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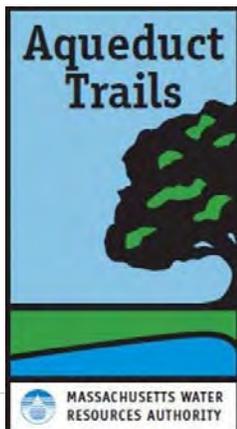
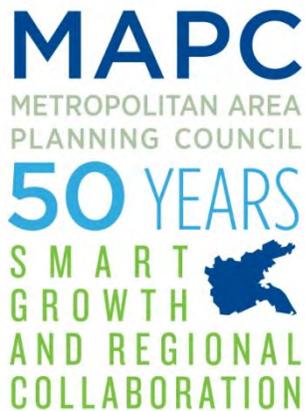
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## Aqueduct Trail Network Development in Metro Boston

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## **Abstract**

The Massachusetts Water Resources Authority (MWRA) and the Metropolitan Area Planning Council (MAPC) are collaborating with associated cities and towns to open up 40 + miles of existing and former aqueduct right-of-ways are available to be permitted for public access for the first time in the western suburbs of Boston. Four aqueducts are being considered for public access.

The first one-mile section along the Weston Aqueduct in Framingham opened to the public in October 2012. By eventually connecting these aqueducts with existing trail systems, we are ultimately creating a 50+ mile continuous greenway network, primarily using existing public land permitted at no cost to municipalities, requiring minimal investment, and creating a maintenance partnership between the MWRA and cities and towns.

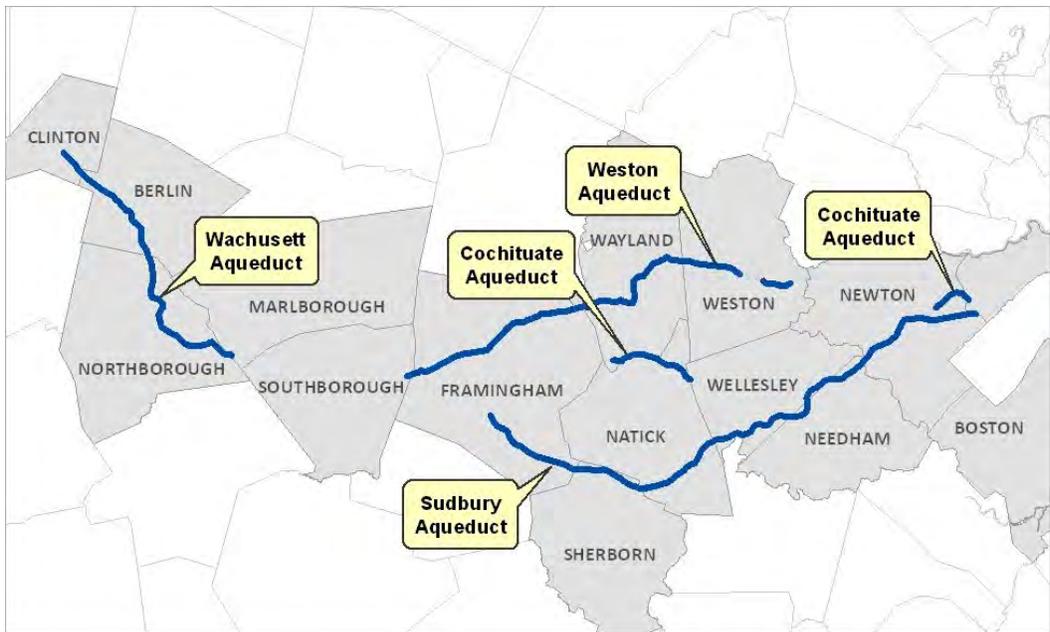
The MWRA is working with each of the communities to issue public access permits. Each town will be able to conduct limited improvements to the right-of-way to allow for improved hiking, cycling, and dog-walking activities. A number of schools are adjacent or close to the aqueduct corridors and will provide car-free access for children to walk between school and home. Sections of these aqueduct corridors have been used as informal trails for a number of years. Under the new policy, public access activities will now be authorized and maintenance responsibilities will be split between the MWRA and municipalities.

MAPC is working with each of the communities to connect the disjointed aqueduct segments into a seamless, continuous, connected greenway network. Working through each town's public process, MAPC is identifying the trail segments that will connect with existing regional rail trails, including the circumferential Bay Circuit Trail around Boston and numerous others. MAPC expects to complete an implementation plan in 2013 that identifies the proposed alignment of the completed aqueduct trail network system.

## **Introduction**

The Massachusetts Water Resources Authority (MWRA) and the Metropolitan Area Planning Council (MAPC) are collaborating with associated cities and towns to open up 40 + miles of existing and former aqueduct right-of-ways are available to be permitted for public access for the first time in the western suburbs of Boston. Four aqueducts are being considered for public access. THE MWRA, led by Executive Director Fred Laskey, is an independent authority that provides wholesale water and wastewater services to 2.5 million people. The entire system of aqueduct trails, rail trails, and trails along rivers will eventually form the planned metro greenway system.

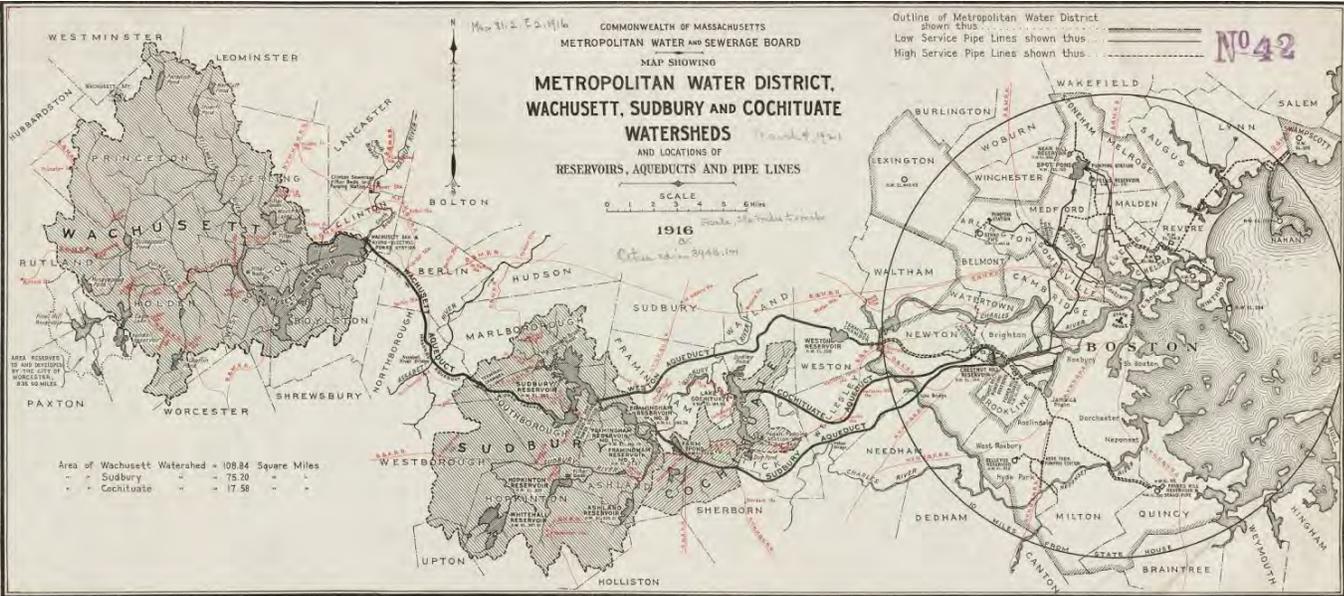
The aqueducts under consideration in this program are noted in the following figure.



**AQUEDUCTS AVAILABLE FOR PUBLIC ACCESS**

**Aqueduct Description and History**

The history of the aqueducts dates back to 1846, when construction started on the Cochituate Aqueduct bringin water from Lake Cochituate in Natick to the City of Boston. In flat areas, the aqueducts are located a few feet underground in a raised berm. Tunnel sections and bridges were constructed where topography and water bodies required additional structures to avoid the need for mechanical pumping.



**HISTORIC MAP OF AQUEDUCTS – 1916**

### **Cochituate Aqueduct – 1846**

Lake Cochituate, originally known as Long Pond, was first considered as a water source as early as 1834. By 1845, the city of Boston, after years of consideration, settled on Lake Cochituate as a water source for the city. The Cochituate water system included the lake and Dug, Dudley and Fisk ponds.

Today, the lake is a state park, operated by the Department of Conservation and Recreation. The Town of Wellesley and City of Newton have care and control of the Cochituate right-of-way and have established trails open to the public. MAPC will be working with the municipalities to include them in the aqueduct trail network.

### **Sudbury Aqueduct – 1875**

The Sudbury Aqueduct was built from 1875 to 1878 and begins at Farm Pond in Framingham and runs eastward for 16 ½ miles to Chestnut Hill Reservoir in Boston. Built at an incline to avoid pumping, towards Boston of one foot per mile, at capacity, the aqueduct carried 80,000,000 gals/day.

The Aqueduct and its structures including tunnels, bridges, and gatehouses, are listed on the State and National Registers of Historic Places.

Waban Bridge, which spans the Charles River in Wellesley, is 536 feet long, 40 feet high, and includes nine semi-circular arches, each with a 22-foot, 4-inch radius. It was built to carry the Sudbury Aqueduct across a valley. The conduit, lined with cement, crosses the bridge in a well featuring a flagstone bottom and brick sidewalls that are topped with a decorative iron fence.

Echo Bridge, officially known as the Charles River Bridge, spans the Charles River and Ellis Street, connecting the city of Newton and the town of Needham. Echo Bridge is primarily an aqueduct built to



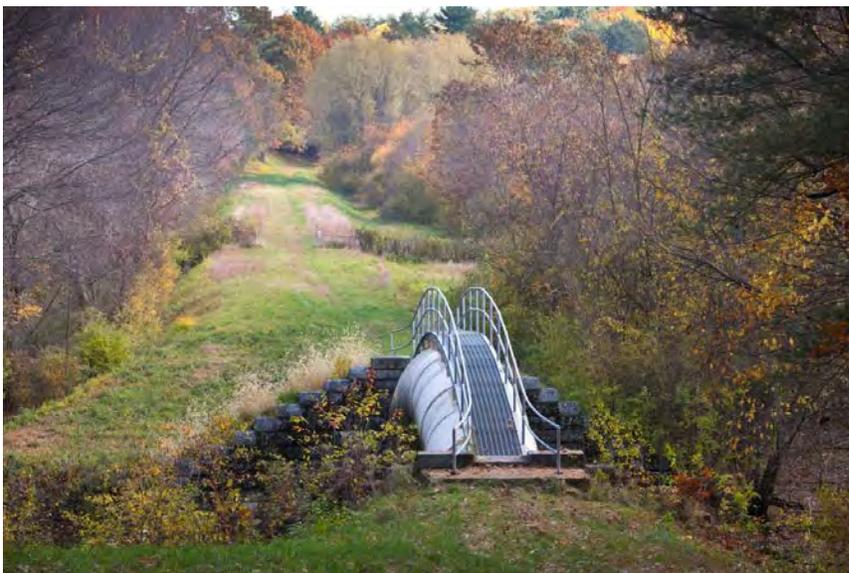
carry water from the Sudbury River to Boston. Constructed in 1876, the stone and brick bridge is 475 feet long and 19 feet wide, with seven stone arches.

The arches vary in span from 127 to 28 feet in length, and are 19 feet wide with seven stone arches. The 127-foot arch was recognized in 1988 as the second longest span in North America and one of the largest stone arches in the world.

The Sudbury Aqueduct was taken out of daily service in 1974 because of poor water quality but is used occasionally to dump water into the Charles River via Lake Cochituate and the Cochituate Aqueduct when the Charles is too low. In May 2010, MWRA activated the Sudbury Aqueduct during a water transmission emergency. In the future, MWRA plans to upgrade and pressurize portions of the alignment by sliplining the brick and mortar aqueduct.

### **Wachusett Aqueduct – 1896**

First built by Metropolitan Water Board, the Wachusett Aqueduct began construction in 1896 and was completed in 1898 at 12 miles long. Its construction marked the first phase of taking water from the south branch of the Nashua River to supply the water needs of Metropolitan Boston. Completion of the Wachusett Reservoir Dam in 1906 and 1907 created what became the principal water source for the Metro Boston area until completion of the Quabbin Reservoir in the 1940s. The Wachusett Aqueduct was removed from service when the Wachusett-Marlborough Tunnel came online in the 1960s.



### **Weston Aqueduct – 1896**

Between 1901 and 1903, the Metropolitan Water and Sewerage Board constructed the Weston aqueduct, 13.5 miles long from Sudbury Reservoir in Southborough to the Town of Weston including Weston Reservoir. The aqueduct is a brick and mortar horseshoe shaped conduit.

Although the aqueduct corridors have been informally used as trails for many years, official MWRA policy has not historically allowed public access on their property except in limited locations. Most sections of the aqueduct have been fenced off with no trespassing signs. The new MWRA policy on access changes all of this.

## MWRA Policy on Access

In May 2012, the MWRA announced a new public access policy for aqueduct right-of-ways, officially allowing the 14 municipalities along the aqueduct rights-of-way to apply for public access.

“GOAL - To protect and preserve existing lands under the care and control of MWRA for water supply purposes, while authorizing and permitting public access consistent with good water supply practices. MWRA recognizes the importance of enhancing public access and public involvement in its facilities as a means of improving its own performance in facilities maintenance and building support from its ratepayers.”

In 1998, the MWRA in cooperation with MAPC and the communities commissioned a feasibility study on authorizing public access to retired aqueduct right-of-ways. The report included discussion on the types of appropriate uses and the legal, jurisdictional and management decisions that would be required to establish such a policy.

In the intervening years, MWRA has established formal agreements with a few host communities in the form of 8(m) permits and a Memorandum of Understanding to allow public access to land under their control. It is important to note that each location has unique characteristics and therefore requires the necessary flexibility to address those characteristics, which will be accomplished by customizing the terms of MWRA’s required 8(m) permit to be issued for each community.



In 2010, a subcommittee, chaired by Board Member Joel Barrera, was established by the MWRA Board of Directors to develop the parameters for public access. The Committee expressed the opinion that more eyes and ears by the public while using the right-of-ways would provide additional safety and security for the water system. There was a broad recognition that there would be a great public benefit from opening the trails to the communities.

In May 2012, the MWRA Board of Directors, led by its Chairman Secretary Richard Sullivan, voted to approve a formal public access policy with guidelines. Since the policy has been announced, MWRA and MAPC have been working with individual communities and are in various stages of executing permits for each community. Framingham and Natick have permits.

Wellesley, Northborough, and Weston are pending. The remaining communities have initiated the permit process.

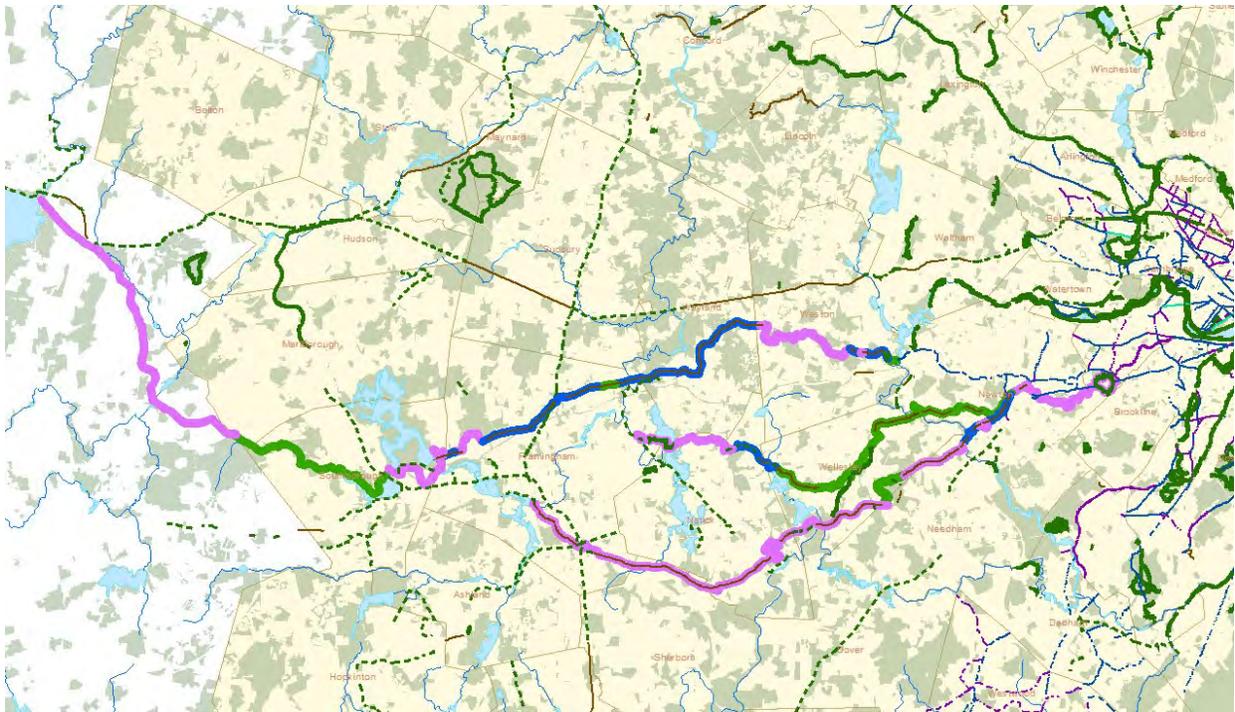
### MAPC Aqueduct Trail Planning

The Metropolitan Area Planning Council is working with each of the 14 communities to connect the disjointed aqueduct segments into a trail network. A number of gaps in the aqueduct network still exist, requiring alternate trail routes. These include:

- **Tunnels.** Land above the tunnels are often developed with other uses, primarily housing.
- **Private Property.** The MWRA owns in fee most of the Weston and Wachusett Aqueducts. However, the Sudbury Aqueduct has numerous sections that are privately owned and feature easements.
- **Highways.** Aqueducts run under interstate highways in several locations.
- **Street Crossings.** Crosswalks and/or signals may need to be provided at street crossings.

Working through each town's often unique and respective public process, MAPC is identifying the trail segments where the eventual aqueduct trail network will connect with regional rail trails and the circumferential Bay Circuit Trail around Boston. An implementation plan will be completed in early 2013, identifying the proposed alignment of the completed Aqueduct trail network system.

The map below shows the current status of the proposed complete trail network. Open sections are indicated in green, planned sections in blue, and proposed locations in purple at the time of this writing. MAPC will work with each of the communities through 2013 to open as many aqueduct sections as possible, or to confirm the alignment of alternate sections.



## PLANNED NETWORK WITH REGIONAL TRAILS

### Opening Day

On October 22, 2012, the first section of aqueduct trail under the new policy was opened for public use. The one-mile section is located in Framingham on the Weston Aqueduct. Support for this groundbreaking event was generously provided through the Community Transformation Grant (CTG) program—a Centers for Disease Control and Prevention (CDC) grant aimed at tackling the root causes of chronic illness such as smoking, poor diet, and physical inactivity under the Massachusetts Department of Public Health (MDPH).

Additional sections of the aqueduct are scheduled to open in 2013, with the goal of completely opening the Weston aqueduct trail in Weston, Wayland, and Framingham by the end of the year.

To celebrate the opening of the first section of trail, MAPC prepared a [3-minute video](#) describing the benefits of the future trail network.



### **OPENING DAY IN FRAMINGHAM, OCTOBER 2012**

The presenters would like to acknowledge and thank the work of trail advocates, legislators, municipal officials, MWRA Board of Directors and staff and the staff at MAPC for a successful kick-off to a program and policy that will have long lasting positive benefits to the Commonwealth.