BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

Richard A. Davey, MassDOT Secretary and CEO and MPO Chairman
Karl H. Quackenbush, Executive Director, MPO Staff

MEMORANDUM

DATE **December 6, 2012**
TO **Boston Region Metropolitan Planning Organization**
FROM **Mark Abbott, and Christine Bettin**
MPO Staff
RE **Safe Access to Transit for Pedestrians and Bicycles: Riverside Station**

Introduction

Riverside Station, located at 333 Grove Street, in Newton, was selected to be included in the Safe Access to Transit for Pedestrians and Bicyclists Study. This study examines nonmotorized accessibility issues related to Riverside Station and identifies short and long-term measures that may improve pedestrian and bicyclist access to the Massachusetts Bay Transportation Authority (MBTA) system. Riverside Station was selected based on the following factors:

- Identified as needing improvements according to a qualitative MBTA station access assessment.[1]
- Located in an area with a high density of employment, retail activity, and/or population.
- Of the large number of passengers boarding or alighting at Riverside Station (almost 2200 on an average weekday), only about 22% walk or bike and 0.4% use an MBTA bus to access the station or to travel from the station to their destinations.[2] This is a relatively low percentage in comparison to other stations along the D Branch of the Green Line.
- Riverside Station has a high parking utilization rate (90%). There are 925 parking spaces, 21 of which are accessible, at a rate of $6.00 per day. There are also 36 bike parking spaces available at this station.
- The local municipality has shown an interest in improving pedestrian and bicycle access to this station.
- There is future development potential.

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[1] Boston Region Metropolitan Planning Organization (MPO), *Needs Assessment* (Volume 2 of *Paths to a Sustainable Region*), Central Transportation Planning Staff (CTPS), September 27, 2011.

[2] Boston Region MPO, *MBTA Systemwide Passenger Survey,* CTPS, May 19, 2010.

Transportation Context

Riverside Station is the western terminus of the MBTA's Green Line D Branch light rail line. Service at Riverside Station began in 1959. Riverside Station is bordered by Interstate 95 (I-95)/Route 128 to the west and by the Massachusetts Turnpike (I-90) to the north, with respective access ramps less than one mile away. The Framingham/Worcester commuter rail line is located to the north of Riverside Station, approximately three-quarters of a mile away. Bus Route 558 connects Riverside Station to downtown Boston via Newton Corner and I-90. On an average weekday, there are 46 passengers boarding Route 558 at Riverside Station for inbound service and 39 for outbound service. A map of Route 558 is provided in the appendix.

Within the vicinity of Riverside Station, Hotel Indigo is located directly to the southwest; the Woodland Country Club is located directly to the southeast; other nearby destinations include the Riverside Office Park, the Williams School, Lasell College, and the villages of Auburndale and Lower Falls.

On February 12, 2009, the MBTA authorized an 85-year lease for a development project at Riverside Station called "The Station at Riverside," which is proposed to be a mixed-use, transit-oriented development on a portion of the Riverside MBTA parcel. It would consist of 426,400 gross square feet of office space, 295 residential apartment units, and 19,300 square feet of ancillary retail space.

The project would provide approximately 2,003 parking spaces in structured parking facilities, which would be available for both project site uses and MBTA needs. Pedestrian pathways are proposed to be built throughout the project site, as well as bike lanes along Grove Street. The project is currently undergoing the permitting process with the City of Newton. The results of this study will aid the City of Newton in defining a new plan for Riverside Station that improves safety for bicyclists and pedestrians.

Pedestrian and Bicyclist Safety

Identifying the Study Area

Records available to Boston Region MPO staff show that there are four intersections within two miles of Riverside Station that each experienced three or more pedestrian or bicycle crashes from 2005 to 2009 (see Table 1).[3] Figure 1 illustrates the locations of the bicycle and pedestrian crashes in proximity to Riverside Station. The majority of the bicycle and pedestrian crashes occurred along Washington Street, Commonwealth Avenue, and Lexington Street. It was assumed that the purpose of the majority of bicycle and pedestrian travel along Washington Street would be to access the MBTA Woodland Station, rather than Riverside Station for inbound service, since Woodland

[3] MassDOT Registry of Motor Vehicles Division crash data, 2005 to 2009.

Station is closer to Boston. Therefore Washington Street was excluded from the study area of this analysis. Commonwealth Avenue was also excluded, since it is separated from Riverside Station by I-90. The intersection of Auburn Street at Lexington Street was included because it links the residential neighborhood to the urban, commercial area.

Given that access to Riverside Station is limited by the adjacent highways and land uses, such as I-90, I-95, and the bordering country club, this analysis focused on the Grove Street corridor, from Quinobequin Road to Auburn Street, in addition to the intersection of Auburn and Lexington streets. The intersections located along Grove Street and Auburn Street that were selected for further analysis (Figure 2) are:

- Grove Street at Quinobequin Road and Asheville Road
- Grove Street at Hancock Street
- Auburn Street at Central Street
- Auburn Street at Lexington Street

Table 1
Intersections within Two Miles of Riverside Station with Three or More Pedestrian or Bicycle Crashes from 2005 to 2009

Intersection	City/Town	Vehicle Crashes	Pedestrian Crashes	Bicycle Crashes	Total Crashes
Glen Road/Washington Court/Washington Street	Wellesley	50	1	2	53
Cedar Street/River Street/Walnut Street	Wellesley	26	1	3	30
Commonwealth Avenue/Lexington Street	Newton	68	4	2	74
Auburn Street/Commonwealth Avenue (south of I-90)	Newton	34	2	2	38

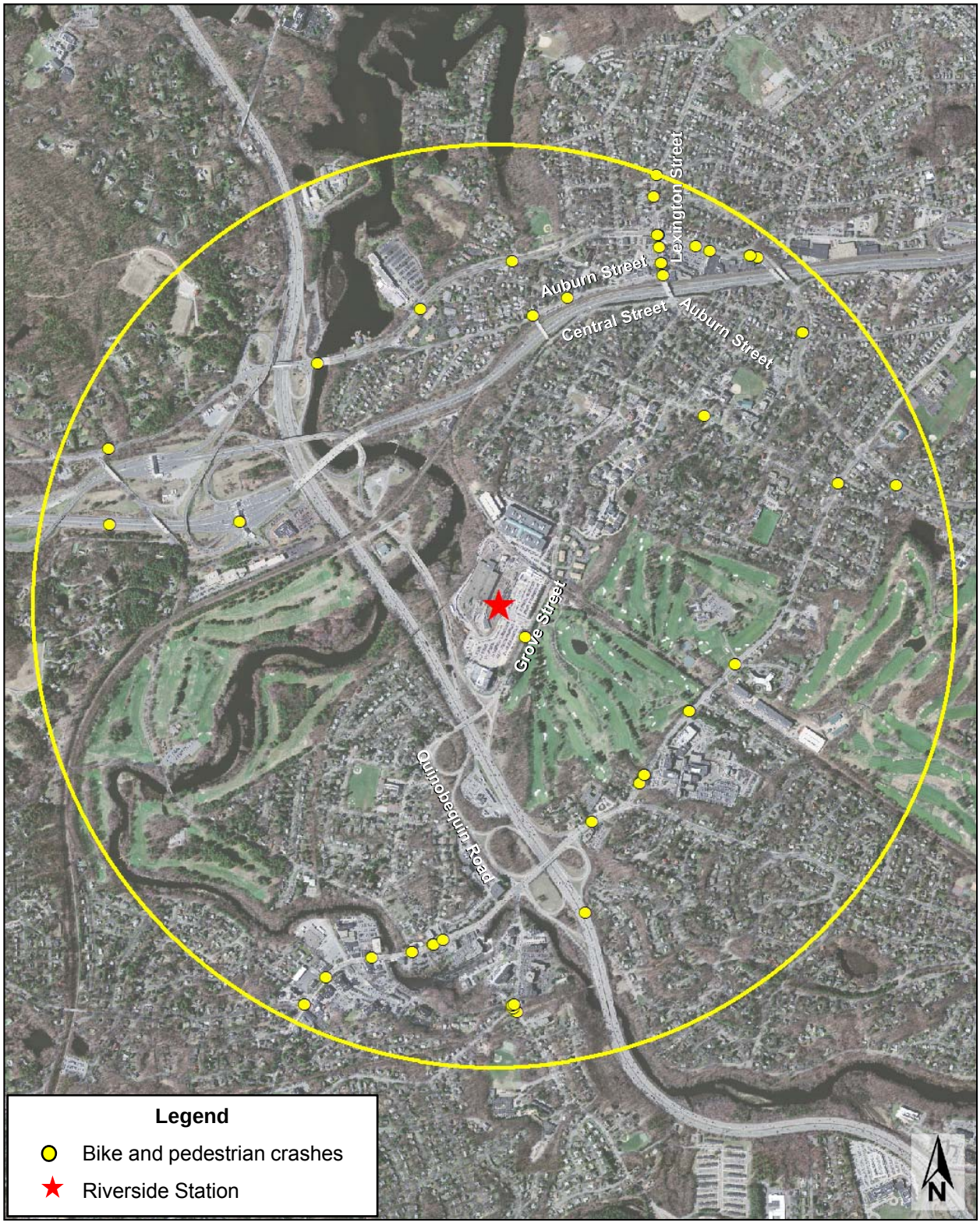

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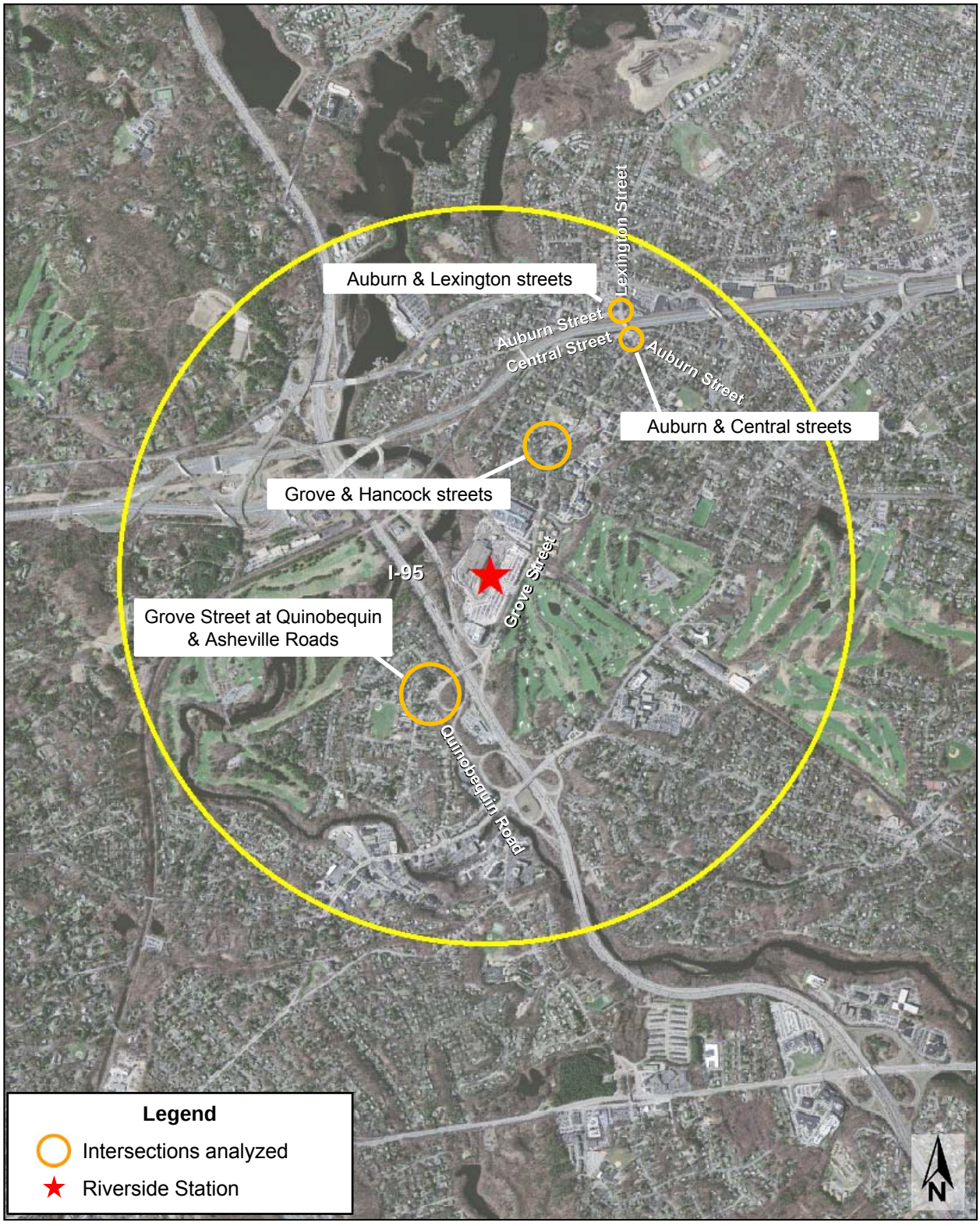
FIGURE 1
Bike and Pedestrian Crashes
within Two Miles of Riverside Station

Safe Access to Transit
for Pedestrians
and Bicyclists



BOSTON REGION MPO

FIGURE 2
Intersections Analyzed within Two Miles of Riverside Station

Safe Access to Transit for Pedestrians and Bicyclists

The Station at Riverside Project

In February 2012, a traffic impact and access study was conducted for The Station at Riverside project as part of its permitting requirements.[4] The study analyzed Grove Street and proposed the following recommendations for operational and safety improvements:

- Install a traffic signal at the entrance to Riverside Station and implement geometric improvements
- Install turning lanes in both directions at the entrance to Riverside Station
- Install a landscaped median in the areas of the proposed turning lanes
- Install a modern roundabout at Grove Street and Route 128 NB ramps
- Install a modern roundabout at Grove Street and Route 128 SB ramps/Asheville Road
- Improve access through the development of a second access driveway
- Provide a sidewalk network throughout the project site that connects to the Lower Falls neighborhood and the Charles River
- Provide bicycle accommodations along Grove Street in areas that will be widened

MPO staff concurs with the Metropolitan Area Planning Council's comments on bicycle and pedestrian uses that were provided to the Massachusetts Department of Transportation on August 19, 2011 (see Appendix). This project should provide separate bicycle facilities within the project site and along Grove Street, with seamless connections between both. The bicycle facilities provided along Grove Street should be continuous throughout the Lower Falls and Auburndale neighborhoods.

As for the proposed roundabout at Grove Street and the Route 128 NB ramps, more information would be needed regarding Options A and B-2 level of service (LOS) analyses for the right turns from the Route 128 NB off-ramp onto Grove Street. According to the traffic impact study, the proposed roundabout would improve these right turns from a LOS F to a LOS B or better. The turn bay for the right turns on Route 128 NB off-ramp appears to add storage room for vehicle queue; however, the merge point of the right turns on Route 128 NB off-ramp and Grove Street EB traffic is so close to the roundabout that this design prevents the turn bay from operating as a right-turn slip-lane. Therefore a clarification of how the Route 128 NB off-ramp right turns were treated in the roundabout analysis for Options A and B-2 and for the 2022 Build conditions without mitigation would be needed.

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[4] VHB/Vanasse Hangen Brustlin Inc., "Traffic Impact and Access Study: Riverside MBTA Station Redevelopment," BH Normandy Riverside LLC, February 2012.

Additionally, if a roundabout at Grove Street and Route 128 NB ramps is included as part of The Station at Riverside project, it should be designed with single lanes, splitter islands, and, if possible, with bike lanes along the outer perimeter of the roundabout. Due to potential visibility issues, the pedestrian crossing on the west leg should be clearly marked with a pedestrian warning sign (MUTCD W11-2) at the crosswalk, as well as a pedestrian warning sign combined with an “ahead” sign (MUTCD W16-9P) in advance of the crosswalk. A new crosswalk should be provided on the north leg of Grove Street and Deforest Road in order to accommodate potential crossings at the sidewalk terminus on the east side of this intersection. A curb-cut ramp to the sidewalk on the east side of Grove Street in advance of the roundabout should also be provided in order to accommodate bicyclists wishing to transition from the bike lanes on the bridge to the sidewalk when traveling through the roundabout.

The proposed roundabout at Grove Street and Route 128 SB ramps/Asheville Road appears to be warranted, based on a review of the analyses provided in the traffic impact study. It should also be designed with single lanes, splitter islands, and, if possible, with bike lanes along the outer perimeter of the roundabout.

The Station at Riverside project is currently undergoing the City of Newton special permit process and the Executive Office of Energy and Environmental Affairs Massachusetts Environmental Policy Act permitting process. There are short and long-term improvements that can be implemented independent of The Station at Riverside project in order to improve safety for the various ROW users along Grove Street, and they are provided in the subsequent sections.

Corridor and Intersection Analysis

This section describes the existing conditions and recommended improvements for the Grove Street corridor and for the four identified intersections. The description of existing conditions is based on a site visit conducted on Friday, August 10, 2012, during the late morning. Recommended improvements are either short- or long-term in nature and are devised in order to help alleviate the concerns and issues identified during the site visit. Short-term recommendations would primarily consist of the installation of signs and pavement markings, which can be implementable within a short time frame with local resources. Long-term recommendations would require more capital-intensive roadway construction, which would necessitate the identification and allocation of resources and entail a longer implementation schedule.

Grove Street Corridor

Grove Street, which is under the jurisdiction of the City of Newton, is classified as an urban collector roadway, with an average daily traffic volume of approximately 15,500 vehicles.[5] The posted speed limit along Grove Street is either 25 miles per hour (mph) or 30 mph. The City of Newton has identified the section of Grove Street from Auburn Street in Auburndale to Hagar Street in Lower Falls as a desired bicycle route.[6]

Grove Street corridor

The Grove Street corridor provides the sole connection to Riverside Station for bicyclists and pedestrians traveling from the residential neighborhoods of Lower Falls and Auburndale. It also serves as the main link to office parks located near Riverside Station, Williams School, Echo Falls Preschool, and Lasell College, as well as to the Auburndale Village Center north of the Auburn Street bridge and the Auburndale commuter rail station.

The majority of the roadway segment pavement is approximately 27 feet wide, with two travel lanes and 5-foot-wide sidewalks in good condition, and is well shaded by trees. Most of the intersections in the study area have pedestrian treatments, such as crosswalks and pedestrian curb-cut ramps. There are also some intersections with enhanced pedestrian treatments, such as pedestrian signals with a dedicated pedestrian phase or audible push buttons, pedestrian refuge islands, crosswalks with either colored brick pavers or ladder-style markings, and “State Law – Yield to Pedestrians” signs. Further south of the study area, traffic calming improvements were implemented at the intersection of Grove Street and Cornell Street in the form of a raised intersection with red crosswalks on all approaches and a textured brick paver center.

During the site visit, some conditions were observed that may affect bicycle and pedestrian access to Riverside Station. There are several crosswalks along the corridor that are simple parallel line markings, rather than ladder-style crosswalks, which are

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[5] Boston Region Metropolitan Planning Organization, “Average Daily Traffic on Massachusetts Roads,” prepared by the Central Transportation Planning Staff, 2008.

[6] City of Newton, “Bicycle Network Plan”, Newton Bicycle Advisory Committee, August 12, 2012.

more visible to motorists. There are gaps in the sidewalk along the east side of Grove Street between the rail corridor overpass and the access ramp to I-95 northbound. The pedestrian entrance into Riverside Station had no signage to encourage its use. There was excessive dirt along the sidewalk and in the roadway on the west side of Grove Street near the pedestrian entrance to Riverside Station. Vegetation along the west side of Grove Street between the access road to the on-ramp to I-90 and to I-95 northbound and the bridge, as well as along the east side of Grove Street near its intersection with Hancock Street, were overgrown and either impeding pedestrian access or impairing visibility between motorists, pedestrians, and bicyclists. There are no bicycle features along Grove Street.

Grove Street NB: overgrown vegetation

Grove Street NB: access to both I-95 and I-90

Short-term recommendations include the following:

Pedestrian Improvements

- Restripe crosswalks with highly visible ladder-style markings at the following locations: the access road to the on-ramp to I-90 and to I-95 northbound, the intersection of Grove Street and Deforest Road, the auto entrance into Riverside Station, the intersection of Auburn and Central streets, and across Auburn and Lexington streets.
- Ensure that sidewalks are well maintained and clear of debris and excessive dirt.
- Trim overgrown vegetation in the following two locations:
  - The west side of Grove Street between the bridge and the access road to the on-ramp to I-90 and to I-95 northbound. This would make the entire width of the sidewalk available, as well as improving visibility of an existing pedestrian crossing sign.
  - The east side of Grove Street at Hancock Street. This would improve visibility for motorists traveling eastbound on Grove Street.

Bicycle Improvements

- Sign and stripe bike lanes in both directions where there is sufficient pavement width.
- Stripe shared-lane markings with "Bicycles May Use Full Lane" (MUTCD R4-11) signage in areas with constrained pavement width. In high-conflict areas, such as adjacent to the auto entrance to Riverside Station, on the approach to various intersections, and adjacent to highway access ramps, stripe bicycle priority lanes. These are shared-lane markings with a pair of dotted lines on either side (see picture at right).

Bicycle priority lane on Longwood Avenue, Boston

- Ensure that pavement along the roadway adjacent to curbs is in good condition, without any potholes, bumps, or longitudinal drain grates, and are clear of debris and excessive dirt.

The following long-term measures are recommended to improve safety for the various ROW users along Grove Street:

Pedestrian and Bicycle Improvements

- Stripe a ladder-style crosswalk on the north leg of Grove Street at the southern entrance to the Riverside Office Park. This would require a curb cut through the existing median, similar to the crosswalk on the north leg of Grove Street at the northern entrance to the Riverside Office Park (see picture at right). This crosswalk will serve pedestrians traveling along the east side of Grove Street who wish to access Riverside Station, and it would help to facilitate crossing Grove Street prior to the sidewalk terminus.

Grove Street: curb cut and ladder-style crosswalk in median

- Enhance the pedestrian entrance on Grove Street at the northeast corner of Riverside Station with directional

signage and with a more prominent “gateway” design. Bicycle access to this walkway would require the construction of a curb-cut ramp in order to accommodate bicyclists accessing the entrance from the roadway. This would encourage bicyclists and pedestrians to enter Riverside Station through this entrance, which provides a more direct route to bicycle parking and the passenger platform, as well as limiting interaction with vehicles at the main entrance.

- Ensure adequate lighting throughout the corridor.

Grove Street at Quinobequin Road and Asheville Road

Existing Conditions

The intersection of Grove Street and Quinobequin and Asheville roads is approximately one-third of a mile southwest of the entrance to Riverside Station. Since I-95/Route 128 generally runs in a north-south direction on the southwestern border of the Riverside Station property, the only route between the Lower Falls neighborhood and Riverside Station is along Grove Street via a two-lane bridge. The intersection of Grove Street at Quinobequin and Asheville roads is located west of this bridge, with access ramps to I-95/Route 128 in close proximity. The intersection is unsignalized, and moderate traffic volumes and speeds were observed during the site visit.

Grove Street at Quinobequin and Ashville roads

Quinobequin Road provides access to I-95/Route 128 and to Route 16. The northbound approach along Grove Street at this intersection provides an uncontrolled, continuous right turn onto Quinobequin Road. The northbound sidewalk on the east side of Grove Street terminates as it approaches the intersection. However, there is no crosswalk across Grove Street for crossing at the termination of the sidewalk to reach the sidewalk on the other side of Grove Street. Additionally, the uncontrolled, continuous right turn may create conflicts for bicyclists traveling along Grove Street to Riverside Station. The Station at Riverside project proposes to construct a modern roundabout at this intersection, which, if designed properly, would help alleviate conflict points between motorists and bicyclists. The roundabout would also include a crosswalk on the south leg of the intersection, which would allow pedestrians to safely cross Grove Street prior to the termination of the

sidewalk. There is no crosswalk on the east leg of this intersection, across Asheville Road.

Recommended Improvements

The following short-term recommendations would improve safety for the various ROW users at this intersection:

Pedestrian Improvements:

- Stripe a ladder-style crosswalk on the west leg of this intersection across Asheville Road.
- Independent from The Station at Riverside project, pedestrian movements at the south leg of this intersection should be addressed through either the installation of a new crosswalk or directional signage alerting pedestrians to cross at a marked crosswalk prior to reaching the sidewalk terminus.

Bicycle Improvements:

- Independent from The Station at Riverside project, install bicycle warning signs and stripe bicycle priority lanes along northbound Grove Street at Quinobequin Road. This would alert motorists making a continuous right turn onto the access road that would conflict with bicyclists.

Grove Street at Hancock Street

Existing Conditions

The intersection of Grove Street at Hancock Street is approximately 1,500 feet from the northeast side of Riverside Station. It is an unsignalized, skewed, “T” intersection. There are two travel lanes with a discontinuous median that serves as channelizing islands along Grove Street. There are no pavement markings at this intersection. Grove Street curves as it approaches this intersection, which may limit motorists’ visibility of bicyclists traveling northbound close to the curve.

Grove Street at Hancock Street: skewed “T” intersection with no demarcation of turning movements

Hancock Street has a stop sign, stop bar, and crosswalk for the southeast approach to Grove Street. The pedestrian curb-cut ramps do not have detectable warning pads. There are no crosswalks on Grove Street; however, there may be a low demand for crosswalks, since Riverside Station is on the same side of Grove Street that intersects with Hancock

Street, which has a crosswalk. During the site visit, low traffic volumes and speeds were observed along both Grove and Hancock streets.

Recommended Improvements

The following short-term measures are recommended to improve safety for the various ROW users at this intersection:

- Stripe pavement markings to more clearly demarcate vehicle travel through the intersection.
- Install ADA-compliant detectable warning pads on all pedestrian curb-cut ramps.
- Trim the aforementioned overgrown vegetation along the east side of Grove Street at Hancock Street.

Auburn Street at Central Street

Existing Conditions

Auburn Street at Central Street

The intersection of Auburn Street at Central Street lies at the northern terminus of Grove Street, which is the northern border of the residential neighborhood located between Riverside Station and I-90. The north approach of Auburn Street crosses I-90 via a bridge and enters a commercial area. There is also an entrance to the Auburndale commuter rail station on this bridge. The north side of Central Street west of this intersection is lined with parked cars that appear to be for users of the Auburndale commuter rail station. Auburn Street is comprised of two travel lanes that are approximately 20 feet in width, which would allow sufficient space for signed and striped bike lanes in both directions.

All legs of this intersection have crosswalks with simple, parallel lines. All corners of this intersection have pedestrian curb-cut ramps, although they do not have detectable warning pads. All corners of this intersection also have pedestrian signals, where push buttons activate an exclusive pedestrian phase for all legs of the intersection at the same time. The north leg of this intersection has a crossing distance of 73 feet and the pedestrian signal timing is 17 seconds. Based on a walking speed of 3.5 seconds per foot, the minimum pedestrian signal timing for a crossing distance of 73 feet is 21

seconds.[7] All legs of this intersection have crosswalks marked with parallel lines. The sidewalks are in fair condition.

Recommended Improvements

The following short-term measures are recommended to improve safety for the various ROW users at this intersection:

- Stripe ladder-style crosswalks at all legs of this intersection.
- Increase the pedestrian signal timing for the exclusive pedestrian phase to 21 seconds, which will meet the minimum timing requirements.
- Upgrade to accessible pedestrian signals with countdown features.
- Install ADA-compliant detectable warning pads on all pedestrian curb-cut ramps.
- Sign and stripe bike lanes in both directions, which would connect to the proposed bike lanes and shared lanes along Grove Street.

Auburn Street at Lexington Street

Existing Conditions

The intersection of Auburn Street and Lexington Street is located on the north side of the Auburn Street bridge that crosses I-90. Lexington Street runs in a north-south direction and is classified as an urban collector between Commonwealth Avenue and Auburn Street. It meets Auburn Street at an unsignalized "T" intersection. The eastbound approach along Auburn Street is stop-controlled.

Auburn Street at Lexington Street

The north and west legs of this intersection have crosswalks and "State Law – Yield to Pedestrians" signs. The west leg has a pedestrian crossing distance of approximately 70 feet, which is broken up by a pedestrian refuge island. The pedestrian crossing distance of the north leg is approximately 50 feet. The northwest corner radius at this intersection appears to be wide, which increases the pedestrian crossing distance and may increase the speed of turning vehicles. During the site visit, traffic volumes and speeds appeared

[7] Massachusetts Highway Department. *Project Development and Design Guide,* Massachusetts Department of Transportation, January 2006.

to be moderate at this intersection. Between 2005 and 2009, there were four pedestrian crashes and two bicycle crashes reported along Lexington Street in close proximity to this intersection. There are no bicycle-specific features at this intersection.

Recommended Improvements

The following short-term recommendations would improve safety for the various ROW users at this intersection:

Lexington Street: Potential location for curb extensions

Pedestrian Improvements:

- Stripe shared-lane markings (for bikes and motor vehicles) and install "Bicycles May Use Full Lane" (MUTCD R4-11) signs along Lexington Street, which would connect to the proposed bike facilities along Auburn Street and Grove Street.
- Install ADA-compliant detectable warning pads on all pedestrian curb-cut ramps.

Bicycle Improvements:

- Ensure that pavement adjacent to curbs along all roadways, is well maintained and in good condition, without any potholes, bumps, or longitudinal drain grates.
- Encourage businesses to install bike racks for their customers.

The following long-term measures are recommended to improve safety for the various ROW users at this intersection:

Pedestrian Improvements:

- Install curb extensions on the north leg of the intersection. Curb extensions would help to reduce the width of the northwest corner radius—which would reduce the pedestrian crossing distance, make pedestrians more visible to motorists, and provide traffic calming.

Bicycle Improvements:

- Ensure adequate lighting along Lexington Street. This would also improve safety for pedestrians.

Building on Safety: A New Access Vision

The recommendations of this study aim to promote accessibility to the Riverside Station from surrounding neighborhoods for pedestrians and bicyclists. If implemented, these recommendations would provide pedestrians and bicyclists with safer and more convenient paths to Riverside Station.

The recommendations are either short-term, low-cost, and quick to implement, or are long-term and would require a more intensive capital investment with a longer implementation schedule. Short-term improvements recommended in this study include striping pavement markings and crosswalks, installing pedestrian and bicycle signage, installing ADA-compliant improvements, striping bike lanes and/or shared-lane markings, trimming vegetation, and providing well-maintained roadways. These types of improvements would improve visibility between pedestrians, bicyclists, and motorists, indicate where these users should travel within the ROW, and provide a safer and more convenient environment.

Long-term improvements recommended in this study include constructing curb extensions, striping new crosswalks—which may require constructing curb cuts, constructing a more prominent pedestrian and bicycle entrance into Riverside Station, and ensuring adequate lighting. These types of improvements more effectively increase visibility between pedestrians, bicyclists, and motorists, as well as helping to reduce vehicle speeds and minimizing crossing distances for pedestrians. The enhanced bicycle and pedestrian entrance at Riverside Station would provide a more direct route to the station platform, while also reducing interaction with vehicles at the main vehicle entrance.

Providing bicycle facilities along Grove Street, as proposed in the City of Newton's Bicycle Network Plan, would connect Riverside Station to the Lower Falls and Auburndale residential neighborhoods.[8] It is recommended that during future roadway reconstruction and/or development projects, such as The Station at Riverside project, the City of Newton evaluate ROW widths in order to determine if segregated bicycle facilities, such as cycle tracks, shared-use paths, and buffered bike lanes, can be accommodated along Grove Street. These types of bike facilities would provide a safer environment for bicyclists.

Implementing the recommendations in this study will improve the roadways used by pedestrians and bicyclists accessing Riverside Station. This may encourage more users of Riverside Station to choose bicycling and walking as modes of transportation, and may also promote the use of public transit. This, in turn, may shift users from personal vehicles, which may also help reduce the strain on commuter parking at Riverside Station, which has a 90% utilization rate. Reducing the demand for parking at Riverside

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[8] City of Newton, Bicycle Network Plan, Newton Bicycle Advisory Committee, August 12, 2012.

Station is a more cost-effective solution in comparison to constructing additional parking spaces. Overall, through the implementation of these recommendations, the City of Newton will improve access to safe, healthy, efficient, and varied transportation options for its residents and visitors.

MSA/CB/cb

APPENDIX

Riverside Station Service History

Maps

MBTA Bus Route 558

Newton Bike Route Map

General Recommendations

MAPC's Comments on the Station at Riverside DEIR to City of Newton

Riverside Station Service History

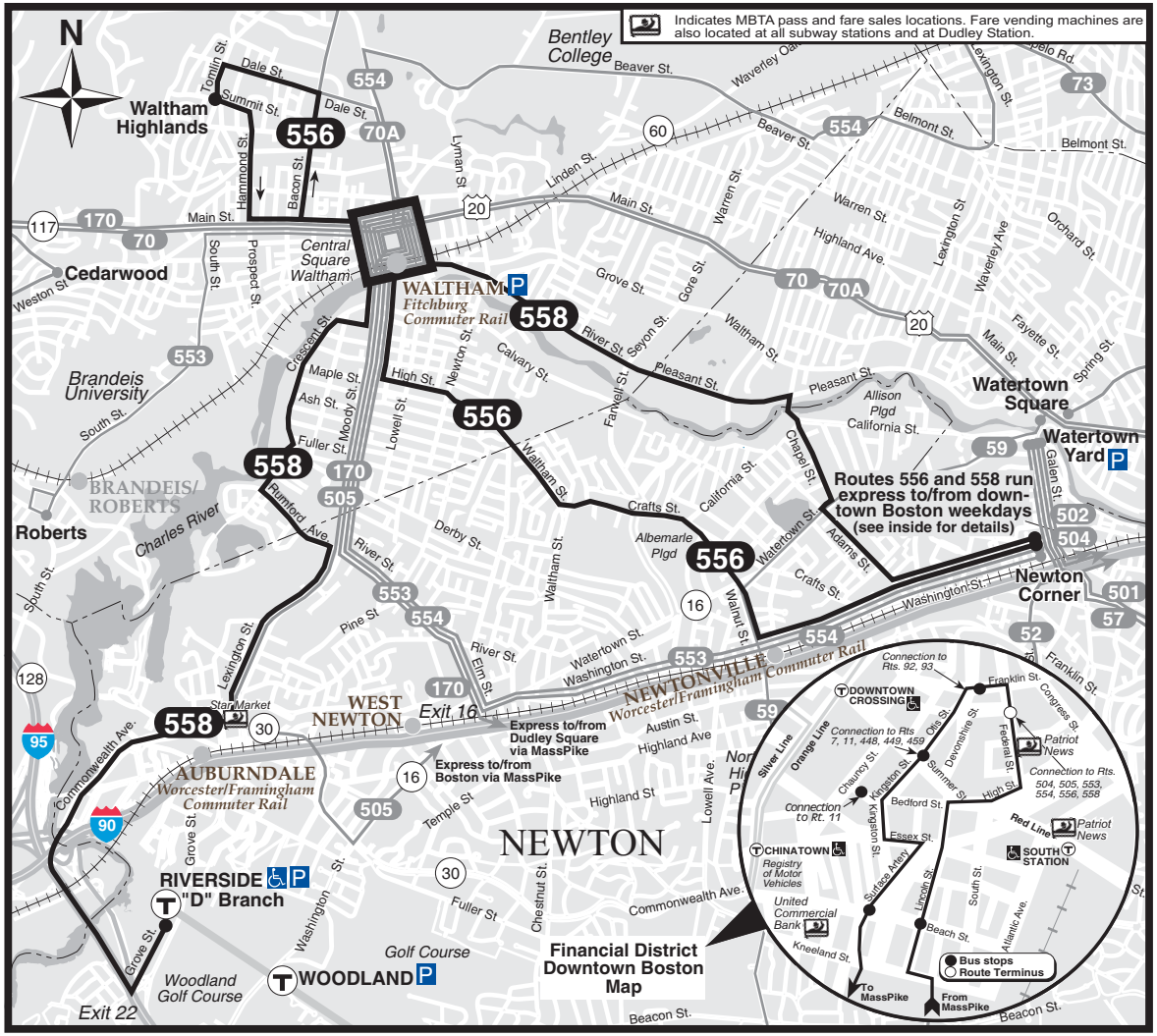
The opening of the Riverside transit line in 1959 represented an important milestone in Boston's post–World War II transportation development. Financial losses during the Great Depression and the ridership demands of war mobilization stressed and depleted Boston's transportation system. As the war ended, plans were drawn up to modernize the system, including service in the central subway, the oldest subway service in America.

An extensive network of streetcar lines served Boston and nearby communities, several of which continued underground in the central subway. The overall plan was to replace streetcar operations in street traffic with rubber-tired buses and trackless trolleys, and concentrate on routes utilizing the central subway. Furthermore, routes that used the central subway but required lengthy on-street running were gradually discontinued.

While streetcars' use of streets was being eliminated, a new transit line was being implemented that, for the first time, would be totally grade-separated. Today's Riverside Line had been the little-used New York Central "Highland Branch" commuter rail line. The Metropolitan Transit Authority (the predecessor of the MBTA) purchased the line from the railroad, built a connection to Kenmore Station, added electric catenary (overhead electric lines), and in 1959 began frequent service on what was then called the Highland Branch. Within a decade the line was re-branded as the Riverside branch of the Green Line, also called the D Line.

Route 556 *Waltham Highlands - Downtown Boston* *via Newton Corner, Central Sq., Waltham & Newtonville*

Route 558 *Riverside - Downtown Boston* *via Newton Corner & Mass Turnpike*



556 558

FALL September 1, 2012 - December 28, 2012

Waltham Highlands - Downtown Boston
via Newton Corner & Mass Pike

Riverside - Downtown Boston
via Newton Corner & Mass Pike

Serving: Central Square Waltham, Newtonville, Marriott Hotel and connections to Fitchburg & Framingham Commuter Rail

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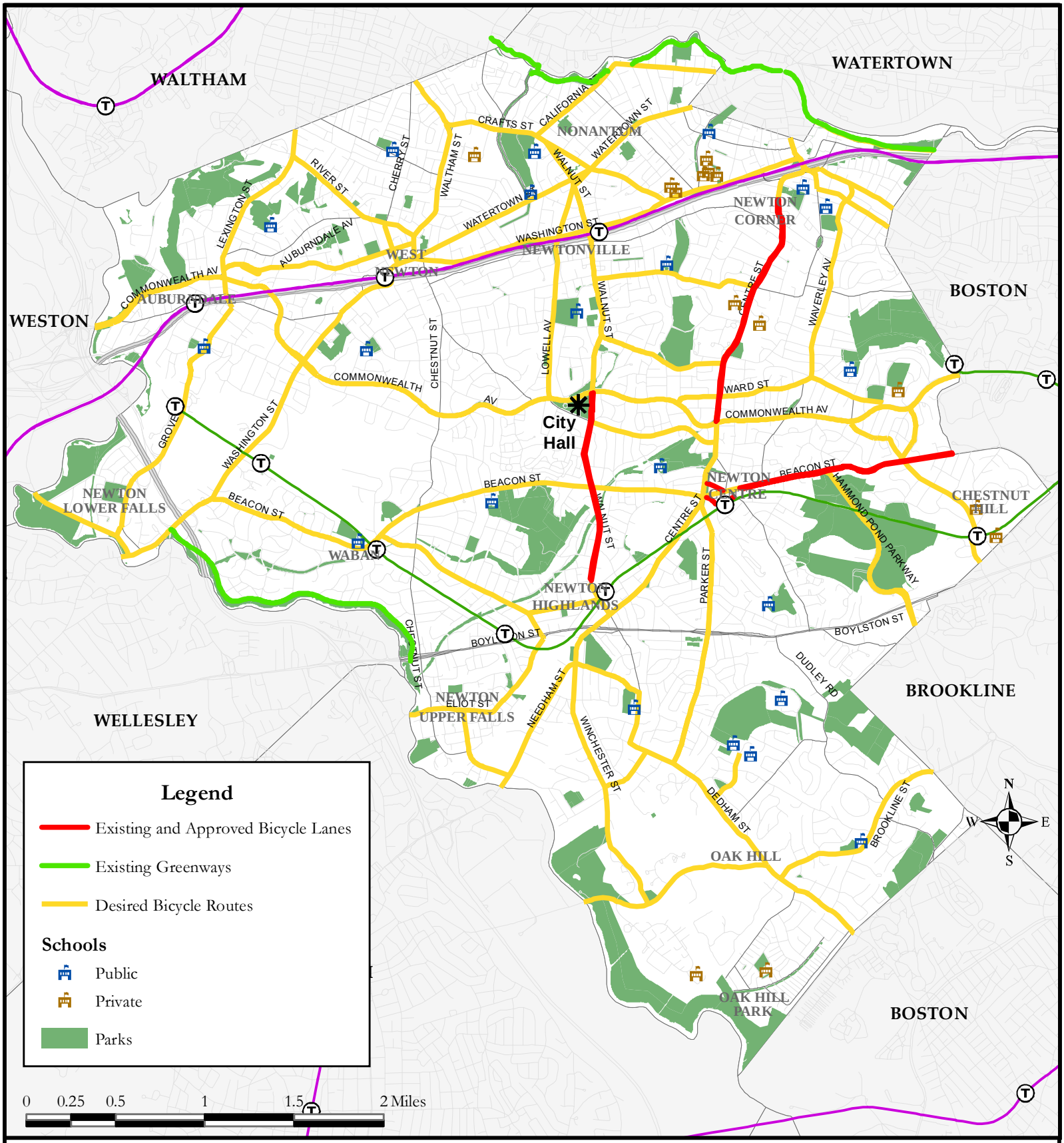


Desired Bicycle Routes

City of Newton, Massachusetts

SOURCE: City of Newton GIS

CITY OF NEWTON, MASSACHUSETTS
Mayor - Setti D. Warren
GIS Administrator - Douglas Greenfield

Map Date: September 27 2012

General Recommendations

Overall, none of the study locations have issues that seriously impede the access of pedestrians and bicyclists to a transit station. However, general maintenance issues should be addressed in all of the study areas. In addition, conditions and facilities could be further improved in order to enhance the safety and quality of pedestrian or bicyclist access; best-practices guidelines should be consulted and applied when possible.

Maintenance of Existing Facilities and Amenities

In each of the study areas, many of the existing facilities and amenities are in need of repair or upkeep. Faded crosswalk paint, uneven and broken pavement surfaces on sidewalks and roadways, malfunctioning pedestrian signals, and malfunctioning streetlamps are examples of facilities and amenities that are in need of attention. At a minimum, these should be in good, functional condition.

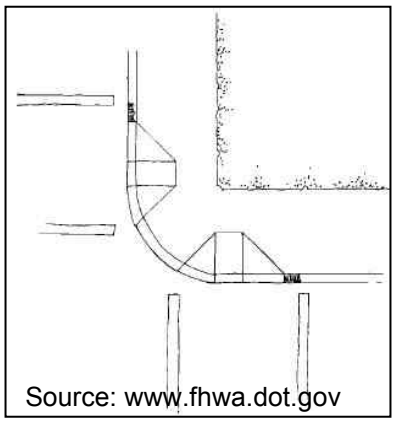
Seasonal Maintenance

Another condition commonly found at many study locations is a need for regular and seasonal upkeep of sidewalks and roadways. Dirt, sand, and debris accumulate in the gutters of roads and on sidewalks, particularly during and after the winter season. The winter also presents the issue of snow and ice, which are often piled onto sidewalks and along the sides of roads. In the summer, weeds and overgrown plants can obstruct pedestrian and bicyclist movement. Aside from being unpleasant and a nuisance, these conditions create obstructions that may make travel hazardous and impede transit patrons from easily using the MBTA system.

Sidewalks

It is important to provide a continuous and accessible network of sidewalks along walking routes to MBTA stations, particularly for pedestrians with disabilities. When a sidewalk is provided on only one side of a roadway, pedestrians often walk in the street or cross at unmarked midblock locations. Sidewalk surfaces should be level, smooth, and without obstructions in the pathway of pedestrians. In addition, best-practices guidelines recommend a buffer between the sidewalk and the roadway. However, on most of the streets in the study areas, roadway widths may not permit this feature.

In a few locations, the sidewalks do not have a curb-cut wheelchair ramp at crosswalks. Also at some locations, sidewalks have diagonal (apex) curb ramps, where only one ramp is provided at a street corner; these ramps typically are not aligned with the marked crosswalks. Diagonal curb ramps are the predominant type used in the study areas; however, this type of curb ramp is not recommended by current Federal Highway Administration best-practices guidelines. Instead, street corners should have two curb ramps, one aligned with one street’s crosswalk and the other aligned with the other


Source: www.fhwa.dot.gov

street's crosswalk (see the diagram at the left). For additional safety, the bottom of the ramps should have a detectable warming strip.

Crosswalks

The crosswalks in the study areas generally are striped with basic markings, very few of which are marked in a manner that goes above and beyond the Manual on Uniform Traffic Control Devices (MUTCD) standards. Typically, they are striped with two parallel solid white lines or have a ladder-style marking. In most cases, the stop line for vehicle traffic is too close to the crosswalk.

Best-practices guidelines recommend that crosswalks be well marked and accentuated by curb extensions. This study recommends, at a minimum, marking sidewalks with ladder-style striping. A 10-foot distance between the stop lines and crosswalks is recommended. Treatments for multilane roadways should include a 10-to-30-foot distance between the stop line and the crosswalk, pedestrian refuge islands/medians, and curb extensions for increased visibility of pedestrians. Also, this study recommends appropriate signs to warn motorists of pedestrian crossing activity.

In order to improve sight lines between motorists and crossing pedestrians, on-street parking should be spaced at least 30 feet back from crosswalks. Furthermore, other innovative options for enhancing crosswalks should be considered, including the use of reflective paint or thermoplastic striping, pavement texturing (see photo, at left), in-pavement lights, crosswalk cones and barrels, and overhead signs.

Signalized Pedestrian Crosswalks

Some signalized pedestrian crossings in the study area have malfunctioning signals and buttons. As a first step, all existing signals should have functioning buttons and walk signals. Moreover, the crossings should be enhanced with more modern signal technology. For example, signals should be equipped with pedestrian activation buttons that light up when pushed, as an indication of having been successfully activated. Also, countdown-style pedestrian crossing signals (see photo, at left) should be used in places with a sufficient amount of pedestrian activity to warrant them.

Intersection Safety

Several intersections in the study areas should be made safer for pedestrians and bicyclists through some minor redesign. (An example of a possible redesign is shown in a photo below, from the website www.pedbikeimages.org/DanBurden.) Curb extensions at the corners, for instance, create a tighter turning radius for vehicles, which slows the speed of traffic at turns. Curb extensions also provide better sight lines for motorists to watch for pedestrians and vice versa. Furthermore, medians and islands can be enlarged to better guide and control traffic, often slowing vehicle speeds as well.

Medians and traffic islands should be large and visible enough to provide sufficient refuge for pedestrians. Plus, striping should be clear and delineate the vehicle turning lanes, the crosswalks, and the stop lines. Lastly, intersections with significant pedestrian activity could be marked as a pedestrian crossing zone (instead of having only crosswalks), where an all-red pedestrian phase is part of the signal cycle.

On-Street Bicycling

On many roads that lead to transit stations, bicyclists must contend with high traffic volumes and on-street parking. High traffic volumes, particularly when combined with high speeds and frequent turning movements, can be intimidating to bicyclists. Traffic-calming measures that reduce vehicle speeds can be implemented to help reduce both the severity and incidence of motor vehicle crashes with bicycles, and can also make bicyclists feel more comfortable while riding along roadways. On-street parking poses challenges in the form of conflicts between vehicles that are parking or discharging passengers, and bicyclists, who are often negotiating traffic to their left in addition to coping with the parked-vehicle activity to their right.

Roadway design and condition are also issues for bicyclists. Narrow lanes and narrow shoulders are a concern, particularly on roads with high traffic volumes. Potholes and poor pavement should be fixed, as bicyclists are more sensitive to pavement conditions than are motorists. Storm-sewer grates should be either grids or parallel bars appropriately placed perpendicular to traffic flow.

There are different types of on-street bicycle facilities that can be provided to improve safety for bicyclists, such as cycle tracks, buffered bike lanes, bike lanes, shared lanes, paved shoulders, and signed routes. Further study of the availability of right-of-way, roadway conditions and bicycle traffic volumes should be conducted in order to determine the type of on-street bicycle facility that would be appropriate for a specific roadway.

Bicycle Parking

All of the stations studied provide bicycle racks. When selecting locations for the installation of bicycle racks, it is important to consider visibility, lighting conditions, protection from the elements, and proximity to destinations. Additionally, racks should be situated in spots that offer enough space not only for storing bicycles, but also for maneuvering them. If bicycle racks or cages are located in an area not easily seen by bicyclists, then directional signage should be considered.

Current bicycle parking guidelines[9] recommend that providers of bicycle racks select types that:

- Support the bicycle upright by its frame in two places, enabling the frame and one or both wheels to be secured
- Allow both front-in and back-in parking
- Are compatible with today's bike frames and with U-locks

Common styles of bicycle parking racks that meet the above guidelines include: the inverted-U or hoop (see photo to left), "A" (a hoop with a horizontal bar), and post-and-loop (also known as bike hitch). Many manufacturers produce these or acceptable variations of these styles. These rack elements are typically arranged in a row or array; the spacing between the rack elements should be a minimum of 30 inches (on centers), but preferably a more comfortable 36 to 42 inches.

Signs: Wayfinding for Transit Stations

Well-placed wayfinding signs—pointing the way to a transit station—reach out to potential riders. They are similar in function to signs that direct motorists to highway ramps. Care should be taken to install the signs at a height and orientation favorable to pedestrians. Also, these signs should use conventional MBTA symbols, lettering, and colors.

Travel Environment

The aesthetic look and feel of the travel environment can encourage use by pedestrians and bicyclists. Communities should implement measures to improve the quality of the street environment through the use of landscaping (trees, shrubs, and flowers, all appropriately placed), lighting, furniture (such as benches and trashcans), and artwork

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[9] One reference is *Bicycle Parking Guidelines* (2002), adopted by the Association of Pedestrian and Bicycle Professionals. For more information, please refer to www.bicyclinginfo.org/de/parkguide.htm.

(such as sculptures and murals). Chambers of commerce and business owners should also be encouraged to enhance storefronts and streetscapes.

Future Considerations

The opportunity to implement many of the recommended improvements may only arise when a roadway construction project occurs. Any roadway construction project should apply best-practices guidelines for serving pedestrian and bicyclist travel in general. More specifically, projects should improve walk and bike access to transit stops and stations as much as possible. In essence, the MBTA, the MassDOT Highway Division, local governments, and land developers should coordinate and cooperate on all transportation improvement projects to ensure that pedestrian and bicyclist needs are integrated into the final designs.

When improvements are made to the accessibility of transit for pedestrians and bicyclists, they can be highlighted in public information campaigns promoting the option of bicycling to transit stations. The improved accessibility can be extolled, along with the cost, time, and health benefits to individuals.

Smart Growth & Regional Collaboration

August 19, 2011

Richard K. Sullivan, Jr., Secretary
Attention: MEPA Office
Deirdre Buckley, MEPA # 14590
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: The Station at Riverside Project, DEIR, MEPA # 14590

Dear Secretary Sullivan:

The Metropolitan Area Planning Council (MAPC) regularly reviews proposals deemed to have regional impacts. The Council reviews projects for consistency with *MetroFuture,* the regional policy plan for the Boston metropolitan area, MAPC's Smart Growth Principles, and the Commonwealth's Sustainable Development Principles, as well as for their impacts upon the environment.

The proposed development has decreased in size since the Environmental Notification Form (ENF) filing in 2010. The current proposal is for a mixed use redevelopment in and around the current parking lot for the MBTA's Green Line Riverside Station. The project will include approximately 295 residential units (348,400 square feet), 426,400 square feet (sf) of office space, 14,300 sf of ancillary retail, and 5,000 sf of café-style restaurant space. We commend the project for including 15% affordable housing within the project to help bridge the gap to meet the region's housing needs. The proposed 2,380 parking spaces are intended to serve both the existing MBTA parking needs and those of the new development. The site will be constructed in multiple phases. Phase 1 consists of the construction of the 1,005 space Intermodal Commuter Facility (ICF) and roadway improvements. Phase 2 consists of construction of the buildings on the existing surface parking lot. Redevelopment is intended to comply with LEED Neighborhood Development (ND) standards.

MAPC has reviewed the document and offers the follow comments on the project.

Transit Oriented Development

Transit-oriented development (TOD) is generally defined as a mixed-use residential, office, or retail area situated at or in close proximity to a transit station. Due to the site's close location to public transportation, transit and bicycle/pedestrian uses are strongly encouraged and single-occupancy vehicle use is discouraged. Bicycle and pedestrian uses are encouraged by having amenities such as secure bicycle storage and wide, well-lit and landscaped pedestrian routes. Single occupancy vehicle use is discouraged by minimizing the amount of parking spaces and charging aggressive parking fees. Buildings are generally constructed to allow for easy movement between the multiple uses on site. In addition, shared parking strategies are utilized to minimize the number of parking spaces on site.

The project is being defined by the Proponent as a "transit-oriented development" but site design seems to significantly prioritize vehicle users over transit users. Many design elements, such as the direct connection to the highway, the lack of bicycle amenities, pedestrian crossings at highway access points, the high number of parking spaces, and the design of the site as many separate uses rather than a cohesive mixed-use development results in a project that will probably encourage vehicle use rather than discourage it.

MAPC has long advocated for TOD, and while this site clearly has the potential for a significant TOD, we are concerned that the project design proposed does not take full advantage of its location at a major MBTA transit station.

Parking and Transportation Demand Management (TDM)

An aggressive Transportation Demand Management (TDM) program is necessary to optimize the advantages of a development in close proximity to transit. Many TDM items are mentioned in the DEIR but issues such as parking fees, car-sharing, and connections to other transit lines were not mentioned and should be explored and addressed.

The proposed site consists of approximately 2,380 parking spaces in on-site garages – 1,005 spaces for transit commuters (replacing the existing 960 surface spaces), 960 spaces for office use, 295 spaces for residential use, and 120 spaces for hotel use. The parking ratio for the large office buildings is approximately 2.42 spaces/1,000 sf, and residential parking ratios are 1 space/unit. Given the large number of office parking spaces proposed, and since the site is located at a transit station, MAPC recommends decreasing the availability of office parking and endorses an aggressive parking fee structure for office employees to encourage transit use, and to discourage single occupancy vehicle use to and from the site. MAPC again recommends that parking be placed closest to roadways and not internal to the site.

As mentioned in MAPC's ENF comment letter, shared parking strategies should be utilized to decrease the number of parking spaces on-site. The current configuration of parking (separate parking structures for office, residential, and transit use) does not promote shared parking. We urge the proponent to take full advantage of the benefits of mixed-use development, including the fact that the various users at the site will have different parking needs throughout the day and thus can decrease the number of spaces on site. As an example, we urge the proponent to visit the Station Landing development in Medford to examine recommended shared parking techniques (shared parking for transit, office, residential, and retail uses in one garage).

MAPC urges the proponent to "unbundle" parking and housing costs at the site rather than simply provide 1 parking space per unit within the unit fee. Separating the cost of the unit and the cost of the parking space at this development would encourage some residents to live car-free, while it would encourage others to reduce their car dependency and utilize transit, bicycle, and walking as primary modes of transportation.

It is recommended that a car-share service (i.e., Zipcar) be provided at the site to further reduce the need for residential vehicle ownership and to promote sustainable transportation alternatives. The car-share service should also be accessible to office tenants and transit users at Riverside station.

As the site is located only three-quarters of a mile from the Auburndale station (Worcester commuter rail line), MAPC recommends that a peak-hour shuttle be provided to offer access between the commuter rail and Riverside station. Given the mixed-use nature of the Riverside site, the shuttle would be functional in both directions. In the morning peak hours, residents of the site would be dropped off at the commuter rail and office employees would be picked up, and vice-versa in the evening peak hours. This shuttle would provide direct transit access to/from the west (Worcester, Framingham, Natick, Wellesley) that is not provided for at the proposed development site as Riverside is the western terminus of the MBTA Green Line; it would also provide direct transit access to/from the east and the downtown Boston area (including Back Bay and South Station).

Bicycle and Pedestrian Uses

Along with the construction of parking in Phase 1, we feel it is critical to complete bicycle and pedestrian accommodations as part of Phase 1 improvements.

Numerous covered, secure bicycle facilities will help promote non-vehicular uses at the site. These could include a bicycle cage either outdoors or in a garage, or facilities to lock bikes in a garage or other buildings. The DEIR proposes138 bicycle parking spaces at the Intermodal Commuter Facility (ICF) and no designated residential or office bicycle parking spaces. MAPC encourages expanding the number of bicycle parking spaces at the ICF significantly, as well as allowing for covered and secure spaces at the residential and office buildings on site. Access to secure bicycle facilities should be detailed and designed to involve zero, or minimal, conflicts with vehicles and buses at the site. In order to encourage bicycle use, 1 bicycle space per 1 residential unit is suggested within the residential parking garage, along with an adequate number of bicycle parking facilities located at the office buildings for employees. Ideally, showers should also be provided for office employees who bike or walk to work.

The majority of the bicycle accommodations shown in the report are provided on local sidewalks. As riding bikes on sidewalks is discouraged (and illegal in Newton), MAPC recommends that separate bicycle facilities be provided at the site and on the plans for the surrounding roadways. Consideration of bicycle lanes should be given in the design of the four-lane roadway connecting the highway ramps and the two-lane roundabout, both of which are typically not ideal for cyclists.

It is suggested that an exclusive pedestrian phase be added at the site driveway to ensure safe and protected crossings for the many users of the proposed site.

In order to require fewer roadway crossings between the transit station and the Building B office location (currently two crossings at a busy roundabout are proposed), MAPC requests that an analysis be performed to assess the feasibility of adding a sidewalk on the northern side of the interior road (on the same side of the road as the MBTA storage yard).

Open space encourages pedestrian activity and creates a sense of place for users and residents. MAPC urges the proponent to create additional easily accessed open space opportunities for residents, office tenants, and transit users, in accordance with the City of Newton's 2007 Recreation and Open Space Plan.

Stormwater Management

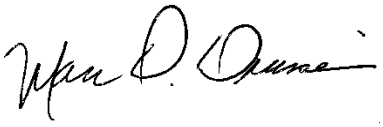
The proponent suggests 10.4 acres of stormwater recharge at the site. Calculations for Hydrologic Soil Group A at the site would require 13.3 acres of recharge (0.60 inches of runoff x 22.1 acres of impervious surface, DEIR page 1-13), according to the Massachusetts Stormwater Standard 3: Loss of Annual Recharge. Furthermore, the proposed Best Management Practice (BMP) for a number of buildings and paved areas, subsequent to pretreatment, would include filtering bioretention areas with underdrains rather than an exfiltrating biotetention area. An exfiltrating system is designed to recharge to groundwater (Stormwater Standards Volume I, page 6), whereas the proposed bioretention areas would merely discharge stormwater to the piped system. Deep sump catch basins and oil/grit separators are offered as the only source of pretreatment prior to roadway runoff entering proposed subsurface infiltration systems (DEIR page 6-16). According to the Massachusetts Stormwater Standards Volume 2, these BMPs only receive the 25% TSS removal credit if they do not have inlet pipes, yet the DEIR's figure 6.5A shows an inlet. Furthermore, the bioretention systems will only meet the 90% TSS removal credit with adequate pretreatment. This is a critical element of the project's Stormwater Management Plan (SMP) due to their requirement to meet the Environmental Protection Agency's Total Maximum Daily Load criteria for the Charles River Watershed. Monitoring must be included in the Stormwater Management Plan (SMP) to ensure that the project has met the new EPA target to reduce phosphorus loading in the Charles River by 65%.

The DEIR states, "The majority of the existing site is impervious; the redevelopment of the site will allow for the reduction of impervious area." However, this reduction is not described in the DEIR. As noted above, page 1-13 of the DEIR states, "Of the BH Normandy lease area approximately 10 acres is currently impervious area." However, Table 1-4 lists land uses totaling 22.1 acres of impervious surface for the project. The claim regarding reduction of impervious surface should be substantiated with clear indications of the current and proposed amounts of impervious surface.

The Secretary's Certificate for the ENF states, "The Draft EIR should include evaluation of collection and re-use of rainwater, creation of raingarden/bioretention areas, tree box filters in open space and landscaped strips among and between the parking lots and inclusion of green roofs." The DEIR does not evaluate the collection and re-use of rainwater for landscaping. The proponent offers pervious pavement for sidewalks but does not consider the use of pervious pavement in the top floor of the proposed parking structures as a method for reducing impervious surfaces. This top floor would be the least utilized floor of the parking structure, making it a logical location to include pervious pavement. The stormwater management system proposed for Building B & P2 relies on a green roof for nutrient reduction. However it was stated that the top level of the P2 garage will "either covered by rooftop or a green roof." We believe that rainwater harvesting, porous pavement, green roofs, etc. are important components to water conservation and recharge at the site level and ask that further evaluation regarding the use of these BMPs is included in a revised SMP.

Thank you for the opportunity to comment on this important project.

Sincerely,



Marc D. Draisen
Executive Director

cc: Candace Havens, City of Newton Planning Director, MAPC Representative
Robert Cohen, MassDOT
Lionel Lucien, MassDOT
Mark Berger, MassDOT