

FINAL

MEMORANDUM

TO: Luba Zhaurova
FROM: Eugene R. Bolinger, RLA
DATE: November 29, 2012
SUBJECT: Cochituate Aqueduct Trail | Project Summary

Introduction

The Cochituate Aqueduct Trail (CAT) corridor analyzed under this effort extends approximately 5,525 linear feet (a little more than 1 mile) from the Natick/Wellesley town line just south of Oxford Street to a point located just southwest of Huron Drive. The condition of the pathway is quite varied, with sections that are easily accessed and traversed and other sections that are difficult to even discern in the landscape. We also examined an offshoot of the Aqueduct Trail that passes through the Town of Natick's Pine Oak Wells property with a potential connection to Bradford Road and the Wethersfield Neighborhood. For the purposes of discussion and reference, we have broken the Aqueduct Trail into four segments as indicated below:

Segment	From	Corridor Length in Feet	Corridor Width in Feet	Elevation (*)	General Description
A	Natick/Wellesley Town Line to Oxford Street	840	80 - 130	135 - 140	Highly visible, easily accessible and easily traversed with a stable dirt and pine needle surface. Links to open trail and meadow area in Wellesley near Overbrook Drive.
B	Oxford Street to Oak Street	2,875	80 - 320	135 - 150	Not visible, not very accessible, highly overgrown with multiple wetlands crossings, invasive vegetation, blocked drainage systems, varied terrain and dumping of debris prevalent.

C	Oak Street to southwest of Erie Drive and Huron Drive	1,810	90 - 140	135 - 140	Not highly visible, not easily accessed from the Oak Street and Erie Drive intersection, with a stable dirt and pine needle surface and comfortable containment by adjacent side slopes.
D	Main CAT through the Pine Oak Wells Property	1,320	N/A	135 - 140	Highly visible and accessible (although gated) gravel surfaced driveway system for the Pine Oaks Well property, wetlands crossing needed if connection to Bradford Road is desired.

(*) Feet above sea level using Natick GIS Mapping

Segment A, B and C are part of the actual Cochituate Aqueduct corridor and owned by the MWRA. Through an 8M permitting process, the MWRA has made over 40 miles of aqueduct corridors (including this one) in nearly a dozen communities throughout the western suburbs of Boston available for public use and enjoyment under long-term lease agreements. Segment D is owned by the Town of Natick.



Photo at left showing a well-defined trail section located south of Oxford Street. In the photo at the right, the trail begins to lose some definition along a segment located north of Oxford Street.

Access to the Trail Corridor

Access onto the trail corridor is presently available at the following locations:

- Overbrook Drive (Wellesley)
- Oxford Street
- Rathbun Road
- Oak Street
- Erie Drive
- Huron Drive (easement connecting Huron Drive to the Cochituate Aqueduct Trail corridor)

Access is clearly defined and fairly manageable at Oxford Street (connecting only to the trail corridor to the south) and at Huron Drive via the right of way to the Pine Oaks Well Fields. At all other locations (particularly during warm weather seasons with leaves on all deciduous trees), access is not clearly articulated and may be challenging due to changes in elevations.

In order to improve access onto the trail corridor, several utility rights of way from Peterson Road and from Whittier Road Extension might be considered. Also, town-owned parcels at 12 Whittier Road Extension and 63 Off Wellesley Road might potentially be used to access the trail. In addition, there are several parcels of undeveloped land designated as being owned by National Lumber Company of Wellesley that might provide a connection between Wellesley Road Extension and the trail corridor.

Abutters

There are both residential and commercial abutters to the Cochituate Aqueduct Trail. Some of the abutter properties are undeveloped and contain no structures, particularly along the eastern side of Wellesley Road Extension (western side of the trail). A summary of the properties containing structures (starting at the southeastern end of the trail and moving northwesterly) is as follows:

Street Addresses	# of Residential Abutters	# of Commercial Abutters
Byron Road	2	
Upland Road	4	
Westwood Road	1	
Oxford Street	3	
Peterson Road	15	
Wellesley Road Extension	1	
Whittier Road Extension	3	
Oak Street	3	
Michigan Drive		3
Huron Drive		5

The majority of residential abutters are located on Peterson Road, to the east of the Cochituate Aqueduct Trail. Many of the properties contain deep (long) and heavily vegetated back yards. Views to the back of residences are largely blocked by this vegetation and the vegetation contained within the trail corridor itself. The density of this vegetative buffer varies seasonally since leaves drop from the canopies of deciduous species for six months each year. Commercial properties located to the northwestern end of the trail are largely blocked from view by dense vegetation and changes in elevation.

As opportunities for formalizing access to the Cochituate Aqueduct Trail corridor are further explored, it will be important to reach out to abutters for their input.

Use Precedents

The most heavily used segments of the Corridor appear to be Segment A, which is cleared and well established and where walkers are frequently encountered; and Segment C, which is cleared to a lesser degree but still fairly well established with visible signs of use. Segment B is the most undeveloped and heavily vegetated with frequent wetland crossings and topographic changes. Debris (mostly yard waste from adjacent properties) also precludes access in places. There are limited stretches of defined pathway within this area, and in general access and use seems lower compared to trail segments A and C.

Street Crossings

The Cochituate Aqueduct Trail corridor crosses several public streets including:

- Oxford Street
- Rathbun Road
- Oak Street

Oxford Street and Rathbun Road appear to be fairly low traffic volume residential streets that connect to limited geographic areas within both Natick and Wellesley. Oak Street is a major local connector with heavy traffic volumes throughout the day, but particularly during morning and afternoon rush hours. Oak Street has undergone full reconstruction, with new roadway surfaces, curb lines and drainage systems being installed at the location where the corridor crosses. A pedestrian activated signal would need to be installed at Oak Street in order to allow safe crossing by future trail users.



A new sidewalk has been included along the western side of the newly reconstructed Oak Street corridor (to the right in the photo above). Logically, a leg of the Cochituate Aqueduct Trail would follow this new sidewalk in order to connect trail Segments B and C.

Topography and ADA Compliance

Although the total change in elevation from one end of the trail corridor to the other is less than 20 feet (over slightly more than a mile of total corridor length) there are several fairly

dramatic and localized changes in elevation that require attention in order to ensure ADA compliance. The locations include:

- Oxford Street (south side)
- Segment B (through the approximate middle of this segment)
- Rathbun Road
- Oak Street (connecting to the trail corridor to the west near the corner of Erie Drive)

In addition, trails would have to be constructed over numerous drainage swales and wetland resource areas in order to provide access and ensure ADA compliance.



Views (from left to right) of a hill that would need to be traversed, a narrow wetlands crossing and a more significant wetlands crossing at the Pine Oak Town Wells property (Segment D) and of a stagnant wetland areas caused by a blocked drain

Wetlands Crossings

Within Segment B, numerous wetlands crossings would be required. Crossings would extend from as little as 5 or 6 feet in length to perhaps as much as 40 to 60 feet in length. The length of a potential crossing will be based on the actual, confirmed width of the wetlands resource area that needs to be crossed. Specific wetlands delineations were not undertaken as part of this effort, but the need for between 6 and 7 crossings is estimated.

Typical wetlands crossings could be accomplished through the installation of simple boardwalks, perhaps 6 feet in width and of the length required to cross the actual drainage way or resource area.

Debris

All corridor segments have been impacted by the dumping of mostly yard waste from both residential and commercial abutter properties. In places, debris precludes access along the corridor. In order to make the corridor visible and passible, large piles of debris would have to be removed from the premises.



A view looking north along the corridor at Oxford Street where vegetative debris precludes access

Vegetation

Vegetation of various qualities, types and ages can be found throughout the trail corridor. Within southeastern and northwestern segments, there is a comfortable absence of understory vegetation with soaring and mature white pines providing an open, airy pedestrian envelope below the high canopy. Within Segment B, invasive vegetation is prevalent and a dense understory of shrubs can be found, including lots of wetland species within the resource areas that dot the middle section of this trail segment. In addition, large wetland complexes are located adjacent to the trail corridor as noted on project mapping and as shown in the accompanying photos.

In conjunction with providing more formal public access and use a vegetative management program would need to be undertaken.



Soaring white pines can be found throughout the length of the corridor and large wetlands resource areas are located adjacent to the corridor

Parking

At this time, parking does not appear to be a major consideration or a major concern. It is expected that the vast majority of users would arrive at the trail on foot, from surrounding neighborhoods. The rather short length of the trail and the relative obscurity of the trail from a

geographic perspective are probably indicators that few users are likely to arrive by vehicle. But the situation should be monitored and if residents were to begin noticing the storage of cars at various locations near the corridor, this should be reported. Some nearby streets are narrow and parallel parking could create some conflicts.

Should parking become a priority, several opportunities could be considered including:

- Installation of on-street parking (angled or parallel) near the intersection of Erie Drive and Oak Street. At this this location, Erie Drive is sufficiently wide to accommodate 6 or 8 parking spaces.
- Shared-use parking at the Pine Street Post Office location, which is reported to be closing.
- Other shared-use off-street parking or on-street parking within the corporate park area of Huron Drive, near the right-of-way that leads to the Trail and to the Pine Oaks Wells property.

Linkages to Other Open Space Assets

There is a trend in municipal recreation and open space planning and design circles to establish extensive, integrated, multi-use trail systems. Just like having good schools, having an expansive park and open space network with a variety of options for activity can be a selling point for a community and for individual neighborhoods or individual properties. Many surrounding communities have made significant gains in this regard and in fact Natick has an evolving and expanding system of trails and paths. The “Natick Walking Map” which is available on the Town’s website lists many trails that are open for public use and enjoyment. The map is dated 2004 and may require updating.

There are numerous potential linkages to the Cochituate Aqueduct Trail that could be explored as summarized below.

Bradford Road- Direct connection to and from the Cochituate Aqueduct trail by use of already developed paths and drives through the Pine Oak Wells property and by constructing a pedestrian bridge across a stream that feeds into Pickerel Pond.

Pickerel Pond Southerly to Route 9- Direct connection to Cochituate Aqueduct trail by use of the Pine Oak Wells property with connections to town-owned open space assets surrounding Pickerel Pond and connecting all the way southerly to Route 9.

Hunnewell Town Forest- It should be noted that the Hunnewell Town Forest extends northerly to Route 9 to a point directly across from the town-owned open space parcels located to the south of Pickerel Pond, as referenced above. Route 9 forms a major barrier to creating this connection, to the point that a pedestrian overpass might be the only option. There are over 3 miles of trails within the Town Forest.

Cochituate Aqueduct Wellesley- the Cochituate Aqueduct extends southeasterly from the Natick/Wellesley Town line to Route 9. Much of this corridor section is overgrown. To the south of Route 9,



Wellesley has formally established a walking trail that leads toward the Town Center. As in the potential Hunnewell Town Forest link referenced above, Route 9 forms a major barrier to making this connection.

Winter Woods- Located just north of Tech Circle, this open space asset contains .7 miles of walking trails. On street links from the Cochituate Aqueduct Trail in the vicinity of Oak Street and Tech Circle could be explored to make this connection.

Scope of Likely Improvements

In order to make the entire trail corridor safe and accessible and usable, the following summary list identifies the types of improvements that would need to be undertaken. Since certain legs of the trail are already largely open and available for use, initial improvements within those segments (A and C) might be quite limited. It is envisioned that the trail would be limited to pedestrian use and include largely soft surfaces (stonedust, stabilized gravels) and limited asphalt or permeable asphalt pavement within high use or steeply sloping areas.

- Grading and trail construction (various surface types)
- Trailheads at key locations to include at least signage, fencing and railings and potentially to also include benches, track receptacles, etc.
- Wetlands (using boardwalks) crossings within Trail Segment B
- Roadway crossings
- Pedestrian signal at Oak Street
- Cleaning, repair or replacement of various culverts (many have been observed to be blocked or otherwise malfunctioning)
- Vegetation management
- Debris removal



Precedent images from a recreational trail system in a neighboring community.

Methods of Construction

It is also important to note that the method by which eventual improvements are undertaken can dramatically impact potential costs. For instance, certain work efforts could be undertaken by volunteers or through the assistance of local corporations or non-profits. Work could also be undertaken by Town forces using town purchased equipment/materials or by contractors who bid on annual public works type projects or by contractors who bid on typical public design, permit, bid and construct projects. In order to establish even budgetary costs, the methods of constructing the various trail elements needs to be determined and an initial design effort (beyond the scope of this initially feasibility study) would need to be undertaken in order to more clearly articulate the initial scope of intended improvements.

Permitting and Design Process

Notice of Intent- In order to implement improvements along the Cochituate Aqueduct Trail, the filing of a Notice of Intent (NOI) with the Natick Conservation Commission will be required. When filed, an NOI is also submitted to the Massachusetts Department of Environmental Protection. Final design plans are typically developed in order to support the NOI filing. Plans would identify all desired improvements and mitigation measures that are intended to protect wetland resource areas. In general, wetlands issues of interest to the Conservation Commission would include:

- Work proposed within or across wetland resource areas (in our case the trail passes across small creeks and drainage ways and through wetlands).
- Work within buffer zones adjacent to wetland resources areas (in our case the trail and work related to its construction would occur within the 100 foot buffer zone that surrounds wetland resource areas.
- Any other work that might have a potential impact to a resource protected under the Wetlands Protection Act and which therefore falls under the jurisdiction of the Natick Conservation Commission.

Design Process- for a project of this nature it would be typical to undertake a process that involves retaining a professional engineering, landscape architectural or environmental consultant for the purposes of preparing plans, specifications and estimates for the full range of desired improvements. Parts of the design process are likely to include:

- On the ground survey
- Wetlands delineation
- Basemap preparation
- Preliminary design
- Final design
- Permitting
- Advertising and bidding
- Construction oversight

Public Hearing and Conclusions

At a public hearing on October 9, 2012 several dozen residents came out to listen to a presentation concerning the feasibility of establishing a trail along the former Cochituate Aqueduct corridor. Most attendees were residents who owned properties abutting the proposed trail alignment or own properties located nearby. A few attendees were open space and recreational trail advocates. One abutter spoke against the concept and others raised concerns about the potential for vandalism, loss of privacy and trash accumulation. After all questions and concerns were addressed, most attendees seemed generally supportive of the concept.

Upon completing this initial phase of study, it is apparent that constructing a recreational trail along the former Cochituate Aqueduct corridor, and in fact through the Town's Pine Oak Wells property, is quite feasible as summarized below:

- Development of a trail is a low intensity use. The vast majority of the aqueduct corridor would remain untouched, and vegetation removals would be limited.
- Grading would be limited to the extent needed to install a 5 or 6 foot wide trail.
- Trail surfacing can be a combination of loose material such as stonedust with limited use of porous asphalt pavement at steeper slopes or within higher use zones.
- The trail alignment can meander in places in order to limit wetlands impacts and in order to traverse the few steeper trail sections, primarily toward the center of Segment B.
- The generous width of the corridor (exceeding 300' in places) means that a sizable setback to abutter properties can be easily maintained. Vegetation helps to block views to most abutter properties.
- Like other parts of the Natick Park and Open Space System, the trail would be available for public use from Dawn to Dusk.
- Portions of Segment A and Segment C are already reasonably accessible and minimal work would be required to make them totally accessible and usable.
- For the trail to successfully negotiate the busy Oak Street corridor, a pedestrian activated crossing signal would have to be installed.

In order to implement the Cochituate Aqueduct Trail, more definitive design and permitting work is required and a method for constructing actual improvements needs to be determined.

Other References

As part of the study process, numerous other documents were compiled and prepared. In particular, refer to:

Cochituate Aqueduct Corridor Map (prepared by Natick GIS)

Cochituate Aqueduct Existing Conditions/Analysis Plan (prepared by Weston & Sampson)

Cochituate Aqueduct Opportunities Plan (prepared by Weston & Sampson)

Cochituate Cost Consideration Memo (prepared by Weston & Sampson) (included on the following page)

Cochituate Aqueduct

Natick, MA

August 8, 2012

Cost Considerations

The following estimated costs relate to a basic level of potential aqueduct corridor trail improvements. The costs are intended only for initial planning purposes and it should be noted that additional planning and design work is required to validate and/or refine these estimates.

It is also important to note that the method by which eventual improvements are undertaken can dramatically impact potential costs. For instance, certain work efforts could be undertaken by volunteers or through the assistance of local corporations or non-profits. Work could also be undertaken by Town forces using town purchased equipment and materials or by contractors who bid on annual public works type projects or by contractors who bid on typical public design, permit, bid and construct projects. The costs below assume a traditional public design, permit, bid and construct process, which carries the highest potential costs.

Costs have been organized according to segments of potential trail.

Segment A | Natick/Wellesley Line to Oxford Street | Approximately 840 LF

Item	Cost	Notes
Trail Asphalt	\$4,000	Heavy use areas, steeper terrain, 100 LF
Trail Stonedust	\$22,200	740 LF
ADA Compliance + Grading	\$10,000	At Oxford Street entry
Trailhead Items	\$5,000	Signage, gateways, furnishings
Vegetation Management	\$4,000	2 days/3 person crew
Total Cost	\$45,200	

Segment B | Oxford Street to Oak Street | Approximately 2,875 LF

Item	Cost	Notes
Oak Street Crosswalk and Signal	\$60,000	
Trail Asphalt	\$32,000	Heavy use areas, steeper terrain, 800 LF
Trail Stonedust	\$53,250	1,775 LF
ADA Compliance + Grading	\$30,000	Oxford Street entry, highland area
Surface Restoration	\$10,000	Wood chippings disturbed areas
Boardwalk Crossings	\$30,000	150 LF
Trailhead Items	\$10,000	Signage, gateways, furnishings
Vegetation Management	\$20,000	10 days/3 person crew
Total Cost	\$245,250	

Segment C | Oak Street to Southwest of Erie Drive and Huron Drive | Approximately 1,810 LF

Item	Cost	Notes
Trail Asphalt	\$16,000	Heavy use areas, steeper terrain, 400 LF
Trail Stonedust	\$42,300	1,410 LF
ADA Compliance + Grading	\$20,000	Oak Street/Erie Drive entry
Surface Restoration	\$6,000	Wood chippings disturbed areas
Trailhead Items	\$10,000	Signage, gateways, furnishings
Vegetation Management	\$4,000	2 days
Total Cost	\$98,300	

Cost Summary		
Segment A	\$45,200	
Segment B	\$245,250	
Segment C	\$98,300	
Segment D	N/A	
Subtotal Construction	\$388,750	
Designer Services (*)	\$58,312	
Total Cost	\$447,062	

* The estimated design fee of 15% of the projected project construction cost would roughly cover design services for site survey, wetlands delineation, testing, permitting, site plan design refinement with public participation, final layout and drainage design, specifications and site design details.

Other Notes

Priorities can be established

Phasing options can be employed