

## ***Chapter 5***

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### ***Economic Analysis and Assessment***

This chapter will deal with cost estimates for: 1) construction of the paved trail system and bridges, 2) implementation of the connector routes, and 3) anticipated yearly maintenance. These estimates were determined by considering like projects and applying appropriate cost on a linear foot basis for trail construction and a mile basis for maintenance. The cost of the bridges was derived from a manufacturer.

The cost of trail construction on an existing rail corridor will vary depending on the condition of the trail bed, types of land that it abuts and additional infrastructure that is required. In addition some subsurface conditions are not easily determined until engineering or construction work has started. This proposed Ware Valley Greenway Trail of this study appears to be without substantial problems. The surface conditions appear stable and the subsurface base is believed to consist of sand and gravel. Erosion is minor, with the exception of the Flat Brook crossing site.

The three road crossings and two stream crossings offer designers a great opportunity to personalize this trail with unique amenities such as bridges, overlooks and trailheads. The design options considered may alter the estimated cost substantially.

The connector routes along public roads have different costs associated with their implementation. Lighting, paving and street painting, signage, and planting strategies will effect the cost of these trails. The cost estimates for these routes will be listed separately from the railbed trail.

#### **Railway Corridor Trail**

The construction estimate provided below utilizes figures from the initial Ware River Valley Greenway Trails Project with an amount added for inflation. After receiving high and low range construction costs from various sources, the author of that report used a mid range multiplier of fifty-eight dollars per linear foot. On the recommendation of Jeff McCollough, Transportation Planner with the Pioneer Valley Planning Commission, this figure was increased to \$65 per linear foot to account for inflation.

Total trail length 1.6 miles =	8,448 linear feet
Estimated Price Per Linear Foot	X 65 dollars
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Total Estimated Cost of Construction	\$549,120

## Bridges

Two water crossings along this trail will require the installation of bridges. Many options are available for this portion of the infrastructure and pricing will vary with each. The construction however should have a minimum structural rating of H-14, guaranteeing a load capacity of 7,000 pounds. This rating will meet the American Society of State Highway and Transportation Officials (ASHTO) requirements. Additional infrastructure requirements of ASHTO as well as the ADA (American Disabilities Act) need to be adhered to insure safety and accessibility.

The use of prefabricated bridges is one option to be considered. They can be custom designed and built to meet State and Federal requirements. Estimates based on a manufacturers quote for this type of bridge is listed below and will give an approximation of the cost involved for each water crossing. The Flat Brook bridge is estimated to be 35 feet and the unnamed stream is estimated to require a 15 ft bridge.

35 ft X 12 ft steel bridge (ASHTO & ADA approved)	\$16,968
15 ft X 12 ft steel bridge (ASHTO & ADA approved)	<u>\$ 8,979</u>
	\$25,948

## Connector Routes

A substantial amount of information needs to be gathered to determine appropriate connector routes and their implementation strategies. On roads with low traffic volume shared lanes are appropriate for bicyclists. Share the roadway signs are used to alert both automobile and bicycle users. In business centers a separate striped lane is required for cyclists. Young children need to use sidewalks for safe bicycling. Requirements for these lanes and signs can be found in the Manual on Uniform Traffic Control Devices (MUTCD). Massachusetts also follows the federal requirements of ASHTO. Strict compliance with these standards will be essential.

The cost of connector routes is often minimal since they can be incorporated into general maintenance of the established roadway. For example painted lanes can be introduced during a scheduled painting. If the implementation involves sidewalks for younger

children on bicycles, these may be put off until resurfacing is scheduled. When connector routes are not implemented in the course of regularly scheduled road maintenance the costs can be substantial. Sidewalks are as high as \$35 a linear foot to install and \$45 a linear foot to refurbish. Coordination efforts with the municipalities transportation department are crucial during every stage of study and installation to insure safety and compliance as well as economic feasibility.

**Trail Maintenance**

- Railway Trail

The cost of trail maintenance is an ongoing expense and should be carefully considered and planned for. Many municipalities have experienced budget cuts in the area of park maintenance and increasingly rely on public support and volunteer efforts. A design, which effectively limits maintenance costs, has a strong advantage over one that ignores this issue.

Information on maintenance costs of similar trails in the Western Massachusetts area is taken from the initial Greenway Trail Project. That project states the Norwottuck 10-mile trail averages \$4,000 per mile to maintain while the Belchertown 5.52 mile trail averages \$3,926 per mile. The author averaged these two operating budgets to obtain a figure of \$3,963 per mile for yearly maintenance costs. This approach leads to an estimated yearly maintenance budget of \$6,340.

Yearly Maintenance Cost per Mile	\$3963
Trail Length in Miles	X 1.6
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Total Yearly Maintenance Cost for Trail	\$6340

- Connector Routes

The cost of maintaining Connector Routes is absorbed in typical road and sidewalk maintenance. The exception to this would be if banners, additional lighting or other design elements are chosen.