CHAPTER 3
OPERATIONS CONCEPTS

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low-density residential areas and major activity centers may only be feasible during peak periods or at a very low frequency (hourly or worse) during off-peak periods (13).

**Peak-Hour Demand Variation**

Passenger demand can also vary within the peak period. Some of this variation is attributable to people timing their trips to arrive at a destination (e.g., job, school) as close to the desired starting time as possible; other is due to day-to-day variations in people's activities that result in them taking different transit vehicles on different days. These variations have implications on the level of onboard crowding, as a service scheduled to accommodate average demand over the peak hour may experience overcrowded conditions during the peak of the peak.

The concept of a *peak hour factor* (PHF) is used to express this demand variation within the peak hour (or any other analysis hour). The PHF is defined as the demand during the hour divided by four times the demand during the peak 15 min of the hour. Thus a PHF of 1.00 indicates even demand in each 15 min period of the hour, while a PHF of 0.25 would indicate that all the demand occurs in one 15-min period. Typical transit PHFs range from 0.60 to 0.95 (2, 14).

Exhibit 3-7 shows actual train loading data for the a.m. peak period for one day at a peak load station on Vancouver’s SkyTrain (15), with the peak hour and the peak 15 min indicated, along with the average passenger loads during those time periods. The PHF represented in the graph is 0.92, which is relatively high (i.e., relatively even loading by 15-min intervals) for transit service.
Even though the average load throughout the peak hour, relative to the peak 15 min, is fairly even, it can be seen from the exhibit that there are considerable variations from one train to the next. Furthermore, the average load during the peak 15 min is 35 passengers per train higher than the average for the peak hour. If this agency had only peak-hour ridership totals to work with and had (hypothetically) a service standard of 300 passengers per train, it might appear to meet its standard based on the average peak hour load, while in actuality, peak 15-min loads would exceed the standard. In many cases, the proportional difference between peak-hour and peak-15-min demands will be much greater than shown in Exhibit 3-7.

Both Exhibit 3-6 and Exhibit 3-7 have illustrated the importance of being aware of demand patterns over both long and short periods of time. The use of automatic passenger counting (APC) equipment allows the collection of passenger demand data on a regular basis. TCRP Report 113: Using Archived AVL-APC Data to Improve Transit Performance and Management (16) provides guidance on collecting, archiving, and using APC data. TCRP Report 135: Controlling System Costs: Basic and Advanced Scheduling Manuals and Contemporary Issues in Transit Scheduling (17) describes the use of ridership data, in conjunction with transit agency loading standards and policy headways, when developing transit schedules.

DEMAND RELATED TO DEMOGRAPHICS

The 2009 National Household Transportation Survey (NHTS, 18) provides data on household travel patterns for all travel modes and trip purposes. The following are selected demographic factors that relate to transit use in the U.S. (19):

- **Gender.** Controlling for other factors that influence mode choice, males are 7% more likely to use transit for a given trip than females.
- **Age.** Compared to persons 16–24 years old, persons in the 25-44 and 45–64 age groups are about half as likely to use transit for a given trip (45–64 years olds are slightly less likely to use it than 25–44 year olds), and those 65 and older are one-fifth as likely to use it. (The NHTS did not ask about trips made by children.)
- **Employment.** Persons who are employed are 41% more likely to use transit for a given trip than those not in the workforce or unemployed.
- **Number of cars in household.** Compared to zero-car households, one-car households are 10% as likely, two-car households 3% as likely, and three-car households 2% as likely to use transit for a given trip.

DEMAND RELATED TO LAND USE

**Land Use Densities Supporting Various Transit Service Modes and Levels**

As indicated above, there are a number of factors that influence the ridership demand for a given transit line—for example, ease of access, demographic factors such as age and car ownership, cost and convenience of transit relative to competing modes—but the density of land uses along the line is a basic requirement. Simply put, the more people and the more jobs that are within easy access distance of transit service, the more potential customers there are to support high-quality service. Conversely, the more spread apart land uses are, the more difficult it is to develop a
### MBTA Bus Ridership Data

#### Load Entering

<table>
<thead>
<tr>
<th>Route</th>
<th>Weekday Ridership (in)</th>
<th>Hour (8am−9am)</th>
<th>Hour (5pm−6pm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus 1</td>
<td>344,111.0</td>
<td>101,331,725.0</td>
<td>291</td>
</tr>
<tr>
<td>Bus 2</td>
<td>354,060.0</td>
<td>105,881,740.0</td>
<td>297</td>
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<tr>
<td>Bus 3</td>
<td>361,676.0</td>
<td>111,730,664.0</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Load Exiting

<table>
<thead>
<tr>
<th>Route</th>
<th>Weekday Ridership (out)</th>
<th>Hour (8am−9am)</th>
<th>Hour (5pm−6pm)</th>
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</thead>
<tbody>
<tr>
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<td>207</td>
<td>63</td>
<td>7</td>
</tr>
<tr>
<td>Bus 2</td>
<td>214</td>
<td>64</td>
<td>8</td>
</tr>
<tr>
<td>Bus 3</td>
<td>221</td>
<td>65</td>
<td>8</td>
</tr>
</tbody>
</table>

---

**Source:** TMA Data from Sept. 2013 through 2014

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**Note:** 
- Ridership data includes in-bound and out-bound passengers.
- Data is based on the average of ridership over the past five years.
- Ridership data is annualized to determine the average ridership per week.

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**Ridership Growth**

<table>
<thead>
<tr>
<th>Route</th>
<th>Riderhip Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus 1</td>
<td>1.2%</td>
</tr>
<tr>
<td>Bus 2</td>
<td>2.9%</td>
</tr>
<tr>
<td>Bus 3</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

---

**Ridership Source:**
- MBTA Bus Ridership Data: Provided monthly ridership data, June 2014
- EZRide Ridership Data: Provided ridership data, June 2014

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**Note:**
- Weekly ridership data includes in-bound and out-bound passengers.
- Ridership data is annualized to determine the average ridership per week.
Hub and Spoke Report
Hub and Spoke

CORE TRANSIT CONGESTION AND THE FUTURE OF TRANSIT AND DEVELOPMENT IN GREATER BOSTON

Authored by Stephanie Pollack, Associate Director, Dukakis Center for Urban & Regional Policy at Northeastern University

June 2012
RISING RIDERSHIP

The Massachusetts Bay Transportation Authority, known locally as the T, serves 175 communities with a population of almost 4.7 million people spread over 3,200 square miles. The MBTA’s integrated transit system includes 14 commuter rail lines, 4 subway lines and over 180 bus routes as well as bus rapid transit, trackless trollies, ferries and a paratransit system. (MBTA Blue Book 2010).

Boston is one of the top five metropolitan areas in the United States for transit ridership. In 2010, the last year for which the American Public Transportation Association compiled comparative data from the Federal Transit Administration’s National Transit Database, the MBTA was the fifth largest transit system in the United States, when measured by the total number of unlinked passenger trips served annually1 (APTA Fact Book 2011). And when per capita transit use is the metric, as shown in Figure 1, Boston also ranks fifth nationally.

Like transit systems across the country, the MBTA has continued to grow its ridership even in the face of the persistent predictions that transit was a dying transportation mode. Six years ago, when the Urban Land Institute’s Boston District Council and Northeastern University’s Dukakis Center for Urban and Regional Policy last teamed up to examine transit and transit-oriented development in metropolitan Boston, that On the Right Track report acknowledged that “transit ridership has declined in recent years.” But the report noted a number of trends “that point toward a future of growing demand for higher quality transit.” That prediction, and others like it, has proven correct — ridership has grown steadily and the rate of increase has accelerated.

Transit ridership has actually been growing modestly but steadily for the past two decades, both nationally and on the MBTA. 2011 marked the sixth consecutive year that Americans took more than 10 billion trips on public transportation. The 2011 total of 10.4 billion trips was the second highest annual ridership recorded since 1957, according to the American Public Transportation Association.

As shown in Figure 2, the MBTA’s ridership over the past two decades roughly parallels the national increase in ridership, rising at an average annual rate of 1.2% between 1991 and 2011. Ridership growth on the MBTA has accelerated during the past five years, with trips increasing at an average annual rate of 2.9% between 2006 and 2011. And 2012 is off to a strong start: April 2012 marked the fifteenth consecutive month in which year-over-year ridership on the MBTA increased and the third straight month that average weekday ridership exceeded 1.3 million. Between January 2007 and April 2012 — with fares remaining unchanged and the retail price of gasoline in Massachusetts rising from $2.26/gallon to $3.86/gallon — MBTA ridership rose at more than twice its longer-term historical average of increasing just over one percent per year.

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1 “Unlinked trips” are the number of times passengers board public transportation vehicles. Passengers are counted each time they board vehicles, no matter how many vehicles they use to travel from their origin to their destination.
FUTURE RIDERSHIP GROWTH

With MBTA ridership rising modestly and steadily over the past twenty years — and the annual rate of increase more than doubling from 1.2% over the past 20 years to 2.9% over the past five years — the MBTA must plan for higher ridership in the future. Even with fares set to increase, which may at least temporarily slow ridership growth, analysis of the MBTA’s historical and more recent ridership data, as well as recent modeling performed by the Commonwealth’s Central Transportation Planning Staff, support the conclusion that the MBTA needs to plan to be able to serve significantly more riders in the near future.

How many more transit trips should the MBTA plan to accommodate? For this report the Dukakis Center developed three scenarios for forecasting MBTA ridership growth from 2011 through 2021: a baseline forecast, a moderate growth scenario and a high growth scenario. The results, as illustrated in Figure 3 and explained in “Ridership Growth Scenarios” on the next page, are both exciting and sobering.

The MBTA’s 2011 ridership was 390 million unlinked trips or approximately 1.28 million unlinked trips on an average weekday, with average weekday ridership increasing to over 1.3 million average weekday riders in the early months of 2012. Figure 4 shows the forecast level of ridership in 2021:

- The baseline growth rate of 1.2% annually predicts that the MBTA would serve at least 420 million unlinked trips in 2021, equivalent to approximately 1.4 million average weekday riders.

- The moderate growth rate of 1.5% annually predicts that the MBTA would serve 450 million unlinked trips in 2021, equivalent to approximately 1.5 million average weekday riders.

- The growth rate of 2.9% annually predicts that the MBTA would serve 500 million unlinked trips in 2021, equivalent to approximately 1.67 million average weekday riders.
Bicycle Analysis
Charles River Basin Report
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- Section C: Arsenal Street Bridge to Eliot Bridge
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- Section E: Western Avenue Bridge to Boston University Bridge
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- Section G: Harvard Bridge to Longfellow Bridge
- Section H: Longfellow Bridge to Craigie Dam Bridge + Drawbridge

Implementation Project Tables

**Appendix**
Acknowledgements

Massachusetts Department of Transportation
Highway Division
Richard A. Davey, Secretary and CEO
Frank DePaola, Administrator Highway Division
Amy Getchell, Connectivity Study/ABP Project Manager
Stephanie Boundy, ABP Public Outreach Coordinator

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The Charles River Basin is a world-class resource for people and nature. The park that stretches eight-and-a-half miles along the river from Watertown to Boston is the convergence of the region’s built and natural environments, and a critical nexus in the metropolitan transportation network. As the Charles River approaches Boston Harbor, it passes through communities of increasing density. The path systems that frame the river banks and the bridges that span the river form a “trunk route” of non-motorized transportation for Newton, Watertown, Cambridge, Boston, and beyond. As many as 10,000 cyclists, pedestrians and runners an hour use these routes. Several of the surrounding urban areas feature well-established bicycle and pedestrian links to the park system. However, many have fragmented or nonexistent connections due to the adjacent parkways, the Massachusetts Turnpike, rail yards or auto-oriented land uses. These barriers can discourage walking and bicycling to, along and across the river. Recognizing these and other concerns, the Department of Conservation and Recreation (DCR) and the Massachusetts Department of Transportation (MassDOT) in 2009 jointly commissioned a study as part of Governor Patrick’s Accelerated Bridge Program to evaluate the conditions and needs of the pedestrian and bicycle facilities along the Charles River Basin.

The Charles River Basin Pedestrian + Bicycle Study for Pathways + Vehicular Bridges begins with the need to identify connectivity gaps that exist where physical or other constraints impede bicycle and pedestrian travel throughout the network of paths, intersections and bridges along the Charles River Basin. The study area focuses on the Charles River Reservation from the Galen Street Bridge in Watertown downstream to the Craigie Dam Bridge and Drawbridge and includes areas within two blocks of the Reservation itself.

**Executive Summary**

**Typical Conditions in the Study Area**

User-created “goat tracks” occur when users feel that the path surface provided is too narrow, too hard or both. Here, three informal paths have been created.

Access for pedestrians and cyclists on the important desire line between Arsenal Mall and the river is uncontrolled and unmarked.

In some of the upstream portions of the Study Area, the character is more rural.

Accommodation for pedestrians and bicyclists is needed on many of the bridges over the river, as well as safe and well-marked ways to negotiate the intersections at either end. This is Charles Circle at the South Bank end of Longfellow Bridge.

The Bowker Overpass roadway may be wide enough, relative to its anticipated vehicular use, to accommodate a dedicated zone for bicycles.

A “user counter” on the Esplanade records three different types of user sharing the path right-of-way: a jogger, a cyclist and a stroller.
The primary goal of the report is to provide conceptual design recommendations for connectivity improvements to and along the Basin for DCR, MassDOT, and the adjacent municipalities to incorporate in the future. Part I, Background + Analysis, (pages 1-10) provides a background and introduction to the study and description of the public process and analysis. It also illustrates the existing pedestrian and bicycle infrastructure and the activity generators within the study area. Part II, Recommendations, (pages 11-35) divides the Basin into segments bounded by the river bridges, beginning at the upstream end of the Basin. It details the recommended enhancements and includes supporting graphics.

The recommendations are listed at the end of the report in the Project Implementation Tables (pages 36-40), showing each project’s priority, relevant jurisdictions, and potential funding sources. Some of these recommendations can be implemented in the short term, while others will require further study and will need to be incorporated into long-term planning and fundraising. The recommendations are preliminary and conceptual in nature. Proposed improvements will need to be evaluated for design and construction feasibility, regulatory compliance, and long-term maintenance costs.
Summary of Connectivity Recommendations

Figure 4
EXECUTIVE SUMMARY

The Connectivity Study is intended for the use of DCR, MassDOT and the municipalities that line the Charles River as a blueprint for moving forward, with recommendations for both near-term and future projects. MassDOT’s GreenDOT policy (http://www.massdot.state.ma.us/greendot.aspx) includes a commitment by Massachusetts Secretary of Transportation Richard Davey to triple walking, bicycling and transit mode share in the Commonwealth by 2030. The variety of projects presented in this report will help Greater Boston become a truly multi-modal region and create a model for integrating green infrastructure that connects people and nature. As the primary corridor for pedestrian and bicycle transportation and recreation, the Charles River Basin will play a central role in ensuring a sustainable future for the region.

Connectivity Recommendations

General recommendations that apply throughout the Basin include:

- DCR should strive to develop a 10’-wide paved path with a parallel soft-surface trail or shoulder for runners where possible. All path widening projects must take into consideration the value of the Reservation as a natural resource. Exceptions to the path-width standards should be made in the presence of historic landscape, riparian habitat or large and mature trees. In “pinch point” conditions, a minimum 8’ paved path, with 3’ shoulder on one side, should be incorporated;
- Traffic signals should be examined to determine if concurrent or exclusive pedestrian phases are appropriate. Exclusive signals are recommended where feasible;
- A wayfinding study should be conducted to identify the type and location of wayfinding signage to enhance pedestrian and bicycle connectivity and to support environmental stewardship, education and interpretation;
- Signing the pathways along the Basin as the “Charles River Greenway” to support the concept of green infrastructure as an integrated element of the Basin’s conservation strategy;
- Regular maintenance of the paths throughout the Reservation is essential to the continued success as a transportation, conservation and recreation corridor.

Other key recommendations include:

- Numerous streetscape enhancements in Watertown and Newton along roadways that should connect directly to the Reservation, but currently do not;
- A new footbridge over the Charles River that connects Newton and Watertown, providing additional opportunities for walking and bicycling loops between the Galen and North Beacon Street bridges;
- New crosswalks, roadway geometry and bike lanes on or adjacent to the North Beacon Street Bridge;
- The lane reduction of a mile-long stretch of Greenough Boulevard to provide new parkland and paths that form an integrated loop with Herter Park on the south bank of the river;
- Road narrowing along Memorial Drive between Mt. Auburn Hospital and John Fitzgerald Kennedy Park in Cambridge to improve connections to Brattle Street and provide space for separated paved and soft-surface paths;
- A link from the Boston University Bridge to the Esplanade, incorporating the rail trestle that may be redeveloped as a part of the Grand Junction trail project;
- A plan to connect the Esplanade with the Emerald Necklace, utilizing a new path through DCR-owned land adjacent to the Bowler Overpass, paralleling the Muddy River and along a widened sidewalk of the viaduct over the Turnpike;
- Previously planned improvements as part of the Memorial Drive Phase II project that will widen the existing concrete path adjacent to the seawall, introduce a parallel soft-surface path in places and plant additional trees;
- Enhancements to improve connections from the Albany and Sidney Street corridors in Cambridge to the river using shared lanes, signage, an improved at-grade railroad crossing and new paths through Fort Washington Park;
- In conjunction with the planned improvements to the Longfellow Bridge through MassDOT’s ABP, new traffic signals and crosswalks to link the Broad Canal path to Cambridge Parkway;
- Bicycle connections through Charles Circle that will include green bike lanes, enhanced signage and frequent shared-lane markings;
- A critical link from the north to the south bank of the Charles utilizing a pair of new foot bridges along the upstream side of the Museum of Science on the 1910-dam, one located where Lechmere Canal and the River join, and the second spanning the 1910 lock, ideas being explored in a preliminary study initiated by DCR;
- At-grade pedestrian and bike enhancements at Leverett Circle (with provisions for a pedestrian overpass in the future).
The reservation between the Harvard and Longfellow Bridges is one of the most trafficked in the whole Basin.

**North Bank.** Major improvements are planned for the path system along Memorial Drive as part of DCR’s Memorial Drive Phase II project. For most of this section there will be a 10-foot, two-way, paved shared-use path adjacent to the roadway with a separated, 6-foot stabilized aggregate path along the river.

Ames Street provides a connection to Kendall Square, the Sixth Street Pedestrian Walk, and East Cambridge. On-street improvements will enhance this connection, as will a proposed pedestrian-actuated signal at the intersection with Memorial Drive. Wadsworth Street connects to Kendall Square and, when reconstructed, will connect to Third Street and East Cambridge. Improvements to this street should follow the reconstruction of the intersection at Main and Third Streets.

East of the crosswalks at Wadsworth Street, there is an existing pedestrian signal and crosswalks to facilitate access to the Longfellow Bridge. This crossing, however, is relatively far from the bridge itself. Wayfinding signage should be added to this area to direct path users to Longfellow Bridge and Main Street.

In the Spring of 2013, construction will begin to rehabilitate the Longfellow Bridge as part of MassDOT’s Accelerated Bridge Program. The plans maintain the bike lanes across the bridge, adding a buffered bike lane to the outbound side and widening sidewalks. The rehabilitation will also include the widening of the path under the Longfellow Bridge along Memorial Drive (See Section H).

**South Bank.** On the Boston side of the river, there are four overpasses over Storrow Drive between the Harvard Bridge and the Longfellow Bridge. The overpasses at Fairfield Street and Dartmouth Street need better bicycle and pedestrian connections to Beacon Street. Both streets are one way for that block; however, bicycle demand is two-way. Counter-flow lanes should be considered in both directions. Further improvements to Fairfield and Dartmouth Streets will improve the connectivity to the river from the Back Bay neighborhood.

The Arthur Fielder foot bridge, built in 1953 and named after the famous Boston Pops conductor, currently provides a vital pedestrian and bicycle connection between Arlington Street and the Esplanade landscape. Nearby destinations include the Hatch Shell concert area, the Esplanade Playspace, Community Boating, an outdoor café and public bathrooms as well as access to the recreational paths along the river. The striking orange/pink curving concrete bridge spans Storrow Drive allowing people from Beacon Hill and Back Bay to access the parkland from the city any time of year.

68. Photosimulation of the reservation adjacent to Memorial Drive showing Phase II improvements, downstream of MIT’s Pierce Boathouse.

69. Photosimulation of Memorial Drive with Phase II improvements, upstream of MIT’s Pierce Boathouse.

70. On the occasion of the 2010 centennial of the Charles River Esplanade, the non-profit Esplanade Association came together with DCR and a group of volunteers, professionals, and concerned citizens to envision an ambitious future of this beloved stretch of riverfront parkland.

With guiding principles for the park’s future, and an extensive list of forward-looking improvements, the Esplanade 2020 Plan provides an excellent context for long-term planning in this area. It is available online from The Esplanade Association.

The Connectivity Study recommendations have considered the visionary ideas of the 2020 Plan. One of the more imaginative proposals from the Plan—currently unfunded—would involve lowering Storrow Drive, enabling the creation of an at-grade crossing near the Hatch Shell, shown in the detail above.
Recommendations

Section G

Harvard Bridge to Longfellow Bridge

Legend

- Existing crosswalk, no improvements needed
- Existing crosswalk, needs improvement
- Proposed crosswalk
- Existing/funded signal
- Proposed signal
- Existing ped bridge/overpass
- Proposed ped bridge/overpass
- Existing Hubway station
- Existing/funded bike lane/cycle track
- Proposed bike lane/cycle track
- Existing/funded multi-use path/sidewalk (primary)
- Existing/funded multi-use path/sidewalk (secondary)
- Proposed multi-use path
- New path/landscaping/reduced lanes
- Proposed bike/ped and street-scape improvements within ROW
- Reconfiguration of intersection recommended
- Entry node to the river with art, seating, lighting, landscape elements and small plaza features

Add wayfinding signage to direct bicyclists/pedestrians to Longfellow Bridge

Add counterflow bike lane to improve access to overpass

Path under bridge to be widened as part of the Longfellow Bridge construction

New bicycle/pedestrian bridge to be constructed with Longfellow Bridge Project

Entry node to the river with art, seating, lighting, landscape elements and small plaza features
South Bank continued. The existing pedestrian overpass from Charles Circle to the Esplanade is to be replaced in conjunction with the Longfellow Bridge Reconstruction. Due to the extremely high volumes of cyclists and pedestrians that use this bridge particularly during events on the Esplanade, the width of the new bridge should be no narrower than 12 feet.

The bicycle connection through Charles Circle is critical. Currently it represents a significant barrier that nearly precludes less-experienced cyclists from bicycling to and from downtown Boston over the Longfellow Bridge.

While there are bike lanes on the Longfellow Bridge, the Draft Boston Bike Master Plan recommends shared lane markings on Cambridge Street. At Charles Circle these two facility types meet (Figure 72). For eastbound Longfellow Bridge traffic, the current design includes a wide bike box intended for queuing bicyclists traveling through to Cambridge Street or left to Charles Street or Mass. General Hospital. Green paint or thermoplastic in a dashed bike lane will also help motorists see this conflict area.

East of Charles Street, a series of tightly spaced “sharrows” can help define another conflict zone where bicyclists may conflict with motorists merging from their right.

Westbound bicyclists on Cambridge Street have difficulty traveling straight through the traffic light due to heavy volumes of right-turning motor vehicles from all three existing travel lanes. Shared lane markings or a green priority shared lane should be incorporated to encourage bicyclists to stay in the middle lane as they enter the intersection. A series of tightly spaced sharrows will help define the path of bicyclists traveling straight through this intersection. In the long term, Cambridge Street and Charles Circle should be reconfigured to accommodate a separated bicycle facility. Once bicyclists pass the Storrow Drive on-ramps, they would enter a buffered bike lane that continues to the planned buffered bike lane on the Longfellow Bridge. Green coloration helps define another conflict area where motorists turn right from Storrow Drive onto the bridge.

Full signalization of this intersection should be studied to discourage motorists from taking a “rolling stop” through the flashing red light from the Storrow Drive off-ramp.
The paths on the Boston and Cambridge sides of the river between the Longfellow Bridge and the Craigie Dam Bridge and Drawbridge provide access to the Broad Canal, Lechmere Canal, the Museum of Science, and Teddy Ebersol’s Red Sox Fields.

North Bank. The recommended connections between the Longfellow Bridge, Broad Canal, and the path are shown in Figure 74. The short ramp from First Street to the westbound lane of the Longfellow Bridge can easily include a bicycle lane. The addition of several crosswalks across First Street and Land Boulevard will connect the end of this ramp, the Broad Canal path, and the path along Cambridge Parkway. Because of the slope and short sight lines, a pedestrian-actuated signal should be incorporated at these two crosswalk locations.

To further enhance the pedestrian connection under the bridge, the wall on the west side of First Street will be enhanced by providing openings in the granite wall. This work will be done during the rehabilitation of the Longfellow Bridge. There are existing bike lanes and a planned cycle track on Binney Street, which ends at Land Boulevard. Across the street, Front Park links to the Cambridge Parkway. A more clearly defined bicycle connection through this park will help complete the movement from Binney Street.

Other streets that provide connections to the East Cambridge neighborhood include Charles Street, which has a signalized crossing at Land Boulevard, and Thorndike Street, which connects to the path around the Lechmere Canal. This canal path links to the Charles River path; however, the connections are not ADA-compliant because of the steep slope from the river to Land Boulevard on the north side.

Currently, the primary path connects from Cambridge Parkway to Land Boulevard, over the Lechmere Canal, and along Charles River Dam Road on the downstream side of the Museum of Science. An alternate route for the path would be on the upstream side of the Museum of Science.

Two new bridges are required to make this connection. DCR consultants have completed conceptual designs for these two bridges. The first is a curved bridge (Figure 75) which will connect from the Esplanade at the north end of Cambridge Parkway over the canal to the Museum of Science parking garage. A cantilevered walkway will be necessary to connect to the existing path behind the Museum of Science. Another bridge will be necessary to cross the open lock that leads to the Craigie Drawbridge. Because of occasional boat traffic, this bridge will need to be a movable bridge (see Figure 76). These connections will create a loop around the east end of the Charles River Basin along the water’s edge, without any road crossings.

In addition to this long-term vision for connectivity on the upstream side of the Museum of Science, improvements are needed to the existing connection on the downstream side. Improved crosswalks at today’s Museum Way signal will enhance the connection of the path to North Point Park and the new North Bank Bridge, which links to Paul Revere Park in Charlestown. There is a long-term vision to connect the Somerville Community Path to the river in this area. This portion of the river also includes the proposed Inlet Bridge between Charles River Dam Road and North Point Park in Cambridge, and the Draw One Walkway across the river, connecting Cambridge and Boston.
South Bank. On the Boston side of the river, the South Bank Bridge, serving cyclists and pedestrians, is planned by DCR to cross over the MBTA train tracks and connect Nashua Street Park with the new Charles River Dam.

MassDOT has committed to reconstruct the pedestrian overpass at Leverett Circle, which will link the MBTA station to the east- and westbound walkways along Storrow Drive. At-grade improvements will help bicyclists and pedestrians navigate this complex intersection. The planned bike lanes on the O’Brien Highway should extend through Leverett Circle. Bike signals and an alternating flashing/steady red right turn arrow will mediate the conflict between eastbound bicyclists and right-turning motorists.

If a flashing red arrow cannot be accommodated with the existing signal equipment, then a permanent “No Right Turn on Red” sign, with hour restrictions, should be installed. The addition of a crosswalk from a traffic island to the MBTA station will satisfy an existing pedestrian desire line while avoiding conflict with vehicles from Nashua Street. These improvements were developed by the Connectivity Study team for MassDOT in the Leverett Circle Pedestrian + Bicycle Crossing Study (2011).*

Both Martha Road and Nashua Street are important links between North Station and the Charles River Reservation. Bicycle facilities are recommended for both streets. Further study is needed to determine if a lane reduction and the addition of bike lanes is appropriate on Nashua Street. Currently the Draft Boston Bike Master Plan recommends shared lane markings along Martha Road and Nashua Street. Additionally, the path connection to the west side of North Station is not well defined. Pavement markings and wayfinding signage directing bicyclists from Martha Road will improve this connection. Bicyclists leaving North Station via Nashua Street will benefit from the addition of a stop sign for cars exiting the underground parking garage.

* http://www.massdot.state.ma.us/portals/0/docs/infoCenter/docs_materials/Leverett_report.pdf

76. Proposed movable bridge by Rosales/Schlaich Bergermann at the lock on the South Bank (courtesy DCR)

77. In addition to the proposed pedestrian overpass at Leverett Circle, some at-grade intersection improvements can be made to enhance pedestrian/bicycle connections to the T station and the West End neighborhood.
Figure 78

Recommendations

Section H
Harvard Bridge to Craigie Dam Bridge + Drawbridge

Legend

Existing crosswalk, no improvements needed
Existing crosswalk, needs improvement
Proposed crosswalk
Existing/funded signal
Proposed signal
Existing ped bridge/overpass
Proposed ped bridge/overpass
Existing Hubway station
Existing/funded bike lane/cycle track
Proposed bike lane/cycle track
Existing/funded multi-use path/sidewalk (primary)
Existing/funded multi-use path/sidewalk (secondary)
Proposed multi-use path
New path/landscaping/reduced lanes
Proposed bike/ped and streetscape improvements within ROW
Reconfiguration of intersection recommended
Entry node to the river with art, seating, lighting, landscape elements and small plaza features
The recommendations set forth in this report are intended for the use of DCR, MassDOT and the municipalities that line the Charles River as a blueprint for moving forward and to help meet the recent call of Massachusetts Secretary of Transportation Richard Davey to triple walking and bicycling in the Commonwealth.

The recommendations are conceptual in nature and will require further analysis and study before moving forward to implementation. The following summary tables categorize each measure by order of magnitude costs, timeline, and jurisdiction. Projects which have been identified as both early to mid-term actions and low to medium cost are listed as priority projects for municipalities and state agencies to act upon in the near future.

The variety of projects presented in this report will help move Greater Boston closer to becoming a truly multi-modal region and will help create a model for integrating green infrastructure that connects people and nature.

### Implementation Project Tables

**Priority Projects**

<table>
<thead>
<tr>
<th>PROJECT AREA/DESCRIPTION</th>
<th>DESCRIPTION</th>
<th>JURISDICTIONAL INVOLVEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. UPPER CHARLES RIVER BASIN (GALEN ST BRIDGE TO ELIOT BRIDGE)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watertown Square Intersection</td>
<td>Shared lane markings on Charles River Rd and N Beacon St to continue bike lanes through the intersection; new crossing with pedestrian signal, entry node to path with art, seating, etc.</td>
<td>Watertown</td>
</tr>
<tr>
<td>Irving Street / Charles River Road</td>
<td></td>
<td>DCR, Watertown</td>
</tr>
<tr>
<td>N. Beacon Street / Charles River Road</td>
<td>Improvements to crosswalks and widen path to 10 feet at pinch point</td>
<td>DCR, DOT</td>
</tr>
<tr>
<td>Arsenal Mall and Arsenal Park Path</td>
<td>Path connection with new crosswalk between Arsenal Street and the N. Beacon Street Bridge</td>
<td>DCR, Watertown</td>
</tr>
<tr>
<td>N. Beacon Street Bridge (north end)</td>
<td>Pedestrian actuated signal; improve crosswalks</td>
<td>DCR, DOT</td>
</tr>
<tr>
<td>N. Beacon Street Bridge</td>
<td>Lane reduction, new bike lanes or cycle tracks</td>
<td>DCR</td>
</tr>
<tr>
<td>Community Rowing Launch Site</td>
<td>Improve path visibility at boat launch</td>
<td>DCR</td>
</tr>
<tr>
<td>North Beacon St Bridge (south end)</td>
<td>Improve path crossing</td>
<td>DCR, DOT, City of Boston</td>
</tr>
<tr>
<td>Arsenal Bridge (south end)</td>
<td>Improve crosswalks and curb ramps at path crossing; remove or tighten free-right turn lanes</td>
<td>DCR, DOT, City of Boston</td>
</tr>
<tr>
<td>Soldiers Field Road parking lot (east of Western Avenue)</td>
<td>Improve path connection through parking lot; improve crosswalk</td>
<td>DCR</td>
</tr>
<tr>
<td>Everett Street at Soldiers Field Road</td>
<td>New crosswalks across Soldiers Field Road</td>
<td>DCR, City of Boston</td>
</tr>
<tr>
<td><strong>B. MIDDLE CHARLES RIVER BASIN (ELIOT BRIDGE TO BU BRIDGE)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memorial Drive at Hawthorn Street</td>
<td>Enhanced crosswalk; potential entry node to river with art, seating, etc.</td>
<td>DCR, City of Cambridge</td>
</tr>
<tr>
<td>JFK Street</td>
<td>Bike lanes from Anderson Bridge to Eliot Street</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Dewolfe Street</td>
<td>Bike/ped ROW and streetscape improvements (from Memorial Drive to Mt. Auburn Street)</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>River Street</td>
<td>Bike/ped ROW and streetscape improvements (from Memorial Drive to Putnam Avenue)</td>
<td>City of Cambridge</td>
</tr>
<tr>
<td>Path improvements along Memorial Drive</td>
<td>Raised crosswalks along path at driveways, widen path to 10 ft between River Street Bridge and BU</td>
<td>DCR, City of Cambridge</td>
</tr>
<tr>
<td>Path along Soldiers Field Road (west of Anderson Bridge)</td>
<td>Improve path crossings to be more visible at driveways to boathouse (potential raised crosswalk)</td>
<td>DCR</td>
</tr>
<tr>
<td><strong>C. LOWER CHARLES RIVER BASIN (BU BRIDGE TO CRAIGIE BRIDGE)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memorial Drive Rotary at BU Bridge</td>
<td>Colored bike lanes in conflict areas, signage and curb adjustments</td>
<td>DCR, City of Cambridge</td>
</tr>
<tr>
<td>Memorial Drive / Ames Street</td>
<td>Improve crosswalks; proposed pedestrian actuated signal</td>
<td>DCR, City of Cambridge</td>
</tr>
<tr>
<td>Walk west of Longfellow Bridge</td>
<td>Add wayfinding signage to direct bicyclists/pedestrians to and from the Longfellow Bridge</td>
<td>DCR, City of Cambridge</td>
</tr>
<tr>
<td>Longfellow Bridge (Cambridge side)</td>
<td>Improve crosswalks at on/off ramp from bridge to Memorial Drive/Land Boulevard</td>
<td>DCR, City of Cambridge</td>
</tr>
<tr>
<td>Commonwealth Avenue / BU Bridge</td>
<td>Improve all crosswalks; potential two-stage left turn queue box for bikes</td>
<td>DCR, City of Cambridge</td>
</tr>
<tr>
<td>Boylston Ave to Beacon Street via Charlesgate East ramp</td>
<td>Sidewalk widened to shared-use path, improved crossings (part of proposed Charlesgate connection)</td>
<td>DOT, City of Boston</td>
</tr>
<tr>
<td>Beacon Street to Harvard Bridge</td>
<td>New crosswalk, add curb extension to remove slip lane; proposed path connection under Starrcode Drive ramp and around gatehouse</td>
<td>DCR, City of Boston</td>
</tr>
<tr>
<td>Harvard Bridge / Storrow Dr WB off-ramp</td>
<td>New traffic signal and crossings (part of proposed Charlesgate connection)</td>
<td>DCR, DOT, City of Boston</td>
</tr>
<tr>
<td>Beacon Street / Massachusetts Ave</td>
<td>Improve crosswalks and other intersection improvements (part of proposed Charlesgate connection)</td>
<td>DCR, City of Boston</td>
</tr>
<tr>
<td>Dartmouth Street</td>
<td>Bike/ped ROW and streetscape improvements; add counterflow bike lane to improve access to overpass</td>
<td>City of Boston</td>
</tr>
<tr>
<td>Charles Circle</td>
<td>Bike improvements; bike lanes, shared lane markings, green bike lanes in conflict areas, etc.</td>
<td>DCR, DOT, City of Boston</td>
</tr>
<tr>
<td>Leverett Circle</td>
<td>Improvements to existing crosswalk, new crosswalk, and other at-grade improvements</td>
<td>DCR, DOT, City of Boston</td>
</tr>
<tr>
<td><strong>D. NEW CHARLES RIVER BASIN (CRAIGIE BRIDGE TO NORTH STATION)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Station to Martha Road connection</td>
<td>New path connection between North Station and Martha Road, including wayfinding signage</td>
<td>City of Boston</td>
</tr>
<tr>
<td>Nashua Street at North Station</td>
<td>Improve bike wayfinding between North Station and the Charles River</td>
<td>City of Boston</td>
</tr>
</tbody>
</table>
## Upper Charles River Basin (Galen St Bridge to Eliot Bridge)

### Recommended Projects

<table>
<thead>
<tr>
<th>Project Area/Description</th>
<th>Description</th>
<th>Timeline</th>
<th>Jurisdiction</th>
<th>Cost</th>
<th>Potential Funding Assistance</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: North Side (Watertown - Charles River Rd - Greenough Blvd)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## MIDDLE CHARLES RIVER BASIN (ELIOT BRIDGE TO BU BRIDGE)

### NORTH SIDE (MEMORIAL DRIVE - WEST CAMBRIDGE)

<table>
<thead>
<tr>
<th>Project #</th>
<th>Description</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intersection at Memorial Drive &amp; Gerry’s Landing Road</td>
<td>Improve existing crosswalks</td>
</tr>
<tr>
<td>2</td>
<td>Gerry’s Landing Road</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>3</td>
<td>Memorial Drive at Squares Street</td>
<td>New path connection from Squares Street to parkland, including new crosswalk at Memorial Drive</td>
</tr>
<tr>
<td>4</td>
<td>Memorial Drive from Squares Street to Exit 4 Park</td>
<td>Low impact project, with limited engineering impact</td>
</tr>
<tr>
<td>5</td>
<td>Entrance to Cambridge Museum of Science</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>6</td>
<td>Memorial Street from Mt. Auburn St to Memorial Dr</td>
<td>Aligned ADA and streetscape improvements</td>
</tr>
<tr>
<td>7</td>
<td>University Road</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>8</td>
<td>Memorial Drive on Exit 4 Park</td>
<td>Low impact project, with limited engineering impact</td>
</tr>
<tr>
<td>9</td>
<td>Commonwealth Ave</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>10</td>
<td>Memorial Street from Commonwealth Ave to Memorial Dr</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>11</td>
<td>Dewolfe Street at Memorial Drive</td>
<td>Improve crosswalks, add entry node to river with art, seating, etc.</td>
</tr>
<tr>
<td>12</td>
<td>Dewolfe Street from Mt. Auburn St to Memorial Dr</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>13</td>
<td>Memorial Drive between Dewolfe and Western Ave</td>
<td>Improve existing crosswalks, add path and entry node to river with art, seating, etc.</td>
</tr>
<tr>
<td>14</td>
<td>Memorial Drive between Dewolfe and Western Ave</td>
<td>Low impact project, with limited engineering impact</td>
</tr>
<tr>
<td>15</td>
<td>Memorial Street and Western Ave</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>16</td>
<td>Middlesex Bridge</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>17</td>
<td>River Street</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>18</td>
<td>Pleasant Street</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>19</td>
<td>Memorial Drive between Pleasant Street and Magazine Street</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>20</td>
<td>Magazine Street at Memorial Drive</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
</tbody>
</table>

### SOUTH SIDE (BRIGHTON - ALLSTON)

<table>
<thead>
<tr>
<th>Project #</th>
<th>Description</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eliot Bridge (East Side)</td>
<td>Bridge path between underpass and bridge sidewalk to the Ashland Path</td>
</tr>
<tr>
<td>2</td>
<td>Path along Soldiers Field Road (west of Anderson Bridge)</td>
<td>Bridge path extending to the underpass at the underpass (potential related crosswalk)</td>
</tr>
<tr>
<td>3</td>
<td>Anderson Bridge</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>4</td>
<td>Passengers Pathway</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>5</td>
<td>Path along Magazine Street</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
<tr>
<td>6</td>
<td>Magazine Drive at Memorial Drive</td>
<td>Aligned ADA and streetscape improvements - curb cut and area crosswalks</td>
</tr>
</tbody>
</table>

### Other

- Potential interest from Mount Auburn Hospital
- Note: Assumes installation of traffic signal in separate process
- Involvement of Mass. Historic Commission likely
- Involvement of Mass. Historic Commission likely
- Partial widening part of River Street Bridge design
- Potential interest from Boston University
## Lower Charles River Basin

**BU Bridge to Craigie Bridge**

### NORTH Side (Cambridgeport - MIT - East Cambridge)

<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Proposed pedestrian overpass</td>
</tr>
<tr>
<td>2</td>
<td>Potential involvement of private property owner</td>
</tr>
<tr>
<td>3</td>
<td>Bike/ped ROW and streetscape improvements (from Memorial Drive to Main Street)</td>
</tr>
<tr>
<td>4</td>
<td>Improve all crosswalks; potential two-stage left turn queue box for bikes</td>
</tr>
<tr>
<td>5</td>
<td>Improve ADA access from path to bridge above</td>
</tr>
<tr>
<td>6</td>
<td>Improve all crosswalks; potential reconfiguration of intersection to mitigate bike lane pinch point</td>
</tr>
<tr>
<td>7</td>
<td>Improves ADA compliant, may require replacement of bridge</td>
</tr>
<tr>
<td>8</td>
<td>Proposed bridge/cycle track per City of Boston Draft Bike Master Plan (from Charles Circle to Beacon Street)</td>
</tr>
</tbody>
</table>

### SOUTH Side (Storrow Dr - Back Bay - Beacon Hill)

<table>
<thead>
<tr>
<th>Project</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Improve ADA compliant, may require replacement of bridge</td>
</tr>
<tr>
<td>12</td>
<td>Improve crosswalks; entry node to river; potential signal phase adjustments</td>
</tr>
<tr>
<td>13</td>
<td>Improve ADA compliant, may require replacement of bridge</td>
</tr>
<tr>
<td>14</td>
<td>Improve all crosswalks; potential involvement of Boston University</td>
</tr>
<tr>
<td>15</td>
<td>Improve ADA compliant, may require replacement of bridge</td>
</tr>
<tr>
<td>16</td>
<td>Improve ADA compliant, may require replacement of bridge</td>
</tr>
<tr>
<td>17</td>
<td>Improve all crosswalks; potential involvement of Mass General Hospital</td>
</tr>
</tbody>
</table>

###Priority Projects

- Potential involvement of Boston University
- Potential involvement of private property owner
- Potential involvement of Mass General Hospital
- Potential involvement of Museum of Science
- Potential involvement of Solomon Foundation
### NEW CHARLES RIVER BASIN
(CRAIGIE BRIDGE TO NORTH STATION)

#### NORTH SIDE (CAMBRIDGE - NORTH POINT PARK - CHARLESTOWN)

<table>
<thead>
<tr>
<th>PROJECT #</th>
<th>DESCRIPTION</th>
<th>TIMELINE</th>
<th>JURISDICTION</th>
<th>COST</th>
<th>FINANCIAL SUPPORT</th>
<th>ADDITIONAL NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Proposed inlet bridge per North Point Master Plan</td>
<td>MID-TERM (3-6 yrs)</td>
<td>CITY OF BOSTON</td>
<td></td>
<td></td>
<td>Potential involvement of North Point developer</td>
</tr>
<tr>
<td>11</td>
<td>Further study needed: connection to Somerville Community Path Extension to North Point Park</td>
<td>MID-TERM (3-6 yrs)</td>
<td>OTHER</td>
<td></td>
<td></td>
<td>Potential involvement of City of Somerville</td>
</tr>
<tr>
<td>12</td>
<td>Path connection adjacent existing bridge between Spaulding Hospital/Nashua Street to the North Point Park</td>
<td>MID-TERM (3-6 yrs)</td>
<td>OTHER</td>
<td></td>
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#### SOUTH SIDE (WEST END - NORTH STATION - NORTH END)

<table>
<thead>
<tr>
<th>PROJECT #</th>
<th>DESCRIPTION</th>
<th>TIMELINE</th>
<th>JURISDIION</th>
<th>COST</th>
<th>FINANCIAL SUPPORT</th>
<th>ADDITIONAL NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Bike/ped ROW and streetscape improvement per City of Boston Master Plan (from Longfellow Dr. to Cambridge)</td>
<td>MID-TERM (3-6 yrs)</td>
<td>OTHER</td>
<td></td>
<td></td>
<td>Potential involvement of Delaware North Company</td>
</tr>
<tr>
<td>14</td>
<td>Bike/ped ROW and streetscape improvement; consider lane reduction (from Longfellow Dr. to North Station)</td>
<td>MID-TERM (3-6 yrs)</td>
<td>OTHER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>New path connection between North Station and the Charles River</td>
<td>MID-TERM (3-6 yrs)</td>
<td>OTHER</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>16</td>
<td>Future South Bank Bridge project per DCR design contract</td>
<td>MID-TERM (3-6 yrs)</td>
<td>OTHER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Implant bike wayfinding between North Station and the Charles River</td>
<td>MID-TERM (3-6 yrs)</td>
<td>OTHER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Nashua Street connection to North Station</td>
<td>MID-TERM (3-6 yrs)</td>
<td>OTHER</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

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**All Recommended Projects**

Craige Dam - North Station
The primary goals of the recommended enhancements to the walkways, bridges, paths and interactions within, and adjacent to, the Charles River Basin include:

- promotion of walking and bicycling as alternatives;
- highlighting the recreational, environmental and cultural opportunities within the Reservation;
- making the Reservation accessible for all users.

The study area stretches from the Chain Bridge in Watertown upstream to the Charles Dam Bridge and Downbridge, including all areas within one or two blocks from the Reservation itself. When fully implemented, the walkway, trail and bridge improvements will enhance pedestrian and bicycle connectivity to the adjacent neighborhoods, many of which currently lack functional or missing connections to the river.

The proposed changes to the Basin are intended to enhance the adjacent communities, transit and highway stations, and create a more cohesive and well-connected network of paths, trails, sidewalks, intersections and other facilities. These improvements will not only manage the wide range of uses along the River but also reduce negative impacts caused by overflow of the current infrastructure, and create a greenway network that supports sustainability in the Basin. This includes ensuring the improved pedestrian and bike facilities that have been planned and, in some cases, implemented, through MassDOT’s Accelerated Bridge Program (ABP). For example, the ABP has recently included bike lanes on the Boston University Bridge and will soon design one-way cycle tracks on the Charles Street and Western Avenue bridges, bike lanes and intersection improvements to the Anderson/Morton Bridge and wider sidewalks and bike lanes along the Longfellow Bridge. This project will also include a replacement footbridge over Storrow Drive from Charles Circle in the Esplanade. In addition to the currently recommended pedestrian and bicycle facilities, the MassDOT ABP bridge teams have also assessed the potential for incorporation below the intersections adjacent to the Anderson, Silver and Western Bridges. Although they have determined undergrounding to be infractile at this time, the ABP projects will not preclude the construction of underpasses in the future.

The planning-level recommendations above are expected to be designed, funded, and implemented over time, with reference to MassDOT’s ABP projects, the City of Boston’s Bike Master Plan, the Esplanade 2030 Plan, and ODOT’s on-going maintenance and upgrades of pathways and parking within the Charles River Reservation.

For the purpose of the Connectivity Study, the 4-mile-long Charles River Basin has been divided into eight sections (A-H). Connectivity recommendations for the north and south banks of each section are detailed on the following pages.

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35 Key to the recommendation sections.