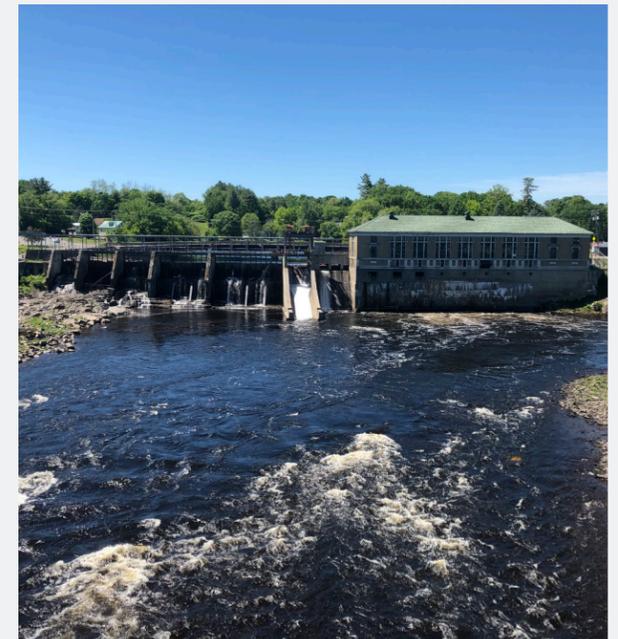


# SKOWHEGAN BRIDGE FEASIBILITY STUDY

## Executive Summary

Prepared: June 2, 2021

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Skowhegan  
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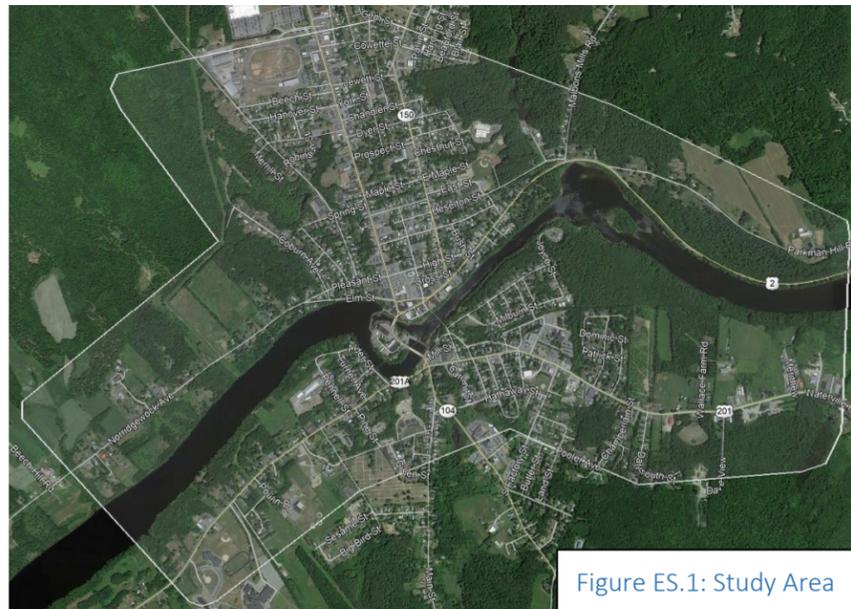
## 1.0 EXECUTIVE SUMMARY

The Town of Skowhegan and the Maine Department of Transportation (MaineDOT) are undertaking a transportation study in the downtown region of Skowhegan to determine the need, effectiveness, and potential location for an additional bridge across the Kennebec River. The current effort began in 2018 as a second bridge study in greater downtown Skowhegan. This study is not a Bridge and Bypass Study that was part of a formal Federal Environmental Impact Statement (EIS) discontinued 10 years ago.

### Study Area

The study area, as depicted on **Figure ES.1**, generally extends from the Fairground to the north, the Redington-Fairview General Hospital to the south, the Skowhegan School District campus to the west and Commerce Drive to the east.

The Study documents existing conditions and evaluates Alternatives that address transportation mobility and safety deficiencies. Alternatives were evaluated based on transportation measures, environmental resources, land use, cost and funding and property impacts. Ultimately both Short and Long-term improvements were identified.



### Existing Conditions Summary

Section 2 presents Existing Conditions with the following key conclusions:

- Island Avenue is the busiest roadway in the study area with an Annual Average Daily Traffic Volume (AADT) of 23,330 vehicles.

- The weekday peak hours in the study area are generally between 7:30-8:30 AM and 3:00-4:00 PM.
- The intersections of Island Avenue/West Front Street/Main Street/Waterville Road, Madison Avenue/Elm Street/Commercial Street, and Water Street/Patten Court/Court Street/Commercial Street are all High Crash Locations (HCL).
- The intersection of Island Avenue, West Front Street, Main Street, and Waterville Road is over capacity and operating at failing levels of service throughout the day.
- Commercial Street vehicle queues are significant during the morning peak hour.

### Alternatives Evaluated

*A1 - Transportation Demand Management/Transit Improvement Strategies (TDM):* Transportation Demand Management (TDM) programs provide tools for commuting travelers to reduce the demand for transportation, i.e., reduce the number of vehicles on the road. These tools include rideshare programs, park and ride lots (which can support rideshare programs), and work from home opportunities, all of which either make it easier to rideshare or to stay off the road altogether.

*A2 - Transportation System Management Improvements (TSM):* Transportation System Management (TSM) addresses the capacity and safety deficiencies of the system. The following present the suggested TSM improvements:

- **Main Street/Island Avenue/West Front Street/Waterville Road** - Convert the Island Avenue YIELD controlled right turn to signal control.
- **Madison Avenue/Elm Street/Commercial Street** – To improve lane utilization on the southbound Madison Avenue approach, it is recommended that two travel lanes continue through the Water Street intersection.
- **Madison Avenue/Pleasant Street/High Street** – To improve lane utilization on the southbound Madison Avenue approach, it is recommended that two travel lanes continue through the Front Street intersection.
- **Commercial Street/Water Street/Court Street** - the following safety mitigation measures are suggested:
  - Replace the YIELD sign with a STOP sign on the Water Street approach.
  - Install Rectangular Rapid Flash Beacons (RRFB) at crosswalk locations.
  - Incorporate geometric modifications to tighten the intersection with the understanding that large trucks must be accommodated.

*A3 – Improve Existing Bridges:* Widen or Improve the existing two Route 201 Island Avenue Bridges to provide mobility enhancements with bicycle and

pedestrian facilities. In conjunction with this the TSM improvements and the following was assumed:

- **Main Street/Island Avenue/West Front Street/Waterville Road** – To address congestion issues the following TSM improvements are suggested. As noted, poor operating conditions will continue.
  - Converting the West Front Street approach from a left, through and right lane configuration to a left, left/through, right configuration. This does require two receiving lanes on Island Avenue (which would require a bridge widening).
  - Converting the Main Street approach from a left and through/right lanes to left/through and through/right lanes. As above this requires two receiving lanes on Island Avenue.

Improvement requires right-of-way acquisition from parcels along the existing corridor and potential impact to the Skowhegan Historic District at the intersection of Island Avenue, Madison Avenue, and Water Street.

*A4 – Downstream Bridge Crossing:* Provide a new river crossing with roadway connections between Route 201 and Route 2 approximately 1 mile south of downtown Skowhegan. Improvement has potential impacts to Arnold Trail to Quebec Historic District, hardwood seepage forest, and private conserved land.

*A5 – Downtown Bridge Crossing:* Provide a new river crossing with roadway connections in the immediate downtown Skowhegan area downstream of the existing Route 201 Bridges. Improvement has potential impacts to the Veteran's Park, the proposed Run of River, and Historic Districts.

*A6 – Upstream Bridge Crossing:* Provide a new river crossing with roadway connections upstream of the existing Route 201 Bridges. Improvement has potential impacts to a town park, state conserved land, and Historic Districts.

### Alternatives Evaluation Considerations

The evaluation of Alternatives was based on the following criteria.

#### Transportation Measures

- **Vehicle Miles Traveled (VMT)** – The number of miles traveled during the AM Peak Hour on non-Interstate highways in the Skowhegan area. An increase in VMT for an alternative could indicate that motorists are following longer, but faster, routes for their trips; a decrease in VMT for the alternative could indicate more direct routes are being provided and are being utilized.

- Vehicle Hours Traveled (VHT) – The number of hours driven by vehicles during the AM Peak Hour on non-Interstate highways in the Skowhegan area. Because all of the alternatives are designed to reduce traffic congestion at one or more locations, VHT decreases for each alternative because shorter travel times are produced for some travel patterns.
- Improves Level of Service (LOS) and Delay at Study Area Local intersections – Study area intersections where LOS is improved.
- Reduction in Crashes.
- Potential for Reducing Truck Traffic through Downtown.
- Potential for improving Emergency Service access during roadway closures.
- Potential for Improving Downtown Mobility.
- Provides Regional River Crossing Redundancy.
- Potential for Improving Bicycle and Pedestrian Conditions – Consideration of traffic volume levels and roadway capacity expansion which likely degrades bicycle and pedestrian conditions.

#### Land Use Measures

- Number of Homes/Buildings with Direct Impact.
- Number of Private Lots Impacted.
- Compatible with Comprehensive Plan.
- Right-of-Way Acquisition Needed.
- Impacts to use of the Waterway.

#### Environmental Resource Measures

- Potential for Impacts to Archeological and Historic Resources – Impact to identified resources.
- Potential for Wetland Impacts – Acres of impact.

- Stream Crossings.
- Potential for Conservation Land and 4(f) Land Impacts – Impact to identified resources.
- Potential for Impacts to Rare, Threatened, Endangered, and Special Concern Plant Species and Habitats – Impact to identified resources.

#### Cost and Funding Measures

- Construction Cost - This total is the construction cost (current dollars only) to implement each improvement/alternative and does not include design, right-of-way, or construction engineering in the estimates.
- Benefit/Cost Measure – This is the ratio of the benefit of each alternative quantified according to safety and mobility improvements on a cost basis versus implementation cost.

#### Purpose and Need

##### Study Purpose

The purpose of the proposed action is to provide a transportation system that will connect Routes 2 and 201 across the Kennebec River in Skowhegan and support improved regional mobility for people and freight. The preferred alternative will most effectively mitigate safety and congestion issues in the downtown area while having the least projected impact to local commerce.

The proposed action will also improve the resiliency and redundancy of the regional system and enhance regional safety. It will be supported by reasonably available local, state, and federal funding.

##### Study Need

The need for the proposed action is demonstrated through current failing Customer Service Levels at the existing crossing and approaches, indicative of insufficient capacity and high instances of crashes. Congestion is observable at or near peak times when access across the river is impacted. It is further demonstrated by existing safety issues at intersections and in Downtown.

#### Public Outreach

An extensive public outreach program requested and managed by the Town was included as part of the study process. The outreach program included a

combination of Study Team meetings, Town Bridge Committee meetings and Public meetings. These engaging meetings were also supplemented with surveys. The COVID-19 pandemic did impact the study schedule and required adaption to a virtual meeting format for some meetings. But at the end of the process the study team concluded the virtual meeting format generated more meeting attendance with broader input than other similar studies.

#### Alternatives Analysis

**Table ES.1** and **Figure ES.2** provide a comparison of Alternatives using the noted criteria. **Table ES.2** summarizes the planning level cost estimates for the alternatives. Alternatives 4 and 5 provide the greatest benefits when considering the study purpose and need. A detailed comparison matrix is provided in the Appendix. A summary of the alternatives is provided as follows:

##### No-Build

- Does not meet purpose and need.
- Will require a deck replacement in short-term with impacts and cost associated with a temporary bridge.

##### Alt. 3 Widen and Improve Existing Bridge, \$36.6M

- Does not provide substantial safety or mobility benefit.
- Potential for adverse environmental impacts.

##### Alt. 4 Downstream Crossing, \$25.5M

- Transportation benefits but not as much as downtown bridge.
- Potential for adverse environmental impacts.

##### Alt. 5 New Downtown River Crossing, Through Arch\*, \$55.3 M

- Significant transportation benefits.
- Adverse environmental impacts including 4(f), Veteran's Park next to municipal building and neighborhood on south side.

\*A steel girder downtown crossing was removed from consideration due to impacts to Skowhegan Run of River recreation area currently being permitted and opposed by Town.

##### Alt. 6 Upstream Crossing, \$30.5M

- Lowest transportation benefits of all alternatives other than upgrade.
- Potential for adverse environmental impacts.

**Table ES.1 – Comparison Matrix**

Category / Alternative	Future (2045) No-Build - Benchmark	Alternative 1: Transportation Demand Management (TDM)	Alternative 2: Transportation System Management (TSM)	Alternative 3: Improve the Existing Route 201 Bridges	Alternative 4: Downstream Bridge Crossing	Alternative 5a: Downtown Bridge Crossing Steel Girder	Alternative 5b: Downtown Bridge Crossing Through Arch	Alternative 6: Upstream Bridge Crossing
Satisfies Purpose & Need	No	No	No	No	Yes	Yes	Yes	Yes
<b>TRANSPORTATION MEASURES</b>								
Improves Safety and Mobility	No	No	No	Yes	Some	Yes	Yes	No
Potential for Improving Downtown Conditions	No	No	No	No	Some	Yes	Yes	No
Improves Regional Mobility and Connectivity	No	No	No	No	Yes	Yes	Yes	No
Provides Regional River Crossing Redundancy	No	No	No	No	Yes	Yes	Yes	Yes
<b>LAND USE MEASURES</b>								
Property and ROW Impacts	No	No	Yes 0.5 Acres	Yes <0.5 Acres	Yes 5.25 Acres	Yes 2.0 Acres	Yes 2.0 Acres	Yes 2.0 Acres
<b>ENVIRONMENTAL RESOURCE MEASURES</b>								
Potential for Impacts to Archeological and Historic Resources	None	None	None	Potential impact to Historic District north of the river	None	Potential impact one home south of the river, and to Historic District north of the river	Potential impact one home south of the river, and to Historic District north of the river	None
Potential for impact to Wetlands, Rare, Threatened, Endangered, and Special Concern Plant Species and Habitats	None	None	None	Yes	Yes	Some	Some	Yes
Potential for Conservation Land and 4 (f) Land Impacts	None	None	None	None	None	Yes	Yes	None
<b>TOWN PLANNING GOALS</b>								
Meets Downtown Planning Goals	No	No	No	No	Some	No	Yes	No
<b>COST AND FUNDING MEASURES</b>								
Estimated Cost	N/A	N/A	Low	Moderate	Moderate	Moderate	High	Moderate

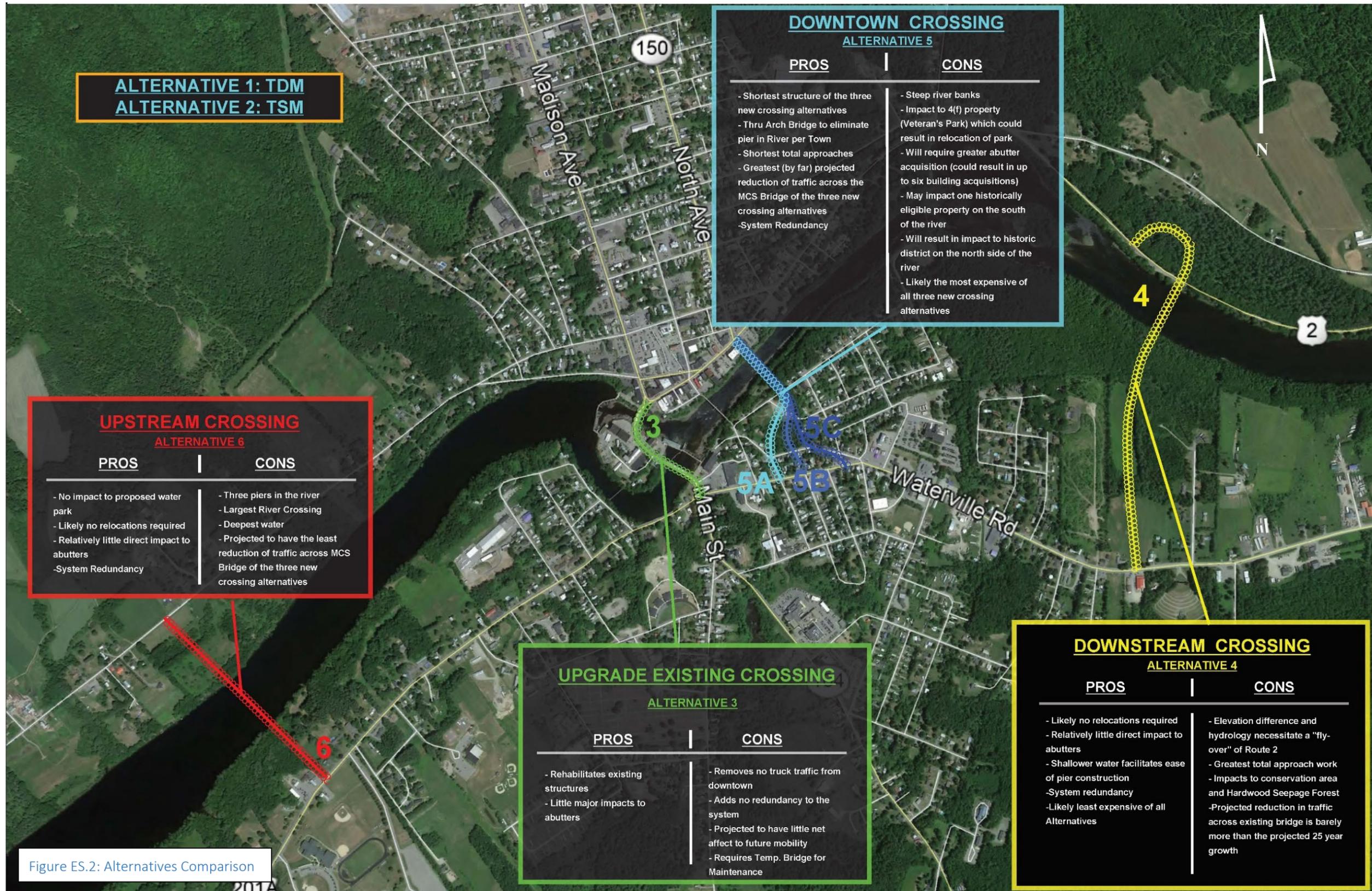


Figure ES.2: Alternatives Comparison

**Table ES.2** summarizes the planning level cost estimates for the alternatives. For Alternative A3, a significant ancillary cost to produce this widening is the effort associated with traffic control during construction. As this crossing is the only route across the river in this vicinity and given the relatively high traffic count along this crossing, it was determined that three lanes of traffic must be maintained at all times during construction. Real estate is insufficient to accomplish this task along the existing corridor and thus, a temporary crossing must be installed, upon which a portion of traffic can be rerouted, while one lane can be maintained along the existing crossing during construction. With current traffic patterns and development around the intersection of Island Avenue and Water Street, the temporary crossing would need to be located offsite. While the exact location of the temporary crossing has not been determined, the likely cost associated with the installation and subsequent removal of temporary approaches and a temporary bridge, as well as costs to maintain a single lane across the existing corridor, is estimated to be **\$7,000,000**. It is worth noting, when considering cost/benefits for each of these alternatives, that this \$7M cost will exist for any major future improvements to these bridges (such as re-decking). If an alternative does not include a new crossing, a temporary crossing will need to be provided to maintain traffic while maintaining the existing structures.

<b>Table ES.2 Planning Level Cost Estimates</b>				
Alternative	A3	A4	A5	A6
Highway Construction Total	\$4,440,837	\$6,507,204	\$6,303,319	\$4,722,483
Bridge Construction Total	\$18,810,000	\$14,260,000	\$38,690,000	\$20,210,000
Temporary Bridge for Existing Bridge Construction	\$7,000,000			
Preliminary Engineering (10%)	\$3,025,084	\$2,076,720	\$4,499,332	\$2,493,248
Construction Engineering (10%)	\$3,025,084	\$2,076,720	\$4,499,332	\$2,493,248
Right-of-Way (estimate)	\$250,000	\$500,000	\$1,250,000	\$500,000
SUB-TOTAL	\$36,551,004	\$25,420,644	\$55,241,983	\$30,418,980
<b>TOTAL</b>	<b>\$36,600,000</b>	<b>\$25,500,000</b>	<b>\$55,300,000</b>	<b>\$30,500,000</b>

**Recommendations**

Recommendations were identified for possible improvements that could be implemented in 2 to 5 years (short-term) and long-term improvements that are likely in a 10+ year horizon. The short-term improvements were identified as part of the Transportation System Management Alternative. Based upon the purpose and need, technical analysis and public feedback the following improvements are recommended for further consideration.

*Short-Term Improvements*

Based upon existing safety and vehicle delay it is recommended the following be implemented:

- **Main Street/Island Avenue/West Front Street/Waterville Road** - Convert the Island Avenue YIELD controlled right turn to signal control.
- **Madison Avenue/Elm Street/Commercial Street** – To improve lane utilization on the southbound Madison Avenue approach, it is recommended that two travel lanes continue through the Water Street intersection.
- **Madison Avenue/Pleasant Street/High Street** – To improve lane utilization on the southbound Madison Avenue approach, it is recommended that two travel lanes continue through the Front Street intersection.
- **Commercial Street/Water Street/Court Street** - the following safety mitigation measures are suggested:
  - Replace the YIELD sign with a STOP sign on the Water Street approach.
  - Install Rectangular Rapid Flash Beacons (RRFB) at crosswalk locations.
  - Incorporate geometric modifications to tighten intersection with the understanding that large trucks must be accommodated.

**Cost: \$200,000**

*Long-Term Improvements*

Based on the Alternatives Analysis and Purpose and Need it is recommended that Alternative 4 (Downstream) and Alternative 5b (Downtown) be considered for additional study and permitting. Federal funds are anticipated for project implementation and a National Environmental Policy Act (NEPA) effort is a requirement but a NEPA effort would build from the work performed in this study. A summary of recommended alternatives is summarized in the following tables.

ALTERNATIVE 4 DOWNSTREAM BRIDGE CROSSING ALTERNATIVE	
Impact Description	Outcome
<b>Improves Congestion at Key Intersections</b>	Some reduction in delay at Island/Front/Main and Madison/High intersections
<b>Reduces Truck Traffic Through Downtown</b>	Yes, 200 less daily trucks
<b>Improves River Crossing Redundancy</b>	Yes
<b>Improves Downtown Mobility</b>	Some improvement, particularly by the removal of trucks, but volumes will not be reduced significantly (-18% average in peak hours)
<b>Impact to the River Recreation</b>	Some Impact – but not at key Run of the River water feature
<b>Potential to Improve Bicycle and Pedestrian Conditions</b>	No
<b>Property Impacts</b>	Some property impacts on the south side approaching Route 201
<b>Environmental Impacts</b>	Yes
<b>Historic Resource Impacts</b>	No
<b>Cost/Benefit</b>	0.79
<b>Meet Purpose and Need</b>	Partially meets some purpose and need metrics
<b>Cost</b>	\$25.5M

ALTERNATIVE 5 DOWNTOWN BRIDGE CROSSING COMPARISON	
Impact Description	Outcome
<b>Improves Congestion at Key Intersections</b>	Greatest reduction in delay at Island/W. Front/Main intersection
<b>Reduces Truck Traffic Through Downtown</b>	Yes, 300 less daily trucks
<b>Improves River Crossing Redundancy</b>	Yes
<b>Improves Downtown Mobility</b>	Traffic volumes will decline with in the Downtown by an average of 37% in peak hours
<b>Impact to the River Recreation</b>	Impacts the Run of the River Project
<b>Potential to Improve Bicycle and Pedestrian Conditions</b>	Some improved connectivity between downtown and south side of town and reduced traffic in Downtown
<b>Property Impacts</b>	Yes
<b>Environmental Impacts</b>	Yes
<b>Historic Resource Impacts</b>	Yes, both Downtown and property on south side at Route 201 intersection
<b>Cost/Benefit</b>	0.92
<b>Meet Purpose and Need</b>	Yes
<b>Cost</b>	\$55.3M