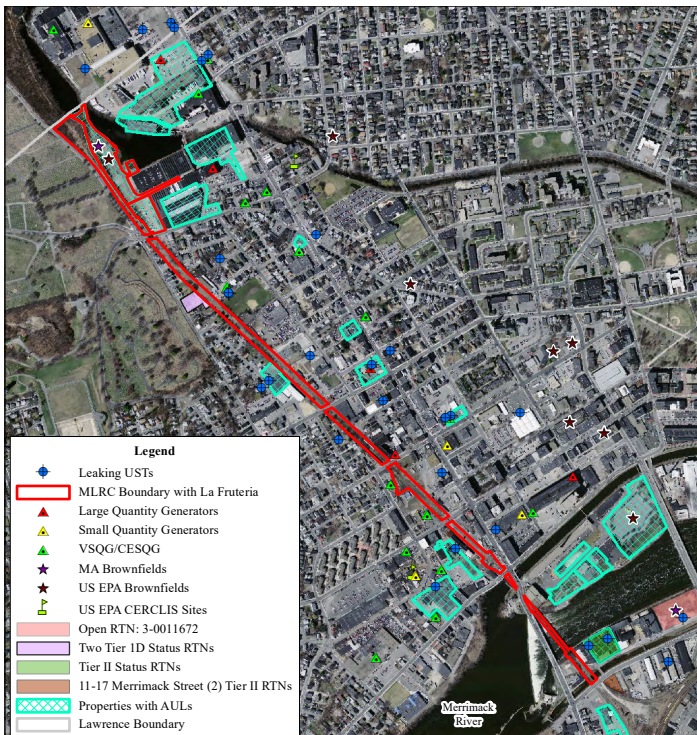
Reports from a nearby subsurface investigation by others indicated that the groundwater table occurs at approximately 8 feet below ground surface (bgs), and reportedly flows from the south/southwest to the north/northeast toward the Spicket River.

Environmental Conditions

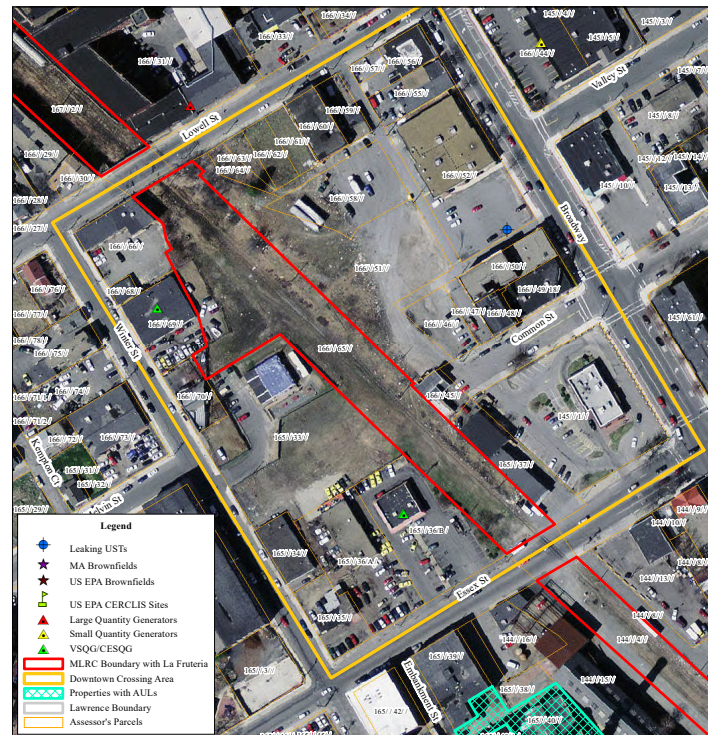
The railroad has not been in operation since 2001 when freight operations were ceased for the majority of the corridor. A significant MassDEP listed disposal site within the corridor is located at 85 Manchester Street. This site has achieved regulatory closure at the conclusion of certain response actions, as well as the recording of an AUL. The AUL restricts certain uses and creates obligations for maintenance of a barrier to prevent exposure to contaminants remaining in the subsurface. A number of additional MassDEP listed disposal sites are present immediately adjacent to the corridor. Contaminants encountered at these properties include petroleum hydrocarbons, chlorinated solvents, PAHs, and heavy metals. Most of the known releases have achieved regulatory closure under the MCP, with or without institutional controls. Additional sites that have the potential to impact the LMRC have been identified based on current and past land use. Land uses include but are not limited to auto repair shops, junk yards, above and underground storage tanks, transformer yards, and laundromats/dry cleaners.

Debris was observed within certain sections of the corridor, including wood pallets, mattresses, large pieces of concrete and stone, brick fragments, scraps of metal, garbage, piles of soil, metal and plastic containers. This indicates the potential for historic dumping that could also have resulted in contaminants entering the environment.

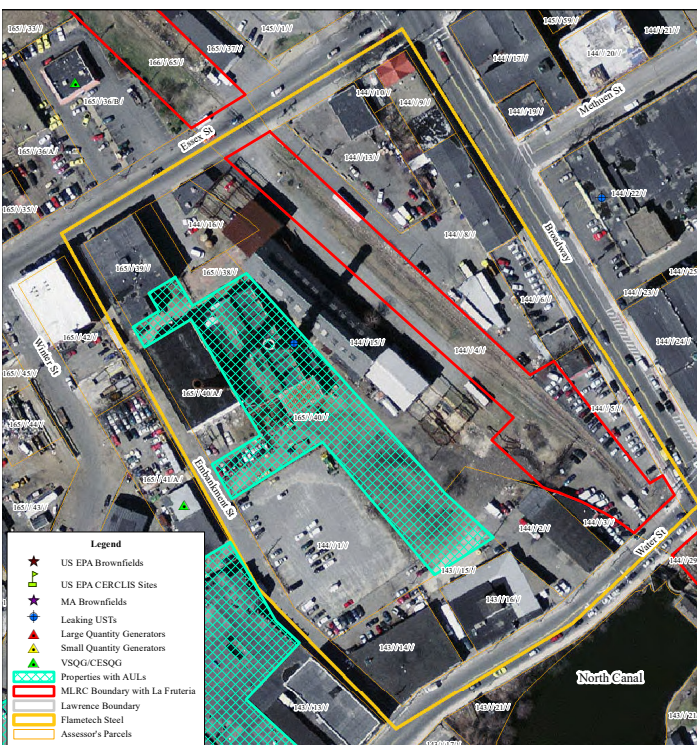
A full Existing Conditions Report, dated April 2016 is available under separate cover.



Overview of Potential Hazards within and In the vicinity of The Corridor. Source: MASSGIS



Environmental conditions on the Downtown Crossing Block. Source: MASSGIS



Environmental conditions on the Flametech Steel Block. Source: MASSGIS

Utilities

Existing surveys and the City of Lawrence Assessor's database, the City of Lawrence Department of Public Works, and the Northern Essex Registry of Deeds were accessed to review the location of easements, parcel boundaries, encroachments, right-of-ways, and utility lines. These records were reviewed for the entire length of the LMRC for existing conditions and the following utilities were located within and adjacent to the LMRC:

- > 10 ft. steam pipe easement throughout most of LMRC
- > 20 ft. wide Sewer easement that intersects the LMRC at approximately 500 ft. north of Haverhill Street
- > Drainage easement
- > Underground fiber optics that run the full length of LMRC
- > Overhead electric throughout length of LMRC

3 *Rail Trail*

Design Goals & Principles

The Manchester Lawrence Rail Trail through Lawrence Center will be a major connective feature for Lawrence neighborhoods, future development and current and future open space alike. This linear trail and new open space will extend fully half the length of the City limits and serve as the southern anchor of a 30 mile Rail Trail to Manchester, NH. The Rail Trail corridor will serve as a major bike and pedestrian corridor for both leisure and commuter uses and as a significant found open space for the City. In developing the design and plan for this new corridor, the goals and principles guiding the design are as follows:

- > Creation of a truly accessible corridor serving the surrounding neighborhoods, the City of Lawrence, and the greater new Hampshire/Massachusetts border region.
- > Creation of a linear park and multi-use path that serves as the southern anchor of a 30 mile Rail Trail network.
- > Incorporation of strong connecting features and regular access points to the surrounding city fabric, open space and trail systems.
- > Enhancement of major corridor assets, including the Merrimack River Bridge, the historic mill-era architecture, and remnant rail artifacts.
- > Emphasis on high-value multi-functional design that simultaneously combines trail use and access, brownfield remediation, and green infrastructure services in a single trail design.
- > Provision of a wide range of trail amenities serving multiple user types with a focus on offering flexibly designed spaces that provide future opportunities for programming.



LEGEND

	RAIL TRAIL BOUNDARY		EXISTING TRACK ALIGNMENT		EXISTING MULTI-USE TRAIL
	RAIL TRAIL - URBAN ZONE		RAIL TRAIL - WOODED ZONE		RAIL TRAIL - CORRIDOR ZONE
	RAIL TRAIL BRIDGE		RESIDENTIAL		MULTI-FAMILY RESIDENTIAL
	RAIL TRAIL ACCESS POINT		COMMERCIAL		INDUSTRIAL & MANUFACT.
	RAIL TRAIL STREET ACCESS POINT		INSTITUTIONAL & PUBLIC SERVICE		OPEN SPACE
			UTILITY		PARKING/VACANT





Locus Map

Rail Trail Concept

Southern Segment

Merrimack Street to Lowell Street

The southernmost segment of the Rail Trail corridor includes the MBTA right-of-way from the back of sidewalk at Merrimack Street to the northern edge of the Downtown Crossing redevelopment block at Lowell Street. This is the most varied segment of the corridor in terms of overall character, containing the grade elevated segment crossing of the South Canal peninsula, the extensive bridge crossing at the Merrimack River, the North Canal Island crossing, and the diagonal crossing of the Flametech Steel and Downtown Crossing blocks. This is the narrowest portion of the right-of-way along the entire project limit, ranging from 30 feet wide along the Merrimack Bridge, to roughly 50 feet wide within the Flametech Development parcel, with the exception of the widened segment at the intersection of Water Street/Canal Street and Broadway. This portion of the Rail Trail will be heavily influenced by redevelopment plans for the adjacent parcels, and improvements to the bridge crossings. Particular focus should be given to creating porous connections with adjacent development whenever possible, and capitalizing on the exceptional views afforded along the Merrimack River and canal bridges.



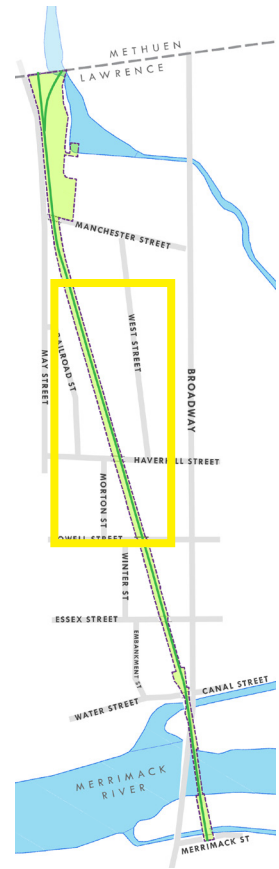
Merrimack River Bridge Rail Trail Improvements

Mid Segment

Lowell Street to Bourgoin Park

The middle segment of the Rail Trail corridor transitions from the urban core character of the development parcels into a mix of residential, commercial, institutional and industrial uses abutting the project boundary. This segment includes the Lowell Street bridge crossing, an at-grade access point at Haverhill Street, future connections to the Lawrence Family Development Charter School parcels, and additional connections associated with Bourgoin Park. The corridor is a consistent 80 feet width throughout this segment, which provides ample space for additional programming along the layout of the trail.

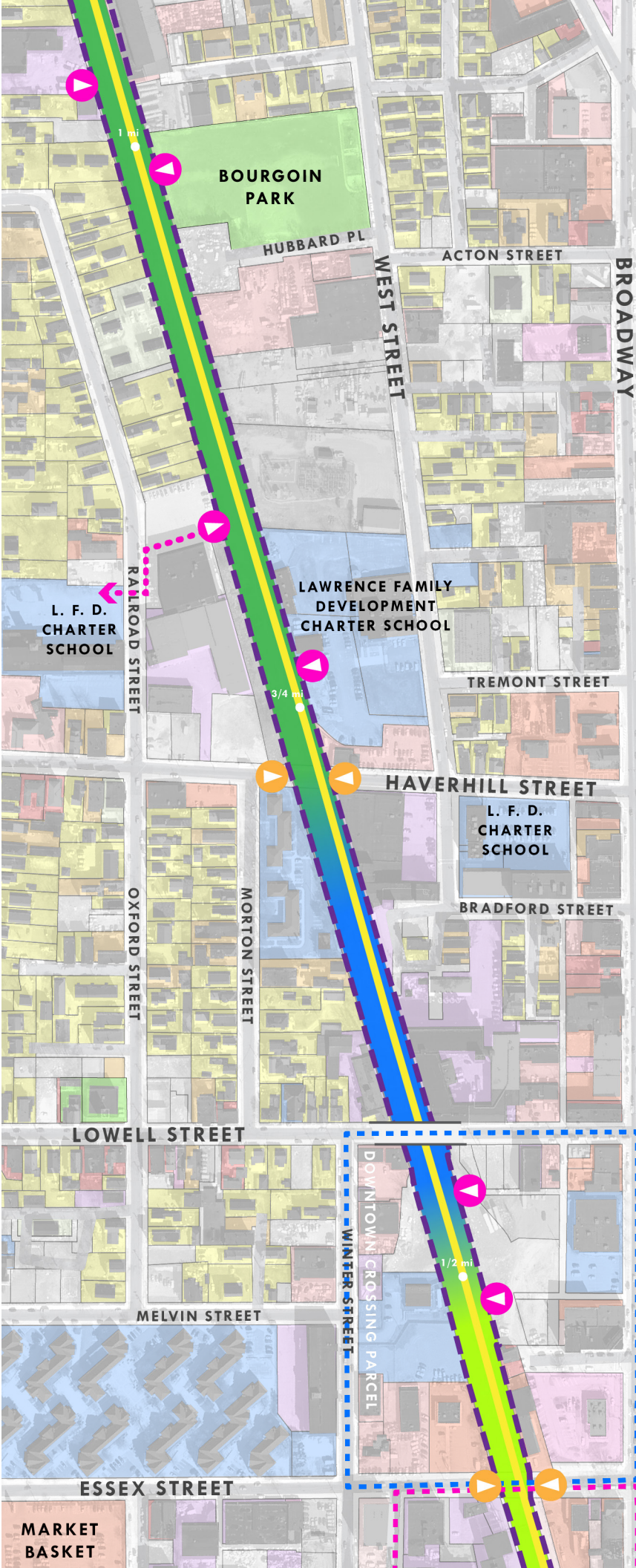
While programming and amenities are encouraged within the corridor starting at Haverhill Street and moving north, because of the enclosed and restricted character of the corridor on either side of the underpass at the Lowell Street Bridge, design elements in this area should focus on moving trail users through this section of the trail for user safety. North of Haverhill Street, the abutting uses of the Charter School and Bourgoin Park offer opportunities to engage a higher density of users and populate the trail corridor with additional amenities.



Locus Map



Bourgoin Park Rail Trail Connection



LEGEND

	RAIL TRAIL BOUNDARY		EXISTING TRACK ALIGNMENT		EXISTING MULTI-USE TRAIL
	RAIL TRAIL - URBAN ZONE		RAIL TRAIL - WOODED ZONE		RAIL TRAIL - CORRIDOR ZONE
	RAIL TRAIL BRIDGE		RESIDENTIAL		MULTI-FAMILY RESIDENTIAL
	RAIL TRAIL ACCESS POINT		COMMERCIAL		INDUSTRIAL & MANUFACT.
	RAIL TRAIL STREET ACCESS POINT		INSTITUTIONAL & PUBLIC SERVICE		OPEN SPACE
			UTILITY		PARKING/VACANT

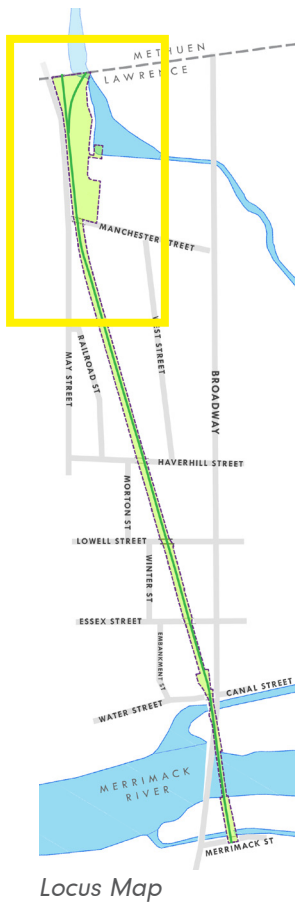




LEGEND

	RAIL TRAIL BOUNDARY		EXISTING TRACK ALIGNMENT		EXISTING MULTI-USE TRAIL
	RAIL TRAIL - URBAN ZONE		RAIL TRAIL - WOODED ZONE		RAIL TRAIL - CORRIDOR ZONE
	RAIL TRAIL BRIDGE		RESIDENTIAL		MULTI-FAMILY RESIDENTIAL
	RAIL TRAIL ACCESS POINT		COMMERCIAL		INDUSTRIAL & MANUFACT.
	RAIL TRAIL STREET ACCESS POINT		INSTITUTIONAL & PUBLIC SERVICE		OPEN SPACE
			UTILITY		PARKING/VACANT





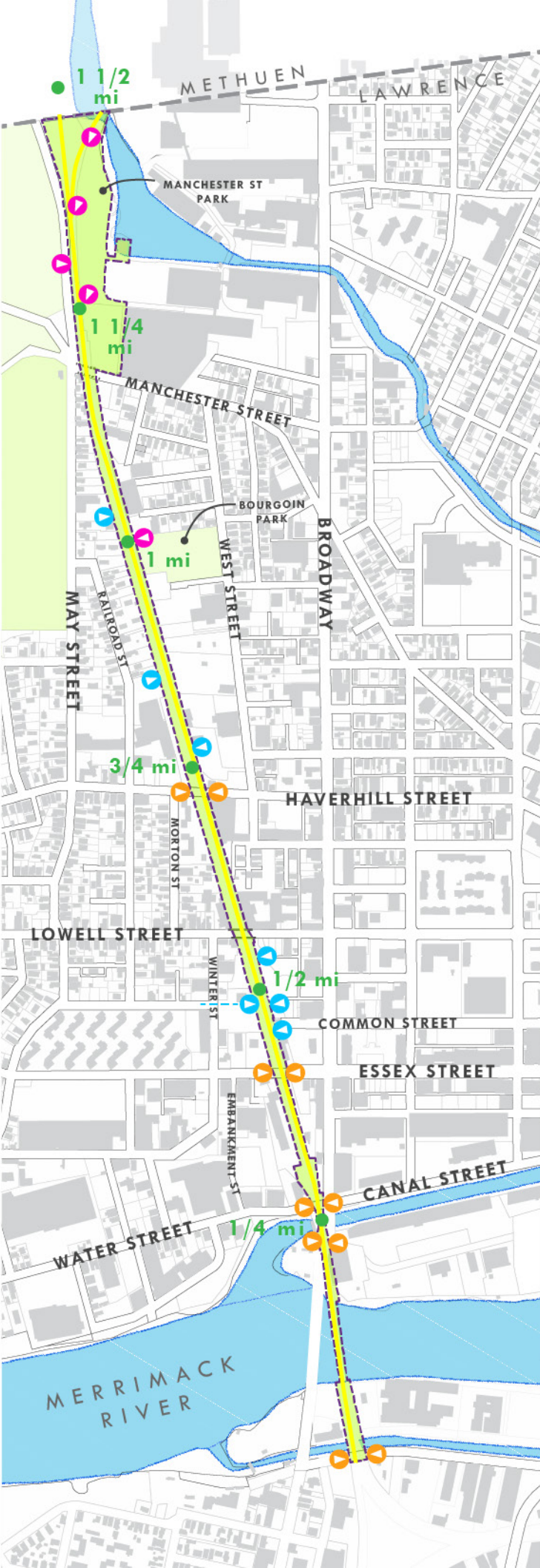
Northern Segment

Bourgoin Park to Methuen City Line

The northern segment of the trail is the most residential and passive of all of the segments. Much of this section has densely vegetated buffers and open space directly abutting the trail corridor, creating a more tranquil setting as compared with the segments to the south. This segment also connects to the Methuen Rail Trail, the Spicket River Greenway and the Manchester Street Park. Multiple access points are proposed in association with the Manchester Street Park design. One of these access points is an accessible walkway, currently in design, which will connect the Manchester Street Park parking lot located to the east of the rail corridor along the embankment at the western edge of the La Fruteria parking lot. The path will connect with the corridor near the Manchester Street crossing. This crossing is the only above-grade crossing for the project corridor, and will be designed in coordination with efforts to increase the clearance at Manchester Street. Design for the northern segment should prominently emphasize identifying trail access points, include passive recreation amenities, and provide continuity with adjacent trail connections.



Connection to Rail Trail and Manchester Street Park



Trail Connections

To be a successful and effective commuter and recreational corridor, the Rail Trail needs regularly spaced access points that provide entrance from both the east and west sides of the City of Lawrence. The diagram at the left shows the proposed access points onto the trail, including both intermediate access points and roadway crossing access points. A general rule of thumb is to provide access points at least every quarter mile along a trail to generate strong connectivity between the corridor and the surrounding neighborhoods and to foster a sense of security for all individuals utilizing the trail. Both physical access points and visual access points into the trail corridor help users feel connected to their surroundings and helps deter illicit behavior by encouraging “eyes on the trail.” The diagram at the left includes stations for each quarter mile marker.

Many of the access points depicted at the left are readily available today and will require only slight modifications to formalize them for trail users. Others, such as the proposed access at the back of abutting properties, will need easements negotiated as part of the trail design. The diagram identifies each connection type by color: PINK for a trail access point, ORANGE for a street access point, and BLUE for an access point that will require negotiations for an easement across and abutting property.

Roadway Crossings

There are six trail locations where the trail crosses active roadways: four at-grade crossings at Broadway, Water Street, Essex Street, and Haverhill Street; one below-grade crossing at Lowell Street; and one above-grade crossing at Manchester Street. There are various strategies for maintaining continuity and improving safety for the users at each of these conditions. Each condition involves different treatments for safe and successful negotiation by trail users. The following pages outline these treatments by crossing type.

LEGEND

- RAIL TRAIL BOUNDARY
- EXISTING TRACK
- RAIL TRAIL PARK ACCESS POINT
- RAIL TRAIL STREET ACCESS POINT
- RAIL TRAIL ACCESS POINT - REQUIRES EASEMENT

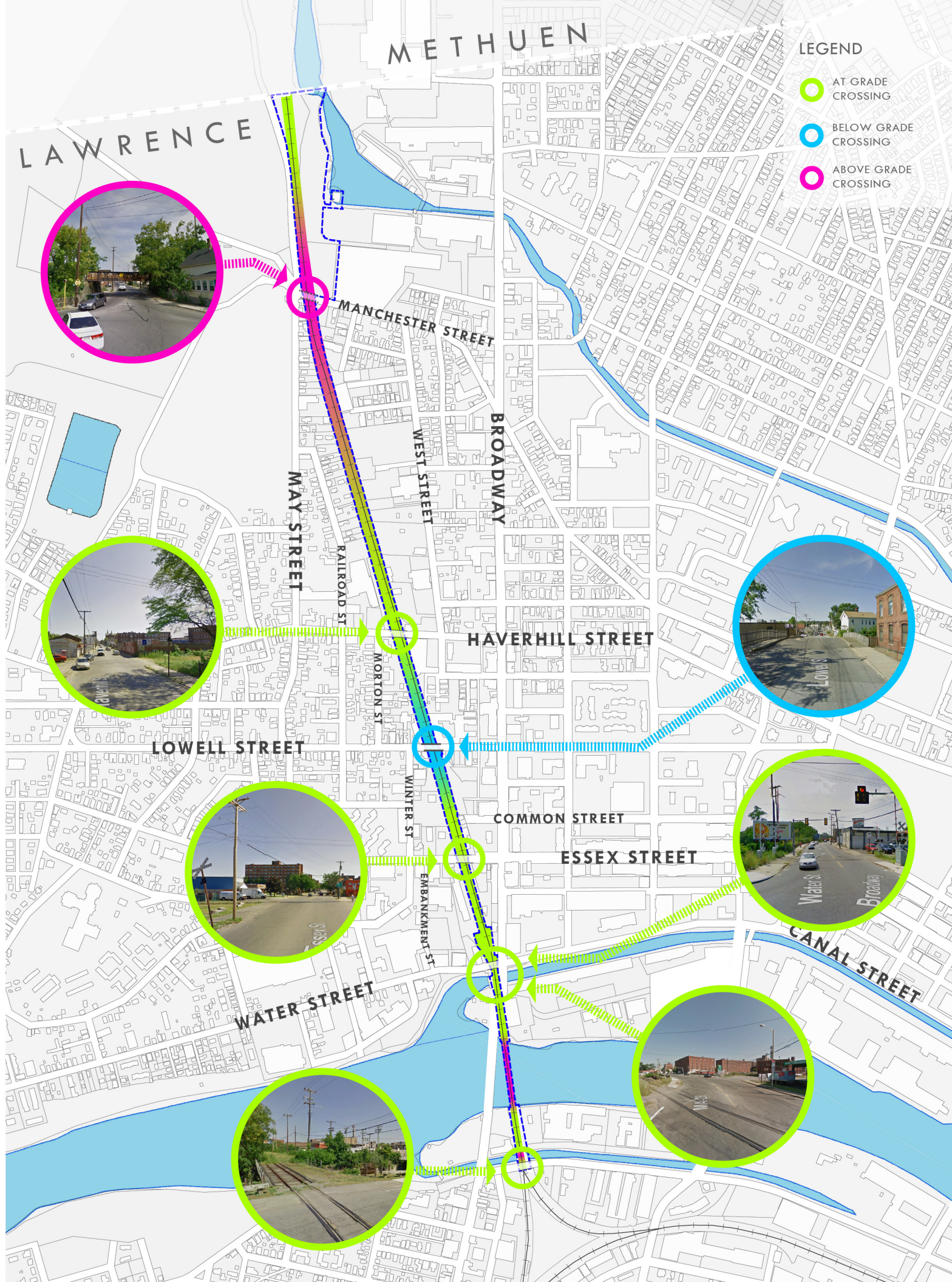


METHUEN

LAWRENCE

LEGEND

- AT GRADE CROSSING
- BELOW GRADE CROSSING
- ABOVE GRADE CROSSING



At-Grade Crossings

These crossings pose the greatest risk of conflict between trail users and vehicular traffic. Brightly colored or patterned crosswalks, easily visible signage and, in some cases, overhead crossing signals will improve driver awareness of the trail route and alert drivers to the potential for pedestrian and cyclist crossings. Where the crossings occur at mid-block locations, such as at Haverhill Street and Essex Street, a tabled condition or “bump out” can be utilized.



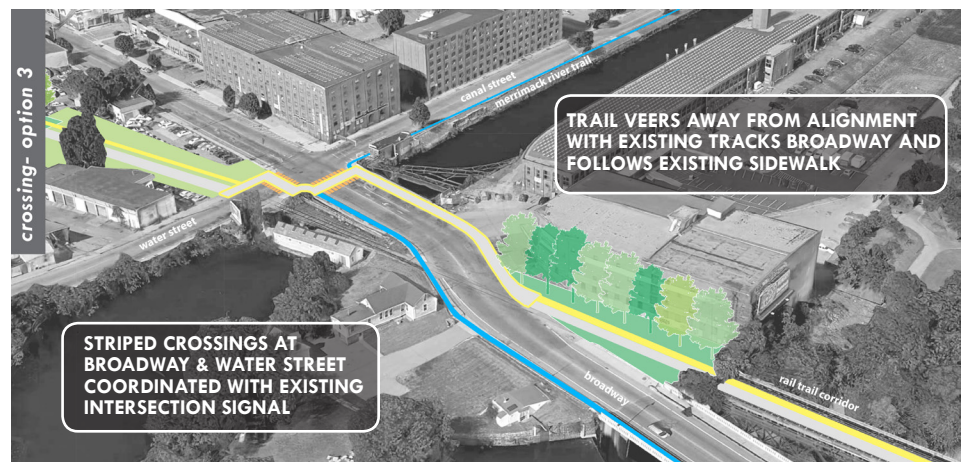
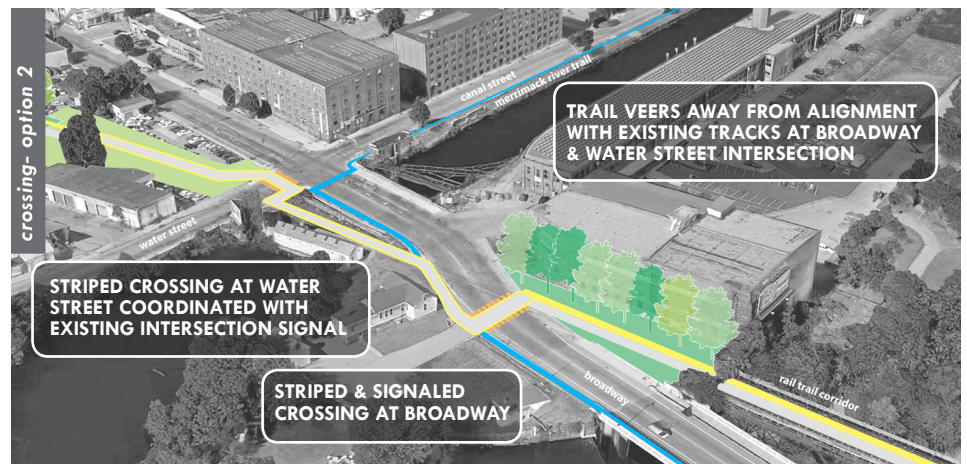
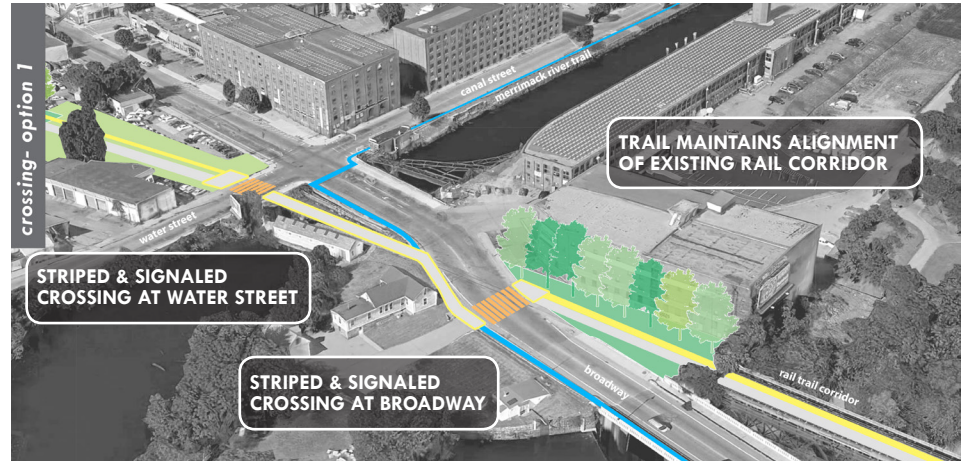
Brightly colored/pattern crosswalks



Overhead bike/ped crossing signal



Bicycle/pedestrian “bump-out”



Pedestrian Crossing and Connectivity to and from Rail Trail

Below-Grade Crossings

The trail crosses under the Lowell Street bridge and, as a result of the overpass and elevated development on either side, this segment of the corridor becomes channelized and has limited access from either side of the trail. There are multiple safety concerns to be considered in the design of the trail in this relatively enclosed condition. It is strongly encouraged that this segment of the trail be lit at night, regardless of whether lighting is installed throughout the corridor. Lighting beneath the bridge could be installed in coordination with a larger artwork installation that enlivens the underpass. Artwork installations could also be coordinated with murals or other artwork installations that expand out along the vertical walls bordering this area. The City of Lawrence has many excellent murals adorning its buildings and alleyways and this would be an great opportunity to involve a local artist or youth program in the development of the corridor installations. Improving the perception of the corridor in this area and encouraging users to pass through this area, but not necessarily linger, is the goal of the design for this segment.

BROADWAY & WATER ST CROSSINGS



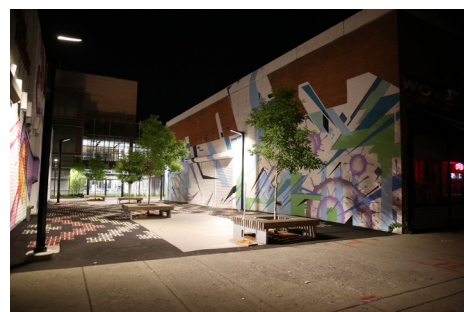
The crossing at the Water Street/Broadway intersection is the most complicated crossing of the corridor, and further design should include the services of a traffic engineer to evaluate the appropriate layout for the Rail Trail in this area. Three alternatives were reviewed as part of this study and the alignments for each are described in the diagrams on the opposite page.



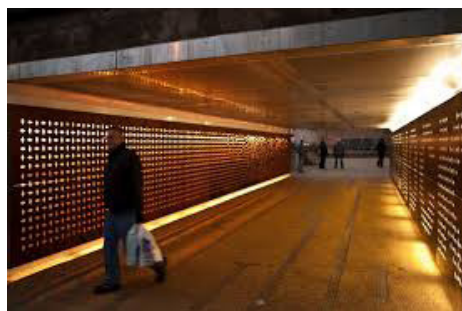
Existing channelized condition immediately north of the Lowell Street Bridge



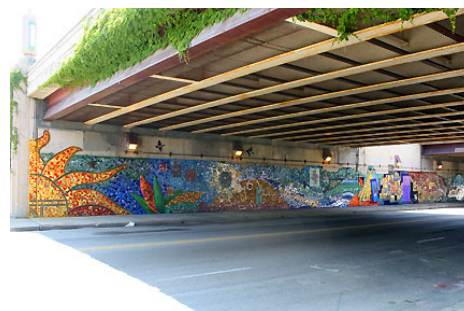
Existing Lowell Street Bridge



Essex Street Connector mural, Lawrence



Bicycle/pedestrian underpass lighting



Underpass mural

Above-Grade Crossing

The crossing at Manchester Street is a plate girder structure bridge dating back to the original use of the corridor. During community meetings, many of the residents expressed an appreciation for the character of this bridge and a desire to see the structure of the bridge maintained but upgraded for safety as part of the trail design. The design of the bridge upgrades is covered in more detail in Chapter 2, but in general the design of the trail will need to incorporate a new decking material for this bridge, increase the guardrail height on either side for the safety of bicycle and pedestrian users, and provide a transition from the on-grade surface condition to the new decked surface on the bridge.



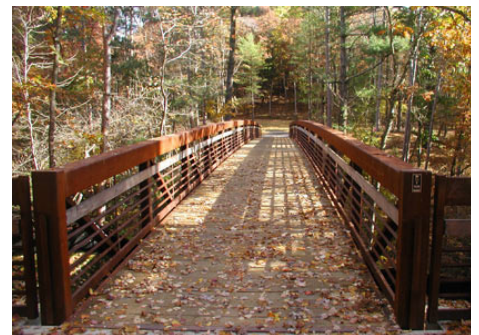
Existing Manchester Street Bridge deck condition



Existing Manchester Street Bridge exterior condition



Example of wood decking over existing plate girder bridge



Example of decking and railing at pedestrian bridge



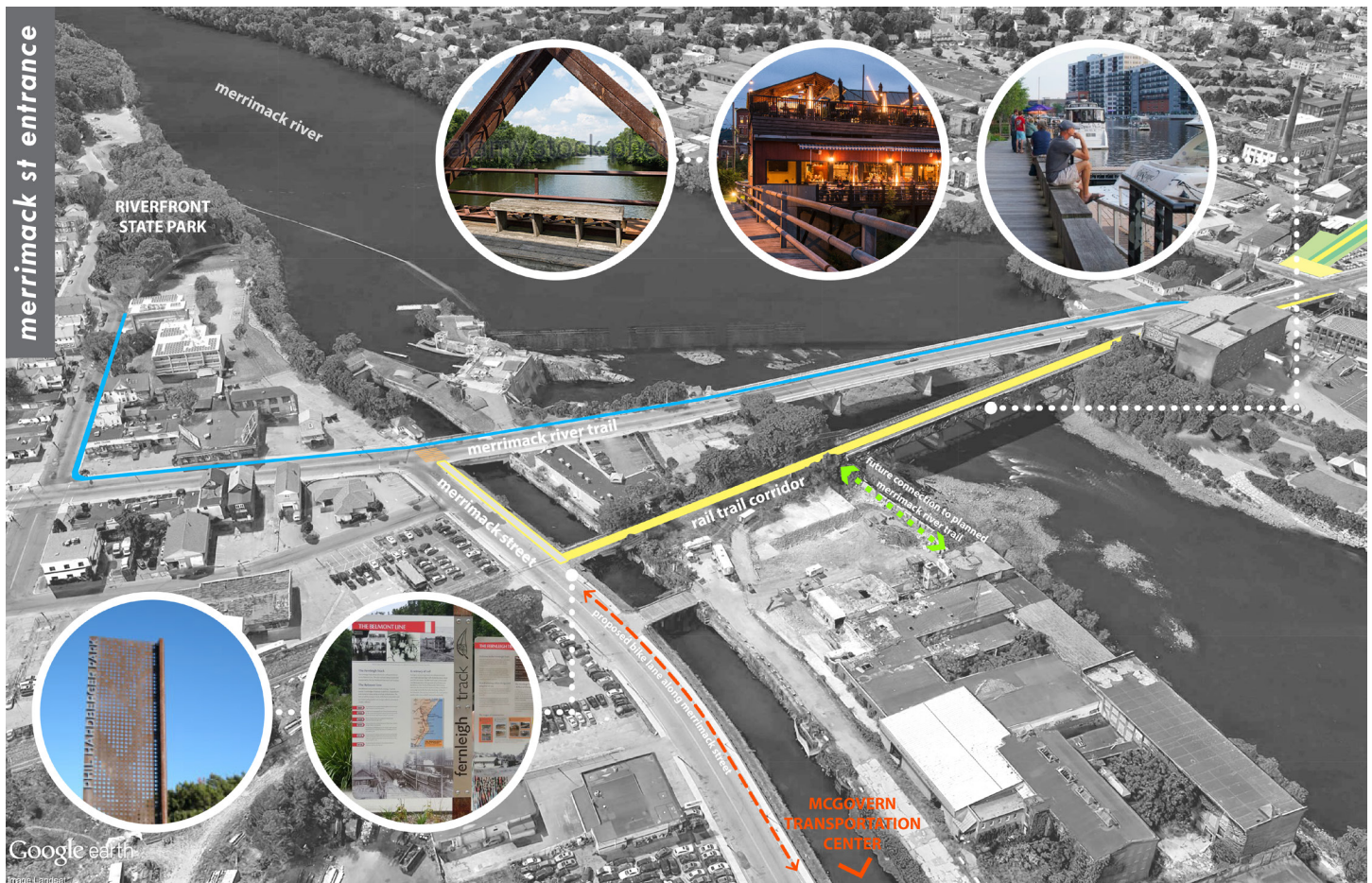
Locus Map

Rail Trail Character Along the Corridor

Along the length of the corridor, the Rail Trail will pass through a variety of cross-sections and adjacent development types. Each of those areas is reviewed in detail here to identify the opportunities and challenges of each area's character typology. The inset photos illustrate precedents from other similar locations.

Merrimack Street Entrance

The Rail Trail improvements for this plan begin at the Merrimack Street intersection; however, the design process for this project should take into consideration bike and pedestrian connections beyond the limits of the MBTA right-of-way to the south. In particular, a formalized connection with the existing Merrimack River Trail and Riverfront State Park should be included as part of the design, with associated trail branding, formalized crossings and wayfinding. Entry and interpretive signage also should be included at this location to demarcate the Lawrence Rail Trail beginning.



The McGovern Transportation Center is located a half mile east from the trail entrance along Merrimack Street. Connecting to this major public transportation hub will help elevate the trail corridor from a leisure amenity to a true commuter route for the City of Lawrence. Adequate lane width exists today to create a dedicated on-street bike lane that could provide a direct connection between the transportation center and the trail corridor. Future designs should include recommendations for strengthening this connection.

An extension of the Merrimack River Trail is also planned along the northern bank of the South Canal peninsula, and design concepts should be developed for this future connection. Given the higher elevation of the Rail Trail relative to adjacent parcels, much of the study around this design will involve negotiating the grade in a way that minimizes perceived barriers between the two trails and provides an accessible connection.

Rail Trail ANCHOR

MERRIMACK RIVER BRIDGE



Combined seating & trail uses on the High Line, NY



Restaurant adjacent to pedestrian crossing over the Connecticut River



Counter seating/dining along the Chicago River

Of the four bridge crossings occurring along the trail corridor, the Merrimack River Bridge is the most impressive and is a focal point of the trail design. This extensive river crossing is a major potential asset to the Lawrence Manchester Rail Corridor as an attractor for both trail users and future economic development interests alike. The design should focus attention on elements such as trail surfacing, guardrail design, and site furnishings to build a strong and unique identity for this dramatic crossing 500 feet in length. Amenities such as distinct seating elements will allow visitors to use the bridge as both a destination and a trail. Additional enhancements to be explored include permanent and fixed seating areas for casual group gatherings, provision of areas for pushcart food vendors, and incorporation of temporary art installations and events staged along this historic piece of infrastructure.



Combination trail and seating area along the Merrimack River Bridge

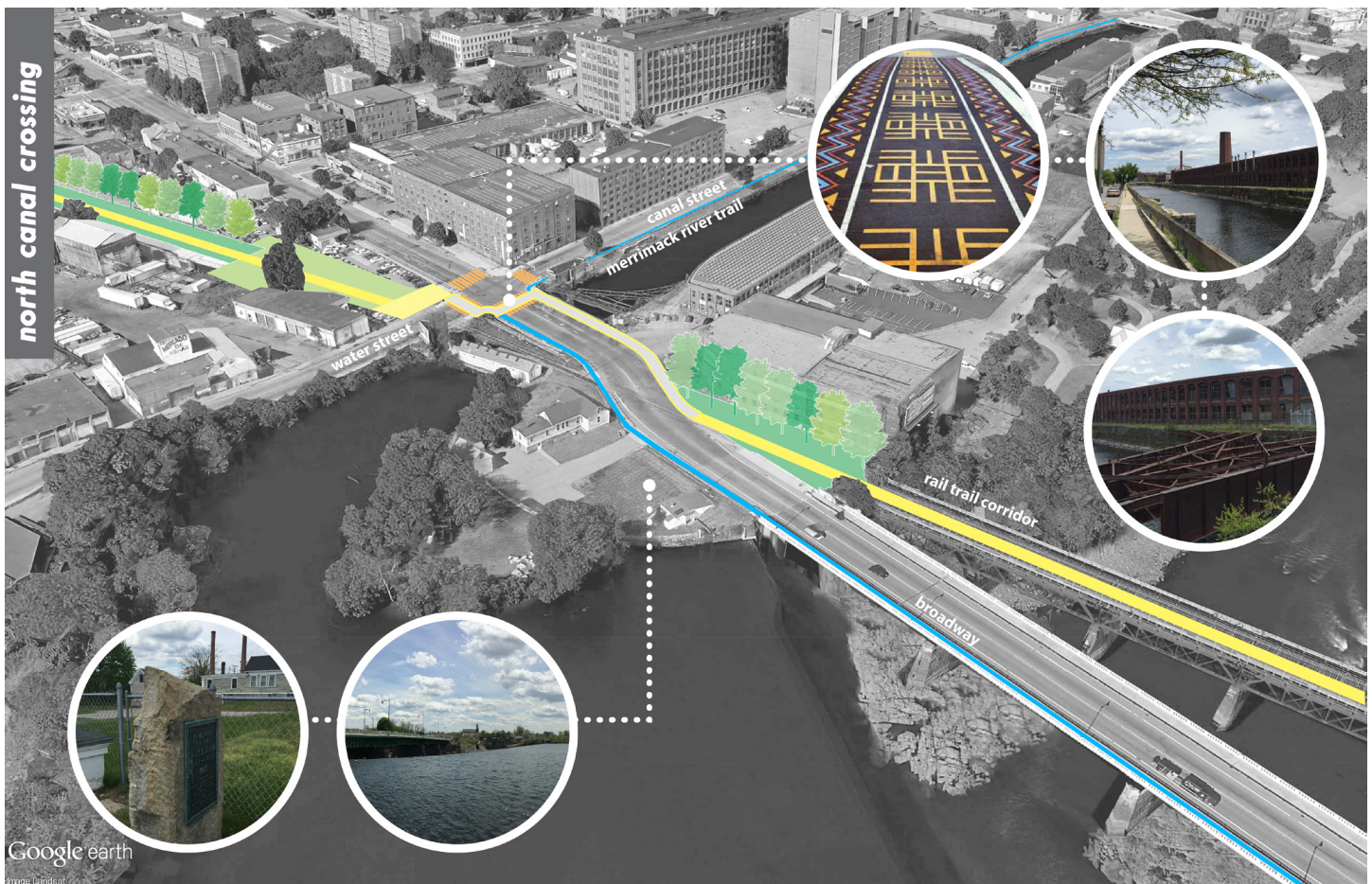


Locus Map

North Canal Crossing

As the trail continues northward, it crosses through the intersection of Broadway and Water Street/Canal Street. This prominent location affords an opportunity for heightened visibility to both resident and tourist trail users alike; utilization of clear branding, signage and wayfinding in this area will be a key component for attracting trail users. The widened right-of-way at the northwest corner of the intersection offers an excellent location for a gateway park to welcome all visitors to both the corridor and the surrounding future developments. Additionally, there are a number of historic and iconic elements found within this area that could be highlighted by interpretive signage along the trail. These include the North Canal lock and gatehouse, historic markers on the Essex Company property, the prominent mill buildings along the North Canal, and the towering smoke stacks on the Flametech Steel parcel.

One last opportunity of note in this area is the prominent viewpoint located on the tip of the North Canal Island just past the Essex Company buildings. Although this area is outside the project boundary, a future connection to this point would offer trail visitors one of the most spectacular panoramic views of the Merrimack River north of the dam.



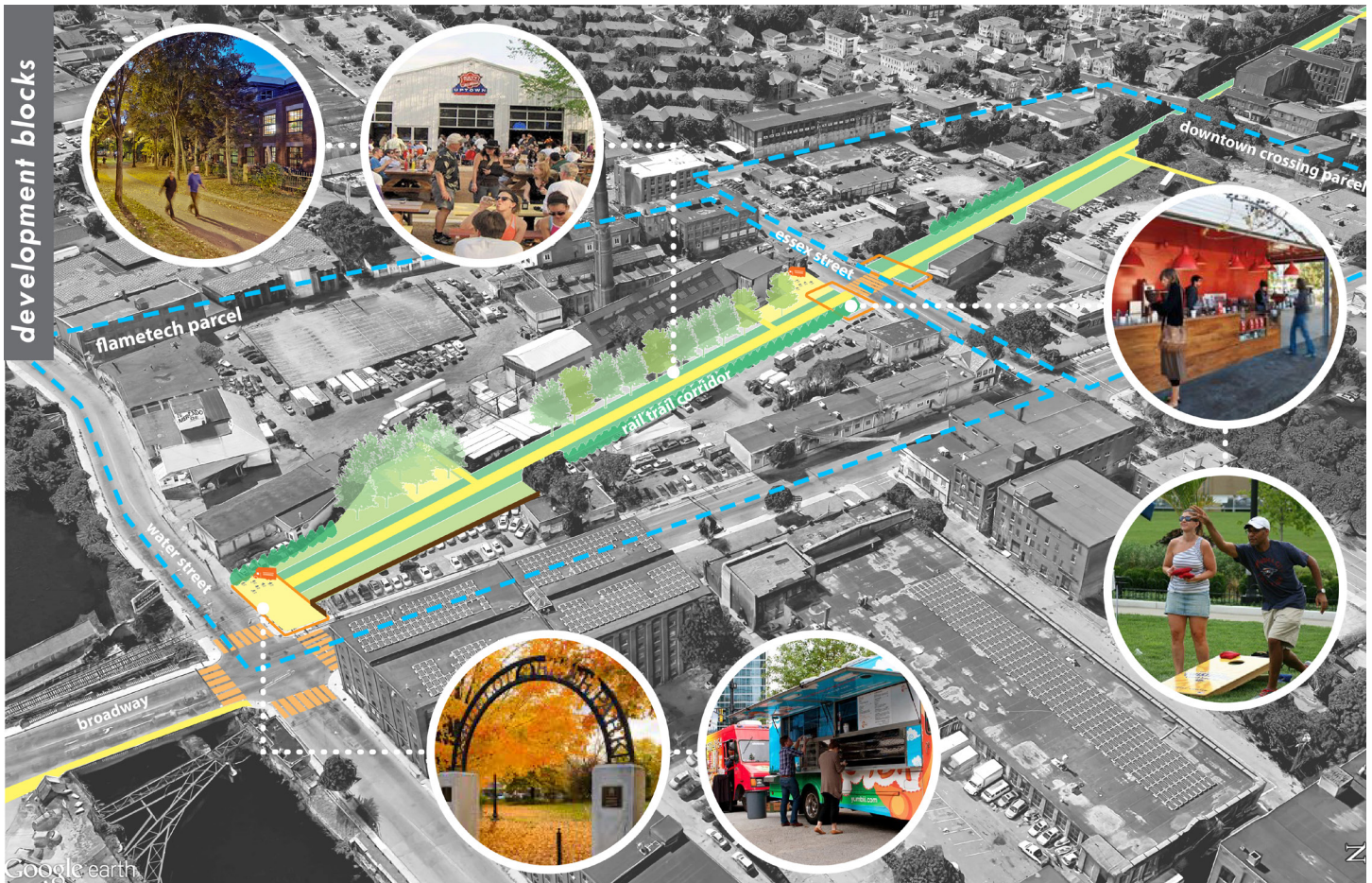


Locus Map

Redevelopment Block Crossing

Just north of Water Street, the Rail Trail enters the two blocks that comprise the Flametech Steel and Downtown Crossing redevelopment blocks. This segment of the trail is more urban in character than areas to the north, and the design character of the trail should reflect this. The trail paving can transition to a brick paved plaza and furnishings should encourage active engagement with the trail. Connections to and from the trail from adjacent development should be encouraged as these parcels are redeveloped. Although the right-of-way is publicly owned, it can also serve as valuable green space for adjacent residential or commercial development.

The trail crossings at both Water Street and Essex Street have the opportunity to be major activators for trail use, and temporary pop-up venues for eating, exercising and socializing will help to publicize the trail and serve as pilot programs to test active uses prior to more costly construction of permanent amenities.



Rail Trail ANCHOR

GATEWAY PARK



Gateway industrial remnant structure at The Steel Yard, Rhode Island



The High Line Section 2 through urban development

The rail corridor opens up at the Water Street and Broadway intersection offering an excellent opportunity for a new gateway park welcoming residents and guests to the city and the new regional Rail Trail corridor. The existing icons of the Flametech Steel building smoke stacks and large steel sign towering just beyond the park site herald both the City's history and the industrial character of the region. The materials and design of the park should hearken to the industrial history of the City and reference the former rail use of the corridor as well.

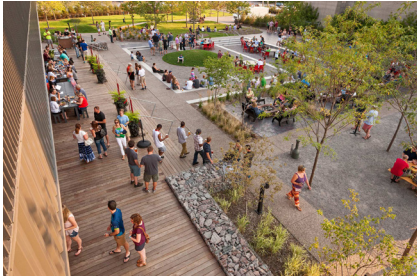
The prospect of a more generous park space on the corner of Broadway and Water Street excited members of the community and triggered a number of varied and creative ideas. Residents saw the gateway as an opportunity for small performance spaces and temporary art installations. Members of the community got excited describing partnerships with City events like Ciclovía and other healthy living initiatives and saw this space as a prime location for event day attractions. Community members gravitated towards concepts with enlivened outdoor seating areas and spaces activated by adjacent building uses.



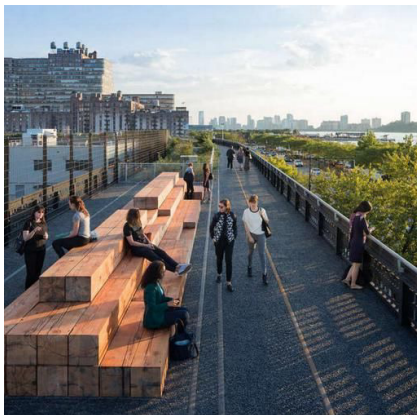
Conceptual design for the Gateway Park

Rail Trail ANCHOR

FLAMETECH PLAZA



Outdoor "spill-out" space at Surly Destination Brewery, Minneapolis, MN



Over 30 residential, commercial and cultural development projects have been planned/constructed in the immediate area following completion of the High Line linear park



Reuse of industrial materials for design of trail plaza spaces

Public investment in trail corridors and park space can serve as a major catalysts for attracting new development to a city or downtown area. Following the wildly successful example of the High Line in NYC, both as a public works project and a local economic engine, cities across the U.S. are moving forward with plans to reinvigorate their available linear corridors and vacant industrial spaces. The Bloomington Trail and Park in Chicago, the Dequindre Cut Greenway in Detroit and the Reading Viaduct Project in Philadelphia are all recent examples of public infrastructure and rights of way being re-envisioned as linear parks and multi-modal corridors.

Given its proximity to two prime redevelopment blocks, the Lawrence Manchester Rail Corridor has the opportunity to stimulate economic interest and spur new development for the City of Lawrence. As pictured below and discussed in detail in Chapter 5, the corridor can serve as a shared space and public plaza activator for future redevelopment plans. Linking the corridor with outdoor "spill-out" spaces associated with first floor commercial development will allow each of these associated uses to benefit from increased foot traffic and visitors generated by these complementary uses. Outdoor plazas, patio seating areas, and lawn activity spaces can all seamlessly blend with the Rail Trail buffer zone, creating porous connections between the corridor and adjacent development.

It is critical that the design for this segment of the corridor acknowledge this potential and be developed with a flexible border zone that can easily connect with future development. As the design progresses, efforts should be made to engage with adjacent parcel owners/developers to better incorporate their functional needs and future vision. In some cases, a transfer of easement rights for parking or circulation in exchange for better contiguous open space elsewhere on the parcel may be a beneficial arrangement for both the trail design and the new development.

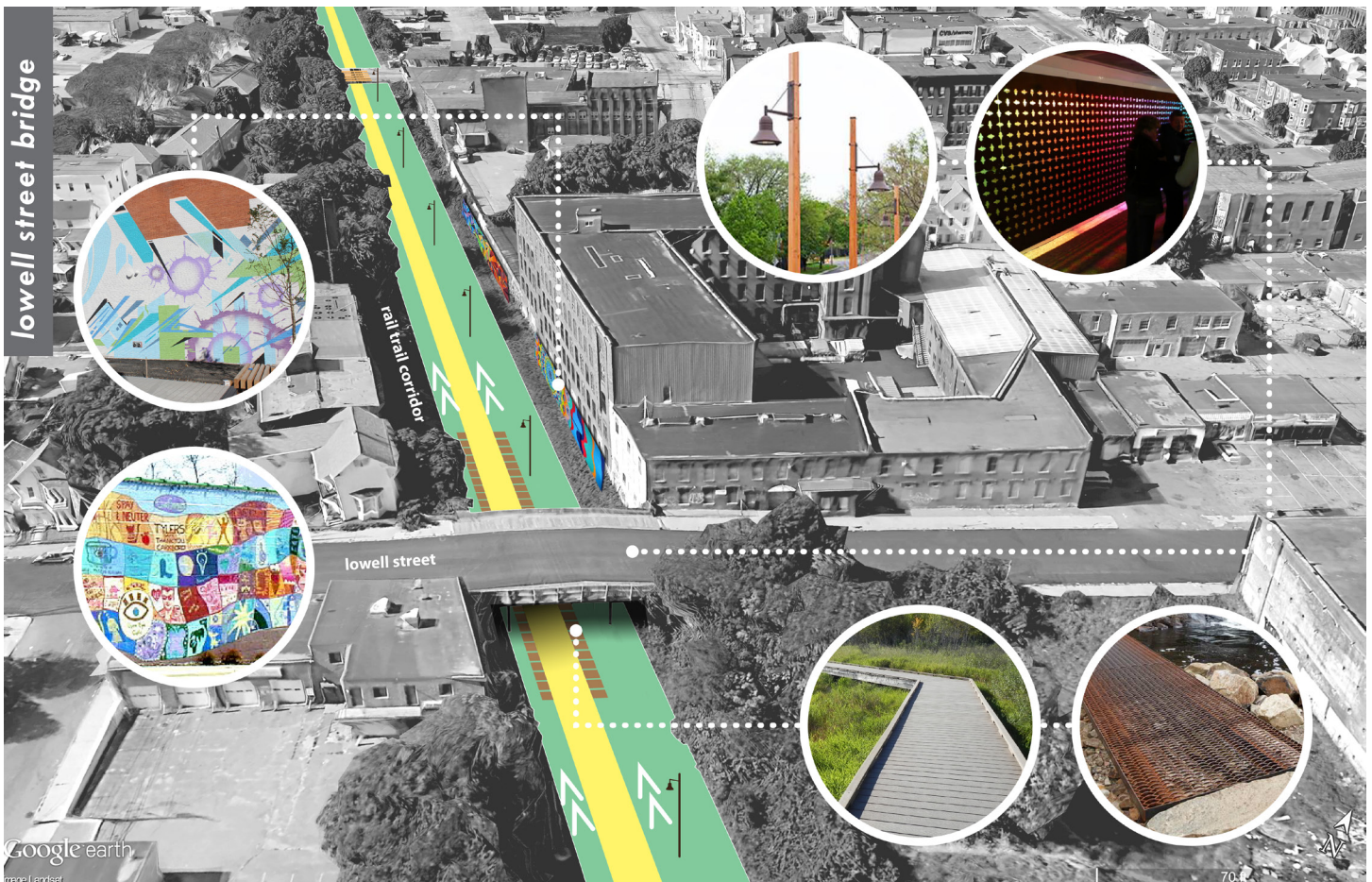


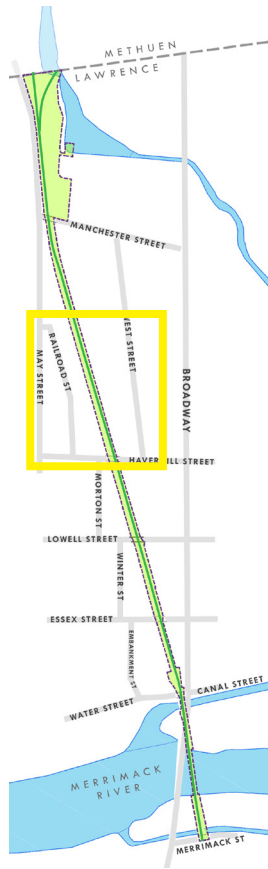
Conceptual design for Flametech Plaza and trail connection

The trail condition at the Lowell Street Bridge is more complicated than other segments of the trail. Adjacent mills and residential development has channelized the right-of-way creating a canyon-like corridor. The limited visibility creates safety issues and the design should encourage movement rather than pausing or lingering by users. Furnishings are not recommended in this area, and improvements should include pedestrian lighting from at least Essex Street to Haverhill Street, including lighting beneath the bridge. The Lowell Street bridge is slated for future repair by MassDOT, and as such all lighting and environmental improvements for this area should be designed to either be independent of the bridge structure or function as temporary improvements until permanent improvements are made with the bridge replacement. The future design of the bridge should incorporate structural elements that are more open and inviting, in contrast to the deeply shadowed and constrained structure that exists today.

The section passing beneath the bridge is also the topographical low point of the corridor in this block and is regularly saturated with standing water. Design of the trail should consider means of addressing this issue which may include a boardwalk crossing or filling of the depressed area. Based on site conditions, the area may be considered a jurisdictional wetland, and as such any solution in this area may need to be permitted. The trail alignment through this area should be designed to be sensitive to the natural condition and consistent with permitting requirements.

Locus Map





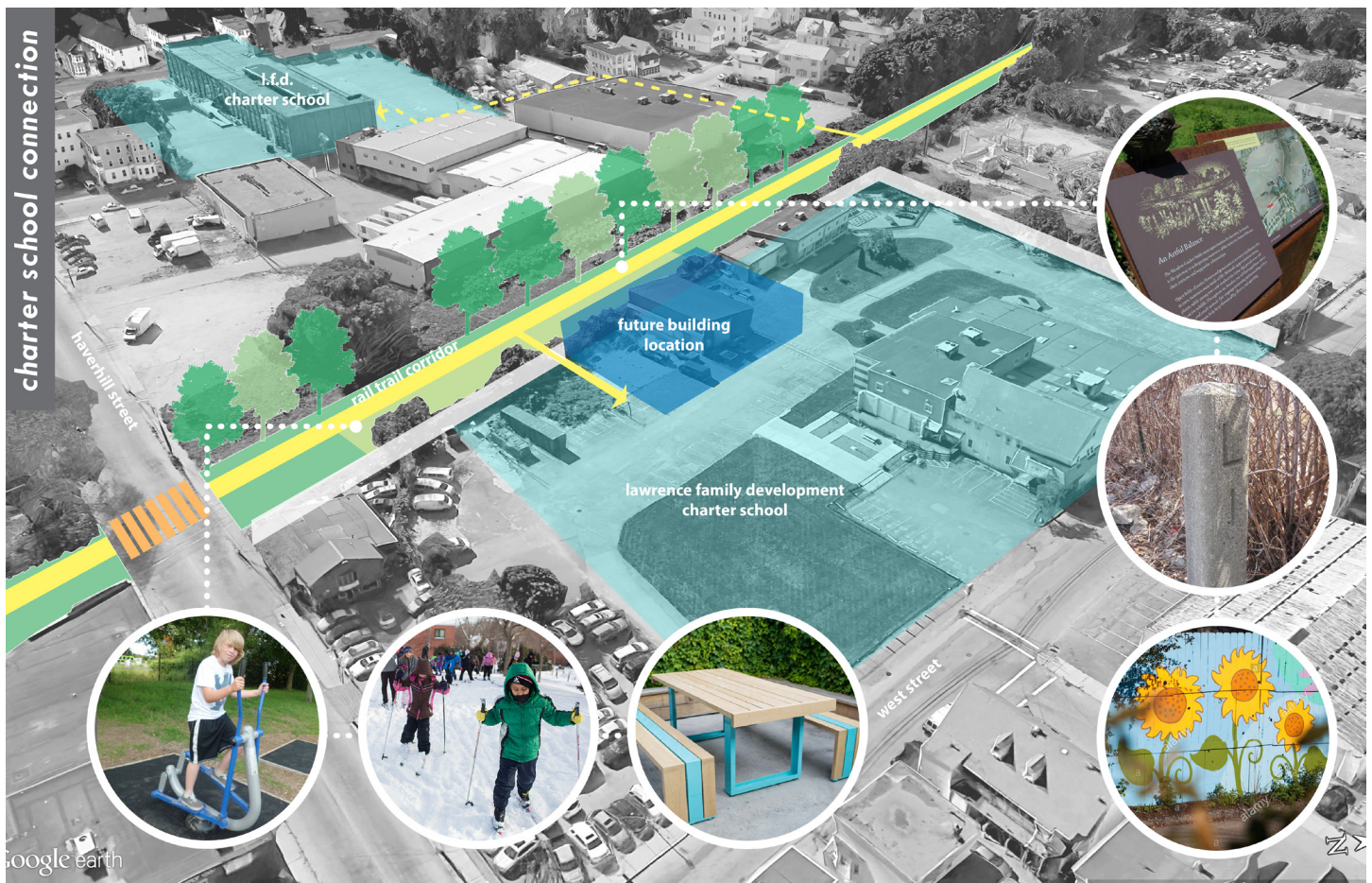
Locus Map

Charter School Connection

To the north of Haverhill Street the Rail Trail passes directly behind the Lawrence Family Development Charter School, providing an excellent opportunity to create a connection to this important educational institution. The Charter School campus includes locations on Railroad Street, the West Street location pictured below, and additional buildings on Haverhill Street. School officials are very interested in incorporating use of the trail into the curriculum through nature walks, physical activity sessions, and extra-curricular activities such as cross-country skiing programs.

School officials also would like to utilize the corridor as a pedestrian connection between the academic building on Railroad Street and the main campus on West Street; this link would remove the need to bus children between the two locations. This connection could occur through an access easement across the Colony Foods parking lot to the trail and then through a gated fence to be coordinated with development of the new gymnasium building on the West Street campus. School officials prefer a high privacy fence, roughly eight foot high and wooden stockade style, to provide adequate security and privacy for the school yard. The stockade style also provides a canvas for school murals, similar to the painted mural along the school yard garden beds.

In order to ensure safe use of the trail by the students, this area of the corridor will



incorporate adequate lighting, fencing and gates for restricting access to school property, and clear sight lines throughout the corridor. Desired trail amenities adjacent to the school include interpretive signage for both natural and historic trail elements, circuit training equipment, and plenty of seating. It was noted that as part of the ongoing use of the rail corridor, the Charter School would help develop a student volunteer program to assist in maintaining the portion of the trail corridor directly adjacent to the school.

Rail Trail ANCHOR

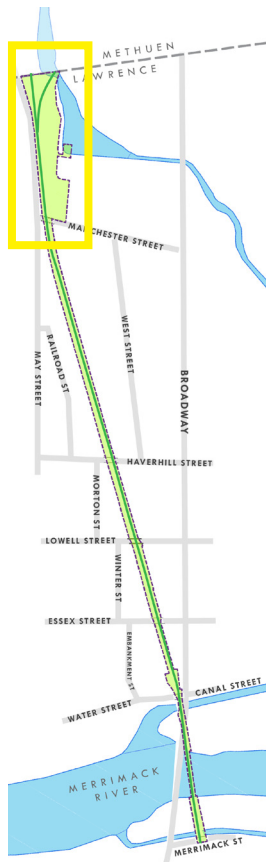
BOURGAIN PARK

Just north of the school, Bourgoin Park - a popular neighborhood park offering a soccer field, baseball field, and playground equipment - abuts the Rail Trail and is the southernmost existing open space adjacent to the corridor. The park is well used today and providing a connection to the Rail Trail will serve to energize both resources. During community meeting discussions, there was strong support for a trail access point at Bourgoin Park. Many liked the option of having a more open connection in this area with programmed trail space directly adjacent to the park. Active programming elements may include circuit training stations, playground equipment, or outdoor game facilities like domino tables or cornhole boards.

The slightly elevated position of the rail bed overlooking the park provides an excellent viewing platform for picnic tables and seating to watch soccer games and other park events. A tree-lined paved trail connection is recommended along either the northern or southern edge of the park to provide direct neighborhood access to the Rail Trail while limiting disruption to the active uses of Bourgoin Park. Soccer is a well-loved sport within the community, and there is currently pressure to increase the available sports fields. As part of the trail design and future park upgrades, it would be possible to rotate the soccer field to a north/south orientation to provide an under 10 (U10) and an under 12 (U12) field side by side within the park. Parking will be a key issue as the park and trail uses expand and the City may want to pursue a parking agreement with the Charter School or other abutting landowners to provide increased parking on weekends and weeknights. The Charter School has offered to allow after hours parking on the lots on either side of Alden Court across West Street. Additionally, Hubbard Place is a public right-of-way that could be utilized for overflow and vendor parking on event days.



Conceptual design for Bourgoin Park trail connection



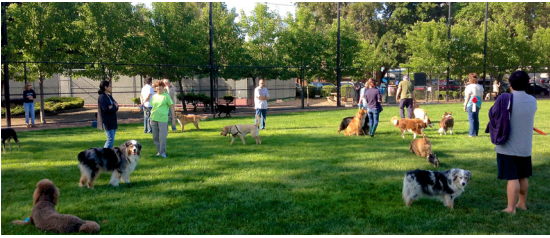
Locus Map

Manchester Street Park

Manchester Street Park is the northern anchor for the Rail Trail corridor. The park serves as a central hub for trail connections to the existing Spicket River Greenway and the Methuen Rail Trail to the north. Multiple access points to the rail corridor in this area will encourage active engagement between park users and the connecting trail systems.

Today the park boasts a variety of amenities including a community garden, playground, picnic area and elevated pavilion on the Spicket River. In addition to these amenities, a wide stretch of open lawn occupies a large portion of the northern end of the park; the lawn is underutilized by residents and visitors. The total lawn area is approximately one acre and provides an excellent expansion opportunity for the park.

It is expected that with the installation of the Rail Trail corridor and connection to the Methuen Rail Trail this park will become even more popular. The open lawn is envisioned for a wide variety of park expansion uses, many of which can overlap, or vary by season. Some examples of suggested active and passive uses can be seen on the next page. In addition to these options for additional amenities and programming, community members were interested in seeing installation of additional shade trees, picnic tables and play equipment in Manchester Street Park. They also noted that formal signage and wayfinding throughout the park would help users locate the various amenities in this area.

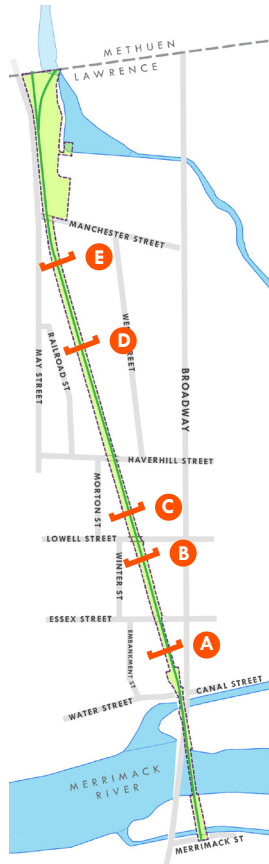
*Dog Park**Skate Park**Ice Skating***Active Uses***Land Sculpture**Wildlife Garden**Tall Grass Maze**Outdoor Movie***Passive Uses**

Rail Trail ANCHOR

MANCHESTER STREET GATEWAY

As part of the Land and Water Conservation Fund grant, a formal entrance and access trail will be built from Manchester Street along the boundary of the rail bed to the main parking lot for Manchester Street Park, creating an inviting pedestrian entrance connecting directly to the existing sidewalk at Manchester Street. The design will include a small entry plaza and gateway kiosk at Manchester Street, a paved walking trail, additional tree and ornamental plantings, and a formalized plaza at the Manchester Street Park parking lot for a pleasant park entrance experience. Also included as part of this design is an accessible walkway leading up the existing sloped rail bed and connecting the parking lot directly to the new Rail Trail. An aerial perspective of the design is seen below.

*Trail head signage**Accessible ramp along slope**Concept design for Bourgoin Park trail connection*



Locus Map

Rail Trail Design

Path Layout and Materials

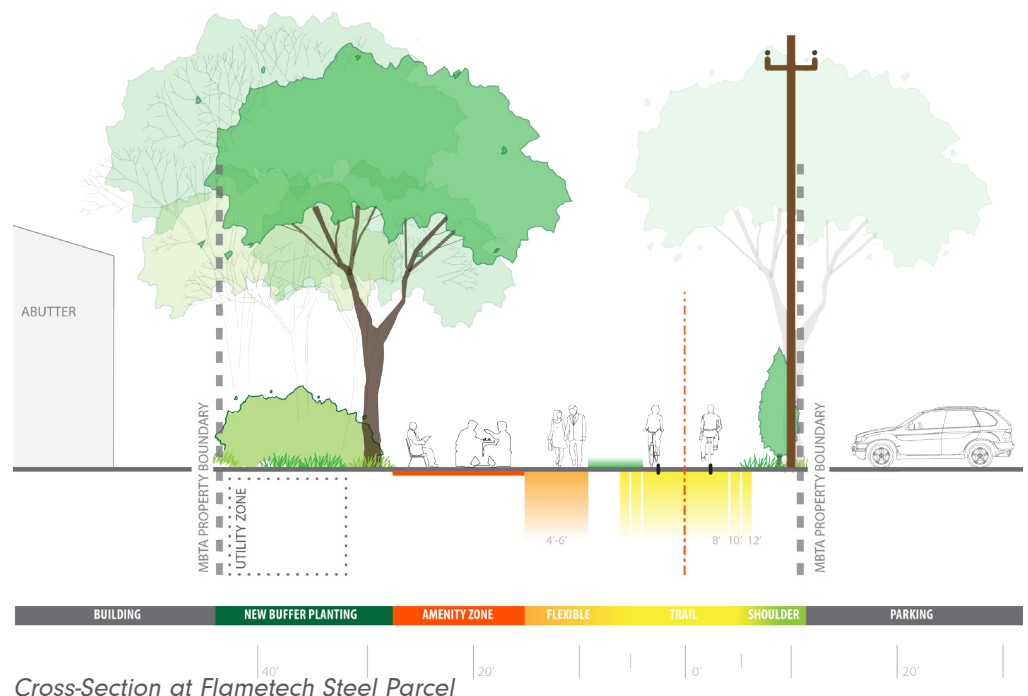
There are a variety of factors to consider when finalizing the Rail Trail layout, materials and furnishings. This section will review each of these topics in detail and present options to consider during the final design of the trail.

Rail Trail Cross-Sections

As mentioned previously, the on-land cross section of the trail varies from 50' to 80' wide along the corridor. The following sections illustrate five key cross-section typologies along the corridor and depict how trails of various width and alignment could be incorporated into the corridor cross section. Final design and layout will need to consider existing vegetation, extent of clearing, finalized locations of amenity zones, and avoidance of the utility easements when necessary.

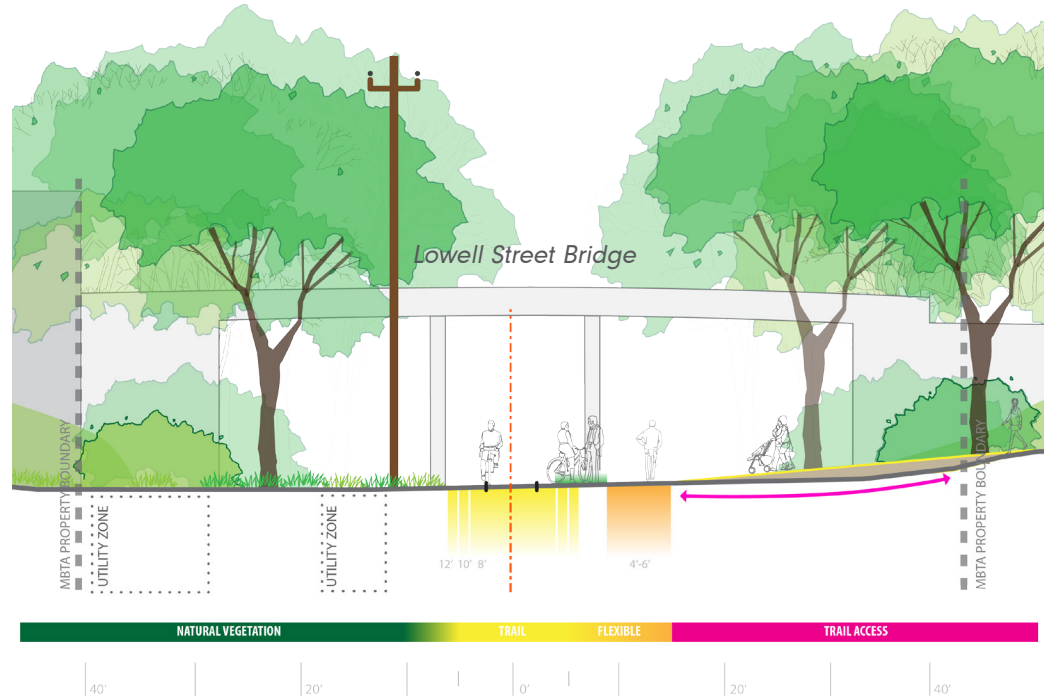
Section A >

The cross-section is 50' wide in this location, providing ample space for a single multi-use trail or separated bike and pedestrian facilities, small amenity zone, and hedge-style buffer plantings along adjacent development. There is adequate area for a single row of shade tree plantings as well if that is consistent with adjacent redevelopment.



Section B

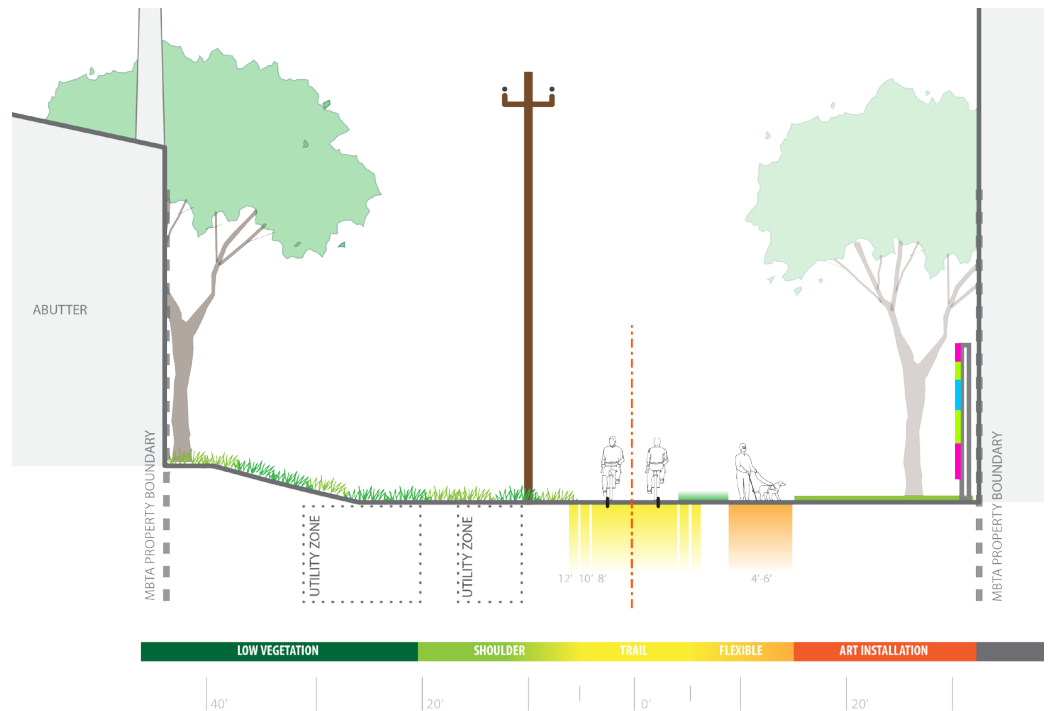
The cross-section is approximately 80' wide on either side of the Lowell Street Bridge. The existing utilities within the corridor are primarily along the western edge of the corridor. Half of the corridor is still fully available for a combined or separated trail system, and there is plenty of buffer space on either side of the trail. While the grade directly adjacent to the bridge abutments is steep, it quickly levels out, allowing for accessible connections to future development.



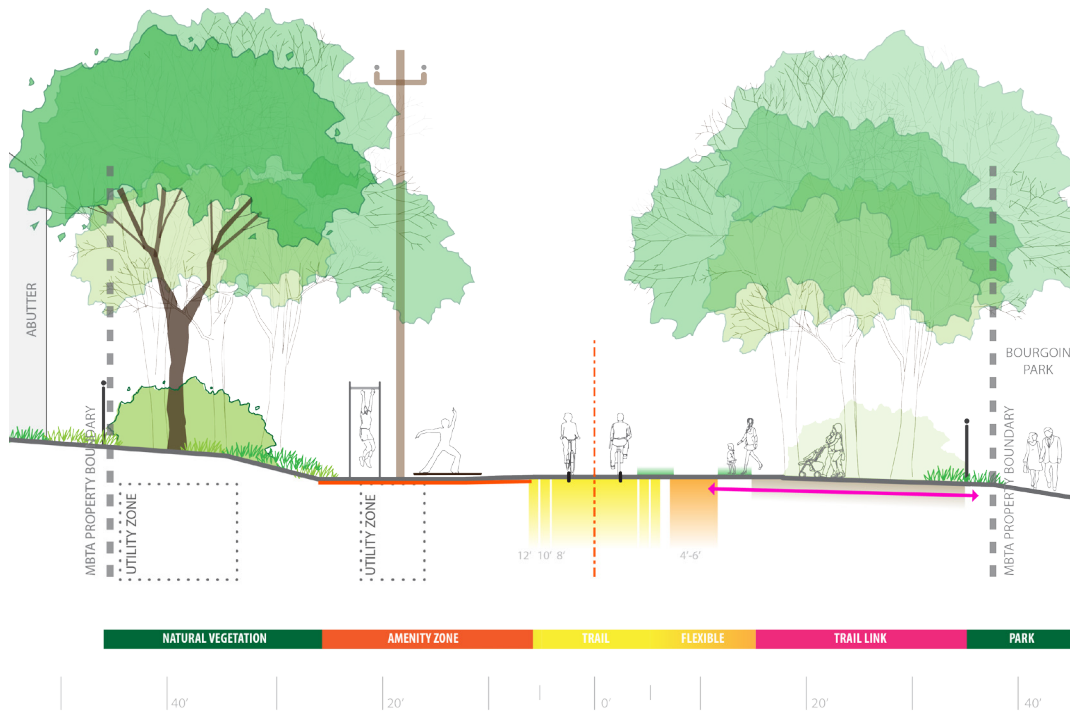
Cross-section south of Lowell Street Bridge

Section C

Nestled between existing buildings, the corridor is 80' wide along this portion of the trail as well. Given the channelized condition, it is recommended that all low vegetation be removed, and clear sight lines be created from the crossing at Haverhill Street. Some vertical installations of murals or artwork on existing walls may be appropriate to help enliven the corridor, but in general this portion of the trail should primarily serve as a thruway.



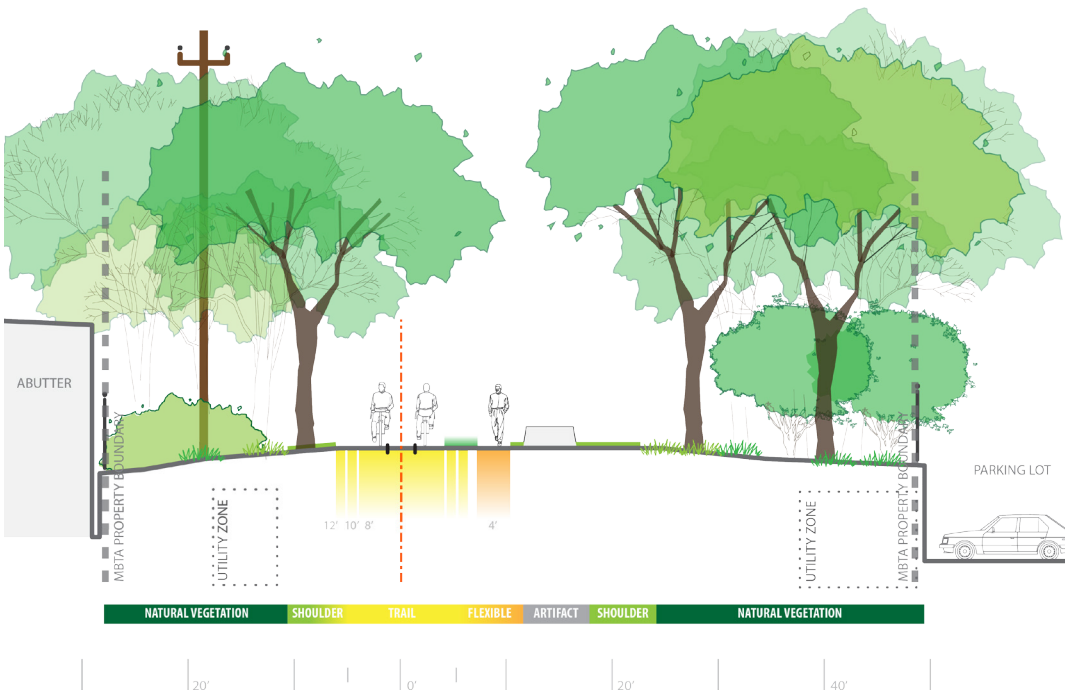
Cross-section north of Lowell Street Bridge



Cross-section at Bourgoin Park

Section D

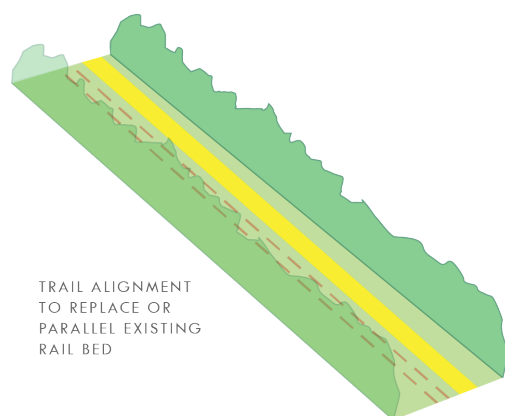
Along the northern sections of the trail, the edge condition is more naturalized. The existing understory of this area could be selectively cleared and maintained to foster a more wooded character for the trail in this zone. There is again ample width for various trail alignments and amenity zones. The grade of the corridor is starting to rise at this point, but it is still possible to create an accessible connection down to Bourgoin Park.



Cross-section south of Manchester Street Bridge

Section E

The cross-section of the trail just south of the Manchester Street Bridge crossing is fully elevated above the surrounding properties. Fencing is necessary in this area to protect users from the fall heights on either side, and should be a minimum of 42 inches in height. There are some existing rail artifacts in this area and preservation and incorporation of these structures into the interpretive signage for the trail should be considered.

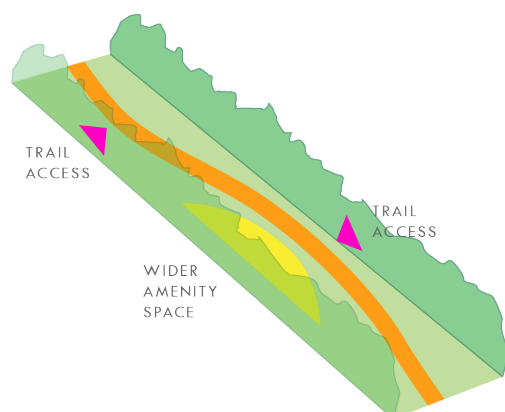


TRAIL ALIGNMENT
TO REPLACE OR
PARALLEL EXISTING
RAIL BED

Axonometric cross-section of linear trail alignment



Linear Rail Trail Alignment



TRAIL
ACCESS

WIDER
AMENITY
SPACE

TRAIL
ACCESS

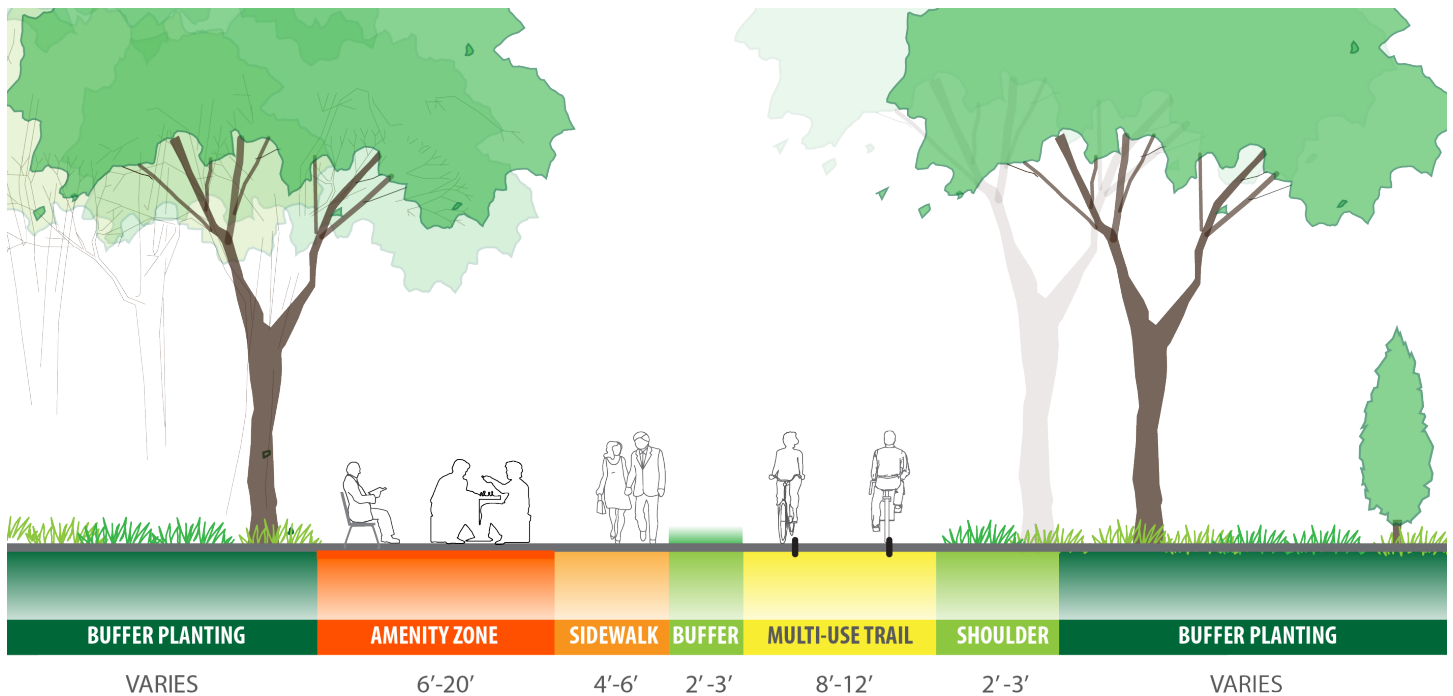
Axonometric cross-section of curvilinear trail alignment



Curvilinear Rail Trail Alignment

Trail Alignment

The corridor width also allows for either a linear trail layout that closely follows the alignment of the rail bed, or a meandering, curvilinear layout that adds additional interest to the experience of the Rail Trail. Public meeting discussions provided positive feedback for both alignments. The 1.4 mile trail could easily incorporate a mix of both alignments. Any curvilinear layout should utilize broad, generous curves for ease of negotiation by bicyclists. As shown in the diagram at left, one opportunity afforded by a curvilinear alignment is the ability to arc towards future connection sites and provide moments of wider open spaces that can be programmed for amenities. The curvilinear alignment also allows for the potential to direct the trail around and away from any identified brownfield hot spots. Required clearing would be more substantial for a curvilinear alignment and should be taken into account during design, along with the location of all utilities within the corridor.



Typical Widths For Multi-Use Corridor Zones

Separate vs. Combined Use Trails

The available width of the existing rail corridor allows for a variety of trail configurations for either combined use or separated paths. The cross-section diagrams on the next page illustrate three potential configurations. The first configuration is a slightly wider multi-use trail, anywhere from 8 to 12 feet wide to allow for two-way traffic running alongside the existing rail bed. This configuration allows the rail ties to be left in place to add a sense of character to the corridor and provide an alternative for pedestrians to use as a walking path instead of the multi-use trail. Rather than removing all of this material, the space between the rails could be in-filled with a hard pack granular material. Access points would need to accommodate accessibility requirements.

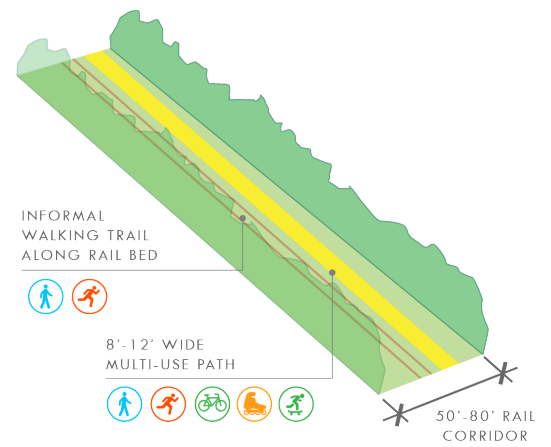
The second configuration shows a single more generous 10 to 14 foot multi-use path for all users including pedestrians, cyclists, or individuals using roller blades, or skateboards. This type of use is best served by a paved surface, but gravel surfacing can also be employed.

The last configuration is a completely separated configuration that provides an 8 to 12 foot wide two-way bike path alongside a 6 to 8 foot wide walking path. The paths could be separated by a green buffer and drainage system with a minimum width of 2 feet, but wider is advisable and feasible given the available cross-section of the corridor. A separated path system is the preferred configuration from comments received during the public meetings.

Final selection and design of the trail system should take into account user preference, available funding, selected trail surfacing material, and any impacts from the further brownfields investigations. See the trail surfacing section for further discussion on options and costs. The following section depicts additional cross sections of the trail and the right-of-way width available for trail and amenity design.



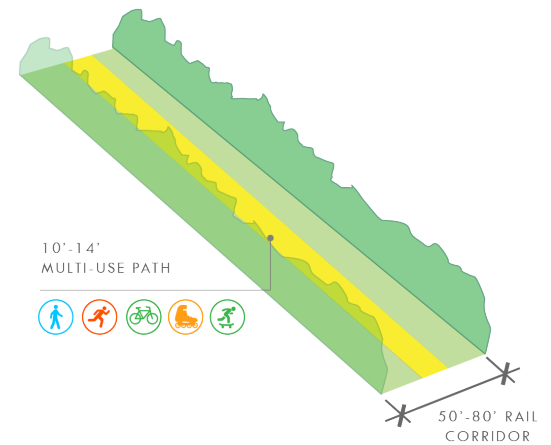
Single Multi-use Path Parallel to Existing Tracks



Axonometric cross-section



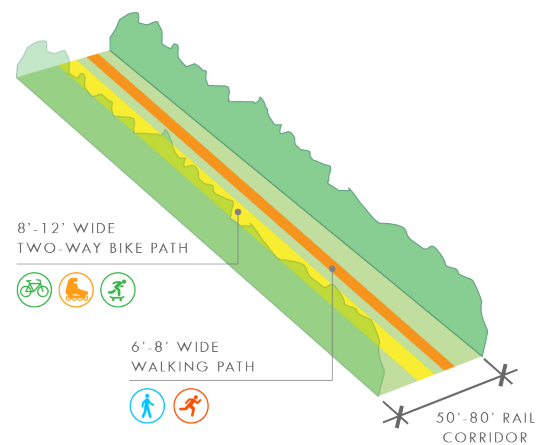
Single Wide Multi-Use Path



Axonometric cross-section



Separate Bike and Walking Paths



Axonometric cross-section



Asphalt Trail

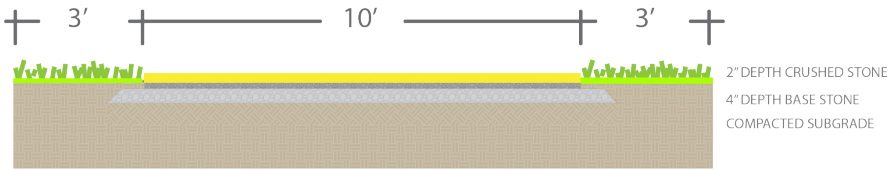


Gravel Trail

Trail Surfacing

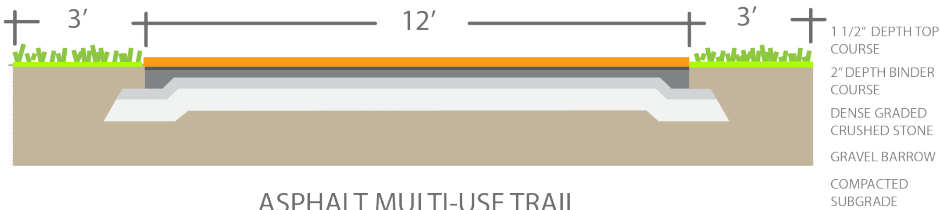
Surfacing options for the trail include hard-pack dirt, resin stabilized soil, gravel, asphalt, concrete, or asphalt unit pavers. Given the relatively natural setting of the trail, level of expected use, and lifetime maintenance, gravel or asphalt surfacing are the recommended options. As shown below, a variety of installation cross-sections have been studied for the Rail Trail corridor and relative cost ranges are included for consideration during design. The pros and cons of each surfacing material are listed with the cross-section.

PROS	CONS
<ul style="list-style-type: none"> ● EASY TO INSTALL ● CAN BE INSTALLED AS A BASE FOR FUTURE PHASING OF TRAIL PAVING ● PERVIOUS SURFACING MAY NOT REQUIRE DRAINAGE ● LOW COST OPTION 	<ul style="list-style-type: none"> ● EDGES OF THE TRAIL TEND TO MIGRATE OUTWARD ● REGULAR MAINTENANCE IS NEEDED TO REPAIR RUTS/REPLENISH STONE ● LESS ACCESSIBLE WALKING SURFACE THAN PAVEMENT

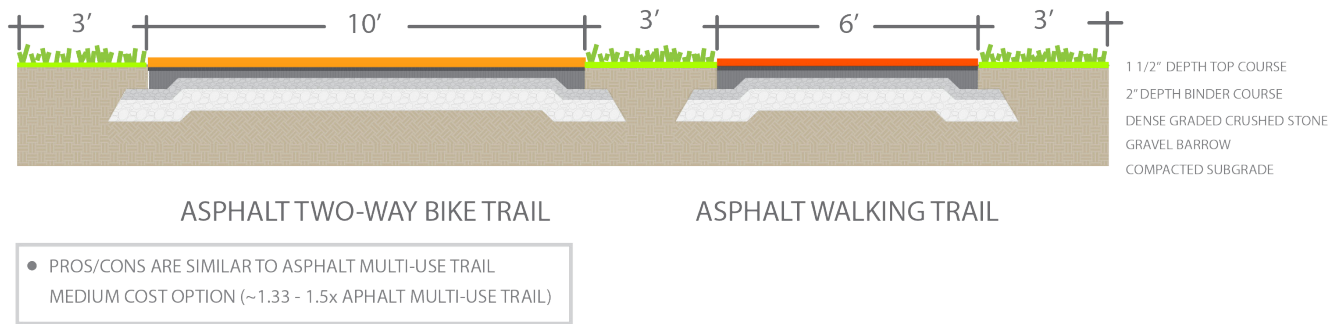


GRAVEL MULTI-USE TRAIL

PROS	CONS
<ul style="list-style-type: none"> ● EASY TO INSTALL ● LEVEL/ACCESSIBLE WALKING SURFACE ● MINIMAL MAINTENANCE OVER THE LIFE OF THE PAVEMENT ● EASY TO PLOW ● LOW COST OPTION (~1.5 - 2x GRAVEL) ● CAN SERVE AS A BROWNFIELD CAP 	<ul style="list-style-type: none"> ● IMPERVIOUS SURFACING REQUIRES DRAINAGE ● MORE COSTLY TO REPAIR THAN GRAVEL ● UNDERGROUND UTILITIES ARE NOT AS EASILY ACCESSIBLE



ASPHALT MULTI-USE TRAIL



Existing Tracks



Existing Tracks

The entire corridor contains the remnants of the old rail bed and tracks. The rails are a nice reminder of the history of the corridor and an interesting artifact for future users. One decision to be made during design of the final Rail Trail will be whether to remove the existing rails and ties entirely or in some portion throughout the corridor. There are cost considerations with the decision to remove all of the existing infrastructure, but some of this work may be offset by the ability to sell the steel rails for scrap. These cost offsetting options should be reviewed as part of the design.

If the trail is installed alongside the existing rail bed, there is a potential to utilize the existing rail alignment as an informal walking space. Alternatively, the rails could be filled in with compacted stone or other material to provide a low cost walking surface as shown in the diagram below and in the photos to the left. Any reuse of the rail bed would first need to be tested for contamination, with appropriate clean-up or capping measures incorporated.

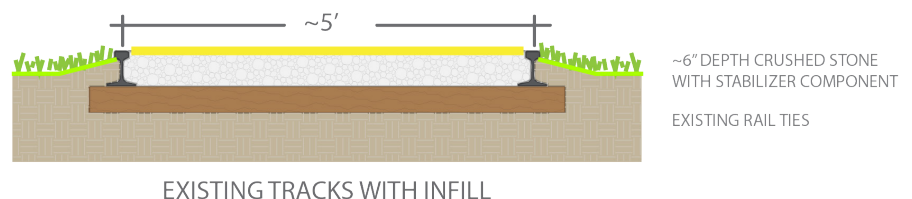


Existing Tracks Parallel to New Trail

Even if most of the main rail corridor is removed for installation of the trail, it is recommended that some of the spurs or more interesting form work from the infrastructure be saved and utilized as part of the interpretive history of the trail. The salvaged pieces could be used in installations and as display pieces along the trail corridor. All of these options should be further explored during the design process of the trail.



Existing Tracks Infilled with Paving



General Trail Amenities



Trail interpretive signage



Trail seating



Game tables

A variety of amenities can be incorporated throughout the corridor and within the adjacent parks/open spaces. The amenities noted in this section are more generally applicable to the entire corridor. Some amenities proposed during the planning process included ideas for specific areas of the trail. These amenities are covered in more detail in the previous section “Rail Trail Character along the Corridor.”

Much of the public discussions surrounding this project focused on additional amenities that could be offered alongside the Rail Trail. General amenities that can be located throughout the corridor include:

- > Interpretive signage
- > Wayfinding signage
- > Benches and seating areas
- > Circuit training stations and distance markers for runners
- > Game tables for chess, checkers, etc.



Circuit training stations along trail

Due to safety and visibility concerns along the corridor, it is recommended that placement of any amenity spaces be located near highly visible entrances, near park spaces, and towards the northern and southern sections of the corridor. Amenities that involve lingering or staying in one place are not recommended for the area of the corridor between Essex and Haverhill Streets.

A The smoke stacks and STEEL sign located on the Flametech Steel parcel are iconic to downtown Lawrence and should be preserved through both the trail and parcel redevelopment.

B There were two identified rail mile markers along the trail corridor. These can be relocated to a more prominent location. The one pictured above is currently located in the corridor near the Lawrence Family Development Charter School and could be utilized as part of the school's history curriculum.

C The trail car ramp/lift located near the Manchester Street crossing is an interesting artifact that could easily remain in place alongside the trail.

D As mentioned earlier, it is recommended that at least some of the standard rail infrastructure be preserved and displayed as part of the design of the corridor. Elements such as the frog switch pictured at right are excellent items of interest to display as part of the history telling of the trail.

E Although not currently within the right-of-way, a rail car bumper is located on the backside of the Colony Foods property, visible from the corridor. The artifact could remain in place or potentially be moved to the trail corridor through discussions with the property owner.



Historic Artifacts

There are a variety of items of historical interest located along the corridor today. Design of the future corridor should incorporate and highlight these elements through effective staging and interpretive signage. In some cases, the elements may need to be relocated to a site where they are more highly visible and have direct access from the trail. Images of the some of the identified items are shown above.

Lighting



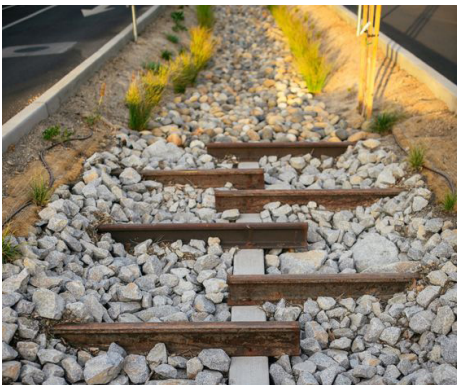
Solar powered pedestrian lights



Pedestrian bridge handrail lighting



Stormwater bioswale along bike path



Rail stormwater runoff attenuators

Lighting the Rail Trail will be a policy and maintenance decision by the City. Many agencies do not light their trails and instead institute a dusk to dawn policy of park usage. During several of the public meetings held during the planning process community members raised concerns about safety of the corridor. Many Rail Trails are now designed as commuting corridors as well, and this particular corridor is well suited for this use. Given the safety concerns of the community and the potential for high commuter use along this corridor, it is advisable that lighting be provided for the full length of the corridor.

The available corridor width provides adequate space for pedestrian scale lighting while also avoiding existing utility corridors. The smaller bridge crossings can be served by pole lighting at either end of the bridges. For the longer span bridge over the Merrimack River, in-laid lighting in the handrail or railing posts will be more appropriate. This form of lighting provides safe lighting levels while avoiding large overhead structures that would be difficult to affix to the existing structure. It is recommended that solar powered light poles be considered to reduce the need for grid supplied electricity, to promote renewable energy use, and to serve as a pilot project for future City investments.

Green Infrastructure

The relatively wide and pervious area of the corridor lends itself well to the opportunity for development of green infrastructure systems that will serve abutting developed areas. Regardless of surfacing material, the trail itself will not generate significant run-off and the infiltration capacity of the corridor should allow for stormwater infiltration to be accommodated through cross-pitching to an infiltration trench directly adjacent to the trail installation. Geotechnical testing for infiltration rates will need to be completed to confirm this. Additionally, soil testing should confirm that areas used for infiltration are free of contamination. Gravel surfacing is considered a semi-pervious material, while asphalt surfacing would be considered impervious and final design should take these characteristics into account. Pervious asphalt products are available, but this material requires regular maintenance in the form of vacuuming to maintain the pervious properties of the surfacing.

Because the corridor offers a larger capacity for stormwater collection and infiltration than necessary for the trail installation, final design should incorporate mechanisms for collection and treatment of stormwater from adjacent developed parcels. The most suitable locations for green infrastructure installations occur where stormwater can be collected from adjacent impervious uses and where the topography naturally slopes in the direction of the corridor. One excellent example of this condition occurs at the Downtown Crossing redevelopment block and the adjacent at-grade crossings by Haverhill Street. As this parcel is redeveloped, efforts should be made to design and locate a green infrastructure system in this location. Similar conditions exist throughout the corridor, and final design should seek to incorporate green infrastructure wherever feasible.

Ongoing Trail Maintenance



Minimize the maintained trail edge (2'-3' maximum width for lawn/low meadow buffer)



Organize volunteer clean-up events like the Methuen Rail Trail clean-up



Engage youth groups in trail planting and upkeep efforts

A successful trail design is as much about future maintenance and upkeep as it is about character. Once the project is constructed, it is the City of Lawrence and its community partners that will ultimately make the Lawrence Manchester Rail Corridor project a success. Garnering a sense of ownership is vital to that ongoing success, and the public engagement process during design should be utilized to build lasting partnerships between the City of Lawrence and community groups, institutions, and businesses as a way of ensuring the Lawrence Manchester Rail Corridor's longevity as a vital community asset. Volunteer cleanup days, shared use agreements, and community organization partnerships can all be utilized to supplement the maintenance capacity of the Department of Public Works. A well maintained trail can mean the difference between a trail that has a spectacular opening day and a lasting community resource that serves as a major economic driver for the City.

Based on community feedback, ongoing maintenance is a major concern secondary only to security and lighting. An awareness of ongoing maintenance needs will be critical during the design phase. The corridor is over 13 acres of land up to 80 feet wide, so initial discussions with the Department of Public Works will be key to understanding their capacities and designing a trail envelope that can be maintained effectively. Some strategies for reducing maintenance needs include:

- > Limiting the manicured trail boundary.
- > Planting slow grow lawn seed blends for reduced mowing requirements.
- > Utilizing shade trees as a primary planting material.
- > Using native/drought resistant plantings.
- > Choosing furnishings that have demonstrated durability and longevity.
- > Planning site furnishing placement for ease of access, replacement and maintenance.

Developing partnerships and agreements during the design phases and as part of future redevelopment agreements will provide additional maintenance support for the trail. As an example of this, officials from the Lawrence Family Development Charter School expressed an interest in helping maintain the corridor directly adjacent to the school property. Additional agreements may be arranged between youth groups such as Youth Build, local nonprofits like Class Inc. or with other adjacent property owners, potentially through maintenance agreements with future new developers. One other potential option for initial maintenance of the trail would be to include an extended maintenance agreement in the original bid document specifications to provide up to three years of ongoing initial contracted maintenance through the construction contract of the project.

Utilities

The corridor has several utility easements and structures running the length of it that will need to be considered and, in some cases, avoided during design of the Rail Trail.

Steam Pipe Easement

There is a 10 foot wide steam pipe easement that runs almost the entire length of the corridor, primarily along the western edge of the right-of-way. There are a couple of locations where the easement perpendicularly crosses the width of the right-of-way. As part of the survey and site investigation for the corridor, the exact depth and width of the structure should be determined prior to final design. Also, any subsurface excavation and/or footings associated with trail design should remain outside of the easement.

Overhead Electric Wires

Overhead electric wires run the length of the corridor, crossing the width of the corridor several times to make connections on either side. Utility poles supporting the wires are located at regular intervals and accommodations should be made through design of the trail layout to avoid the existing poles. Layout of pole lights or any structures with significant height should be located outside of the immediate proximity of the wires. The utility corridor is owned by National Grid and pole relocation or electrical connections will require proper permitting.

Fiber Optic

The fiber optic utility corridor runs along the western edge of the right-of-way, almost directly below the overhead wires in many locations. The utility corridor is owned by AT&T. The trail layout should avoid the utility corridor to limit any future demolition necessary for utility repair. The depth and easement limits should be determined prior to final design. Similar to the steam pipe easement, any subsurface excavation and/or footings associated with trail design should remain outside of the easement.



Rail Trail Programming

Programming Options

There are a variety of programming options available for the Rail Trail, some specific to particular areas, and some appropriate throughout the corridor. A few general categories for consideration are included below.

Partnerships with City Events/Programming

Once open, the Lawrence Manchester Rail Corridor, and specifically the Gateway Park located at the corridor entrance, will offer an additional anchor location to hold City events. The Gateway Park space can be utilized as the start/finish line for events like the annual Ciclovía biking event or a location for a mobile Farmer's Market. The Gateway Park can also serve as a finishing point for downtown parade routes for events like Semana Hispana and provide an ending location complete with vendors, artisans, and music.

Linking the new 1.5 mile section of the Lawrence Manchester Rail Corridor with the 3.5 mile Spicket River Greenway and 1.0 mile on-street Merrimack River Trail would provide a 5.5 mile circular loop of the City which is long enough to hold 5K or 7K race events during festivals like the Lawrence 5K and Family Fun Day. Members of the Mayor's Health Task Force and the statewide Mass in Motion programs are also eager to help bring additional events to corridors like the Lawrence Manchester Rail Corridor.



Agriculture Ventures / Job Training



Raised planting beds



Container grown trees



Community garden



Shipping container farm

The broad width of the corridor offers an opportunity to utilize some of the additional open space for urban agriculture/skill building ventures. In cities nationwide, there is an effort to locate food growing and production activities within the city limits as part of the local food/production movement. Many of the residents of Lawrence have expressed an interest in growing their own produce, and a community garden with nine plots located at the Manchester Street Park is already expanding this capacity within the City. Lawrence currently has a network of over 300 gardeners. Building from that momentum, design of the Rail Trail should look for opportunities to expand production areas and offer plots to additional residents in areas where the right-of-way expands to widths in excess of sixty feet.

Additionally, this production opportunity can be expanded to other startup ventures such as nursery-type production of annuals and tree liners. The state's Greening the Gateway Cities program requires thousands of trees annually, providing a potential source of revenue for the Rail Trail in addition to job-training opportunities. Nonprofits such as the Urban Farming Institute in Boston help pair individuals looking to develop agricultural job skills with urban agriculture opportunities. Similar opportunities could be provided within Lawrence as an economic development driver through partnerships with nonprofits and groups like Groundwork Lawrence, Class Inc., and YouthBuild.

Activities such as these do require some maintenance facilities. Opportunities for water hook-up or water truck access should be explored during design. Additionally, depending on the scale of the activities, small storage facilities may also be necessary for storing gardening/maintenance equipment. Any agricultural or nursery activities within the corridor should be carried out in a way that isolates the planting soil from the potentially contaminated subgrade. This can be done through the use of raised planting beds, pot-in-pot production, or other barrier liners. Another option would be to isolate the agricultural activities from the corridor completely through the use of installations like hydroponic shipping container farms, which would not require use of the land to begin production. If commercial activities are carried out, a leasing arrangement would need to be approved by the MBTA as well and a competitive bid process for commercial access to the corridor would likely be necessary.

Recreational Tourism

Development of the Lawrence Rail Trail in connection with the Methuen Rail Trail and other local trail networks is an excellent opportunity to generate increased tourism to the City through expanded recreational offerings and events. Space exists within the corridor to create facilities for urban off-road cycling, BMX facilities, skateboarding, cross-country skiing, and race events. Design of the Rail Trail should evaluate opportunities for expansion of these types of events into the City of Lawrence. Collaboration and connection with interest groups such as New England Mountain Bike Association (NEMBA), <http://www.nemba.org/>, New England Nordic Ski Association (NENSA), <https://www.nensa.net/>, Lawrence YMCA, <http://lawrence.mvymca.org/>, Merrimack Valley Striders, <http://mvsruns.com/>, and other user networking groups will facilitate initial exposure of the trail through use of their established publicity and outreach channels. Additionally, cultivating relationships with these groups will provide an ongoing support network for the City and for stewardship groups/volunteers looking to take on responsibility for care of the trail.



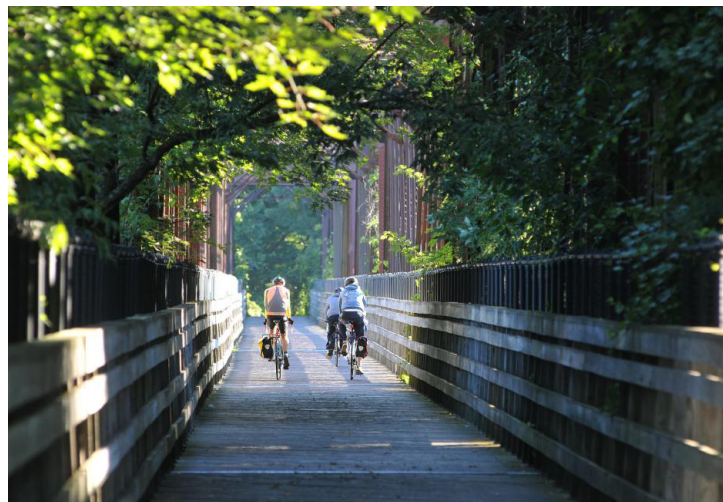
BMX bike trail ramps



BMX bike course



Regional race event



Regional bike touring

4 MARKET STUDY

Byrne McKinney & Associates, Inc. conducted an analysis of the real estate market and financial potential for the redevelopment blocks within the Lawrence Manchester Rail Corridor Study Area to advance the creation of a Plan for the area. The market study looked at the project area as an extension of Downtown.

General Market Context

A number of factors in the Project Area, and the larger downtown Lawrence area, create market opportunities that support redevelopment:

- > Positive growth and unmet demand for some uses (especially for residential and industrial uses).
- > Good accessibility to and from the surrounding market area.
- > Substantial population and employment densities.
- > Historically significant built environment.
- > Authentic and appealing downtown environment.

At the same time, the area has a number of challenges to redevelopment:

- > Existing site conditions and negative market perceptions – including rundown and underutilized buildings and potential contamination issues.
- > Substantial market competition in the surrounding area.
- > New construction in the downtown is not feasible without financial supports.

The study focused on the following four market segments, considered to be the most logical uses for the project area:

- > Residential
- > Retail
- > Office
- > Light Industrial

Residential Use

Market Observations

- > Lawrence is a “value” market offering a cost competitive alternative to submarket locations closer to Boston, Cambridge and other Rte. 93/495 employment centers.
- > The downtown is an attractive location for housing, providing a handsome historic environment, access to commercial amenities and ready Commuter Rail access to Boston.
- > The downtown also serves direct market demand generated in Lawrence proper which enjoys a substantial employment base.
- > Housing development here could serve as a powerful anti-blighting agent for the area.

Financial Findings

Financial Pro Forms were developed for two residential prototypes to test their financial feasibility. Large scale residential development feasibility (100 units or larger) was tested on the Downtown Crossing Block for a program consisting of 4 buildings of 40 units each; and small scale residential development feasibility (under 20 units) was tested on the Downtown Crossing Block for infill sites each supporting 16 units.

The analysis resulted in the following conclusions:

- > While demand is strong, rents in the downtown cannot easily shoulder the cost of substantial new construction without supports. And, the economics of urban scale/high-rise construction (meaning anything taller than 7-8 stories) are especially challenging in the current market.
- > The analysis demonstrates that larger, denser residential programs that require structured parking can be made feasible with supports (i.e., Tax Credits, Home Funds, etc.).
- > Likewise, smaller scale, market rate infill developments are also feasible for local builder/developers as cost savings and profit taking can occur at different levels of project execution.
 - > Smaller projects do not require the level of financing or management sophistication or the financial resources (equity capital) required by larger projects so present an opportunity for a larger universe of potential developers.
 - > In addition, these projects are most often undertaken through open-shop construction contracts, so are less expensive to build, have reduced soft costs and/or benefit from developer contribution of in-kind services.

- > In exchange, these entrepreneurial developers are often able to realize some of their returns in the form of fees for things such as development management, construction management, property management and the like, rather than just from their return on capital invested.
- > Any incentives or assistance (grants, lower cost financing, etc.) that can reduce project costs or improve a project's net revenue can help to enhance the viability of new residential construction.
- > On the cost front, the public's contribution of land at a reduced or zero cost, or assistance in covering a project's cost of environmental clean-up, demolition, parking construction or other amenities, all help to reduce the costs that would otherwise need to be borne by the developer and thus improves feasibility.
- > Likewise, public programs or initiatives that increase a project's revenue potentials (i.e. that produce higher rents or sale prices) such as installing public amenities like the proposed Rail Trail or eliminating nearby blighting influences; or that reduce or slow the expenses of property operation like reducing real estate taxes (through an agreement with the City), decreasing the need for paid security details, offering free or low cost parking, or sharing maintenance costs, etc. all produce more revenue to the bottom line and enhance project feasibility.

Retail Use

Market Observations

- > Lawrence is primarily a neighborhood/community serving market offering goods and services to the local residential and day-time employee markets (restaurant, grocery, convenience goods, entertainment, etc.).
- > Visitation to historic sites and other transient demand has the potential to bolster downtown retail performance (for existing and new space) provided that there is a concerted effort to match the transient demand to the supply (food and beverage, gifts, sundries, etc.).
- > Identifying credit quality build-to-suit tenants or owner-users is essential to any major retail development success in both the short and long terms.

Financial Findings

- > Economic fundamentals support new development feasibility for certain kinds of retail users (e.g. fast food chains, convenience store chains, drive-through banks, etc.), some of which may not be desirable from a public policy perspective given their low intensity land use, parking and traffic impacts. The feasibility of "chain" retail use depends on the willingness of these build-to-suit users to pay the rent needed to support the cost of construction.
- > Ancillary retail uses (meaning in this case, smaller scale, independent ground

floor retail uses ancillary to other uses such as residential above) were tested, and do not make a positive contribution to overall project feasibility, as the smaller scale occupants typically associated with ground floor retail generally lack the capacity to pay rents sufficient to cover the cost of new construction.

- > That said, like the observations for residential feasibility, supports aimed at reducing the cost of development (e.g. lower land costs, public parking, etc.) or improving marketability (e.g. adjacent public realm improvements like the proposed Rail Trail, etc.), could help the feasibility of ground floor retail aimed at ancillary, “non-chain” retail occupancy.

Office Use

Market Observations

- > Lawrence is a “local” market offering a cost competitive option to local finance, insurance and real estate (FIRE) users that serve the commercial office needs of community.
- > Demand is seen as limited for the larger scale users who typically need/want broader access to and visibility from the regional highway network.
- > Substantial upper floor space (in varying states of renovation) is available to meet the identified demand targets, with limited demand for new space creation.
- > Identifying build-to-suit tenants or owner-users is seen as essential to any new office development success in both the short and long terms - speculative office development is a non-starter.

Financial Findings

- > Office use was tested, and economic fundamentals do not support new development feasibility – achievable, market rate office rents are not sufficient to underwrite the cost of new construction.
- > While incentives such as those already mentioned for residential and retail development could help to close the gap, only a bona fide occupant (tenant or owner) willing to knowingly pay a non-economic rent or price will produce new construction feasibility for new office development. Such users might include public, non-profit or institutional users for whom other motivations (e.g. economic development, service area constraints, etc.) trump the normative market rent/price considerations.

Industrial Use

Market Observations

- > The Lawrence industrial market offers a cost competitive option for growing companies and start-ups and has seen strong sector growth in food manufacturing, arts and entertainment, medical devices and technical services.
- > While demand in these sectors is good, economic fundamentals do not support new development feasibility – achievable rents are not sufficient to underwrite the cost of new construction.
- > And like office, identifying build-to-suit anchor tenants or owner-users is essential to any new development success - speculative new construction is not viewed as financeable.
- > That said, existing floor space (in varying states of renovation) is available in the study area and it appears could be feasibly redeployed to meet the identified demand targets.
- > Note that demand for industrial, job creating development is finite. Any plan to attract industrial uses to the study area must be undertaken with an eye toward the larger City-wide economic development strategy, especially given the level of public support needed to create a feasible project in this location.

Financial Findings

Financial Pro Forms were developed for two industrial prototypes to test their financial feasibility. New industrial construction feasibility was tested on the Flametech Steel Block for a prototypical 20,000 square foot one story industrial/flex building on a subdivided site flanking the proposed Rail Trail; and industrial rehabilitation feasibility was tested on the Flametech Steel Block for a 24,000 square foot industrial shell building fronting on Essex Street. The analysis resulted in the following conclusions:

- > The analysis demonstrates that new industrial development does not generate enough income to support the cost of new construction. Substantial public intervention would be required to close the feasibility gap for new construction.
- > Conversely, redevelopment of existing industrial shells for flex/industrial uses is feasible, depending on the level of renovation and remediation required to support occupancy.
- > Like residential and retail uses, public supports that reduce the cost of development (reduced land costs, site prep, infrastructure supports, parking, amenities, etc.), enhance project marketability (and rents/sale prices). For example, installing public amenities such as the proposed Rail Trail, removing blighting influences and/or reducing or slowing the growth of occupancy costs (real estate tax agreements with the City, shared maintenance, etc.) offer the potential to enhance the feasibility of new industrial development.

Other Market Observations

In addition to the four land uses detailed above, the analysis examined other potential uses:

- > The downtown hotel market does not support feasible new hotel development today, but successful business attraction and expansion initiatives and downtown revitalization efforts are expected to provide an economic rationale for downtown hotel development in the future.
- > Institutional and public sector uses, including existing non-profit, medical and governmental entities are anchoring influences in the downtown, providing a destination draw that enhances activity levels in the downtown market overall and improves development feasibility for private sector development.

Strategic Development Approach

The most impactful actions that can be undertaken in the near term to spur revitalization of the Study Area begin with a general cleanup of the area (meaning environmental remediation, demolition of obsolete structures, and removal of other blighting influences) and the construction of new open space amenities such as the Rail Trail. Both these activities will activate public use of the corridor and will help to change the market's perceptions of the area. Public sector support for these initiatives will be essential.

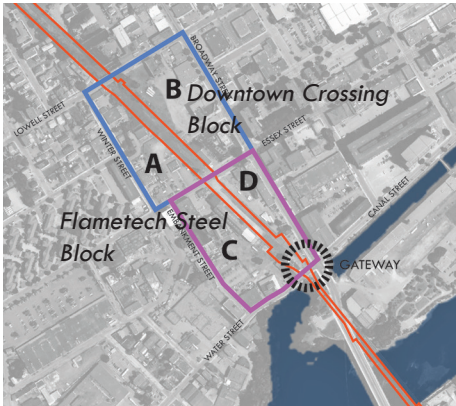
After these "enablers" are complete, the area's redevelopment potential becomes more realizable and it is recommended that residential and industrial programs form the core of a future plan. Residential uses should be concentrated in the Downtown Crossing Block where they can extend and connect with the existing residential neighborhood. Industrial uses should be concentrated to the south in the Flametech Steel Block, where industrial and commercial uses now predominate.

In all cases the strategic approach should be aimed at leveraging the added value and economic potential created by the Rail Trail – that is, taking advantage of Rail Trail frontage and organizing a rational street grid that optimizes the ability of future development occupants (residents and employees) to use and enjoy the trail.

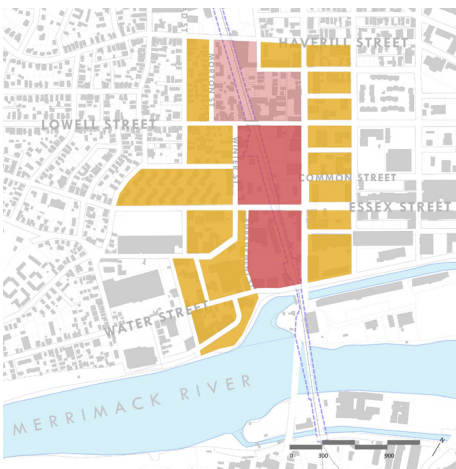
Promotion of the Plan should also include encouragement/assistance in advancing private redevelopment efforts including:

- > Ensuring that the zoning and regulatory framework is supportive of the Plan.
- > Working with owners to achieve site assembly.
- > Helping to bring a coordinated internal roadway and utility infrastructure grid in the Downtown Crossing and Flametech Steel Blocks.
- > Providing encouragement and assistance with strategies for shared parking.
- > Providing tax relief where appropriate.
- > And generally, being ready, opportunistically to help push private sector development ideas forward to fruition.

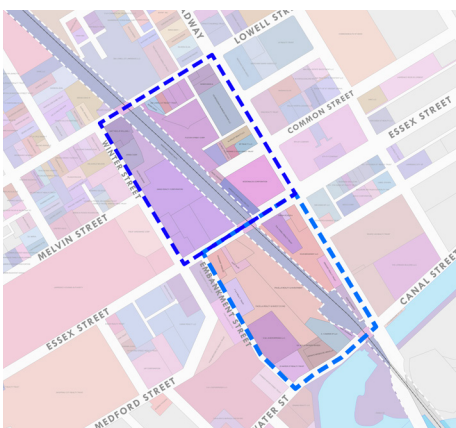
5 REDEVELOPMENT BLOCKS



Development Block Quadrants



Existing Block Size



Existing Ownership - multiple parcels of the same color indicate same ownership

As discussed in Chapter 1, in addition to being an important open space, recreation and transportation resource for the City, the Rail Trail is intended to be a catalyst for redevelopment in the areas around it, particularly with respect to the two blocks at the southern end of the corridor before it crosses the North Canal. This chapter documents:

- > The existing conditions on those two blocks as they effect potential redevelopment and
- > The evolution of conceptual redevelopment plans for the two blocks

Existing Conditions

The Flametech Steel Block is bounded by Water Street, Embankment Street, Essex Street and Broadway. The Downtown Crossing Block is bounded by Essex Street, Winter Street, Lowell Street and Broadway. Both blocks are bisected from northwest to southeast by the rail corridor.

The four quadrants created by the rail corridor have similar geometry but vary in size, visibility and access. The quadrants all have a long, roughly triangular shape. Although the “point” of the triangle is cut off, they each have one narrow end and one wide end. This complex geometry makes the siting of buildings and parking less efficient.

Parcel	Width	Length	ACREAGE
A	95-300'	730'	3.4
B	210-390'	7300'	4.1
C	215-380'	680'	5.2
D	20-210'	680'	1.6
TOTAL			14.3

Table 1: Parcel Sizes

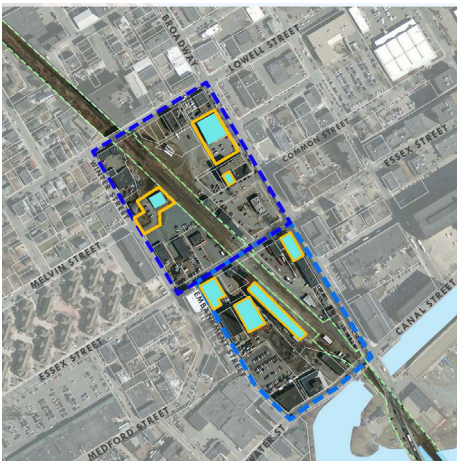
As shown in the drawing at left, these two blocks are significantly larger than the surrounding blocks. East of Broadway the regularly sized blocks are more consistent with a downtown city scale, while the two redevelopment blocks are superblocks with few existing opportunities for access into the parcels. One of the goals of the conceptual redevelopment plans is to create more pedestrian and bicycle access points into the blocks to connect to both the Rail Trail and existing and potential new development across the Rail Trail.



Parcels in single ownership shown in yellow



Frontage on the corridor shown in green, on Essex Street shown in red and on Broadway shown in blue



The Wilson Building, GC Restaurant Building, Flametech Steel Buildings, Day Break Shelter and Oasis Center are highlighted.

There is diverse ownership of land within the two blocks, with a number of small parcels and numerous owners, complicating redevelopment, access, circulation and parking. However, each of the four quadrants has a large parcel in single ownership. These parcels vary significantly in scale and geometric configuration, but they share some common characteristics. While large enough to accommodate some redevelopment, they are irregularly shaped and have limited frontage. As shown on the drawing at left, the parcels have significant frontage on the rail corridor, but much less frontage on Broadway and Essex Streets, the major commercial roadways in the project area.

Although a number of architecturally significant historic buildings have been demolished over the years, the redevelopment blocks still retain buildings illustrative of the project area's rich architectural heritage. Most notable are:

- > The partially occupied Wilson Building at the southeast corner of Essex and Embankment Streets features large windows, has 8,000 square foot floor plates whose width and depth are adaptable for either industrial or residential development. The Andrew Wilson Company moved into sheet metal fabrication in 1947; most of the local schools in Lawrence and nearby cities and towns installed Wilson lockers.
- > The GC Restaurant Building (formerly an office building for Pacific Mills) at the southwest corner Essex Street and Broadway.
- > The Slayton Building on the north side of Common Street Extension west of Broadway. The owners of the Slayton Building have received Planning Board approval to convert the building to residential use. The E.M. Slayton Freezer Company was a cold storage/wholesale produce and provision house in the late 19th and early 20th centuries. It is one of two remaining buildings that faced and framed the park in front of the old Lawrence Railroad Station at the corner of Broadway and Essex Street.
- > The two Flametech buildings were an integral part of the Pacific Mills complex and provide a unique redevelopment opportunity. Both buildings feature very high ceilings, long structural spans and skylights which flood the interiors with natural light. The steel fabrication building parallels the Rail Trail and a new commercial tenant could link to the trail with a plaza or a wide walkway. The former boiler room has a handsome brick facade facing Essex Street which, in coordination with the Wilson Building, presents an opportunity for an entrance plaza to the new industrial/commercial district and to the Rail Trail itself.

The conceptual redevelopment plans retain all of these buildings.

The Downtown Crossing Block is currently home to two important social service facilities – the Day Break Shelter on the west side of the corridor and the Oasis Center senior day care on the east side of the corridor. The shelter is retained in the two conceptual redevelopment plans; the Oasis Center is retained in Conceptual Redevelopment Plan 2.



Wilson Building



GC Restaurant Building



The Slayton Building

Conceptual Redevelopment Plans

Redevelopment at the scale offered by the two redevelopment blocks is a long-term process dependent on a number of factors (in addition to the site specific factors described above), including existing owners' interest in redevelopment and in potentially partnering with adjacent property owners, market conditions, existing physical environment and zoning. This planning study examined all of these factors:

- > In one-on-one meetings, a number of existing property owners expressed interest in redevelopment and in potentially working with adjacent landowners to parcels that could be more easily developed. And, as mentioned above, the owner of the Slayton Building is already moving forward with redevelopment of that building.
- > The existing market conditions are discussed in Chapter 4.
- > It is assumed that the Rail Trail and adjacent amenities will be constructed, greatly improving the physical environment.
- > Although the existing zoning is not entirely consistent with the desired uses and siting principles for these blocks, the redevelopment blocks are included in the City's new Downtown Smart Growth Overlay District which is anticipated to be in place in the next six months. The conceptual redevelopment plans are consistent with the new overlay district.

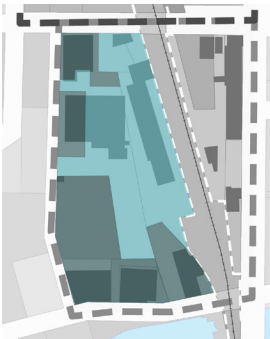
Over the course of the study, a variety of aspirational conceptual redevelopment plans were developed and assessed. It is not intended that future redevelopment exactly follow these plans, but rather that they provide existing property owners and potential future developers with ideas for what can be accommodated on the sites, how individual parcels can be consolidated to provide more usable parcels, and guiding principles that should inform future redevelopment.

The principles guiding these plans include:

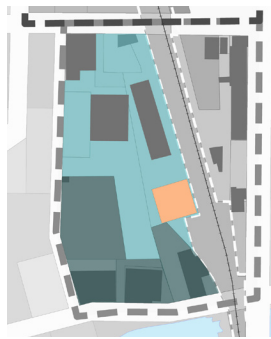
- > Encourage new development that enhances and encourages activity along the new Rail Trail.
- > Incorporate the preferred uses and market recommendations from Chapter 4.
- > Create multiple pedestrian connections from adjacent streets and neighborhoods both to and across the Rail Trail.
- > Create an attractive street edge on all sides of the blocks, particularly along Broadway and Essex Streets which are important existing commercial corridors and connect the Project Area to Downtown and other neighborhoods

- > Allow redevelopment to be phased to respect the interest of individual property owners
- > Encourage shared parking facilities to minimize the need for individual property owners to accommodate all of the necessary parking on one parcel. Because of the irregular parcel shapes, these individual lots result in very inefficient parking layouts and require multiple curb cuts.

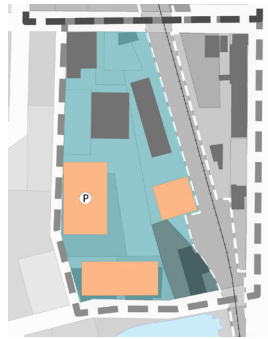
For each of the development quadrants, potential staging options were created to illustrate multiple options for consolidating parcels over time, to allow property owners flexibility.



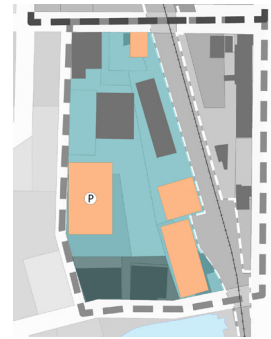
Existing conditions. Blue area indicates the Flametech Steel parcel.



Phase 1: One new building (shown in tan) is added to the Flametech Steel parcel adjacent to the rail corridor.



Phase 2: The new building from Phase 1 remains. A parking garage is constructed on the existing Spector Textile Products parking lot and a new building is added along Water Street. The blue area indicates parcels encompassed by the redevelopment.



Phase 3: The new building from Phase 1 and the parking garage from Phase 2 remain. New buildings are added on Water and Essex Streets, adjacent to the corridor. The new Phase 2 building on Water Street is not included; Phase 3 is shown as an alternative to Phase 2.



Phase 4: All of the new buildings from Phases 1 through 3 are included in Phase 4.



Examples of clean industrial uses adjacent to residential development include (from the top): Commonwealth Kitchen with adjacent newly constructed housing in Dorchester; Boston Winery in Dorchester; and Seven Cycles in Watertown.

At a Community Meeting on June 9, 2016, three very conceptual development options were shown to generate discussion on preferred development elements.



Conceptual Parcel Redevelopment Options from the Public Meeting on June 9, 2016.

One option included all residential use with buildings and a series of adjacent open spaces/plazas focused on the trail. Parking for the buildings was adjacent to the street. While people liked having development adjacent to the corridor, there was concern about all residential use and the resulting loss of jobs and about the unattractive street edge created along Embankment and Winter Streets.

A second option included both residential and industrial use and focused new buildings along the street edge, resulting in the trail corridor being surrounded by a sea of surface parking. Attendees were concerned about the isolation of the trail from surrounding streets and the new development.

A third option included both residential and industrial use and retained the Flametech Steel buildings. For the most part, residential uses were concentrated on the Downtown Crossing Block with industrial uses concentrated on the Flametech Steel Block. The Rail Trail also provides a buffer between the two uses in several locations. New buildings were sited so that while some were adjacent to the street frontage, others were focused on the trail, and a series of new east-west paths connected pedestrians to and across the trail. This concept received the most support and was further developed for the final Conceptual Redevelopment Plans.

Residential and light industrial uses can be compatible adjacent uses, provided there are appropriate regulations regarding items such as delivery hours, outdoor storage and hours of operation. Depending on the type of industrial use, adjacent residences can be attractive to those looking for a more industrial loft-style aesthetic or artist live/work space.

Aspirational Conceptual Redevelopment Plans

The following two aspirational conceptual development plans illustrate two of many options for how the Downtown Crossing and Flametech Steel Blocks could be redeveloped. The plans show potential land use and building layout, consistent with the principles outlined earlier in this chapter. They were developed to provide initial ideas and inspiration to existing property owners and future developers. It is not anticipated that redevelopment will or should be exactly as shown in the plans.

Conceptual Redevelopment Plan 1



The drawing at right illustrates Conceptual Redevelopment Plan 1. West of the rail corridor, buildings are all shown as industrial, with the two main Flametech Steel buildings retained, in addition to the Wilson Building. The Wilson Building and the two Flametech Steel buildings are shown with ground floor retail/restaurant use flanking a large open space facing Essex Street. The historic architectural facades of these buildings create a beautiful frame for the plaza area. The new Essex Street Plaza, illustrated in the ground level and birds eye renderings, includes outdoor seating, gathering, lawn and game areas that can serve the retail and restaurant uses. Food and beverage related industries, such as a brewery, pasta or chocolate production facility with ground floor retail or restaurant components could naturally spill out into the adjacent plaza and would help to attract visitors to the Rail Trail.



The supporting structure from the existing Flametech Steel gantry helps to define a seating area and provides a dramatic sculptural element to the plaza. The plaza creates an attractive entry into the rail corridor from Essex Street, one of Lawrence's main commercial streets and an important link to the Tower Hill neighborhoods.

Two new industrial buildings are shown along Water Street with another smaller building just to the north. Parking for all of these buildings, along with replacement parking for the existing Spector Textile Products parking lot, is provided in surface lots and a new three-floor garage.



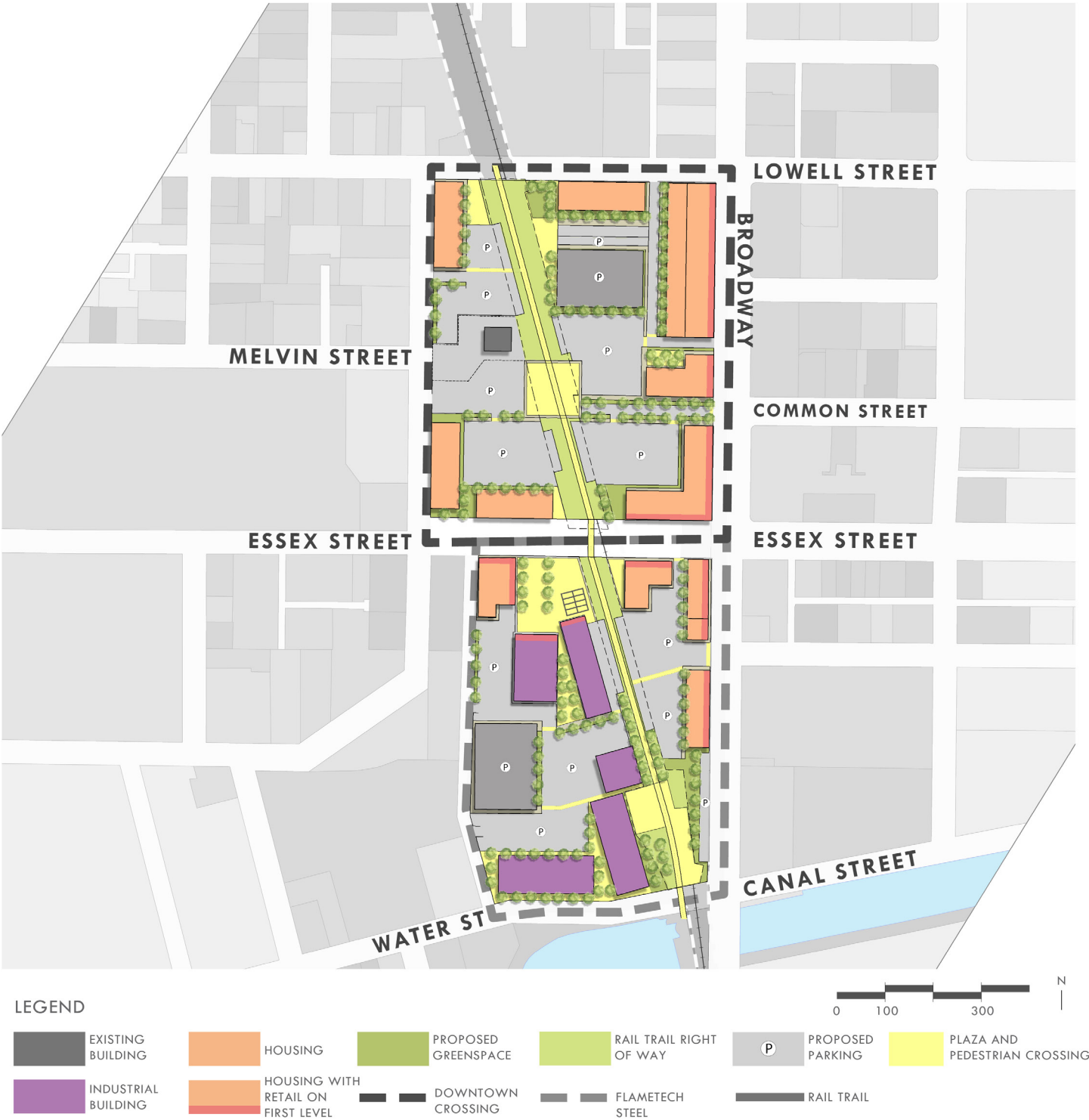
To the east of the rail corridor, the plan shows residential buildings with ground floor retail use along Essex Street and Broadway. The buildings as shown are five stories and, because the ground floor is retail, there is no potential for parking under the buildings. Meeting the parking requirements with surface lots is difficult in all four quadrants and it is particularly challenging in this Flametech Steel quadrant. The density illustrated is based on several assumptions. Residents in this quadrant would have a shared parking agreement with the industrial/commercial businesses on the west side of the Rail Trail and some of the demand for retail/restaurant customer parking would be met with on-street parking and city parking lots as it is today. It also is assumed that the evening patrons of restaurants and clubs would have the opportunity for a shared parking arrangement with the adjacent industrial/commercial businesses operating on a daytime schedule.



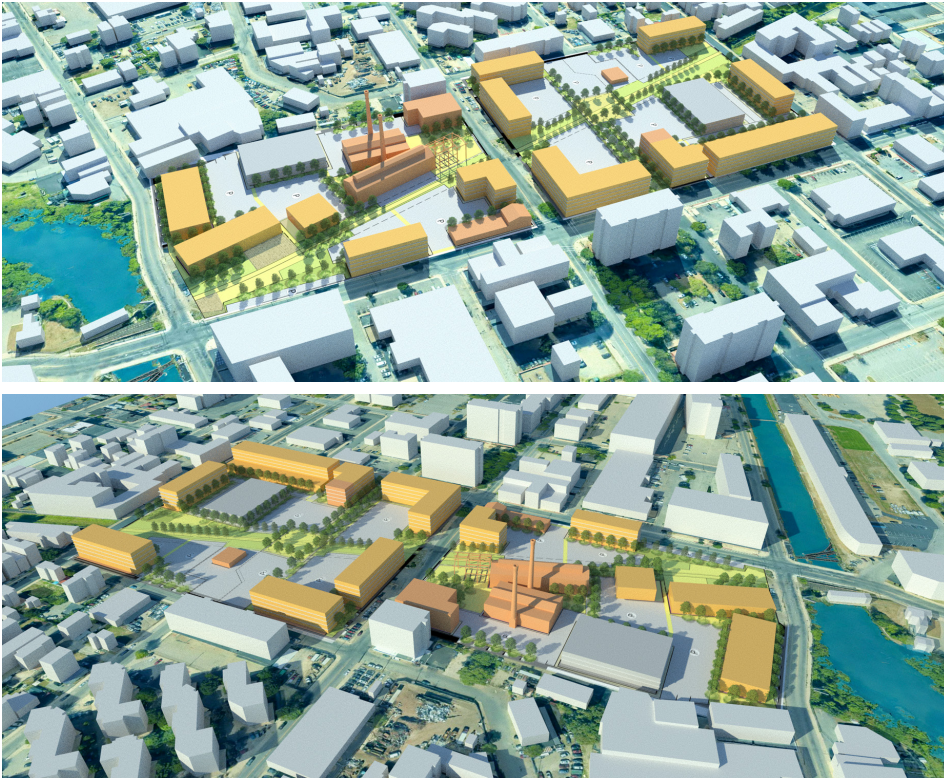
The interiors of the Flametech Steel buildings (top two) are remarkably similar to the interior of the Rhinegeist Brewery in Cincinnati, OH (lower two). That historic building is being reused as a brewery with an active event space.



In Windsor, VT, the Harpoon Brewery and The Sustainable Farmer market share this outdoor space with seating areas and lawns for games such as cornhole.



Conceptual Redevelopment Plan 1



From top: 3-D aerial views of Conceptual Redevelopment Plan 1, facing west with the Merrimack River on the left, and facing east with the river on the right. New buildings are yellow, existing buildings are orange and parking garages are gray.

Block	Use	Square Feet or Units	Parking Requirements ²	Parking Spaces Shown
Downtown Crossing Block	Residential	363 Units	454	
	Commercial	61,405 SF	162	
	Industrial	0	0	
	Surface Lots			303
	Structured Parking			200
Subtotal			616	503
Flametech Steel Block	Residential	70 Units	87	
	Commercial	37,210 SF	59	
	Industrial	72,105 SF	131	
	Surface Lots			202
	Structured Parking			200
Subtotal			277	402
TOTAL			892	905

Table 2: Amount of new development and parking requirements by use

Table 2 shows the amount of development by use illustrated on the Conceptual Redevelopment Plan, and the resulting parking requirements based on the City's new Downtown Smart Growth Overlay District (see page 75). As shown, there is a total of 13 surplus parking spaces for the two blocks combined, although there is a shortage of 113 space on the Downtown Crossing Block. The shortage on the Downtown Crossing Block could be accommodated by a combination of one or more of the following options:

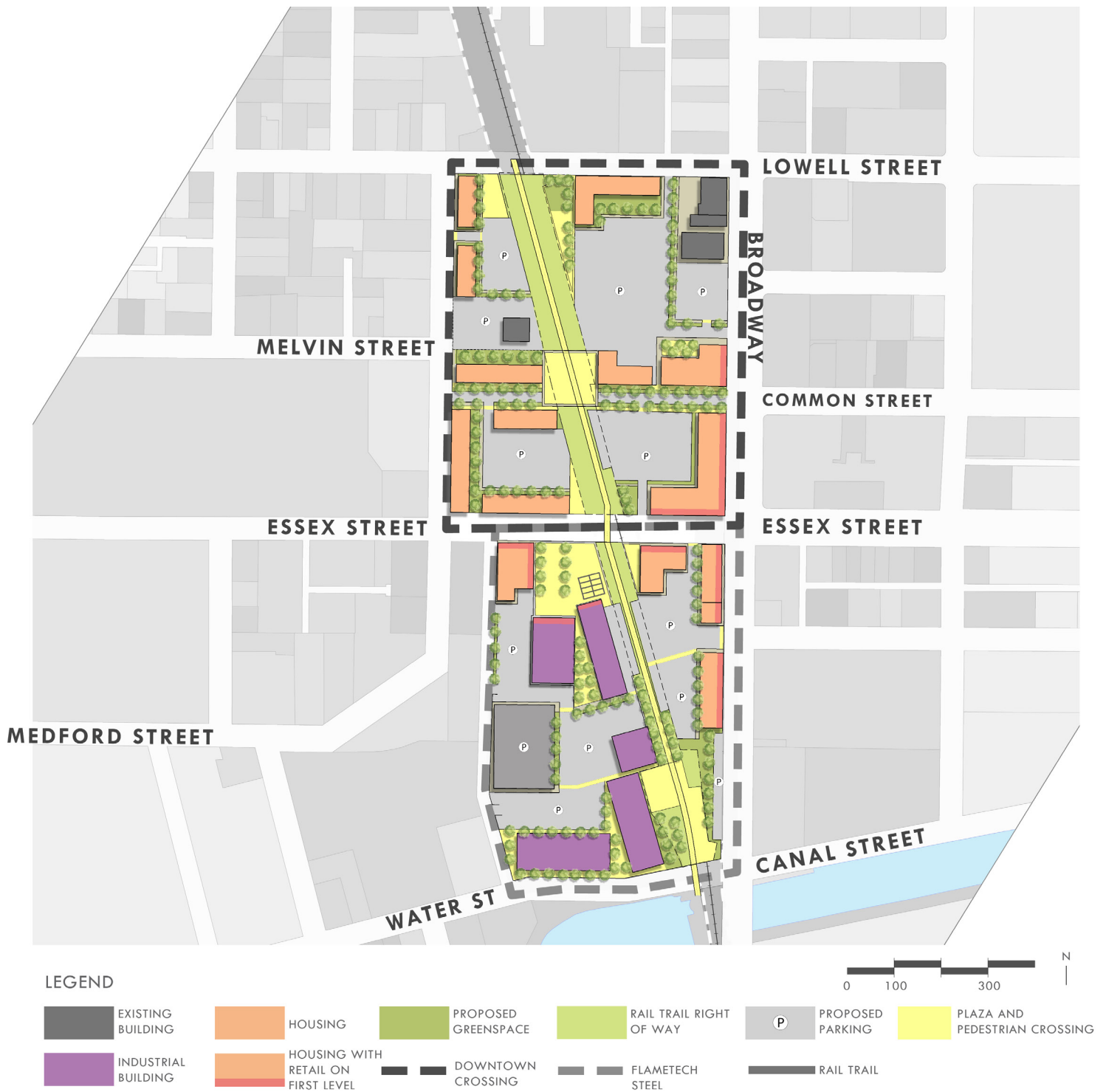
- > Leasing spaces in the garage on the Flametech Steel block
- > Adding a floor to the Downtown Crossing parking structure
- > Reducing residential density,
- > Expanding the footprint of the building at the northwest corner of Essex street and Broadway and placing structured parking over the ground floor
- > Requesting approval for reduced or shared parking as allowed by the new overlay district

The parking requirement counts do not include replacing the existing approximately 84 spaces in the Spector Textile Products parking lot. Replacement of those spaces would use up most of the surplus spaces in the garage on the Flametech Steel parcel.

² For residential uses, a mix of studios, 1, 2 and 3 bedroom units is assumed and an average of 1.25 spaces per unit was used; parking for commercial uses was calculated at 3 spaces per 1000 sf after deducting the first 2500 square feet; parking for industrial uses was calculated at 1 space per 550 square feet.



Aerial and street level view of the new plaza on the south side of Essex Street



Conceptual Development Plan 2

Conceptual Redevelopment Plan 2



From top: 3-D aerial views of Conceptual Redevelopment Plan 2, facing west with the Merrimack River on the left, and facing east with the river on the right. New buildings are yellow, existing buildings are orange and parking garages are gray.

Conceptual Development Plan 2 is a slight modification to Plan 1. On the Downtown Crossing Block, residential buildings are a smaller scale than those in Plan 1. Most of the buildings are shown as three-story townhouse developments. The Common Street extension has residential development lining the north side from Broadway to the Rail Trail corridor and then continuing west to Winter Street, providing a continuous attractive pedestrian route the entire length. The existing set of Broadway commercial buildings along the northern portion of the block near Lowell Street remains and the Oasis Center also is shown as remaining. Because of the smaller scale of the residential buildings, and the resulting reduced parking requirements, all of the parking is shown in surface parking lots. Development on the Flametech Steel Block is the same as shown in Conceptual Plan 1.

³For residential uses, a mix of studios, 1, 2 and 3 bedroom units is assumed and an average of 1.25 spaces per unit was used; parking for commercial uses was calculated at 3 spaces per 1000 sf after deducting the first 2500 square feet; parking for industrial uses was calculated at 1 space per 550 square feet.

<i>Block</i>	<i>Use</i>	<i>Square Feet or Units</i>	<i>Parking Requirements³</i>	<i>Parking Spaces Shown</i>
Downtown Crossing Block	Residential	253 Units	316	
	Commercial	41,058 SF	87	
	Industrial	0	0	
	Surface Lots			297
	Structured Parking			0
Subtotal			403	297
Flametech Steel Block	Residential	70 Units	87	
	Commercial	37,210 SF	59	
	Industrial	72,105 SF	131	
	Surface Lots			202
	Structured Parking			200
Subtotal			277	402
TOTAL			680	699

Table 3: Amount of new development and parking requirements by use

Table 3 shows the amount of development by use illustrated on the Conceptual Redevelopment Plan, and the resulting parking requirements based on the new Downtown Smart Growth Overlay District. As shown, there is a total of 19 surplus parking spaces for the two blocks combined, although there is a shortage of 106 space on the Downtown Crossing Block. As with Option 1, the shortage on the Downtown Crossing Block could be accommodated by a combination of one or more of the following options:

- > Leasing spaces in the garage on the Flametech Steel block and potentially adding an additional floor to the garage
- > Tucking some ground floor parking under the townhouse buildings
- > Reducing residential density
- > Expanding the footprint of the building at the northwest corner of Essex street and Broadway and placing structured parking over the ground floor
- > Requesting approval for reduced or shared parking as allowed by the new overlay district

The parking requirement counts do not include replacing the existing approximately 84 spaces in the Spector Textile Products parking lot. Replacement of those spaces would use up most of the surplus spaces in the garage on the Flametech Steel parcel.

Zoning

The current zoning allows (sometimes by Special Permit) the residential, commercial and industrial uses envisioned in the concept plans, as well as garages, filling stations, and vehicle storage/impoundment facilities and car washes. The existing zoning code also requires 30 foot front setbacks and 25 foot side and rear setbacks, as well as two parking spaces per dwelling unit for units with two or more bedrooms.

However, as discussed previously, the City has developed a new Downtown Smart Growth Overlay District that includes some of the following provisions:

- > A focus on mixed use, including commercial, residential and clean light industrial uses.
- > No minimum front setback and a maximum front setback of 15 feet.
- > Reduced parking requirements.
- > Minimum residential density of 20 units per acre.

The conceptual redevelopment plans are consistent with the new zoning overlay district which is anticipated to go into effect within six months.

6 NEXT STEPS

The City has made significant progress in beginning to implement this Master Plan:

- > Land and Water Conservation Fund monies have been secured to design and construct the new pedestrian connection from Manchester Street to the Manchester Street Park and the Rail Trail. An agreement with the owner of the La Fruteria grocery store will transfer the land needed for this connection from La Fruteria to the City of Lawrence.
- > The City committed to use funding from its Community Development Block Grant program as well as support from the Commonwealth's Gateway City Park Program for final design of the Rail Trail and a consultant has been selected for the design. The work will begin in January 2017 and continue for approximately 18 months.
- > The City is actively working to secure funding for construction of the Rail Trail through the MassDOT (Massachusetts Department of Transportation) Improvement Program.
- > The City's new Downtown Smart Growth Overlay District is anticipated to be in place within six months.

This Master Plan and the associated brochure will be used in continuing meetings between the City and property owners and potential developers to encourage their active participation in redevelopment of the Flametech Steel and Downtown Crossing Blocks.

Other implementation recommendations include:

- > Continued work to secure state and federal funding for environmental clean-up and infrastructure work such as utility upgrades and structured parking necessary to support development.
- > Developing and/or strengthening relationships with local organizations for assistance with ongoing maintenance and programming of the Rail Trail.

