Conceptual Network Plan and Feasibility Study

Lynn Walking and Bicycling Network Plan

Lynn, Massachusetts

Final

February 2019
Conceptual Network Plan and Feasibility Study

Lynn Walking and Bicycling Network Plan

Lynn, Massachusetts

Prepared For:
City of Lynn – Office of Community Development
3 City Hall Square
Room 311, City Hall
Lynn, MA. 01901
718/586/6770

Prepared By:
Kittelson & Associates, Inc.
294 Washington Street, Suite 11
Boston, MA 02108
(617) 377-4000

Project Manager: Tess Stribos
Project Principal: Conor Semler

Project No. 22576.00

February 2019
# TABLE OF CONTENTS

Executive Summary .......................................................................................................................... 2
The Challenge .................................................................................................................................... 4
- Project Introduction ..................................................................................................................... 4
- Project Description and Goals ...................................................................................................... 4
- Project Scope and Study Area ....................................................................................................... 4
Engaging The Community .............................................................................................................. 9
- Community Workshops ............................................................................................................... 9
- Stakeholder Meetings .................................................................................................................. 9
- Online Platforms ....................................................................................................................... 10
Building “Informed-Consensus” ..................................................................................................... 12
- Existing Conditions ..................................................................................................................... 12
- Workshop #1 Objectives ............................................................................................................. 22
- Workshop #1 Outcomes ............................................................................................................. 26
Developing The Vision .................................................................................................................. 30
- Tiered Criteria for Route Alignment ............................................................................................ 30
- Workshop #2 Objectives ............................................................................................................. 31
- Workshop #2 Outcomes ............................................................................................................. 31
Implementing The Plan .................................................................................................................. 49
- Implementation Strategy ............................................................................................................. 49
- Short-Term Implementation Strategy .......................................................................................... 49
- Conceptual Cost Estimates ........................................................................................................ 52
- Funding ....................................................................................................................................... 53
Conclusion .................................................................................................................................... 56
LIST OF FIGURES

Figure 1. The Preferred Route of the Northern Strand in Lynn ............................................................. 2
Figure 2. Planning Processes at Multiple Levels .................................................................................... 5
Figure 3. Network Plan Study Area ........................................................................................................ 6
Figure 4. Annual Average Daily Traffic Volumes .................................................................................. 14
Figure 5. Existing and Proposed Walking and Biking Facilities ............................................................ 16
Figure 6. Pedestrian and Bicycle Crashes and Severity ........................................................................ 17
Figure 7. Percentage of Population that are Youth or Seniors ............................................................ 18
Figure 8. Percentage of Households with No Vehicle .......................................................................... 19
Figure 9. Percentage of Workers Who Walk or Bicycle to Work ......................................................... 20
Figure 10. Environmental Justice Populations ..................................................................................... 21
Figure 11. Directional Arrows for Guidance of Route Alternatives ..................................................... 24
Figure 12. Route Options Developed During Workshop #1 .................................................................. 27
Figure 13. EJ Neighborhoods Surrounded by Barriers to Walking and Biking ..................................... 32
Figure 14. Alternative #1 - Common/Lynnway .................................................................................... 33
Figure 15. Alternative #2 - Common/Nahant ...................................................................................... 33
Figure 16. Alternative #3 - Summer/Lynnway ..................................................................................... 34
Figure 17. Alternative #4 - Summer/Nahant ....................................................................................... 34
Figure 18. Alternative #5 - Neptune/Lynnway ..................................................................................... 35
Figure 19. Alternative #6 - Neptune/Nahant ....................................................................................... 35
Figure 20. Recommended Alternative ................................................................................................. 37
Figure 21. Typical Section Example for Summer Street – Sidepath/Shared Use Path ......................... 39
Figure 22. Typical Section Example for Neptune Street Court – Traffic Calmed Bike Boulevard ........ 40
Figure 23. Typical Section Example for Neptune Boulevard - Road Diet with Shared Use Path ........ 40
Figure 24. Typical Section Example for State Street (Long-Term) and Commercial Street - Two-Way Separated Bike Lane ................................................................................................................. 41
Figure 25. Typical Section Example for Blossom Street (Long-Term) - Two-Way Separated Bike Lane 41
Figure 26. Typical Section Example for Central Avenue and Washington Street - Two-Way Separated Bike Lane .................................................................................................................................. 41
Figure 27. Typical Section Example for Broad Street (Long-Term) - Two-Way Separated Bike Lane .. 42
Figure 28. Typical Section Example for Nahant Street – Traffic Calmed Bike Boulevard ................. 42
Figure 29. Relationship between Speed, Traffic Volume, and Facility Type ........................................ 43
Figure 30. Bike Facility Types ............................................................................................................... 44
Figure 31. Raised Driveway Crossing ..................................................................................................... 45
Figure 32. Raised Side Street Crossing ................................................................................................. 45
Figure 33. Curb Extension ..................................................................................................................... 46
Figure 34. Protected Intersection ......................................................................................................... 46
Figure 35. Raised Crosswalk (Midblock) ............................................................................................... 47
Figure 36. Rectangular Rapid Flash Beacon (RRFB) ............................................................................. 47

LIST OF TABLES
Table 1. Route Evaluation Criteria ....................................................................................................... 28
Table 2. Tiered Route Evaluation Criteria ............................................................................................ 30
Table 3. Route Evaluation Results ........................................................................................................ 36
Table 4. Planning-Level Construction Cost Estimate ........................................................................... 52

APPENDICES
Appendix 1. Conceptual Plan
Appendix 2. Conceptual Cross Sections and Renderings
Appendix 3. Technical Memo: Route Alternatives Elimination
Appendix 4. Public Engagement Materials
Section 1  Executive Summary
EXECUTIVE SUMMARY

In recent years, major planning efforts have taken place around Lynn. The City of Lynn (the City) is building on this regional momentum by proactively planning for investment with the Lynn Walking and Bicycling Network Plan (Network Plan) and aligning regional and local planning efforts. At the community workshops for the Network Plan community members voiced concern that resources and destinations within and around the city are difficult to reach or are even considered cut off for residents. The development of the Northern Strand Community Path is an opportunity for Lynn to create safer and more connected walking and bicycling options in the city to address these issues. Lynn is uniquely positioned as the destination of the regional bicycling facility. This 10-mile Northern Strand, when completed, will connect the cities of Everett, Malden, Revere, Saugus, and Lynn to the Lynn Shore and Nahant Beach Reservation. At the same time in Lynn, nearly a decade of work by the Community Path of Lynn Coalition has brought a local, grassroots vision to the table for the abandoned MBTA railbed in Lynn.

The Lynn Walking and Bicycling Network Plan builds on these regional and local planning efforts to leverage State investment and align local and regional initiatives to achieve the greatest benefit for Lynn residents, community organizations, business owners, and other local stakeholders in the city of Lynn. The Network Plan is the resulting product stemming from a planning process based around multi-day public workshops held in Lynn. It contains a planning-level feasibility study for the Preferred Route Alternative of the Northern Strand as it transitions from an off-street facility at Western Avenue onto the public roads in Lynn. The Preferred Route Alternative splits at Western Avenue into a Main Route and a Local Spur. The latter continuing along the abandoned MBTA railbed to connect the local neighborhoods to the regional Northern Strand with a path (see Figure 1). The Main Route consists of a continuous, branded bike facility, including the improvement of pedestrian facilities, new intersection and mid-block crossing locations, and appropriate traffic calming measures.

Figure 1. The Preferred Route of the Northern Strand in Lynn
Section 2 The Challenge
THE CHALLENGE

PROJECT INTRODUCTION

The Massachusetts Executive Office of Energy and Environmental Affairs (EEA) is developing the Northern Strand Community Trail, running from Medford to Saugus and crossing multiple communities on its way. This 10-mile shared use path runs on an old railbed on (former) Massachusetts Bay Transportation Authority (MBTA) right-of-way. However, partway through the City of Lynn, the railbed is cut-off by the active MBTA Commuter Rail line – just short of the Northern Strand’s envisioned terminus at the Lynn Shore and Nahant Beach Reservation. While in other cities, the planned path has a dedicated space, completing the 10-mile long facility requires making choices about what route it will take on Lynn city streets. The City of Lynn is therefore taking this opportunity to position Lynn as a destination on this regional route, transforming the shared use path into an equitable resource that activates shops, residential neighborhoods, and public amenities: through the Lynn Walking and Bicycling Network Plan (Network Plan).

PROJECT DESCRIPTION AND GOALS

The Network Plan was prepared in accordance with the City’s request for both a network plan for bicyclists and pedestrians and a feasibility study for a regional shared use facility. The main goal of the Network Plan is to identify the most feasible route for the Northern Strand through Lynn.

As such, the Network Plan consists of three elements:

- An assessment of alternative routes for the Northern Strand from Western Avenue to the Lynn Shore and Nahant Beach Reservation;
- A planning-level feasibility study of the recommended alternative for the Northern Strand; and
- A consideration of secondary routes to connect to/from the Northern Strand and future waterfront development

The planning-level considerations are limited to the following factors: right-of-way (ROW), land and roadway ownership, stakeholders, engineering evaluation, feedback from the public, and additional research done by the project team to determine the feasibility in line with the level and scope of the Network Plan. In all this, the planning process was steered by the public feedback received throughout the process.

PROJECT SCOPE AND STUDY AREA

The Network Plan is municipal planning process by the City of Lynn that both responds to and proactively creates a ‘blueprint’ as the City engages with planning processes occurring at multiple levels, as shown in Figure 2. The Northern Strand is a regional shared use path project implemented by EEA through its...
Gateway Cities Parks Program. At the neighborhood level, the Community Path of Lynn Coalition (CPLC) has been working for multiple years leading up to the Network Plan on the local section of the Northern Strand through Lynn, primarily focusing on the abandoned MBTA-owned railbed in City of Lynn’s Ward Six in West Lynn.

**Figure 2. Planning Processes at Multiple Levels**

While the Network Plan is a municipal plan, it focuses on the core area of the city as a starting point for building a more walkable, bikeable Lynn by leveraging the Northern Strand as a major initial investment in a longer-term vision. **Figure 3.** shows the Network Plan Study area, from west of Western Ave at the current and temporary terminus of the Northern Strand to the Lynn Shore Reservation and Nahant Beach. The study area includes downtown Lynn, focusing on the Market Street corridor, and part of the West Lynn neighborhood surrounding the abandoned MBTA railbed.
Figure 3. Network Plan Study Area

Start at terminus of the planned Northern Strand Community Path at 756 Western Avenue

End at Lynn Shore & Nahant Beach Reservation
The Network Plan is one of a series of planning processes that the City of Lynn has undertaken in collaboration with regional and state partners over the past decade, including:

- Northern Strand Community Path Design (2018 and ongoing by Brown, Richardson + Rowe for the EEA)
- Lynn Waterfront Open Space Master Plan (2018 and ongoing by Brown, Richardson + Rowe for the City of Lynn)
- Route 1A/Lynnway/Carroll Parkway Study in Lynn (2016 by the Boston Region Metropolitan Planning Organization)
- Northern Strand Trail Communities Bicycle and Pedestrian Network Plan (2013 by the Metropolitan Area Planning Council)
- Market Street Gateway Plan (2009 by VHB for the City of Lynn)
- Lynn Waterfront Master Plan (2007 by Sasaki for the City of Lynn)

These plans underscore the evolving nature of Lynn as it welcomes new development and envisions connections to and from its downtown and waterfront assets.

The Network Plan kicked off in June 2018, with a six-month planning process resulting in a set of conceptual plans and this report, which documents the planning process and provides recommendations to bring the Network Plan from a conceptual ‘blueprint’ to a fully-realized infrastructure investment. Following this planning process, the plan will be used by EEA and Brown, Richardson + Rowe to design this final link of the Northern Strand through Lynn as part of their ongoing design process occurring in multiple Northern Strand communities.
Section 3  Engaging the Community
ENGAGING THE COMMUNITY

This project’s planning process was set up so that the two major phases of identifying the Northern Strand route alternatives and selecting the preferred alternative occurred during two intensive community workshops. These workshops were supplemented with stakeholder meetings and the use of online platforms to gather additional feedback. The community engagement efforts consisted of the following:

COMMUNITY WORKSHOPS

The two three-day public workshops were the base of the planning process for the Network Plan and are detailed in the next sections. These included:

- **Workshop #1** – Tuesday, August 21st through Thursday, August 23rd, 2018 at the Lynn Vocational Technical Institute
- **Workshop #2** – Tuesday, November 13th through Thursday, November 15th, 2018 at the Lynn City Hall Auditorium

Each workshop generally ran from the morning to 8 pm, with public drop-in hours during the afternoons and evenings. For the flyers, schedules and other materials for the workshops and other public engagement efforts see **Appendix 4**.

STAKEHOLDER MEETINGS

The project team attended several meetings with the Network Plan’s Working Group, which includes public, private and non-profit organizations such as:

- City of Lynn Community Development and Public Works departments and Mayor’s Office
- City of Lynn Fire and Police departments
- Economic Development & Industrial Corporation of Lynn (EDIC)
- Lynn Housing and Authority and Neighborhood Development
- Community Path of Lynn Coalition
- The Food Project
- Hall Company

The project team also coordinated with Brown, Richardson + Rowe to facilitate a streamlined transition from the Northern Strand conceptual design to the final design to be created by Brown, Richardson + Rowe.
ONLINE PLATFORMS

To gather additional feedback and share plan materials with those unable to attend the Community Workshops, the project team maintained:

- A dedicated website for the project (www.lynnbikeped.com)
- An interactive webmap for collecting feedback during each project phase (maps.kittelson.com/lynn), with 57 unique comments were collected throughout the planning process, with 127 “like” interactions associated with 44 of the comments
- A social media page on Facebook (www.facebook.com/Lynn-Walking-and-Bicycling-Plan-669370730062455/) that has reached a thousand people since June 2018, according to Facebook-provided statistics

For more details on these three platforms see Appendix 4.
Section 4  Building “Informed-Consensus”
BUILDING “INFORMED-CONSENSUS”

EXISTING CONDITIONS

Roadway Facilities

Traffic volume data provide the following information:

- Whether a roadway is operating under-capacity and may have room to replace travel lanes with bike lanes or is operating at capacity, thus requiring a trade-off between automobile level of service and bike quality of service if seeking to install on-street bike facilities.
- Whether traffic volumes create high-stress conditions for bicycling, therefore necessitating the use of separated facilities to create low-stress routes that can serve users of all ages and abilities. Typically, a two-lane, 25 mph road with no bike facilities will begin to feel high-stress to a mainstream rider above 1,500 vehicles per day.\(^1\) Higher traffic volumes require greater levels of separation.

As shown in Figure 4, most streets that provide direct more connections between Western Avenue and the Lynn Shore & Nahant Beach Reservation have traffic volumes that require separated facilities to feel comfortable for the average person on a bike. Neighborhood residential streets tend to be low-stress, but they require crossing high-stress roads and making a circuitous route.

The project team identified the following information using the most recent available traffic volume data from MassDOT (2016):

- South Common Street has much lower traffic volumes than North Common Street, but it has the same cross section (layout of travel and parking lanes).
- Neptune Boulevard is operating under-capacity, with very low volumes compared to the amount of road space available.
- Market Street should be subject to more detailed traffic analysis to determine whether it is operating under or at capacity. Vehicles use sections of the road as a four-lane cross section when it is not officially marked as such.

\(^1\) Furth, Peter. 2017. Level of Traffic Stress Criteria for Road Segments, version 2.0.
Lynnway/Carroll Parkway traffic volumes decline by approximately 10,000 vehicles per day on the section east of Market Street, since Market Street is a major entrance/exit point for vehicles on the Lynnway.
Figure 4. Annual Average Daily Traffic Volumes
Pedestrian and Bike Facilities

Though the City of Lynn has good sidewalk coverage in the core area and has walking routes in its historic linear park, the Lynn Common, bicycle facilities are lacking throughout the city, and pedestrian crossing challenges exist, particularly at large and busy intersections along the Lynnway/Carroll Parkway. Figure 5 shows existing and proposed pedestrian and bicycle facilities. Planned facilities include:

- **Short-term:** The section of the Northern Strand from Saugus to Western Avenue that is currently in the EEA’s Northern Strand Community Path design process
- **Long-term:** A Harborwalk that would be built as the Lynn waterfront is redeveloped; this proposed facility is currently in the planning phase as part of the Lynn Waterfront Open Space Master Plan (Draft).

Crashes

Figure 6 shows MassDOT-recorded crash locations from 2011 through 2015 where a person walking or biking was involved, along with crash severity. The majority of crashes led to injury, with fatalities within the study area located on the Lynnway and on Market Street.

Transit Facilities

Lynn is served by several MBTA transit services, including the Rockport/Newburyport commuter rail line and nine MBTA bus routes. The Central Square-Lynn MBTA commuter rail station is elevated above Washington Street and Central Square and serves as hub along with a public parking garage/Park & Ride and busway east of Market Street. MBTA bus routes 426, 429, 435, 436, 439, 441, 442, 448, 449, 455, 456, and 459 serve downtown Lynn via either South Common Street, Lynnway, Franklin Street, and Union Street. Additionally, Route 439 to Nahant runs along Washington Street and Nahant Street and Route 435 serving Neptune Towers runs along Tremont Street, Summer Street, and Neptune Boulevard.

Transportation Users

Demographic data from the US Census Bureau 2016 American Community Survey (ACS) Five-Year Estimates shed light on the opportunity to better serve youth and seniors (Figure 7), households without a vehicle (Figure 8), and workers commuting by foot or bicycle (Figure 9), with bicycle and pedestrian facilities in the residential areas where they are concentrated and connecting them to everyday destinations.

---

Figure 5. Existing and Proposed Walking and Biking Facilities
Figure 6. Pedestrian and Bicycle Crashes and Severity
Figure 7. Percentage of Population that are Youth or Seniors

Data Source: US Census Bureau American Community Survey 2016 5-Year Estimates
Figure 8. Percentage of Households with No Vehicle
Figure 9. Percentage of Workers Who Walk or Bicycle to Work
Environmental Justice Communities

In any planning process, it is important to examine where communities that have historically been underserved or even harmed by infrastructure investments live. Environmental Justice (EJ) seeks to ensure that low-income residents and communities of color have meaningful participation in decision-making processes, are not disproportionately affected by potential negative impacts, and benefit fairly from projects and programs. In Massachusetts, EJ communities are defined as any census block group where:

- Annual median household income is equal to or less than 65% of the statewide median; or
- 25% or more of the residents identify as minority (non-white races as well as Hispanic ethnicity including White Hispanic); or
- 25% or more of households have no one over the age of 14 who speaks English only or English very well – Limited English Proficiency (LEP)/English Isolation

Most of the core area of Lynn is classified as an EJ area, with several neighborhoods meeting multiple EJ criteria, as shown in Figure 10. Nearly the entire Network Plan study area is home to low-income communities of color, with three pockets of more concentrated linguistic isolation.

**Figure 10. Environmental Justice Populations**

Source: MassGIS OLIVER
WORKSHOP #1 OBJECTIVES

Workshop #1 was an opportunity for the project team to engage in fact-finding about route alternatives and for the Lynn residents and other stakeholders to begin the process of building an ‘informed consensus’ on the Northern Strand route. This process began with the founding of goals and principles intended to guide the study after this workshop:

Goals and Principles

Using information and feedback gained from local stakeholders and workshop participants, the project team developed a series of goals and principles to guide the identification and evaluation of route alternatives. These goals and principles also functioned as an over-arching framework to inform the route evaluation criteria at a high level. They included:

- Connect the Community Path – The Community Path, as envisioned by grassroots efforts, represents an important local investment as vocalized by the attendees and is critical to the overall resident and stakeholder acceptance of the Network Plan.
- Connect to the Water – The City is currently working toward a waterfront open space master plan as well as bringing more development focus towards the marina.
- Bring People Downtown – Downtown Lynn is the heart of the City; Leveraging the Northern Strand to boost the activity in the downtown core project is critical.
- Focus on Multimodal Safety – As more bicyclists and pedestrians are encouraged, the more focus must be paid to providing facilities that are safe, comfortable, and accessible to all types of users.
- Balance User Needs with Context – Streets change as they move through different neighborhoods, and different parts of the City. The multimodal facilities also need to adapt and conform to their respective contexts.
- Prioritize the Network – While there is a primary path for the Northern Strand to travel through Lynn, the remaining streets and neighborhood connectors need to be prioritized and considered for implementation over time to complete a wide-breadth of walkable and bikeable streets in the City.

Route Alternatives

The identification of route alternatives during Workshop #1 was guided by the following considerations, visualized in Figure 11:

- Starting from the temporary terminus of the Northern Strand at Western Avenue, connect to the following destinations:
• Lynn Shore & Nahant Beach Reservation

• Downtown Lynn

• Ferry Terminal

• Future waterfront development and Gear Works development

  ▪ Identify streets that could be part of a hierarchy of primary and secondary routes in the Network Plan

  ▪ Identify preliminary ideas for focus area intersections including Market Square and North Common Street / South Common Street / Franklin Street / Essex Street / Central Avenue / Market Street
Figure 11. Directional Arrows for Guidance of Route Alternatives
Public Interaction and Feedback

As a 3-day public event, Workshop #1 gave stakeholders an opportunity to participate in the planning process through a variety of activities, including:

- Origin and destination dot-mapping for a variety of trip purposes
- String-mapping of walking, biking, and driving routes through Lynn
- Walking and biking audit to identify issues and opportunities
- Working Group meeting for city officials and working group members to discuss goals and concerns and to align local efforts

Image 1. Workshop #1 Activities
WORKSHOP #1 OUTCOMES

By the end of Workshop #1, the project team identified several options and variations for the Northern Strand to gather initial reactions before formalizing the route alternatives during Workshop #2.

Route Options

Figure 12 shows all the route options explored during Workshop #1. They were organized according to two major functions:

- Community Path options create local connections in West Lynn and include future connections to the waterfront area near the Gear Works development, the future Harborwalk, and the Ferry Terminal. These options would require one or more of the following:
  - New crossing where the abandoned MBTA railbed approaches the active MBTA commuter rail line
  - Bike facility on the City of Lynn Department of Public Works (DPW) access road
  - Bike facility on Commercial Street and Gas Wharf Road
  - Bike facility on Oakville Street, Bennett Street, and extension of Harding Street
  - Bike facility on Summer Street or Neptune Street Court
  - Permission to travel adjacent to the GE Aviation plant to River Works MBTA station

- Regional Facility options partially overlap with Community Path options and extend the Northern Strand to the downtown, the Ferry Terminal, and the Lynn Shore and Nahant Beach Reservation. These options would require one or more of the following:
  - Bike facility on South Common Street or inside the Lynn Common
  - Bike facility on Summer Street or Neptune Street Court
  - Bike facility on Neptune Boulevard and Wheeler Street/State Street
  - Bike facility on Blossom Street and new intersection across the Lynnway
  - Bike facility on Market Street or Washington Street
  - Bike facility on the Lynnway or land south of the Lynnway and around Nahant Rotary

As the project team received feedback, these options were filtered and refined to a smaller set for soliciting feedback on the interactive webmap from September to November.
Figure 12. Route Options Developed During Workshop #1

Route Evaluation Criteria

Table 1 details the route evaluation criteria that were developed in draft form at the end of Workshop #1 and refined during the time leading up to Workshop #2.
<table>
<thead>
<tr>
<th>Category</th>
<th>Criterion</th>
<th>Scoring and Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level of Interagency Coordination Required</td>
<td>1 point - High (State involvement)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 points - Medium (Local, with multiple departments, institutions, and businesses)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 points - Low (Local, primarily with neighborhoods)</td>
</tr>
<tr>
<td></td>
<td>Engineering Effort (based in need to redesign major intersections, perform traffic analysis, consider impacts to curb, drainage, and utilities, and consider impacts to MBTA bus operations)</td>
<td>1 point - High complexity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 points - Medium complexity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 points - Low complexity</td>
</tr>
<tr>
<td></td>
<td>Cost</td>
<td>1 point - High cost (high-level planning estimate)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 points - Medium cost (high-level planning estimate)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 points - Low cost (high-level planning estimate)</td>
</tr>
<tr>
<td></td>
<td>Timeline</td>
<td>1 point - Long (High interagency + High engineering effort)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 points - Medium-term (Medium interagency + Medium engineering effort or high/low combinations)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 points - Short (Low interagency + low engineering effort)</td>
</tr>
<tr>
<td></td>
<td>Accessibility to Destinations</td>
<td>1 point - Low (Provides access to lower-density residential land uses)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 points - Medium (Provides access to commercial and medium-density residential land uses)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 points - High (Provides access to commercial, mixed use, institutional, and/or high-density residential land uses)</td>
</tr>
<tr>
<td></td>
<td>Reuse of Abandoned Railbed</td>
<td>0 points - No (Focuses investment on existing roads)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 point - Yes (Leverages opportunity to transform abandoned corridor into new public space)</td>
</tr>
<tr>
<td></td>
<td>Environmental Justice Impact (Based on population in census block groups adjacent to route segment, weighted by number of EJ criteria met, using data from MassGIS)</td>
<td>1 point - Low (0 to 1,999 weighted-population counts receiving access)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 points - Medium (2,000 to 5,999) weighted-population counts receiving access)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 points - High (6,000+ weighted-population counts receiving access)</td>
</tr>
<tr>
<td></td>
<td>Route Continuity</td>
<td>1 point - Low (Route is circuitous and requires intensive wayfinding measures)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 points - Medium (Route has a few turns requiring wayfinding measures)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 points - High (Route provides direct connections)</td>
</tr>
<tr>
<td></td>
<td>Public Feedback (Received throughout process, but especially on cross-section boards presented during Workshop #2 and interactive webmap)</td>
<td>1 point - Not favored</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 points - Somewhat favored or mixed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 points - Consistently favored</td>
</tr>
</tbody>
</table>
Section 5  Developing the Vision
DEVELOPING THE VISION

Coming out of Workshop #1, the project team had a set of preliminary route options, feedback about those, and a set of evaluation criteria by which to further evaluate a more final set of route alternatives. During the time between Workshop #1 and #2, the project team also gathered information about specific issues, such as safety and adjacent land ownership. This information led to the elimination of several route alternatives (see Appendix 3) and the addition and refinement of other alternatives, as reflected in updates to the interactive webmap leading up to Workshop #2.

TIERED CRITERIA FOR ROUTE ALIGNMENT

Leading up to and during Workshop #2, four overarching needs emerged from public feedback, stakeholder feedback, and deeper assessment of the route options. These led to the creation of two tiers of criteria summarized in Table 2:

- **Tier I Criteria** were used to determine where the multiple route alternatives could be located given spatial constraints and major challenges from Western Avenue to the Lynn Shore and Nahant Beach Reservation
- **Tier II Criteria** were used to compare the alternatives against each other to determine the recommended route.

### Table 2. Tiered Route Evaluation Criteria

<table>
<thead>
<tr>
<th>Tier I Criteria: Potential Route Locations</th>
<th>Tier II Criteria: Selection of Preferred Route</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No removal of on-street parking:</strong> Received consistent and repeated feedback that removal of on-street parking would not be received well in both residential and commercial areas</td>
<td><strong>Feasibility</strong></td>
</tr>
<tr>
<td></td>
<td>o Interagency Coordination</td>
</tr>
<tr>
<td></td>
<td>o Engineering Effort</td>
</tr>
<tr>
<td></td>
<td>o Planning and Construction Costs</td>
</tr>
<tr>
<td></td>
<td>o Timeline</td>
</tr>
<tr>
<td><strong>Branded, recognizable regional facility:</strong> The preferred route must be appropriate for facility that is open 24/7 and connects Lynn to surrounding cities, with a mix of local, commuting, and recreational trip-making by Lynn residents and visitors to Lynn</td>
<td><strong>Placemaking and Revitalization</strong></td>
</tr>
<tr>
<td></td>
<td>o Accessibility to Destinations</td>
</tr>
<tr>
<td></td>
<td>o Reuse of Abandoned Railbed</td>
</tr>
<tr>
<td></td>
<td>o Environmental Justice Impact</td>
</tr>
<tr>
<td></td>
<td>o Route Continuity</td>
</tr>
<tr>
<td><strong>Two-way separated bike facility for on-street sections:</strong> Allows for efficiency of space and DPW maintenance (existing 8’ – 10’ snow plow)</td>
<td><strong>Public Feedback</strong></td>
</tr>
<tr>
<td><strong>Avoid active MBTA rail lines:</strong> For reasons of feasibility, timeline, and safety</td>
<td></td>
</tr>
</tbody>
</table>
WORKSHOP #2 OBJECTIVES

Workshop #2 was an opportunity for the project team to gather feedback on route alternatives and design ideas and for the Lynn community to consolidate an ‘informed consensus’ on the Northern Strand route through Lynn.

WORKSHOP #2 OUTCOMES

Alternatives

A final set of six (6) route alternatives emerged based on the Tier I and Tier II criteria. The major choices were between the South Common Street, Summer Street, and Neptune Street for the first section and between the Lynnway/Carroll Parkway and Nahant Street for the last section. All route alternatives travel on Market Street for one or more blocks. In addition, all route alternatives include a local spur of the Northern Strand.

*Inclusion of Abandoned Railbed Spur in All Alternatives*

The common element in each route alternative is the inclusion of the abandoned MBTA railbed from Western Avenue to Bennett Street as a spur of the Northern Strand. This spur is included in all route alternatives to allow local access to the main Northern Strand route from the neighborhood southeast of Western Avenue and west of the abandoned MBTA railbed. As shown in Figure 13, one area of West Lynn is home to residents facing both environmental justice challenges and physical barriers to walking and biking connectivity and accessibility:

1. The active commuter rail line to the south
2. The GE industrial area to the west
3. Western Avenue to the north—a high-stress roadway due to traffic volumes, speeds and limited number of signalized crossing locations
4. The abandoned MBTA railbed to the east—currently a barrier because its changing grade, single access point at Summer Street, and condition of abandonment and perceived public safety issues

This access is important, because it is the only area in Lynn with over 1,000 residents who face barriers to safe walking and biking on all four sides.
While some of the alternative routes presented in the following pages use part of the abandoned railbed as the main route, others include it as a spur:

- For Alternatives #1 and #2, this off-street section functions as a spur of the Northern Strand to facilitate local access.
- For Alternatives #3 through #6, it functions partially as the main Northern Strand route and partially as a spur for local access and placemaking.

The route alternatives evaluation accounted for whether it would function as the main Northern Strand route or the local spur.

The final set of six (6) route alternatives are shown in **Figures 14-19**.
Six Route Alternatives Meeting Tier 1 Criteria

Figure 14. Alternative #1 - Common/Lynnway

Figure 15. Alternative #2 - Common/Nahant
Figure 16. Alternative #3 - Summer/Lynnway

Figure 17. Alternative #4 - Summer/Nahant
Alternatives Evaluation Using Tier II Criteria

The route alternatives were evaluated as follows:

- Routes were divided into segments based on roadway or corridor character and constraints
The abandoned railbed, as a common element of all route alternatives, was not included as a segment except where it would serve as the main Northern Strand route instead of a spur.

- Each segment was scored with all criteria except route-level criteria
- Segment scores were averaged across the entire route (A sensitivity analysis using sum of segment scores instead of average scores was conducted, leading to similar results)
- Route-level criteria were assessed for each route (Reuse Abandoned Railbed, Route Continuity, and Public Feedback)
- The score was summed across criteria.

### Table 3. Route Evaluation Results

<table>
<thead>
<tr>
<th></th>
<th>Feasibility</th>
<th>Placemaking &amp; Revitalization</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IC</td>
<td>E</td>
<td>C</td>
</tr>
<tr>
<td><strong>Alternative #1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common/Lynnway</td>
<td>2.0</td>
<td>1.9</td>
<td>1.8</td>
</tr>
<tr>
<td><strong>Alternatives #2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common/Nahant</td>
<td>2.1</td>
<td>2.0</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Alternative #3</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer/Lynnway</td>
<td>1.9</td>
<td>2.3</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Alternative #4</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer/Nahant</td>
<td>2.0</td>
<td>2.4</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Alternative #5</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neptune/Lynnway</td>
<td>1.9</td>
<td>2.1</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Alternative #6</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neptune/Nahant</td>
<td>1.9</td>
<td>2.3</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Note: IC = Interagency Coordination, E = Engineering Effort, C = Cost, T = Timeline, AD = Accessibility to Destinations, R = Reuse of Abandoned Railbed, EJ = Environmental Justice Impact, RC = Route Continuity, P = Public Feedback

As shown in **Table 3**, Alternative #1 (Common/Lynnway) had the highest score. The range of difference between scores was small, since there were many overlapping segments. Also, the drivers of high scores varied across each route segment, leading to an averaging out at the route level.

The scores also reflect the different functions that a shared use path can have within a community based on its location and purpose. A regional facility is a branded, continuous path that spurs economic development and puts Lynn’s “best face forward.” A local facility connects neighborhoods outwards, connects residents to local institutions, and allows children to bike safely to school. As a regional shared use path, the main Northern Strand has the former function. The secondary bike network can serve the latter function, but a local spur of the Northern Strand is needed where connectivity is limited in West Lynn.
Recommended Alternative

The recommended alternative consists of:

- A main route that travels north on Western Avenue, through Market Square, on South Common Street, Market Street, crossing the Lynnway/Carroll Parkway and heading east on the south side of the Lynnway/Carroll Parkway to an existing crosswalk across Nahant Road. A continuous two-way separated bike facility, at level with the roadway, typically 10-feet wide and including a 3-foot raised buffer is recommended throughout the alignment of the preferred alternative. In a few select areas, the facility transitions into a sidewalk-level shared use path where repurposing road space was not desired.
- A local spur along the abandoned MBTA railbed.

See Appendix 1 for the conceptual plan drawings and Appendix 2 for conceptual cross sections and renderings for select segments.

Figure 20. Recommended Alternative

Main Route – Segment Description

- **Western Avenue**: Two-way separated bike facility transitions to sidewalk at roundabout, using the broad shoulder on Western Avenue and repurposing parts of the landscaped area of the roundabout.
- **Market Square**: Transition from sidewalk to two-way separated bike facility on the south side.
- **South Common Street**: Two-way separated bike facility on the south side, repurposing one of two through lanes and moving on-street parking away from the sidewalk. The bike facility is separated by the on-street parking and a 3-foot raised buffer.

- **Market Street from South Common Street to Tremont Street/Liberty Street**: Transition from street to sidepath on the west side (sidewalk level), transition back to street level at Tremont Street. This segment resulted from a compromise in terms of the continuity of the facility in order to keep all current on-street parking between 1 Market Street and 65 Market Street (10-15 spaces).

- **Market Street from Tremont Street/Liberty Street to State Street**: Two-way separated bike facility on the west side, narrowing the existing through lane width and keeping on-street parking, but moving it away from the sidewalk.

- **Market Street from State Street to Broad Street**: Two-way separated bike facility on the west side, keeping on-street parking, but moving it away from the sidewalk. Planted medians and left-turn pockets respectively organize the space.

- **Market Street from Broad Street to Lynnway/Carroll Parkway**: Transition from street to intermediate-level two-way separated bike facility on the west side (in Carroll Parkway green space), transition back to street level at the Lynnway/Carroll Parkway.

- **Lynnway/Carroll Parkway**: Two-way separated bike facility on the south side at street level, repurposing one of three existing through lanes.

- **Nahant Rotary**: Two-way separated bike facility on the east side at street level, repurposing one through lane.

- **Nahant Road**: Transition from street to sidepath on the west side, and wayfinding signs to connect to Lynn Shore Promenade and the East Coast Greenway.

*Local Spur - Community Path Description*

- **Western Avenue**: Neighborhood gateway with raised intersection, pedestrian crossing beacon, and wayfinding signs

- **Western Avenue to Neptune Street Court**: Shared use path through abandoned MBTA railbed right-of-way.

- **Summer Street Crossing**: Raised intersection, pedestrian crossing beacon (RRFB), and wayfinding signs

- **Neptune Street Court**: Open lawn area showcasing existing mural and grading to transition to Neptune Street Court access point and secondary bike facility along Neptune Street
- **Neptune Street Court to remainder of abandoned MBTA railbed right-of-way:**
  Pedestrian park with options for placemaking elements such as community gardens and local artist installations, as well as open spaces for viewsheds, and eventually community access to areas like the Gearworks Site and other areas beyond Bennett Street especially if the existing bridge crossing over Bennett Street could be rebuilt to provide safer access.

**Toolkit (Future Installments by the City)**

**Secondary Network**

The secondary network consists of on-street routes that provide important connections to the Northern Strand, downtown Lynn, and future waterfront development. These initial streets include Summer Street, Neptune Street Court, Neptune Boulevard, State Street, Commercial Street, Central Street, Washington Street, and Nahant Street, shown in Figure 20 to 27.

**Figure 21. Typical Section Example for Summer Street – Sidepath/Shared Use Path**
Figure 22. Typical Section Example for Neptune Street Court – Traffic Calmed Bike Boulevard

Figure 23. Typical Section Example for Neptune Boulevard - Road Diet with Shared Use Path
Figure 24. Typical Section Example for State Street (Long-Term) and Commercial Street - Two-Way Separated Bike Lane

Figure 25. Typical Section Example for Blossom Street (Long-Term) - Two-Way Separated Bike Lane

Figure 26. Typical Section Example for Central Avenue and Washington Street - Two-Way Separated Bike Lane
As the City of Lynn becomes a more bike and pedestrian friendly environment, other connections will be desired, especially from neighborhoods to the north of Lynn Common and east of Downtown Lynn. In the future, a more comprehensive network, including a wayfinding strategy, should be planned as part of Bicycle and Pedestrian Master Plan for the entire City of Lynn.
Typical Street Conditions

Beyond the conceptual designs for the Northern Strand and the series of secondary network streets, the Network Plan also examined general guidance for facility types and treatments that can be applied for all remaining City streets both existing and future.

Bike Facility Types

As speed of vehicles or traffic volumes increase, the level of separation necessary for safe and comfortable biking increases, as illustrated in Figure 29. Since City of Lynn’s speed limit is set at 25 mph unless otherwise posted, a “sharrow” is not an appropriate facility for most streets in Lynn unless combined with traffic calming elements such as regularly placed speed humps and curb extensions.

Figure 29. Relationship between Speed, Traffic Volume, and Facility Type
**Figure 30** shows common bike facility types ranging in level of separation from a shared lane to a fully separated bike lane or shared use path. The facility type should be selected based on the street’s traffic volume and operating speed to provide the level of comfort necessary for riders of all ages and abilities to feel safe using the facility.

**Figure 30. Bike Facility Types**

- **Raised crossings** make streets safer by reducing the speed of turning vehicles while increasing the visibility of pedestrians and bicyclists. They are recommended for crossings at major driveways (**Figure 31**) and at minor streets or side streets (**Figure 32**). See the MassDOT Separated Bike Lane Planning & Design Guide for more information.
Figure 31. Raised Driveway Crossing

Source: MassDOT Separated Bike Lane Planning & Design Guide

Figure 32. Raised Side Street Crossing

Source: MassDOT Separated Bike Lane Planning & Design Guide
Curb extensions installed at intersections increase the visibility of pedestrians and reduce crossing distance (Figure 33). They also reduce the corner radius, thus slowing turning speeds of motorists. Curb extensions can be combined with stormwater management features that absorb rainwater and reduce flooding.

**Figure 33. Curb Extension**

![Curb Extension](source)

Source: NACTO Urban Street Design Guide

At major intersections with intersecting separated bike lanes, a protected intersection treatment (Figure 34) reduces conflicts between modes and provides a clear, predictable path of travel. Treatment elements consist of a corner refuge island, pedestrian crossing islands, and where necessary, a mountable truck apron.

**Figure 34. Protected Intersection**

![Protected Intersection](source)

Source: MassDOT Separated Bike Lane Planning & Design Guide
Pedestrian Crossing Treatments

Raised crosswalks (Figure 35) can be used both at intersections and at midblock locations. Midblock crosswalks should be installed where a significant (or anticipated) pedestrian desire line causes people to cross where a marked crossing does not exist, often at key access points to destinations.

Figure 35. Raised Crosswalk (Midblock)

Pedestrian crossing beacons such as pedestrian hybrid beacons (PHB, previously referred to as HAWKs) or Rectangular Rapid Flash Beacons (RRFBs) should be installed at unsignalized locations that are high-volume pedestrian crossings or high-priority bike route crossings. These user-actuated beacons allow bicyclists and pedestrians to alert drivers that they are crossing. RRFBs (Figure 36) tend to be much lower-cost than PHBs.

Figure 36. Rectangular Rapid Flash Beacon (RRFB)
Section 6  Implementing the Plan
IMPLEMENTING THE PLAN

The implementation plan addresses the next step for the Northern Strand through the City of Lynn along the alignment of the preferred route alternative as proposed by the Network Plan.

The Preferred Route Alternative is detailed as part of the Network Plan up to a conceptual design for the recommended facility as part of the Northern Strand on City-owned streets. Preliminary design elements included a planning-level consideration of horizontal alignment, vertical profile, typical cross-section, intersection treatments at key crossing locations, and drainage patterns. The next step is for the Network Plan to guide and inform the design and construction process of the Northern Strand through the City of Lynn. During this phase, issues and topics not covered by the Network Plan will be further examined. These include, but are not limited to, detailed traffic analysis, detailed intersection treatment design, right-of-way acquisition or easements, landscaping/lighting/amenities, and environmental measures.

IMPLEMENTATION STRATEGY

The long-term, permanent design intention, as the result of the public process facilitated during this study, is intended as a continuous on-street separated bike facility with raised curbs on current existing City streets and a local spur running off-street on the abandoned MBTA railbed. While the timeframe for implementing all the elements can vary, there are a variety of temporary measures that can improve the current conditions in the short-term and allow for more walkable and bike-friendly streets, as well as prepare all users for the long-term permanent condition. The following section proposes a selection of appropriate short-term measures.

SHORT-TERM IMPLEMENTATION STRATEGY

Northern Strand Main Route

Most on-street sections of the Northern Strand can be implemented in the near-term with painted buffers and surface-mounted tubular markers (flex posts) before raised curbs are installed. This treatment would also allow Lynn residents to benefit from the new infrastructure sooner and would allow motorists to become accustomed to the new travel lane conditions. It would also allow segments such as South Common Street and Market Street to move ahead while segments that require more coordination, such as the Lynnway/Carroll Parkway, are progressing through design and permitting.

The proposed on-street sections where painted buffers and flex post can be installed are:

- Western Avenue
- Market Square
- South Common Street
Market Street (except from South Common Street to Tremont Street)

On the proposed on-street sections of Lynnway/Carroll Parkway and Nahant Road these temporary measures may not be feasible due to high vehicular speeds and the increased amount of interagency coordination necessary. Additional coordination with DCR is needed for this segment and may be needed for temporary measures as well.

The City is advised to coordinate early on among stakeholders and consider doing public outreach about pinch points along the main route that currently require transitioning to the existing sidewalk. Early coordination may allow the City to leverage opportunities that may not have emerged during the planning process of the Network Plan in its current stage. These pinch points include:

- Western Avenue roundabout
- Market Square from South Common Street to Tremont Street
- Nahant Rotary and Nahant Road

**Northern Strand Local Spur/Community Path Extension**

The ideal scenario for implementation of the Northern Strand Local Spur is that it is included in the design process together with the Northern Strand Main Route and planned for construction to begin concurrently with the Main Route. It is acknowledged that there may be existing site issues that will delay or adjust the appropriate phasing of the full construction of the Local Spur (e.g. potential environmental remediation, existing right-of-way infringements and historic usage, and site grading and elevation modifications), however, it is critical to the overall success of the Northern Strand project, especially in terms of the branding and messaging to the residents of Lynn, that the Local Spur is considered and treated as a cohesive part of the Northern Strand.

**Market Square Transformation**

The long-term concept for Market Square would involve extending the current western boundary of the Lynn Common toward the existing median on Market Square and further connect to the splitter island of the new roundabout. This concept will create new green space and safer pedestrian connections, but it will inevitably also change the traffic pattern around Market Square. The short-term concept for Market Square is shown in Appendix 1, Sheet 2a. The ultimate alignment of Market Square is shown as Appendix 1, Sheet 2b. Investigating the implementation of the short-term concept may result in the overall Northern Strand being implemented in a shorter timeline. However, the transformation of Market Square will serve as an important gateway to the city along the Northern Strand’s main route. The City is advised to begin pursuing the long-term concept for Market Square as a project to be included in the next possible Transportation Improvement Program (TIP) process. Early action items include preparing a Project Need Form (PNF) to be submitted to MassDOT.
Secondary Routes

Secondary routes can be developed by the City at any time as part of a repaving project or as a pilot project that can be made permanent when funding is available. The City’s Complete Streets Committee should identify which secondary routes require prioritization for the FY 2020 Complete Streets Funding Program application.
CONCEPTUAL COST ESTIMATES

The conceptual cost estimate was prepared as part of a general feasibility analysis for the Preferred Route Alternative. Table 4 summarizes this conceptual cost per segment. To clarify Table 4: The first column shows each segment, the assumed length of segment, and a brief description of items included in the cost of each segment. The second column shows the ‘soft costs’ as an overall percentage of the total construction cost. Soft costs are defined as design complexity costs and complexity of inter-agency coordination for each segment. The third column shows conceptual construction cost as "cost per linear foot." These ranges are established utilizing MassDOT’s pay item cost and organized into a low and high range. The low range assumes just materials and construction costs and the high range assumes materials, construction costs, and 30% contingency. The fourth column shows the overall estimate of cost which merges the anticipated low and high ranges of soft costs with the low end and high end of construction costs, and multiples by the linear length shown per segment for a range of low-to-high costs for the given segment. Finally, below the sub-total of each segment, other general items are estimated using a similar process to determine the low-to-high range. Combined the conceptual cost estimate arrives at an overall project cost range.

This estimate is based off the graphical drawings (Appendix 1) and conceptual sections (Appendix 2) that were created over the course of the Network Plan and is generally limited in detailed design and engineering data. Other exclusions from the conceptual cost estimate are listed following Table 4.

Table 4. Planning-Level Construction Cost Estimate for the Northern Strand Preferred Route Alternative through Lynn

<table>
<thead>
<tr>
<th>Preferred Route Alternative Segment Improvements*</th>
<th>Soft Cost / Total Construction Cost in %</th>
<th>Construction Cost per Linear Foot (low to high range)</th>
<th>Estimate Cost Range (low to high range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western Avenue (through Roundabout): 610 LF</td>
<td>8% - 9%</td>
<td>$150 - $200</td>
<td>$100,000 - $135,000</td>
</tr>
<tr>
<td>two-way bike lanes; traffic separator; landscape islands; existing inlets; inlet adjustments; driveways; new sidewalk; new ped ramps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Square (Roundabout to Commercial St): 825 LF</td>
<td>12% - 14%</td>
<td>$250 - $300</td>
<td>$230,000 - $285,000</td>
</tr>
<tr>
<td>two-way bike lanes; traffic separator; existing inlets; inlet adjustments; driveways; new sidewalk; new ped ramps; new trees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Common Street (Commercial St through City Hall Square): 3,050 LF</td>
<td>8% - 10%</td>
<td>$250 - $300</td>
<td>$825,000 - $1,010,000</td>
</tr>
<tr>
<td>two-way bike lanes; traffic separator; landscape islands; existing inlets; inlet adjustments; driveways; new ped ramps; new trees; traffic signal modification;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Street (City Hall Square to Lynnway): 2,070 LF</td>
<td>9% - 10%</td>
<td>$250 - $300</td>
<td>$565,000 - $685,000</td>
</tr>
<tr>
<td>two-way bike lanes; traffic separator; existing inlets; inlet adjustments; driveways; new sidewalk; new ped ramps; new trees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Lynnway (Market St to Rotary): 2,520 LF</td>
<td>12% - 14%</td>
<td>$375 - $500</td>
<td>$1,060,000 - $1,450,000</td>
</tr>
<tr>
<td>two-way bike lanes; traffic separator; existing inlets; inlet adjustments; driveways; new sidewalk; new ped ramps; new trees; traffic signal modification; bike traffic light</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nahant Road (Rotary to Crossing): 970 LF</td>
<td>8% - 10%</td>
<td>$100 - $140</td>
<td>$105,000 - $150,000</td>
</tr>
</tbody>
</table>
### Exclusions

The following areas shown in the plan set are not included in the conceptual cost estimate:

- Additional street engineering and/or drainage modifications
- Permitting and construction administration
- Ultimate preferred median concept at Market Square and Lynn Common (shown on Appendix 1, sheet 2b)
- The redesign of pavement, curbs and landscaping (e.g. curb redesigns, bulb outs and engineering costs) other than on the south side of all the segments of the alignment of the Preferred Alternative Route
- Cost associated with Local Spur concept design (shown on Appendix 1, sheet 6)
- Landscaping and design at the terminus of the Northern Strand (the Lynn Shore and Nahant Beach Reservation)

### FUNDING

While the EEA has set aside $11 million in Gateway City Parks Program funds for fiscal years 2020-2021, this funding goes to cover construction in all the Northern Strand communities. Additional funding sources will likely be needed to fully realize the Northern Strand project through Lynn as well as future additions to the network. The following programs should be leveraged to support the design and construction of facilities in Lynn:

- **MassTrails Grant Program**: MassTrails is an inter-agency initiative led by the Governor’s Office, EEA, the Department of Conservation and Recreation (DCR) and MassDOT. MassTrails grants of up to $300,000 are awarded to high-priority projects. Grants are reimbursable and require a minimum 20% local match. Funding sources for the MassTrails program include the

<table>
<thead>
<tr>
<th>Sub-Total</th>
<th>$2,885,000 – $3,715,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADA Accessible Ramps (102 Ramps; Each @ Low: $6,400, High: $8,600)</td>
<td>$655,000 - $880,000</td>
</tr>
<tr>
<td>Existing Driveway Rebuild (40 Driveways*; Each @ Low: $8,000, High: $11,000)</td>
<td>$320,000 - $440,000</td>
</tr>
<tr>
<td>Site Furnishings Movement/Replacement (74 (varies); Each @ Low: $3,000, High: $4,000)</td>
<td>$220,000 - $300,000</td>
</tr>
<tr>
<td>Rectangular Rapid Flash Beacon (2 RRFBs; Each purchased and installed @ Low: $10,000, High: $15,000)</td>
<td>$20,000 - $30,000</td>
</tr>
<tr>
<td>Maintenance of Traffic During Construction (20% Applied to Sub-Total)</td>
<td>$580,000 - $745,000</td>
</tr>
<tr>
<td>Planning-Level Cost Estimate</td>
<td>$4,680,000 - $6,110,000</td>
</tr>
</tbody>
</table>

*General improvements included in all segments: pavement milling; removal of structures and obstructions; erosion control; clearing and grubbing; general earthworks; traffic control; mobilization; storm water system & water quality treatment; irrigation; pavement markings; signage

**Does not assume permanently closing any current driveways
Recreational Trails Program (RTP) and Commonwealth Trails funding set aside as part of the FY2019-2023 Capital Investment Plan.

- **MassDOT Complete Streets Funding Program**: This is a competitive program that rewards municipalities demonstrating a commitment to complete streets; bike lanes, pedestrian facilities, and shared use paths are eligible project categories. City of Lynn has been participating in this program and should continue to leverage it to cover funding gaps on any section of the Northern Strand alignment.

- **Massachusetts Community Preservation Act**: As the City of Lynn looks toward future development and creating network of facilities that connect to the Northern Strand, it may consider whether to adopt the Community Preservation Act (CPA). This tool allows cities and towns to create a Community Preservation Fund that can be used for shared use path development in addition to open space protection and affordable housing. It requires the city to add a surcharge to local property taxes, as adopted by a ballot referendum. Though urban communities with large low-income populations such as Gateway Cities have historically been less able to participate in this program, several Gateway Cities have adopted the CPA in recent years. Homebuyers in all non-CPA communities pay into the statewide matching fund through real estate deed fees, but only CPA communities can receive the matching funds.

- **Federal Transportation Funding Programs (Safe Routes to School, Surface Transportation Block Grant Program, Congestion Mitigation and Air Quality Improvement Program)**: To receive federal aid, projects must be programmed during the Transportation Improvement Program (TIP) process. City of Lynn should coordinate with the Boston Region Metropolitan Planning Organization (Boston MPO) to include eligible projects in the TIP, so that they can be compiled into the Statewide Transportation Improvement Program (STIP). Even after inclusion in the regional TIP, continued advocacy at MPO meetings is necessary to advance the project, and the project needs to adhere strictly to federal design criteria and procedures.

The following resources provide guidance for municipalities working to advance pedestrian and bike initiatives:

- **Draft Municipal Resource Guide for Bikeability**, MassDOT, November 2018
- **Massachusetts Pedestrian Transportation Plan**, MassDOT, September 2018
Section 7  Conclusion
CONCLUSION

The Lynn Walking and Bicycling Network Plan is a ‘blueprint’ for current and future planning efforts to improve the walkability and bikeability of Lynn. The Network Plan informs continued infrastructure efforts by the City and ensures the communication of deliberate planning and implementation through both public and private investment in Lynn.

The next step for the Network Plan is to be further developed and informed by local and regional planning efforts. With the State investment of the Northern Strand, the City can begin preparing certain longer-term elements of the Network Plan, like the proposed concept for Market Square.

The Lynn Walking and Bicycling Network Plan begins the process and dialogue toward creating a more walkable and bikeable Lynn.
Appendix 1  Conceptual Plan
The Preferred Route Alternative
*Main Route + Local Spur*

- Sheet 2a + 2b
- Sheet 3
- Sheet 4
- Sheet 5
- Sheet 6

- **Main Route**
  - South Common Street
  - Market Street

- **Local Spur**
  - Western Avenue
  - Lynnway/Carroll Parkway
  - Market Street

Lynn Walking and Bicycling Network Plan
The short-term installation of this on-street section of the Northern Strand is an integral link of the Preferred Route Alternative.
Western Avenue and Market Square

Long-Term
City Hall Square and Market Street
Market Street, Carroll Parkway, Lynnway
Western Avenue: Neighborhood gateway with raised intersection, pedestrian crossing beacon, and wayfinding signs.

Western Avenue to Neptune Street Court: Shared use path through abandoned MBTA railbed right-of-way.

Summer Street Crossing: Raised intersection, pedestrian crossing beacon, and wayfinding signs.

Neptune Street Court: Open lawn area showcasing existing mural and grading to transition to Neptune Street Court access point and secondary bike facility along Neptune Street.

Neptune Street Court to remainder of abandoned MBTA railbed ROW: Pedestrian park with options for placemaking elements such as community gardens and local artist installations, as well as open spaces for dramatic viewsheds, and eventually community access to areas like the Gearworks Site and other areas beyond Bennett Street especially if the existing bridge crossing over Bennett Street could be rebuilt to provide safer access.
**Market Square:** Transition from sidewalk to two-way separated bike facility on the south side of Market Square, retaining existing angular parking.

**South Common Street:** Two-way separated bicycle facility on the south side, repurposing one of the two through lanes and moving on-street parking away from the sidewalk. New raised crosswalks to access Lynn Common.
**Market Street from South Common Street to Tremont Street/Liberty Street:** Transition from street to sidepath on the west side (sidewalk level), transition back to street level at Tremont Street. This segment resulted from a compromise in terms of the continuity of the facility in order to keep all current on-street parking between 1 Market Street and 65 Market Street (10-15 spaces).

**Market Street from Tremont/Liberty Street to State Street:** Two-way separated bike facility on the west side, narrowing the existing through lane width and keeping on-street parking, but moving it away from the sidewalk.
Market Street from State Street to Broad Street: Two-way separated bike facility on the west side, keeping on-street parking, but moving it away from the sidewalk. Planted medians and left-turn pockets respectively organize the space.
**Lynnway/Carroll Parkway:** Two-way separated bike facility on the south side at street level, repurposing one of the three through lanes.
Appendix 3  Technical Memo: Route Alternatives Elimination
MEMORANDUM

Date: November 9, 2018
Project #: 22576

To: Meaghan Hamill
Office of Mayor Thomas M. McGee
3 City Hall Square
Lynn, MA, 01901

From: Conor Semler; Tess Stribos; John Paul Weesner; Margaret Kent

Project: Lynn Walking and Bicycling Network Plan
Subject: Route Alternatives Elimination

This memorandum provides preliminary documentation of the route alternatives evaluation that Kittelson & Associates, Inc. (Kittelson) is conducting for the Lynn Walking and Bicycling Network Plan (referred to as the Network Plan). More detailed information will be contained in the plan document at the end of the study. In preparation for Community Workshop #2, the sections below describe reasons why previously identified route alternatives that have been eliminated as the project team works towards identifying the preferred, feasible route for connecting the Northern Strand Community Path from Western Avenue to the Lynn Shore and Nahant Beach Reservation.

FOCUS OF COMMUNITY WORKSHOP #2

The Network Plan is examining connections both to the Lynn Shore and Nahant Beach Reservation and to the waterfront immediately south of the Lynnway. During Community Workshop #1, the project team identified potential connections to the waterfront via Harding Street, Commercial Street, and Blossom Street. These connections are “secondary” because they would be longer-term projects requiring further study. They are intended to work with other plans for future development in Lynn, including the Open Space Master Plan and the Waterfront Master Plan.

During Community Workshop #2, the project team will focus on identifying the most feasible route for reaching the Lynn Shore and Nahant Beach Reservation. The City of Lynn seeks to leverage state investment as part of the Northern Strand project. Ending at the Lynn Shore and Nahant Beach Reservation is a requirement of the Northern Strand project, which is funded through the Executive Office of Energy and Environmental Affairs’ (EEA) Gateway City Parks Program. The Network Plan can benefit from the opportunity, momentum, and budget the State has allocated to that effort by identifying a preferred route as a core outcome. This opportunity factors into the feasibility and
timeline of implementation of the Network Plan routes. Without the state investment, there is little opportunity to implement most of the recommendations from the Network Plan.

ELIMINATED ROUTE ALTERNATIVES

With the goal of connecting to the Lynn Shore and Nahant Beach Reservation in mind, the sections below explain why certain route alternatives identified during Workshop #1 have been eliminated for consideration as the extension of the Northern Strand Community Path.

Along the Active MBTA Commuter Rail Line

This route alternative was eliminated because:

- It requires crossing the abandoned bridge (over Bennett Street) owned by the MBTA. The structural integrity of the bridge is questionable and may require upgrades and/or complete replacement. There is also a major gas line that runs on the bridge would require modification, potentially adding significant cost.
- After crossing the bridge, the route would travel along an active rail line, which typically requires 25 feet of separation to ensure safety, with average separation being over 30 feet. The amount of space next to the commuter rail line through Lynn varies, with less than 10 feet approaching the bridge over Commercial Street. The bridges over Commercial Street and Blossom Street are pinch points that making building a path along the active rail practically infeasible without building new bridges and embankments. These types of measures are very costly, both for the more complex civil engineering required, and for construction.
- Additionally, MBTA would need to be consulted, and ultimately approve any such path alignment. Historically, MBTA has not been very receptive to trails along or crossing over their active rail lines.
- In addition to the restricted right of way of the active rail line and large investments that would be required to make it happen, this alternative has a significantly longer timeline. While other alternatives may require one to four years for planning and implementation, the planning, design, and construction phases for continuing along the commuter rail line would double or triple this timeline.

Bennett Street

This route alternative was eliminated because:

- The grade separation between the old MBTA bridge and Bennett Street would likely require acquiring land from private properties (for example, West Lynn Auto Service) to be able to descend the path down to the street level while meeting engineering standards and ADA requirements. This would factor in substantial additional costs and time (e.g. stakeholder coordination, acquisition costs, extensive design efforts, medium budget investment for the slope and safety measures). The route from Bennett Street does not lead naturally to the beach, and it seems it historically never has (based on Atlas of the City of Lynn, Massachusetts from 1897, accessed through Library of
Congress). This explains the prominent presence of the active rail and railyard south of Bennett Street—both major obstacles to connectivity.

- Connecting from Bennett Street to the east would require one of the following continuations:
  - Via Commercial Street to the Lynnway, which is owned by the Department of Conservation and Recreation (DCR) and would need to be part of a long-term project with uncertainty around feasibility and willingness of DCR to engage.
  - Across Neptune Boulevard Playground and on the campus of Lynn Tech to either Blossom Street or Shepard Street, which then requires either going via the Lynnway or going north to Wheeler Street. Going north would be going away from the beach, making it less attractive for state investment. Also, extending the trail through the Lynn Tech Campus is problematic from a campus security standpoint.
- The land use context of Bennett Street is industrial and auto-oriented, with a significant lack of pedestrian facilities and multiple driveway cuts, making it an uncomfortable environment for people walking and biking.

Oakville Street to River Works and the Future Gearworks Development

This route alternative was eliminated because:

- The changing grade separation of the MBTA railbed from Summer Street to Bennett Street would require dropping down to the street level on the west side of the railbed. Grading the path downward would require acquiring land from properties consisting of industrial buildings built right to the edge of the MBTA right-of-way (for example, Meninno Construction, P.B. Welding & Fabrication, North Shore Steel).
- Continuing to the Gearworks site would require crossing GE property, requiring a legal process to obtain easements. Therefore, it is a longer-term process and it makes this alternative less attractive. This does not mean this route is infeasible or undesirable. It means it falls outside of the feasibility timeline of this planning effort. It could, however, be an interesting extension of the Network Plan in the future.
Appendix 4  Public Engagement Materials
OUTREACH PLATFORMS AND MATERIALS

Logo for the project, for website and other communications created by Kittelson.

Website Banner
www.lynnbikeped.com

Facebook Page

Interactive WebMap
www.maps.kittelson.com/lynn
Statistics on number of people reached as of November 20, 2018
(source: facebook.com)

Lynn Walking and Bicycling Plan

<table>
<thead>
<tr>
<th>Events</th>
<th>People Reached</th>
<th>Event Responses</th>
<th>Ticket Clicks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1K</td>
<td>29</td>
<td>0</td>
</tr>
<tr>
<td>+1 last 7 days</td>
<td>+672 last 7 days</td>
<td>+15 last 7 days</td>
<td>+0 last 7 days</td>
</tr>
</tbody>
</table>

Chart of people engaged and reached in November, 2018
(source: facebook.com)
<table>
<thead>
<tr>
<th>DAY 1</th>
<th>MORNING</th>
<th>AFTERNOON</th>
<th>EVENING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday November 13</td>
<td>SETTING UP SHOP</td>
<td>OPEN HOUSE 3:00 pm - 8:00 pm Gallery - Walk Around Style</td>
<td>ACTIVITY Rate Alternative Routes and Trade-offs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EVENT: OFFICIAL OPENING &amp; TRADE-OFFS PRESENTATION 7:00 pm - 8:00 pm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACTIVITY Create your own Street Section!</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Q&amp;A Discussion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DAY 2</th>
<th>MORNING</th>
<th>AFTERNOON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday November 14</td>
<td>OPEN HOUSE 9:00 am - 12:00 pm Gallery - Walk Around Style</td>
<td>OPEN HOUSE 6:00 pm - 8:00 pm Gallery - Walk Around Style</td>
</tr>
<tr>
<td></td>
<td>ACTIVITY Rate Alternative Routes and Trade-offs</td>
<td>ACTIVITIES Rate Alternative Routes and Trade-offs</td>
</tr>
<tr>
<td></td>
<td>ACTIVITY Create your own Street Section!</td>
<td>Create your own Street Section!</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off-Site: Project Team talks to business owners and residents of Lynn</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DAY 3</th>
<th>MORNING</th>
<th>AFTERNOON</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday November 15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PUBLIC PRESENTATION 6:30 pm - 7:30 pm Presentation Questions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OPEN HOUSE 6:00 pm - 8:00 pm</td>
</tr>
</tbody>
</table>
November 13 - 15
@ City Hall Auditorium

Visit the website:
www.LynnBikePed.com

Join in to give input on:

- What route works best to connect to Nahant Beach?
- What must you give up to make space for you to bike and walk? What do you gain?
- Issues to discuss:
  Number of lanes, on-street parking, green space, safe crossings, and more!

Lynn Walking and Bicycling Network Plan

Open House Hours

Tuesday 3 - 8 pm
Wednesday 9am-12pm 6pm - 8pm
Thursday 6 - 8 pm

Public Presentation

In collaboration with:
Community Path of Lynn Coalition

www.LynnBikePed.com

What is the route between Western Ave and Nahant Beach?

How much space is needed for safe biking?

Connecting the Community Path to the rest of the City

Better pedestrian crossings

What about parking?

Improvements for Market Street!

Cross the Lynnway safely

Can I get to the Ferry Terminal?

Pizza & Snacks Provided!

Tuesday - Thursday | November 13 -15, 2018
Lynn City Hall | Auditorium
## DAY 1
August 21

**OPEN HOUSE**
1:00 pm - 8:30 pm
Gallery - Walk Around Style

**EVENT: WALK & BICYCLE AUDIT**
1:00 pm - 1:30 pm

**EVENT: OFFICIAL OPENING & INTRODUCTION PRESENTATION**
6:00 pm - 7:30 pm

**OPEN HOUSE STUDIO**
1:30 pm - 3:30 pm
Activity: string mapping your journey

---

## DAY 2
August 22

**OPEN HOUSE**
1:00 pm - 8:00 pm
Gallery - Walk Around Style

**OPEN HOUSE STUDIO**
Activity: string mapping your journey

**TENTATIVE EVENT**
**MOCK PATH**
11:00 am - 6 pm
Project Team sharing lunch time with residents and interested folks at Mock Path

---

## DAY 3
August 23

**EVENT**
**TRAFFIC SAFETY WORKSHOP (INTERACTIVE)**
4:00 pm - 5:00 pm

**PUBLIC PRESENTATION**
6:30 pm - 7:30 pm
Gallery - Walk Around Style
Presentation
Questions
What is next?
Join us at the community workshop: 3 days of activities, presentations, open houses and outdoor events

Share your thoughts with the City of Lynn’s planning and design team

The City of Lynn needs your help to plan:

- Community Path: rail corridor from Western Ave to the waterfront
- On-street bike facilities from Western Ave to downtown

Visit www.LynnBikePed.com

August 21 though 23, 2018
Lynn Technical Vocational School - 80 Neptune Blvd, Lynn
¡Vengan a mejorar la Ciudad de Lynn para caminar y andar en bicicleta!

Venga con nosotros al taller de la comunidad: 3 días de actividades, presentaciones, jornadas de puertas abiertas y eventos al aire libre

Comparta sus ideas con el equipo de diseño y planificación de la Ciudad de Lynn

21 al 23 de Agosto
@ Lynn Tech Fieldhouse
www.LynnBikePed.com

Lynn
Plan para una Red para Caminar y Andar en Bicicleta

La ciudad de Lynn necesita su ayuda para planear:
- Ruta de la Comunidad: corredor ferroviario desde Western Ave hasta frente al mar
- Instalaciones para bicicletas en la calle desde Western Ave hasta el centro de la ciudad

Visite www.LynnBikePed.com

In inspección a Pie Martes, 21 de agosto a la 1 pm - comienza en el 756 Western Ave
Casa Abierta martes, miércoles 21, 22 de agosto, 1 pm a 8 pm @ Lynn Tech Fieldhouse
Taller Interactivo: Seguridad para todos los modos: Jueves, 23 de agosto 1 pm @ Lynn Tech Fieldhouse
Presentación Pública Jueves, 23 de agosto 6.30 pm - 7.30 pm @ Lynn Tech Fieldhouse

Del 21 al 23 de Agosto de 2018
Lynn Technical Vocational School - 80 Neptune Blvd, Lynn

In collaboration with:

Find us on Facebook .com/Lynn Walking and Bicycling Plan

Kittelsson & Associates Community Path of Lynn Coalition