

12-15-2000

Auburn Trails Feasibility Study

Rizzo Associates, Inc.

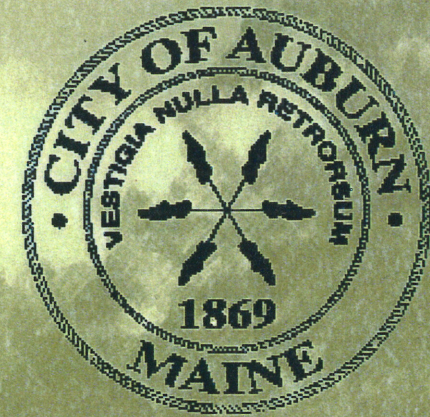
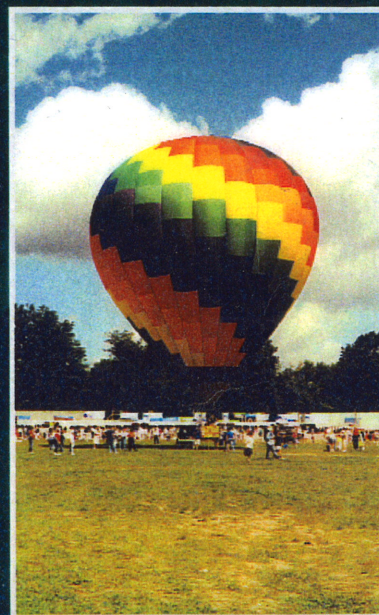
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Auburn Trails

Feasibility Study

Submitted to:

Maine Department of Transportation

Submitted by:

Rizzo Associates, Inc.

December 15, 2000

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BACKGROUND

The Maine Department of Transportation (MDOT) contracted with Rizzo Associates to study the feasibility of developing shared use paths along the Little Androscoggin River and along the Maine Central Railroad in downtown Auburn. A previous plan called for converting the Lewiston-Auburn Railroad (formerly the Canadian National Railroad) to a shared use path that would link the existing bicycle/pedestrian bridge (former railroad bridge) over the Androscoggin River to the south end of the city near the airport. The possibility of reactivating the Lewiston-Auburn Railroad required that this feasibility study evaluate other possible locations for a trail. A trail linking the Little Androscoggin Shared Use Path to West Pitch Park, which is also evaluated in this study, is an essential component of Auburn's planned downtown trail network.



Little Androscoggin River

PUBLIC INVOLVEMENT

Three public meetings were held during the preparation of the feasibility study. At the first meeting on November 17, 1999, the public was introduced to the study and provided comments on the study approach and scope. The project team presented draft recommendations to the public on April 5, 2000. Comments received at this meeting were valuable in refining the proposals. Final recommendations on trail location and design, order-of-magnitude cost estimates and potential project phasing were



Maine Central Railroad at School Street

presented to the public at a third meeting held on June 1, 2000. Comments at this meeting have been incorporated in this report.

Meetings were also held at MDOT's office in Augusta on October 26, 1999 and June 1, 2000. Rizzo Associates met with Guilford Transportation, owners of the Maine Central Railroad, in South Portland on November 11, 1999 and July 19, 2000.

STUDY METHODOLOGY

Rizzo Associates conducted extensive field reconnaissance of the trail, roadway and bridge alternatives associated with both the Little Androscoggin River Shared Use Path and the Downtown Rail Trail.

The City of Auburn and MDOT provided reports, maps, plans and other data used in the feasibility study. References used in preparing the analyses and cost estimates for this project include:

- portions of the National Flood Insurance Program maps, water surface profiles, and report
- topography mapping from the City of Auburn electronic data files
- plans of the Lewiston-Auburn Railroad (LARR) Sidewalk Overpass Repairs prepared by Baker Design Consultants

- current MDOT inspection report and partial plans for the South Main Street (Iron) Bridge
- foundation plans for the North Bridge over the Androscoggin River
- MDOT files on the foundation conditions at the South Bridge over Androscoggin River
- report on the existing truss bridge over the Androscoggin River
- plans for the construction of the bicycle/pedestrian path on the truss bridge over the Androscoggin River
- plans and bid costs for a recent MDOT bicycle/pedestrian bridge project in Brunswick, Maine
- valuation plans of Maine Central Railroad

The bridge crossings or underpasses evaluated for this study included ten (10) locations as follows:

- A. Separate bicycle/pedestrian bridge over the Androscoggin River near the existing truss bridge
- B. Bicycle/pedestrian facility cantilevered from the existing truss bridge over the Androscoggin River
- C. Separate bicycle/pedestrian underpass under Main Street adjacent to Bonney Park
- D. Combined bicycle/pedestrian and railroad underpass adjacent to Bonney Park
- E. Bicycle/pedestrian underpass under railroad at Moulton Park
- F. Bicycle/pedestrian bridge between the dams on the Little Androscoggin River
- G. Bicycle/pedestrian bridge over the two railroads near the Upper Barker Mill Dam

- H. Bicycle/pedestrian bridge over the Little Androscoggin River and the two railroads near the Upper Barker Mill Dam
- I. Bicycle/pedestrian bridge over the Little Androscoggin River, the two railroads, and Washington Street near the Upper Barker Mill Dam
- J. Restriping the existing South Main Street Bridge over the Little Androscoggin River

For each of the structure types studied, we prepared sketch plans showing plan view, an elevation, and deck cross section. Precast, pre-stressed concrete; structural steel girder; and pre-fabricated steel structures were considered. At the request of MDOT, we evaluated relocating some existing historic highway truss bridges to these sites for re-use as bicycle/pedestrian bridges. Because of the span lengths on these bridges, substructures were developed as reinforced concrete on spread footing or pile foundations. Scour around footings in the rivers was considered. Descriptions and order-of-magnitude cost estimates for each structure alternative are presented in the following section.

ALTERNATIVES ANALYSIS

Path Alignments

The MDOT and the City of Auburn wanted to investigate possible shared use path alternatives linking the existing bicycle/pedestrian bridge over the Androscoggin River (former railroad bridge) to the residential area at Bennett Avenue. An on-road bicycle route was assumed linking Bennett Avenue and points south, including the Lewiston-Auburn Airport. This project was intended to find alternatives to developing a rail-to-trail project on the Lewiston-Auburn Railroad, since this option would be precluded if the railroad were reactivated.

Alternative path alignments developed for the Little Androscoggin River Shared Use Path are shown on Figure 1. Path locations on the east and west banks of the Little Androscoggin River were evaluated. A series of bridge and underpass alternatives that would be part of the path system were also evaluated.



Existing Bridge over Androscoggin River

The feasibility of developing a shared use path along a section of the active Maine Central Railroad in downtown Auburn was also analyzed. The limits of this rail-with-trail project (Downtown Rail Trail) were set in the south at High Street and in the north at Turner Street. The Downtown Rail Trail would connect to the Little Androscoggin River Shared Use Path near Hutchins Street and to the West Pitch Park path system and the existing trail along the Androscoggin River. Our study of this concept included an educated preliminary decision about which side of the tracks the trail would fall, followed by verification based on further field walks and the review of Guilford Transportation's valuation plans (val-plans) of that line.

All paths were assumed to be 10 to 12 feet wide with two to three foot wide unpaved shoulders. The paths would have a bituminous concrete (asphalt) surface course and be designed for use by pedestrians, bicycles, skaters and other non-motorized users.

Roadways

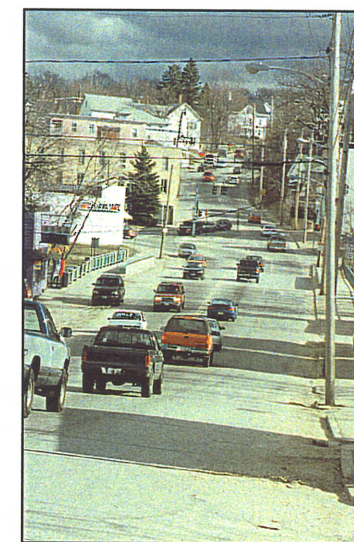
Portions of the existing street system were evaluated for bicycle and pedestrian use in connection with the Little Androscoggin River Shared Use Path and the Downtown Rail Trail. These alternatives are also shown on Figure 1 and summarized as follows:

- Main Street/South Main Street from Bonney Park to Mill Street and a portion of Mill Street were considered as a

possible link between Bonney Park and a new path on the east bank of the Little Androscoggin River

- Main, Academy and Elm streets were considered as a possible link between Bonney Park and the Downtown Rail Trail
- Hampshire Street was considered as a possible link between the Downtown Rail Trail and the West Pitch Park path system and the existing trail along the Androscoggin River

Cross sections for bicycle-related improvements to several of these roadways were developed (see Figure 2). Bicycle lanes could be developed on South Main Street from Bonney Park across the Little Androscoggin River Bridge by restriping the existing roadway. The 45-foot wide South Main Street roadway could accommodate bicycle lanes on each side and either one parallel parking lane or a turn lane. The bicycle lane designs shown on Figure 2 could easily be accommodated in scheduled improvements to this section of roadway.

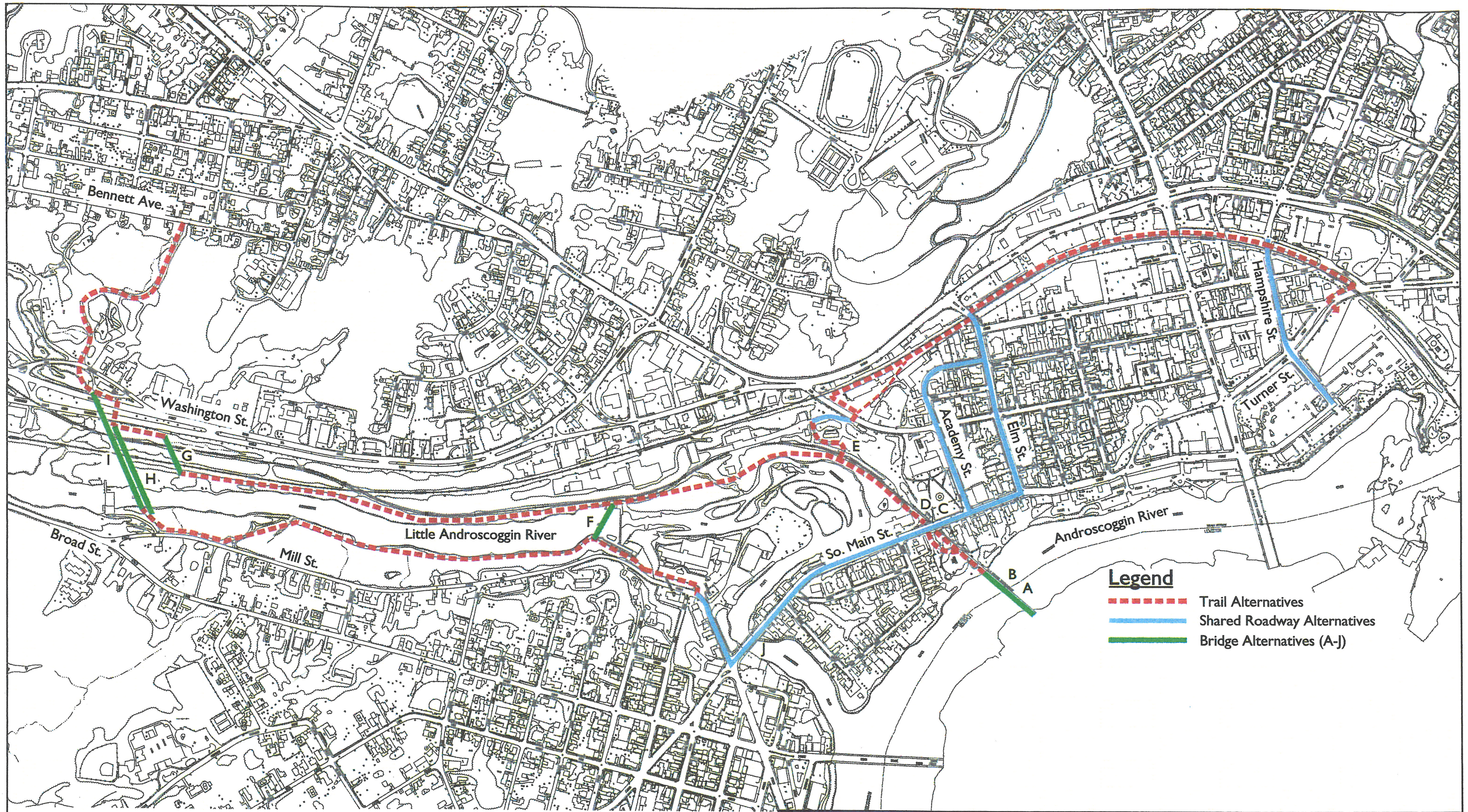


South Main Street

Bicycle lanes could not be developed on Main Street from Bonney Park to either Academy Street or Elm Street without eliminating turn lanes or parallel parking lanes at the intersections. Neither was deemed feasible, in part, due to the neighborhood opposition expressed at the April 5, 2000 public meeting.

Hampshire Street is considered a viable bicycle route linking the Downtown Rail Trail to West Pitch Park. Cyclists would travel with the flow of traffic in shared travel lanes. No changes to the roadway cross section are recommended. The route

would be used by advanced and basic adult/teenage bicyclists. Less experienced cyclists could continue on the Downtown Rail Trail to Turner Street, but they would be required to walk their bicycles down a sidewalk on Turner Street and cross Turner Street at a new mid-block crosswalk to reach West Pitch Park.



- Legend**
- Trail Alternatives
 - Shared Roadway Alternatives
 - Bridge Alternatives (A-J)



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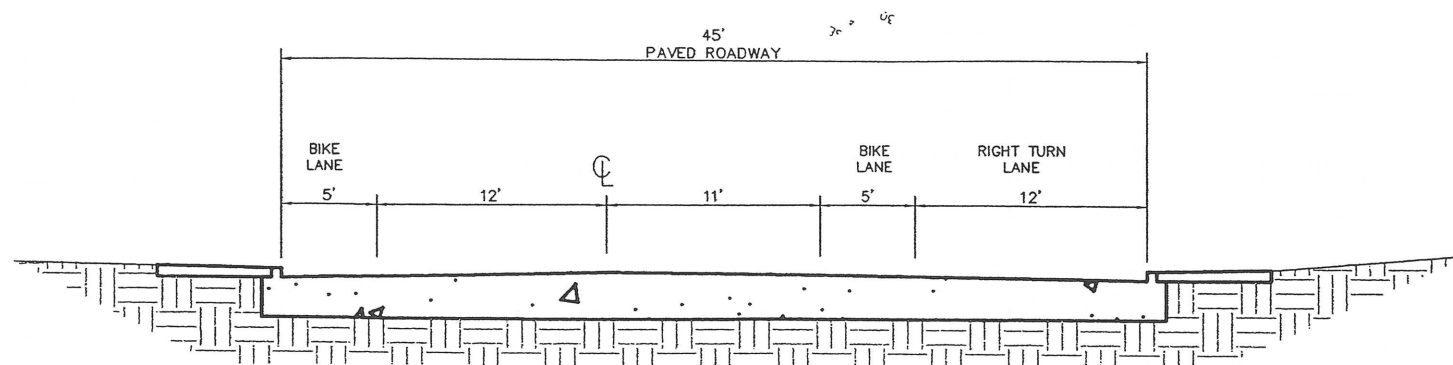
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Base Map Info
Provided by
City of Auburn, ME

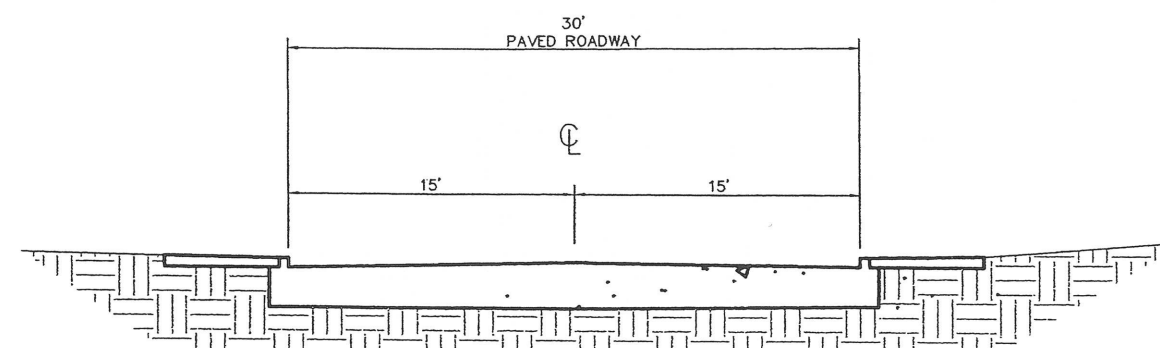
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Auburn Trail Alternatives

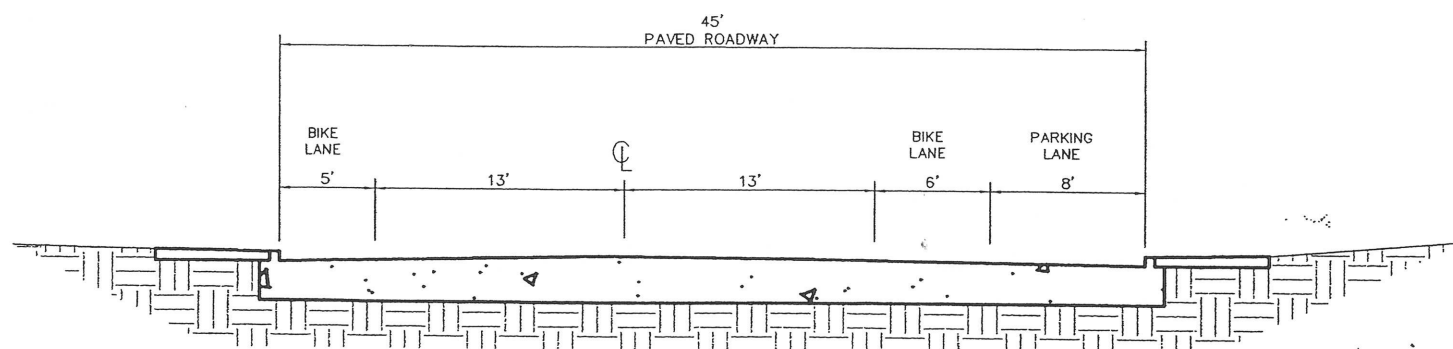
Figure
1



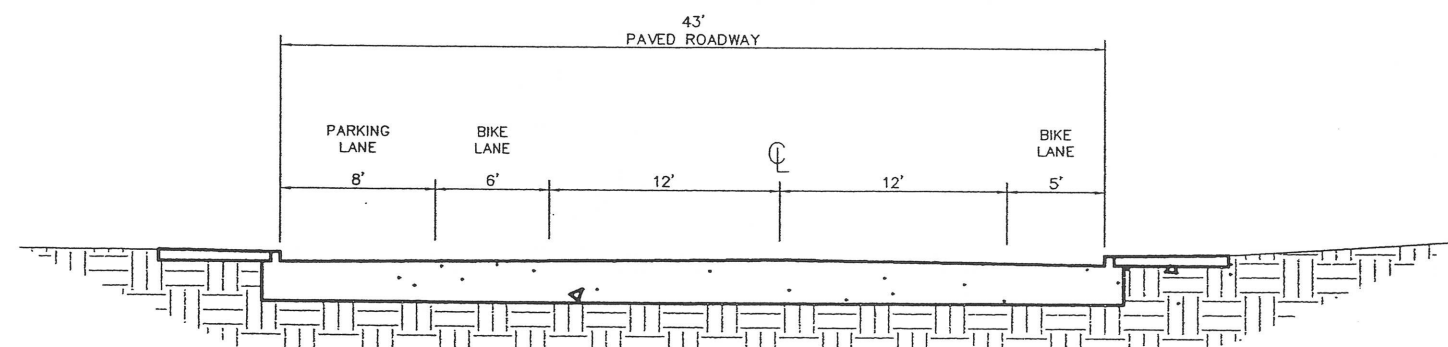
BIKE LANES WITH RIGHT TURN LANE
SOUTH MAIN STREET
 BETWEEN NEWBURY ST. (S) AND LAUREL ST.
 (LOOKING NORTH)



WIDE CURB LANES
ACADEMY STREET
 (LOOKING WEST)



BIKE LANES WITH PARKING LANE
SOUTH MAIN STREET
 NORTH OF LITTLE ANDROSCOGGIN RIVER BRIDGE
 (LOOKING NORTH)



BIKE LANES WITH PARKING LANE
ELM STREET
 (LOOKING WEST)

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Shared Roadway Designs

Figure
2

Structures

Ten (10) structures were evaluated as part of the alternatives analysis for the Little Androscoggin River Shared Use Path and the Downtown Rail Trail Feasibility Study. The path alternatives required examining various structures spanning the Androscoggin River, the Little Androscoggin River, the Maine Central Railroad, the Lewiston-Auburn Railroad, Washington Street, and Main Street. A concept plan and cost estimate for each structure was developed. Descriptions of the structure alternatives are provided below.

A. Separate bicycle/pedestrian bridge over the Androscoggin River

This bridge was studied using an alignment downstream of the existing truss bridge. During preliminary design it is assumed that the location will be further defined. This location provides a length of crossing that can be used on either the upstream or downstream side of the existing truss bridge.

The piers for this new bridge were placed in line with the piers of the existing truss bridge to reduce scour potential and not create smaller waterway openings for floating debris during spring runoff or flood flow. The North Bridge located upstream from this site and the South Bridge located downstream from this site are founded on piles. We assumed solid pier shafts for this study supported on steel piles. Heavy stone was placed around the pier shafts to control potential scour. The pier shafts were battered to assist with ice flow. During preliminary design and with a hydraulic study, it may be possible to reduce the substructure costs as these components are designed.

There are three spans on this structure similar to the existing truss bridge. The spans are at least 100 feet or longer. Prefabricated steel bridge superstructures were used for these spans for their relatively light weight, speed of erection, and cost.

B. Bicycle/pedestrian facility cantilevered from the existing truss bridge over the Androscoggin River

This option assumes that the existing truss bridge will be placed back in rail service. It also assumes that the MDOT 15-foot separation between edge-of-rail and edge-of-trail requirement can be reduced with the installation of safety barriers or fencing.

The cantilevered bicycle/pedestrian facility was evaluated for a width of 12 feet (inside dimension). The cantilevered trail spans were designed to match the panel points on the truss. The floor beams of the trail introduced loads directly into the floor beams of the truss. Our preliminary computations sized the elements of this cantilevered system. No attempt was made to design all connections. The trail loads were not applied in conjunction with railroad loading.

C. Separate bicycle/pedestrian underpass under Main Street adjacent to Bonney Park

This study assumes that the existing railroad overpass will remain in place and will allow the safe passage of trains when the existing tracks are re-activated. The Main Street overpass for the passage of bicycles and pedestrians under the street would be a separate structure adjacent to the railroad overpass. We further considered that the horizontal alignment for a bicycle path is more flexible than a railroad track, and less area of Bonney Park would be disturbed.

This new overpass structure was sited to the south of the existing railroad structure where there is sufficient distance to construct a new structure without affecting the potential stability of the railroad overpass. Insufficient distance exists on the north side. There is a residence with lawn and fence on the easterly side and a granite stone wall on the westerly side adjacent to the northerly abutment of the existing bridge.

We assumed a pre-cast box culvert structure at this location with a 12 foot width and a 10 foot height. This structure has a relatively short construction time and will allow minimal detour and/or one-way traffic through or around the site. The height will provide for some depth of fill over the top slab. Utilities can be placed in this fill, although some may require insulation to protect against freezing.

D. Combined bicycle/pedestrian and railroad underpass adjacent to Bonney Park

The existing railroad overpass is constructed of mortared stone abutments with a pre-cast concrete slab deck for the roadway. There are sidewalks on both sides constructed of timber. The existing guardrail is inadequate to withstand crashes. On the easterly side of the bridge, a water pipe installed at the roadway

grade is subject to damage by vehicles or vandals. The City of Auburn has prepared a preliminary design to replace the timber sidewalks with precast concrete slabs, lower the water pipe below the roadway surface, and construct a crash-worthy guardrail.

During our study we observed the condition of various elements of this structure. There are spalls on the underside of the roadway deck slabs with evidence of leakage. There are cracks in the mortared joints of the stone abutments and wingwalls. More important, there is a visible bulge in the southerly abutment wall on the westerly side. This bulge should be monitored since it indicates a potentially unstable condition. It would be expensive to dismantle and reconstruct this wall to ensure a reasonable service life.

At this location, we would recommend reconstruction of the existing Main Street Bridge over the railroad and construction of an underpass wide enough to accommodate the railroad and trail with adequate separation. Due to the increased span length, deeper pre-stressed deck units are required. It is assumed that the existing vertical clearance at the bridge will be maintained. To maintain this clearance, the grade of Main Street would be raised, which may require retaining walls parallel to the centerline of Main Street. Drive access to adjacent buildings will require re-grading, as well as roadway drainage reconstruction. A two-span structure may reduce potential impacts on adjacent property because shallower deck units can be used. The construction of this new bridge would require a longer construction time than the previous alternative.

In our opinion, the existing bridge will require reconstruction in the near future due to the deficiencies previously mentioned.

E. Bicycle/pedestrian underpass under railroad at Moulton Park

A concept plan for connecting the Little Androscoggin Shared Use Path to the Downtown Rail Trail at Moulton Park (skateboard park) was developed. The plan includes a box culvert under the railroad in an existing elevated section (railroad on berm) adjacent to the park. The inside dimensions of the box culvert would be 12 feet (width) by 10 feet (height).

F. Bicycle/pedestrian bridge between the dams on the Little Androscoggin River

A concept plan for a 200-foot long single-span, pre-fabricated steel-truss trail bridge was developed for crossing the Little Androscoggin River. The location of this bridge is somewhat flexible. It is recommended that the bridge be placed upstream from the Barker Mill Dam (lower dam).

G. Bicycle/pedestrian bridge over the two railroads near the Upper Barker Mill Dam

Assuming that the Little Androscoggin River shared use path was located on the west bank of the river, then the path would need to cross both the Maine Central Railroad and the Lewiston-Auburn Railroad to access Washington Street and points south and west. The two railroads are parallel within a 125-foot wide corridor. A single-span, prefabricated steel-truss bridge approximately 200 feet long would be required to cross both railroads. The bridge would be located in the vicinity of the Upper Barker Mill Dam. It would not be feasible to cross the railroads at grade because of existing policies against the construction of new, at-grade crossings of railroads.

H. Bicycle/pedestrian bridge over the Little Androscoggin River and the two railroads near the Upper Barker Mill Dam

Assuming that the Little Androscoggin River shared use path was located on the east bank of the river, then the path would need to cross the Little Androscoggin River, the Maine Central Railroad and the Lewiston-Auburn Railroad to access Washington Street and points south and west. A three-span, prefabricated steel-truss bridge approximately 550 feet long would be required. The bridge would be located in the vicinity of the Upper Barker Mill Dam. No bridge piers would be located in the river.

I. Bicycle/pedestrian bridge over the Little Androscoggin River, the two railroads, and Washington Street near the Upper Barker Mill Dam

Both of the previous options assume that the Little Androscoggin River shared use path would cross Washington Street at grade. If a grade-separated trail crossing were desirable, then the

bicycle/pedestrian bridge previously described (Structure H) would extended over Washington Street. With this addition, the structure would include five spans for a total length of 850 feet. One of the bridge piers would be located in the wide grass median of Washington Street.

J. Restriping the existing South Main Street Bridge over the Little Androscoggin River

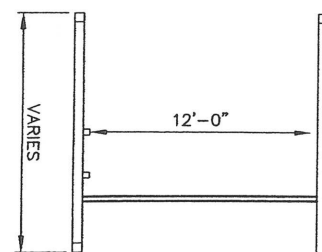
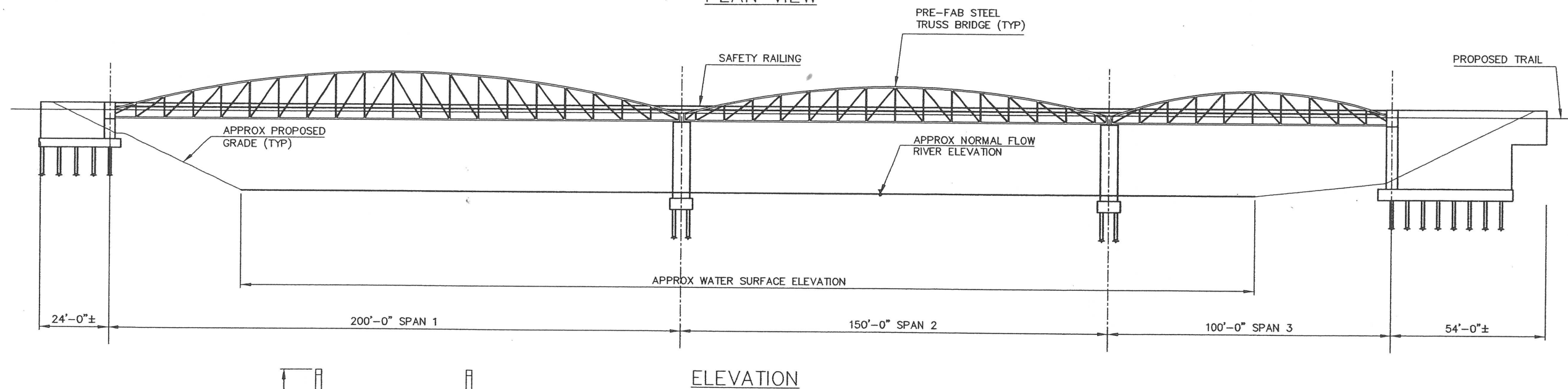
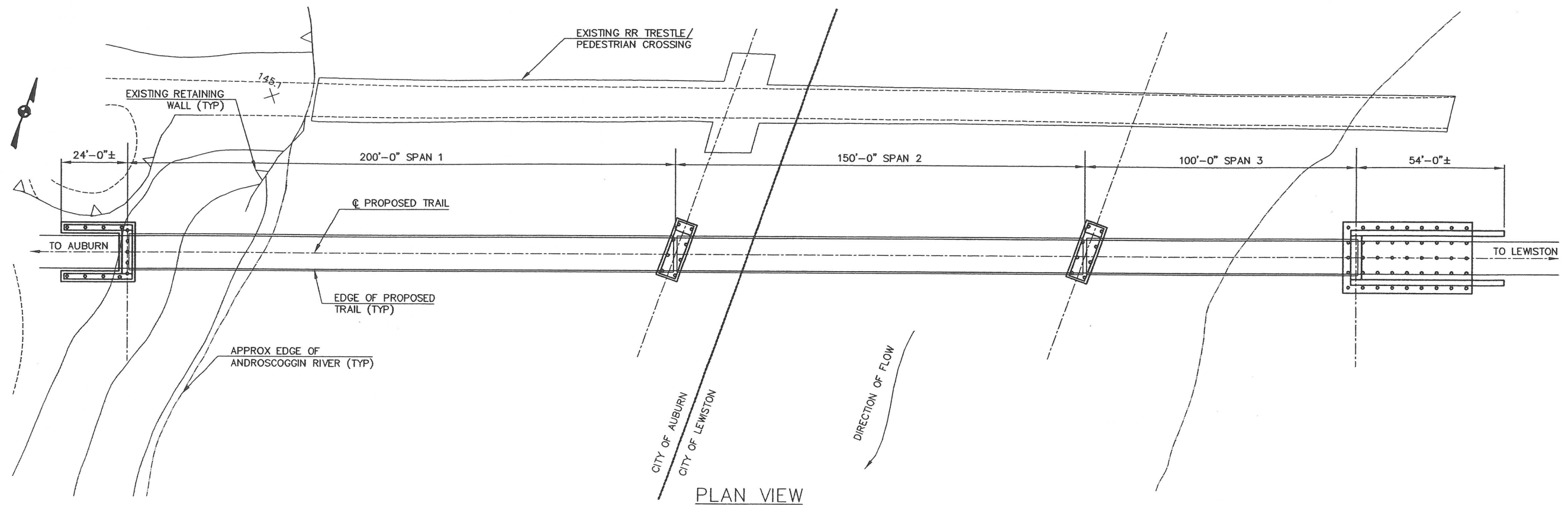
This bridge is located at the intersection of South Main, Mill, and Pulsifer streets and was originally built in 1948. A deck replacement project was performed in 1991. The bridge is a through steel plate girder structure with sidewalks on the outside of the plate girders. The sidewalks are supported by brackets attached to the girders. The latest (1998) MDOT bridge inspection report indicates that the deck, paint, wearing surface, superstructure and substructure all had ratings of 7 or higher on a scale of 1-9 with 9 representing the best condition and 1 representing the worst condition. Given these ratings, it is doubtful that this bridge will be replaced in the near future.

The width of each sidewalk is seven feet. The width of the deck is approximately 45 feet curb to curb. The bridge could be restriped to provide three 11-foot travel lanes, two five-foot bike lanes, and a one-foot curb offset on each side of the bridge. The separate bike lanes would eliminate the joint use of the sidewalks by bicycles and pedestrians. Reconstruction of the bridge would not be required. Restriping the roadway on the bridge could be accomplished during the planned resurfacing of South Main Street.

Cost estimates for all of the alternative structures analyzed in the feasibility study are presented in Table 1. Concept plans are presented in Figures 3 through 12.

Table 1 Order of Magnitude Cost Estimates: Structures

Letter	Description	Estimated Span	Structure Type	Estimated Cost (\$)	Figure No.
A	Three-span Bridge over Androscoggin River (independent structure adjacent to railroad bridge)	450' (3 Span)	Pre-fab Steel Truss	\$1,050,000	3
B	Truss extension on existing railroad bridge over Androscoggin River	450'	Cantilevered Truss Extension	\$350,000	4
C	Independent trail tunnel under Main Street	12'	Box Culvert	\$510,000	5
D	New rail with trail tunnel under Main Street (replaces existing rail tunnel)	53' (1 Span)	Precast Concrete Deck Beam Bridge	\$880,000	6
E	Railroad bridge over trail at Moulton Park (trail connects Little Androscoggin Trail to Downtown Rail Trail)	12'	Box Culvert	\$290,000	7
F	Single-span Bridge over Little Androscoggin River upstream of Barker Mill Dam	200' (1 Span)	Pre-fab Steel Truss	\$620,000	8
G	Bridge over two railroads in vicinity of Upper Barker Mill Dam	200' (1 Span)	Pre-fab Steel Truss	\$630,000	9
H	Bridge over Little Androscoggin River and two railroads in vicinity of Upper Barker Mill Dam	550' (3 Span)	Pre-fab Steel Truss	\$1,040,000	10
I	Bridge over Little Androscoggin River, two railroads and Washington Street in vicinity of Upper Barker Mill Dam	850' (5 Span)	Pre-fab Steel Truss	\$1,440,000	11
J	South Main Street Bridge over Little Androscoggin River		Iron bridge	na	12



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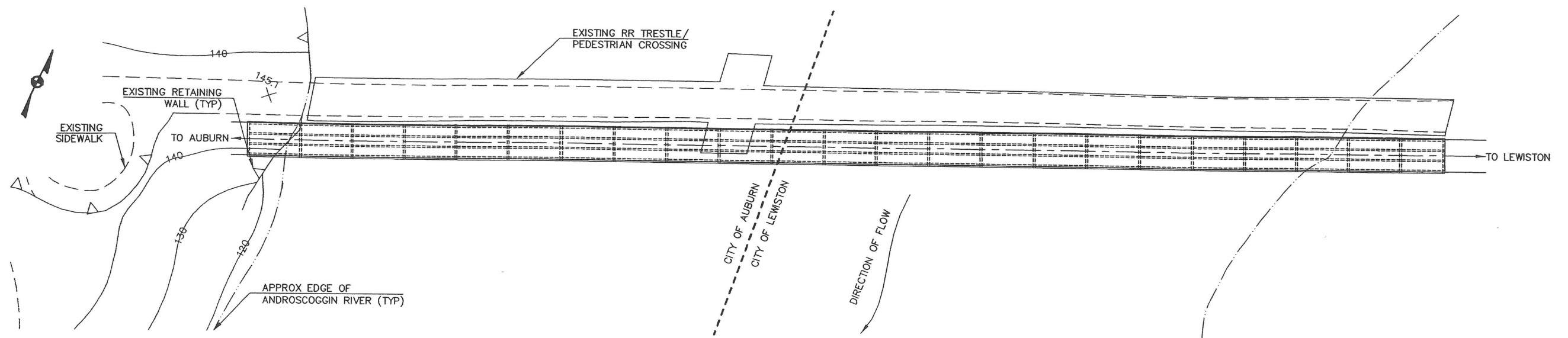
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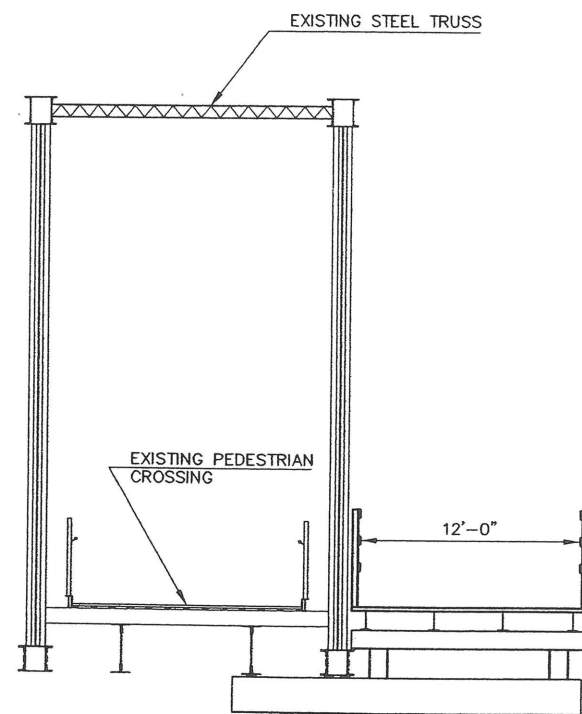
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Separate Bike/Ped Bridge
Over Androscoggin River
Near Existing Truss Bridge

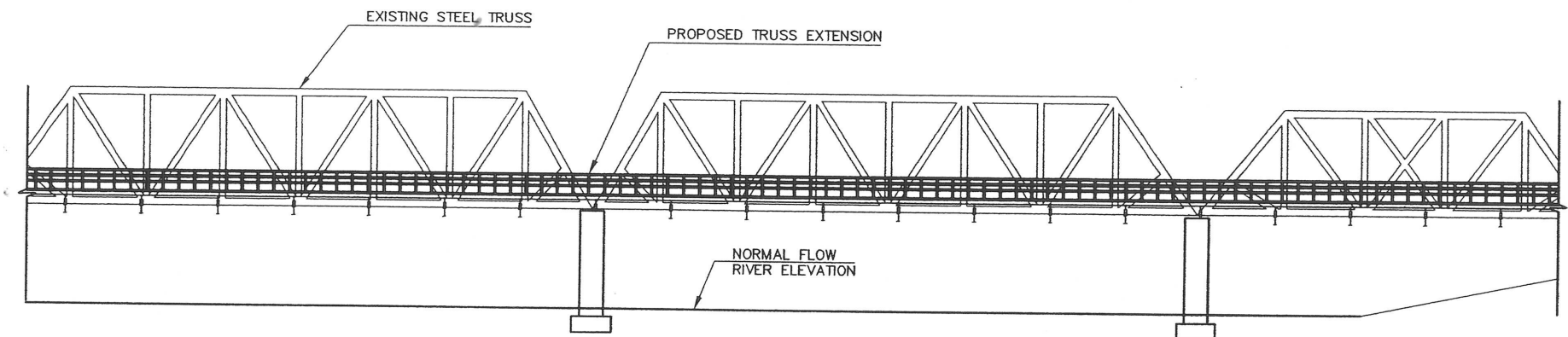
Figure
3



PLAN VIEW



SECTION



ELEVATION

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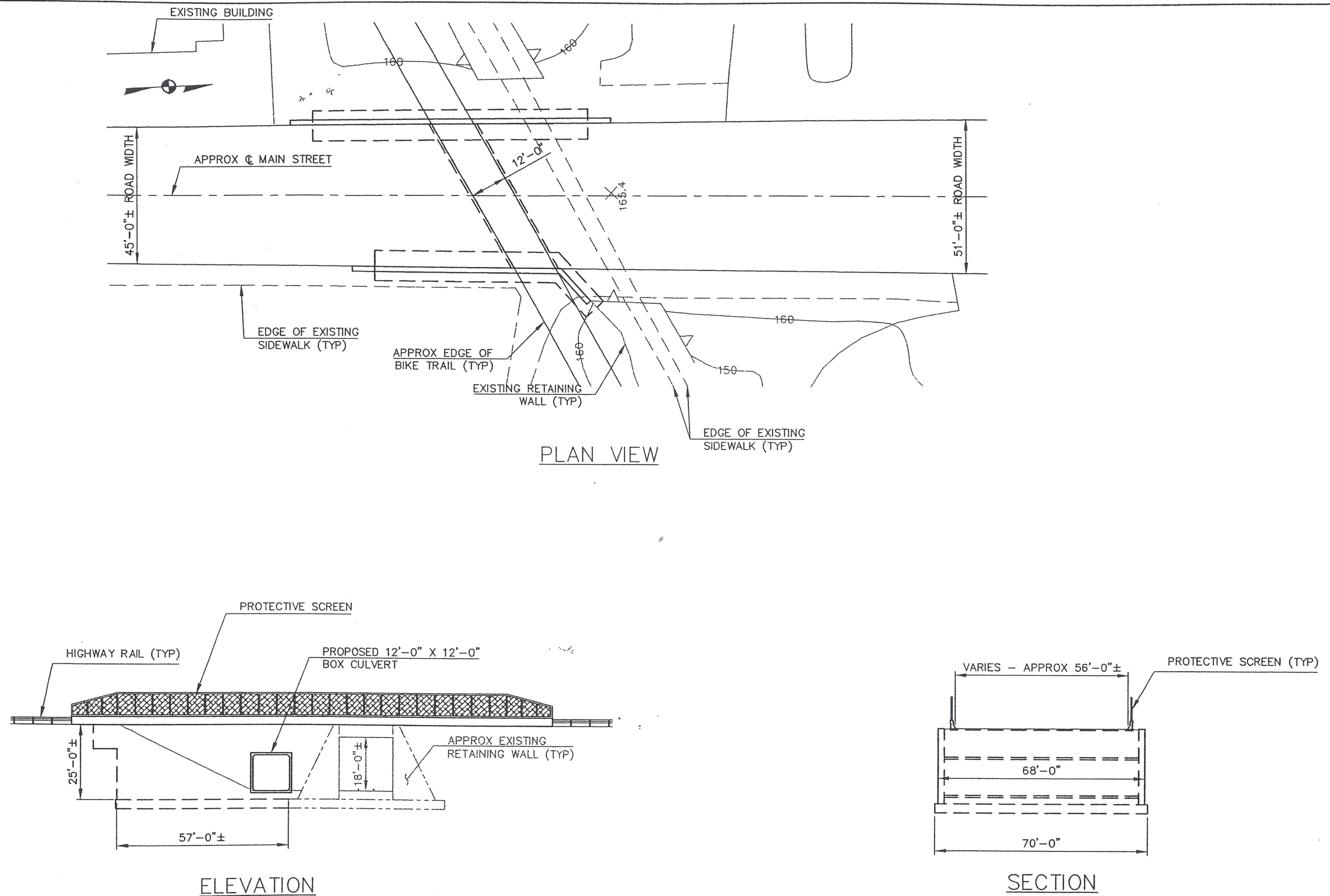
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Bike/Ped Facility Cantilevered
From Existing Truss Bridge
Over Androscoggin River

Figure
4



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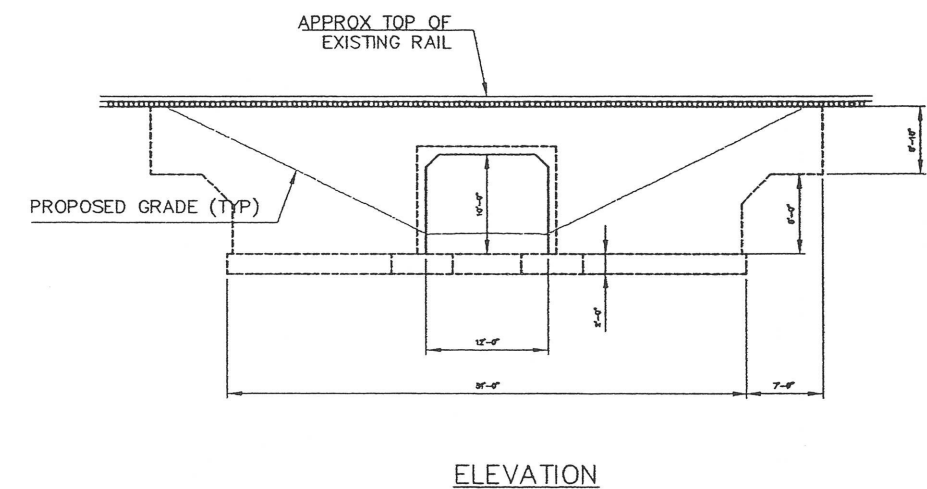
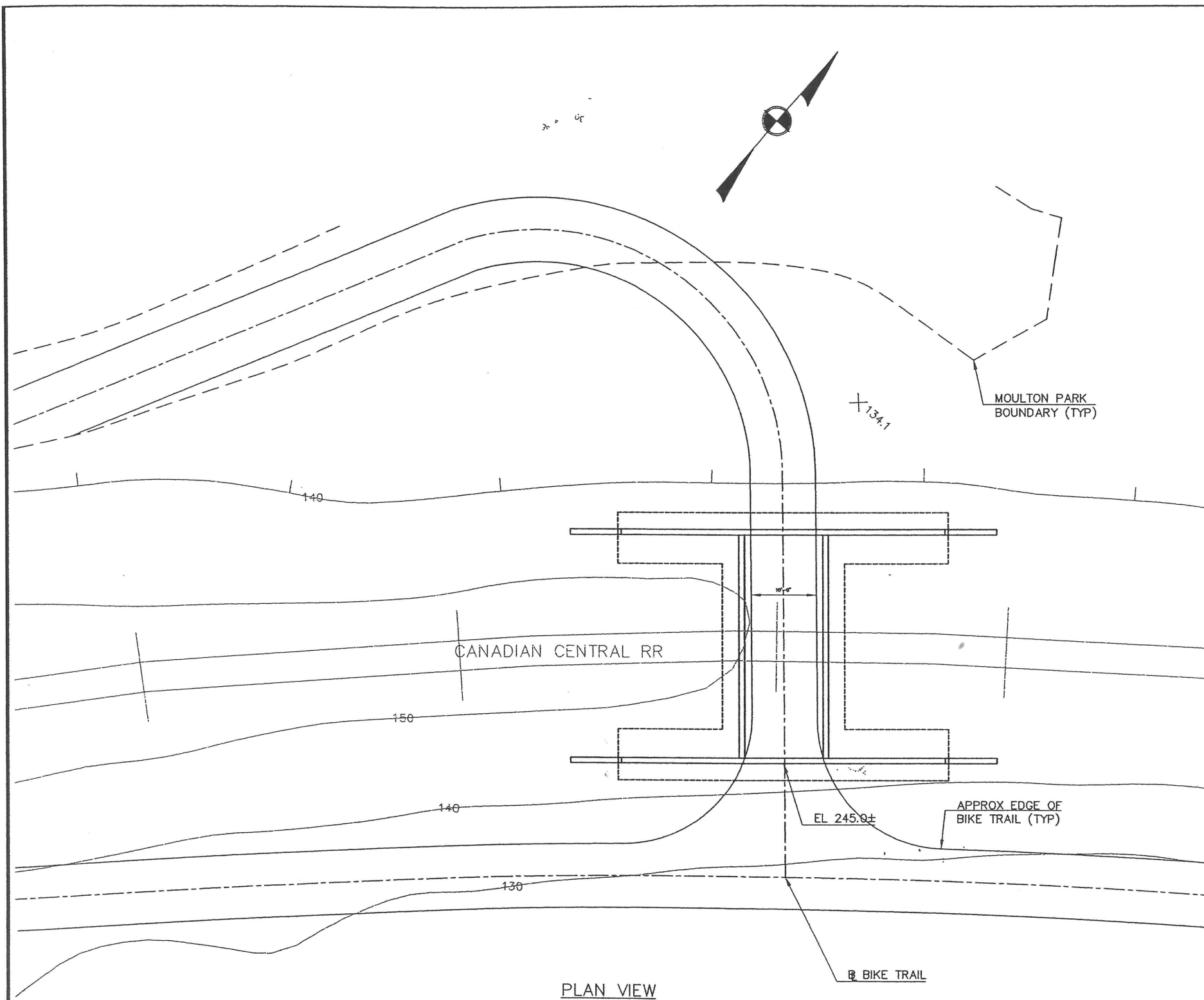
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Separate Bike/Ped Underpass
Under Main Street Adjacent
to Bonney Park

Figure
5



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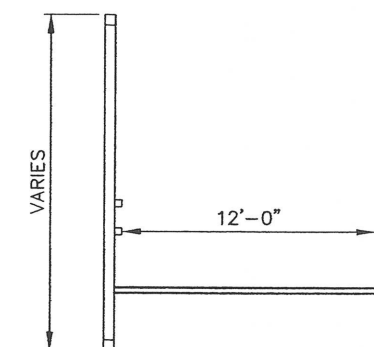
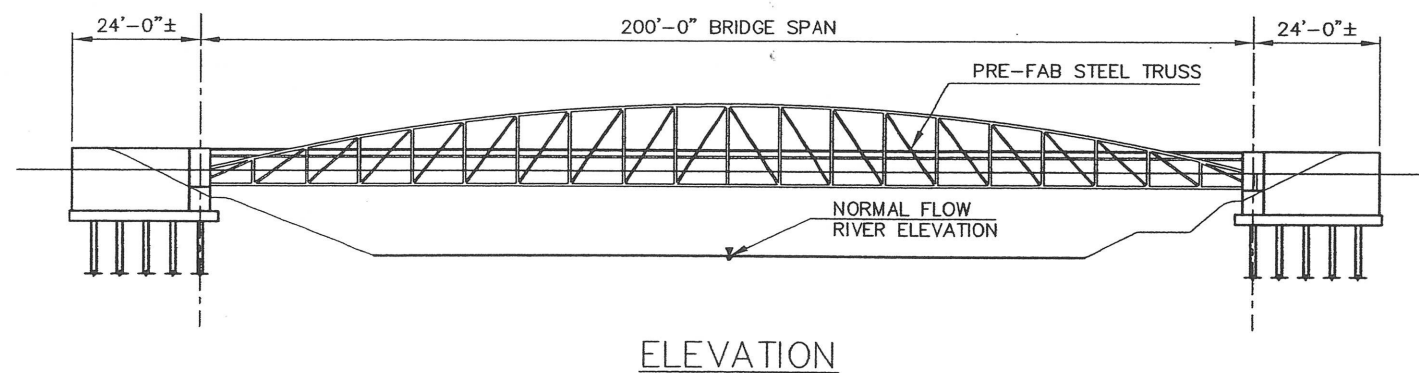
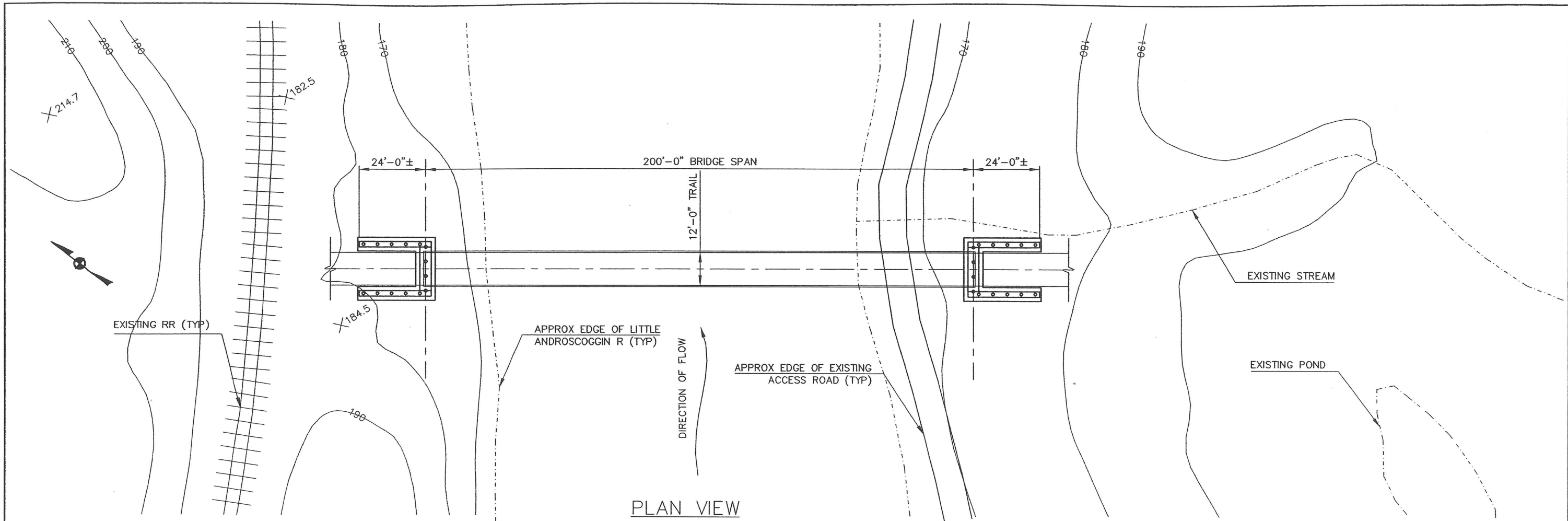
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Bicycle/Pedestrian Underpass
Under Railroad at
Moulton Park

Figure
7



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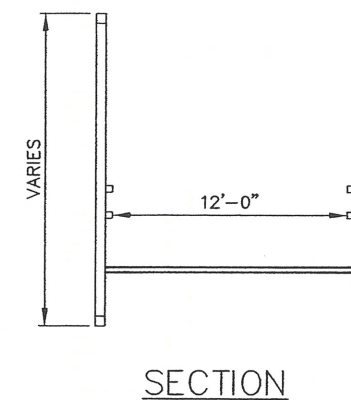
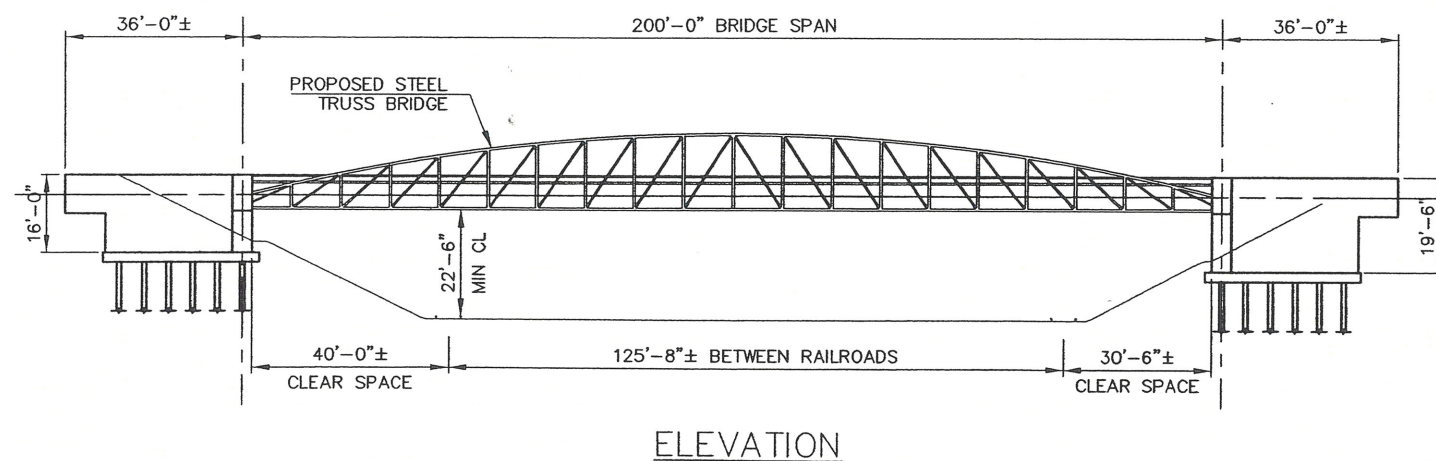
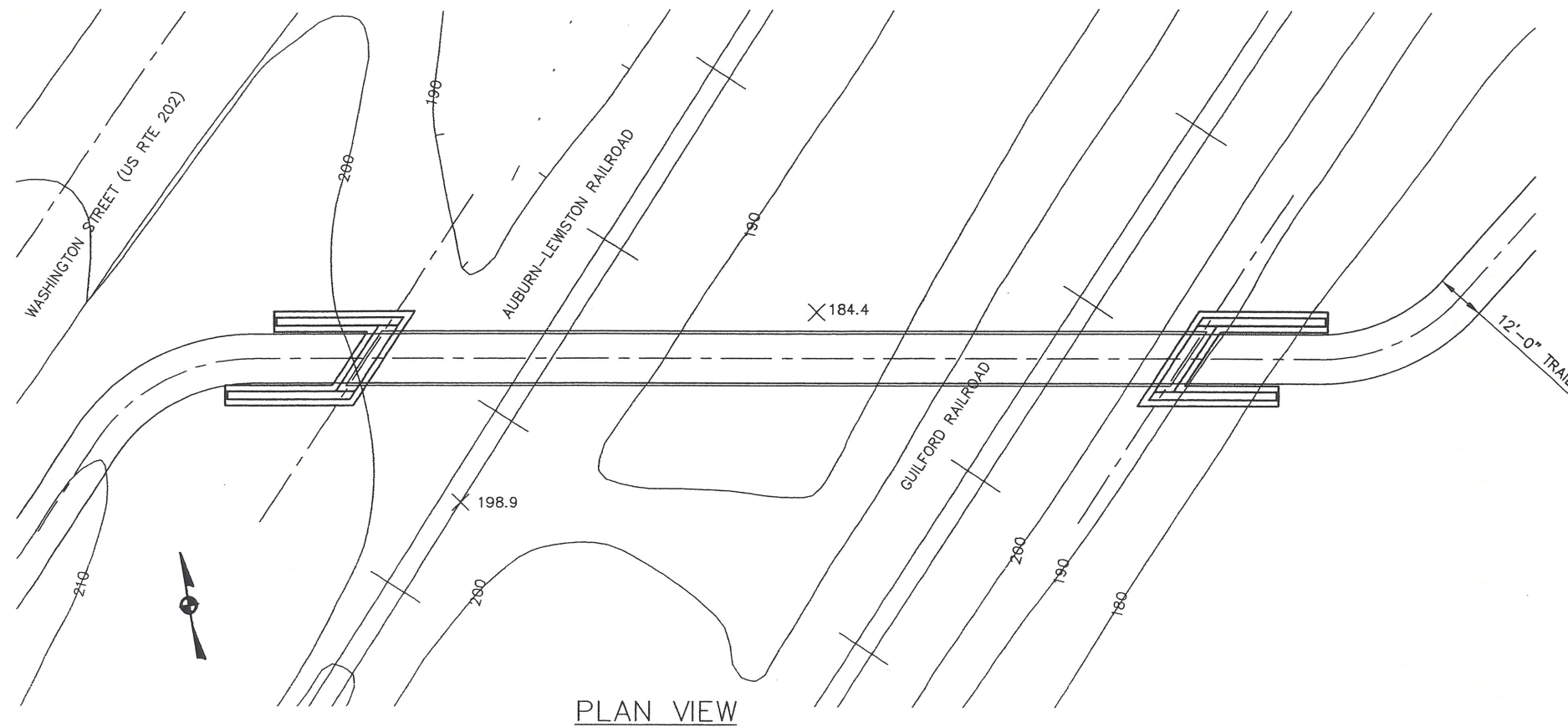
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Bicycle/Pedestrian Bridge
Between Dams on the
Little Androscoggin River

Figure
8



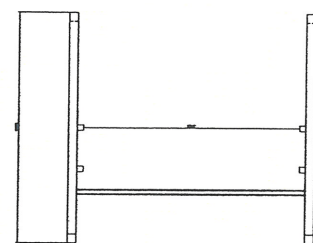
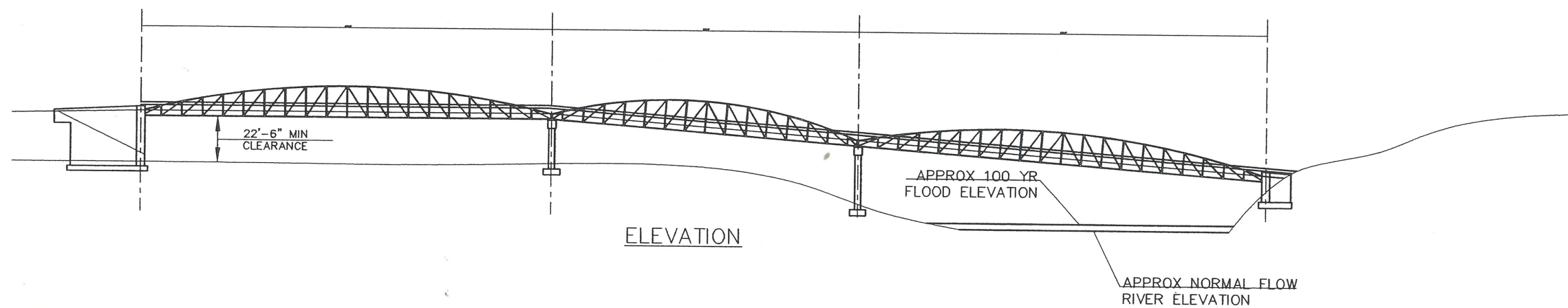
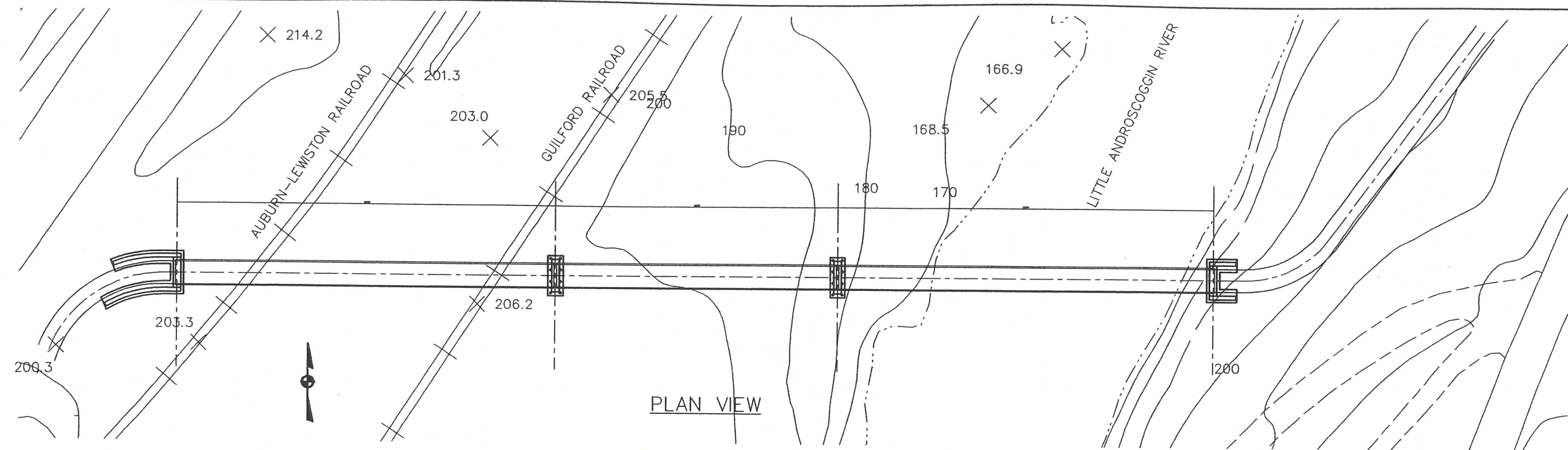
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Auburn Trails Feasibility Study

RIZZO
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0 NTS Feet

Bicycle/Pedestrian Bridge Over
Two Railroads Near
Upper Barker Mill Dam
Figure
9



SECTION

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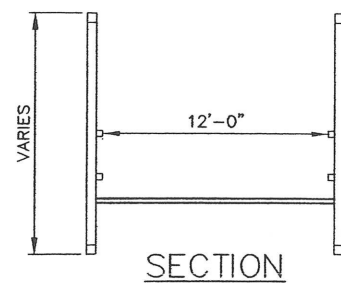
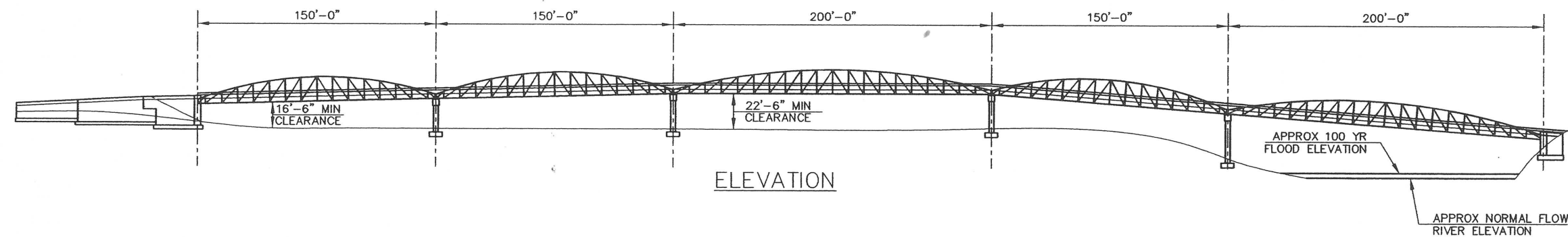
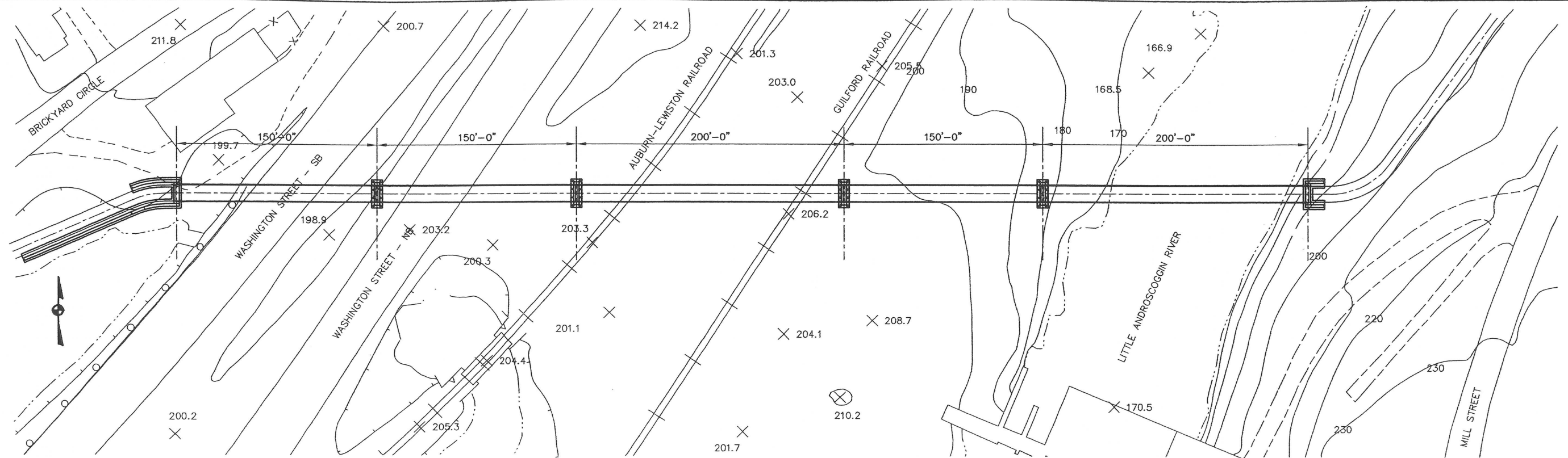
Auburn Trails Feasibility Study

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A TETRA TECH COMPANY

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Bike/Ped Bridge Over Little
Androscoggin River and
Railroads Near Upper Dam

Figure
10



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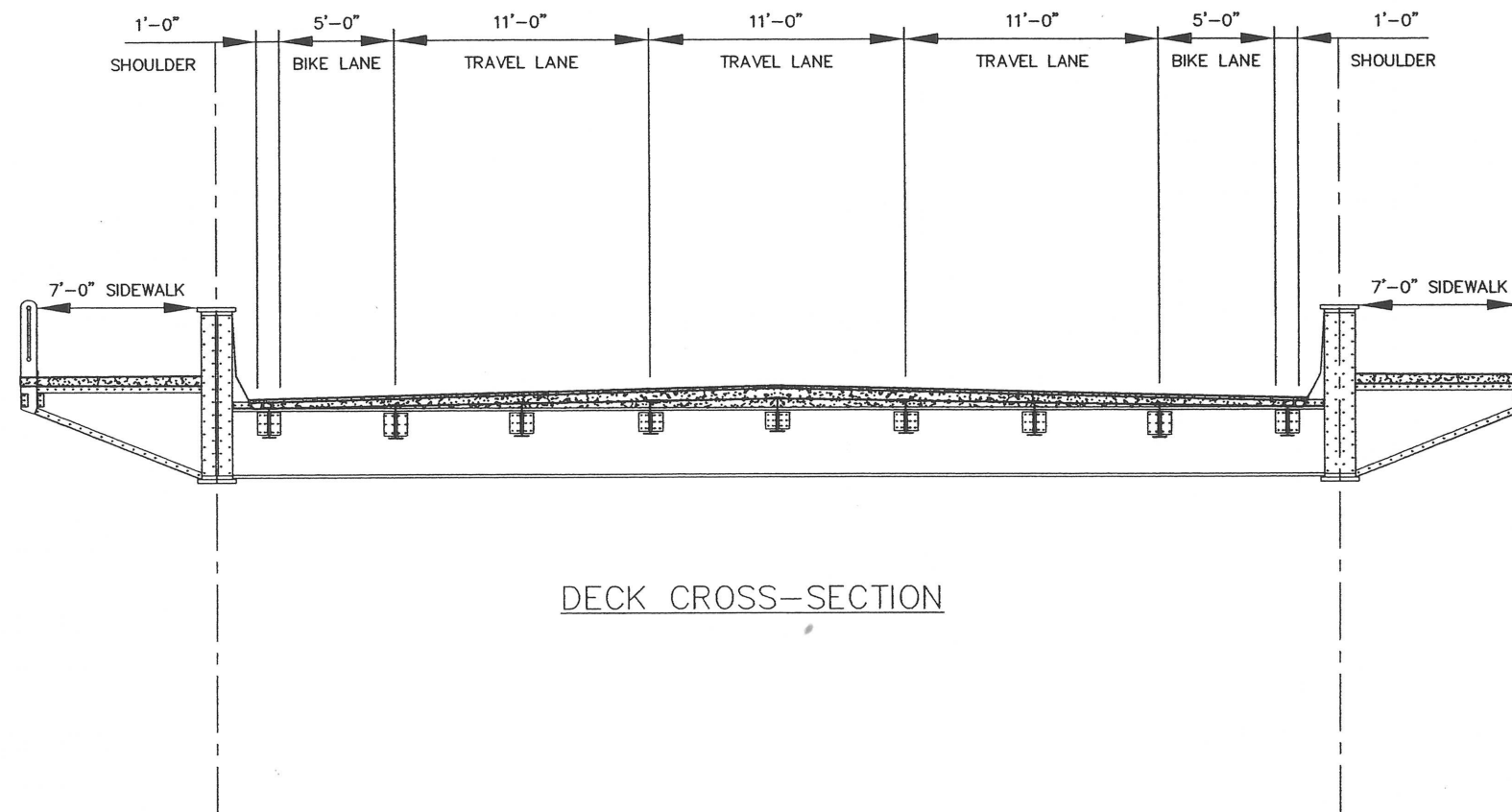
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Bike/Ped Bridge Over Little
Androscoggin, Railroads
and Washington Street

Figure
11



DECK CROSS-SECTION

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Restriping the South Main
Street Bridge Over The
Little Androscoggin River

Figure
12

CONCLUSIONS AND RECOMMENDATIONS

The following section summarizes conclusions of the feasibility study and recommendations for developing the Little Androscoggin River Shared Use Path and the Downtown Rail Trail. Order-of-magnitude cost estimates and recommended project phases are also presented.

Conclusions

Downtown Rail Trail

A bicycle/pedestrian trail along the Maine Central Railroad between High Street and Turner Street in downtown Auburn is feasible. The trail could be easily constructed given that the original railroad right-of-way was about 100 feet wide and contained two sets of rails and now only one set is active. Guilford Transportation has leased or sold portions of their right-of-way to owners of abutting properties demonstrating that they currently do not need the full width of the original right-of-way.



Maine Central Railroad at High Street

The trail would be located on the east side of the railroad between High and Elm streets and on the west side between Elm and Turner streets. The City of Auburn would negotiate with Guilford Transportation to lease or purchase the necessary property. Construction of a trail with a minimum 15-foot offset from the near rail and the construction of fencing within the separation would decrease trespassing within the railroad corridor. Pedestrians are currently walking close to the active railroad as evidenced by well-worn paths despite existing prohibitions. The

construction of a paved path further from the railroad with fencing between the railroad and the path will improve safety and decrease potential liability of the railroad owner. The proposed 15-foot minimum rail/trail offset and the proposed fencing are consistent with MDOT's Policy on Design Standards for Pedestrian Trails within a State-owned Rail Corridor (Draft, January 2000) and the state of the practice.¹ The Downtown Rail Trail could easily be connected to the Little Androscoggin River Shared Use Path through an underpass (box culvert) constructed under the Lewiston-Auburn Railroad at Moulton Park.



Lewiston-Auburn Railroad at Moulton Park

Little Androscoggin River Shared Use Path

Assuming that the Lewiston-Auburn Railroad is reactivated, then a new bicycle/pedestrian facility over the Androscoggin River will be required. The railroad bridge, which was converted to a bicycle/pedestrian bridge, will need to be converted back to railroad use. Bicycles and pedestrians could best be accommodated on a platform (truss extension) constructed on the south side of the existing bridge. A bicycle path (separate from the rail alignment) could be constructed through Bonney Park to Main Street without disrupting existing park uses.

Path users would cross Main Street at grade in a new mid-block crosswalk with pedestrian/bicyclist-activated traffic signals. It is feasible to construct a shared use path on the south and east side of the Lewiston-Auburn Railroad from Main Street to the west bank of the Little Androscoggin River just upstream of the Barker



Bonney Park



Existing trail on east bank of Little Androscoggin River

Mill Dam (lower dam). From that point, a trail bridge would be constructed over the river connecting to an improved paved path along the east riverbank. The path on the east bank would connect to Mill Street at both ends. At this point the project satisfies most of the project objectives including:

- 1) connecting the Lewiston and Auburn trail systems over the Androscoggin River

¹See *Rails with Trails: Design, Management and Operating Characteristics of 61 Trails Along Active Railroads*, Rails-to-Trails Conservancy, November 2000 and *Rails with Trails Best Practices Report, Phase I: State of the Practice*, Alta Transportation Consulting, October 2000 (Draft).

- 2) developing a path along the Little Androscoggin River
- 3) connecting downtown Auburn to New Auburn

Satisfying the fourth objective of the Little Androscoggin River Shared Use Path (connecting to Bennet Street) is technically feasible but extremely expensive. Three options were evaluated:

1. Extend the trail on the west riverbank of the Little Androscoggin River from the Barker Mill Dam to the Upper Barker Mill Dam. Construct a bridge over both railroads, a mid-block crossing at grade on Washington Street, and a trail on city-owned property to Bennett Avenue.
2. Extend the trail on the east bank of the Little Androscoggin River to the Upper Barker Mill Dam. Construct a bridge over the river and the two railroads, a mid-block crossing at grade on Washington Street, and a trail on city-owned property to Bennett Avenue.
3. Extend the trail on the east bank of the Little Androscoggin River to the Upper Barker Mill Dam. Construct a bridge over the river, the two railroads, and Washington Street, and a trail on city-owned property to Bennett Avenue.

While the first option includes the shortest structure, it also requires the construction of about 1,800 feet of high retaining wall due to the steep topography on the west riverbank between the two dams.



Maine Central Railroad on west bank of Little Androscoggin River

Option 1 is more expensive than Option 2. Option 3 is the most expensive due to an 850-foot-long structure, which alone is estimated to cost about \$1.5 million. Option 2, which involves crossing the river and the two railroads with a 550-foot structure, is recommended to connect the Little Androscoggin River Shared Use Path to Bennett Avenue. This option includes an at-grade crossing of Washington Street. Crosswalks would be installed across both barrels of Washington Street with advance warning signs. A pedestrian/bicyclist activated flashing yellow beacon should be considered as well. When triggered, the advance warning sign would indicate that bicyclists and pedestrians are crossing ahead.



Washington Street

Recommendations

Based on the analysis and input from the public, the City of Auburn and the State of Maine, recommendations were developed for the design and construction of the Little Androscoggin River Shared Use Path and the Downtown Rail Trail. It is recommended that the project be implemented in three phases:

Table 2 Recommended Project Phasing

Phase	Project	Estimated Cost
1	Construct the Downtown Rail Trail and part 1 of the Little Androscoggin River Shared Use Path	\$500,000
2	Construct part 2 of the Little Androscoggin River Shared Use Path and connect to Downtown Rail Trail	\$1,820,000
3	Construct part 3 of the Little Androscoggin River Shared Use Path with a connection to Bennett Avenue	\$1,400,000
TOTAL		\$3,720,000

Descriptions of each project phase and more detailed information on project design and construction costs follow.

Table 3 Cost Estimate - Phase I Little Androscoggin Path

Phase: Segment	Description	Quantity	Unit Cost	Price (\$)
I:1	Trail: East Bank Mill Street to Mill Street			
0.62 mi.	Bituminous Concrete Path	2274 ft	\$45 /ft	\$101,175
	Low Retaining Wall	1000 ft	\$187 /ft	\$187,000
	Culverts	3	\$500	\$1,500
TOTAL				\$289,675

Phase I - Little Androscoggin River Shared Use Path (part I) and Downtown Rail Trail

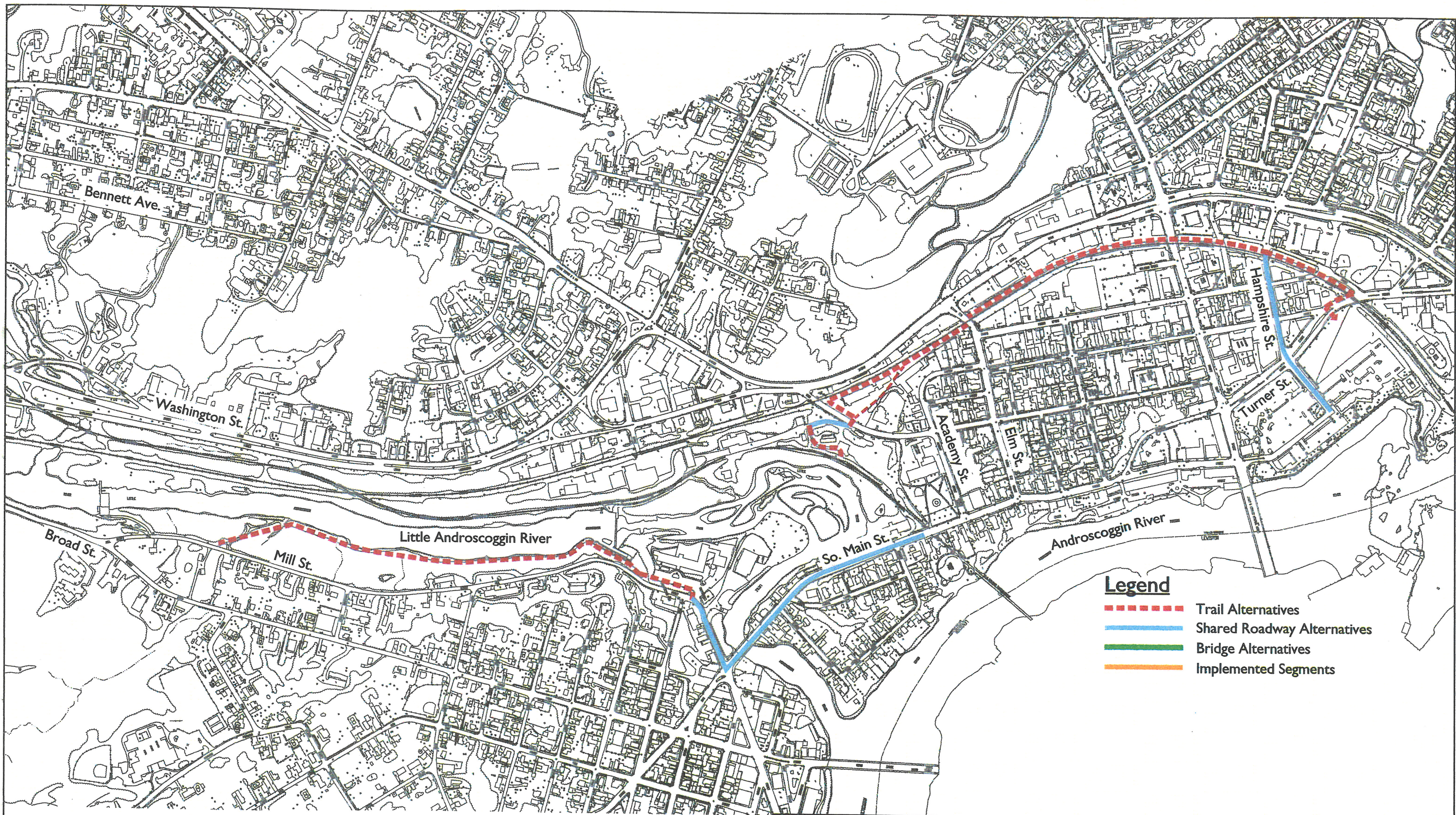
In this phase of the project, the portion of the Little Androscoggin River Shared Use Path on the east bank of the river would be constructed approximately on the alignment of an existing dirt trail/access road. Bike lanes would be provided on South Main Street, and the Downtown Rail Trail would be constructed from Moulton Park to West Pitch Park (see Figures 13, 14 and 15). In the event that the Lewiston-Auburn Railroad is not reactivated, the Phase 1 projects remain viable.

Little Androscoggin River Shared Use Path

The first section of the Little Androscoggin River Shared Use Path would be constructed on the east bank of the river where a dirt path is now located. The improved path would connect to Mill Street at both ends. Bicycle lanes would be striped on South Main Street between Mill Street and Bonney Park including on the bridge over the Little Androscoggin River. The segment of Mill Street between South Main Street and the beginning of the Little Androscoggin River path will be signed as a bicycle route.

Downtown Rail Trail

The Downtown Rail Trail will begin in Moulton Park off Hutchins Street. From the park, the trail will proceed on a shared roadway along Hutchins Street and across High Street about 350 feet east of the Minot Avenue signalized intersection. Depending on analysis performed during the design process, this crossing may or may not require a pedestrian-activated signal.



Legend

- Trail Alternatives
- Shared Roadway Alternatives
- Bridge Alternatives
- Implemented Segments



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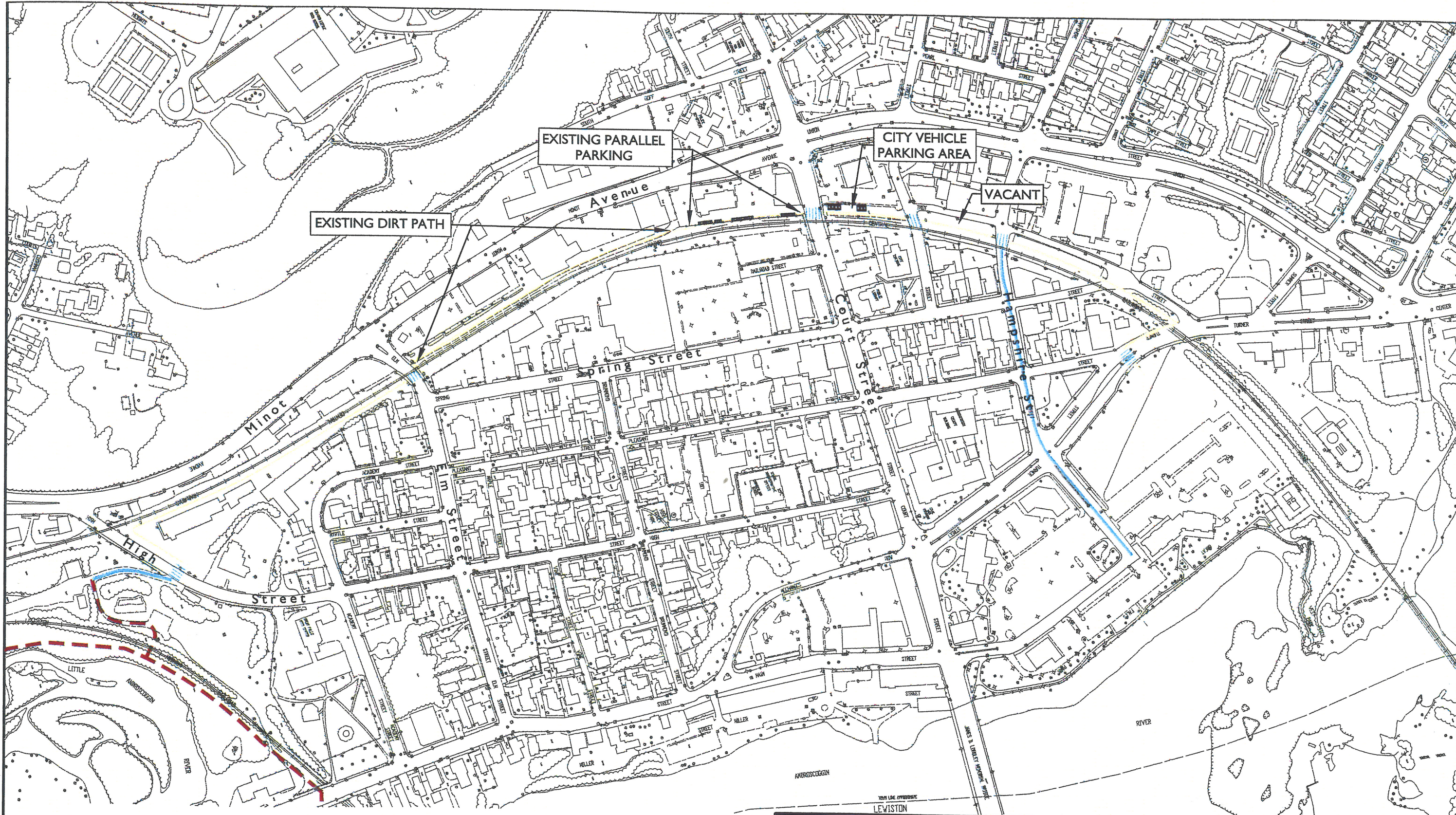
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Auburn Trails Feasibility Study

Auburn Trails - Phase 1

Figure
13



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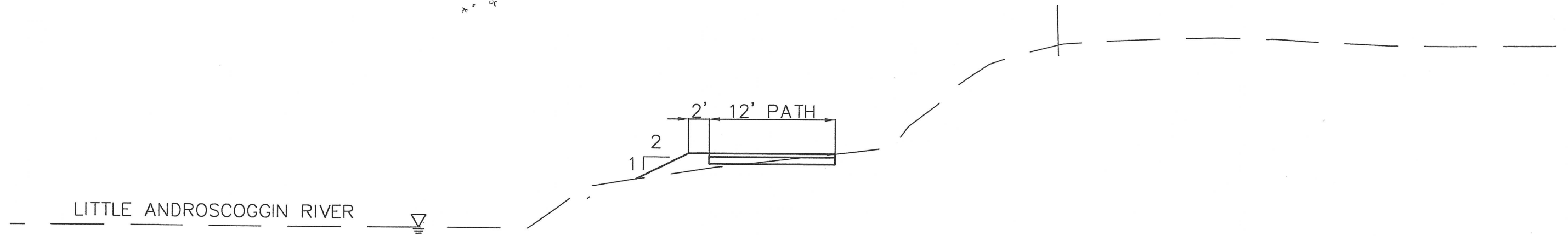
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City of Auburn, ME

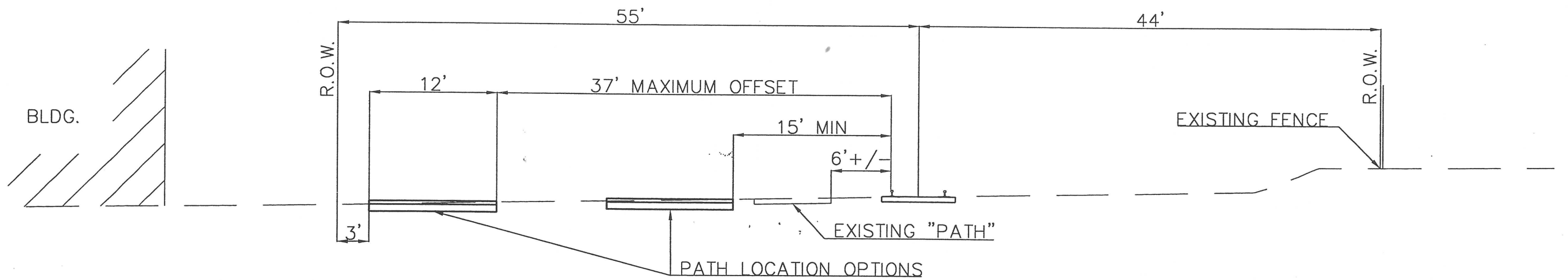
Auburn Trails Feasibility Study

Downtown Rail Trail

Figure
14



LITTLE ANDROSCOGGIN RIVER SHARED USE PATH LOOKING NORTH



DOWNTOWN RAIL TRAIL LOOKING NORTH
(BETWEEN ELM AND COURT STREETS)

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Typical Trail Sections

Figure
15



High Street at Hutchins Street

Between High Street and Elm Street, the path would run along the east side of the tracks at a 15-foot offset. A building located less than 11 feet from the tracks precludes the development of a trail on the west side. For the first 465 feet of the path from High Street, the railroad right-of-way is only 33 feet from the centerline. The path may be constructed 15 feet for the nearest rail and still leave a few feet to the former cargo off-loading area at the rear of an existing second-hand store. Continuing north behind the former Agway building, the right-of-way opens to 44 feet on this side. On the west side along this segment, some of the railroad right-of-way has been sold off to private entities as close as 25 feet to the centerline of the tracks.



**Maine Centrail Railroad between
High and Elm streets**

From Elm Street to Turner Street, the right-of-way is, with few exceptions, 55 feet from the centerline on the west side and 44 feet on the east. Given the wider right-of-way, fewer obstructions and the presence of an existing dirt path on the west side, the recommendation is to locate the path there as well.

Restrictions on the east side include a portion of the railroad right-of-way that was sold to accommodate the Shop 'n Save store. This parcel was sold to within 35 feet of the track centerline. Also, between Shop 'n Save and Court Street there is an ATM building with a paved lot to within 20 feet of the railroad centerline. Other areas on the east side of the railroad will be difficult or impossible to work around.

On the west side beginning at Elm Street, the dirt path previously mentioned appears to be frequently traveled by pedestrians and cyclists alike. In some locations, the path comes very close to the active railroad tracks. The Downtown Trail would replace this existing path further away from the railroad tracks. It would encounter a tight squeeze behind the tire shop where an existing structure appears to encroach considerably on the railroad right-of-way, perhaps under agreement with the railroad. The path would continue to the parcel on the southeast corner of Minot Avenue and Court Street. On this lot, there is a restaurant and a professional building with parallel parking at the rear of the properties along a section of guardrail. Since the guardrail is only about 10 feet from the railroad centerline, the path would come through this section of the lot as a shared roadway. The parking may have to be rearranged to accommodate the bicycle/pedestrian facility. It is our understanding that those property owners had purchased these portions of the railroad right-of-way.

Crossing Court Street, the path would then continue as a shared roadway between Court Street and Hampshire Street. The City of Auburn has leased these properties from the railroad for a considerable amount of time. The original documents state that the City shall pay the railroad an annual fee of \$10 payable on the first day of May. Although the fees have increased, the City maintains the use of this property to within 18 feet of the railroad centerline, meeting the minimum trail edge-to-near rail centerline offset of 15 feet.

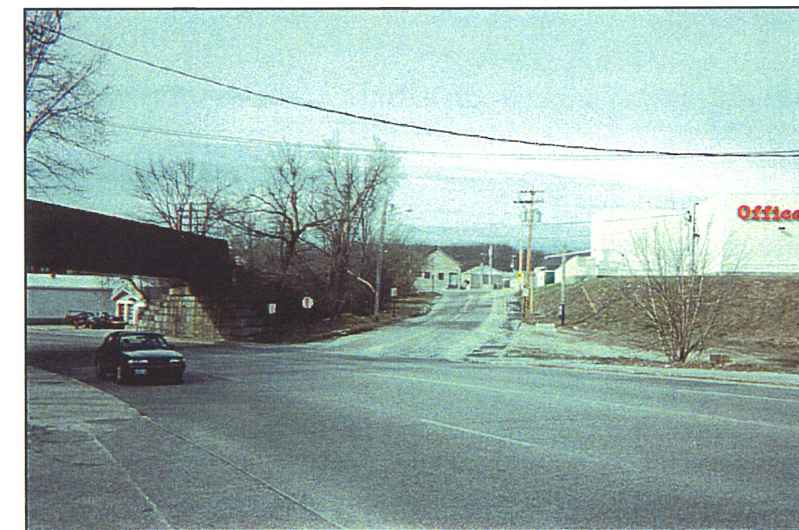
Although probably not emphasized as a bicycle route due to its steep grade, Hampshire Street will remain a viable connection to



Hampshire Street

Great Falls Plaza. Advanced and basic adult cyclists would be able to make this direct connection in spite of the grade and traffic volumes at the intersections of Hampshire Street with Pleasant Street and Turner Street. Child cyclists have the option of continuing on the trail to Turner Street.

Between Hampshire Street and Turner Street along the west side of the railroad, the right-of-way holds steady at 55 feet from the centerline. There is one parcel under lease agreement with the railroad that contains a building slated for demolition. The other segment closer to Turner Street also has a steep grade.



Maine Central Railroad at Turner Street

At Turner Street, the railroad is situated high upon a berm and the trail can no longer follow directly beside it. Those cycling the trail will be directed through signage to dismount and walk their bicycles under the railroad overpass to a crosswalk slightly south of the bridge. This crosswalk would cross Turner Street and bring them to a path along the east side of the railroad berm and ultimately connect to the West Pitch Park path system and the existing trail along the Androscoggin River.

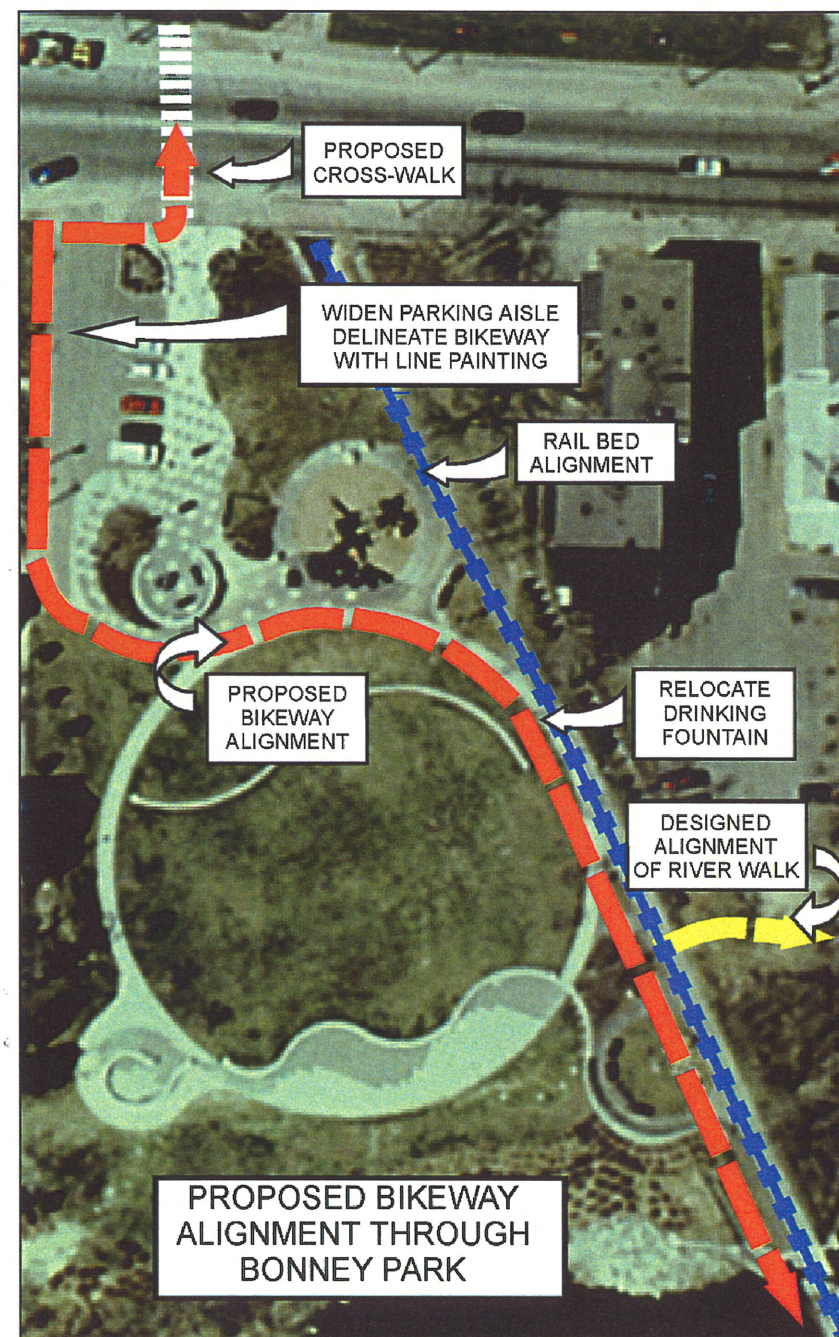
Table 4 Cost Estimate - Phase I Downtown Rail Trail

Phase: Segment	Description	Quantity	Unit Cost	Price (\$)
1:2	Downtown Rail Trail: High to Hampshire			
0.76 mi.	Downtown Rail Trail	4000 ft	\$52 /ft	\$207,979
	Hampshire Street to Main Street	1140 ft	\$0 /ft	\$0
TOTAL				\$207,979

Phase 2 Little Androscoggin River Shared Use Path (part 2)

Implementation of this phase is predicated on the decision to reinstate rail service on the Lewiston Auburn Railroad. In this phase, the northern segment of the Little Androscoggin Shared Use Path would be constructed. The path will begin at the Androscoggin River, where a truss extension will be constructed on the south side of the existing railroad bridge. The truss extension is the lower cost option compared to a separate companion structure.

The path will be constructed as a separate rail with trail through Bonney Park on the south side of the railroad. The park will be redesigned to accept the rail with trail (see Figure 16). A pedestrian/bicyclist-activated traffic signal and crosswalk would be installed on South Main Street south of the existing roadway bridge over the railroad. The path will continue on the other side of the street, remaining on the south side of the railroad. The path will curve along the west bank of the Little Androscoggin River to just south of the Barker Mill Dam, where a single-span bridge will be constructed to the east bank (see Figure 17).



Courtesy of Icon architecture, inc.

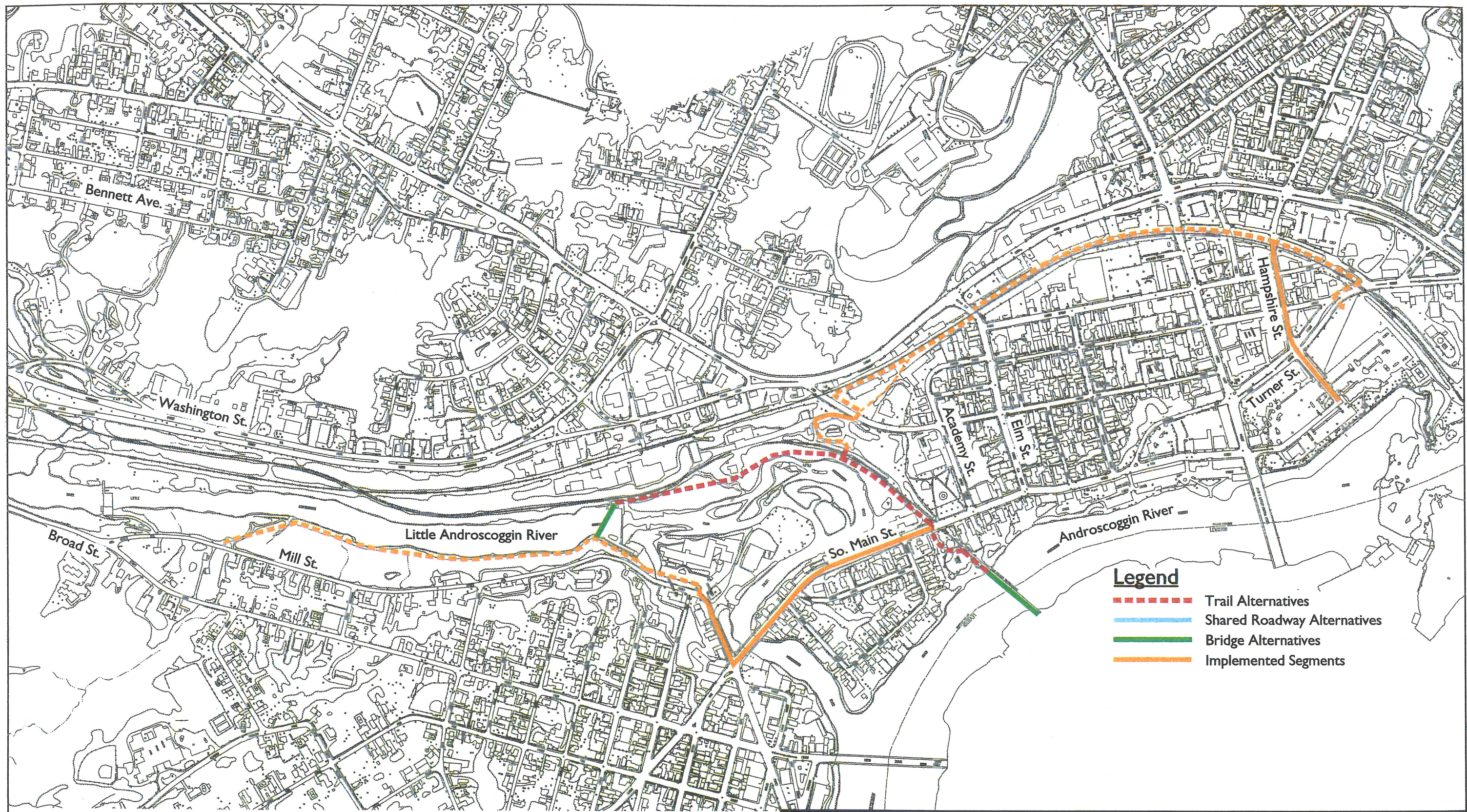
Figure 16 Proposed Bikeway Alignment

Table 5 Cost Estimate - Phase 2

Phase: Segment	Description	Quantity	Unit Cost	Price (\$)
2:1	Moulton Park Connection to West Bank Trail			
	Box Culvert - Structure E	12 ft	N/A	\$290,000
	Existing Drive/Road to High Street	650 ft	\$0 /ft	\$0
	Segment Total			\$290,000
2:2	Truss Ext. on Exist. RR Bridge			
	Cantilever - Structure B	450 ft	N/A	\$350,000
	High Retaining Wall at Approaches	200 ft	\$475 /ft	\$95,000
	Segment Total			\$445,000
2:3	Trail: Bonney Park to Barker Mill Dam			
0.50 mi.	Bituminous Concrete Path	1740 ft	\$45 /ft	\$77,430
	At-Grade Crossing - Ped Activated		N/A	\$40,000
	Low Retaining Wall	500 ft	\$187 /ft	\$93,500
	High Retaining Wall	300 ft	\$475 /ft	\$142,500
	Timber Platform at Culvert	100 ft	\$615 /ft	\$61,500
	Segment Total			\$414,930
2:4	Bridge at Barker Mill Dam			
	Bridge - Structure F	200 ft	N/A	\$620,000
	High Retaining Wall at Approaches	100 ft	\$475 /ft	\$47,500
	Segment Total			\$667,500

Phase 3 Little Androscoggin River Shared Use Path (part 3)

The most difficult and expensive phase of the project will extend the Little Androscoggin River Shared Use Path along Mill Street to the Upper Barker Mill Dam. A 550-foot long structure will be constructed over the Little Androscoggin River and the two railroads. Crosswalks will be installed across both barrels of Washington Street (see Figure 18). Advance warning signs and a pedestrian/bicyclist activated flashing yellow beacon would be installed on Washington Street. An existing trail on city-owned property between Washington Street and Bennett Avenue would be improved. The trail intersects Bennett Avenue between two single-family homes. Landscaping would be provided as a screen between the trail and the homes. At Bennett Avenue, trail users would travel on existing streets to Poland Road, Hotel Road and



Legend

- Trail Alternatives
- Shared Roadway Alternatives
- Bridge Alternatives
- Implemented Segments



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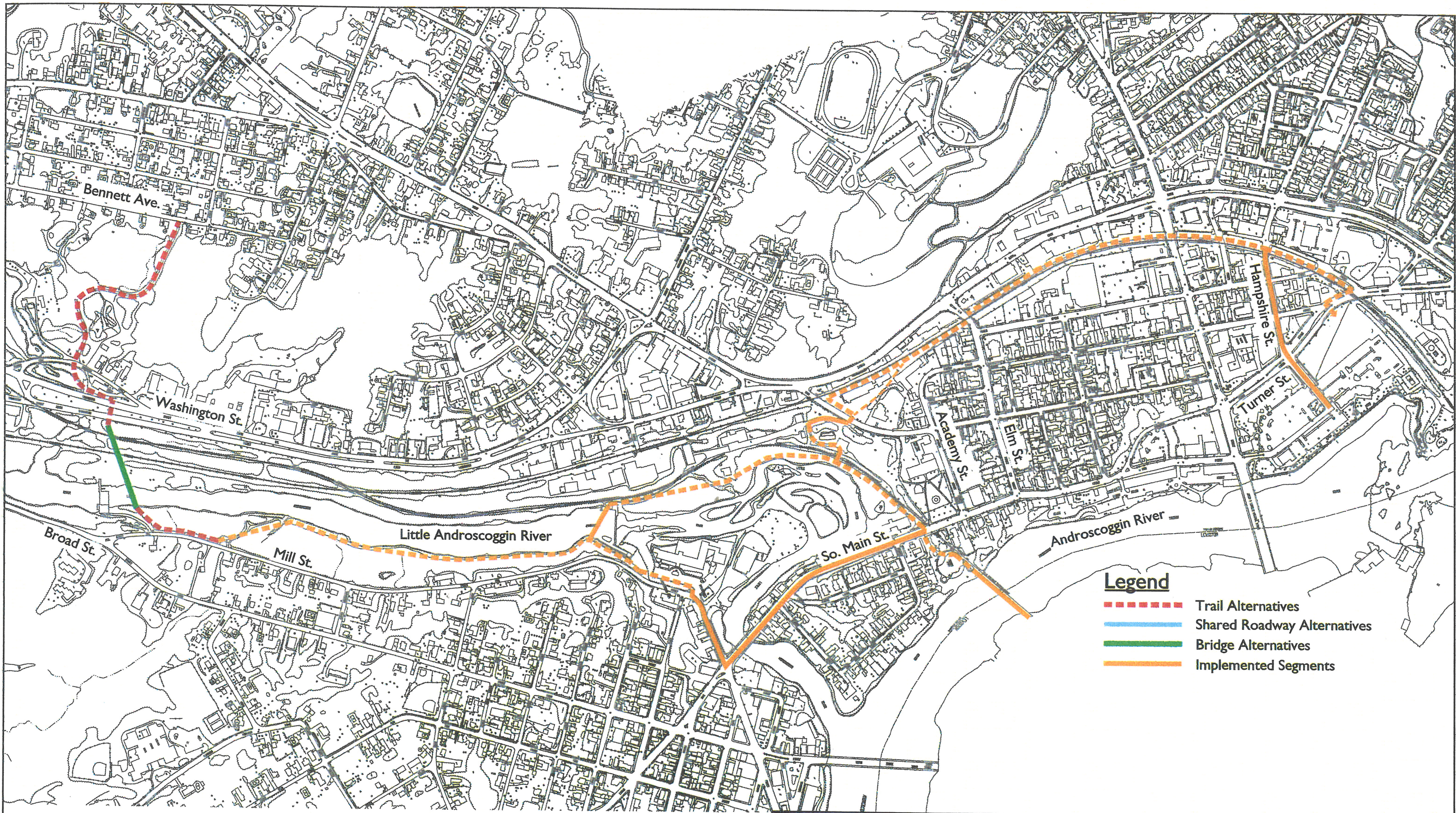
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Auburn Trails - Phase 2

Figure
17



Legend

- Trail Alternatives
- Shared Roadway Alternatives
- Bridge Alternatives
- Implemented Segments



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Auburn Trails - Phase 3

Figure
18

Junction Road, which parallel the Lewiston Auburn Railroad and provide access to the Lewiston Auburn Airport.

Table 6 Cost Estimate - Phase 3

Phase: Segment	Description	Quantity	Unit Cost	Price (\$)
3:2	East Bank Trail -- Structure H			
0.58 mi.	Bituminous Concrete Path	1912 ft	\$45 /ft	\$85,102
	Bridge - Structure H	550 ft	N/A	\$1,040,000
	High Retaining Wall	200 ft	\$475 /ft	\$95,000
	Low Retaining Wall	300 ft	\$187 /ft	\$56,100
	Timber Platform at Culvert	100 ft	\$615 /ft	\$61,500
TOTAL				\$1,337,702

NEXT STEPS

In October 2000, the City of Auburn applied to MDOT for approximately \$1 million in Transportation Enhancement monies to fund portions of the Auburn Trails. The application covers the proposed Downtown Rail Trail and 1.25 miles of the Little Androscoggin River Path. The later project includes a single-span prefabricated bridge (Bridge F) over the Little Androscoggin River and the proposed path on the east riverbank. The City of Auburn intends to secure the necessary easements for the project and complete final design and construction bid documents in the current fiscal year (FY 2001). The trails would be constructed in fiscal years 2002 and 2003.

It is expected that MDOT will have made a final decision on rail reactivation before the beginning of FY 2003. Once that decision is made, the City of Auburn would seek additional Transportation Enhancement funds to complete the remaining segments of the Little Androscoggin River Path.