City of Quincy Bicycle and Pedestrian Network Plan

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Metro Boston Consortium for
Sustainable Communities

Prepared for
City of Quincy

April 2014

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Sustainable Metro Boston

Consortium for Sustainable Communities

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Project Background

The purpose of this report is to recommend solutions for improving the cycling and walking environment in the City of Quincy. Most of the recommendations focus on solutions that can be implemented in the short term and relatively low cost. Identifying existing conditions and potential opportunities was fundamental to this project. The resulting recommendations create a network of bicycle and pedestrian facilities based almost entirely upon existing rights of way with **no changes to curb location**.

A large share of recommendations also require little to no alterations to existing designated on-street parking spaces. Therefore, the proposed changes are appropriate for near-term (ranging from immediate to 2-3 year) implementation. The City is also encouraged to review our recommendations for lane reductions or "road diets" by reducing the number of travel lanes or consolidating existing underutilized parking as a feasible means for achieving more bicycle and pedestrian-friendly roadways.

Connections concentrate on linking Quincy's four transit stations, off-road trails, parks, dense residential areas, business districts, schools, and retail centers, Quincy's shoreline including Wollaston Beach, the Blue Hills, and other points of interest, such as Quincy's historic resources. Although bicycles are legally allowed on most roadways (and thus bicycle facilities are not required to allow bicycle travel) excluding limited access highways, striping and signage prioritizing space for cycles and alerting drivers to share the road on local roadways provides a safer environment for bicyclists and encourages more people to travel in this manner.

While this report covers Quincy exclusively, it is part of a larger bicycle and pedestrian planning effort by MAPC comprising 13 total communities in the region aligned as four clusters. Quincy was designated as a stand-alone cluster both because of its large size and because of its adjacency to Boston to which it currently lacks strong bicycle and pedestrian connections. The over-arching vision for the project is to identify a network of on- and off-road connections and routes for each of the clusters.

The network proposed in this report includes some existing cycling and walking facilities, but is primarily composed of recommendations for new bicycle and pedestrian accommodations such as exclusive bicycle lanes, shared lane markings, shared use paths, cycle tracks, and route signage. Key barriers for cycling and walking have also been identified.

The primary goal of this effort is to 1) Develop a bicycle and pedestrian network plan consisting of region-wide on- and off-road connections; and, 2) begin to institutionalize the implementation of pedestrian and bicycle accommodation at the local level in all projects.

Table 1 provides a summary of the approximate number of miles of new bicycle lanes recommended for Quincy and the other communities in the network plan.

Table 1: Proposed miles of bike lanes for Quincy and the other 12 municipalities in the regional network plan

Municipality	*Proposed bike lanes (miles)*
Quincy	**23.22**
Chelsea	3.2
Dedham	11.66
Everett	7.5
Hudson	11.7
Lynn	23
Malden	9
Marlborough	15.0
Maynard	2.5
Revere	9.5
Saugus	15
Stow	3.5
Westwood	9.09
TOTAL	143.87

In addition to this plan, MAPC has collaborated with Quincy on several projects in recent years aimed at improving multi-modal transportation conditions in the City. In 2010, MAPC produced the *Boston Region's Pedestrian Transportation Plan*[1] which was officially adopted by Quincy City Council. In 2013 MAPC worked with the City of Quincy on a station area plan for Wollaston Center, named *Re-Envisioning Wollaston*. Cycling and walking recommendations that emerged from the plan have been incorporated into the recommendations found in this report.

The recommendations in this report are not intended to supplant or contradict any existing plans in the City of Quincy (open space plans, master plans, etc.). Rather, the recommendations can be used in conjunction with these other initiatives and assist in prioritization and identifying opportunities for new bicycle accommodation during upcoming roadway repaving efforts. Beyond the specific recommendations in this report, Quincy is strongly encouraged to include access for pedestrians and when reconstructing roadways.

At the conclusion of the planning effort, it will be the responsibility of the City to implement the recommendations. MAPC recommends implementing the majority of these bicycle and pedestrian recommendations as roadways are repaved and/or reconstructed over the next few construction seasons to minimize costs and to ensure optimal roadway surface conditions for cycling. Recommendations also include expediting the implementation of certain key routes by restriping with paint ahead of their cyclical repaving.

[1] *The Boston Region's Pedestrian Transportation Plan*. MAPC. 2010. www.mapc.org/resources/ped-plan

Context and Existing Conditions

The City of Quincy is a large, diverse city directly south of Boston adjacent to Boston itself as well as to Milton (located to the west), Randolph (located to southwest) and Braintree (located to the south), and also connected to Weymouth (located to the southeast) via the Fore River bridge. According to the 2010 Census, Quincy's population was greater than 92,000 residents[2], and approximately 45,824 jobs[3] are located within the City. With the Neponset River as its northern boundary, the Weymouth Fore River as part of its southern border, and Quincy Bay as its eastern border, the City is largely surrounded by water. This makes certain key bridges some of the most important connections Quincy has to its surroundings, especially the Hancock Street Bridge across the Neponset River linking Quincy to the City of Boston. The Granite Avenue Bridge also across the Neponset is another vital connector, although it sits a little outside of city limits connecting neighboring Milton to Boston.

Interstate 93 cuts a north-south swath through the City. While an important vehicular route with three exits in Quincy, the roadway acts as a barrier for bicyclists and pedestrians, cutting off the westernmost section of town that contains the Blue Hills and several other areas. This plan seeks to address this and other barriers. Other important roadways in Quincy include Adams Street, Quincy Shore Drive, Furnace Brook Parkway, Southern Artery, Hancock Street, Newport Avenue, Burgin Parkway, Quincy Avenue, and Washington Street. Sea, East Squantum, and Dorchester Streets are also important connectors as they serve as the main corridors on the City's two penninsulas.

Bicycle and pedestrian priorities for Quincy include connections to its MBTA stations, recreational and historical amenities, the downtown revitalization project area known as Adams Green, and its neighbors, Milton, Braintree, Weymouth and especially the City of Boston. Just across the Neponset River from Quincy is Pope John Paul II Park, a 66-acre reservation owned by the Massachusetts Department of Conservation and Recreation (DCR) that connects into the Boston Harbor Walk. Linking Quincy to the Harbor Walk is one of the key goals of this report. There are a number of opportunities throughout the City to connect Quincy's vibrant neighborhoods to each other, to downtown, to the City's mountain and sea natural resources, as well as to Boston. Currently, there are gaps in the bicycle and pedestrian network to all of these key locations.

Commute Data

The 2010 American Community Survey compiles statistics over a 5 year period about the modes people use to travel to work. The results are summarized for the six communities and compared with regional data in Table 2 below. Note that the ACS survey is given to less than 15% of all households over a five year period; therefore, margins of error may be significant. This data does not include the many recreational or utility (e.g., running errands) trips that are taken by foot or bicycle in these communities.

Table 2: Boston Region Travel to Work Data

Municipality	*Population*	*Employees*	*Walk (%)*	*Bicycle (%)*	*Drive (%)*	*Transit (%)*	*Other (%)*
Quincy	**90,780**	**48,577**	**2.3**	**0.2**	**69.2**	**25.0**	**3.3**
MAPC Region	3,066,394	1,820,350	6.5	1.1	71.2	16.0	0.6
Massachusetts	6,587,536	3,304,919	4.6	0.7	80.5	9.1	0.6

Source: 2010 American Community Survey, 2010 Census

[2] Source: MAPC Analysis based on Census 2010, ACS estimates 2005-09, Info-Group Business Data
[3] Source: MA EOLWD ES-202, 2011

As shown in the table, the walking and cycling mode shares in the City of Quincy are lower than the overall average for both the MAPC region and the state. Quincy's share of commuters travelling via foot and bicycle contrasts with Cambridge and Somerville's, two communities that like Quincy are Inner Core communities located adjacent to the City of Boston and served by the Red Line. These are two communities notable for having prioritized bicycle and pedestrian infrastructure. As a result, Cambridge's walk and bike share percentages are 22% and 6.5%, respectively. Somerville's walk and bike share percentages are 10% and 4.5%, respectively.

On the other hand, Quincy commuters drive less and utilize transit far more than do those in the region and State. It is likely that a large number of these transit commuters access the transit system by walking or biking to stops and stations. Improving the cycling and walking environment in the City will help not just those who walk or bike to work, but those who commute by transit as well.

Existing Pedestrian Infrastructure

Given that Quincy is a relatively dense, urban environment, the majority of main and local roads contain a sidewalk on at least one side.[4] Table 3 below shows the sidewalk availability in Quincy as well as the other 12 communities in the regional network plan, denoting the percent of the community with a sidewalk on at least one side. Compared to the other municipalities in the network, Quincy is among those with the highest percentage of sidewalk coverage with 79% along its main roads and 82% on local roads. Chelsea and Everett provide the highest percentage of sidewalks on their main roads, and Lynn and Malden provide the highest percentage of sidewalks on their local roads. In less dense areas, such as Stow, Maynard, Saugus and Westwood, a significant number of main roads lack sidewalks on at least one side. Stow also has no sidewalks whatsoever on its local roads, while Westwood has them on only a small percentage of local roads. Overall, Quincy has a relatively good network of pedestrian infrastructure as a foundation for future improvements.

Table 3: Sidewalk Coverage for Quincy and the other 12 municipalities in the regional network plan (2007 data)

Municipality	% of Roads with Sidewalks (at least one side of road)	
	Main Roads	Local Roads
Quincy	**79%**	**82%**
MAPC Region Average	56%	52%
Chelsea	89%	76%
Dedham	59%	62%
Everett	89%	76%
Hudson	48%	39%
Lynn	75%	99%
Malden	80%	92%
Marlborough	51%	41%
Maynard	29%	66%
Revere	68%	78%
Saugus	32%	64%
Stow	15%	0%
Westwood	36%	29%

Source: MassGIS, 2007

[4] Local roads are those classified by the MassDOT functional classification. Main roads are all non-local roads (urban collectors, urban principal arterials, etc.)

City Projects (Recent and Future)

The following list of local projects is based upon discussions with the city and is not the result of this report's recommendations. This list is intended to highlight important roadway projects and is not intended to be an exhaustive list of all upcoming or planned roadway construction projects.

- A repaving project was completed in 2013 on **Adams Street** from the Milton town line to Furnace Brook Parkway. As part of this project, Quincy's first bicycle lanes were striped along a majority of the section of roadway being repaved.

- The City of Quincy is conducting a feasibility study for a project on **Furnace Brook Parkway** along Black's Creek between Quincy Shore Drive and Southern Artery. If undertaken, the desired outcome of the project is to improve walkability inside the guardrail in this section of the parkway. The feasibility study has been funded through Community Preservation Funds. Site visits have been carried out by various elected officials, state agencies, and other interested parties.

- A major downtown redevelopment project known as **Adams Green** will begin constructionshortly in the area bounded by the MBTA Quincy Center station, Burgin Parkway, Mayor Hannon Parkway, Chestnut Street, Temple Street, and Washington Street. The project will involve closing off a portion of Hancock Street between Washington Street and Temple Street to vehicular traffic and creating a new pedestrian-only open space on a portion of the roadway between City Hall, United First Parish Church, and the historic burial ground. The redesign will feature improved pedestrian infrastructure as well as some bicycle lanes and sharrows.

- The **Neponset Riverwalk** is an on-going project described in further detail later in this document. The current phase of this project will connect from the 2 Hancock Street waterfront segment up to Squantum Point Park via the Boston Scientific campus.

- The **Fore River Bridge** connecting Quincy to Weymouth is being replaced with completion expected in fall 2016. The new bridge will provide ADA-compliant sidewalks and a bicycle accommodating shoulder in both directions. At least one sidewalk will be available to pedestrians throughout the construction process.

- The **Neponset River Bridge** connecting Boston to Quincy over the Neponset River was recently reconstructed with eight foot sidewalks that can serve as multi-use paths accommodating bicycles as well as pedestrians.

- There is a recent Master Plan for **Faxon Park**, an 88 acre open space located at the top of Penn's Hill that will be guiding improvements.

Cycling and Walking Barriers

Key barriers have been selected due to a combination of a lack of sidewalks and/or bicycle accommodation, high traffic volumes and speeds, and other conditions that impede pedestrians and cyclists. Such problem areas raise potential safety concerns as well as discourage travel by foot or bicycle.

Furnace Brook Parkway at I-93 Rotary

This high speed rotary is the interchange connecting Interstate highway 93 to the City of Quincy. With high merging speeds and an extra wide lane that functions as two lanes, it is a major challenge to cyclists. It is also an east-west impediment to pedestrians as it lacks safe crossings at its entry and exit intersections and sidewalks are narrow in places and poorly maintained. Curb cuts are missing in several locations such as shown in Figure 1. The rotary can be made significantly safer by providing clear channelization of the vehicular lanes, removal of excess asphalt, consistent curbs, and clearly marked crosswalks.

Figure 1: Quincy Shore Drive between Ocean Street and Conant Road (Source: MAPC)

Fore River Bridge Rotary

The Fore River Bridge Rotary is a key intersection between Quincy and Weymouth, located along Route 3A just before the Fore River Bridge on the Quincy side. The eastern end of Washington Street, a key on-road route for cyclists heading to Weymouth, widens to four lanes and terminates at the rotary. Cyclists travelling from Quincy to Weymouth are forced to navigate this rotary, which has many of the same issues as the Furnace Brook Parkway at I-93 Rotary such as high speeds and

ambiguous lane demarcation with excess pavement that creates geometric ambiguities that can lead to conflicts.

Striping bicycle lanes along Washington Street as soon as possible is one of the primary recommendations of this report thus addressing issues with the Fore River Bridge rotary is a higher priority than the Furnace Brook/I-93 rotary. The network plan recommends a cycling and walking route that avoids that rotary given its present conditions, but there are no alternative routes that could be recommended for the Washington Street route to Weymouth that could avoid the Fore River Bridge rotary. Like the other rotary, this one could be improved by providing better definition of traffic flow, clear lane channelization, removal of excess asphalt, consistent curbs, and improved pedestrian crosswalks.

Quincy Shore Drive

Because it is largely a 4-lane roadway, the width of Quincy Shore Drive acts as a pedestrian barrier to accessing a significant stretch of Quincy's coastline including Wollaston Beach. The overall pedestrian infrastructure is good, with excellent sidewalks and frequent painted crosswalks, and yet it is difficult to cross 4-lanes. There is no bicycle accommodation. A reduction in lanes as recommended in this plan would greatly improve the pedestrian experience along this corridor, improve the City's access to its waterfront, and create space for a cycle track or bike lanes. Because the road is owned and maintained by the DCR, Quincy will have to work collaboratively with that agency to make such a change.

Figure 2: Quincy Shore Drive between Ocean Street and Conant Road (Source: Google Maps)

Hancock Street (Route 3A)

Hancock Street is a busy, urban principal arterial with four travel lanes on the northern section and generally challenging for bicycles throughout. From a pedestrian perspective, there are sidewalks along most of its length, and so the difficulty is in crossing. The City of Quincy should strengthen connections across and make modifications on this road to make it less of a barrier through implementation of the bicycle and pedestrian recommendations in the plan.

Figure 3: Hancock Street between Kendall Street and Hunt Street (Source: MAPC)

Southern Artery (Route 3A)

This urban principal arterial becomes a high speed, four-lane expressway between Coddington and Washington Streets. Although this roadway has ample shoulder on most of its length, the frequent driveways, lack of curbs, and absence of human scale urban design elements such as street trees, planting strips, street furniture and a clear sidewalk definition (the sidewalks along this road are largely indistinguishable from the entry and exit driveways and parking areas in front of buildings) lead to an unsafe and uncomfortable place for cyclists or pedestrians.

Figure 4: Southern Artery between Stewart Street and Edison Park (Source: Google Maps)

Plan Methodology

The following sections describe MAPC's process for determining bicycle and pedestrian recommendations applicable to Quincy. The primary focus of the recommendations is on bicycle recommendations because they are less expensive and require less time to implement. This is also because Quincy has a relatively good existing network of pedestrian facilities and yet has not a single bicycle-specific facility as of the writing of this report.

Bicycle Accommodations

MAPC examined Quincy's entire street network, collecting street widths and existing condition data for all non-local roads[5], and identifying opportunities and constraints for providing bicycle accommodation in those areas (see **Appendix E** for the functional Classification of Quincy's road network). The focus of this effort was to identify, based on the existing street widths, curb locations, and parking requirements, the opportunity to stripe bicycle facilities on these roads as soon as possible. The recommendations detail any required redistributions of the roadway width to provide bicycle accommodations.

As a general rule of thumb, MAPC considered its recommendations based upon the following design guides from the AASHTO Guide for the Planning, Design, and Operation of Bicycle Facilities[6]:

- Parking lanes – 7-8' wide.
- Travel lanes – 10-12' wide. Eleven feet is often ideal. Greater than 12' may encourage vehicles to speed, whereas 10' is adequate on many roads but may be less than optimal for bus routes and roadways with high volumes of heavy or wide vehicles.
- Bicycle lanes –5' wide. Five feet generally provides enough comfort for a bicyclist to ride side-by-side with a vehicle. Four foot bicycles lanes may be installed next to curbing where bicycle lanes are desired but additional space is not available.

MAPC recommends providing bicycle lanes or shared lanes when repaving all City-owned roadways identified in the plan. Some roadways may be restriped prior to repaving, but a smooth surface is preferred for new bicycle facilities.

The key on-road bicycle accommodations that were considered in this network plan include bicycle lanes, cycle tracks, buffered bicycle lanes, and shared lane markings[7]. Bicycle facilities with physical separation from motor vehicles are typically the most desired as they provide the highest level of protection and encourage the highest use, however, the limited roadway space often found in our region typically calls for reconstruction of the roadways or other choices that require less excess roadway space. Fortunately, a significant proportion of Quincy's roads are indeed wide enough for bicycle lanes and even buffered lanes or cycle tracks in many instances.

Complementing the bicycle facilities should be campaigns (e.g., mailings, information sessions, signage, traffic enforcement) to educate both motorists and cyclists on the meaning of the new pavement markings and the laws governing how these modes of transport interact with each other.

[5] Major roads were identified by examining the MassDOT functional classification for all roads (See Appendix C). Local roads were excluded from the analysis unless they were needed to create an important connection. Functional classification maps can be accessed at the following website: http://www.massdot.state.ma.us/planning/Main/MapsDataandReports/Maps/FunctionalClassification.aspx

[6] See Chapter 4: Design of On-Road Facilities: http://www.railstotrails.org/resources/documents/ourWork/trailBuilding/DraftBikeGuideFeb2010.pdf

[7] See Appendix A: Description of Bicycle Facility Types & Design Considerations

Pedestrian Accommodations

Sidewalk availability and accessibility is an important part of transportation infrastructure in every city and town. Along with bicycling, increased rates of walking in a community can improve health, increase economic development, and reduce vehicle use, air pollution, and the cost for maintaining local roadways. In order to prioritize pedestrian infrastructure and improvements, MAPC reviewed the sidewalks of non-local roads.

At present only 79% of Quincy's main roads and 82% of its local roads have sidewalks on at least one side. **MAPC recommends that all new roads and reconstructed roads should have ADA-compliant sidewalks or walkways constructed on both sides with well-striped Continental crossing style crosswalks connecting the sidewalks**. In addition, the current regional policy guidelines (*Boston Region's Pedestrian Transportation Plan*, 2010) call for the provision of sidewalks on both sides of all roadways (not just those recently constructed or reconstructed). At the bare minimum, MAPC recommends that all communities in the region provide sidewalks on at least one side of every main road.

Although limited rights of way may constrain the width available for sidewalks, The Americans with Disabilities Act mandates a minimum width of three feet of unobstructed sidewalk passageway (e.g., no trees, benches, or signage obstructing the passageway). A sidewalk width of five feet allows two adults to walk comfortably side-by-side. A grass buffer of one or more feet, often with planted trees, can separate the pedestrian space from the vehicular travel lanes, add to the comfort of pedestrians and help reduce stormwater runoff.

MAPC also recommends that traffic calming measures, such as speed tables, curb extensions, flashing beacons, rumble strips, and narrower travel lanes be considered in areas with pedestrian destinations where excessive speeds have been observed.

Areas around schools, in particular, should focus on providing pedestrian amenities in order to increase the safety of students, parents, and teachers. Providing a safe pedestrian environment for students to access school is essential and should be a priority. These areas should include enhanced striping, raised crosswalks, and pedestrian crossing signals.

See **Appendix B** for brief descriptions of sidewalk design considerations and traffic calming measures including featured information from the *Boston Region's Pedestrian Transportation Plan*. See **Appendix C** for a list of additional bicycle and pedestrian facilities design guides.

Note on Recommendations

The detailed recommendations for pedestrian and bicycle accommodations that follow have been developed by MAPC based on current best practices and local conditions. We have met with the City of Quincy staff and Quincy Bicycle Commission to discuss and finalize the recommendations; however, implementation of the plan, while strongly recommended, is not required. What is implemented is up to the City based on local priorities, funding and public support. In addition, proper education for all users of the roadway should be included to increase safety. Ultimately any improvements made to specific locations should be focused on improving the safety of all users of the roadway.

Note that MAPC did not undertake detailed intersection design as a part of this plan; rather, as a part of a regional bicycle network plan, these recommendations are based upon on-site mid-block measurements for the various street segments, and may require additional design at intersections and other conflict areas. Because roadway widths can be inconsistent, prior to installing bicycle facilities road segments should be engineered to ensure each segment follows design guidelines (**Appendix C**).

The following pages provide a detailed description of recommendations for Quincy broken down as "high priority recommendations" and "network recommendations." High priority recommendations outline key routes and are of the highest precedence because they will form a backbone of continuous corridors throughout the city from which a larger extended network may evolve. The network recommendations go on to identify a large number of other opportunities for extending the bicycle and pedestrian network beyond the backbone of key corridors.

High Priority Recommendations

In addition to conducting extensive field work, MAPC met with Quincy City from various departments as well as the City's recently formed Bicycle Commission. Their input was critical in forming the plan's overall recommendations as well as determining priorities. The highest priority recommendations fall into two categories: on-road bicycle striping along key routes; and greenway corridors that avoid busy streets, seeking maximum separation from automobiles. This chapter gives detailed descriptions of these routes falling into these two high priority categories. The chapter which follows it will go on to outline Network Recommendations which go beyond these initial priorities and will likely be longer term projects for the City.

A map of the high priority recommendations is shown in Figure 5 and in greater detail in **Appendix D**.

Figure 5: Priority bicycle network striping and proposed greenways

2014 Priority Bicycle Facility Striping

The first group of priorities consists of striping on-road bicycle lanes and shared lane markings (where bike lanes do not fit) along key corridors throughout the city. The recommended striping can be accomplished by reallocating the width of existing right of ways with paint, with no changes to curb location and minimal impact to existing on-street parking requirements.

The recommended striping will define a core bicycle network system connecting within the City and to Boston, Milton, Weymouth, and Braintree. Based on input from the Quincy Bicycle Commission and MAPC analysis, three corridors are recommended for striping by the end of 2014.

Hancock and Washington Streets

Hancock and Washington Streets are the key corridors in the City connecting to Boston to the north and Weymouth (via the Fore River Bridge) to the south, along with North Quincy, Wollaston, and Quincy Center MBTA stations. This is the highest priority corridor for bicycle network striping in the City outside of current roadway resurfacing projects.

Hancock Street Bridge to Furnace Brook Parkway – shared lane markings

Furnace Brook Parkway to Adams Street – bicycle lanes

Adams Street to Coddington Street – striped as part of the Adams Green Project

Coddington Street to Southern Artery – bicycle lanes

Southern Artery to the Fore River Bridge – shared lane markings

Note – In the long term, we are recommending that the four lane sections of Hancock and Washington Streets be reduced to three lanes with a turning lane in the center and through lanes and bicycle lanes on either side. Further discussion of these "road diet" recommendations is found in the Bicycle Network Recommendations section later in the report.

Adams Street

Adams Street provides direct access from Quincy Center to Milton. As a two lane, primarily residential street, it's an ideal route for cycling through the City. Bicycle accommodation will be provided under a current repaving project between the Milton line and Furnace Brook Parkway.

Furnace Brook Parkway to Newport Ave – stripe existing shoulders as bike lanes

Newport Avenue to Hancock Street – shared lane markings

Braintree Spur

Shared lane markings are recommended connecting Quincy Center to Braintree.

Hancock Street to School Street – shared lane markings

School Street to Franklin Street – shared lane markings

Franklin Street to Independence Avenue – shared lane markings

Priority Greenway Corridors

Greenways are low traffic low stress corridors for cycling and walking. Where possible, greenways are located on separate trails, ideally in a green vegetated setting. However, right-of-way is not always available for this form of greenway and they may take more urban forms. Low-traffic residential streets are often a component of greenways that are not completely separate trails. Greenways are typically branded with a unique identity, and are consistently signed to allow users to easily follow the route. The Freedom Trail in Boston is a local example of a greenway corridor, marked with brick lines in the sidewalk.

Figure 6: Greenway wayfinding example (Source: Studio L'image)

Greenways can be implemented over time in gradual steps. The greenway can be marked with signs and pavement markings in the first step. Once the greenway corridor is established, higher end design including traffic calming, landscaping, and urban design elements can be applied. Greenways provide corridors for transportation, recreation, and tourism connecting key points in the city.

This plan proposes an extension of the existing Neponset Riverwalk greenway, as well as proposing two new greenways. The Sea to Summit greenway connects the ocean and Blue Hills, while the Quincy Spine greenway connects all four MBTA stations on traffic-free or low-traffic streets.

Neponset Riverwalk Extension

The City has had a long term vision for a passive recreational trail along the Neponset River that could eventually link Wollaston Beach to Marina Bay and then follow the Neponset River south into Milton and across the Granite Street Bridge to connect to Dorchester. The 2007 Neponset Riverwalk Design Report noted that from Marina Bay to the Milton line, public access to the Neponset River is extremely limited with most of the riverbank lined by office developments and industrial space.

The riverwalk would offer a great recreational space for the City and better connect residents to the river. It would also connect a string of destinations that are currently cut off from one another including Wollaston Beach, Mosswetusset Hummock, the Dickenson Parcel (used by locals as an ad-hoc skating rink and can be restored to a natural salt marsh), Marina Bay, Squantum Point Park, the Adams Inn and Milton.

The first portion of the Neponset Riverwalk from Adams Inn to Squantum Point Park is largely complete with the final segments to be constructed in 2014. The existing segments were constructed over many years by private waterfront developers. The Neponset River Watershed Association (NepRWA) was the primary advocate and negotiator.

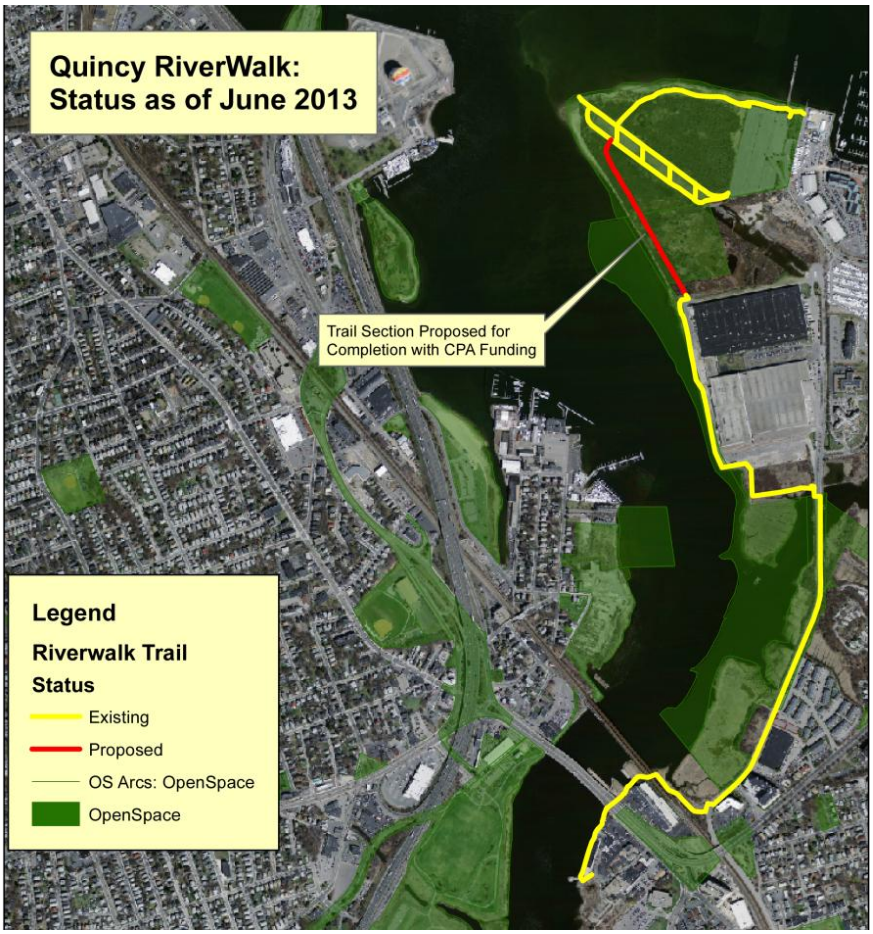


Figure 7: Neponset Riverwalk Vision (Source: Neponset River Watershed Association)

With completion of the Riverwalk in 2014, MAPC is recommending studying the feasibility of developing an extension southwest to Granite Street in Milton and then connecting to the Neponset Trail on the Boston side. This section, as mapped in **Appendix D**, would follow the edges of the salt marsh, requiring bridges and boardwalks, and connect to an abandoned railroad bed along the north side of Presidents Golf Course, to Granite Street. The railroad bed could be converted into a rail trail.

Sea to Summit Greenway

The Sea to Summit Greenway is a proposal to connect Quincy's highest hills and the ocean with a signed trail. The Blue Hills are the highest coastal range on the Atlantic Coast south of Maine. The high point in the Blue Hills is less than five miles from the ocean. The total length of the proposed trail is approximately 12.08 miles.

As can be seen in the Figure 5 map, the Sea to Summit Greenway begins at Nut Island on the coast, following the MWRA dike through Houghs Neck to Merrymount Park. Then the trail follows Furnace Brook Parkway to the Skyline Trail in the Blue Hills to Chickatawbut Hill, the high point in Quincy at 517 feet. The trail would be open to both cycling and walking except in the Blue Hills

where cyclists would follow Wampatuck and Chickatawbut Roads to the overlook point instead of the Skyline Trail.

The Greenway transitions from the coastal beaches to tidal salt marshes, along Furnace Brook to rocky hillsides showing the diverse range of Quincy's natural features. The Greenway as proposed is located on existing trails and roadways, requiring only branding, installation of wayfinding signs, and some attention to road crossings.

Passing through Houghs Neck, the dike (an MWRA pipe leading to Nut Island) is a major opportunity. Upgrading the surface would make the trail more hospitable to bicycles, strollers and other active transportation users. Quincy and MAPC should engage with the MWRA to enable formal public access as well as to develop a plan for improvements to the surface of the trail.

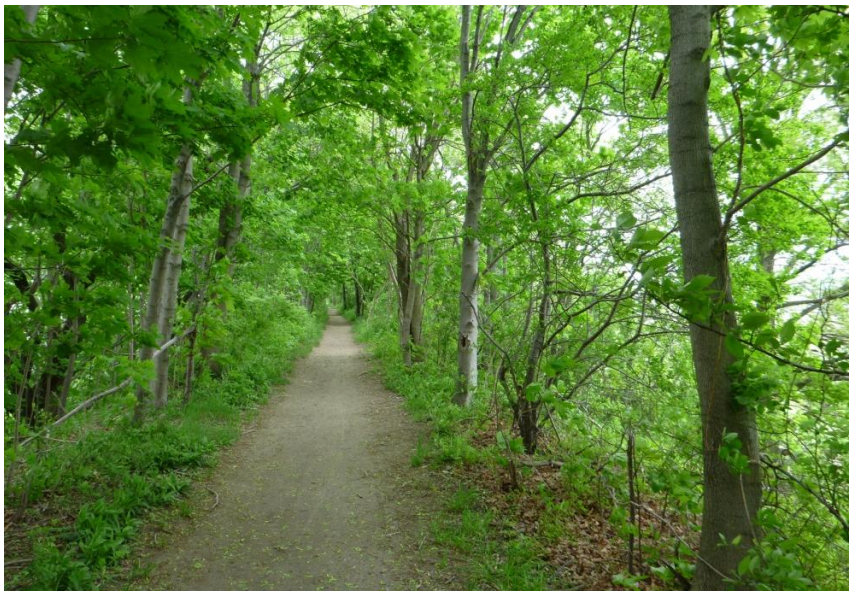


Figure 8: MWRA dike (Source: MAPC)

Furnace Brook Parkway, under DCR control, has wide six-foot shoulders between Hancock Street and Centre Street allowing for easy conversion to bike lanes. The Greenway diverts to West Street to cross under I-93 and avoid the Parkway rotary.

Figure 9: Furnace Brook Parkway (Source: MAPC)

The Blue Hills Reservation is one of Quincy's greatest assets. While the reservation reaches into Dedham, Milton and Randolph, the majority of its 7,000 acres are in Quincy. The Skyline Trail runs about 9 miles through the reservation from one end to the other.

Figure 10: The view from the top on the Skyline Trail (Source: MAPC)

Quincy Spine Greenway

The Quincy Spine is a proposed greenway that would connect all four of the MBTA stations in Quincy and creates a low- or traffic-free alternative route to Hancock Street and other busy streets (Figure 5). The Spine is essentially a route that starts at the Hancock Street Bridge, and parallels Hancock Street along nearby streets to Quincy center, Burgin Parkway, and Quincy Adams Station.

Key sections of the proposed Greenway include a shared use path along Commander Shea Boulevard, following an old road through Merrymount Park, and following low traffic residential streets through the City. The total length of the proposed trail is approximately 5.12 miles.

Commander Shea Boulevard between the new section of the Neponset Riverwalk and North Quincy Station is a two-lane road with no sidewalks, and fairly wide at 38 feet in most sections (Figure 11). We are recommending development of a shared use path using excess space in the roadway.

Figure 11: Commander Shea Boulevard (Source: MAPC)

Development of the path can be done fairly inexpensively as a pilot project, using only paint and flexible bollards to separate the path from the existing roadway space (Figure 12). The travel lanes of the roadway should be narrowed to a standard 11 or 12 feet. Where the southbound roadway crosses under Hancock Street, the unused travel lane should be converted to a shared use path and end at the North Quincy Station parking lot.

Figure 12: Example of a bi-directional cycle track

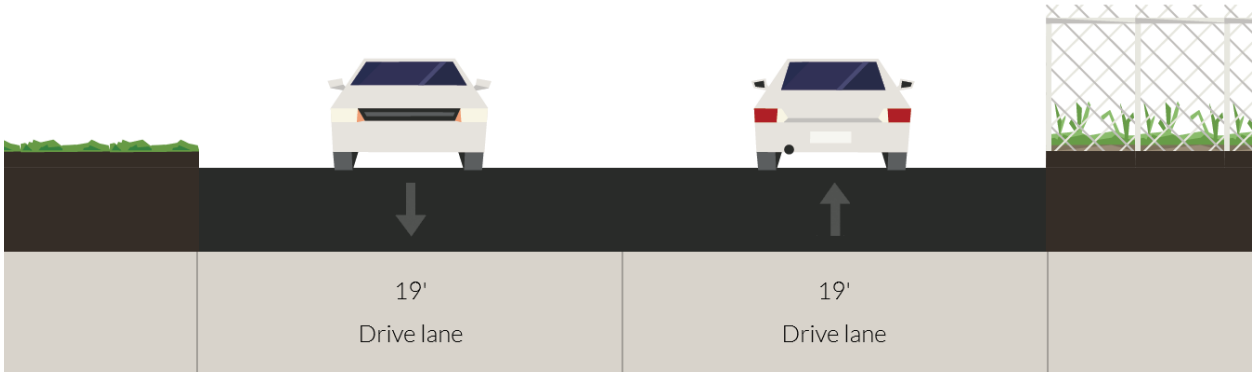


Figure 13: Commander Shea Boulevard existing conditions

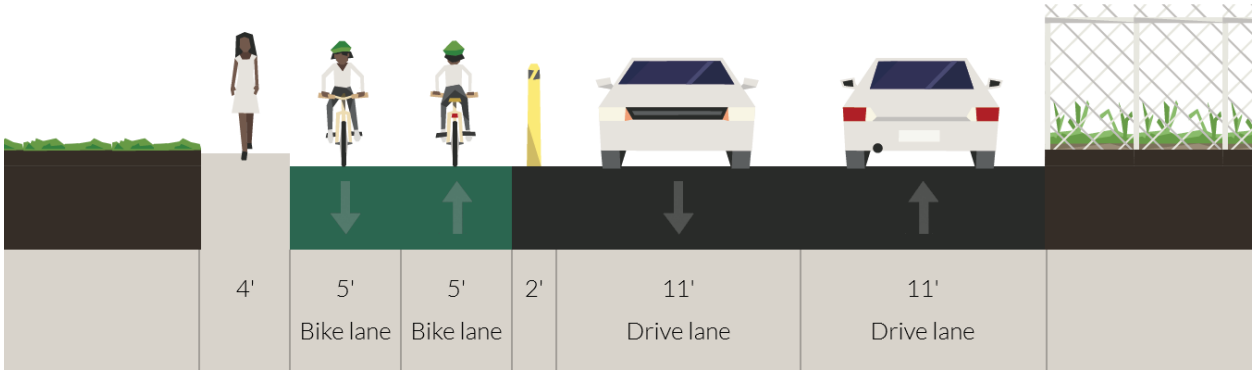


Figure 14 Commander Shea Boulevard proposed shared use path (two way cycle track with pedestrian space)

Network Recommendations

This chapter addresses MAPC's full bicycle network recommendations. These are the complete web of connections throughout the City building upon the key corridors ("Priority Bicycle Facility Striping" and "Priority Greenway Corridor" projects) detailed in the previous chapter. The full set of network recommendations are detailed in the comprehensive Quincy Bicycle/Pedestrian Network Map (Figure 26) found in **Appendix E** and in the Quincy Bicycle Recommendations table (Table 4) below. A number of higher-complexity projects are also found in this chapter in the "Key Projects" section that are not detailed on the network map and recommendations table.

The full set of recommendations in this plan call for the installation of approximately 33.28 miles of new bicycle and pedestrian facilities broken down as follows: 23.22 miles of bike lanes; 8.52 miles of shared lanes; 1.54 miles of improved path (for a shared-use path).

The recommendations found in Table 4 involve redistributing existing roadway space to allow for bicycle accommodations. The Network Map (Figure 26) shows these recommendations and also shows certain street segments designated as "on-road routes" which are recommended to be left as they already are. These streets are important connectors within the network that do not have space for adding cycling facilities and/or are safe and usable in their current configuration.

A more comprehensive table in **Appendix D** provides detailed measurements on the existing rights-of-way, followed by MAPC's recommendations, categorized by street segments.

Note that the bicycle recommendations for the majority of roads are city-owned. In some cases MAPC proposed bicycle facilities on roads not owned by Quincy, but rather the State DOT, the DCR, or private ownership (e.g. Marina Drive which is recommended to be made part of the Neponset Riverwalk). In these cases MAPC understands that the process for implementation will differ from City-owned roads and encourages Quincy to engage with the appropriate state offices to implement the recommendations.

Key to Bicycle Recommendations in Table 4

Abbreviation	Recommendation
BL	Bike Lane
SL	Shared Lane
SUP	Shared Use Path
SH	Shoulder
CT	Cycle Track

Table 4: Quincy Bicycle Recommendations

Street Name	Segment's Cross Streets	Priority	Recommend	Comments
Adams Street	Hancock to Furnace Brook Parkway	**H**	BL	*2014 Bike Network*
Adams Street	Furnace Brook Pwky to Milton line	**H**	BL	*2014 Bike Network*
Beale Street	Hancock to Cushing		SL	
Beale Street	Cushing to Newport		BL	
Beale Street	Newport to Winthrop		SL	
Beale Street	Winthrop to Summit		BL	
Beale Street	Summit Ave to Adams St		SL	
Billings Road	West Elm to Holmes		BL	
Centre St	Columbia to Quincy Adams Station		BL	
Centre St	Copeland St to Columbia		SL	
Chickatawbut	Willard St to Quincy line		SL	
Coddington Street	Hancock to Southern Artery		SL	
Commander Shea Blvd	Seaport Dr to Seawinds Condos		BL	*Neponset Riverwalk*
Commander Shea Blvd	Seawinds Condos to N Quincy Station	**H**	CT	*Quincy Spine Greenway*
Dimmock Street	Hancock Street to Presidents Lane		BL	*Quincy Spine Greenway*
Dorchester Street	East Squantum to Moon Island		BL	
East Howard Street	South Street to Quincy Ave.		BL	
East Squantum Street	Hancock to Atlantic St		SL	
East Squantum Street	Atlantic Street to Quincy Shore Dr		SH	
East Squantum Street	Mosswetusset Hummock to Huckins		BL	
Fenno Street	Quincy Shore Drive to Andrews Road		BL	
Fenno Street	Andrews Road to Hancock		SL	
Franklin Street	School St to Presidents Ave	**H**	SL	*Quincy Spine Greenway*
Furnace Brook Pkwy (DCR)	Quincy Shore Drive to Hudson		SL	*Sea to Summit Greenway*
Furnace Brook Pkwy (DCR)	Hudson to Hancock		SL + SUP	*Sea to Summit Greenway*
Furnace Brook Pkwy (DCR)	Hancock to Centre St		BL	*Sea to Summit Greenway*
Granite Avenue (Milton)	Neponset River to Thistle		BL	
Granite Street	Hancock to Burgin Parkway		BL	Adams Green Project
Granite Street	Burgin Parkway to Fort St		BL	*Quincy Spine Greenway*
Hancock Street	Newport Ave to E Squantum St	**H**	BL	*2014 Bike Network .*
Hancock Street	E Squantum St to Furnace Brook	**H**	SL	*2014 Bike Network*
Hancock Street	Furnace Brook to Dimmock/Adams	**H**	BL	*2014 Bike Network*
Hancock Street	Adams to Russell Park	**H**	SL	*Adams Green Project*
Hancock Street	Russell Park to Granite St	**H**	BL	*Adams Green Project*
Hancock Street	Granite Street to School St	**H**	SL	*2014 Bike Network*
Harvard Street	Sherman Street to Beale Street		BL	parking on narrow shoulder
Harvard Street	West Squantum Street to Sherman Street		SL	
Howard Street	Quincy Ave. to Braintree Border		BL	
Independence Ave	Franklin St to Braintree line	**H**	SL	*2014 Bike Network*
McGrath Hwy (Revere Rd)	Granite St to Southern Artery		BL	
Merrymount Parkway	Furnace Brook Pkwy to Hancock		CT	*Quincy Spine Greenway*
Quarry St	Stedman to Granite St		BL	
Quincy Shore Drive (DCR)	East Squantum to Furnace Brook Pkwy		CT	
Quincy Shore Drive (DCR)	Furnace Brook to Sea Street		BL	
Russell Park	Southern Artery to Woodward		BL	
Russell Park	Woodward Ave. to Hancock Street		SL	
School Street	Fort Street to Franklin St		BL	
School Street	Franklin Street to Hancock Street	**H**	SL	*2014 Bike Network*
Sea Street	Quincy Shore Dr to Babcock St		BL	
South Street	Washington Street to Cleverly Court		BL	
Southern Artery	Furnace Brook Pkwy to Russell St		BL	
Southern Artery	Washington St to Quincy Ave		BL	
Wampatuck Rd	Willard St to Chickatawbut Rd		SL	
Washington Street	Coddington St to Southern Artery	**H**	BL	*2014 Bike Network*
Washington Street	Southern Artery to Fore River Bridge	**H**	BL	*2014 Bike Network*
Water Street	Franklin to Pleasant		BL	
West Squantum Street	Hancock to Fayette St		SL	
West Squantum Street	Fayette Street to Milton Line		BL	
West St	Centre to Willard		SL	*Sea to Summit Greenway*
Whitwell	Adams to Farrell		BL	
Whitwell	Farrell to Granite		SL	
Willard St	Ben Robertson to Chickatawbut Rd		BL	

While the recommendations in Table 4 are exclusively for roads in Quincy, **the City should work with the City of Boston to link to Boston's burgeoning bicycle network wherever possible to provide a seamless transition across city lines. In addition, it should work closely with Milton and Braintree to create safe connections into these adjacent communities and encourage them to build bicycle facilities that integrate with Quincy's efforts to connect its network to their borders.**

Roadway Repair Schedule

In the short-term, a number of streets identified in our recommendations have the potential for striping bicycle lanes or shared lane markings without waiting for their turn in the road repaving cycle. Among the shorter-term projects, some road segments can add the recommended bicycle facilities without changes to the existing centerline striping, and, therefore, could be installed without roadway resurfacing.

In the medium- to long-term, the City of Quincy's Roadway Repair schedule provides an on-going opportunity to add the appropriate bicycle facilities as part of the Department of Public Works normal repaving operations. The roads designated for repaving, therefore, can be considered a high priority in the sense that there is an upcoming opportunity to add bicycle lanes or shared lane markings, as appropriate. Such on-going efforts would complement the recommendations in this report for adding bicycle lanes, shared lane markings, etc. to other high priority areas that are not necessarily included in the repaving schedule.

There is also the opportunity to make larger changes to the right of way such as the road diets detailed in the Key Projects section below that can be accomplished in the medium- to long-term.

Key Projects

Projects that will be more involved than the recommendations featured in the network map and recommendations table are described in this section. These projects will likely require traffic studies and further analysis before they can be implemented.

Road Diets

Many roads in cities and towns have been built excessively wide, and with higher traffic speeds than appropriate for the context in which they reside. Such roads may have multiple travel lanes, or have lanes that are wider than necessary, creating barriers for pedestrians to cross. The reduction in automobile travel lanes known as a "road diet" has many benefits, and Quincy has many four lane streets that are ideal candidates for this type of intervention. The most common type of road diet is a reduction of travel lanes from four (two in each direction) to three lanes made up of two through lanes and a center left turn lane. The space liberated by the fourth lane can then be reallocated to pedestrian or bicycle facilities such as bike lanes (Figures 15 and 16 illustrate the classic road diet).

Figure 15: Real world example of a road diet (Source: Pedestrian Bike Information Center, "Road Diets" training module, 2009 via Federal Highway Administration (FHWA); http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_013.htm)

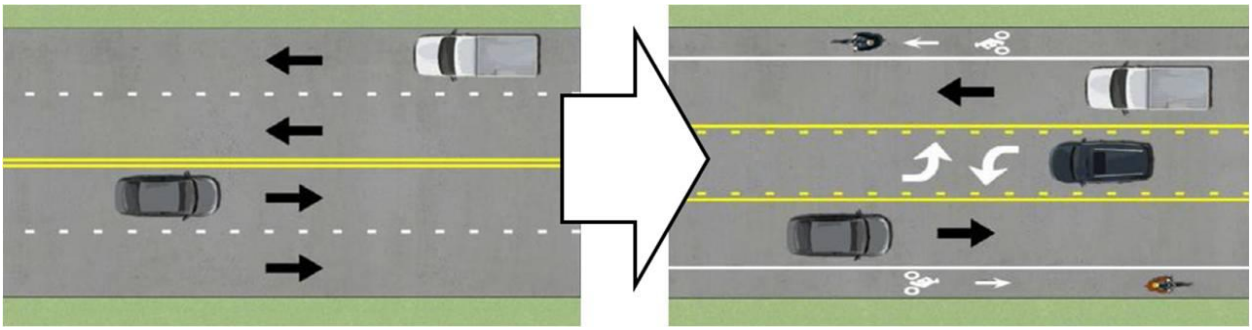


Figure 16: Illustration of a road diet (Source: Seattle DOT, Edited by PPS; http://www.pps.org/reference/rightsizing/)

Researchers from the National Cooperative Highway Research Program (NCHRP) 17-25 project team conducted a study analyzing the reduction in crashes produced by road diets where lanes are reduced from 4 to 3 with a center two-way left-turn lane. Their results showed a reduction in total crashes of 19 to 47 percent depending on the road's context. The average crash reduction for all roadways is 29 percent[8].

We are recommending road diets on Quincy Shore Drive, Sea Street, Quarry Street, and Hancock Street.

Quincy Shore Drive

Quincy Shore Drive is a DCR controlled roadway, recently reconstructed around 2005, that is four lanes wide, with angled parking and no bicycle accommodation. A Northeastern University study indicated that the roadway could operate effectively with one lane in each direction and turn lanes at key intersections. Narrowing the roadway could significantly improve the connection between the neighborhood and the ocean and encourage higher walking and biking access.

Initially we are recommending travel lane reductions and striping bicycle lanes in each direction. Longer term, we are suggesting construction of a two-way cycle track adjacent to the walkway along Wollaston beach.

Sea Street

Sea Street is the major artery to Houghs Neck, a largely residential part of the City. Narrowing the road way can free up space for significant urban design upgrades including landscaped median, street trees, wider sidewalks, and bike lanes. A project to address Sea Street is in the beginning stages and we encourage the city to include these elements.

Quarry Street

The western portion of Quarry Street is two lanes at 40 ft in width. However between the top of the hill and Granite Street, the same 40 ft width is squeezed into four travel lanes. This section should be reverted to two lanes with bike lanes throughout.

[8] "Evaluation of Lane Reduction "Road Diet" Measures on Crashes;" United States Department of Transportation - Federal Highway Administration; Publication Number: FHWA-HRT-10-053; June 2010; http://www.fhwa.dot.gov/publications/research/safety/10053/index.cfm

Hancock Street Phase II

We have made a short term, "Phase I" recommendation to paint sharrows along Hancock Street in the Priority Recommendations chapter earlier in the report. This "Phase II" recommendation of a four to three lane road diet should be implemented in the longer term as the City gradually improves its cycling environment. As a overly-wide road that cuts through the heart of North Quincy, Hancock Street provides a significant opportunity to create bicycle lanes right along the key bicycle network route connecting key locations along one of Quincy's main streets.

The road cross-sections offer an example of how a road diet might be designed with the right-of-way reallocated to allow bicycle lanes without altering existing curb location. A reduction from 4 to 3 travel lanes with the center lane functioning as a two-way left turn lane allows ample room for bicycle lanes to be added to both sides of the street.

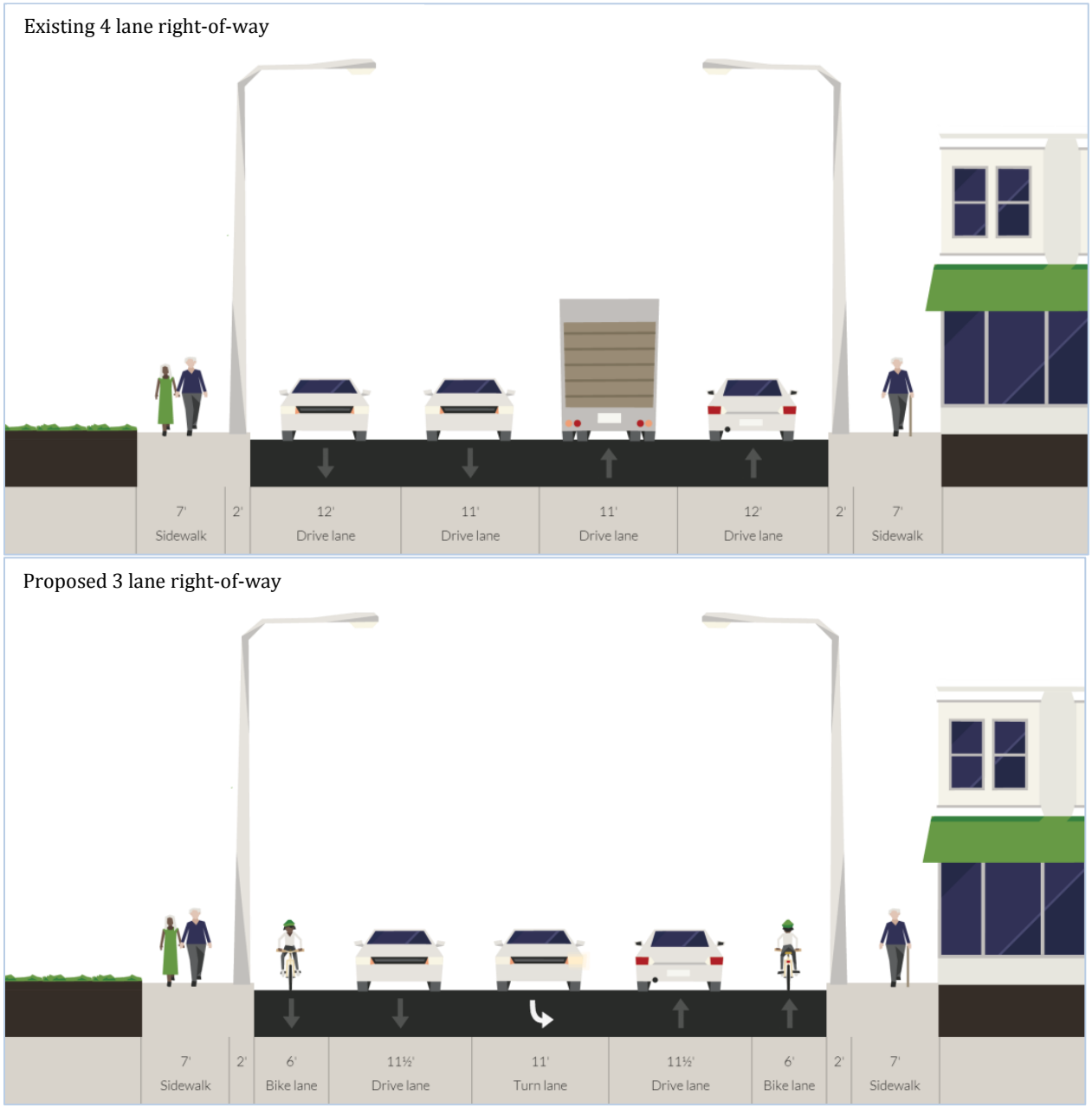


Figure 17: Example of Existing Conditions and Proposed Road Reallocation Hancock Street (between Hunt and East Squantum Streets)

Shared Use Paths

Shared use paths are essentially paved trails that are separated from motor vehicle traffic, often on former railroad corridors or along water bodies. There are few existing shared use paths in Quincy, limited to a path between Commander Shea Boulevard and Quincy Shore Drive in Squantum Point. Opportunities for new separated paths are also limited; however construction of these short segments can significantly improve connectivity for cyclists and pedestrians. Our recommendations for shared use paths can be found below (listed from north to south).

North Quincy Railroad Right of Way

As discussed in the section on the Neponset Riverwalk Extension, the former railroad ROW adjacent to the Presidents Golf Course can accommodate a trail between Granite Street in Milton and Newport Avenue in Quincy. Sections of the corridor are privately owned, including an office park with a great deal of surface parking.

Quincy Shore Drive Connector

The sole existing shared use path in Quincy runs between Quincy Shore Drive and Commander Shea Boulevard and stops a few hundred feet west of Wollaston Beach. We are recommending connecting this path to the Beach via a path along the north side of Quincy Shore Drive.

Commander Shea Boulevard

As discussed in the above section, conversion of a portion of this roadway to a shared use path can provide a key link between the Neponset Riverwalk, Boston (via the Hancock Street Bridge) and North Quincy Station.

Merrymount Park

An old road through Merrymount Park is currently a wide dirt trail. Repaving this to provide a connection through the park is recommended as part of the Quincy Spine Greenway. Excess pavement width on Merrymount Parkway can be converted to a two way cycle track.

School Connection

A new shared use path can be constructed between the School/Pleasant Street intersection and Centre Street entirely through City land or easements connecting two schools and a city park. The trail would pass through Lincoln-Hancock School, Kincaide Park, and Sterling Middle School.

MBTA Station Access

Quincy Adams MBTA station is a large, multi-level complex currently accessible only from its west side with entrances from Burgin Parkway and Centre Street. Neither of these entrances are bicycle and pedestrian friendly as the roads on this side of station are busy with auto-dominated land uses abutting them. MAPC recommends opening an east side entrance to create an access point for the large residential neighborhood between the station and Faxon park.

The lack of an entrypoint on this side currently mandates a one or more walk around the station from this neighborhood to gain access. An entry to the station already exists along Independence Avenue across from Verchild Street but is closed off by a chain linked gate. This entrance would provide a pedestrian and bicycle friendly access point to the station. A residential permit parking program or two hour parking rules could allay concerns about people driving into the neighborhood to park and utilize the station.

Appendix A– Description of Bicycle Facility Types and Design Considerations

The following are brief descriptions of the types of bicycle facilities that were considered. The list is ordered by desirability, with facilities providing the highest separation between vehicles and bicycles listed first. Complete descriptions, photos, and design guidance for these bicycle facilities can be found in the *NACTO Urban Bikeway Design Guide*.[9] In addition, the *Manual on Uniform Traffic Control Devices* (MUTCD) provides detailed design guidelines on striping for bicycle lanes and shared lanes markings.[10]

Cycle Track - A cycle track is an exclusive bicycle facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bicycle lane. A cycle track is physically separated from motor vehicle traffic and distinct from the sidewalk. A cycle track may be placed at the street level, sidewalk level, or in between. There are several potential opportunities identified in this study to include cycle tracks in discreet road segments. Classified in this report as buffered bicycle lanes (described below), these segments are listed in the Bicycle Recommendations for several of the municipalities. Because of the greater capital investment of cycle tracks, this report assumes municipalities may prefer less expensive options such as buffered bicycle lanes but encourages providing cycle tracks and physically separated bicycle facilities wherever feasible.

Figure 18: Illustrated cycle track

[9] The illustrations below depicting the various bicycle facilities are from the NACTO Urban Bikeway Design Guide, accessible online at http://nacto.org/cities-for-cycling/design-guide/
[10] See: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part9.pdf

Buffered Bicycle Lane - Buffered bicycle lanes are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. Pavement markings usually provide this buffer, and lack any sort of physical separation.

Figure 19: Illustrated buffered bicycle lanes

Bicycle Lane - A bicycle lane is defined as a portion of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists.

Figure 20: Illustrated bicycle lanes

Shared Lane - Shared lane markings (SLMs), or "sharrows," are road markings used to indicate a shared lane environment for bicycles and automobiles. Among other benefits, shared lane markings reinforce the legitimacy of bicycle traffic on the street and recommend proper bicyclist positioning. Sharrows should be marked as frequently as 100' apart and not greater than 250' apart, as well as immediately after intersections.

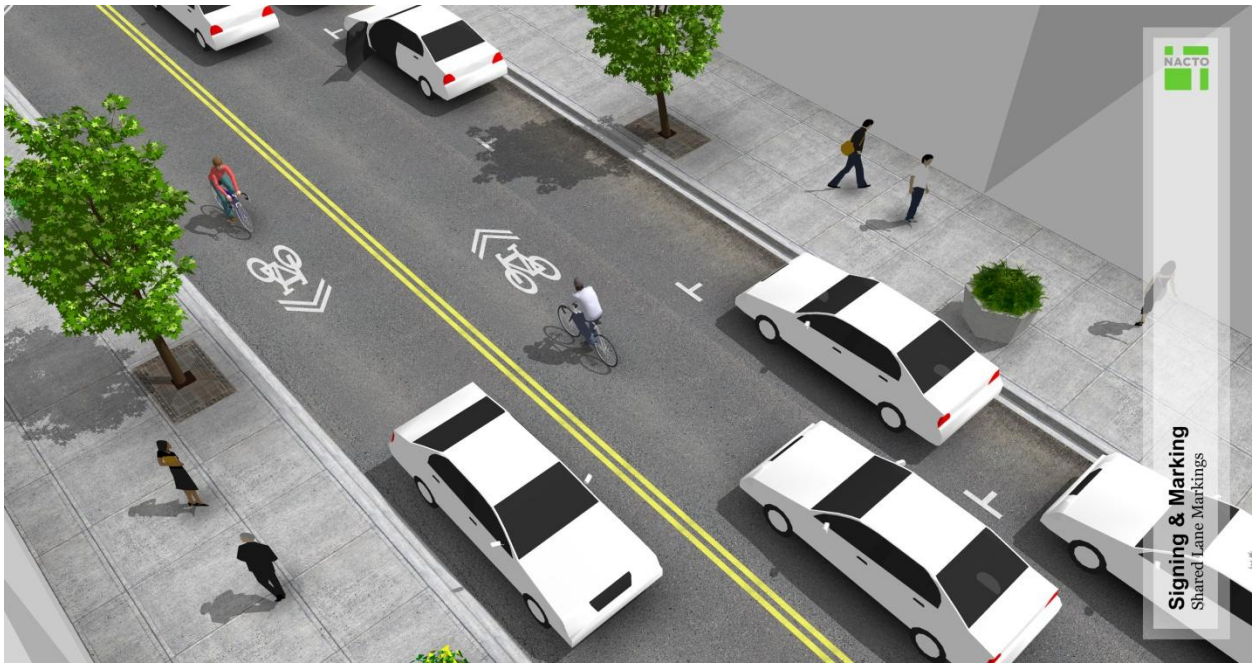


Figure 21: Illustrated shared lane markings

Signage – Signs can complement the pavement markings, further alerting motorists to the presence of bicyclists and encouraging all users to share the road. On quiet residential streets with low traffic volumes or low speed that connect to major destinations, signs can be used as a means of connecting the bicycle network through these areas without the need to install pavement markings. Signs can also be used for wayfinding purposes to various points of interest.

Figure 22: Examples of bicycle signage

Appendix B– Description of Sidewalk Design Considerations

Accessibility

Pedestrian facility design must comply with accessibility standards in the Rehabilitation Act of 1973 (Section 504) and the Americans with Disabilities Act (ADA) of 1990. ADA Standards for Accessible Design applies to all projects involving new or altered pedestrian facilities, not just projects funded by state or federal sources.

Sidewalks

Sidewalks are critical components for an effective pedestrian network. Sidewalks, provided on both sides of a street, are generally the preferred pedestrian facility and provide for a safe walking area outside the motor vehicle traffic travel-way. The preferred and most common sidewalk surface is concrete as it requires the least amount of maintenance and has a long life span. Other materials such as asphalt, brick, crushed granite/stone, or bricks and pavers may be used as long as ADA requirements are met. A minimum sidewalk width of 5 feet is encouraged to allow for two adult pedestrians to comfortably walk side-by-side. The Americans with Disabilities Act (ADA) mandates a minimum width of 3 feet of unobstructed sidewalk passageway. Reasonable flexibility exists to allow communities to adjust some dimensions to meet community goals.

Sidewalk Zones - According to Cambridge's Pedestrian Plan and depicted in Figure 23, 'Sidewalk Zones,' the sidewalk is divided into three zones: Curb Zone, Travel Zone and the Building or Comfort Zone. The width of each zone depends in part on the overall width of the sidewalk. Sufficient Curb and Building or Comfort Zones are necessary in order to maintain a usable Travel Zone.

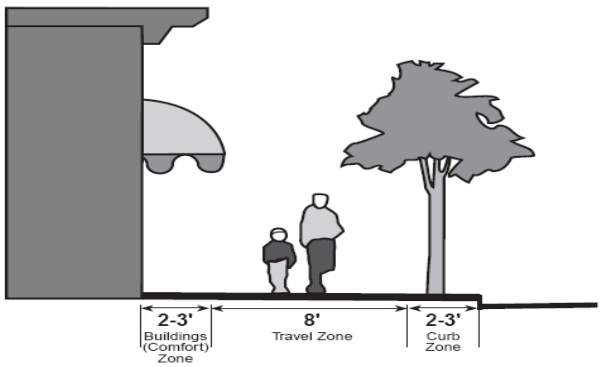


Figure 23: Cambridge, MA sidewalk zones

Lighting - Pedestrians often assume that motorists can see them at night. Without appropriate lighting motorists may not be able to see pedestrians crossing roads in time to stop. Well-designed and well-placed street lighting improves pedestrian visibility and safety.

Crosswalks - Marked crosswalks are used to help designate areas where motorists yield to pedestrians and direct pedestrians to preferred crossing points. Marked crosswalks contribute towards pedestrian safety. Ideally, marked crosswalks should be used in conjunction with other measures, such as curb extensions, advance warning signage for motorists, traffic signals and traffic calming treatments, to improve pedestrian crossing safety.

Speed tables – Speed tables are used for traffic calming and pedestrian safety. A variation of speed humps, they are often used as raised crosswalks. They typically feature a flat, elevated, textured surface running from curb to curb across a street or intersection accessed by ramps from the roadway.

Curb extensions - Curb extensions extend the sidewalk into the street, reducing the time and distance it takes a pedestrian to cross. Curb extensions can also prevent drivers from parking in front of crosswalks and blocking curb ramps.

Figure 24: Examples of curb extensions

Curb radii – Curb radii is the measurement of the sharpness of a corner at an intersection. Generally, a smaller or tighter curb radius is better for pedestrians. Compared to a large curb radius, a smaller curb radius allows for more pedestrian area at the corner, flexibility in the placement of curb ramps, shorter street crossings, requires vehicles to slow as they turn the corner, and improves sight distance between pedestrians and drivers.

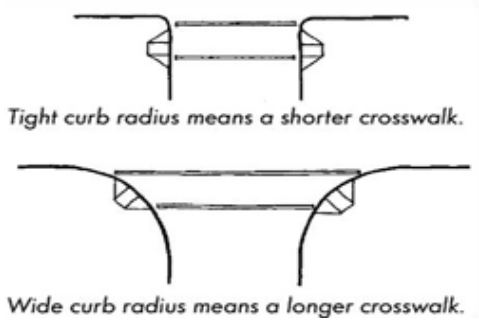


Figure 25: Curb radius illustration

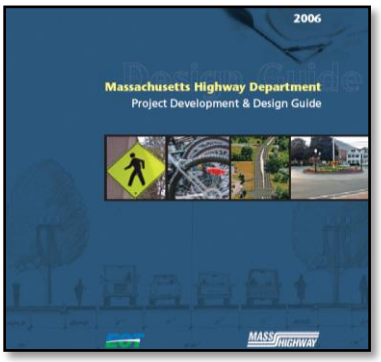
Curb ramp - Curb ramps are used wherever there is a difference in level along a path a pedestrian is traversing. They should be designed to provide an accessible route so pedestrians may safely transition from a roadway to a curbed sidewalk and vice versa.

Intersection signals - In an effort to create safe and walkable communities, different actions can be taken to help make traffic signals work well for pedestrians. Signal timing is an important component to how an intersection operates for pedestrians. Traffic signals create gaps in the traffic flow and allow pedestrians to safely cross a street. Each municipality should perform a complete inventory of its signals and ensure that the equipment is updated and properly maintained. Signals need to be designed and timed to be pedestrian friendly and allow for adequate crossing time.

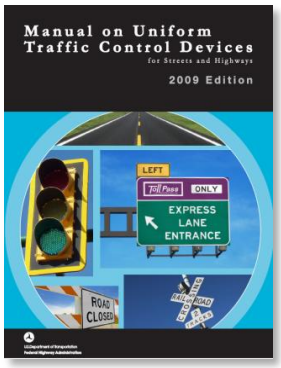
Appendix C –Facilities Design Guidelines References

MassDOT's Development and Design Guidebook[11]

The primary resource that should be adhered to is the *MassDOT Project Development and Design Guidebook*.



Multimodal accommodation that encourages and supports safe travel for pedestrians, bicyclists and other modes of travel is a key feature of the MassDOT Guidebook. The MassDOT Guidebook directs the designer to begin at the edge with the pedestrian and work their way in, to ensure that the needs of non-motorized users remain integral to project planning and design. This approach facilitates the use of context-sensitive design, environmental protection and the careful consideration of the safety and accessibility needs of pedestrians, bicyclists and non-motorized facility users.

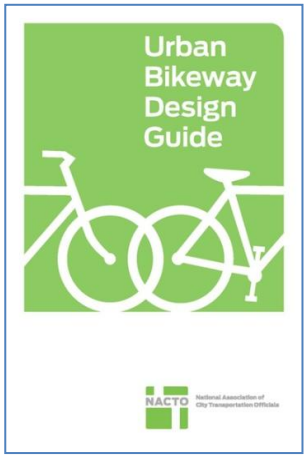


Manual on Uniform Traffic Control Devices (MUTCD)[12]

The Manual on Uniform Traffic Control Devices, or MUTCD, defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic. States must adopt the 2009 National MUTCD as their legal State standard for traffic control devices within two years.

The MUTCD gives guidelines regarding the location and frequency of crosswalk installation, how long a pedestrian should wait at an intersection before crossing, how much time a pedestrian has to cross a street as well as the design and placement of signals and striping.

NACTO Urban Bikeway Design Guide[13]

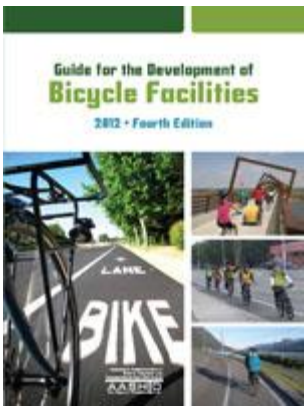


The purpose of the *NACTO Urban Bikeway Design Guide* (part of the Cities for Cycling initiative) is to provide cities with state-of-the-practice solutions that can help create complete streets that are safe and enjoyable for bicyclists.

The NACTO Urban Bikeway Design Guide is based on the experience of the best cycling cities in the world. The designs in this document were developed by cities for cities, since unique urban streets require innovative solutions. Most of these treatments are not directly referenced in the current version of the AASHTO Guide to Bikeway Facilities, although they are virtually all (with two exceptions) permitted under the Manual on Uniform Traffic Control Devices (MUTCD). The Federal Highway Administration has posted information regarding MUTCD approval status[14] of all of the bicycle related treatments in this guide and in August 2013 issued a memorandum[15] officially supporting use of the document. All of the NACTO Urban Bikeway Design Guide treatments are in use internationally and in many cities around the US.

[11] www.massdot.state.ma.us/highway/DoingBusinessWithUs/ManualsPublicationsForms/ProjectDevelopmentDesignGuide.aspx
[12] http://mutcd.fhwa.dot.gov/pdfs/2009/pdf_index.htm
[13] http://nacto.org/cities-for-cycling/design-guide/
14 http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_guidance/mutcd_bike.cfm
[15] http://nacto.org/wp-content/uploads/2013/09/design_flexibility_memorandum_092013.pdf

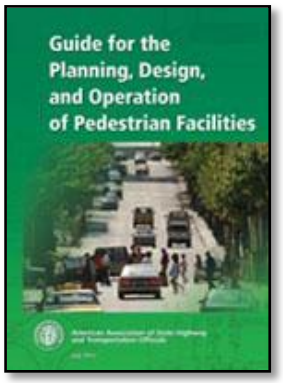
AASHTO Guide for the Development of Bicycle Facilities (2012)



This guide provides information on how to accommodate bicycle travel and operations in most riding environments. It is intended to present sound guidelines that result in facilities that meet the needs of bicyclists and other highway users. Sufficient flexibility is permitted to encourage designs that are sensitive to local context and incorporate the needs of bicyclists, pedestrians, and motorists. However, in some sections of this guide, suggested minimum dimensions are provided. These are recommended only where further deviation from desirable values could increase crash frequency or severity.

This guide has been updated from the previous guide published in 1999. The fact that new guidance is presented herein does not imply that existing bicycle facilities are inadequate or unsafe, nor does it mandate the initiation of improvement projects. The intent of this document is to provide guidance to designers and planners by referencing a recommended range of design values and describing alternative design approaches.

AASHTO's Guide for the Planning, Design and Operation of Pedestrian Facilities (2012)



The purpose of this guide is to provide guidance on the planning, design, and operation of pedestrian facilities along streets and highways. Specifically, the guide focuses on identifying effective measures for accommodating pedestrians on public rights-of-way. The AASHTO Guide is widely used in the planning and engineering industry.

Appendix D– Bicycle Network Recommendations

Street Name	Segment's Cross Streets	Curb-to-Curb Width	Paved Shoulder	Parking Lane	Travel Lane	Travel Lane	M	Travel Lane	Travel Lane	Parking lane	Paved Shoulder	Priority	Recommendations	Comments
Adams Street	a. Hancock to Alleyne	40 to 44	4	x		x		x		x		**H**	bike lanes	2014 Bike Network
Adams Street	b. Newport Ave to Presidents Lane	54		14		x		x	x		2.5	**H**	bike lanes	2014 Bike Network
Adams Street	c. Presidents Lane to Dewson	40		8.5		x		x		8		**H**	bike lane or sharrows	2014 Bike Network. Parking on narrow shoulder Adams NHS
Adams Street	d. Dewson to Whitwell	34.5	5			x		x			5	**H**	bike lanes	*2014 Bike Network*
Adams Street	e. Whitwell to Furnace Brook Pkwy	46				13		13				**H**	Bike Lanes + 1 or 2 parking lanes	*2014 Bike Network*
Adams Street	f. Furnace Brook Pwky to Milton line	46				23		23				**H**	Bike Lanes + 1 or 2 parking lanes	*2014 Bike Network*
Beale Street	a. Hancock to Cushing												sharrows	
Beale Street	b. Cushing to Newport												bike lanes	
Beale Street	c. Newport to Winthrop	30											sharrows	
Beale Street	d. Winthrop to Summit	32				16		16					bike lanes	
Beale Street	e. Summit Ave to Adams St	24				12		12					sharrows	
Billings Road	West Elm to Holmes	48		8		16		16		8			bike lanes	room for bike lanes, parking, two travel lanes
Centre St	Copeland St to Columbia	32-24											sharrows	parking restrictions in sections but also parking on both sides elsewhere
Centre St	Columbia to Quincy Adams Station	varies											bike lanes	Reduce curb radii at Burgin intersection to short crossing distance
Chickatawbut	Willard St to Quincy line	26				13		13					sharrows	Busy windy road with lots of cyclists - needs traffic calming
Coddington Street	Hancock to Spear			x		x		x					sharrows	*Adams Green Project*
Coddington Street	Spear Street to Southern Artery	44		x		x		x		x			sharrows	Next to high school
Commander Shea Blvd	Seaport Dr to Seawinds Condos	32											bike lane	*Neponset Riverwalk*
Commander Shea Blvd	Seawinds Condos to North Quincy Station	38											shared use path	*Quincy Spine Greenway* . Build cycle track on MBTA side of roadway
Dimmock Street	Hancock Street to Presidents Lane	44			x	x		x	x				bike lanes	*Quincy Spine Greenway*
Dorchester Street	East Squantum to Moon Island	35	4			12		19					bike lanes	informal parking on inland side
East Howard Street	South Street to Quincy Ave.	44	10			12		12			10		bike lanes	stripe existing shoulders as bike lanes, possibly retain one side parking
East Squantum Street	a. Hancock to Clark												sharrows	
East Squantum Street	b. Clark St to Bayfield Rd	26											sharrows	
East Squantum Street	c. Billings Street to Atlantic Street	22											sharrows	
East Squantum Street	d. Atlantic Street to Quincy Shore Dr	31											widen 3 ft paved shoulders	
East Squantum Street	e.Mosswetusset Hummock to Victory Rd	36											bike lanes	
East Squantum Street	f. Victory to Huckins	34	5			12		12			5		bike lanes	Existing road is 2 lanes with shoulders
Fenno Street	a. Quincy Shore Drive to Andrews Road	34				x		x					bike lanes	School access, sporadic parking
Fenno Street	b. Andrews Road to Thornton Street	26				x		x					sharrows	
Fenno Street	c. Thornton Street to Hancock Street	20				x		x					sharrows	
Franklin Street	School St to Presidents Ave											**H**	sharrows	*Quincy Spine Greenway*
Furnace Brook Pkwy (DCR)	a. Quincy Shore Drive to Hudson	26				13		13					sharrows	*Sea to Summit Greenway*
Furnace Brook Pkwy (DCR)	b. Hudson to Hancock	26				x		x					sharrows plus widen sidepath	*Sea to Summit Greenway* . potentially widen 5.5 foot sidepath
Furnace Brook Pkwy (DCR)	c. Hancock to Centre	36	6			12		12			6		bike lane	*Sea to Summit Greenway*. stripe bike lanes on existing shoulder
Granite Avenue (Milton)	Neponset River to Thistle				x	x		x	x				bike lanes	road diet - 4 to 3 lanes to accommodate bikes
Granite Street	a. Hancock to Burgin Parkway	34 *2			x	x	x	x	x				bike lanes	Adams Green Project
Granite Street	b. Burgin Parkway to Whitwell	63		x	x	x		x	x				bike lanes	*Quincy Spine Greenway* . Road diet - 4 to 3 lanes to accommodate bikes
Granite Street	c. Whitwell to Fort Street	40			x	x		x	x				bike lanes	*Quincy Spine Greenway* . Road diet - 4 to 3 lanes to accommodate bikes

Street Name	Segment's Cross Streets	Curb-to-Curb Width	Paved Shoulder	Parking Lane	Travel Lane	Travel Lane	M	Travel Lane	Travel Lane	Parking lane	Paved Shoulder	Priority	Recommendations	Comments
Hancock Street	a. Newport Ave to E Squantum St	46	1		11	11		11	11		1	**H**	bike lanes	*2014 Bike Network* . Road diet from 4 to 3 lanes or parking to match section to south
Hancock Street	b. E Squantum St to Furnace Brook Pkwy	42		8		13		13		8		**H**	sharrows	*2014 Bike Network*
Hancock Street	c. Furnace Brook Pwky to Dimmock/Adams	45				x		x				**H**	bike lanes	*2014 Bike Network*
Hancock Street	d. Adams to Russell Park											**H**	sharrows	*Adams Green Project*
Hancock Street	e. Russell Park to Granite St											**H**	bike lanes	*Adams Green Project*
Hancock Street	f. Granite Street to School St	44		x		x		x		x		**H**	sharrows	*2014 Bike Network*
Harvard Street	West Squantum Street to Sherman Street	26				13		13					sharrows	
Harvard Street	Sherman Street to Beale Street	32	4			12		12			4		bike lanes?	parking on narrow shoulder
Howard Street	Quincy Ave. to Braintree Border		x			x		x			x		bike lanes	
Independence Ave	Franklin St to Braintree line											**H**	sharrows	*2014 Bike Network*
McGrath Hwy (Revere Rd)	Granite St to Southern Artery	26.5 * 2			x	x	x	x	x				bike lanes	in next striping cycling, narrow travel lanes to add bike lanes
Merrymount Parkway	Furnace Brook Pkwy to Hancock	48		7.5		16.5		16.5		7.5			cycle track	*Quincy Spine Greenway* . Two way cycle track on north side of parkway
Quarry St	a. Stedman to Furnace Brook Pkwy	39	1			18		18			1		bike lane	some street parking
Quarry St	b. Furnace Brook Pkwy to top of hill	40				20		20						
Quarry St	c. Top of hill to Granite	40			10	10		10	10				bike lane	Road diet 4 to 3 lanes and bike lanes
Quincy Shore Drive (DCR)	a. East Squantum to Fenno	48 *	2		11	11		11	11		2		sharrows short term, cycle track future	Future road diet 4 lanes to 2 lanes with turn lane, cycle track
Quincy Shore Drive (DCR)	b. Fenno to Furnace Brook				12	12		12	12				sharrows short term, cycle track future	future move traffic to inner carraigeway, outer carraigeway for cycling/walking, greenspace
Quincy Shore Drive (DCR)	c. Furnace Brook to Sea Street	40											bike lanes	eliminate unused painted median to provide bike lanes
Russell Park	Southern Artery to Woodward	40											bike lanes	bike access to high school, formalize parking on one side only
Russell Park	Woodward Ave. to Hancock Street	52		8		12	x	12		8			sharrows	access to high school
School Street	a. Fort Street to Stevens Street	30				x		x					bike lanes	
School Street	b. Stevens Street to Franklin Street	44				x		x					bike lanes	
School Street	c. Franklin Street to Hancock Street	43.5		x		x		x		x		**H**	sharrows	*2014 Bike Network*
Sea Street	Quincy Shore Dr to Babcock St	44			12	12		12	12				bike lanes	road diet - reduce to two lanes, plus bike lanes and turn lane where needed
South Street	Washington Street to Cleverly Court	34	4			15		15			4		bike lanes	stripe existing shoulders as bike lanes
Southern Artery	Furnace Brook Pkwy to Russell St	40	8			x		x			7		bike lanes	establish parking on one side of street only
Southern Artery	Washington St to Quincy Ave	40				x		x					bike lanes	
Washington Street	Coddington St to Southern Artery	50		14		11		11		14		**H**	bike lanes	2014 Bike Network. Convert extra parking lane width space to bike lanes
Washington Street	Southern Artery to Fore River Bridge	50			14	11		11	14			**H**	bike lanes	2014 Bike Network. Short term 4 ft bike lanes, future road diet - 4 to 3 lanes
Water Street	Franklin to Pleasant												bike lanes	
West St	Centre to Willard	26				x		x					sharrows	*Sea to Summit Greenway*
West Squantum Street	a. Hancock to Fayette St												sharrows	
West Squantum Street	b. Fayette Street to Harvard Street	32	4			12		12			4		bike lanes	some curb cut issues
West Squantum Street	c. Harvard Street to Milton Line	38	6			13		13			6		bike lanes	bus stops, potential ad-hoc parking
Whitwell	a. Adams to Farrell	34	4			13		13			4		bike lanes	stripe bike lanes on existing shoulder
Whitwell	b. Farrell to Cranch	40	8			12		12			8		sharrows	some parking on both sides here
Whitwell	c. Cranch to Granite	28	2			12		12			2		sharrows	
Willard St	a. Ben Robertson - Copeland	32				17							bike lane	
Willard St	b. Wampatuck Rd to West St	34	5			12		12			5		bike lanes	stripe bike lanes on existing shoulder
Willard St	c. West St to Chickatawbut Rd	34				17		17					bike lanes	
Wampatuck Rd	Willard St to Chickatawbut Rd	28											center line removal or shared lane	Rotary bypass

Appendix E– Maps

First Map – Bicycle and Pedestrian Network Plan Complete Recommendations

Second Map – Priority Network Recommendations

Third Map – Roadway Functional Class

2014 Quincy

Bicycle & Pedestrian Network Plan

Regional facilities
- Regional Greenway (proposed)
- Regional walking trail (proposed)

	Proposed	Existing
Shared-use paths		
Improved path	------	———
Unimproved path	------	———
Bicycle facilities (on-road)		
Cycle track	------	———
Bike lane	------	———
Shared lane	------	———
On-road route	------	———
Walking facilities		
Walking path or trail	------	———
Water facilities		
Water trail	------	———

- Building
- Municipal boundary
- Water body
- Open space
- Quincy-owned Parcel

Data Sources: MAPC, MassGIS, MassDOT

June, 2014

0 1,000 Feet

N W E S

MAPC 50 YEARS
METROPOLITAN AREA PLANNING COUNCIL
SMART GROWTH AND REGIONAL COLLABORATION

Quincy

Priority Recommendations
Bicycle and Pedestrian
Network

	Proposed	Existing
Shared-use paths		
Improved path		
Unimproved path		
Bicycle facilities (on-road)		
Cycle track		
Bike lane		
Shared lane		
On-road route		
Walking facilities		
Walking path or trail		

Municipal boundary
Water body
Open space
Quincy-owned Parcel

Data Sources: MAPC, MassGIS, MassDOT

November, 2013

0 2,000 Feet

N W E S

MAPC 50 YEARS
METROPOLITAN AREA PLANNING COUNCIL
SMART GROWTH AND REGIONAL COLLABORATION

Figure 267: Priority Network Recommendations

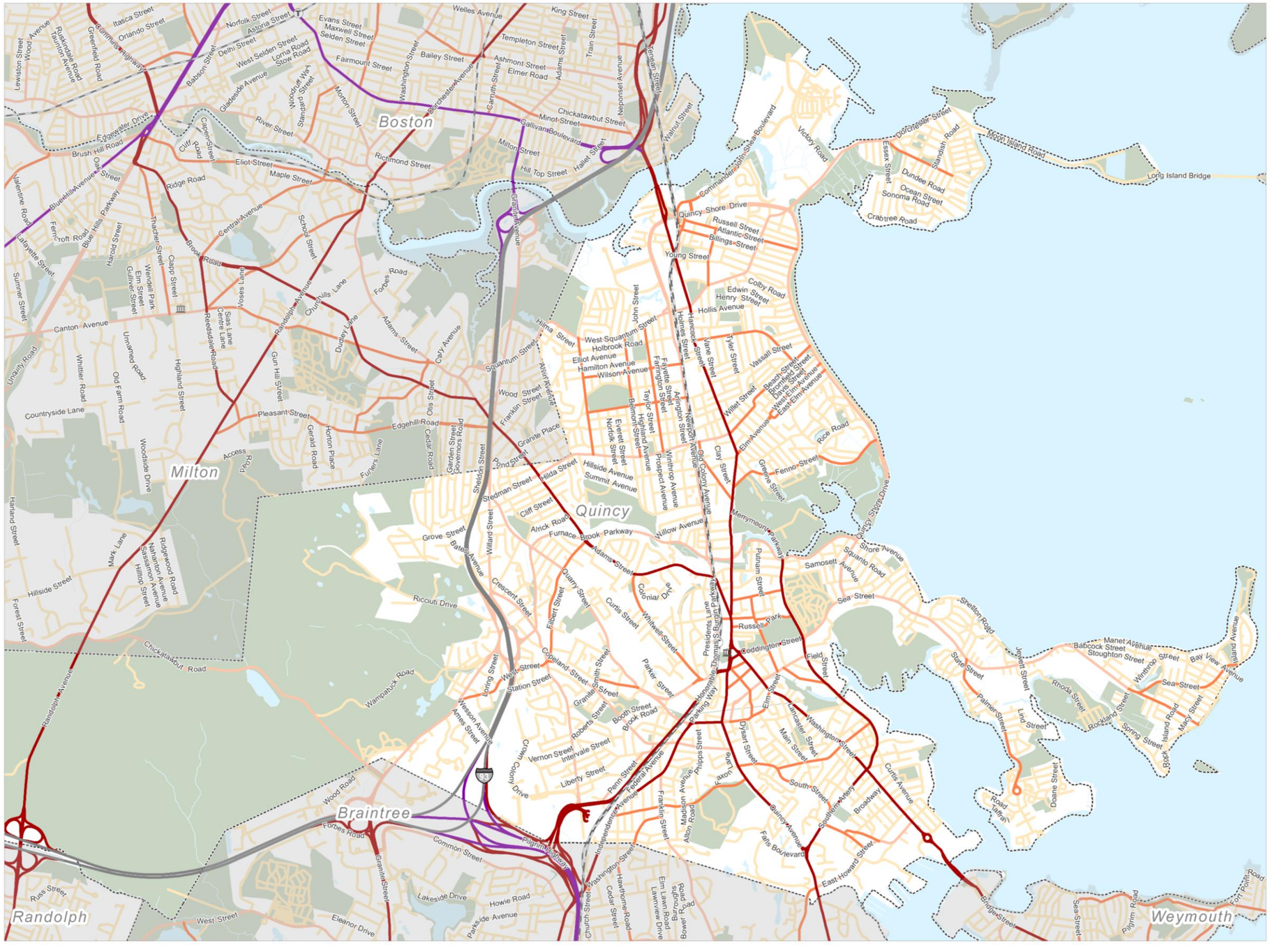


Figure 27: Roadway Functional Class Map