

THE MIDDLESEX CANAL RESTORATION

Bicycle & Walking Paths Concept Study



Segment Five:

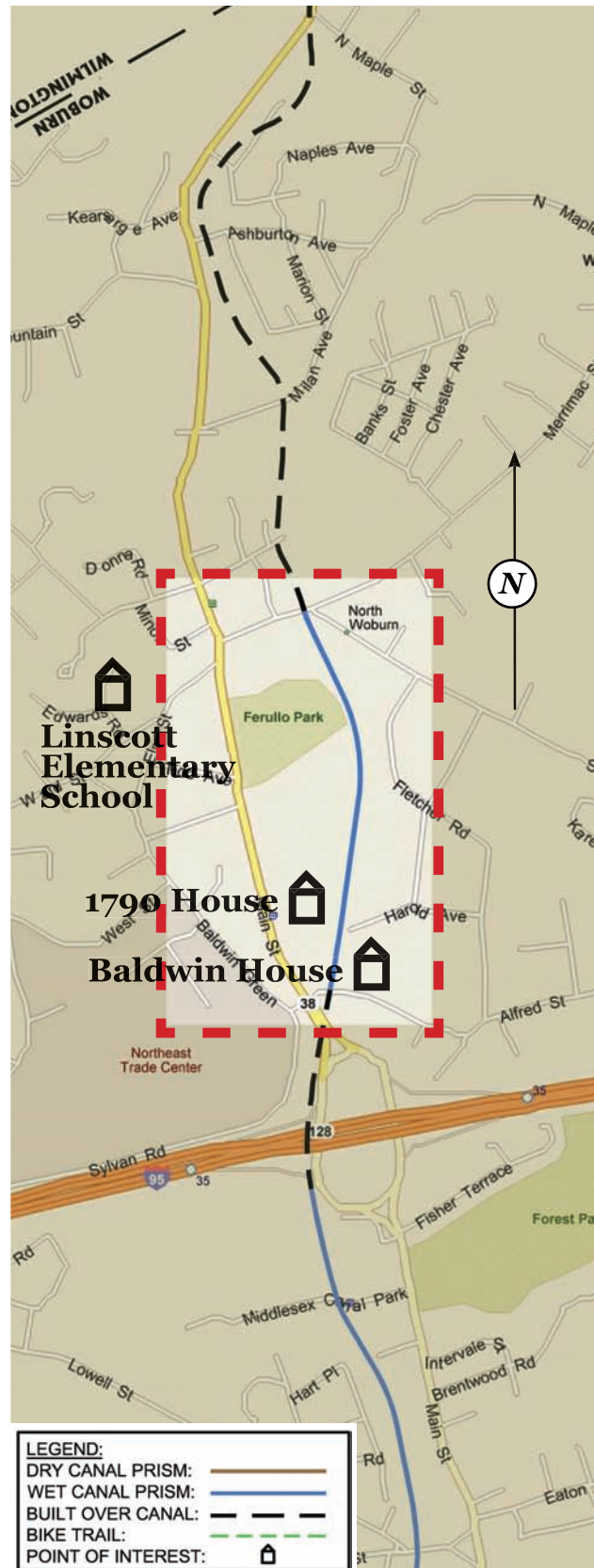
Alfred Street *to* School Street
Woburn, Massachusetts
of
The Middlesex Canal Restoration Program Study

prepared for
The Middlesex Canal Commission

May 2008

prepared by
The Waterfield Design Group, Inc.
50 Cross Street Winchester Massachusetts 01890 USA

Segment Five: Alfred Street to School Street



The Middlesex Canal Restoration

Bicycle & Walking Paths Concept Study

Segment Five: Alfred Street to School Street

Project Goals

At the request of the Middlesex Canal Commission and the City of Woburn, Waterfield Design Group Inc. has studied the canal and the abandoned railroad as possible historic reclamation sites from Alfred Street to School Street in Woburn Massachusetts.

Based upon meetings with the Canal Commission and the City of Woburn, the goal of developing this segment has two elements. First will be developing the canal's towpath as a walking path while finding unique ways to restore and preserve the Canal cross section. Second, the creation of a paved asphalt bike path will utilize the abandoned railroad bed and preserve the historic competition and ultimate replacement of the canal by the railroad.

Situated adjacent to the Baldwin Mansion, 1790 House, Woburn's Kiwanis Park, and with a connection to Ferullo Field this project will provide for over 10 acres of outdoor recreation for the residents of Woburn and visitors to the site.

The restoration of the canal can be coupled with the opportunity to highlight the historical significance of the surrounding community while providing public access and preserving an existing wildlife habitat.

Opportunities to incorporate interpretive features like the ruins of the stone abutments of Baldwin's Bridge, the holding basin, and the placement of informative and interpretive signs will be investigated. The creation of an "English Garden" at the Kiwanis Park location could serve to bring back the image of the era when the Middlesex Canal was the major transportation route for material goods from Boston to New Hampshire and an engineering marvel of its day.



The Baldwin Mansion today



Illustration of the English Garden with the Baldwin Mansion in the background

Segment Five: Alfred Street to School Street

Existing Conditions Summary

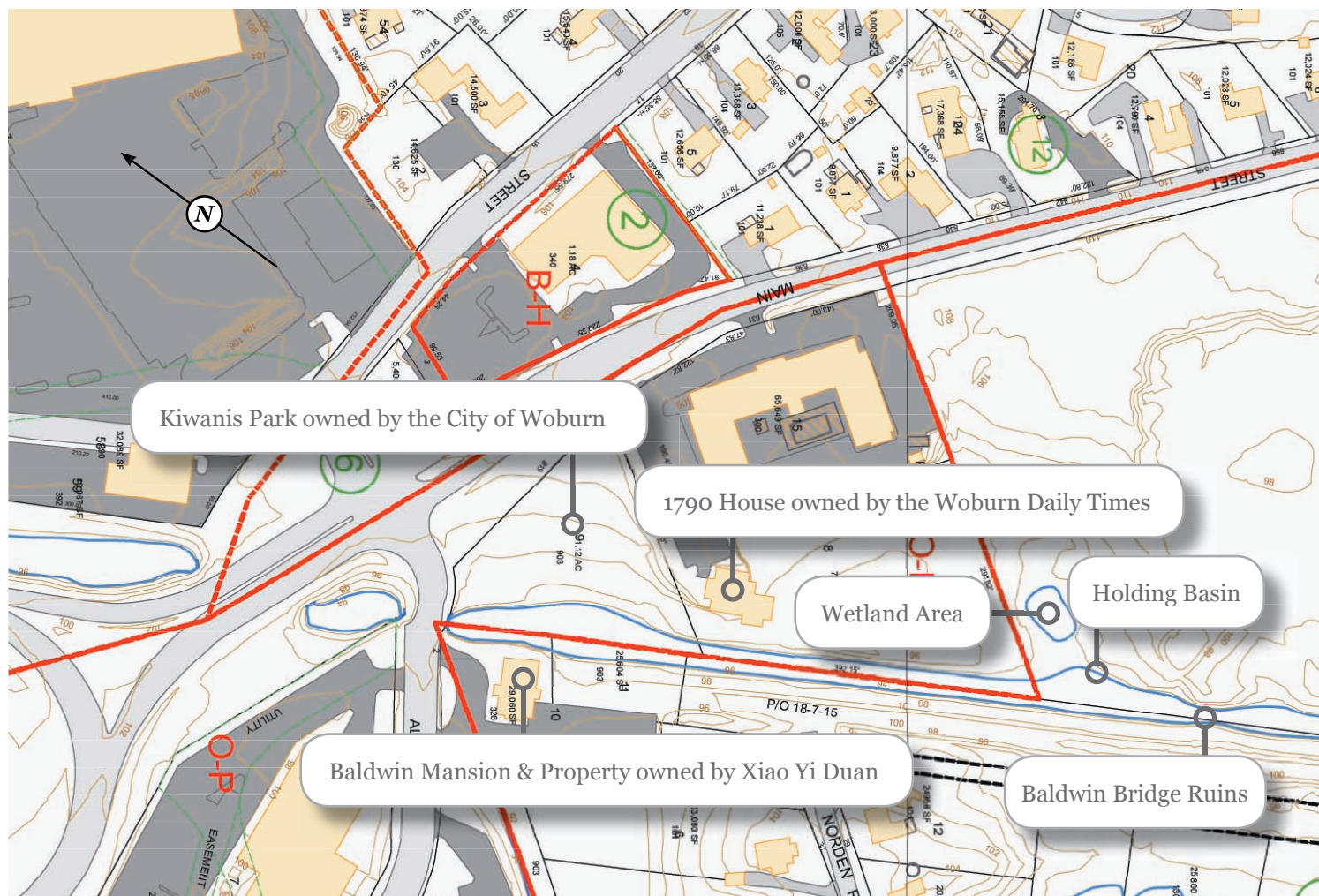
The Alfred Street to School Street segment consists of approximately 2,560 feet of wet canal. Flowing south to north, the canal operates as a drainage channel with flow from upstream segments of the canal as well as contribution from the immediate area.

The southern terminus of the segment begins at Alfred Street between the Woburn Kiwanis Park and the Baldwin Mansion. Beginning just north of the Baldwin Mansion, the towpath and the railroad right-of-way run parallel with the canal to School Street. The towpath is in good condition with some minor vegetative overgrowth. The railroad right-of-way has much more vegetation and some large diameter trees which make it more difficult to traverse.

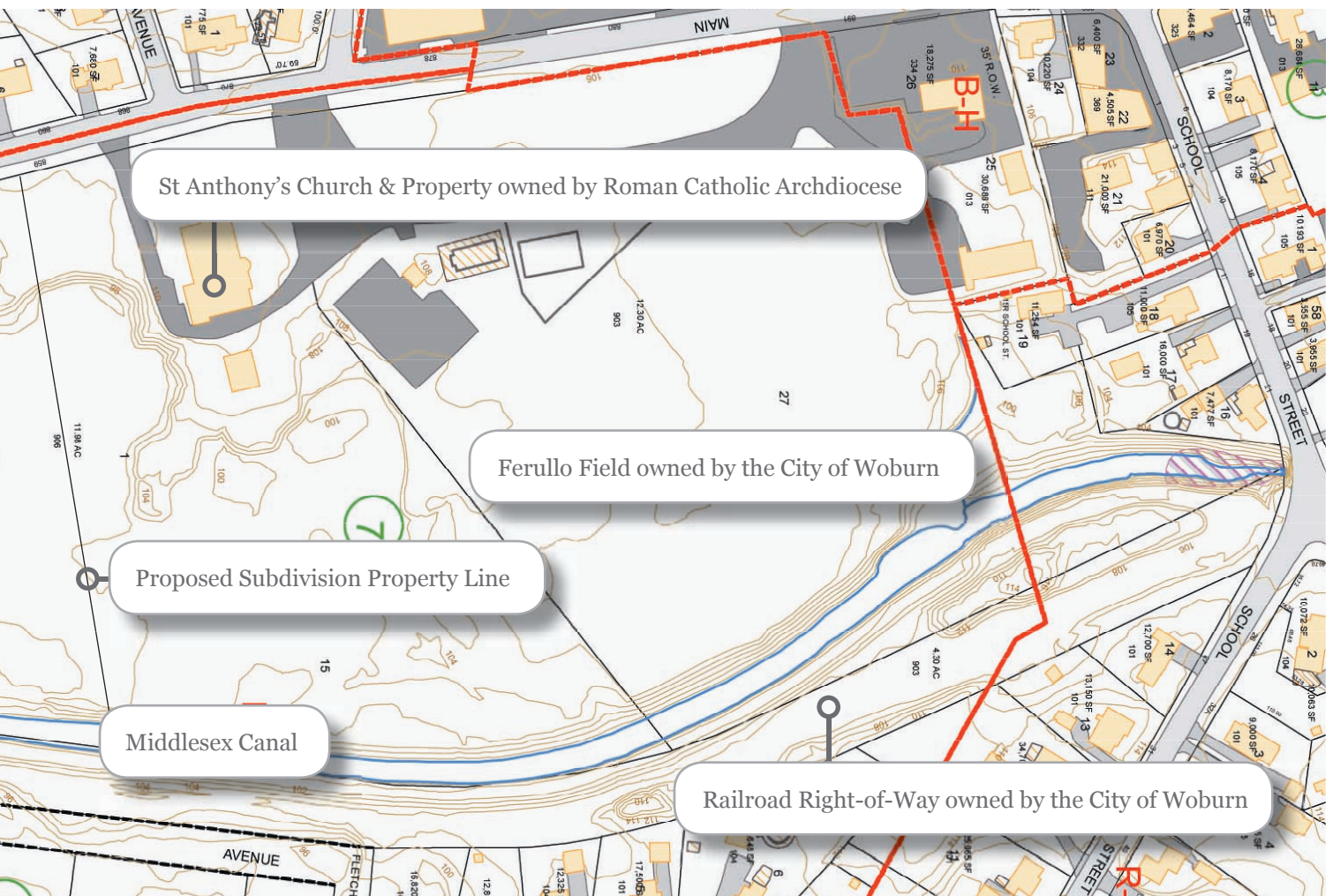
The west bank of the canal is heavily vegetated. Located just north of the Kiwanis Park and the 1790 House, the bank becomes extremely wet. This area served as a

holding pond during the years of the canal's operation. It has since filled with sediment and is largely now a wetland. The remaining portions of the west bank have a consistent slope up from the canal's edge leveling off approximately 20' from the water surface. This slope makes travel along the water's edge difficult. A narrow gravel path is located at the top of the slope. This path traverses along the canal route behind the Roman Catholic Church ending at the Ferullo Field baseball park.

Ownership of the canal varies. For the majority of the segment, ownership is split down the center of the canal. Almost the entire east bank of the canal is owned by the City of Woburn with the exception being the site of the Baldwin Mansion (currently utilized as a Chinese food restaurant). At this location, the towpath and canal to the centerline, is owned by the restaurant proprietor. The west bank is divided into four parcels with



three ownership groups. The City of Woburn owns the parcels at either end of the segment, Kiwanis Park to the south and Ferullo Field to the north. Between these two parcels is property owned by the Woburn Daily Times (site of the 1790 House) and the Roman Catholic Church (St. Anthony's Church).



Segment Five: Alfred Street to School Street

Concept Summary

This canal segment's high visibility and proximity to several historic landmarks and open spaces makes it one of the most important restoration sites of the old Middlesex canal.

Including a paved bicycling and skating path on the adjacent railroad bed provides a link to the historic replacement of the canal by the railroad.

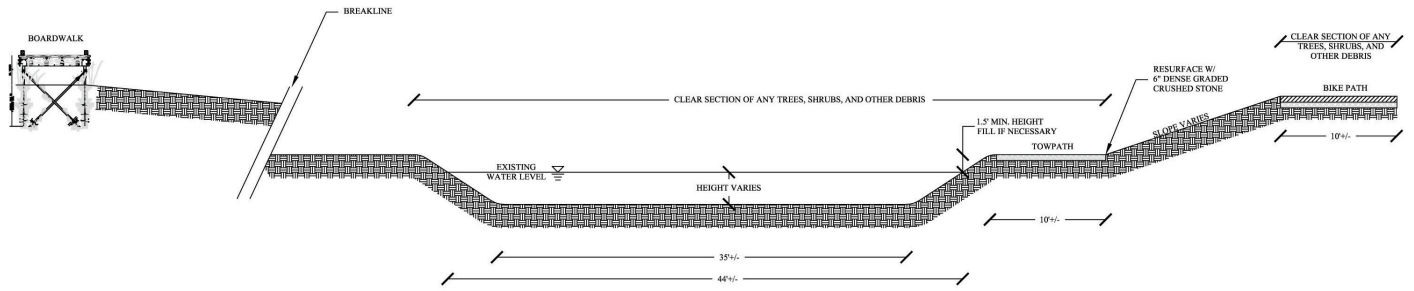
Together, with the connection to the two city parks, this historic restoration will create one large outdoor public space within a densely populated area. A detailed description of each proposed project element follows:

Canal Restoration

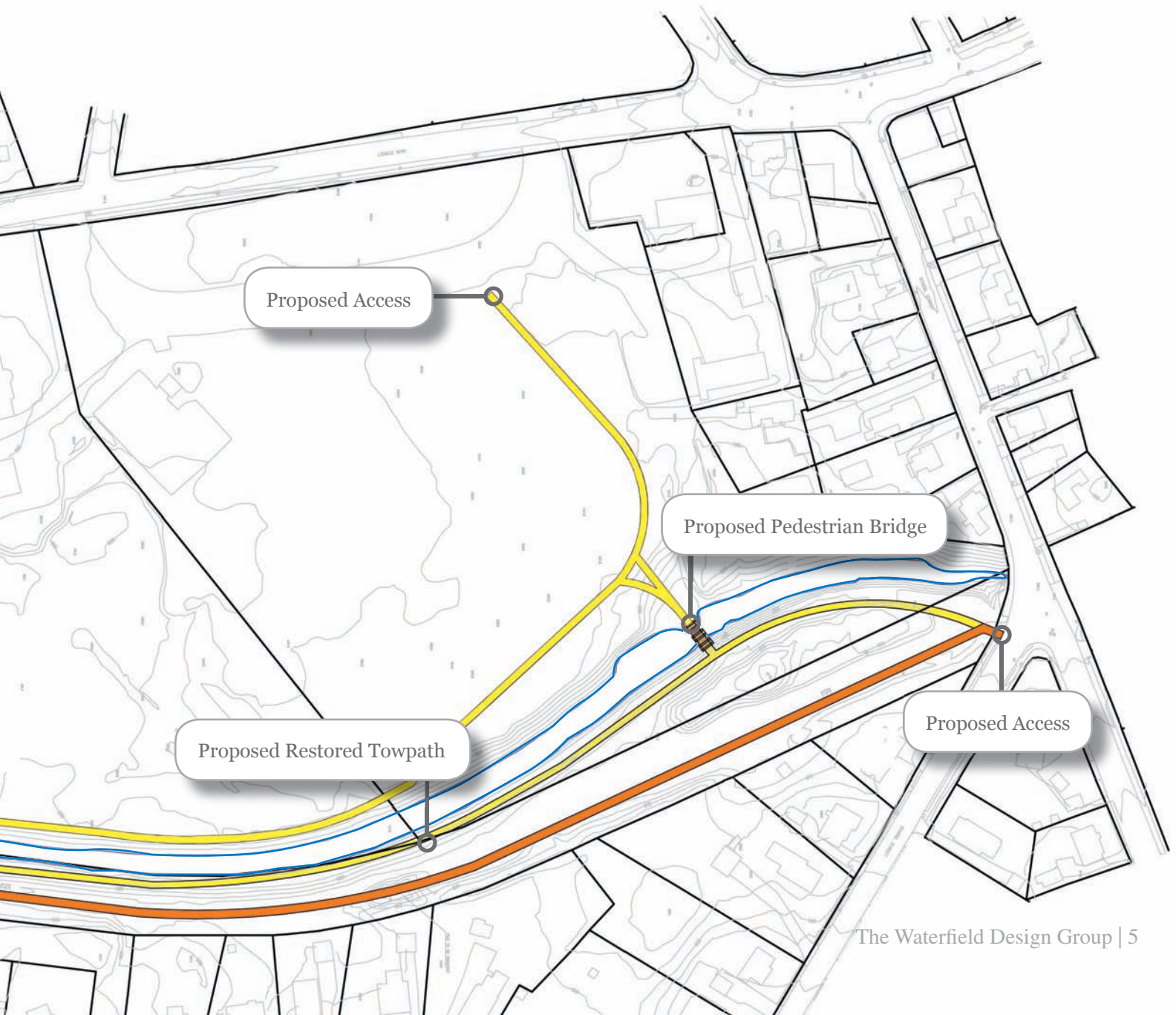
The canal at this location is in good condition compared to many other extant segments. This is in large part due to the fact that a restoration effort

had taken place here in the 1960's. At one time, rides on a replica canal boat were offered on weekends in the summer. The canal banks are no longer uniform in shape and heavily overgrown. Since the initial restoration effort, Massachusetts adopted The Wetlands Protection Act (WPA) which was enacted to protect wetlands, associated resource areas, and floodplains from possible negative impact of development. The regulations associated with the WPA could make complete restoration of the segment today a major permitting effort. In addition, any materials dredged from the canal bottom would need to be thoroughly analyzed to ensure no hazardous materials are present. For these reasons, it is not recommended at this time that the entire length of the canal be restored to its original cross section. Rather, it is proposed that segments of the canal visible at locations of access (School Street intersection) or public interest (Kiwanis Park) be fully restored.





WET CANAL RESTORATION WOBURN SECTION "A"



Restoration at these locations would involve accurately recreating the canal cross section. At areas visible from intersection streets, 100' restoration sections are recommended to provide a visual element for the passerby. At locations such as the Kiwanis Park, the canal along its entire length would be proposed for restoration.

Towpath Restoration

The existing towpath is in relatively good condition. Periodic maintenance takes place to clear vegetation from the travel way and it appears that gravel and wood chips are spread to protect the surface. It is proposed that the entire surface would be replaced with a dense graded crushed stone or pea stone material. It is intended that this path would be used mainly by foot traffic (no commuter bicycles, roller blades etc.).

In addition, the majority of all vegetation between the towpath and the canal would be cleared to recreate as best as possible, the original look of the canal.

Bike Path Creation

Utilizing the un-restored and overgrown abandoned railroad bed, a paved bicycle path will be created. Connecting Alfred Street and School Street this path will be ideal for local bicycle commuters wishing to avoid the traffic of Main Street. It will also provide access for intermediate cyclists and families wanting to explore the historical landscape of Woburn.

Recreational Loop Creation

Enlarging and expanding portions of an existing path located on the west side of the canal it is proposed that a recreational loop be created. This loop, consisting of a stone dust path along the west side of the canal, would connect to the existing towpath and railroad bed bike path through the use of two pedestrian bridges, one at each end of the canal segment. It is recommended that the bridge at the southern end of the segment be constructed to replicate the rudimentary type design that is depicted on historic renderings of the area. This bridge would be a visual cornerstone to the park improvements recommended at the Kiwanis Park. The second pedestrian bridge would be located at the northern end of the project in the vicinity

of Ferullo Park. As this bridge would be less visible, a more economical design could be chosen. Portions of the proposed path on the west bank are located on private property and access/maintenance easements will need to be obtained in order to complete the construction.

It should be noted that even without the acquisition of easement over private land to complete the "looped" path, the inclusion of both pedestrian bridges is still recommended as it will provide connection to the Kiwanis park and the baseball field. Both these element help to complete this project as a major open space public park.

Improvements to Ferullo Field

An important factor necessary for the success of the project will be access. Limited space is available for visitors of the canal to park and enjoy its amenities. Review of the existing parking facilities at Ferullo Field indicated that the space available to the City may be currently under utilized. In addition to the unconventional parking layout which exists along Main Street, a significant amount of land is being encroached upon by an abutting automobile garage/junk yard. If this area were to be reclaimed by the City, ample space would be available to create a generous amount of parking for visitors to the canal and ballpark alike. In addition, improvements to the existing facility parking should be evaluated to determine if a more efficient use of the current parking area presents itself.

English Garden

At the site of the Kiwanis Park, it is proposed that significant landscape improvements be incorporated into the site including walkways, trees, a fountain, and other plantings. The desired result would be the creation of an "English Garden" that once existed near the current park's location.



Existing Towpath



Existing Railroad Bed



Kiwanis Park Rendering with English Garden

Segment Five: Alfred Street to School Street

Summary of Restoration Challenges

CHALLENGE #1: Parcel Ownership

The majority of the canal along this segment is owned by the City of Woburn and is to be the focus of the plans. In addition, the following properties will be incorporated into the plans with the specific agreement of the responsible City departments:

- Railroad Right of Way
- Kiwanis Park
- Ferullo Field

Three lots abutting the westerly side of the canal and one abutting the southern side of the canal lot will need the written approval of the private owners, specifically as follows:

- Defined easement
- Right to construct paths and amenities
- Right to public access and use of the area.
- All rights need to be perpetual

Before the design of the pathways can proceed, these easements and appropriate rights must be finalized.

CHALLENGE #2: Access at Pedestrian Locations

Construction of the recreational loop with towpath reconstruction, bike path, and English Garden will require access for pedestrian visitors. Below is a list of the access points to the canal and paths from pedestrian locations, areas where access maybe a challenge are in **bold**:

- Ferullo Field
- Sidewalk along School Street
- **Sidewalk along Main Street**
- **Baldwin Mansion Parking Lot**

It will need to be determined who is responsible for the access and maintenance of the sidewalk along Main Street as it is a sidewalk along State Highway 38. This will need to be determined and permission will need to be granted to the City in order for the English Garden pathways to access the sidewalk.

Permission would be needed from the owners of the

Baldwin Mansion for pedestrians to cross their parking lot to access the paths along the canal from Alfred Street.

Before the design of the pedestrian access ways were to go any further permission would need to grant from the appropriate responsible agencies.

CHALLENGE #3: Access for Automobile Parking

Construction of the recreational loop with towpath reconstruction, bike path, and English Garden will require access for automobiles to park. Below is a list of the access points to the canal and paths from parking locations, areas where access maybe a challenge, are in **bold**:

- Ferullo Field
- Off of School Street
- **Baldwin Mansion Parking Lot**

It will need to be determined what Xiao Yi Duan, the owner of the Baldwin Mansion, will allow for automobile access to the canal and associated paths. Questions that will need to be answered include:

- Will canal visitors be allowed to park in the restaurant parking lot?
- Will there be spaces marked off for canal visitors?
- If canal visitors are not allowed to park in the restaurant parking lot will restaurant patrons be allowed to park and visit the canal before or after their visit to the restaurant?
- Will there be fences and/or signs delineating the entrance and existence of the canal and pathways on the restaurant's property?

It will also need to be determined to what extent the City of Woburn would allow the Ferullo Field parking lot to be reconstructed to accommodate visitors.

Before the design of the pathways were to go any further these questions would need to be answered to the satisfaction of the Commission and the City

CHALLENGE #4: English Garden

The English Garden, although it proposes significant improvements to the site, through recreating the historic characteristic of the landscape and enhancing the historic atmosphere of the district, it also proposes a challenge in the responsibility of its creation and maintenance.

Before the design of the English Garden were to go any further these questions would need to be answered to the satisfaction of the Commission and the City.

Summary of Restoration Items

ITEM #1: Path Construction (towpath, bike and recreational path)

Construction of the easterly side of the canal will mostly be clearing and grubbing. The entire length of the towpath is clear of any major debris with some overgrown vegetation. Most of the railroad bed is clear with the exception of some trees around the edges and one problem area that will need some excavation work and brush clearing.

Pedestrian crossings for the canal are needed. The first crossing will be at the Kiwanis Park and the other will be at the northern end near the drainage swale. The westerly side of the canal has a couple of areas that will need some path clearing. The first area to the north near the existing drainage swale will need a path cut out to the baseball field and the other area will be for a path to go around existing wetlands towards the 1790 House. Excavation and tree removal will be needed in these areas. In addition, construction of an elevated boardwalk may be necessary to reduce any potential impacts to the wetlands at this area.

ITEM #2: Wetlands

Even though the Middlesex Canal is manmade, under current regulations it maybe considered a wetland. If that is the case, then a wetland permit is required by the state.

ITEM #3: Canal Clearing

For aesthetic reasons, the canal waterway and the surrounding land should be cleared of any debris, such as fallen trees, trash, and overgrown vegetation.

ITEM #4: Interpretive Elements

The purpose of this project is to restore the Middlesex Canal and remind people of what it used to be. Therefore, specific areas of the canal should be defined to be exact replicas of the original canal. Signature features for this segment could be restoring a section of the canal and towpath, recreating the railroad bed as a bicycle path, and constructing one or both of the pedestrian crossings to look like the bridges from that time period. Other important restoration efforts include highlighting the old bridge abutment and holding basin and recreating the old English Garden at Kiwanis Park.

ITEM #5: Hydrology

This segment of the canal as it exists today does not have much flow. The culvert from the rotary under Alfred Street should be checked and cleared of any debris to make sure it's operating properly. If it is clear, some type of aeration device should be considered to keep the water flowing properly. Maybe a fountain or two could be installed to keep the water from being stagnant while adding to the aesthetics.

Segment Five: Alfred Street to School Street

Conceptual Cost Estimate*

Item	Unit	Quantity	Unit price	Total
Site Preparation				
Clearing and Grubbing	A	0.75	\$5,000.00	\$3,750.00
Removal of Canal Debris (Wet Segment)	LF	844	\$50.00	\$42,200.00
Tree Removed - Dia. Under 24 Inches	EA	88	\$750.00	\$66,000.00
Tree Removed - Dia. 24 Inches and Over	EA	4	\$1,500.00	\$6,000.00
Mobilization	LS	1	\$10,000.00	\$10,000.00
Bales of Hay for Erosion Control	EA	1,710	\$13.00	\$22,230.00
			Subtotal	\$150,180.00
Embankment & Path Construction				
Earth Excavation	CY	0	\$26.00	\$0.00
Earth Excavation Rehandled and Reused	CY	0	\$15.00	\$0.00
Ordinary Borrow	CY	1,890	\$26.25	\$49,612.50
Fine Grading , Compacting and Finishing	SY	3,970	\$5.00	\$19,850.00
Gravel Borrow for Sub-base	CY	635	\$35.00	\$22,225.00
Dense Graded Crushed Stone (Towpath)	CY	780	\$44.00	\$34,320.00
Hot Mix Asphalt (Bike Path)	TON	475	\$130.00	\$61,750.00
Wooden Boardwalk	LF	325	\$90.00	\$29,250.00
			Subtotal	\$217,007.50
Drainage and Utilities				
Cleaning Drainage Structures	EA	2	\$250.00	\$500.00
			Subtotal	\$500.00
Interpretive Elements				
100' Wet Canal Restoration	EA	2	\$20,000.00	\$40,000.00
Pedestrian Bridges	EA	2	\$35,000.00	\$70,000.00
Bridge Foundations	EA	2	\$40,000.00	\$80,000.00
English Garden Landscaping	LS	1	\$20,000.00	\$20,000.00
Illustrative Signage	EA	4	\$1,000.00	\$4,000.00
			Subtotal	\$214,000.00
			Construction Subtotal	\$581,687.50
			10% Construction Contingency	\$58,168.75
			Subtotal	\$639,856.25
			Survey and Design	\$63,985.63
Design and Construction Total				\$703,842

* This estimate for budgeting purposes only

A = Acre, EA = Each, CY = Cubic Yard, LF = Linear Feet, LS = Lump Sum, SY = Square Yard, TON = Ton