SKOWHEGAN BRIDGE FEASIBILITY STUDY

Prepared: June 2, 2021

DRAFT

T·Y·LIN INTERNATIONAL

MaineDOT

Skowhegan Maine

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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.

Figure ES.1: Study Area

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
TRANSPORTATION MEASURES								
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
LAND USE MEASURES								
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
ENVIRONMENTAL RESOURCE MEASURES								
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
TOWN PLANNING GOALS								
Meets Downtown Planning Goals	No	No	No	No	Some	No	Yes	No
COST AND FUNDING MEASURES								
Estimated Cost	N/A	N/A	Low	Moderate	Moderate	Moderate	High	Moderate

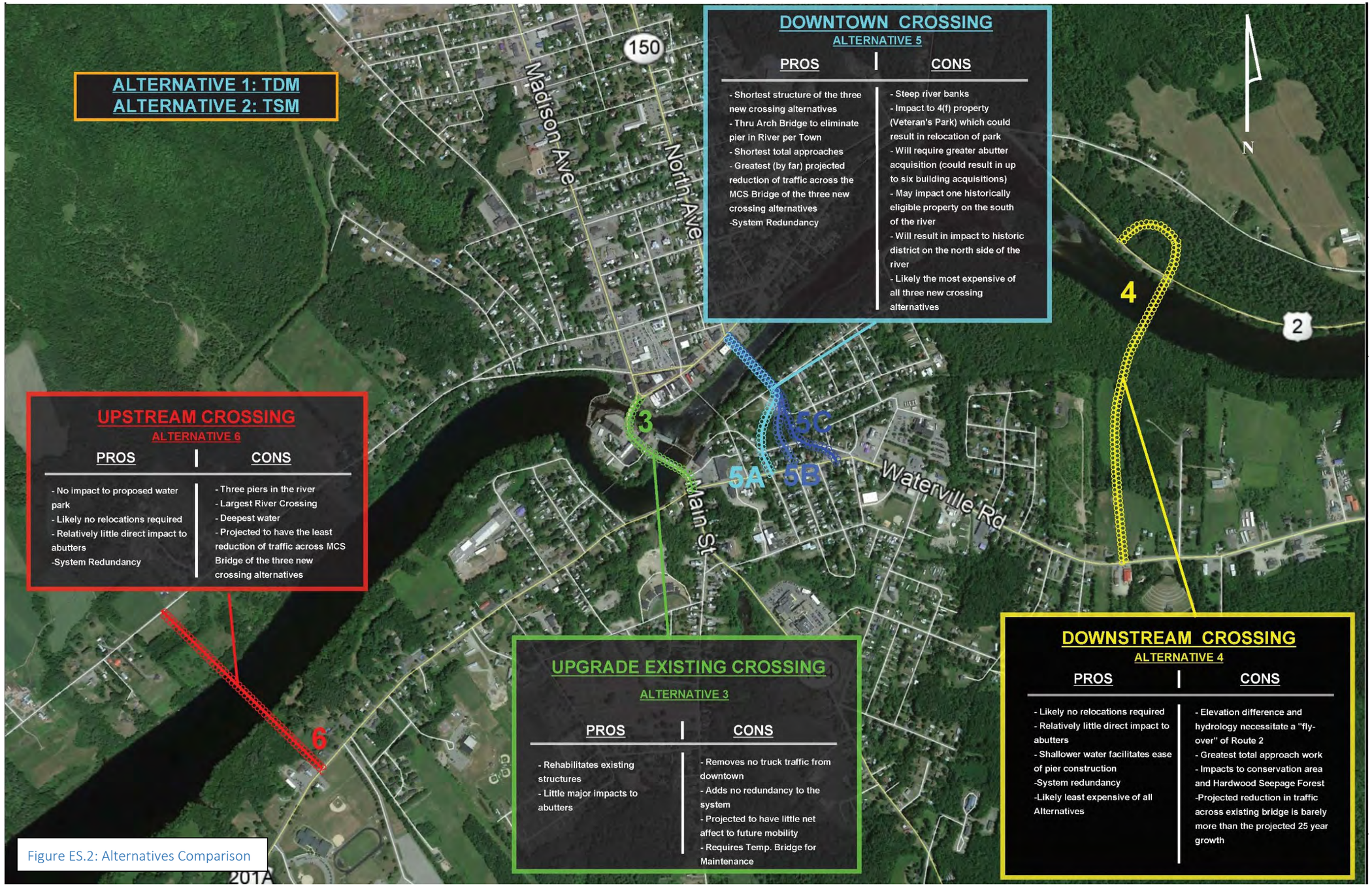


Figure ES.2: Alternatives Comparison

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.

Table ES.2
Planning Level Cost Estimates

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
TOTAL	**$36,600,000**	**$25,500,000**	**$55,300,000**	**$30,500,000**

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

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

2.0 EXISTING TRANSPORTATION CONDITIONS

Traffic Volumes

Hourly Traffic Volumes

Intersection turning movement counts were conducted at key intersections in the study area in June 2019 with the Court Street/High Street intersection updated in July 2019. **Figure 2.1** presents the Weekday AM and PM peak hour traffic volumes. Traffic volumes in 2019 were adjusted to reflect Design Hour or summertime conditions. In addition to intersection turning movements counts, hourly traffic counts were conducted throughout the study area using tube counts in June 2019.

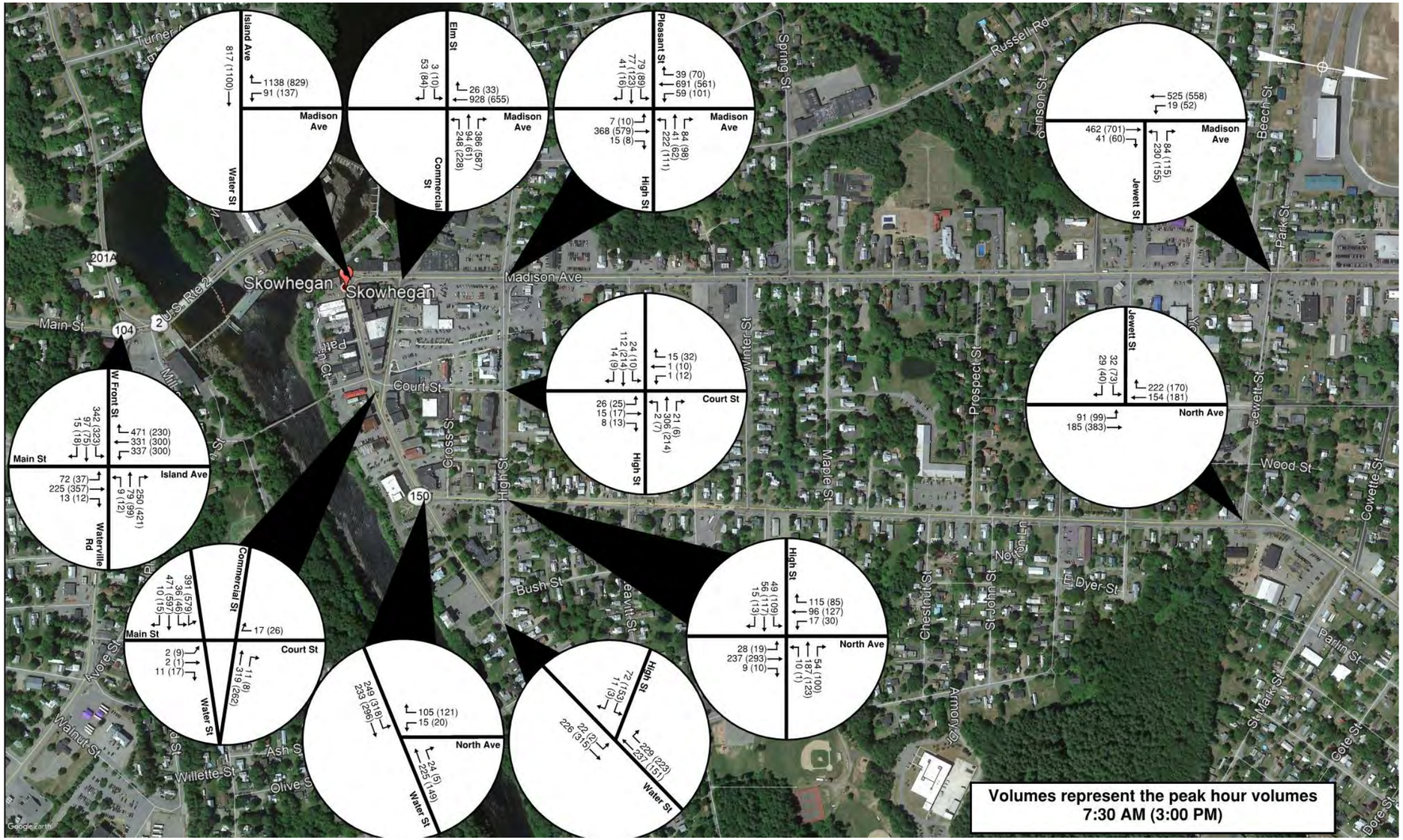
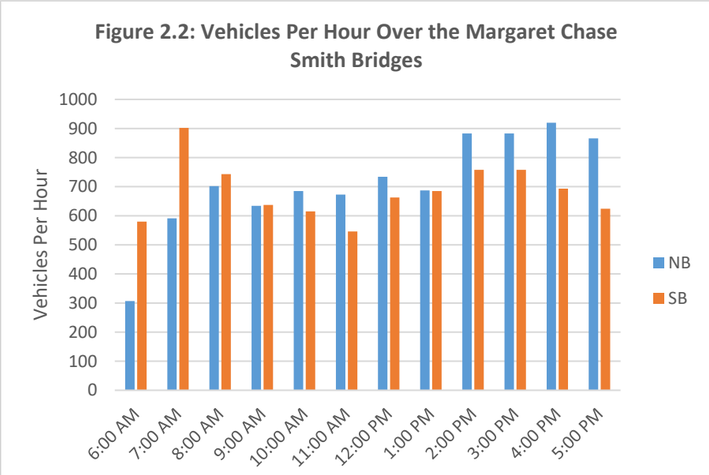


Figure 2.1: Design Hour Traffic Volumes

Hourly Traffic Volume Variation

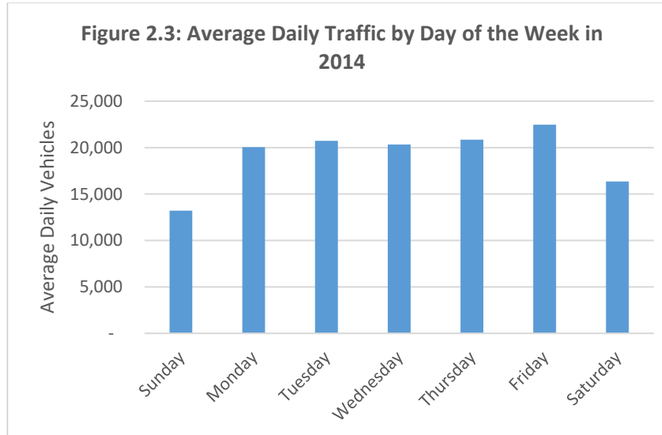
Traffic volumes fluctuate throughout the day, but noticeable peaks are visible. **Figure 2.2** shows traffic volumes over the Margaret Chase Smith Bridges on Island Avenue. Both northbound and southbound traffic peak hours occur from 7:30 AM to 8:30 AM. The southbound traffic does not have a clear peak hour in the afternoon. The northbound traffic has a peak hour from 2:45 PM to 3:45 PM.



Weekly Traffic Volume Variation

Weekly traffic volume distributions were determined using data collected at the MaineDOT permanent count station on Island Avenue that was last operational in 2014. A year's worth of data was collected and averaged to represent the typical day of the week conditions. Daily traffic volumes are presented as daily averages due to the unequal number of each day of the week.

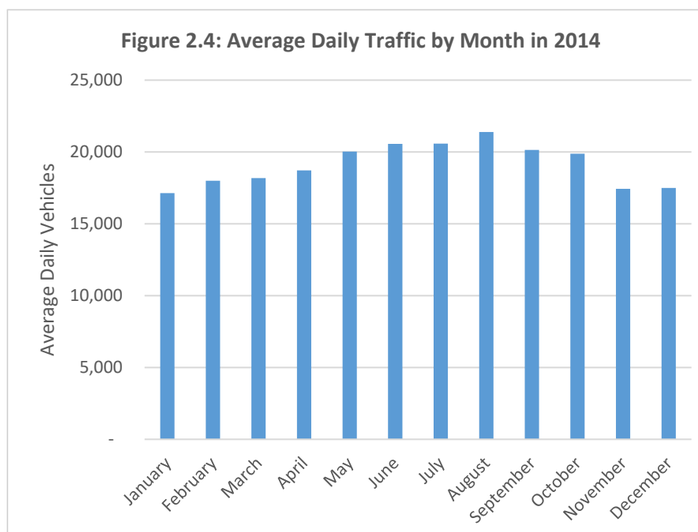
The average weekday volumes are fairly equal from Monday to Thursday with between 20,046 and 20,854 crossing vehicles. Friday is the busiest day of the week with an average of 22,468 crossing vehicles. The weekend has less traffic with 16,357 and 13,209 crossing vehicles on Saturday and Sunday respectively. The data is presented visually in **Figure 2.3.**



Seasonal Traffic Volume Variation

Data from the permanent count station on Island Avenue in 2014 was obtained to quantify the seasonal traffic volume variation. Seasonal volumes are presented as average daily traffic volumes per month due to differences in the number of days in each month.

August is the busiest month with an average of 21,389 crossing vehicles. January is the least busy month with an average of 17,138 crossing vehicles. The data is presented visually in **Figure 2.4.**



Annual Average Daily Traffic Volumes

Annual Average Daily Traffic (AADT) is the average of the vehicular traffic for all days summed and divided by 365. **Figure 2.5** shows the AADT on major roads in the study area. The highest AADT is 23,330 vehicles over the Margaret Chase Smith Bridges.

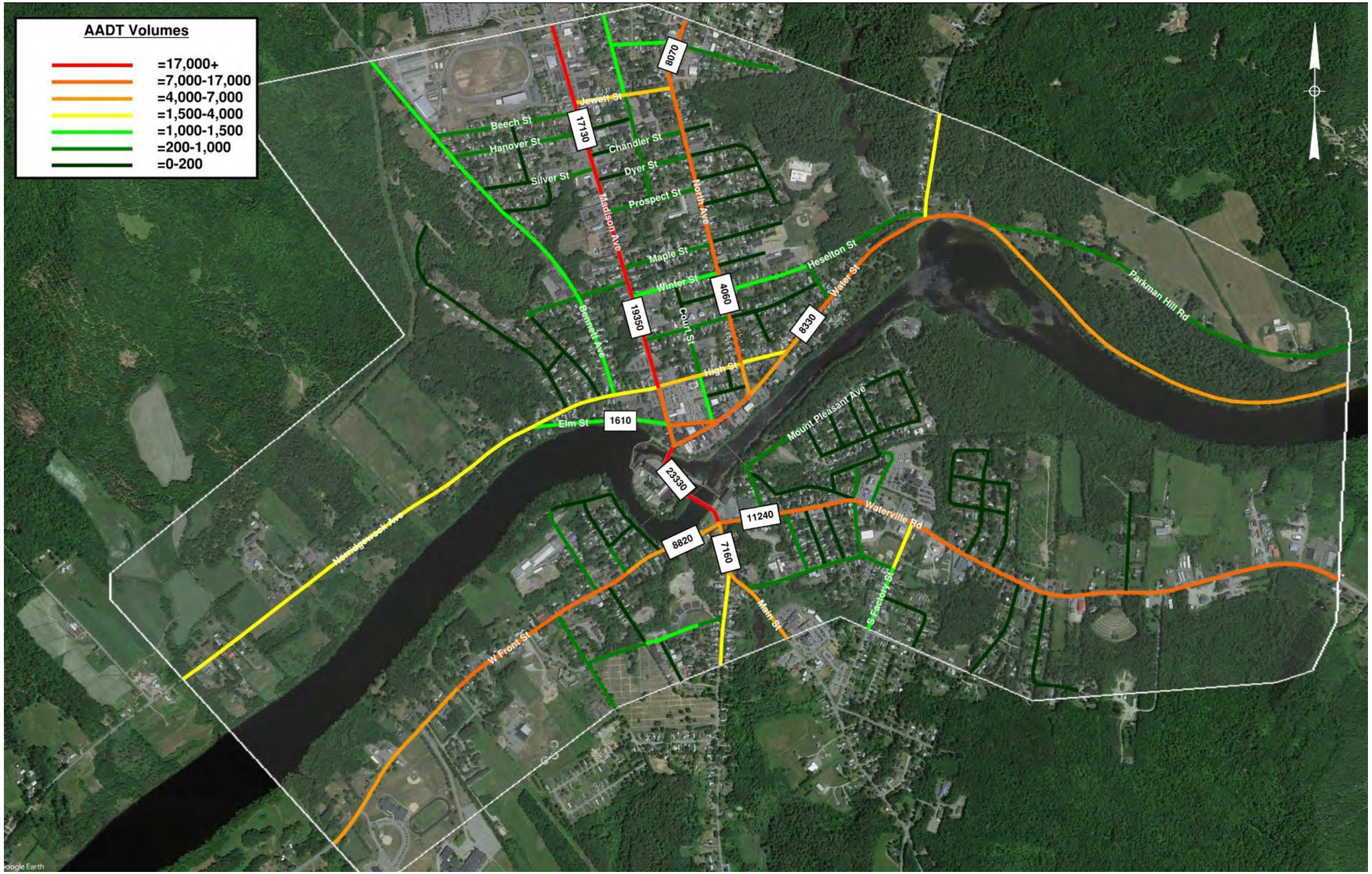


Figure 2.5: 2019 Existing Annual Average Daily Traffic Volume (AADT)

Historical Traffic Volume Growth

AADT information has been collected on most Skowhegan roadways in 2014 and 2017. These values are compared to the AADT values collected in 2019 in **Table 2.1**.

Table 2.1
AADT Growth in Skowhegan

Location	2014 AADT	2017 AADT	2019 AADT
Waterville Road east of Island Avenue	11,620	11,430	11,240
Island Avenue north of Waterville Road	19,140		23,330
Madison Avenue north of High Street	17,130	18,140	19,350
North Avenue north of High Street	7,730		4,060
Water Street east of High Street	4,940		5,050
West Front Street east of Island Avenue	8,300	6,780	8,820
Main Street south of Waterville Road	6,270	6,200	7,160

Traffic volumes in Skowhegan have typically increased slightly since 2014. The largest increase was on Island Avenue over the Margaret Chase Smith Bridges, which rose 4,190 vehicles. North Avenue saw the largest decrease with 3,670 fewer vehicles. It should be noted that volumes in 2019 may have been impacted by sewer/road construction on North Avenue.

Vehicle Classification

Heavy vehicles occupy significantly more queue space than passenger vehicles and have slower acceleration/start-up times, impacting traffic mobility. **Table 2.2** lists the volume of trucks in Skowhegan entering the noted intersection between 6:00AM and 6:00PM. Heavy vehicle volumes are depicted in **Figure 2.6.** More information about the routes heavy vehicles take can be found in the Origin-Destination section that follows.

Table 2.2
Heavy Vehicle Percentages at Key Intersections
Percent (# of Trucks 6AM-6PM)

Intersection	Single Unit Trucks	Tractor Trailers	Total
Island Ave./ Waterville Rd. /Main St. / W. Front St.	3.28% (629)	3.36% (696)	6.64% (1325)
Commercial St. / Water St. / Court St.	2.83% (370)	2.38% (311)	5.21% (681)
Madison Ave. / High St.	2.61% (403)	2.57% (398)	5.18 (801)
North Ave. / High St.	3.99% (38)	1.47% (14)	5.46% (52)
Madison Ave. / Jewett St.	2.99% (444)	2.85% 424	5.84% (868)
North Ave. / Jewett St.	2.99% (27)	1.99% (18)	4.98% (45)

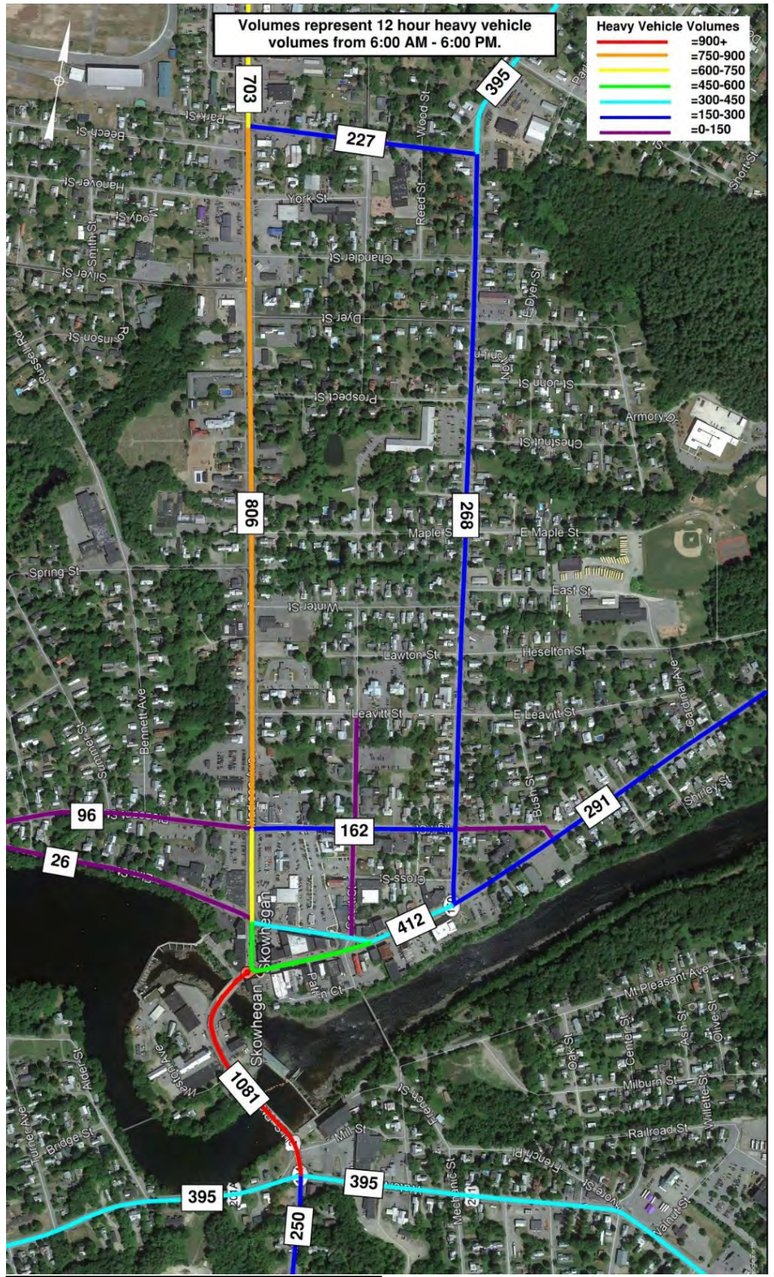


Figure 2.6: Heavy Vehicle Heat Map

Origin and Destination Patterns

The origins and destinations of vehicle trips that currently cross the Margaret Chase Smith Bridges in Skowhegan are described below. This information can help the understanding of the patterns of current travel through downtown Skowhegan as well as form the basis for estimates for traffic shifts that could occur with the potential provision of an additional river crossing. The patterns have been derived from probe-based origin-destination data provided by the StreetLight Insight web app under a MaineDOT subscription.

General Traffic

Approximately 33 percent of the current vehicle traffic that crosses the Margaret Chase Smith Bridges is making a trip that is internal to Skowhegan (i.e., both the start of the trip and the end of the trip are within Skowhegan). Another 37 percent of the vehicle traffic has one end of its trip within Skowhegan (i.e., either starting in Skowhegan with an external destination or arriving at a Skowhegan destination from an external origin). The remaining 30 percent of the vehicle traffic is comprised of vehicles that are passing through Skowhegan without making a stop for personal or commercial business.

The distribution between internal and through vehicle trips remains relatively consistent throughout the day. The peak period for internal-to-Skowhegan traffic on the bridges occurs during the midday when the value reaches 37 percent of total traffic.

Heavy Trucks on the Margaret Chase Smith Bridges

Current travel patterns for heavy trucks (5-axle semi-trailing or larger) in Skowhegan have been derived from 12-hour vehicle turn movement counts taken at 11 intersections during June 2019 and from origin-destination data provided by StreetLight (and described above).

Heavy trucks on the Margaret Chase Smith Bridges are headed toward or are coming from one of three primary directions on the north side of the Kennebec River:

- About 47 percent to or from Madison Avenue/Route 201
- About 35 percent to or from North Avenue/Route 150
- About 18 percent to or from Water Street/Route 2

For heavy trucks on the bridges, the trip origins and destinations on the south side of the river are as follows:

- Roughly 50 percent to or from Waterville Road/Route 201
- Roughly 15 percent to or from Main Street/Route 104
- Roughly 35 percent to or from West Front Street/Route 2

The heavy vehicle origin destination pattern is visualized in **Figure 2.7.**

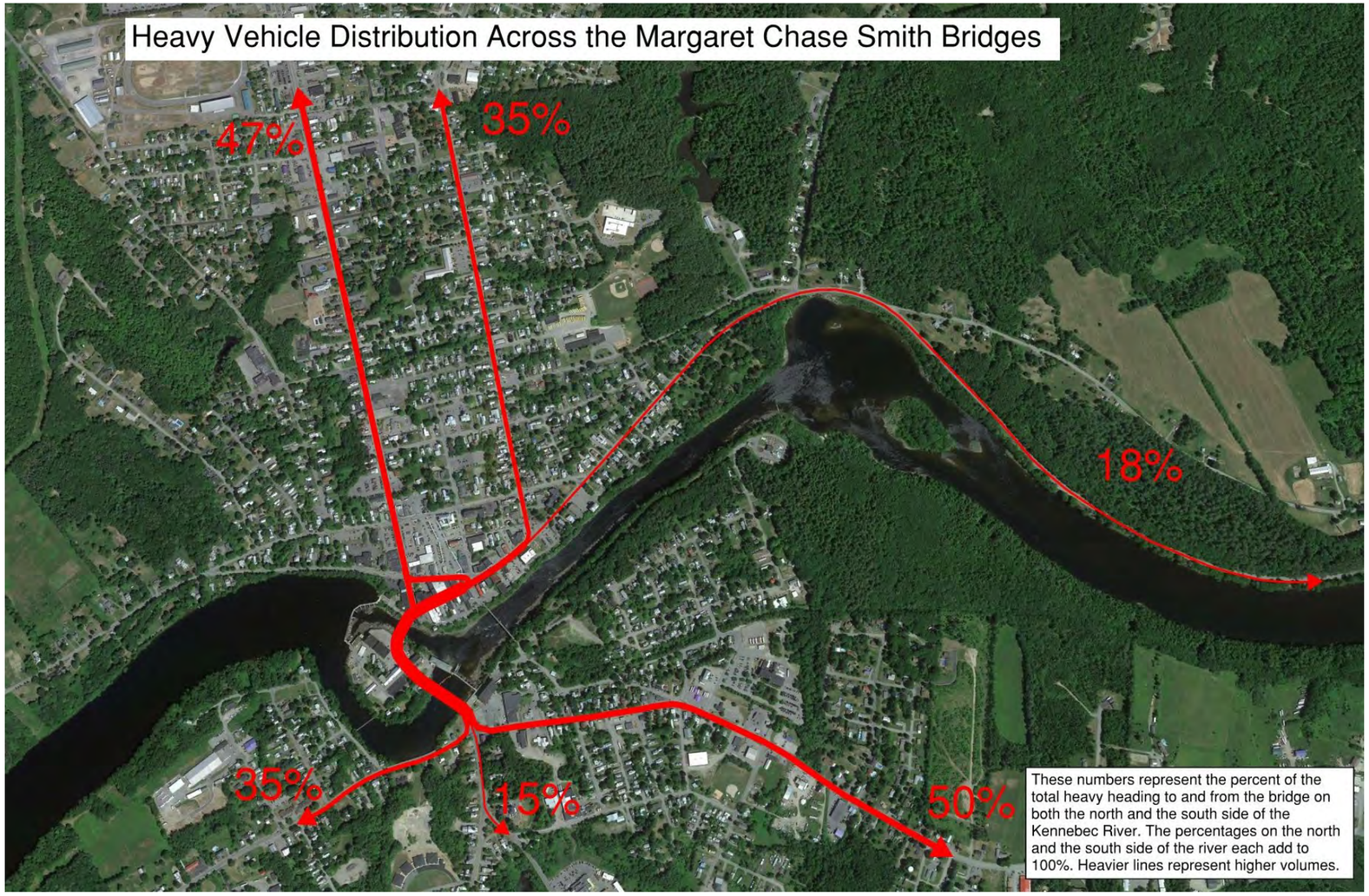


Figure 2.7: Origin Destination Patterns across the Margaret Chase Smith Bridges

Heavy Trucks Passing Through the Skowhegan Urban Core

In order to achieve a better understanding of patterns for all heavy truck travel through Skowhegan, an analysis of routes taken by heavy trucks through Skowhegan are described below.

Route 2 (Water Street)

For heavy trucks entering Skowhegan on westbound Route 2 (from the direction of Canaan):

- About 48 percent have a destination across the Margaret Chase Smith Bridges (some continue straight onto Commercial Street, then turn left onto Madison Avenue; some turn right onto High Street, then turn left onto Madison Avenue)
- About 50 percent are destined to northbound Route 201 (some turn right onto High Street, then right onto North Avenue, left onto Jewett Street, and right onto Madison Avenue; the majority turn right on High Street, then right onto Madison Avenue; some continue straight onto Commercial Street, then turn right onto Madison Avenue)
- About 2 percent are headed toward northbound Route 150 (turn right onto High Street, then right onto North Avenue)

This distribution is shown in **Figure 2.8.**

For heavy trucks exiting Skowhegan on eastbound Route 2 (toward Canaan)

- About 71 percent have an origin across the bridges (all continue eastbound on Water Street from the bridge)
- About 25 percent are from southbound Route 201 (some turn left from Madison Avenue onto High Street; some turn from Madison onto Water Street; some turn left onto Jewett Street, then right onto North Avenue, then left onto High Street to Water Street)
- About 4 percent are from southbound Route 150 (turn left onto High Street, then left onto Water Street)

This distribution is shown in **Figure 2.9.**

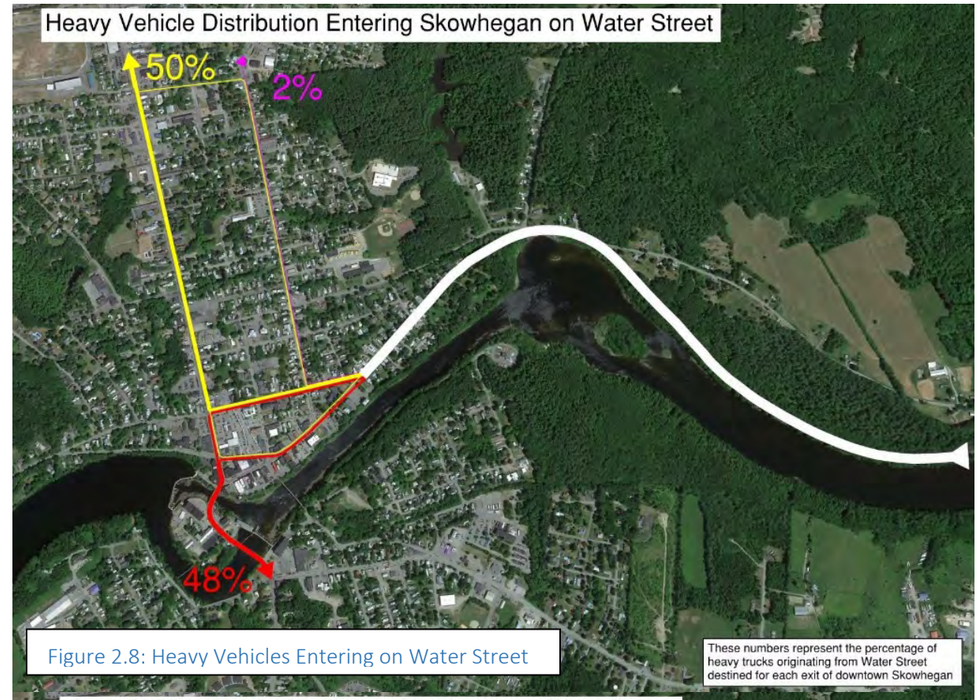


Figure 2.8: Heavy Vehicles Entering on Water Street

Figure 2.9: Heavy Vehicles Exiting on Water Street

Route 150 (North Avenue)

For heavy trucks entering Skowhegan on southbound Route 150 (from the direction of Athens)

- About 93 percent are headed toward the Margaret Chase Smith Bridges (the majority of trucks turn right onto Jewett Street and follow it to Madison Avenue; some turn right from North Avenue onto Water Street, then straight onto Commercial Street, then left onto Madison Avenue)
- About 4 percent are headed toward eastbound Route 2 (turning left from North Avenue onto High Street as the path to Route 2)
- About 3 percent are headed toward northbound Route 201 (turning right onto Jewett Street, then right onto Madison Avenue)

This distribution is shown in **Figure 2.10.**

For heavy trucks exiting Skowhegan on northbound Route 150 (toward Athens)

- About 92 percent have an origin across the bridges (turning left from Water Street onto North Avenue)
- About 2 percent are from westbound Route 2 (turning right from Water Street onto High Street, then right onto North Avenue)
- About 6 percent are from southbound Route 201 (turning left from Madison Avenue onto Jewett Street, then left onto North Avenue)

This distribution is shown in **Figure 2.11.**

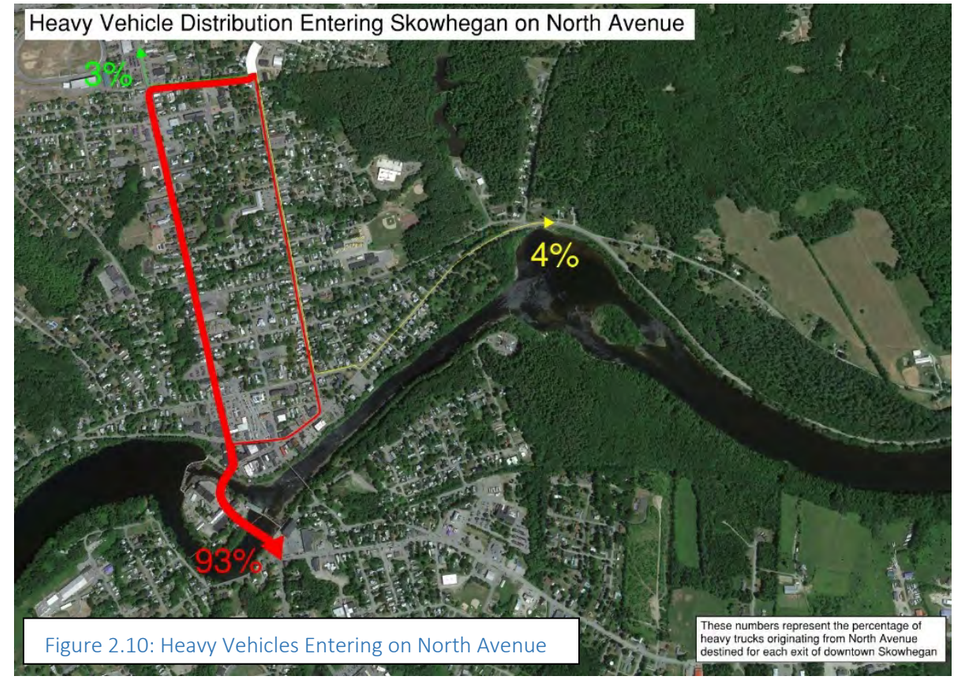


Figure 2.10: Heavy Vehicles Entering on North Avenue

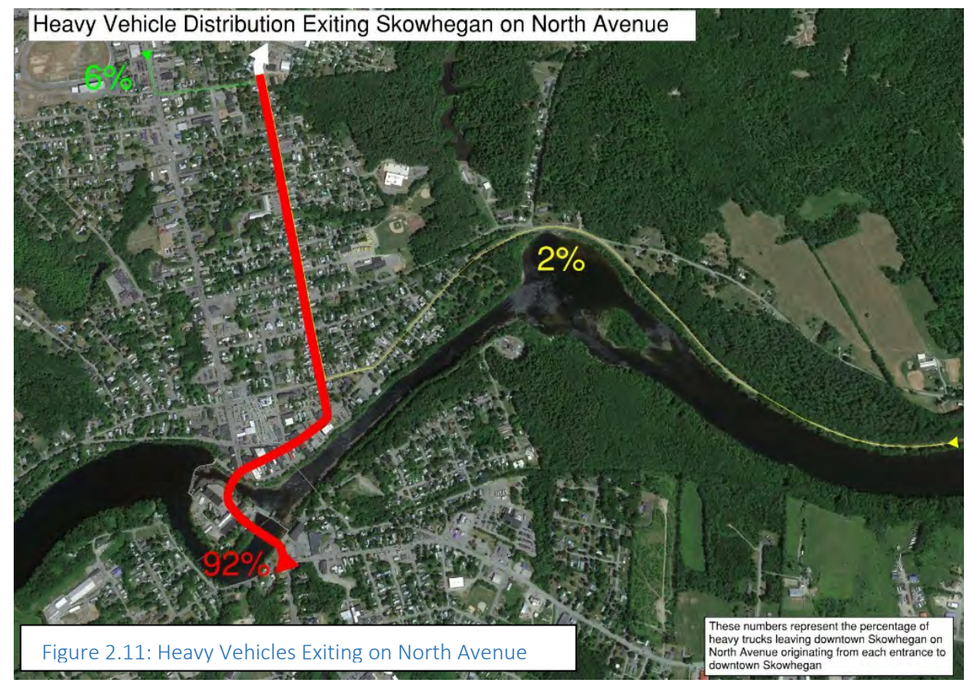


Figure 2.11: Heavy Vehicles Exiting on North Avenue

Route 201 (Madison Avenue)

For heavy trucks entering Skowhegan on southbound Route 201 (from the direction of Solon)

- About 84 percent are headed toward the Margaret Chase Smith Bridges (via Madison Avenue)
- About 12 percent are headed toward eastbound Route 2 (some turn left from Madison Avenue onto High Street to access Route 2; some turn left at Water Street at the south end of Madison Avenue; some turn left onto Jewett Street, then right onto North Street, left onto High Street to Water Street)
- About 4 percent are headed toward northbound Route 150 (turning left from Madison Avenue onto Jewett Street, then left onto North Avenue)

This distribution is shown in **Figure 2.12.**

For heavy trucks exiting Skowhegan on northbound Route 201 (toward Solon)

- About 72 percent have an origin across the bridges (the majority turn left onto Commercial Street, then right onto Madison Avenue; some turn left from Water Street onto North Avenue, then left onto Jewett Street to Madison Avenue)
- About 25 percent are from westbound Route 2 (some turn right onto High Street, then right on North Avenue, left on Jewett Street, and right on Madison Avenue; the majority turn right onto High Street, then right on Madison Avenue; some continue straight on Commercial Street, then turn right onto Madison Avenue)
- About 3 percent are from southbound Route 150 (turning right on Jewett Street, then Madison Avenue)

This distribution is shown in **Figure 2.13.**

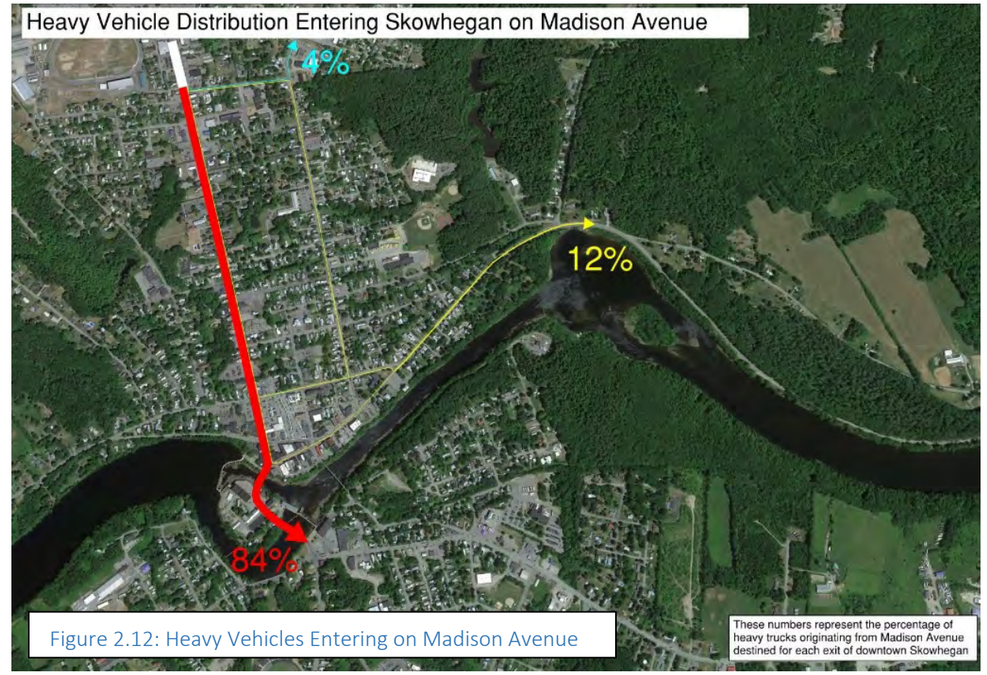


Figure 2.12: Heavy Vehicles Entering on Madison Avenue

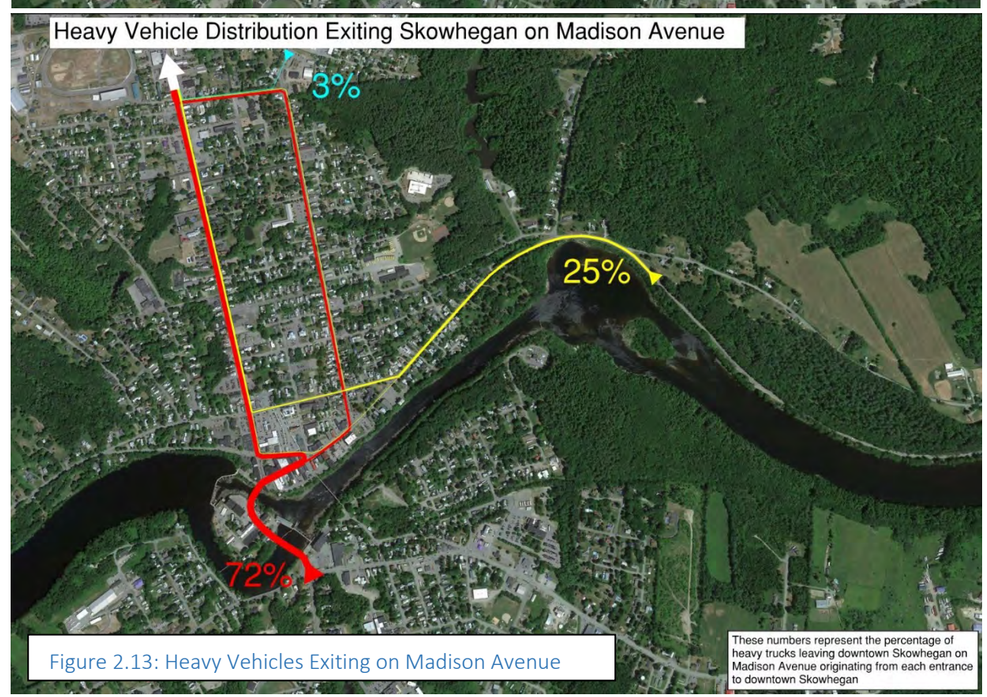


Figure 2.13: Heavy Vehicles Exiting on Madison Avenue

Roadway Classification

Functional classification is the process by which public streets and highways are grouped into classes according to the character of service they are intended to provide based on mobility (arterials provide greater mobility) and access to the highway (local roads provide greater access, but much less mobility). Classifications include Principal Arterial Interstate, Principal Arterial Other Freeways and Expressways, Other Principal Arterials, Minor Arterials, Major/urban Collectors, Minor Collectors and Local Roads.

In Skowhegan, the highest-class roadways are Principal Arterials including Madison Avenue (Route 201), Water Street (Route 2), Waterville Road (Route 201), West Front Street (Route 201A and Route 2), and Island Avenue (Route 201 and Route 2). Other federally classified roadways include the major collectors Pleasant Street, North Avenue (State Route 150), Main Street (State Route 104), Jewett Street, and High Street and the minor collector Malbons Mills Road. The federal functional classification is shown in **Figure 2.14.**

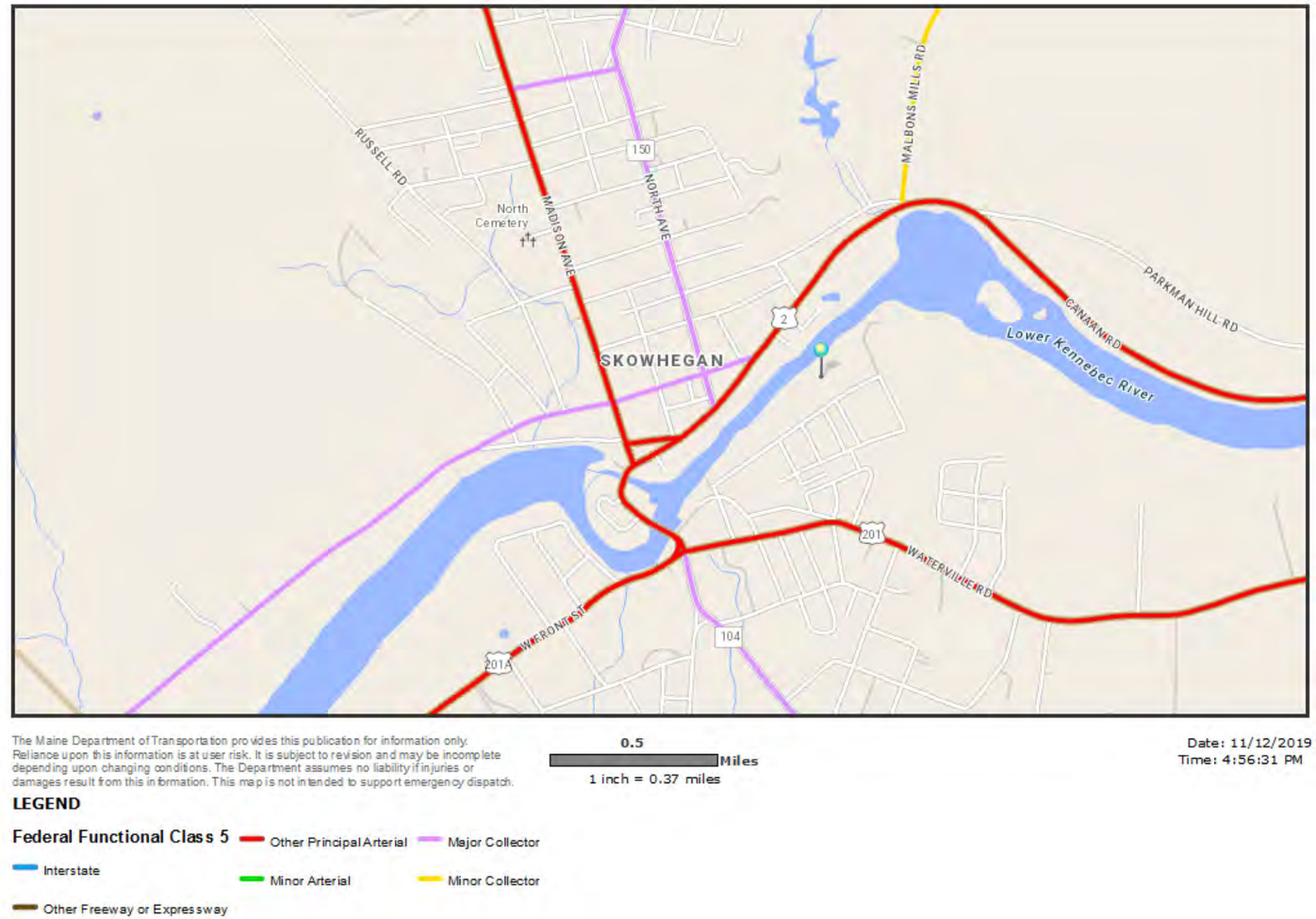


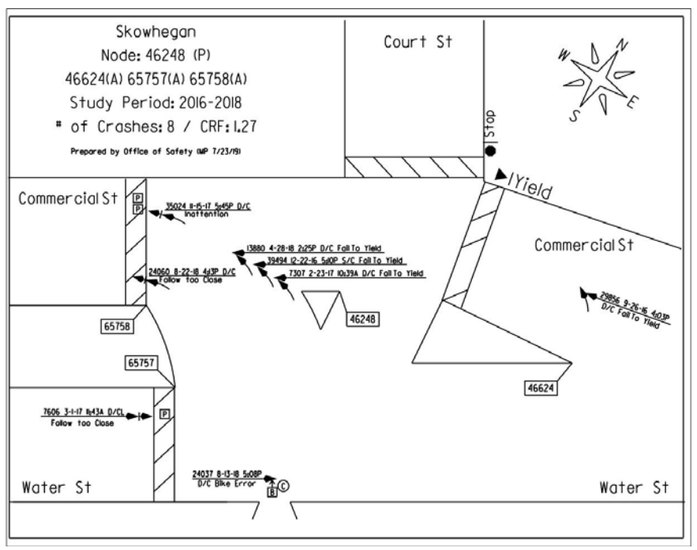
Figure 2.14: Federal Functional Classification

Safety

Crash data was obtained from MaineDOT for the most recent three-year period (2016-2018). MaineDOT has established criteria for establishing High Crash Locations (HCL) where an intersection or road segment has 8 or more crashes and a Critical Rate Factor (CRF) greater than or equal to 1.0 over a three-year period. The CRF is a comparison of the study locations with other comparable locations in the State. **Figure 2.15** summarizes the High Crash Locations or locations with significant crash numbers for intersections and roadway segments for the three-year period 2016-2018. A summary of each location is presented as follows.

Commercial Street/Water Street/ Court Street

There were 8 crashes at this intersection with a CRF of 1.27 during the most recent three-year period. Six of these crashes involved left turning vehicles on Water Street. Three pedestrians were struck at this intersection as well as one bicyclist. No trucks were involved in crashes at this location.



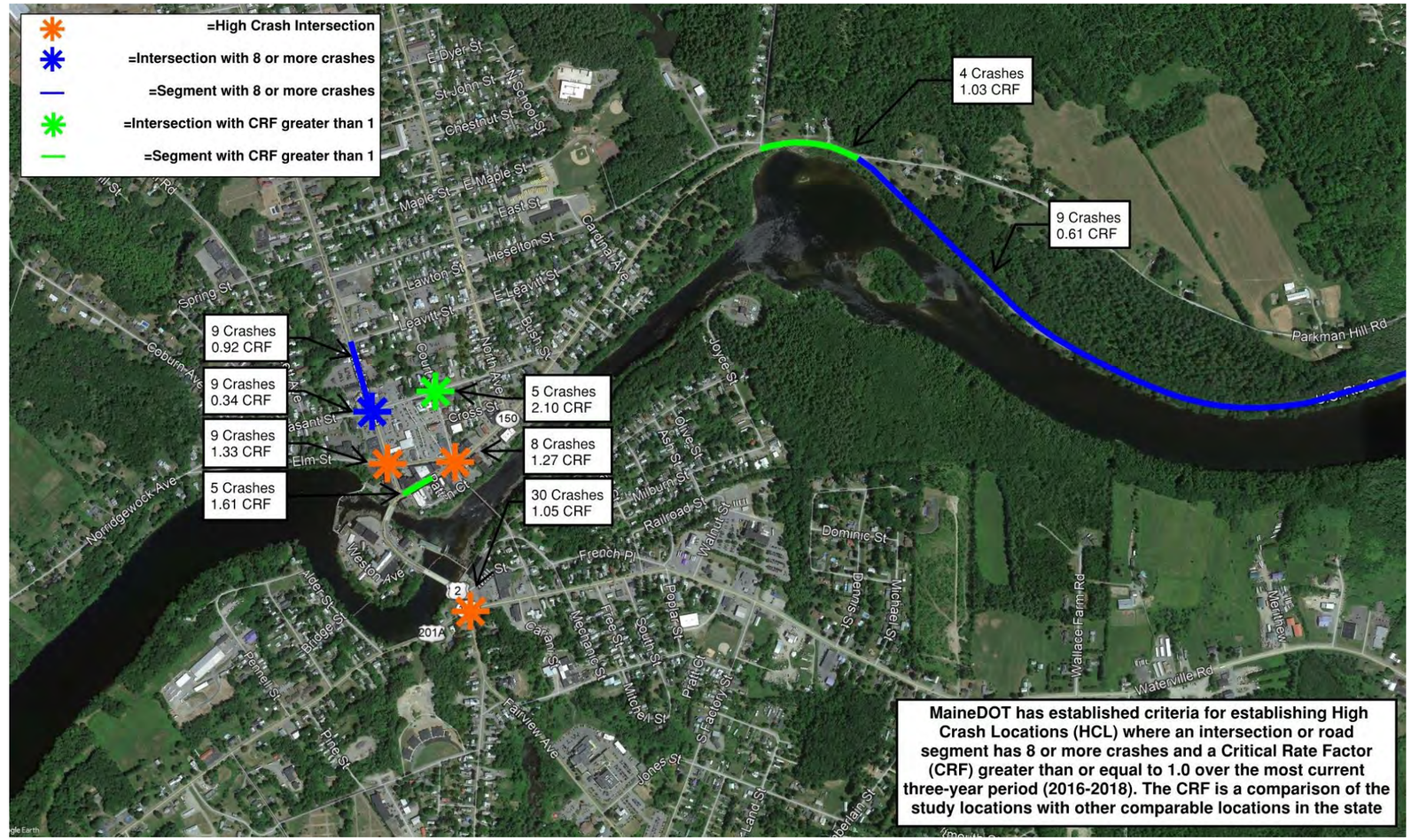
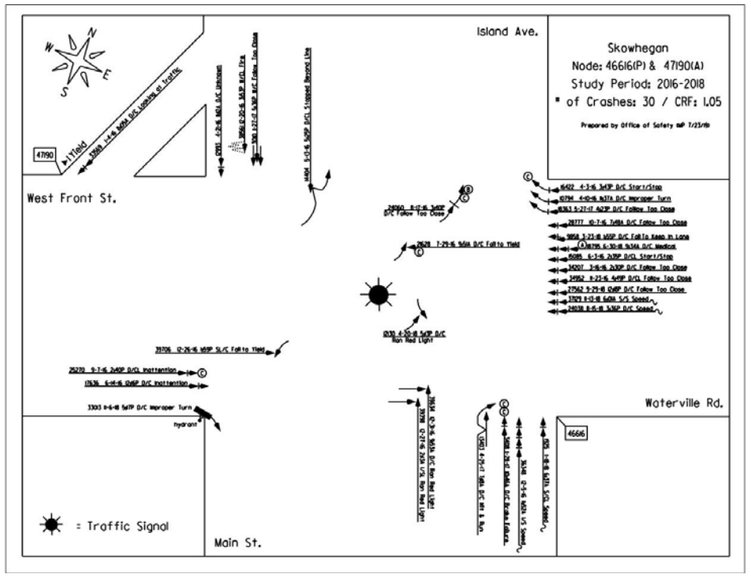


Figure 2.15: High Crash Locations

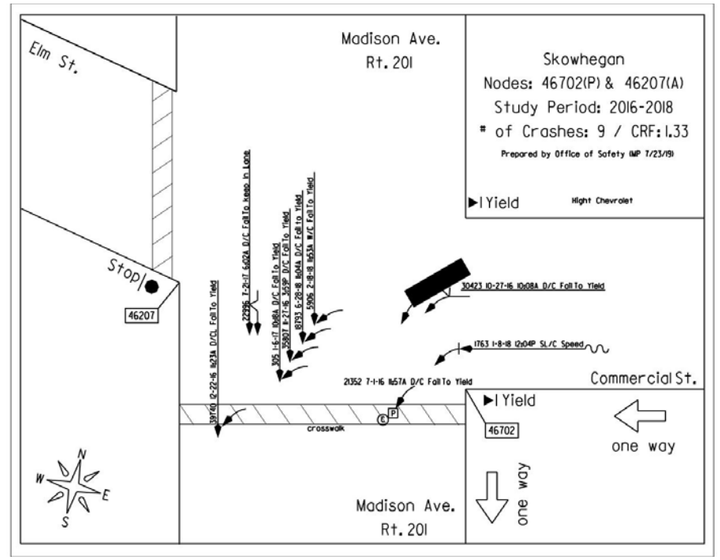
Island Avenue/West Front Street/Waterville Road/Main Street

There were 30 crashes at this intersection with a CRF of 1.05 during the most recent three-year period. Twenty-one (21) of these crashes were rear-end collisions. Speed and drivers following too closely contributed to the crashes as drivers start and stop in the heavy traffic at this intersection. One truck was involved in a crash when the truck improperly turned right from West Front Street onto Main Street and struck a fire hydrant. The Town has programmed the installation of a right-turn lane on West Front Street.



Madison Avenue/Commercial Street/Elm Street

There were 9 crashes with a CRF of 1.33 at this intersection during the most recent three-year period. Eight (8) of the 9 crashes involved a left-turning vehicle from Commercial Street onto Madison Avenue. One pedestrian was struck in the crosswalk at this intersection. MaineDOT is designing and installing a traffic signal at this location which should resolve the crash pattern. One truck was involved in a crash when a truck and a passenger vehicle were involved in a side swipe crash as both were turning left from Commercial Street onto Madison Avenue. MaineDOT has programmed improvements, including installation of a traffic signal, at this location.



Traffic Mobility

Intersection Capacity Analysis

The standard used to evaluate traffic operating conditions of the transportation system is referred to as the Level of Service (LOS). This is a qualitative assessment of the quantitative effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays, and freedom to maneuver.

Level of Service provides a measurement of the delay experienced at an intersection as a result of traffic operations at that intersection. In general, there are six levels of service: Level of Service A to Level of Service F. The highest, Level of Service A, describes a condition of free-flow operations where the effects of incidents are easily absorbed. Level of Service B describes a state in which maneuverability and speed limits are beginning to be restricted by other motorists although level of comfort is still high. In Level of Service C, experienced drivers are still comfortable, but maneuverability is noticeably restricted. Level of Service D brings noticeable congestion and driver comfort levels decrease. In Level of Service E, roadway capacity is reached, and disruptions are much more prevalent – driver comfort has declined. Finally, Level of Service F is the result of volumes greater than roadway capacity with congestion and possible stopped conditions. MaineDOT has determined that Levels of Service A-D are acceptable conditions for intersections.

The measures of delay for each Level of Service rating for unsignalized and signalized intersections are found in **Table 2.3**.

Table 2.3
LOS CRITERIA

LOS	Signalized Intersection	Unsignalized Intersection
A	≤10 sec	≤10 sec
B	10–20 sec	10–15 sec
C	20–35 sec	15–25 sec
D	35–55 sec	25–35 sec
E	55–80 sec	35–50 sec
F	>80 sec	>50 sec

Queue represents the distance in feet of vehicles waiting at a stop bar controlled by either a traffic signal or STOP sign. Most commonly reported is the 95th percentile queue, in other words the queue that will not be exceeded 95% of the time. A vehicle length of 20 feet can be used to visualize the number of vehicles in the queue. While it does not impact the level of service directly, it is another measure of the effectiveness of the intersection. The overall results are seen in the **Table 2.4** with greater detail provided in the **Appendix.**

Intersections followed by (S) are signalized while intersections followed by (U) are unsignalized.

Table 2.4
Existing Intersection Level of Service

	AM Delay (sec/veh)	**AM** LOS/ Delay	**PM** Delay (sec/veh)	**PM** LOS/ Delay
Main Street/Island Avenue/W. Front Street/Waterville Road (S)				
Overall	92.5	F	105.4	F
Island Avenue/Water Street/Madison Avenue (U)				
Overall	0.3	A	0.5	A
Madison Avenue/Elm Street/Commercial Street (U)				
Overall	6.3	A	2.6	A
Water Street/Court Street/Commercial Street (U)				
Overall	1.1	A	1.5	A
Water Street/North Avenue (U)				
Overall	1.5	A	1.3	A

Table 2.4 Existing Intersection Level of Service				
	AM Delay (sec/veh)	**AM** LOS/ Delay	**PM** Delay (sec/veh)	**PM** LOS/ Delay
Madison Avenue/High Street (S)				
Overall	13.1	B	10.4	B
North Avenue/High Street (S)				
Overall	9.7	A	10.9	B
Court Street/High Street (U)				
Overall	0.8	A	1.1	A
Madison Street/Jewett Street (S)				
Overall	7.5	A	6.3	A
North Avenue/Jewett Street (U)				
Overall	1.1	A	1.6	A
Water Street/High Street (U)				
Overall	0.8	A	1.7	A

Bicycle and Pedestrian Facilities

The study area includes sidewalks on at least one side of the road for most of the heavily populated streets. There are sidewalks on both sides of Island Avenue, Water Street from Madison Avenue to North Avenue, Commercial Street, Madison Avenue from Water Street to High Street, Court Street from Commercial Street to High Street, and various points on North Avenue. The sidewalks are shown in **Figure 2.16.**

There are no formal marked bicycle lanes in the study area. Shoulders wider than 5 feet can provide space for bicyclists and refuge for pedestrians when sidewalks are not present. West Front Street has mostly continuous shoulders except where turning lanes are provides at the Skowhegan School District campus. Waterville Road has continuous shoulders except on the eastbound side where the additional climbing lane is present. Water Street has continuous shoulders outside of a brief segment where a turning lane onto Malbons Mills Road cuts out the shoulder. Madison Avenue has no useable shoulder, but North Avenue offers bicyclists a much safer alternative. The shoulders are shown in **Figure 2.17.**

Key deficiencies for bicyclists and pedestrians in the study area are:

- Many sidewalks have telephone poles protruding from the middle
- The unsignalized crosswalks on Madison Avenue currently cross a 4-lane road with high speeds with no control, refuge, or visual enhancements.
- No bicycle facilities on Madison Avenue

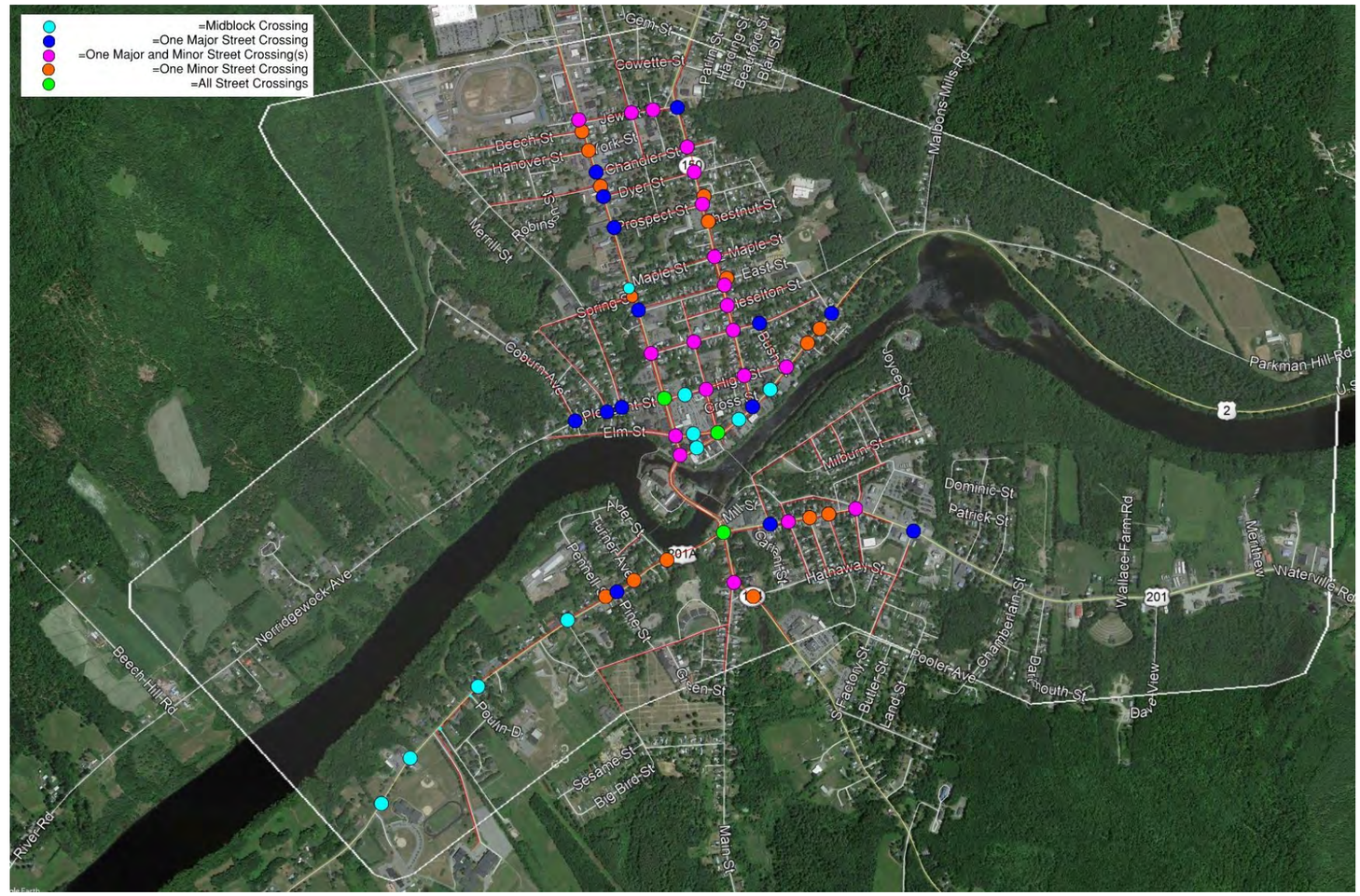


Figure 2.16: Pedestrian Facilities

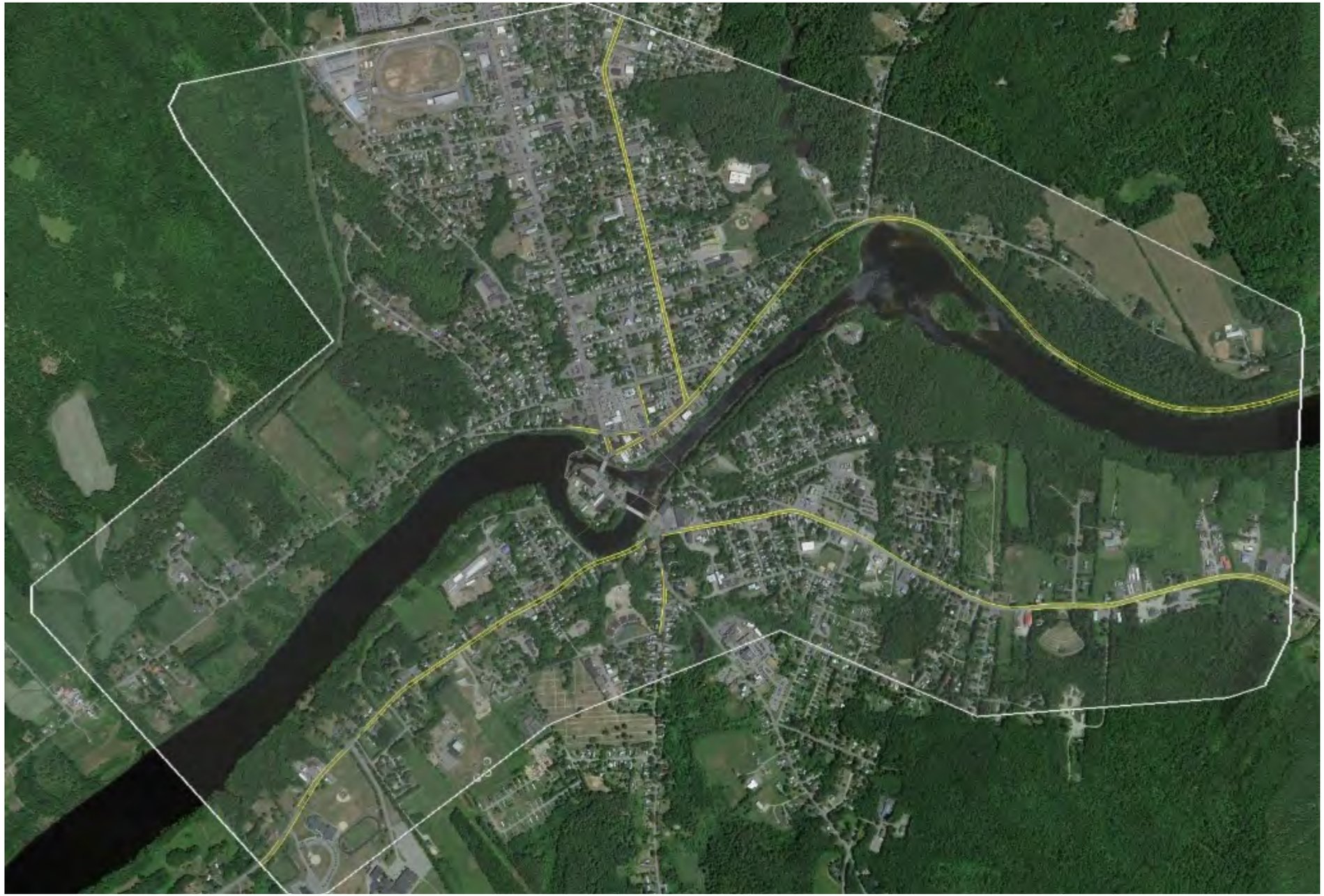


Figure 2.17: Roadway Shoulders in Skowhegan

3.0 EXISTING ALTERNATIVE TRANSPORTATION

Bus Transportation

The Kennebec Valley Community Action Program (KVCAP) offers a flex-route general public bus service in lower Somerset County on Mondays, Wednesdays, and Fridays from 7:30 AM to 4:00 PM known as the Somerset Explorer. This service is available in Skowhegan, Madison, Anson, and Norridgewock. This program is expanded to 5 days a week during the summer months. Fares are between $1.25 to $1.50 per ride and rides are free for those under 18 years old. The local Skowhegan Route schedule is given in **Table 3.1.**

Table 3.1
KVCAP Somerset Explorer Skowhegan Local Route

Skow-Chamber of Commerce	8:30	9:30	10:30		1:00	2:00
Riverside Terrace (2 Stops)	8:36	9:36	10:36		1:06	2:06
MRI Drive	R	R	R		R	R
Ice Cream Shoppe	8:43	9:43	10:43		1:13	2:13
Dollar Tree	R	R	R		R	R
Hannaford	8:48	9:48	10:48		1:18	2:18
Wal-Mart	8:49	9:49	10:49		1:19	2:19
Spring House Gardens	8:51	9:51	10:51		1:21	2:21
W. Front Street Residence	8:57	9:57	10:57		1:27	2:27
Indian Ridge/ Local Meadows	9:01	10:01	11:01		1:31	2:31
Redington - Fairview Hospital	9:06	10:06	11:06		1:36	2:36
Dartmouth Street	9:09	10:09	11:09		1:39	2:39
Kennebec Behavioral Health	9:12	10:12	11:12		1:42	2:42
DHHS- Career Center	R	R	R		R	R
Skow-Chamber of Commerce	9:20	10:20	11:20		1:50	2:50

*R denotes reserve only stops. Riders wishing to board from these locations must call ahead. The bus will pick up passengers within ¾ of a mile of the bus route as long as the rider calls ahead.

Carpooling

GOMaine offers carpooling options for commuters statewide. GOMaine rewards those who make Ecofriendly commuting choices with retailer discounts, restaurant coupons, and tickets to events. This feature is lightly utilized in Skowhegan. There are 3 carpools originating in Skowhegan listed on GOMaine. The only designation listed from Skowhegan goes to Freeport. There were 2 carpools with destinations in Skowhegan. Neither listed an origin.

Traffic in Skowhegan could be reduced by increasing those who utilize carpooling. Partnerships between GOMaine and Skowhegan's major employers (such as New Balance, Sappi, and the Redington Fairview General Hospital) could increase the number of carpools in the area.

GOMaine offers those who carpool the benefit of Emergency Ride Home. One of the main concerns of commuters when choosing to carpool is immediate ability to get back to their homes should something happen to their family or home. GOMaine will provide a rental car for workers in Skowhegan completely free of cost as long as the commuter carpools at least 3 times per week.

4.0 EXISTING RIVER BRIDGE STRUCTURES

Route 201 utilizes two bridges to cross the Kennebec River in Skowhegan, the Margaret Chase Smith Bridges, North and South, #2617 and #2785, respectively. These bridges carry three lanes of traffic, two southbound and one northbound with sidewalks on both sides of the roadway and were constructed in 1976. Both bridges have satisfactory or better condition ratings for their structural components but have less than desirable deck geometry due to their roadway widths of 40 feet for North and 36 feet for South. The typical maintenance plan would include replacement of the concrete deck by year 50 or within the next seven years followed by a wearing surface replacement at year 75. The bridge has a 100-year life cycle expectancy.

The next closest river crossings are in Norridgewock, which is roughly 6 miles to the north, and in Hinckley, about 8 miles to the south. Abutment to Abutment detours range from 12 miles on state aid roads to 31 miles on state routes to the north and 16 miles of townway roads to 24 miles on state routes to the south.

The distance to the nearest crossings creates risk in terms of mobility and access during events of emergency. While these structures are presently in satisfactory condition, an occurrence of a motor vehicle crash, flood, or other unforeseen event that would require the closure of either of these bridges would displace and detour approximately 23,000 vehicles per day.

Conversation with the Emergency Management Director of Somerset County revealed this scenario to be one of his greatest concerns regarding Traffic Incident Management. Closure of the crossing, without proximal redundancy, has potential to create service issues in terms of emergency responder response and transportation to and from schools and hospitals, as the detour would take at least 15 minutes.

5.0 EXISTING ENVIRONMENTAL RESOURCES

This section describes the methodology and results of a desktop analysis performed to identify historic, archaeological, and natural resources that are known to occur within and nearby the Skowhegan Bridge Feasibility Study Area. The purpose of this desktop analysis is to provide baseline information on the presence of these protected resources within the Study Area, and to help inform decision making on potential project alternatives. As the Skowhegan Bridge Feasibility Study (the Study) progresses and potential scopes of work are defined, a more focused review of protected resources may be conducted to determine additional studies and permitting requirements that may be needed for individual improvement projects.

STUDY AREA

An overall Skowhegan Bridge Feasibility Study Area was developed by MaineDOT to review the downtown business district of Skowhegan for potential traffic pattern improvements. For the purposes of analyzing existing historic and environmental resources, the study was defined to focus on areas of potential roadway improvement work to reduce traffic congestion through the downtown. This study area comprises approximately 2,240 acres, as shown on **Figure 5.1.**

The Study Area is predominantly developed, with development primarily consisting of roadways, mixed commercial/residential spaces (mostly in the downtown business district), single-family residences (including those within small, closely developed neighborhoods), and conservation/recreation areas both north and south of the Kennebec River. In general, residential developments are present north and south of the Kennebec River, particularly in the north central region of the Study Area. Most of the conservation lands are in the western and eastern parts of the Study Area. Some of the conserved lands also offer public recreational opportunities.

The Study Area includes the Skowhegan Historic District, in which many of the buildings were built in the 19th century. While some of the roadways and development within the Study Area have existed since the late 18th and early 19th century (e.g., the Historic District, Cedar Street, French Street, Milburn Street, and Oak Street), much of the development within the Study Area is relatively recent. The Skowhegan State Fair Grounds were acquired in 1856 and is within the northern region of the Study Area.

5.1 HISTORIC AND ARCHAEOLOGICAL RESOURCES

The following section provides a discussion of regulatory requirements for projects impacting historic or archaeological resources and provides an overview of the historic and archaeological resources documented within the Study Area. A discussion of the data sources and methodology used for the analysis is also included below.

ARCHAEOLOGICAL AND HISTORIC CONTEXT OF THE STUDY AREA

Historically the section of the Kennebec River that flows through the Study Area in Skowhegan was inhabited by Native American fishing and hunting camps and villages prior to being settled by European settlers. The area was utilized for fish, fur, and ship building timber in the late 1700s. Benedict Arnold marched his army through Skowhegan in 1775. By the late 18th century mills and factories developed along the river and its tributaries. During the 20th century commercial growth spread along Waterville Road. Route 2 comes through the Historic District along Water Street and several listed historic buildings are located along Commercial and Water Streets. The Skowhegan Historic District is now part of a revitalization effort to bring the downtown area as the town's center once again.

REGULATORY BACKGROUND

SECTION 106

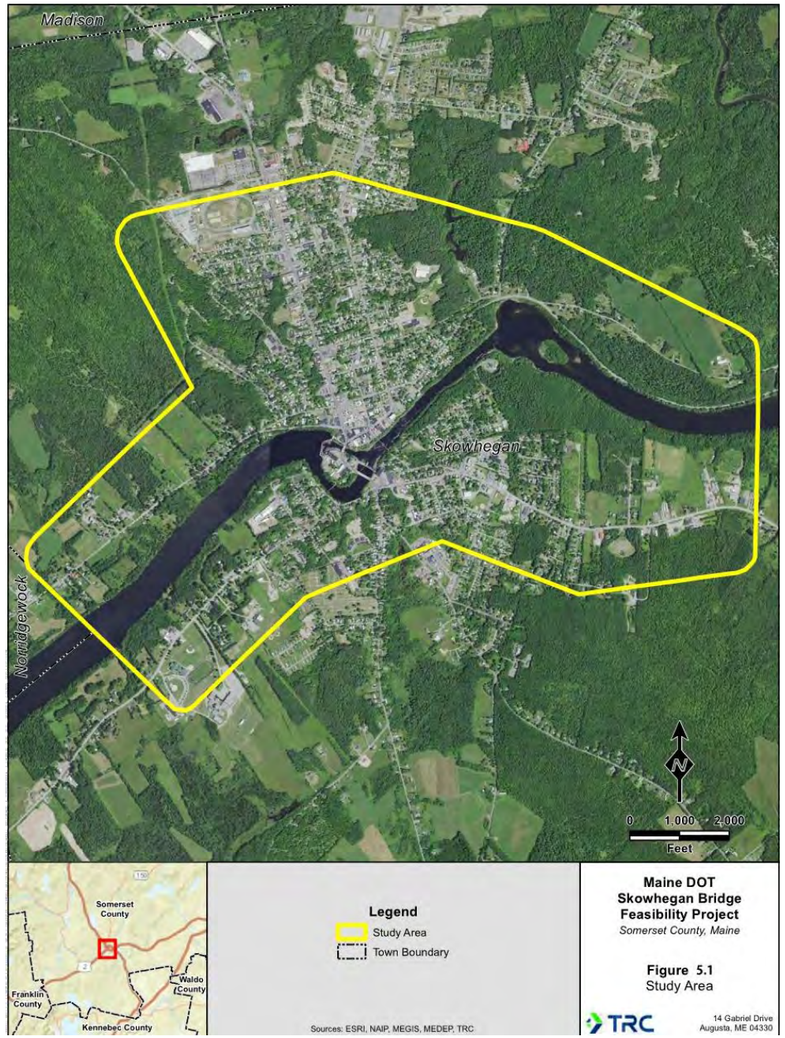
Pursuant to Section 106 of the National Historic Preservation Act of 1966 (Section 106), any project, activity, or program either funded, permitted, licensed, or approved by a Federal Agency is required to assess and consider the effects of the activity on "historic properties". "Historic properties" include prehistoric or historic districts, sites, buildings, structures, or objects included in or eligible for inclusion in the National Register of Historic Places (National Register). "Historic properties" can include properties or features of traditional religious and cultural importance to an Indian tribe, as long as they also meet the criteria for listing in the National Register.

In Maine, the Section 106 process is coordinated by the Maine Historic Preservation Commission (MHPC). The MHPC assesses the effects of any federally funded, permitted, or licensed undertaking on "historic properties." The goal of this consultation process is to identify the presence of significant historic buildings, structures, districts, and archaeological sites and take steps to avoid, minimize, or mitigate adverse effects (Maine Historic Preservation Plan, MHPC 2005[1]).

NATIONAL REGISTER OF HISTORIC PLACES

Properties are nominated to the National Register, or determined "eligible", under one or more criteria of significance. They can be related to local contexts, or in some cases to subjects of statewide or national importance. The four general criteria are:

- Association with important events or historic trends;
- Significance by way of association with important persons;
- Significance for architecture and design; and
- Potential to yield important information in history or prehistory (usually through archaeology).



[1] Maine Historic Preservation Commission. 2005. *A Heritage for the Future: A Plan for Preserving Maine's Historic and Archaeological Resources*. Available online at: https://digitalcommons.usm.maine.edu/mhpc-docs/1.

The National Register documentation is on file at the National Park Service (NPS), National Register of Historic Places in Washington, D.C. and at the MHPC.

MAINEDOT PROGRAMMATIC AGREEMENT

In 2004, the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), the Advisory Council on Historic preservation, the MHPC, and the Maine Department of Transportation (MaineDOT) entered into a programmatic agreement regarding implementation of Section 106 on MaineDOT projects that receive federal funding. Pursuant to that agreement, MaineDOT is responsible for initiating the Section 106 process, in particular MaineDOT is responsible for defining the area of potential effect (APE) for each undertaking, identifying historic properties within the APE using MHPC Historic Buildings/Structures survey forms, and evaluating the eligibility of any historic properties for inclusion in the National Register. Documentation is forwarded to the MHPC for concurrence and entered in the MHPC survey files.

METHODOLOGY

Archaeological and historic resource identification within the Study Area involved outreach to the MHPC to inquire about the presence of known or potential historic or archaeological resources within the Study Area. Additionally, the analysis collected data on historic buildings, structures, and districts currently listed or previously determined to be eligible for listing in the National Register from the NPS's online interactive mapping application. Finally, the desktop analysis also included a review of information displayed on the Cultural Architectural Resource Management Archive (CARMA). CARMA is an on-line architectural survey database for Maine's historic above ground resources. Developed and underwritten by the MaineDOT for the MHPC, CARMA enables architectural historians, survey consultants, and the public to search for surveyed properties and identify properties that have been evaluated for listing in the National Register of Historic Places.

LIMITS OF AVAILABLE DATA

Because existing determinations of National Register eligibility (per NPS or CARMA) were made only for properties immediately within earlier projects' APEs, the complete status of the potentially historic buildings in the Study Area remains undetermined. Similarly, archaeological excavations are conducted when disturbance is threatened, but other currently unknown archaeological sites may exist within the Study Area.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

ARCHAEOLOGICAL

Multiple archaeological sites have been identified in Skowhegan during assessment of previous studies. Phase "O" assessments have been conducted for significant historic and prehistoric archaeological resources. Prehistoric studies were focused on river crossings and historic surveys included downtown area, possible historic sites shown on town maps, and abandoned roadways. Several prehistoric sites are documented along the Kennebec River. Site specific locations are not available to the general public to prevent possibility of looting or disturbance.

NRHP ELIGIBLE STRUCTURES

Based on review of current NPS data, there are 48 properties within the Study Area currently listed on the National Register and 15 are eligible (**Figure 5.2 – Cultural Resources**). Twenty-eight properties are located within the Skowhegan Historic District in downtown Skowhegan and there is one eligible property. However, as described above in the Limits of Available Data section, there may be other properties in the Study Area that are potentially eligible for listing on the National Register.

According to CARMA review, many properties within the Study Area have been assessed for previous projects. Data forms, including photographs, are included for the structure data in the CARMA database, however no determinations have been made for many of the structures assessed.

RECOMMENDATIONS

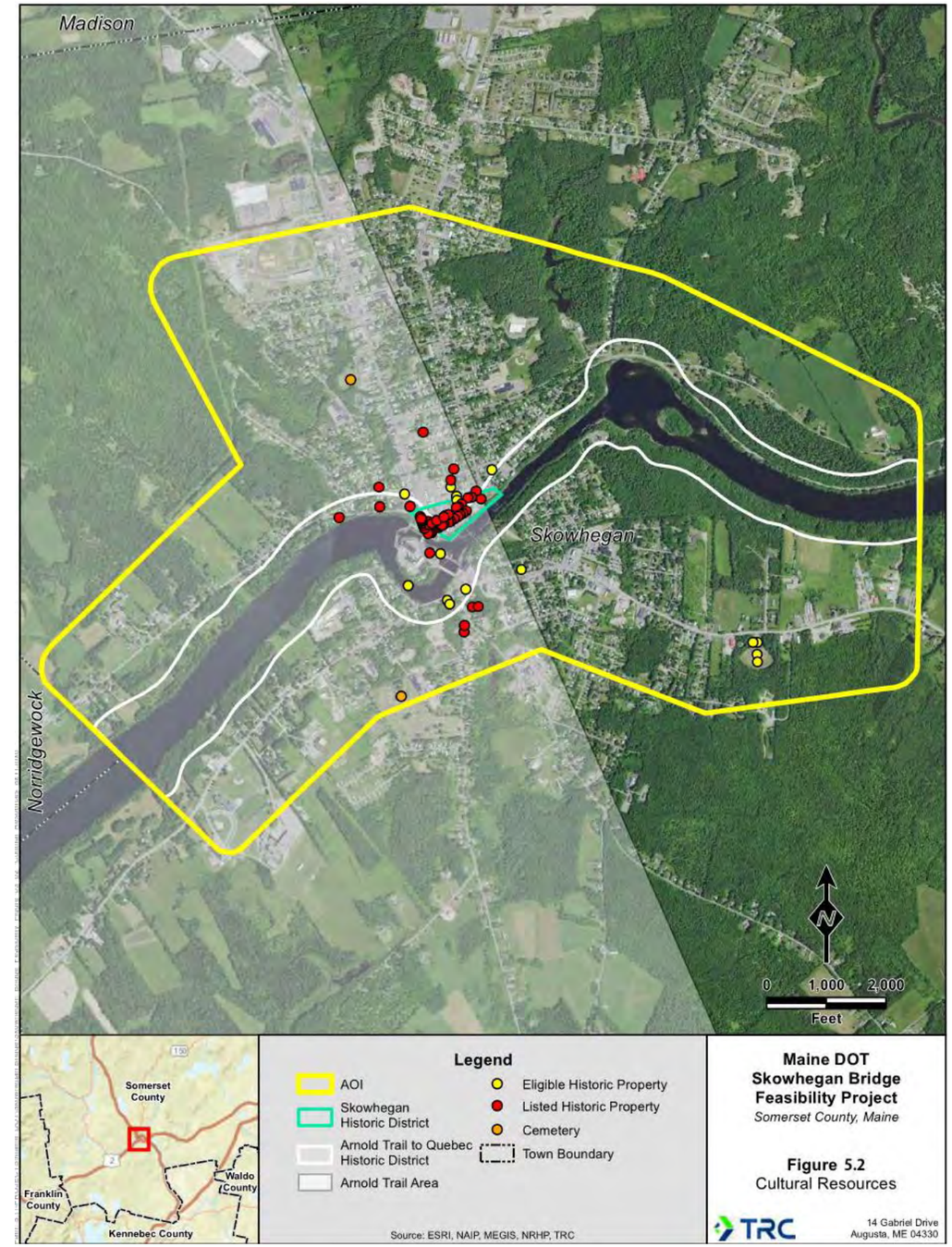
The need and extent of required follow-up study and correspondence will depend on the scope of road improvement work ultimately defined and implemented. Archaeological surveys are necessary for development in shoreland areas in the Town of Skowhegan. If soil disturbance is proposed within the Kennebec River or its tributaries in the Study Area, or if significant alterations of the viewshed or current infrastructure are required along Route 2, where there are several potentially eligible structures, then additional consultation with the MHPC, and further archaeological and historic architectural investigations, may be warranted. Follow-up consultation with the MHPC and additional study, as necessary, would proceed under the MaineDOT programmatic agreement described above.

5.2 NATURAL RESOURCES

This section provides an overview of methods and findings for identifying natural resources that are regulated by Federal and State agencies as well as the non-regulated resources considered important to the environment and character of the Study Area.

NATURAL RESOURCES WITHIN THE STUDY AREA

The Study Area is located within the Kennebec River at Skowhegan, Kennebec River at Hinckley, and Wesserunsett Stream watersheds and the Whitten Brook and Currier Brook sub-watersheds. The Kennebec River flows west to east through



the Study Area. Whitten Brook is an Urban Impaired Stream that drains from Coburn Woods forest and flows north to south-east until it reaches the Kennebec River. Currier Brook is a Threatened Stream located south of the Kennebec River in the central Study Area. Soils within the Study Area are predominantly derived from sandy glaciofluvial deposits (**Appendix** – Skowhegan Bridge Feasibility Study Soils). Wesserunsett Stream is located outside the Study Area though a small area of the watershed is in the northeastern portion of the Study Area.

The majority of the Study Area has been developed for residential, commercial, industrial, and transportation uses and infrastructure. Most of the upland areas located within the Study Area have been developed, and many of the wetlands in this area have been altered over time to facilitate development and drainage. Large tracts of unfragmented and contiguous forested cover are found within most of the Conservation Lands and shoreline segments adjacent to the Kennebec River. Two pockets of undeveloped forest occur on the west and east sides of town north of the Kennebec River within the Study Area. A few agricultural parcels are in the outskirts of the town. A hydroelectric dam facility is located upstream from the Route 2/201 bridge crossing in the Study Area.

REGULATORY BACKGROUND

At the state level, the Maine Department of Environmental Protection (MDEP) reviews developments that may have a substantial effect on the environment under the Site Location of Development Act (Site Law, 38 M.R.S.A. §§ 481-490). MDEP regulates impacts to wetlands, waterbodies, and other protected natural resources under the Natural Resources Protection Act (NRPA, 38 M.R.S.A §§480-A to 480-HH). Site Law incorporates stormwater permitting. For Projects that do not require a Site Law permit but still meet the requirements for stormwater permitting, applicants must meet the provisions of Maine's Stormwater Law (Chapter 500). MaineDOT and Maine Turnpike Authority (MTA) Projects also have a General Permit for the Discharge of Stormwater from MaineDOT and MTA Municipal Separate Storm Sewer Systems (MS4). Compliance with the General Permit authorizes MaineDOT and MTA to discharge stormwater, pursuant to Water Pollution Control Law, 38 M.R.S.A. §413.

At the federal level, the U.S. Army Corps of Engineers (USACE) regulates the placement of dredged or fill material in waters of the United States, which include wetlands and surface waters, under Sections 404 and 401 of the Clean Water Act (CWA, 33 CFR §1341 and 1344).

The Maine Floodplain Management Program (a division of the Department of Agriculture, Conservation, and Forestry) works with other state agencies (e.g., MDEP) to ensure that development under state review is designed and developed to reduce future flood damages. Additionally, federally-funded agencies (such as MaineDOT) are required to comply with Executive Order 11988. This requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

WETLANDS AND STREAMS

The NRPA identifies certain wetlands areas as Wetlands of Special Significance (WOSS). Impacts to WOSS require more rigorous review and permitting than non-WOSS wetlands and frequently require compensation through restoration, enhancement, or preservation. MDEP also has jurisdiction over projects with stream impacts. Under the NRPA, MDEP may require permitting for direct and indirect impacts to streams, including crossings, and for certain activities within 75 feet of streams and a subset of wetlands.

The USACE has jurisdiction over rivers, streams, and wetlands. Section 404 of the CWA requires that projects that impact wetlands follow the sequential process of first avoiding adverse impacts to wetlands and surface waters, then minimizing impacts that cannot be practicably avoided, and finally compensating for those impacts that cannot be further minimized.

VERNAL POOLS

The MDEP regulates a subset of naturally created vernal pools known as significant vernal pools. The term "significant vernal pool" includes the vernal pool basin plus a 250-foot surrounding "critical terrestrial habitat". The Maine Chapter 335, Significant Wildlife Habitat, defines a vernal pool as:

> *Whether a vernal pool is a significant vernal pool is determined by the number and type of pool-breeding amphibian egg masses in a pool, the presence of fairy shrimp, use by rare, threatened, or endangered species, or other criteria as specified in Section 9(B). Significant vernal pool habitat consists of a vernal pool depression and that portion of the critical terrestrial habitat within 250 feet of the spring or fall high water mark of the depression. An activity that takes place in, on, or over a significant vernal pool habitat must meet the standards of this chapter.*

The USACE's Maine General Permit (2015-2020) defines a vernal pool as:

A vernal pool, also referred to as a seasonal forest pool, is a temporary to semi-permanent body of water occurring in a shallow depression that typically fills during the spring or fall and may dry during the summer. Vernal pools have no permanent inlet or outlet and no viable populations of predatory fish. A vernal pool may provide the primary breeding habitat for wood frogs (Rana sylvatica), spotted salamanders (Ambystoma maculatum), blue-spotted salamanders (Ambystoma laterale), and fairy shrimp (Eubranchipus sp.), as well as valuable habitat for other plants and wildlife, including several rare, threatened, and endangered species. A vernal pool intentionally created for the purposes of compensatory mitigation is included in this definition.

The USACE has the discretionary authority to review and authorize or deny impacts within any vernal pool that meets the definition above. However, the USACE, working with the U.S. Fish and Wildlife Service (USFWS) as their primary biology consultation agency, tends to only regulate vernal pools of natural or manmade origin that have particularly high productivity for vernal pool indicator species. In certain circumstances, the USACE may regulate activities in the terrestrial area surrounding a vernal pool out to 750 feet beyond the vernal pool depression, generally depending on the quality of the surrounding habitat and productivity of the feature.

THREATENED AND ENDANGERED SPECIES

Section 7 of the Endangered Species Act (ESA) requires that for any project in which there is a federal action that "may affect" listed threated or endangered species or their critical habitat, the action agency must consult with either the USFWS or National Marine Fisheries Service (NMFS). The ESA directs all Federal agencies to conserve threatened and endangered species and, in consultation with other agencies, ensure that their actions do not jeopardize the continued existence of a listed species or destroy or adversely affect designated critical habitat. Additionally, in cooperation with federal agencies, MaineDOT and MTA have developed specific programmatic agreements for certain species, such as the federally endangered Gulf of Maine Distinct Population Segment of the Atlantic salmon, that allows for expedited review of certain types of projects. The Maine Department of Inland Fisheries and Wildlife (MDIFW) oversees the Maine Endangered Species Act (MESA), which includes a state-specific list of threatened and endangered species. Under Site Law, the Maine DEP generally consults with MDIFW regarding Site Law projects' potential effects on MESA-listed species and encourages applicants to work with MDIFW on avoidance and minimization of impacts to MESA species.

WILDLIFE

USFWS has primary responsibility for bald eagle management under the Bald and Golden Eagle Protection Act (BGEPA, 16 CFR §668-668c). NMFS is responsible under the ESA, as well as the Marine Mammal Protection Act (MMPA), for protecting marine mammals and threatened and endangered marine species. Additionally, USFWS regulates wildlife habitat under the Fish and Wildlife Coordination Act, which involves evaluation of impacts to fish and wildlife from water resource development projects.

Under NRPA Chapter 335, Significant Wildlife Habitat includes: seabird nesting island; significant vernal pool habitat; MDIFW-mapped moderate and high-value inland waterfowl/wading bird habitats and MDIFW-mapped shorebird nesting, feeding and staging areas. These are regulated by the MDEP with MDIFW acting as a consulting and commenting agency for the MDEP.

OTHER CONSTRAINED LANDS (E.G. CONSERVED LANDS AND SECTION 4(F) PROPERTIES)

Conserved properties, public lands and designated open spaces may provide obstacles to successful siting and routing when they are located in the vicinity or path of proposed linear transportation projects. Additionally, Section 4(f) of the Department of Transportation Act of 1966 (49. U.S.C. §303 and 23 U.S.C. §138) requires that the FHWA and other DOT agencies avoid siting projects on publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites, unless there is no feasible alternative or the use of the property will have a de minimis impact. Section 4(f) applies to projects that receive funding or require approvals from federal agencies.

METHODOLOGY

Publicly available data was obtained to identify known locations of Federal and State regulated natural resources as well as non-regulated resources that are considered important to the environment and character of the H/E Study Area. The following data sources were consulted:

- MDIFW
- MNAP
- USFWS' Information, Planning and Consultation System (IPaC)
- MHPC
- Maine Office of GIS
- Federal Emergency Management Agency (FEMA) - Floodplain Flood Map Service Center
- USFWS National Wetland Inventory (NWI)
- US Geologic Survey (USGS) National Hydrography Dataset (NHD)
- Natural Resources Conservation Service (NRCS) Soil Maps

LIMITS OF AVAILABLE DATA

It is important to note that publicly available data are not general based on field study, rather they are devised through remote sensing and aerial photography interpretation. These data are meant for planning purposes only.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

WETLANDS AND WATERBODIES

NWI wetlands are shown on **Figure 5.3 – Wetlands, Waterbodies, and Watersheds** on the following page. Numerous NWI wetlands and mapped hydric soils occur throughout the Study Area. The NWI and hydric soils data indicate wetlands are located primarily along the river and stream banks. There are some small wetlands in both the developed and undeveloped portions of the Study Area. Additionally, NWI indicates the majority of wetlands have a forested buffer around them.

The Study Area has three mapped waterways with associated NWI wetlands:

Kennebec River – runs west to east and through the Weston Dam Hydro Station and under the Island Avenue bridge through the Study Area. The stretch of Kennebec River within the Study Area is both a mix of high-risk area (AE) and moderate risk area (X shaded) for flooding. A portion of Kennebec River is mapped by FEMA as a 100-year Flood Zone.

Currier Brook – located mainly in the developed area of Skowhegan within the central Study Area south of the Kennebec River. A segment of Currier Brook is classified as a Threatened Stream due to bacteria impairment from urban non-point source pollution. A portion of Currier Brook is also mapped by FEMA as a 100-year Flood Zone.

Whitten Brook – flows from a large undeveloped forest from the north to south-east direction through a residential neighborhood before flowing into the Kennebec River within the Study Area. Whitten Brook is classified as an Urban Impaired Stream as a result of urbanization and associated stormwater runoff. A portion of Whitten Brook is also mapped by FEMA as a 100-year Flood Zone.

Prior to final planning for any project that expands existing roadway infrastructure or adds new infrastructure, a complete field delineation should be conducted to determine and map the boundaries of jurisdictional wetlands and streams. Once locations are determined, project planners can implement the appropriate measures to avoid and minimize impacts.

VERNAL POOLS

According to data received from MDIFW, there are no mapped significant vernal pools in the vicinity of the Study Area (**Appendix** – MDIFW Environmental Review). No significant vernal pools in the Study Area are found in the Maine Geolibrary Data Catalog. A field survey for potential vernal pools would be necessary prior to project design and permitting. This study could take place concurrent with the wetland delineation suggested in the previous section. If potential vernal pools are identified proximal to potential impact areas, a breeding season survey (approximately late April through early June) would be required to ascertain the productivity of each feature.

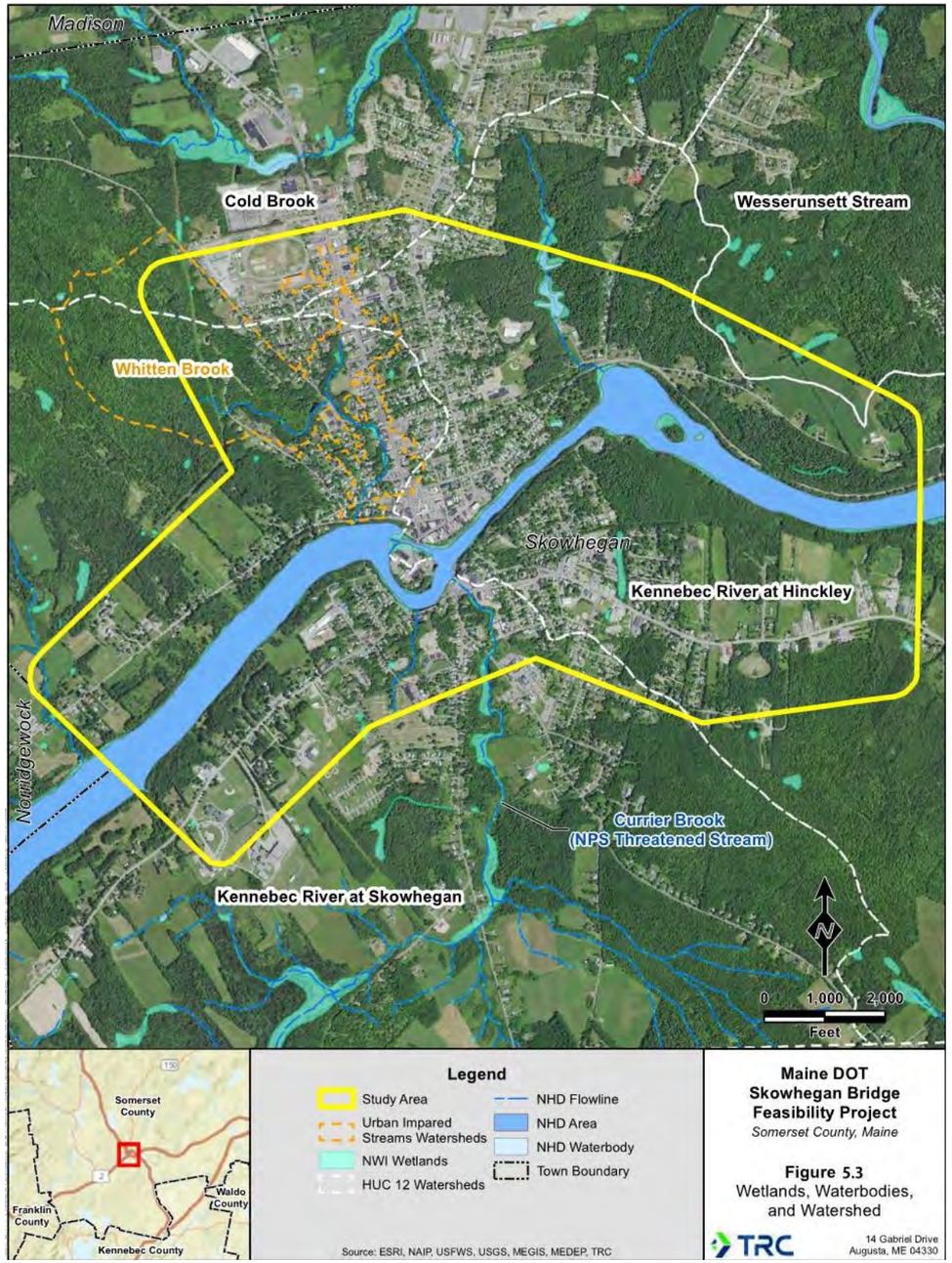


Table 5.1: Rare, Threatened, Endangered, and Special Concern Plant Species and Habitats

Resource	Source of Data	State Status*	Site Name
Animals			
Bats	USFWS, MDIFW	T, E, SC (NLEB – Federal T)	Forested Areas
Fish			
Atlantic Salmon (*Salmo salar*)	USFWS	E	Kennebec River
Habitats			
Rivershore Outcrop (Bluebell – balsam ragwort shoreline)	MNAP	N/A	Kennebec River Great Eddy
Hardwood Seepage Forest	MNAP	N/A	Kennebec River Great Eddy
Plants			
Clinton's Bulrush (*Trichophorum clintonii*)	MNAP	SC	Kennebec River Great Eddy
Garber's Sedge (*Carex garberi*)	MNAP	SC	Kennebec River Great Eddy
Indian Grass (*Sorghastrum nutans*)	MNAP	E	Kennebec River Great Eddy
Long-leaved Bluet (*Houstonia longifolia*)	MNAP	SC	Kennebec River Great Eddy
Pale Green Orchis (*Platanthera flava* var. *herbiola*)	MNAP	SC	Kennebec River Great Eddy
Wild Garlic (*Allium canadense*)	MNAP	SC	Kennebec River Great Eddy

* State legal status is defined according to Title 12 Section 544, and Title 12 Section 544 B:

- E ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
- T THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

Non-Legal status:

- SC SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
- PE Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been

THREATENED AND ENDANGERED SPECIES

Table 5.1 provides a listing of rare, threatened, or endangered (RTE) species known to occur, or with the potential to occur, within the Study Area. This table was assembled based on data received from MNAP, MDIFW and USFWS IPaC research. According to data received from the agencies, there are limited known occurrences of RTE species within the Study Area. Additionally, the majority of RTE species occurrences located in the Study Area are plant species and botanical habitats along the shoreline of the Kennebec River. If instream work on the Kennebec River is to take place, a comprehensive field survey will be needed and additional consultation with MNAP (**Appendix 3** – MNAP Consultation) will need to take place prior to any work.

According to a preliminary IPaC research, two protected species that occur within the Study Area are Atlantic Salmon (*Salmo salar*) and northern long-eared bat (NLEB) (*Myotis septentrionalis*). Atlantic Salmon, listed as endangered in Maine, is an anadromous fish species that live in the sea and spawn upstream in fresh water. No Atlantic salmon spawning, or rearing habitat is documented in the Study Area as review on the Beginning with Habitat website. As such, the presence of this species in this area would likely not impact project design or permitting requirements. The MDEP is also not likely to require additional surveys for this species if future transportation projects are not proposing to impact the area of the mapped occurrence.

MDIFW indicated during their review that while several of the state-listed bat species occur within the area during migration and/or breeding season, they do not anticipate significant impacts to the species as a result of a potential transportation project. According to the preliminary species list obtained from the USFWS IPaC system (**Appendix 4** – IPaC Unofficial Species List), NLEB may occur in the Study Area. However, there are no mapped critical habitats for the NLEB, and no documented maternity roosts occur in the State. The Study Area is located more than 50 miles from the nearest known hibernacula. Therefore, a potential transportation project occurring within the Study Area is not likely to have an adverse effect on this species and additional consultation or study would not be required.

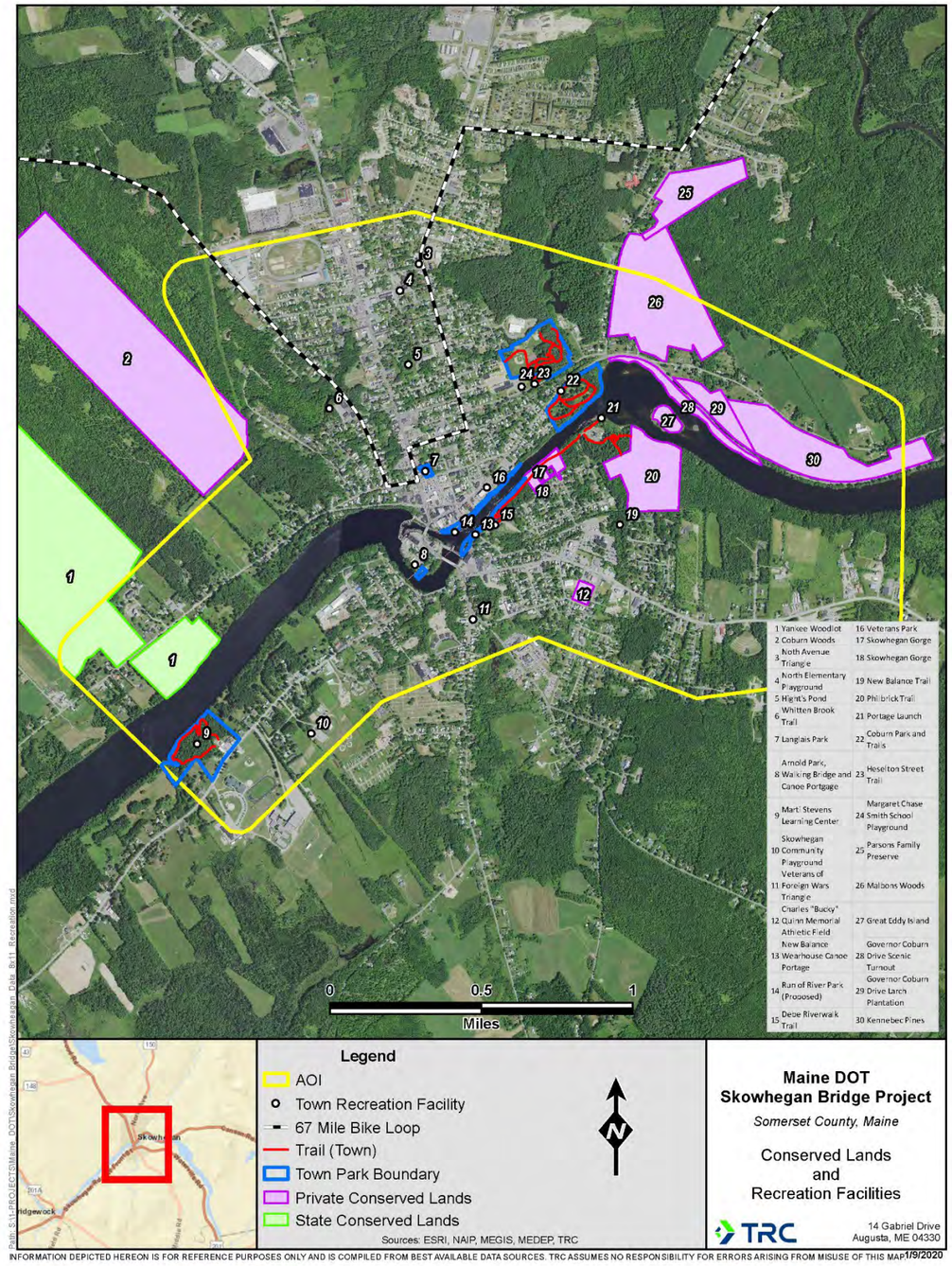
WILDLIFE HABITAT

In their review of the Study Area (**Appendix** 2), the MDIFW recommends following Construction Best Management Practices to avoid erosion, sedimentation, flow alteration, and other impacts to instream work. It is also recommended that any instream work be done between July 15th and October 1st to minimize potential impacts to fisheries habitat. In general, if a future transportation project would require any site disturbance, then further agency consultation is recommended to ensure avoidance and minimization of impacts on stream resources.

OTHER CONSTRAINED LANDS (E.G. CONSERVED LANDS AND SECTION 4(F) PROPERTIES)

There are nine private conserved lands all owned by the Somerset Woods Trustees (SWT) and one state conserved land managed by the Maine Bureau of Parks and Lands within the Study Area **(Figure 5.4 – Conserved Lands** on this page**)**. The largest tract of undeveloped conservation land in the Study Area, known as the Kennebec Pines, is comprised of a mature softwood forest located north of Route 2 and the Kennebec River within the eastern most part of the Study Area. The Kennebec Pines is an approximately 35-acre conservation area that about 5 acres of this parcel fall outside the Study Area. This forested area is connected to the Governor Coburn Drive Larch Plantation. Other conservation lands owned by SWT located within the Study Area include: Governor Coburn Drive Scenic Turnout, Great Eddy Island, Philbrick Trail, Skowhegan Gorge, and Charles "Bucky" Quinn Memorial Athletic Field with associated playground, the Amanda Berry Play Place. Several partial parcels that fall within the Study Area include: Malbon's Woods that provides a public informal trail system and Coburn Woods that has public trails with associated Taylor Field which is maintained for grassland bird nesting habitat.

Approximately 2 miles of the 67 Mile Bike Loop is located within the Study Area that provides varied terrain for experienced cyclists. This loop starts and ends in Skowhegan and goes through Cornville, Athens, Brighton Plantation, Bingham, Solon and Madison. Future plans for the Run of River Whitewater Recreation Area, a whitewater park in downtown Skowhegan, is under the planning phase. Additionally, six parks are located in the Study Area including: the Arnold Park at Walking Bridge with associated New Balance Warehouse Canoe Portage, Coburn Park, Hight's Pond, Langlais Park, North Avenue Triangle, and Veterans of Foreign Wars Triangle. The following 5 trails are in the Study Area: Marti Stevens Learning Center, New Balance Trail, Debe Riverwalk Trail, Whitten Brook Trail, and the Heselton Street Trail. Skowhegan also has four playgrounds and sport complexes and two facilities and memorials within the Study Area. This project will likely not require the taking and use of these lands under Section 4(f) and therefore, Section 4(f) is likely not applicable.



6.0 ALTERNATIVES FOR CONSIDERATION

The following provides a summary of Alternatives that were evaluated.

Future 2045 No-Build: No changes to the existing transportation system with the exception of programmed improvements. The following intersection improvements are programmed in the study area and were assumed to be in place.

Madison Avenue/Elm Street/Commercial Street – Installation of a traffic signal and associated geometric improvements.

Island Avenue/Main Street/West Front Street/Waterville Road – Construction of a channelized right-turn lane on West Front Street (this has been implemented).

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. Example TDM strategies are noted as follows.

- GO MAINE TDM Program
  - Carpool and Vanpool
  - Ride-Matching System
  - Emergency Ride Home
  - Information on local and regional bus, ferry, and rail services
  - Media Releases and Commuter e-news
- Transit
  - Expanded and/or increased frequency of current service.
- Park and Ride Lots

A2 - Transportation System Management Improvements (TSM): Transportation System Management (TSM) addresses the mobility and safety deficiencies of the system. TSM improvements can be made alone or in combination with other improvements. The following describes recommended TSM improvements at locations identified as having operational or safety deficiencies. Further detail on the SimTraffic analysis that supports these improvements is provided in **Section 9.0**.

- **Main Street/Island Avenue/West Front Street/Waterville Road –** To address congestion issues the following TSM improvements are suggested. Poor operating conditions will continue.
  - Converting 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 YEILD 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: This Alternative consists of widening or improving the existing Route 201 Bridges to provide mobility enhancements, improved bicycle and pedestrian facilities and additional width for emergency vehicle travel. It was assumed that four lanes (two in each direction) would be provided. In addition to the widening of the Bridges the TSM improvements noted previously, and the following were assumed.

- **Main Street/Island Avenue/West Front Street/Waterville Road –** To address congestion issues the following improvements are suggested. 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.

A4 – Downstream Bridge Crossing: This Alternative consists of providing a new river crossing with roadway connections between Route 201 and Route 2 approximately 1 mile south of downtown Skowhegan. (**See Figure 6.1**).

General details include:

- The Bridge Structure is likely to be 3 or 4 spans and between 725 to 825 feet long.
- The roadway connecting Route 201 to the bridge is approximately 2400 feet and 1250 feet from the bridge to Route 2.
- No buildings are anticipated to be impacted.
- General property impacts are limited.
- No impact to proposed Run of the River park.
- Shallower water facilitates ease of bridge pier construction.
- The elevation difference between north and south side riverbanks and hydrology necessitates a "fly-over" of Route 2.
- This Alternative has the greatest amount of approach or roadway construction.
- Impacts to conservation area and hardwood seepage forest on the north side of river.
- The intersection of the new roadway and Route 201 is proposed to be signalized with dedicated turning lanes from each direction onto the new roadway and dedicated left and right lanes onto Route 201 from the new roadway.
- The intersection of the new roadway and Route 2 is proposed to be signalized with dedicated turning lanes from each direction onto the new roadway and dedicated left and right lanes onto Route 2 from the new roadway.
- Estimated Cost: $25.5M

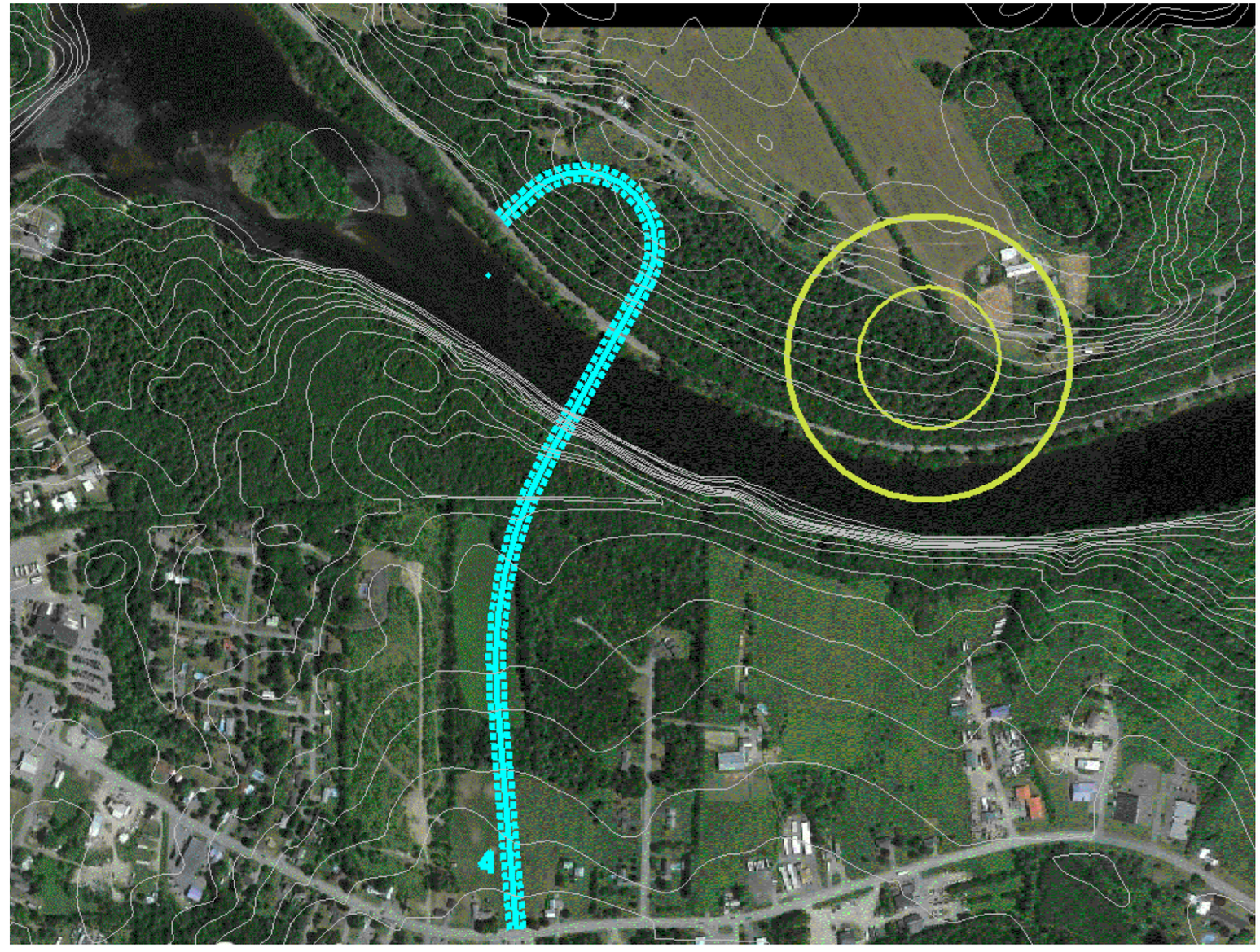


Figure 6.1 – A4 Downstream Bridge Crossing Concept

A5 – Downtown Bridge Crossing: This Alternative consist of a new river crossing with roadway connections in the immediate downtown Skowhegan area downstream of the existing Route 201 Bridges. (See **Figure 6.2)**.

General details include:

- Bridge Structural Options:
  - Conventional two-span with a pier in the river channel.
  - Long-span to clear the river channel and a short approach span over Debe Park Trail. Single span structure to minimize impacts to proposed Run of the River park.
  - Overall bridge length for either span arrangement is approximately 380 feet.
- Roadway Approach Options:
  - 5A: Is a roadway on the south side that is approximately 1050 feet in length and whose alignment intersects Route 201 at Mechanic Street.
  - 5B: Is a roadway on the south side that is approximately 1000 feet in length and whose alignment intersects Route 201 at Free Street.
  - 5C: Is a roadway on the south side that is approximately 1100 feet in length and whose alignment intersects Route 201 near French Street.
  - The roadway is approximately 225 feet from the bridge to Front Street.
- The bridge is the shortest structure of the three proposed crossing alternatives.
- The approach roadway work is the shortest total approaches of the three proposed crossing alternatives.
- Impact to 4(f) property (Veteran's Park) which could result in relocation of park.
- Will require greater abutter acquisition (could result in up to six building acquisitions).
- May impact one historically eligible property on the south side of the river, and a Historic District on the north side of the river.
- Direct impacts to the future water park would occur with a conventional two span bridge and no direct impact with a long span bridge. Visual impacts would occur for either span arrangement.
- Each of the intersections of the new roadway and Route 201 is proposed to be signalized with turning lanes from each direction onto the new roadway and left and right lanes onto Route 201 from the new roadway.
- The intersection of the new roadway and Route 2 is proposed to be signalized with turning lanes from each direction onto the new roadway and dedicated left and right lanes onto Route 2 from the new roadway, as well as a dedicated through lane onto Route 150.
- Estimated Cost: $55.3M

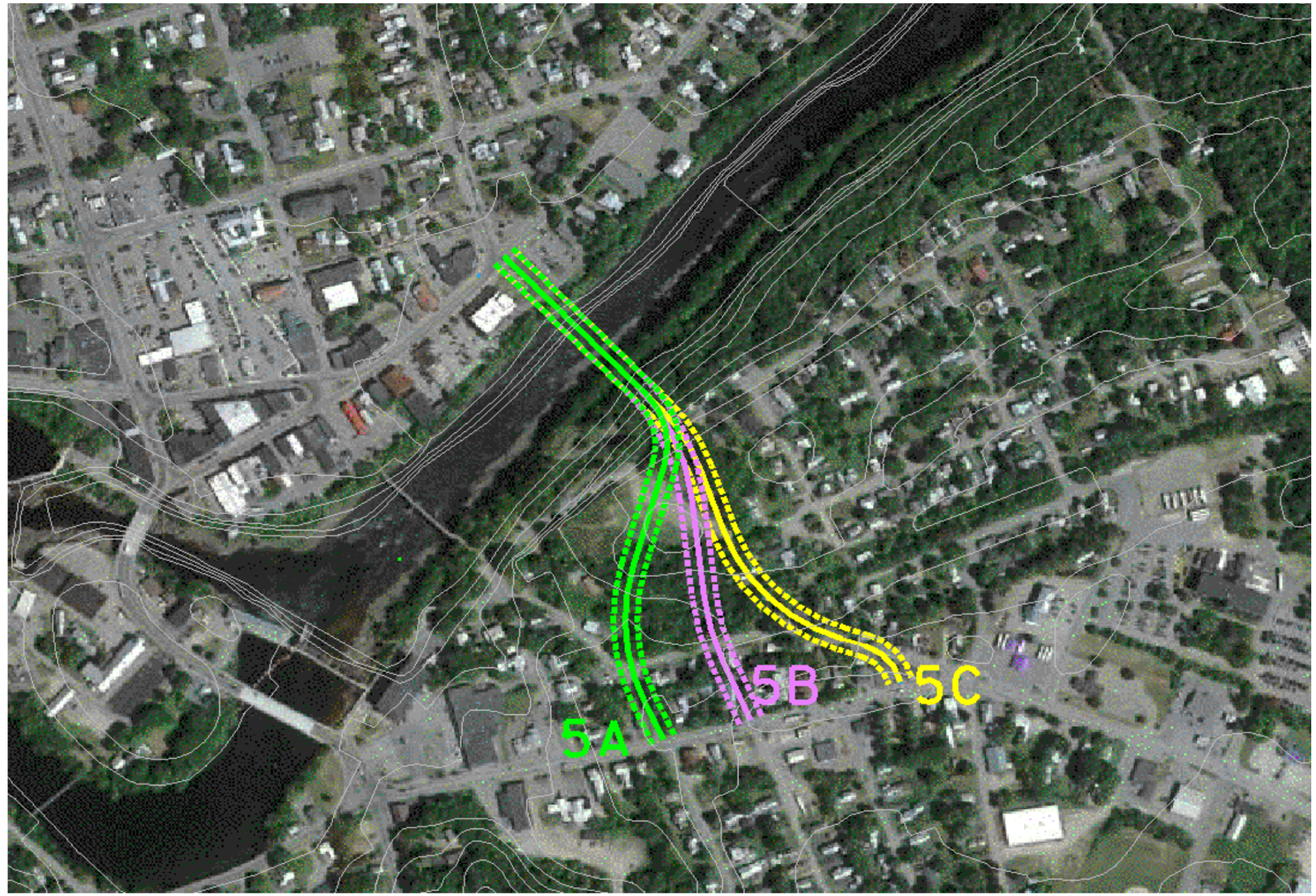


Figure 6.2 – A5 Downtown Bridge Crossing Concept

A6 – Upstream Bridge Crossing: This Alternative consists of a new river crossing with roadway connections upstream of the existing Route 201 Bridges. (See **Figure 6.3**).

General details include:

- The Bridge Structure is likely to be 4 spans and approximately 900 feet in length.
- The roadway connecting Route 201A to the bridge is approximately 650 feet and 830 feet from the bridge to Norridgewock Avenue.
- No impact to proposed Run of the River park.
- No buildings are anticipated to be impacted.
- General property impacts are limited.
- Three piers will be required in the river.
- The bridge is located where it is the longest river crossing.
- The bridge is located where the river is the deepest.
- The intersection of the new roadway and Route 201A is proposed to be signalized with dedicated turning lanes from each direction onto the new roadway and dedicated left and right lanes onto Route 201A from the new roadway.
- On Norridgewock Avenue and approaching the proposed alternative from the east, a dedicated left-turn lane onto the new roadway, and a dedicated through lane continue west on Norridgewock Avenue are proposed. On Norridgewock Avenue and approaching the proposed roadway from the west, a dedicated right-turn/through lane is proposed. On the proposed roadway and traveling north, dedicated left and right-turn lanes onto Norridgewock Avenue are proposed
- Estimated Cost: $30.5M

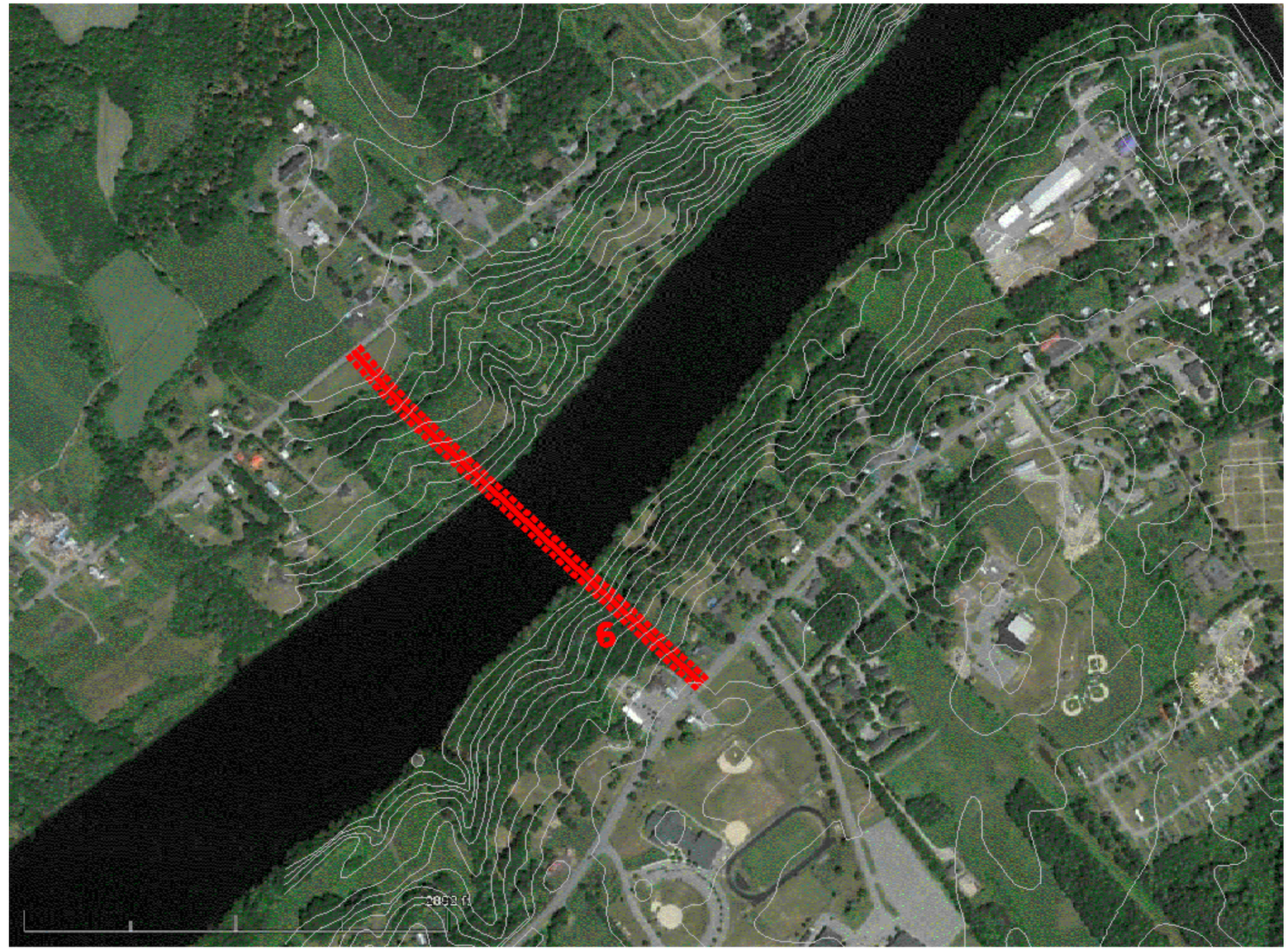


Figure 6.3 – A6 Upstream Bridge Crossing Concept

7.0 2045 Future Traffic Conditions

The Maine Statewide Travel Demand Model was used to develop year 2045 traffic volume forecasts. Forecasts were developed for the study area intersections and existing and proposed bridge crossings. Forecasts were developed for four distinct future transportation system scenarios.

- *Future Base Condition (No-Build)*
- *A4 – Downstream Bridge Crossing*
- *A5 – Downtown Bridge Crossing*
- *A6 - Upstream Bridge Crossing*

7.1 Annual Average Daily Traffic Volumes (AADT)

Figure 7.1 presents Average Annual Daily Traffic volumes for existing, 2045 No-Build and proposed bridge crossing Alternatives. A summary is noted as follows.

Future Base Condition (No-Build)

In 2045 the AADT on the Margaret Chase Smith Bridges is forecast to be 29,300 vehicles. This represents a 13 percent increase over the existing volume of 25,900 vehicles. On the upstream Norridgewock Bridge the 2045 AADT is forecasted to be 11,800 vehicles a 23 percent increase over the existing volume of 9,600 vehicles. On the downstream Hinckley Bridge the 2045 AADT is forecasted to be 2,600 vehicles a 12 percent increase over the existing volume of 2,300 vehicles.

A4 – Downstream Bridge Crossing

A proposed bridge crossing downstream of downtown is forecasted to have an AADT of 7,000 vehicles. The Margaret Chase Smith Bridges would see a reduction in volume from 29,300 vehicles to 24,000 vehicles. While this is a 18% reduction in traffic volumes in 2045, it is only a 7% reduction from existing traffic levels.

A5 – Downtown Bridge Crossing

A proposed bridge crossing in downtown is forecasted to have an AADT of 11,200 vehicles. The Margaret Chase Smith Bridges would see a reduction in volume from 29,300 vehicles to 17,600 vehicles. This corresponds to a 40% reduction in traffic volumes in 2045 and a 32% reduction from existing traffic levels.

A6 – Upstream Bridge Crossing

A proposed bridge crossing upstream of downtown is forecasted to have an AADT of 9,900 vehicles. The Margaret Chase Smith Bridges would see a reduction in volume from 29,300 vehicles to 24,700 vehicles. While this is a 16% reduction in traffic volumes in 2045, it is only a 5% reduction from existing traffic levels.

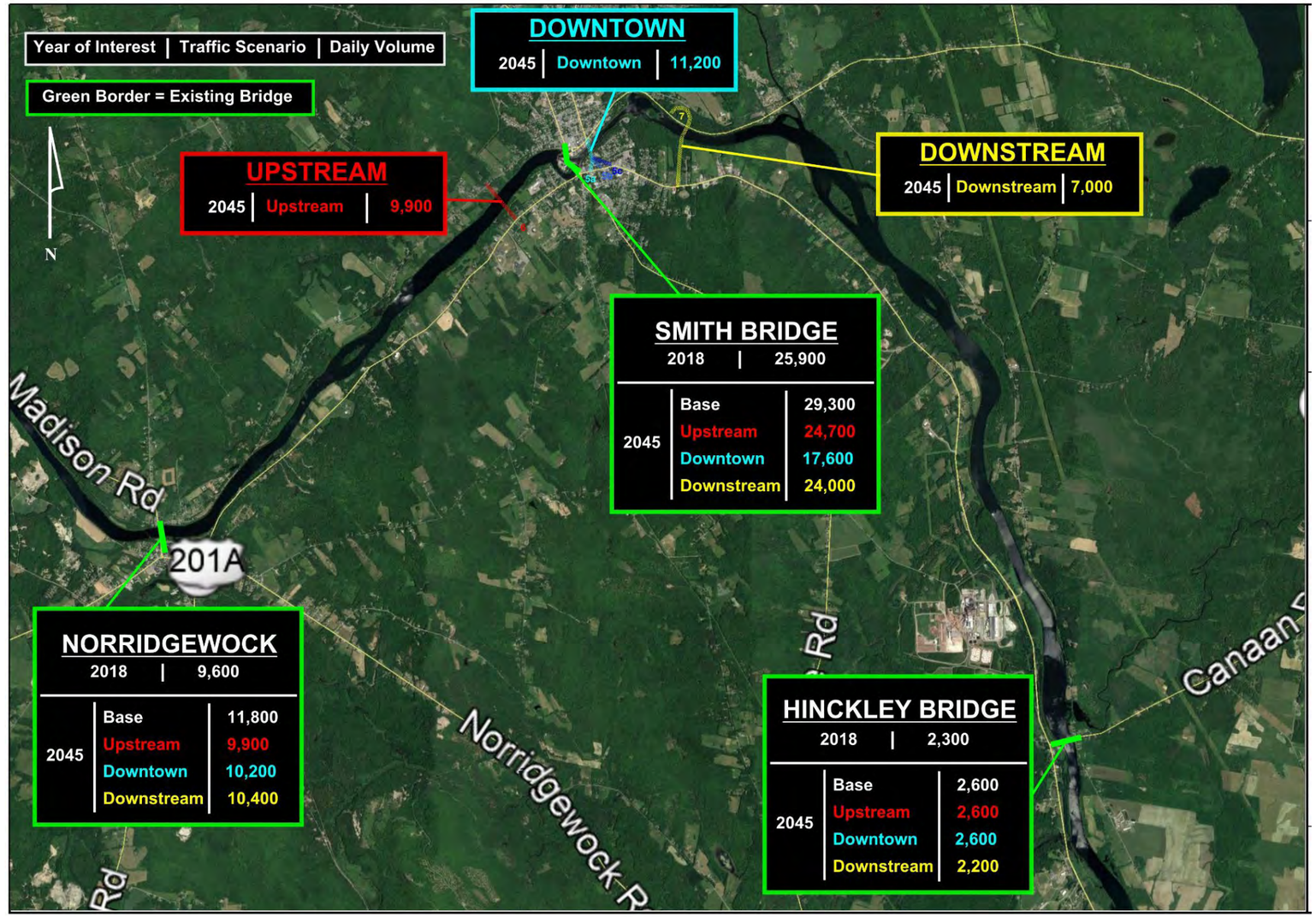


Figure 7.1 – Annual Average Daily Traffic Volumes

7.2 Annual Average Daily Traffic Volumes (AADT) Traffic Volume Shift

A4 – Downstream Bridge Crossing

Figure 7.2 depicts daily traffic volume changes with a Downstream Bridge Crossing with the following summary.

- 3,100 daily vehicles that route between Downtown Skowhegan and northerly destinations (Route 201/Route 150) and Route 201 to the south would shift from the Margaret Smith Bridges to the new bridge. A portion of these vehicles would travel on Route 2 to downtown and some would be expected to travel to Malbon Mills Road to Dr. Mann Road.
- 3,500 daily vehicles that currently travel along Route 2 would shift to the new bridge. Most of these vehicles are through vehicles traveling east-west, with some traffic traveling to destinations on the south side of the Town (Route 104).
- 400 daily vehicles that would use the new bridge crossing for routing between Route 201 to the south and Route 2 to the east.

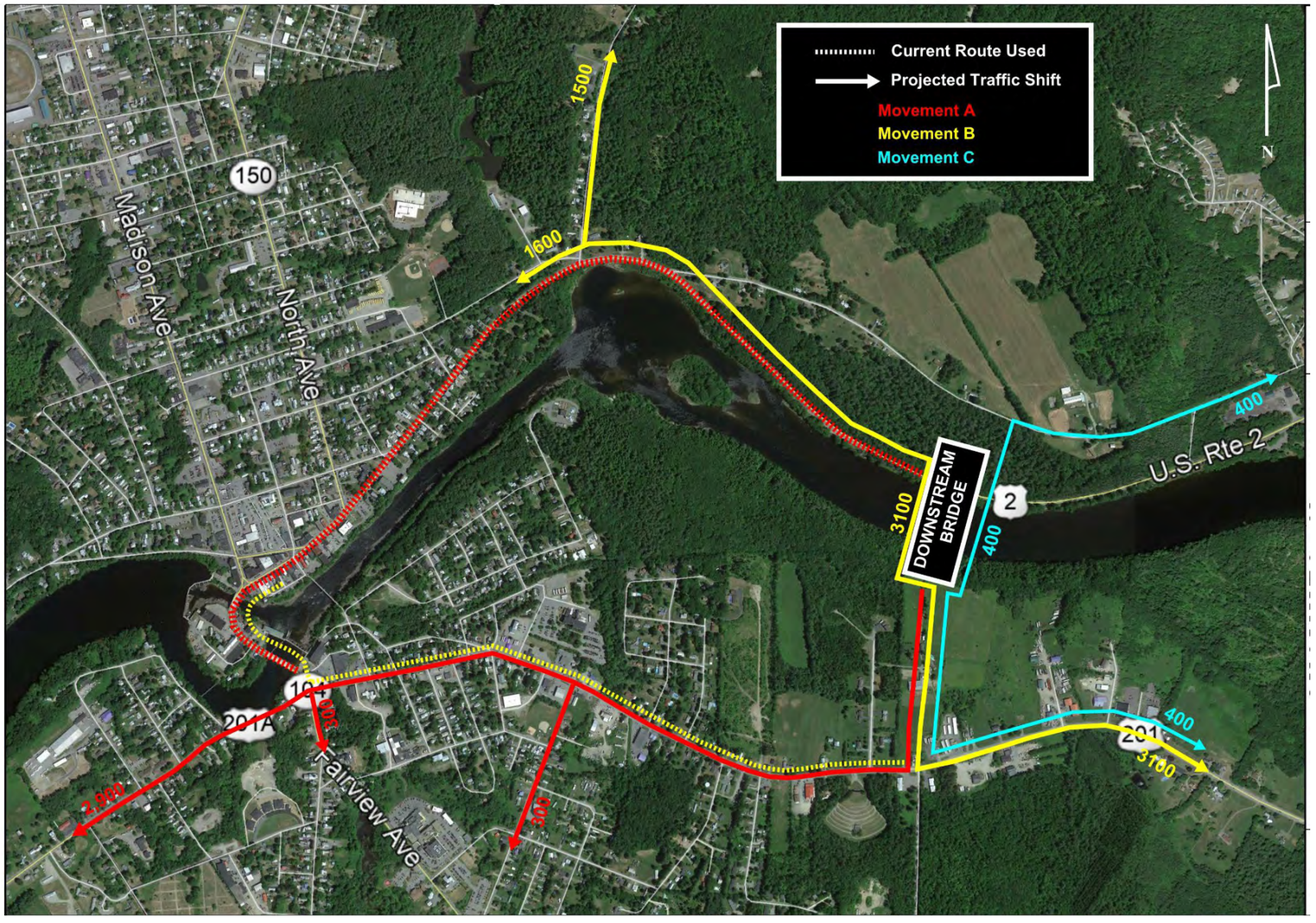


Figure 7.2 – A4 Downstream Bridge Crossing AADT Volume Shift

A5 – Downtown Bridge Crossing

Figure 7.3 depicts daily traffic volume changes with a Downtown Bridge Crossing with the following summary.

- 12,000 daily vehicles shift from the existing bridges to the new bridge.
- 1,200 daily vehicles that will use the new bridges are primarily Route 2 east-west movements.
- 10,000 daily vehicles have origin-destinations between Route 201 to and from the south and Route 201 to the north, Route 2 to the east and downtown destinations.

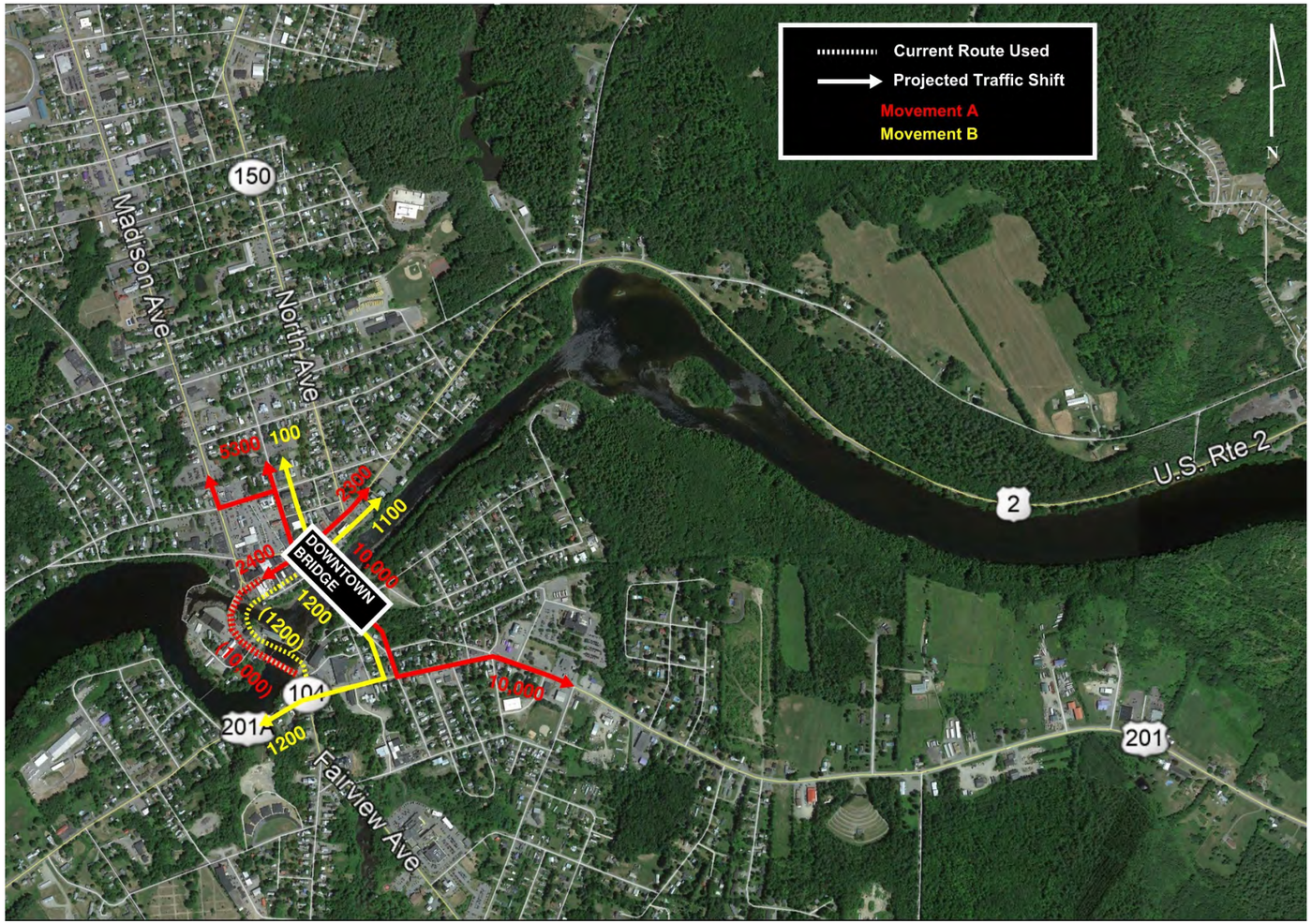


Figure 7.3 – A5 Downtown Bridge Crossing AADT Volume Shift

A6 – Upstream Bridge Crossing

Figure 7.4 depicts daily traffic volume changes with an Upstream Bridge Crossing with the following summary.

- 5,800 daily vehicles shift from the existing bridges to the new bridge.
- 2,400 daily vehicles that currently use Norridgewock Avenue towards downtown, shift to Route 2 and use the new bridge.
- 3,400 daily vehicles that current use the existing bridges shift to Norridgewock Avenue and the new bridge.

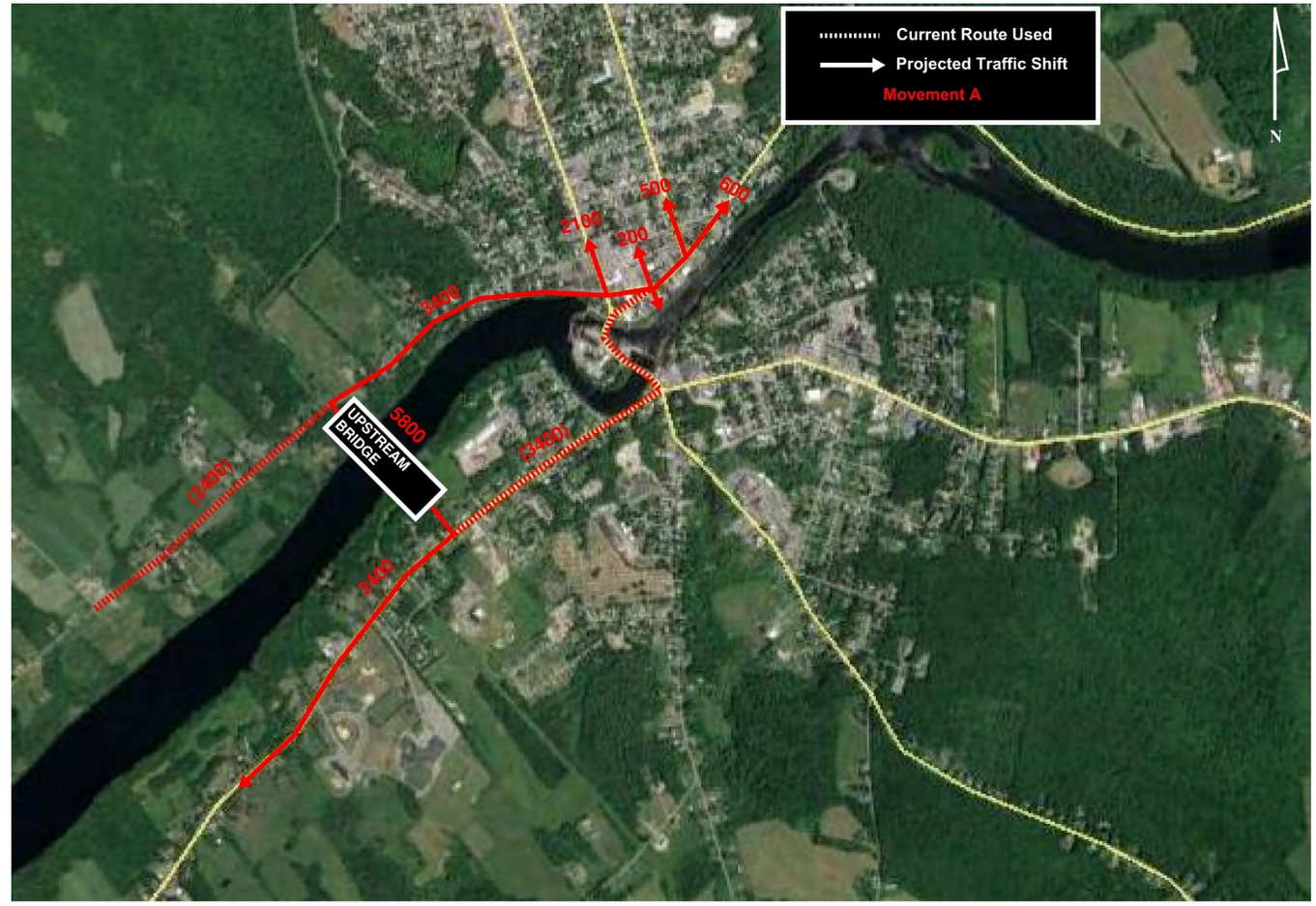


Figure 7.4 – A6 Upstream Bridge Crossing AADT Volume Shift

7.3 Daily Truck Traffic Volumes

Figure 7.5 presents Daily Truck Traffic volumes for 2045 No-Build and proposed bridge crossing Alternatives. A summary is noted as follows.

Future Base Condition (No-Build)

In 2045 the Daily Truck Volume on the Margaret Chase Smith Bridges is forecast to be 1,100 trucks. On the upstream Norridgewock Bridge the 2045 Daily Volume is forecasted to be 100 trucks. On the downstream Hinckley Bridge the 2045 Daily volume is forecasted to have few trucks.

A4 – Downstream Bridge Crossing

A proposed bridge crossing downstream of downtown is forecasted to carry 300 daily trucks. The Margaret Chase Smith Bridges would see a reduction of 200 trucks or an 18 percent reduction.

A5 – Downtown Bridge Crossing

A proposed bridge crossing in downtown is forecasted to carry 400 daily trucks. The Margaret Chase Smith Bridges would see a reduction of 300 trucks or a 27 percent reduction.

A6 – Upstream Bridge Crossing

A proposed bridge crossing upstream of downtown is forecasted to carry 100 daily trucks. The Margaret Chase Smith Bridges would see little change in truck traffic.

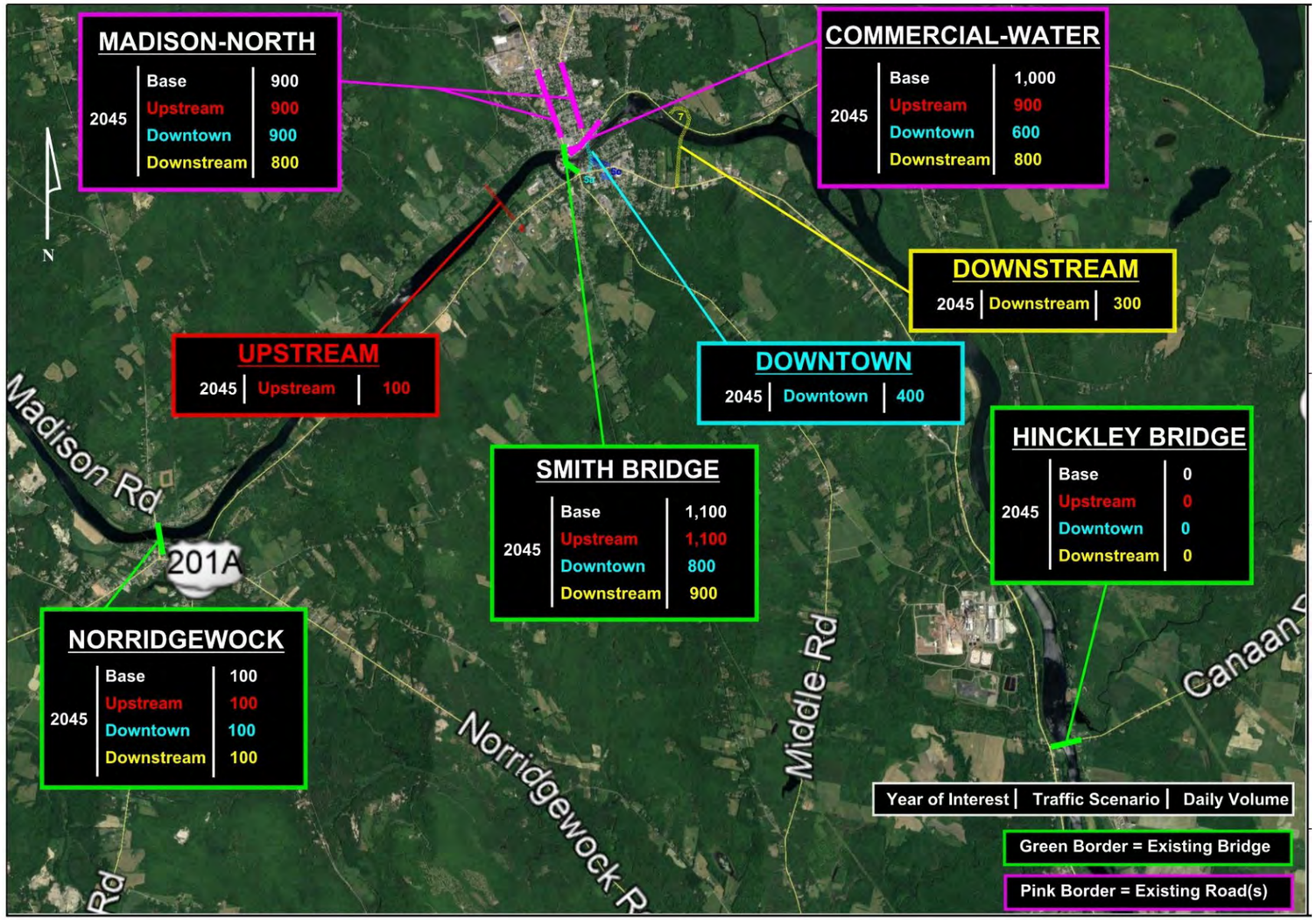


Figure 7.5 – Daily Truck Traffic Volumes

7.4 - 2045 No-Build Peak Hour Traffic Volumes

Figure 7.6 presents the 2045 No-Build AM and PM peak hour intersection turning movement volumes**. Figures 7.7 and 7.8** present AM and PM peak hour changes between Existing 2019 and Base 2045 volume forecasts. Traffic is expected to increase on area roadways from approximately 11% to 25%. Growth for key study area roadways is estimated to be:

- Island Avenue is estimated to have traffic growth of approximately 15% in the AM peak hour and 17% in the PM peak hour.
- Route 201 south of Island Avenue is estimated to have traffic growth of approximately 19% in the AM peak hour and 24% in the PM peak hour.
- Route 2 west of Island Avenue is estimated to have traffic growth of approximately 12% in the AM peak hour and 17% in the PM peak hour.
- Route 201 north of Jewett Street is estimated to have traffic growth of approximately 20% in the AM peak hour and 18% in the PM peak hour.
- Route 2 east of High Street is estimated to have traffic growth of approximately 15% in the AM peak hour and 17% in the PM peak hour.
- Route 150 north of Jewett Street is estimated to have traffic growth of approximately 22% in the AM peak hour and 17% in the PM peak hour.

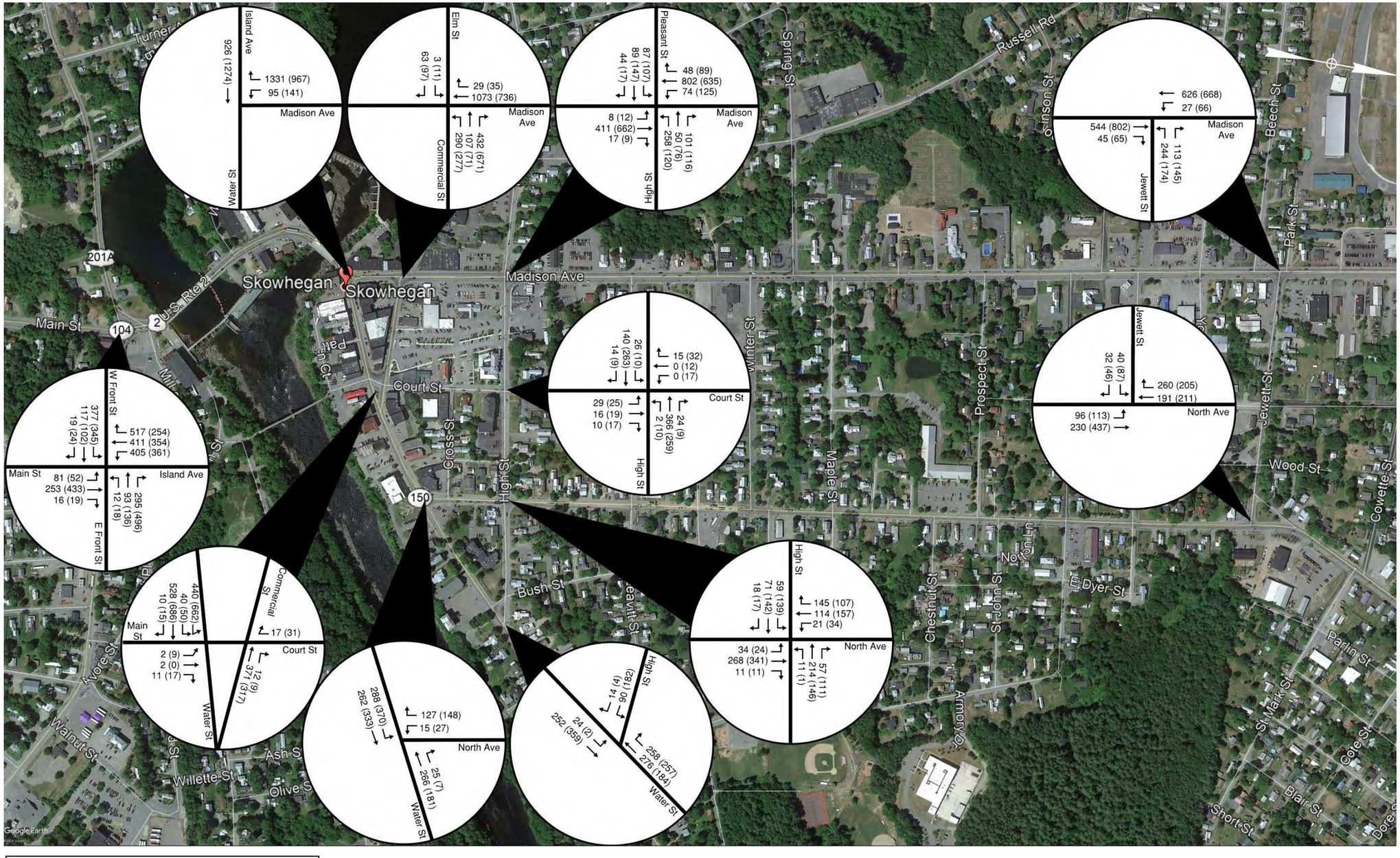


Figure 7.6 – 2045 No-Build Traffic Volumes
xxx- AM Peak Hour
(xxx) – PM Peak Hour

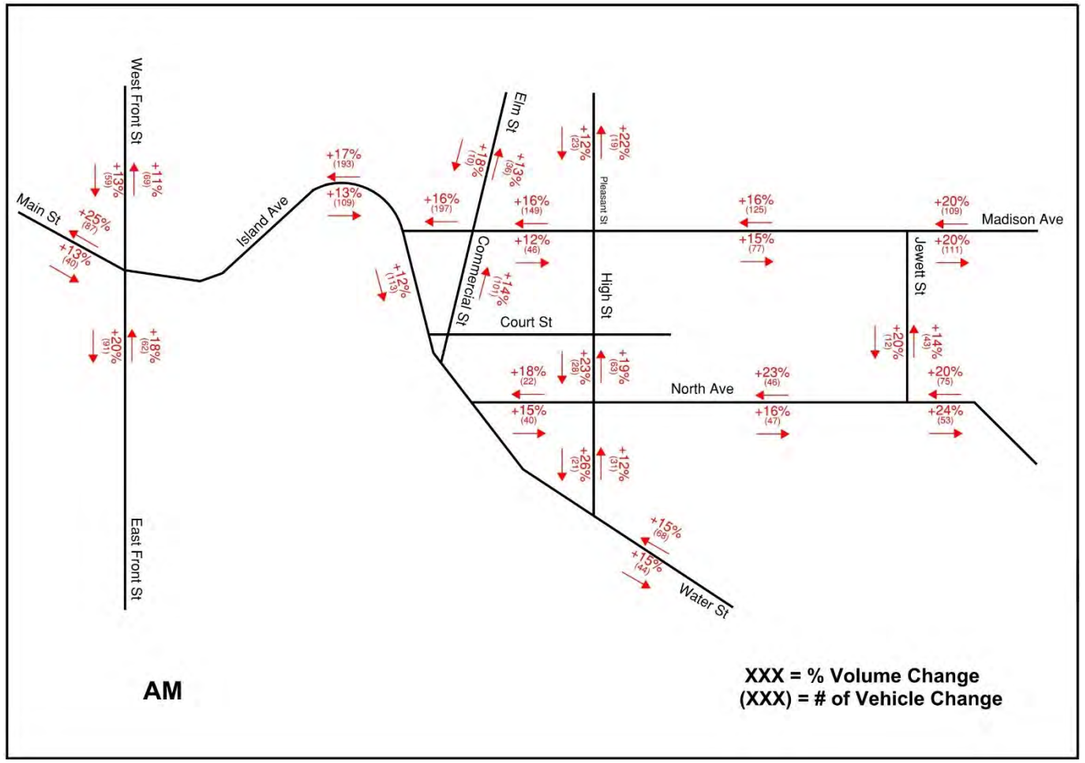


Figure 7.7– Change Between 2045 No-Build and 2019 Traffic Volumes (AM Peak Hour)

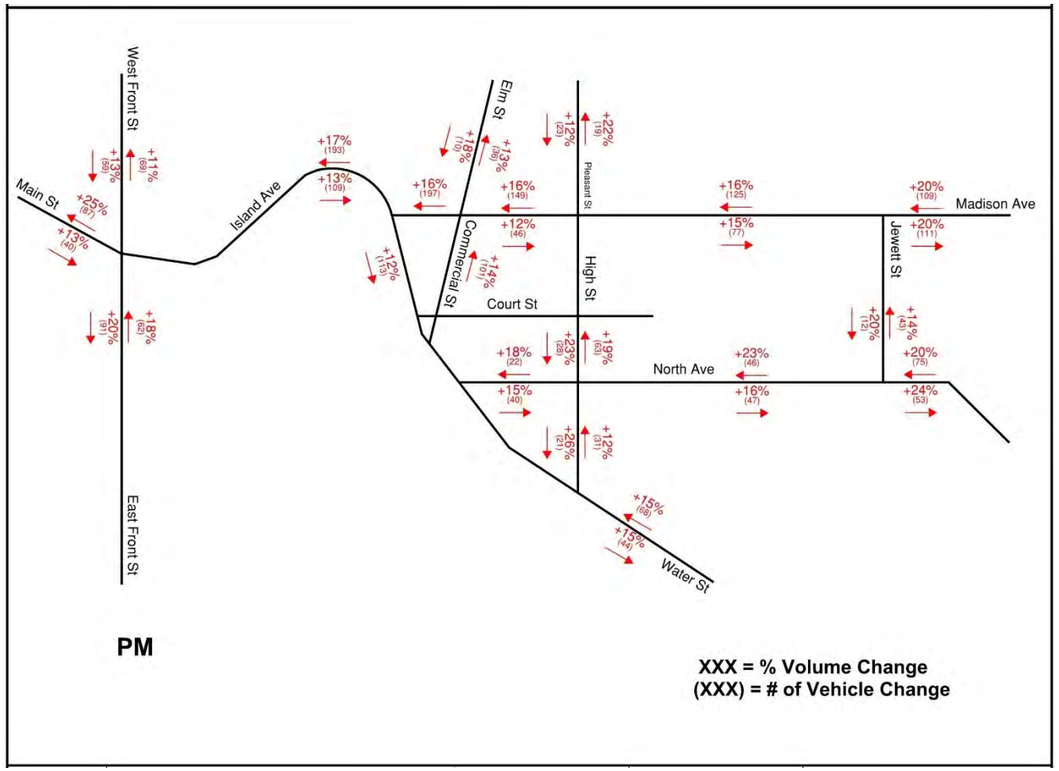


Figure 7.8– Change Between 2045 No-Build and 2019 Traffic Volumes (PM Peak Hour)

7.5 - 2045 Downstream Bridge Crossing (A4) Peak Hour Traffic Volumes

The construction of a new bridge crossing downstream of downtown reduces peak hour traffic volumes on many streets in the study area. However, in many cases the traffic growth reductions equate to volumes levels that are similar to existing 2019 conditions. The following summarizes the magnitude of the traffic reductions.

- Island Avenue is estimated to have traffic reductions of approximately -16% in the AM peak hour and -20% in the PM peak hour.
- Route 201 south of Island Avenue is estimated to have traffic growth of approximately 15% in the northbound direction and a -11% reduction in the southbound direction during the AM peak hour. Approximately a -14% reduction is traffic volumes is forecasted in the PM peak hour.
- Route 2 west of Island Avenue is estimated to have traffic growth of approximately 10% in the westbound direction and no volume change in the eastbound direction during the AM peak hour. Traffic is forecast to increase by 31% in the eastbound direction with no change in the westbound direction during the PM peak hour.
- Route 201 north of Jewett Street is estimated to have no changes to volume during the AM peak hour and a minor growth of 3% in the northbound direction during the PM peak hour.
- Route 2 east of High Street is estimated to have traffic volume reductions of approximately -38% in the AM peak hour and -30% in the PM peak hour.
- Route 150 north of Jewett Street is estimated to have traffic volume reductions of approximately -12% in the AM peak hour and -18% in the PM peak hour.

Figures 7.9 and 7.10 present the 2045 A4 AM and PM peak hour intersection turning movement volumes (see Appendix for volumes at new intersections with bridge). Figures **8.11 and 8.12** present AM and PM peak hour changes between A4 and the 2045 No-Build volume forecasts.

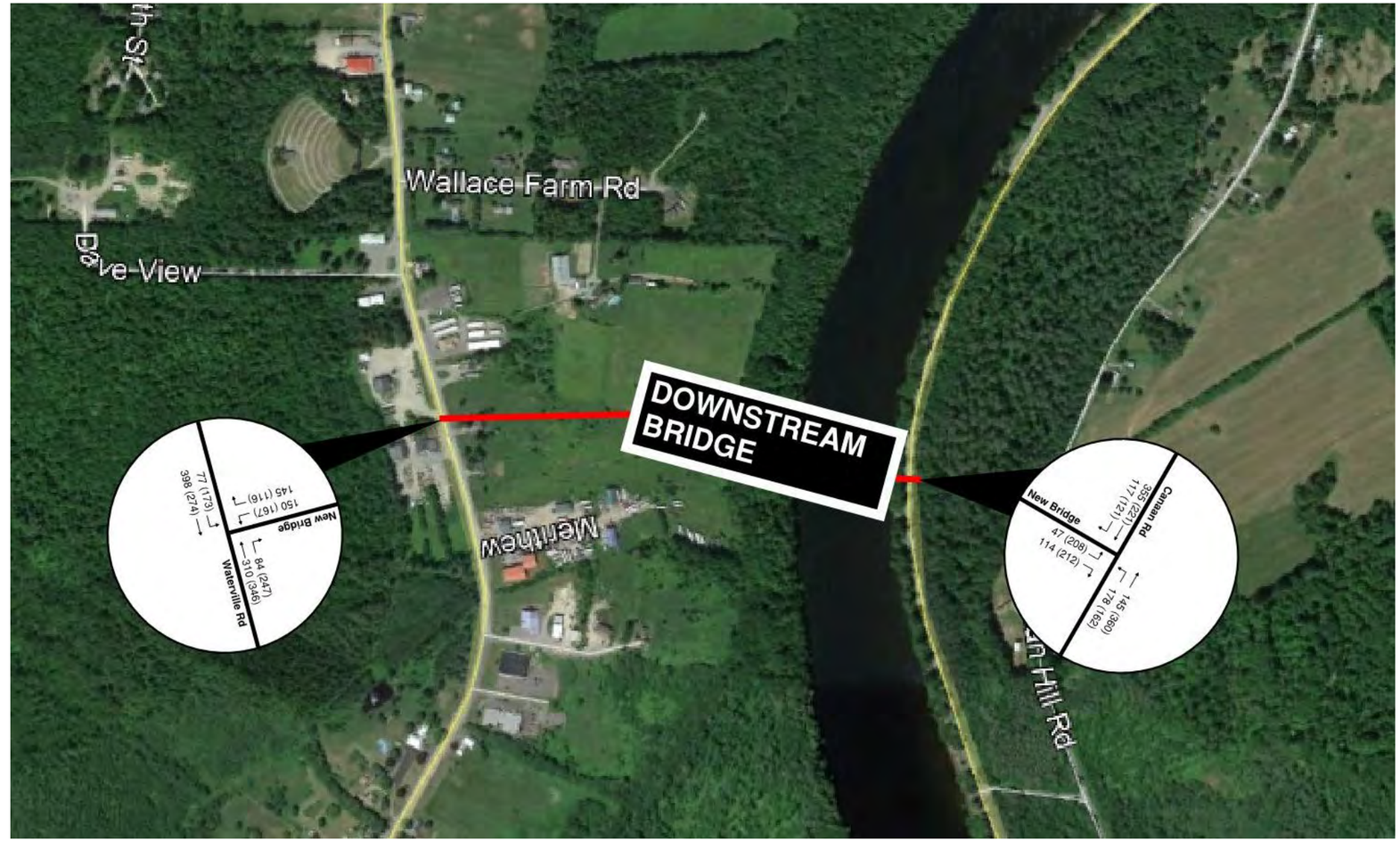


Figure 7.9 – 2045 Downstream Bridge Crossing (A4) Peak Hour Traffic Volumes
xxx- AM Peak Hour
(xxx) – PM Peak Hour

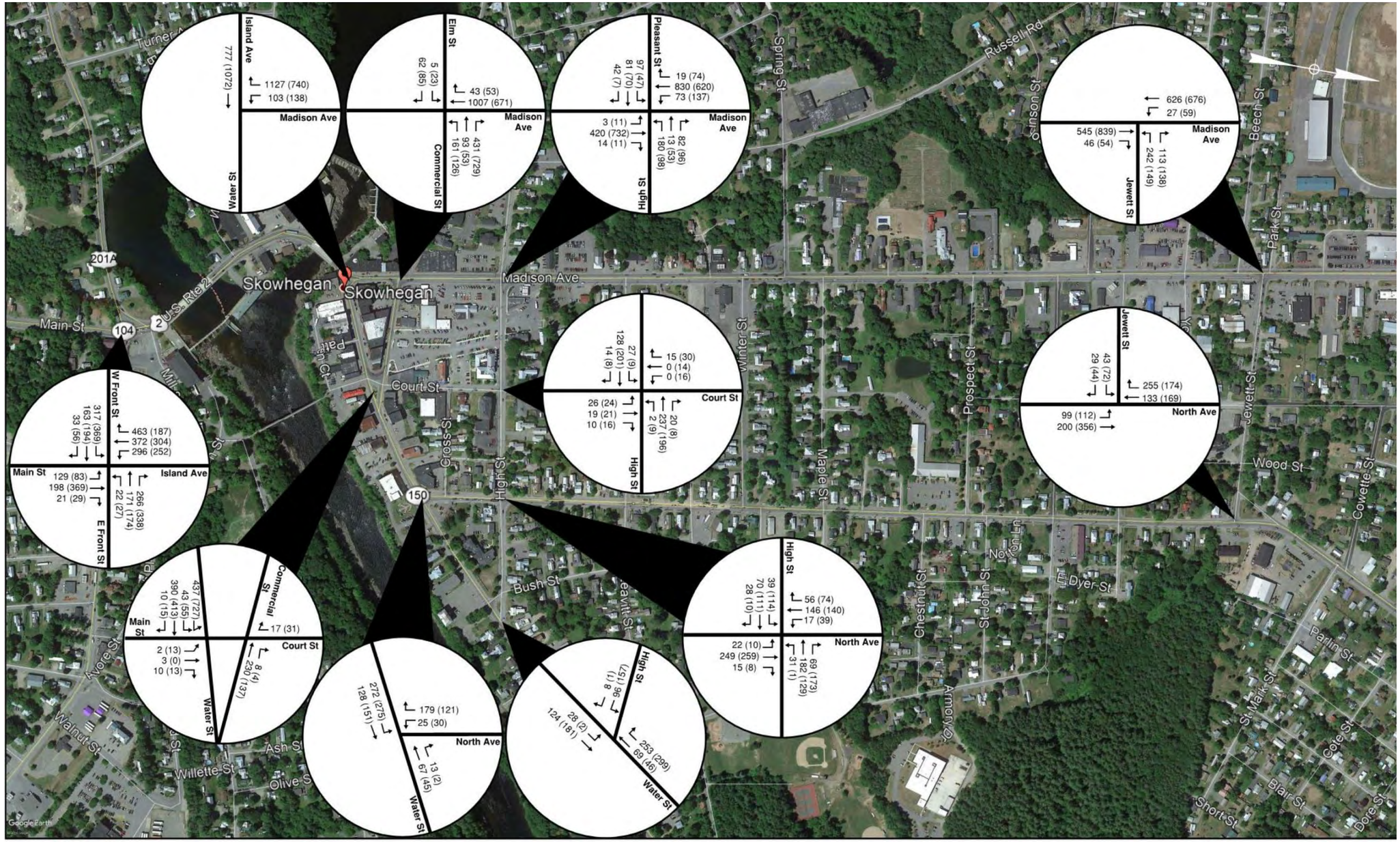


Figure 7.10 – 2045 Downstream Bridge Crossing (A4) Peak Hour Traffic Volumes
xxx- AM Peak Hour
(xxx) – PM Peak Hour

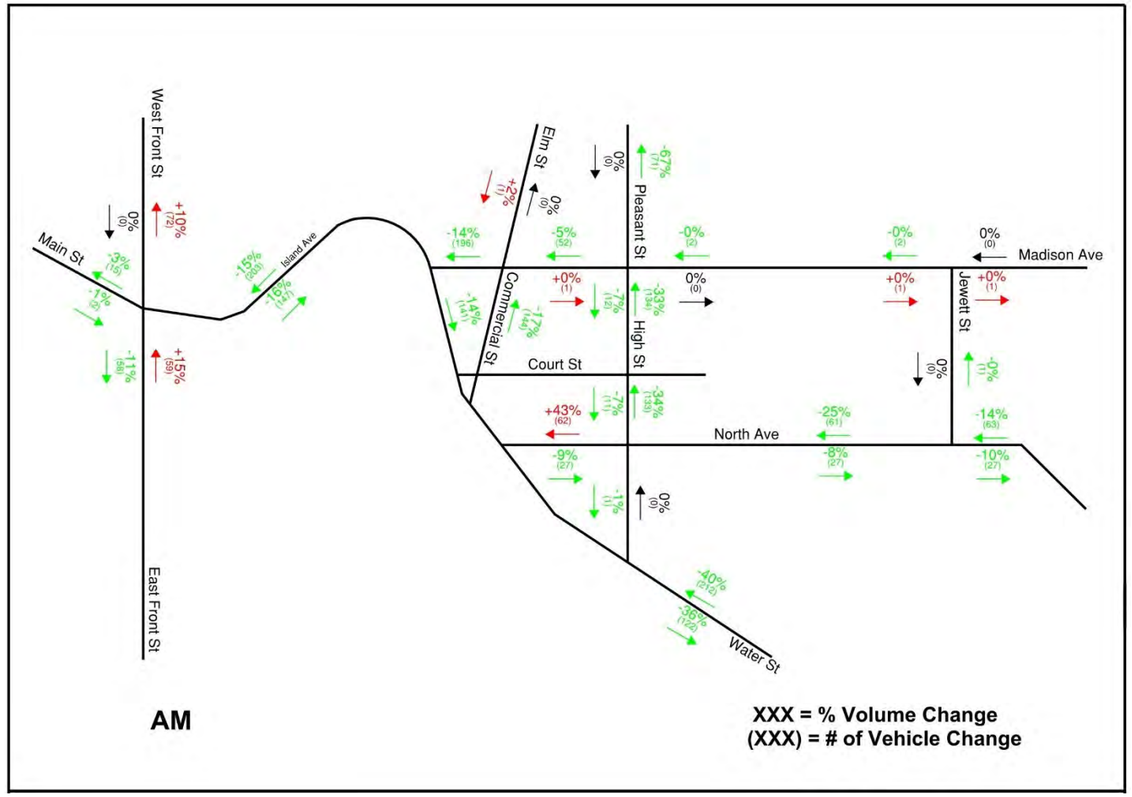


Figure 7.11– Change Between 2045 Downstream Bridge Crossing and 2045 No-Build Traffic Volumes (AM Peak Hour)

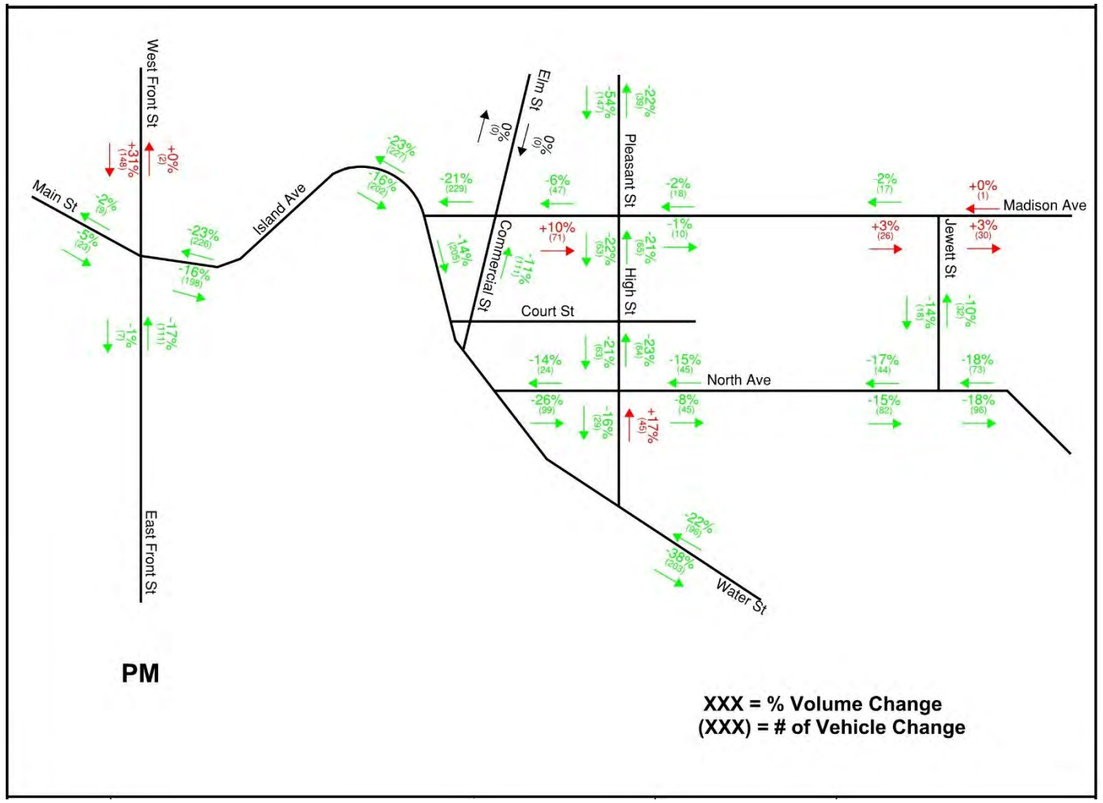


Figure 7.12– Change Between 2045 Downstream Bridge Crossing and 2045 No-Build Traffic Volumes (PM Peak Hour)

7.6 - 2045 Downtown Bridge Crossing (A5) Peak Hour Traffic Volumes

The construction of a new bridge crossing in the downtown area has mixed impacts as traffic increases on some streets in the study area. The following summarizes the magnitude of the traffic reductions.

- Island Avenue is estimated to have significant traffic reductions of approximately -36% in the AM peak hour and -37% in the PM peak hour.
- Route 201 south of Island Avenue is estimated to have significant traffic reductions of approximately -58% in the AM peak hour and -48% in the PM peak hour.
- Route 2 west of Island Avenue is estimated to have traffic growth of approximately 10% in the westbound direction and no volume change in the eastbound direction during the AM peak hour. Traffic is forecast to increase by 38% in the eastbound direction and an 2% increase in the westbound direction during the PM peak hour.
- Route 201 north of Jewett Street is estimated to have minor increases in traffic in the northbound direction during both peak hours. No change in traffic volumes is forecast for the southbound direction.
- Route 2 east of High Street is estimated to have little volume change during both peak hours.
- Route 150 north of Jewett Street is estimated to have no volume change during the AM peak hour and minor increases in traffic during the PM peak hour.

Figure 7.13 presents the 2045 A5 AM and PM peak hour intersection turning movement volumes. Figures **7.14 and 7.15** present AM and PM peak hour changes between A5 and the 2045 No-Build volume forecasts.

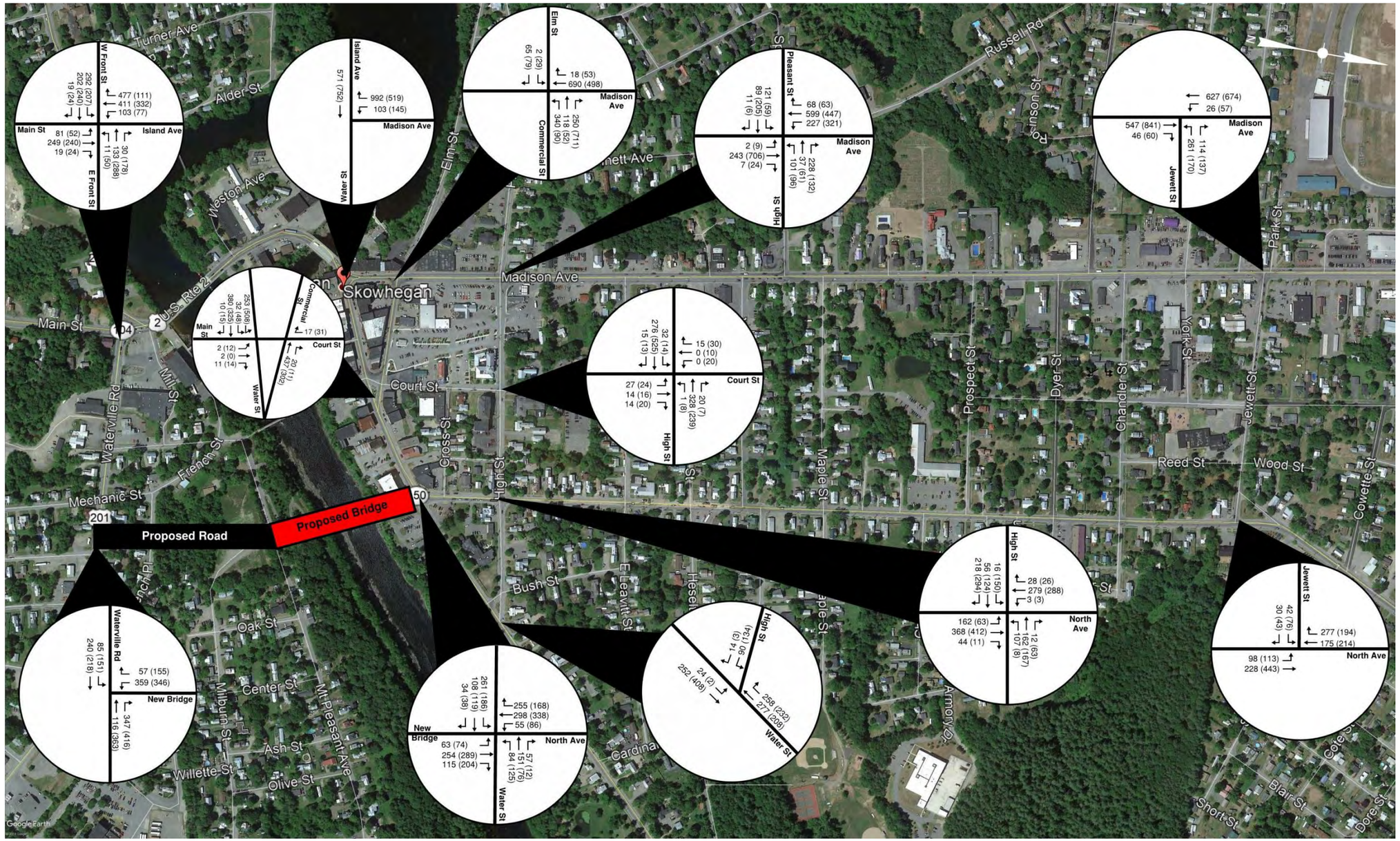


Figure 7.13 – 2045 Downtown Bridge Crossing (A5) Peak Hour Traffic Volumes
xxx- AM Peak Hour
(xxx) – PM Peak Hour

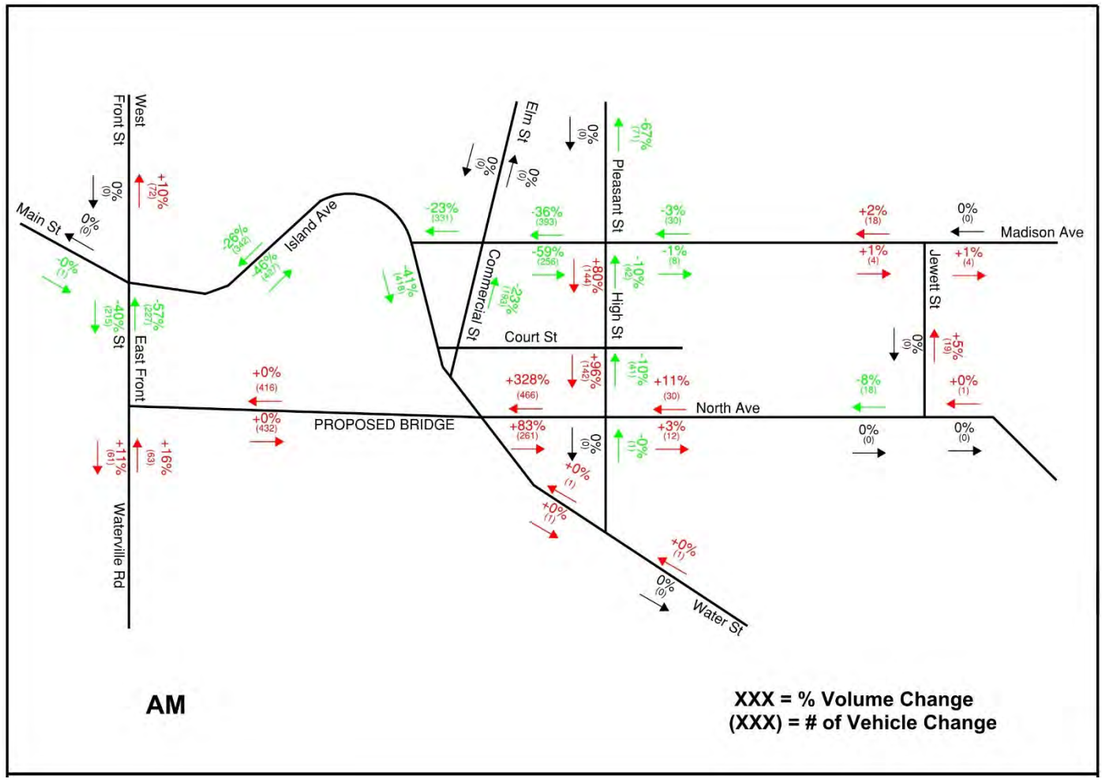


Figure 7.14 – Change Between 2045 Downtown Bridge Crossing and 2045 No-Build Traffic Volumes (AM Peak Hour)

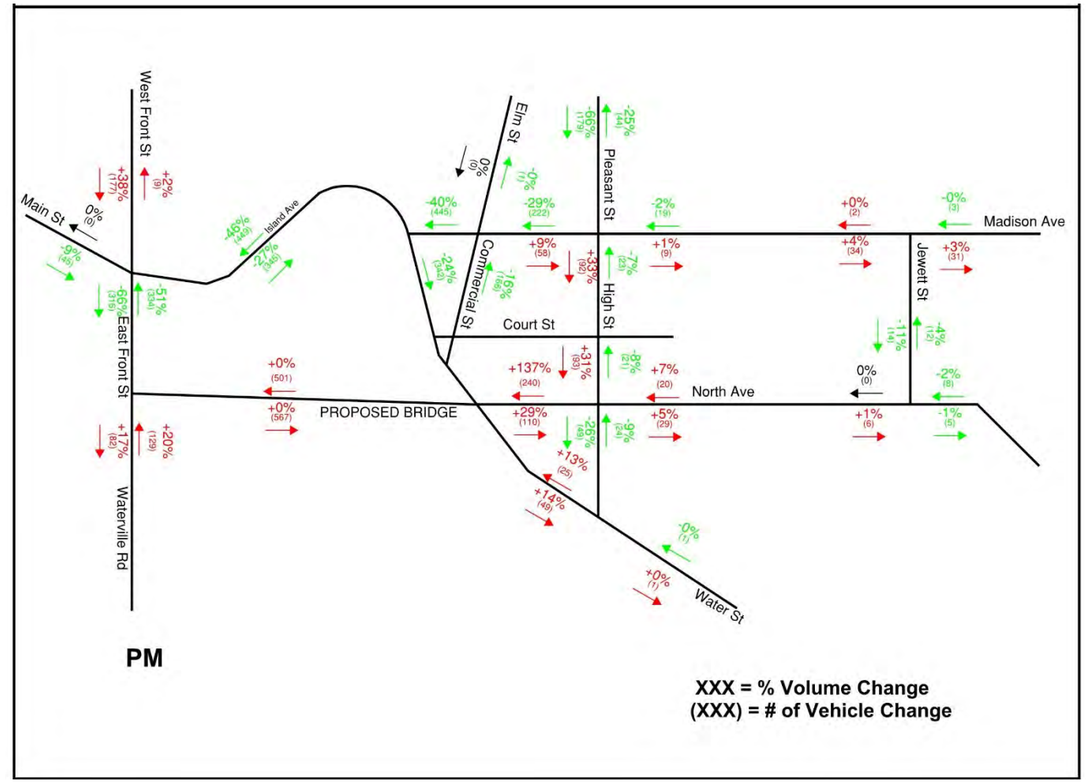


Figure 7.15 – Change Between 2045 Downtown Bridge Crossing and 2045 No-Build Traffic Volumes (PM Peak Hour)

7.7 - 2045 Upstream Bridge Crossing (A6) Peak Hour Traffic Volumes

The construction of a new bridge crossing upstream of downtown reduces and increases peak hour traffic volumes on streets in the study area. However, in many cases the traffic growth reductions equate to volumes levels that are similar to existing 2019 conditions. The following summarizes the magnitude of the traffic reductions.

- Island Avenue is estimated to have traffic reductions of approximately -15% in the AM peak hour and -19% in the PM peak hour.
- Route 201 south of Island Avenue is estimated to have no volume change in the AM peak hour. Traffic growth of approximately 15% in the northbound direction and a -11% reduction in the southbound are forecasted in the PM peak hour.
- Route 2 west of Island Avenue is estimated to have traffic volume reduction of approximately -20% during the AM peak hour. Traffic is forecast to increase by 10% in the westbound direction with no change in the eastbound direction during the PM peak hour.
- Route 201 north of Jewett Street is estimated to have little or no change during both peak hours.
- Route 2 east of High Street is estimated to have little or no change during both peak hours.
- Route 150 north of Jewett Street is estimated to have little or no change during both peak hours.

Figures 7.16 and 7.17 present the 2045 A6 AM and PM peak hour intersection turning movement volumes (see Appendix for newly created intersections with the bridge). Figures **7.18 and 7.19** present AM and PM peak hour changes between A6 and the 2045 No-Build volume forecasts.

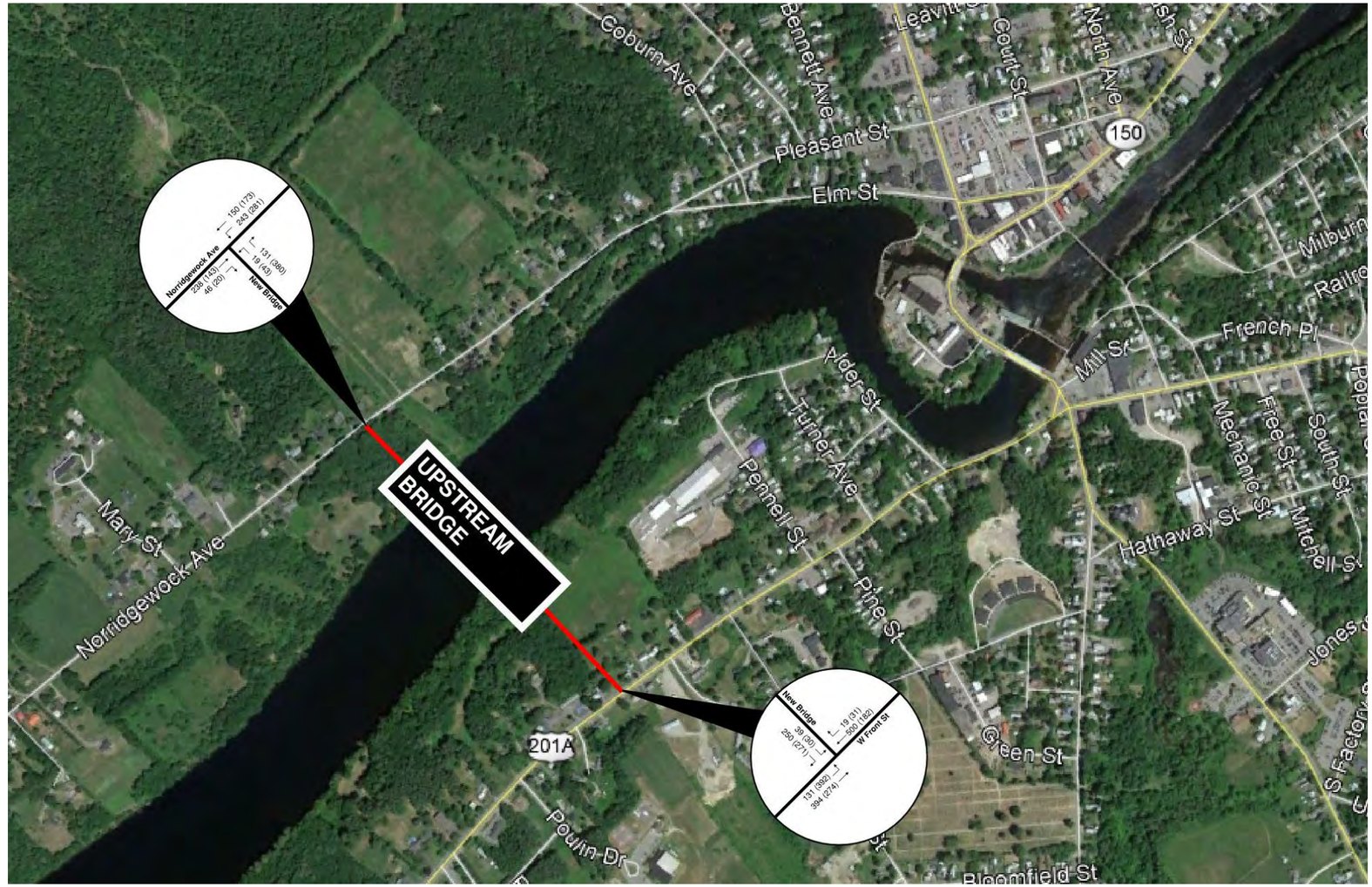


Figure 7.16 – 2045 Upstream Bridge Crossing (A6) Peak Hour Traffic Volumes
xxx- AM Peak Hour
(xxx) – PM Peak Hour

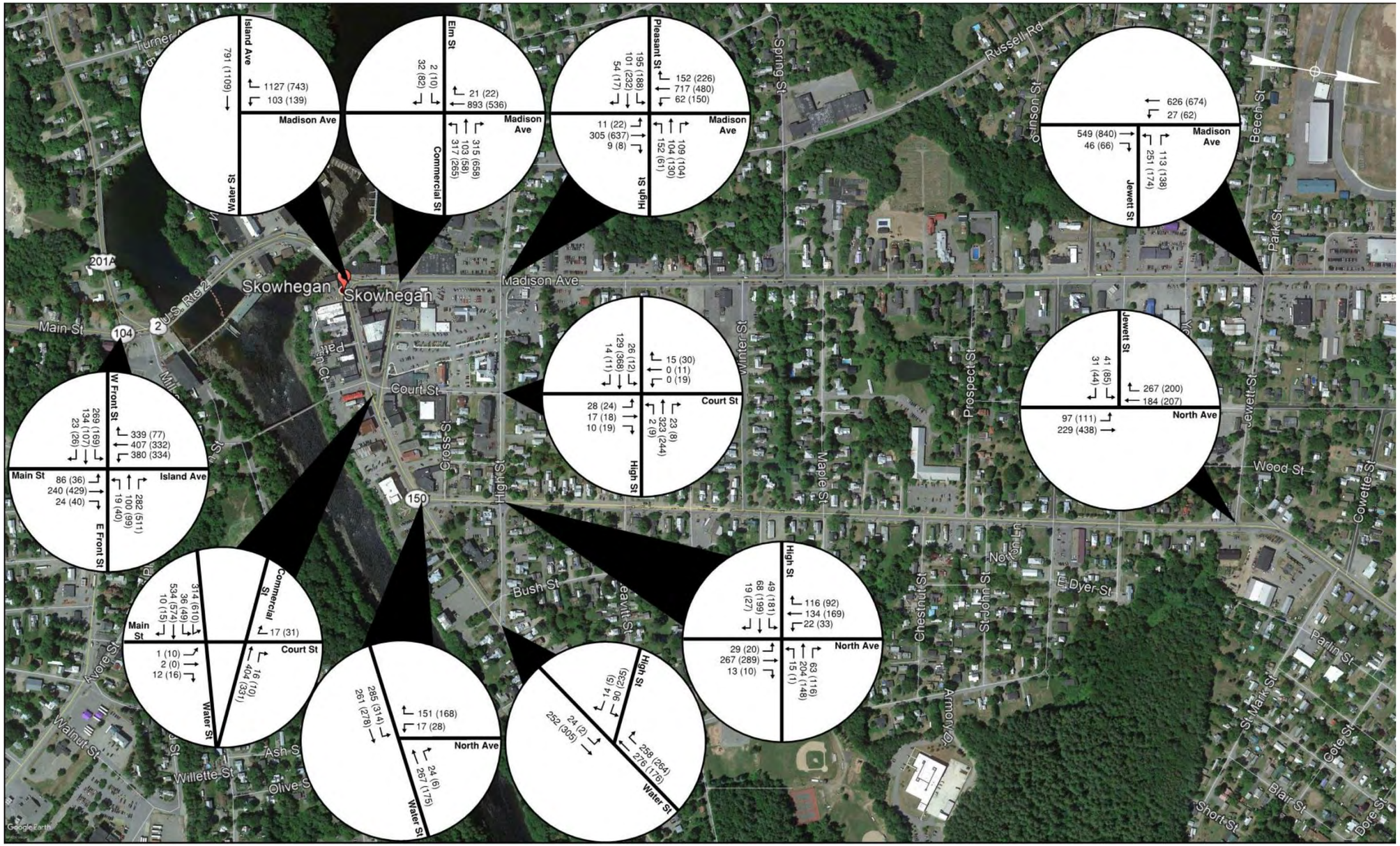


Figure 7.17 – 2045 Upstream Bridge Crossing (A6) Peak Hour Traffic Volumes
xxx- AM Peak Hour
(xxx) – PM Peak Hour

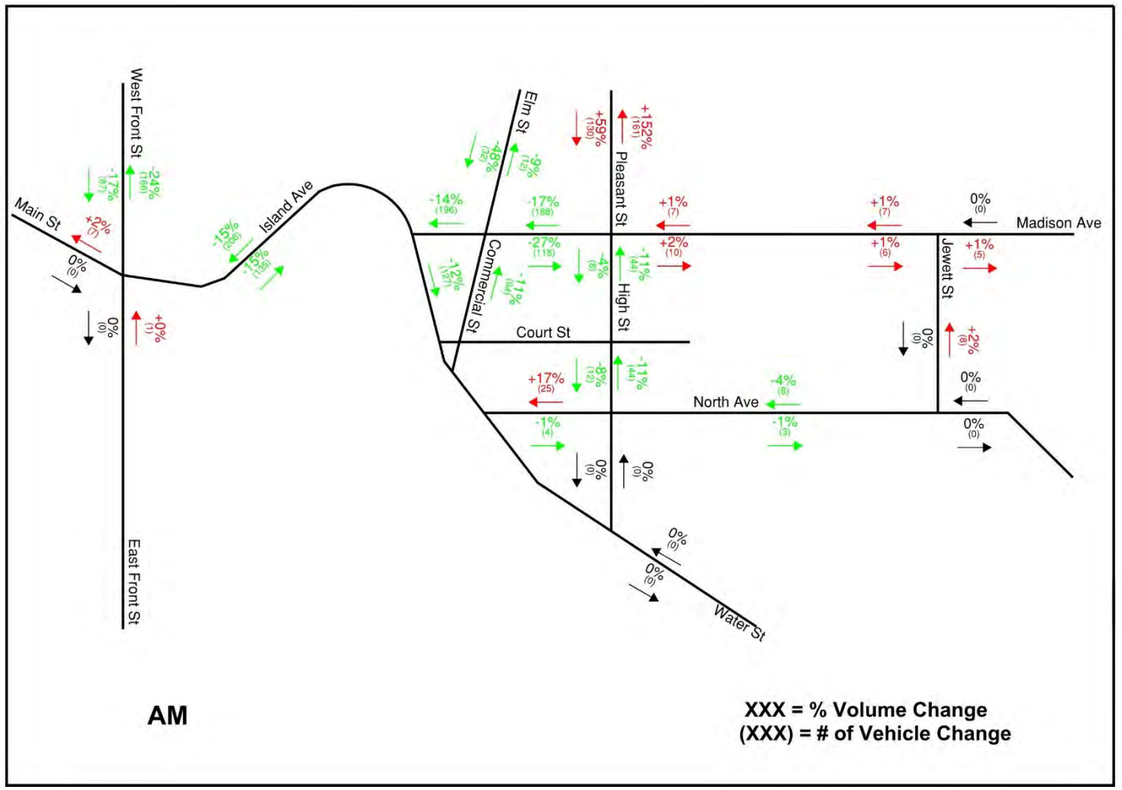


Figure 7.18 – Change Between 2045 Upstream Bridge Crossing and 2045 No-Build Traffic Volumes (AM Peak Hour)

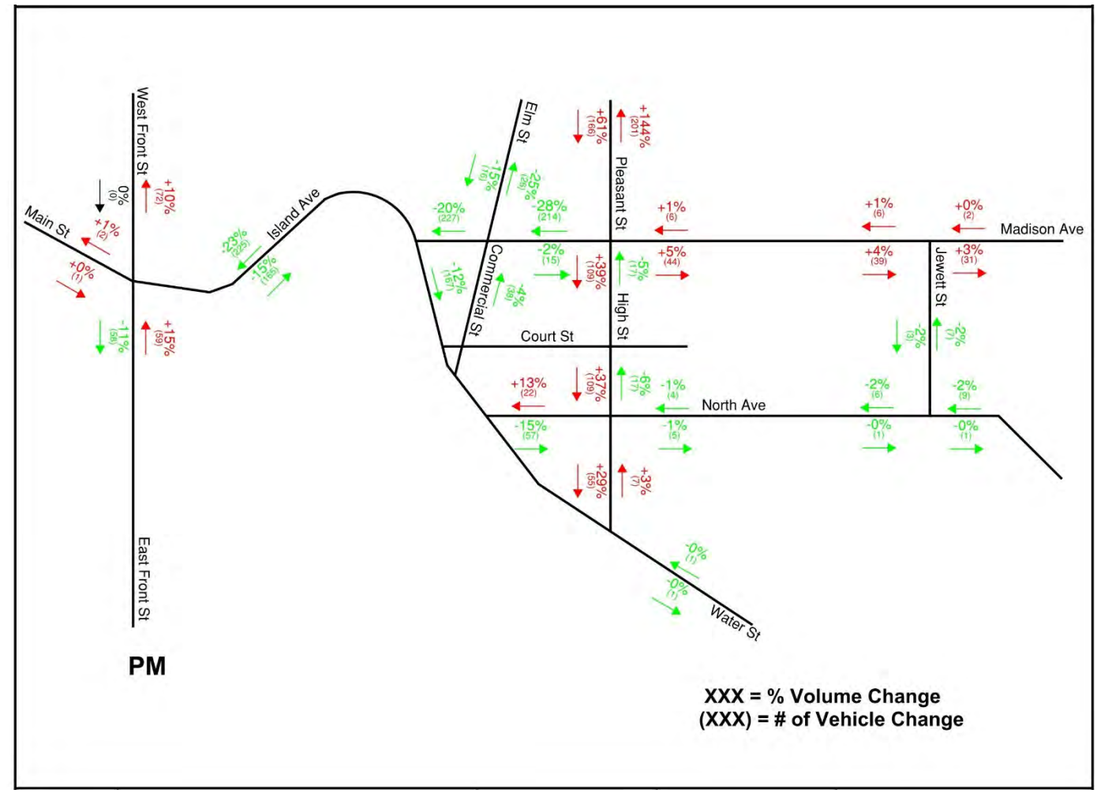


Figure 7.19 – Change Between 2045 Upstream Bridge Crossing and 2045 No-Build Traffic Volumes (PM Peak Hour)

7.8 – Bridge River Crossing Redundancy Analysis

To assess the impact of a potential closure of the existing Margaret Chase Smith Bridges on regional travel, traffic modeling was performed that quantified changes in Vehicle-Miles-Traveled (VMT) and Vehicle-Hours-Travel (VHT) for each of the Bridge Crossing alternatives and for the No-Build alternative. **Table 7.1** summarizes change in VMT and VHT when the Margaret Chase Smith Bridges are removed from the three build alternatives and the No-Build Alternative. The A5- Downtown Bridge Crossing Alternative provides the greatest redundancy benefit based upon travel time and distance motorist would travel. Under a No-Build condition, the closure of the Margaret Chase Smith Bridges has a significant impact on regional travel with daily travel distance increasing by approximately 23%.

Table 7.1

Percent Change in 2045 Daily VMT and VHT with closure of the Margaret Chase Smith Bridges combined with the noted Alternative

Alternative	VMT	VHT
No-Build	23.4%	29.1%
A4 -Downstream Bridge Crossing Only	4.6 %	5.8 %
A5 - Downtown Bridge Crossing Only	0.4 %	1.6 %
A6 - Upstream Bridge Crossing Only	3.7 %	12.1 %

8.0 Evaluation of Alternatives

8.1 Traffic Operations / Safety

A SimTraffic analysis was conducted at the study intersections for the 2045 AM and PM peak hour conditions. **Table 8.1** summarizes the Level of Service (LOS) at key intersections within the study area. Traffic analysis conclusions for each Alternative are provided as follows. Refer to the **Appendix** for detailed modeling results. According to the modeling results, the following intersections were noted to have mobility issues in the 2045 No-Build condition.

- **Main Street/Island Avenue/West Front Street/Waterville Road –** This location currently experiences severe congestion and the introduction of the right-turn lane on West Front Street is not sufficient to provide acceptable levels of service.
- **Madison Avenue/Elm Street/Commercial Street** – The Madison Avenue southbound approach is estimated to have poor levels of service due to downstream lane conditions where only one lane is traveling across the Margaret Chase Smith Bridges at Water Street. The Elm Street left-turn is a low volume movement but is projected to have long delays.
- **Madison Avenue/Pleasant Street/High Street** – This location has several movements that are projected to operate poorly. Similar to the Elm Street/Commercial Street intersection, lane utilization on southbound Madison Avenue contributes to congestion issues.

A2 TSM

Improvements were identified at the intersections that were found to have mobility issues as described as follows.

- **Main Street/Island Avenue/West Front Street/Waterville Road –** Limited system management improvements were identified with the exception of signalizing the channelized right-turn from Island Avenue to West Front Street. While delay is reduced, wait times will continue to be significant.
- **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. Acceptable levels of service will be provided on Madison Avenue.
- **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 Water Street intersection. Acceptable levels of service will be provided on Madison Avenue.

Safety

The existing conditions analysis identified three intersections that are classified as High Crash Locations, Commercial Street/Water Street/Court Street, Main Street/Island Avenue/West Front Street/Waterville Road and Madison Avenue/Commercial Street/Elm Street. As noted previously, the Madison Avenue/Commercial Street/Elm Street intersection is programmed for traffic signalization and that change would be expected to mitigate the safety problems. The mobility improvements at the Main Street/Island Avenue/West Front Street/Waterville Road intersection may mitigate crash patterns associated with congestion and vehicle queues. No additional safety mitigation actions are recommended. For the Commercial Street/Water Street/Court Street intersection the following safety mitigation measures are suggested:

- Replace the YEILD 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.

A3 Improve Existing Bridges

This alternative assumes intersection improvements with additional opportunity with four lanes on the Margaret Chase Smith Bridges. The only difference from A2 TSM is at the Main Street/Island Avenue/West Front Street/Waterville Road intersection. Overall, the intersection will operate at an unacceptable level of service, but a greater reduction in delay is estimated versus A2 TSM.

- **Main Street/Island Avenue/West Front Street/Waterville Road –** To address congestion issues the following 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 requires the bridge widening).
    - Converting the Main Street approach from left and through/right lanes to left/through and through/right lanes. As noted above this requires two receiving lanes on Island Avenue.
- **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. Acceptable levels of service will be provided on Madison Avenue.
- **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 Water Street intersection. Acceptable levels of service will be provided on Madison Avenue.

A4 Downstream Bridge Crossing

The provision of a Downstream Bridge crossing provides some mobility improvements as noted below but congestion will continue without other mitigation improvements:

- **Main Street/Island Avenue/West Front Street/Waterville Road –** Acceptable operating conditions will be provided in the AM peak hour, but severe delay will continue in the PM peak hour.
- **Madison Avenue/Elm Street/Commercial Street** The southbound Madison Avenue and Elm Street approaches will operate poorly in the AM peak hour.
- **Madison Avenue/Pleasant Street/High Street** – The southbound Madison Avenue and High Street approaches will operate poorly in the AM peak hour. Overall a LOS F condition is estimated for the AM peak hour.

A5 Downtown Bridge Crossing

The provision of a Downtown Bridge crossing provides mobility improvements but as noted below but congestion will continue without other mitigation improvements:

- **Main Street/Island Avenue/West Front Street/Waterville Road –** Reduced delay can be expected with level of service improving to E in both the AM and PM peak hours.
- **Madison Avenue/Elm Street/Commercial Street** – This intersection will operate at acceptable levels of service.
- **Madison Avenue/Pleasant Street/High Street** – The southbound Madison Avenue left-turn will operate at LOS F during the PM peak hour. It should be noted that the southbound Madison Avenue left-turn volume will increase as motorist route to North Avenue and the new bridge. The modeling assumed the existing shared left/through lane will function as a default left-turn lane.

A6 Upstream Bridge Crossing

The provision of an Upstream Bridge crossing provides some mobility improvements as noted below but congestion will continue without other mitigation improvements:

- **Main Street/Island Avenue/West Front Street/Waterville Road –** Reduced delay can be expected but unacceptable operating conditions will be provided in the AM and PM peak hours.

- **Madison Avenue/Elm Street/Commercial Street** The southbound Madison Avenue approach will operate poorly in the AM peak hour, although improved from No-Build conditions.
- **Madison Avenue/Pleasant Street/High Street** – The southbound Madison Avenue approach will operate poorly in the AM peak hour, although improved from No-Build conditions.

Table 8.1 – Level of Service Summary

Intersection/Approach Lane	2019 Existing		2045 No-Build		Alternative 2 TSM Improvements (Three Lane Bridge)		Alternative 3 TSM Improvements (Four Lane Bridge)		Alternative 4 Downstream Bridge Crossing		Alternative 5 Downtown Bridge Crossing		Alternative 6 Upstream Bridge Crossing	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Main Street/Island Avenue/West Front Street/Waterville Road (S)	E	F	F (194)	F (211)	F (163)	F (206)	F (96)	F (97)	D (55)	F (168)	E (59)	E (70)	F (73)	F (92)
Island Avenue/Water Street/Madison Avenue (U)	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Madison Avenue/Elm Street/Commercial Street (S), (U, for Existing 2019)	C	A	C	B	A	A	B	A	D	B	B	A	C	C
Water Street/Court Street/Commercial Street (U)	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Water Street/North Avenue (U)	A	A	A	A	A	A	A	A	A	A	N/A	N/A	A	A
Madison Avenue/Pleasant Street/High Street	B	B	F	B	B	B	B	B	F	A	A	C	D	C
North Avenue/High Street (S)	A	A	B	A	A	A	A	A	A	A	B	B	A	A
Court Street/High Street (U)	A	A	B	A	A	A	A	A	D	A	A	A	A	A
Madison Street/Jewett Street (S)	A	A	A	A	A	A	A	A	A	A	A	A	A	A
North Avenue/Jewett Street (U)	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Water Street/High Street (U)	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Proposed Downstream Bridge/Route 2(S)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Proposed Downstream Bridge/Waterville Road (S)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Water Street/North Avenue/Proposed Downtown Bridge (S)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	N/A	N/A
Free Street/Proposed Downtown Bridge/Waterville Road (S)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	C	N/A	N/A
Proposed Upstream Bridge/Norridgewock Avenue (S)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A
Proposed Upstream Bridge/West Front Street (S)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A

8.2 Roadway Design for Alternatives

Concept level designs have been created for each alternative. Consideration has been given to projected AADT, potential use, and the likely routing assignment, to derive the anticipated Highway Corridor Priority (HCP) for each alternative. Current design standards have been utilized to develop concept level cost estimates and impacts. Below is a summary of the criteria used for each alternative.

Alternative 3 - Widen Existing Crossing (HCP 1)
The controlling elements for this alternative, such as lane width, shoulder width, and design speed will be consistent with the existing parameters and in league with an HCP 1 corridor. Each bridge, approaches, and the roadway in between will be widened to add a fourth 12' lane, while keeping consistent shoulder and sidewalk widths to link beyond the bridge approaches. The widening is meant to improve mobility and capacity by adding a second lane in the northbound direction and will require additional modifications to the intersections at Water Street/Madison Avenue and West Front Street/Main Street. True mobility enhancements will only be realized from this alternative if turning movements at the aforementioned intersections are addressed, as adding additional capacity on the bridge will not result in a benefit unless traffic can efficiently enter and exit Island Avenue.

Alternative 4 - Downstream Bridge Crossing (HCP 2)		
Controlling Elements	**Required Standard**	**Comments**
Design Speed	35 MPH	Speed is limited by the radius of the curve wrapping back around to Route 2.
***Lane Width**	11'-12'	A 12' lane is desired but could be reduced to 11' to reduce footprint and impact.
***Shoulder Width**	3' - 5'	A 4' shoulder is desired to achieve an offset of 16' to the face of guardrail from centerline.
Cross Slope (Travel way)	2%	
Minimum Radius	340'	The limiting radius is the curve wrapping back around to Route 2. It has a radius that meets this minimum.
Super elevation (emax)	6%	
Maximum Grade (%)	5%	This maximum grade will likely be achieved at the approach to the intersection with Route 2.
Vertical Clearance	15'	No vertical constraints will exist along this new corridor. However, the fly over of Route 2, an HCP 1, must have a clearance of at least 16'.
Non-Controlling Elements		
Clear Zone	12'	
Side Slopes	3:1 or Flatter	Given the relatively remote nature of this alternative, 3:1 side slopes with additional area free from hazard to achieve clear zone is likely. Guardrail and 2:1 slopes will be necessary at bridge approaches.
Intersections		
Southern Intersection with Route 201	This intersection is expected to be signalized. On Route 201 and approaching the proposed alternative from the east, a dedicated right-turn lane onto the new road, and a through lane continuing on Route 201 west are proposed. Similarly, approaching the proposed alternative from the west, a dedicated left-turn lane onto the new road, and a through lane continuing on Route 201 east are proposed. Traveling south on the proposed alternative and approaching Route 201, a dedicated left and dedicated right-turn lane are proposed.	
Northern Intersection with Route 2	This alternative involves a fly-over of Route 2, wrapping around and tying back into a signalized intersection. On Route 2, approaching the proposed alternative from the east, a dedicated right-turn lane onto the new corridor, and a through lane to continue west on Route 2 are proposed. Similarly, approaching the proposed alternative from the west, a dedicated left-turn lane onto the new corridor, and a through lane continuing east on Route 2 are proposed. Traveling north on the proposed alternative and approaching Route 2, a dedicated left and dedicated right-turn lane are proposed.	
Other		
Pedestrian Connectivity	Given the relatively remote location and distance to existing pedestrian facilities, sidewalk is not proposed for this alternative.	

Alternative 5 - Downtown Bridge Crossing (HCP 2)		
Controlling Elements	**Required Standard**	**Comments**
Design Speed	25 MPH	Speed is limited by development both north and south of the river and by speed of connecting roads.
***Lane Width**	11'-12'	A 12' lane is desired but could be reduced to 11' to reduce footprint and impact.
***Shoulder Width**	3' - 5'	A 4' shoulder is desired to achieve an offset of 16' to the face of guardrail from centerline.
Cross Slope (Travel way)	2%	
Minimum Radius	144'	All curves will exceed this radius
Super elevation (emax)	6%	
Maximum Grade (%)	5%	All grades will fall below this maximum.
Vertical Clearance	15'	No vertical constraints will exist along this new corridor.
Non-Controlling Elements		
Clear Zone	12'	
Side Slopes	3:1 or Flatter	3:1 side slopes with additional area free from hazard to achieve clear zone is likely necessary to minimize slope impacts. Guardrail and 2:1 slopes will be necessary at bridge approaches.
Intersections		
Southern Intersection with Route 201	Three separate options exist for this intersection, with the preferred option being an intersection with Route 201 across from the existing intersection with Free Street. This newly formed four-way intersection is proposed to be signalized. On Route 201 approaching the proposed alternative from the east, a dedicated right-turn lane onto the new corridor, and a through/left-turn onto Free Street are proposed. Similarly, when approaching the proposed alternative from the west, a dedicated left-turn lane onto the new corridor, and a through/right-turn onto Free Street are proposed. Traveling south on the proposed roadway and approaching Route 201, a dedicated left-turn onto Route 201, and through/right-turn lane are proposed.	
Northern Intersection with Route 2	This intersection is proposed to be signalized. On Route 2 and approaching the proposed alternative from the east, a dedicated left-turn lane onto the new roadway is proposed. This approach will also contain a through/right-turn lane to afford movements continuing west on Route 2 and turning onto Route 150. Approaching the proposed roadway from the west, a through/right turn lane accommodating movements continuing east on Route 2 and turning onto the new roadway. As well as a dedicated left-turn lane accommodating movement north onto Route 150 are proposed. Traveling north on the proposed roadway, dedicated left and right-turn lanes onto Route 2, as well as a dedicated through-lane onto Route 150 are proposed.	
Other		
Pedestrian Connectivity	Given the downtown nature of this alternative, opportunity exists to afford sidewalks along the new alignment to help improve pedestrian connectivity. Additionally, the bridge for this alternative is proposed to span the recreational trail on the south side of the river.	

Alternative 6 - Upstream Bridge Crossing (HCP 2)		
Controlling Elements	**Required Standard**	**Comments**
Design Speed	25 MPH	The horizontal curve that connects the new corridor to Norridgewock Avenue is the limiting factor for speed.
***Lane Width**	11'-12'	A 12' lane is desired but could be reduced to 11' to reduce footprint and impact.
***Shoulder Width**	3' - 5'	A 4' shoulder is desired to achieve an offset of 16' to the face of guardrail from centerline.
Cross Slope (Travel way)	2%	
Minimum Radius	833'	All curves will exceed this radius.
Super elevation (emax)	6%	The proposed alignment is straight and will require little/no super elevation.
Maximum Grade (%)	5%	All grades will fall below this maximum.
Vertical Clearance	15'	No vertical constraints will exist along this new corridor.
Non-Controlling Elements		
Clear Zone	18'	
Side Slopes	3:1 or Flatter	3:1 side slopes with additional area free from hazard to achieve clear zone is likely necessary to minimize slope impacts. Guardrail and 2:1 slopes will be necessary at bridge approaches.
Intersections		
Southern Intersection with Route 201A	This intersection is proposed to be signalized. On Route 201A and approaching the proposed alternative from the east, a dedicated right-turn lane onto the new roadway, and a dedicated through lane continuing west on Route 201A are proposed. Similarly, approaching the proposed roadway from the west a dedicated left-turn lane onto the roadway, and a dedicated through lane continue on Route 201A are proposed. On the proposed roadway and traveling south, dedicated left and right-turn lanes onto Route 201A are proposed.	
Northern Intersection with Norridgewock Avenue	This intersection is proposed to be signalized. On Norridgewock Avenue and approaching the propose alternative from the east, a dedicated left-turn lane onto the new roadway, and a dedicated through lane continue west on Norridgewock Avenue are proposed. On Norridgewock Avenue and approaching the proposed roadway from the west, a dedicated right-turn/through lane is proposed. On the proposed roadway and traveling north, dedicated left and right-turn lanes onto Norridgewock Avenue are proposed.	
Other		
Pedestrian Connectivity	Given the relatively remote location and distance to existing pedestrian facilities, sidewalk is not proposed for this alternative.	

8.3 Bridge Design for Alternatives

Base Condition (No-Build)

For comparison of alternatives in this study, the baseline condition includes a future redecking of the existing Margaret Chase Smith Bridges. Rehabilitation of the existing bridge decks is on the medium-range horizon. Traffic volumes require that at least 3 lanes be maintained at all times during construction. The existing bridge is not wide enough to phase the rehabilitation while maintaining traffic and the site constraints make an on-site temporary bridge impractical. It is anticipated that an off-site detour would be required. Temporary roadways and a temporary bridge would be required either downstream or upstream of the existing bridges.

A3 – Improve Existing Bridges

Widening the existing Margaret Chase Smith Bridges would involve adding approximately 22 feet to one side to provide space for four lanes of traffic and with improved bicycle and pedestrian facilities. Steel girders, similar to the existing would be added. Concrete abutments and pier would be widened to support the additional girders. The foundations are anticipated to be spread footings on bedrock constructed behind cofferdams. This option requires the most challenging in-water work.

Widening the existing bridges would require an off-site detour similar to the baseline condition. It is assumed that the existing deck would be replaced at the time of widening. This avoids duplication of mobilization and traffic control costs.

A4 – Downstream Bridge Crossing

The downstream bridge would be 3 or 4 spans and between 725 and 825 feet in total length depending on the final alignment. To maintain hydraulic clearance the bridge would span over Route 2. Continuous steel girders are likely the most cost effective. The 37-foot wide bridge would provide two 12-foot travel lanes and 5-foot shoulders. Girder depth would be between 8’-3” and 10’-9” depending on span configuration. The in-water piers are expected to be founded on spread footings on bedrock. Cofferdam requirements downstream of the dam would be less significant due to the shallower water depth. Abutments would be supported on driven piles or spread footings depending on the bedrock contours.

With the addition of a second crossing, temporary roadways and a temporary bridge would no longer be required for the future rehabilitation of the existing bridge decks. Traffic control needs are greatly reduced for this condition. The cost of deck rehabilitation is included in this alternative.

A5 – Downtown Bridge Crossing

The downtown bridge would be 2 spans with a single pier. This option would have the shortest total bridge length, at approximately 380 feet. The southern span would also go over the Debe Park Trail. The north end of the bridge would be four lanes wide to accommodate northbound turning lanes and a single lane southbound. Beyond the required queue lengths, the bridge could begin to taper down to either one or two lanes northbound. Function benefit to additional lanes versus the cost savings to taper will need to be evaluated. Five-foot shoulders and 5-foot sidewalks on both sides bring the overall width to 71 feet. By providing unbalanced superstructure spans the pier could be located on the bedrock outcrop along the southern edge of the river. This would be within the channel at high flows but out of water at lower flows. Similar to the downstream option, less significant cofferdams would be required or possibly avoided completely. Abutments would be supported on driven piles or spread footings depending on the bedrock contours.

A5 – Downtown Bridge Crossing – Alternate

This option would eliminate the pier within the highwater channel. The superstructure span across the river would be increased to about 300 feet. This span length, combined with limited hydraulic clearance of about 11 feet from roadway grade, suggests an above-deck through-type structure such as an arch or truss. The rise of an arch above the deck would be about 60 feet for this span length. A steel arch or truss is an option but would be fracture critical, leading to increased maintenance costs. Either a short approach span or an independent structure would span the Debe Park Trail. Pier/Abutment foundations options would be the same as for the 2-span arrangement above.

As discussed for Alternate 4, a second bridge eliminates the need for temporary roadways and a temporary bridge.

A6 – Upstream Bridge Crossing

The upstream alignment would require a bridge length of approximately 900 feet consisting of 4-span steel plate girders. Like the downstream option the width would be 37 feet, with two 12 foot travel lanes and 5 foot shoulders. Girder depth would be between about 10’-0”. The three in-water pier foundation types are less obvious in this location. Pending geotechnical investigation, the foundations could be spread footings on bedrock or pile supported. Cofferdams will be significant, particularly for spread footings. The abutments would likely be perched part way up the embankment and supported on driven piles.

As discussed for Alternate 4, a second bridge eliminates the need for temporary roadways and a temporary bridge.

8.4 Environmental Resource Impacts of Alternatives

TRC conducted a desktop review of potential environmental impacts for three alternative locations for the Skowhegan bridge crossing. The locations for Alternative 4, Alternative 5 (A, B, C), and Alternative 6 were provided by TYLI on August 4, 2020. TRC reviewed the following resources and developed a list of potential impacts for each alternative accordingly:

- USGS National Hydrography Dataset (NHD);
- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping;
- National Park Service (NPS) National Register of Historic Places (NRHP);
- Maine Historic Preservation Commission (MHPC) Cultural Architectural Resource Management Archive (CARMA);
- Beginning with Habitat Mapping;
- State of Maine Office of GIS (MEGIS); and
- Town of Skowhegan

Alternative 4

Alternative 4 is located east of downtown Skowhegan, within the Arnold Trail to Quebec Historic District and the Arnold Trail to Quebec Historic Area. There are no potential impacts to any listed or eligible historic structures. There is the potential for approximately 1.17 acres of wetland impacts, which includes the Kennebec River and shoreline wetlands as mapped on NWI mapping. There are no mapped NHD streams in the vicinity of Alternative 4. Field surveys would be necessary to determine the actual extent of wetlands and streams. There are three privately conserved areas within the footprint of Alternative 4, Governor Coburn Drive Scenic Turnout, Governor Coburn Drive Larch Plantation, and the Kennebec Pines. No town parks or state conserved lands would be impacted in this location. Alternative 4 is also located on the edge of a Maine Natural Areas Program (MNAP) Exemplary Natural Community-Hardwood Seepage Forest. The community is located south of Parkman Hill Rd, and is bounded by Route 2 to the south. There is a Bald Eagle (*Haliaeetus leucocephalus*) nest located a quarter mile east of Alternative 4. If the nest remains active, consultation with Maine Department of Inland Fisheries and Wildlife (MDIFW) and USFWS would need to take place. However, because the nest is greater than the 660 foot threshold for disturbance and outside of the mapped essential habitat there would be no need for permits or restrictions.

Alternative 5

Alternative 5 is located to the northeast of the existing bridge in Skowhegan. Alternative 5 has three different options for the southern side of the crossing, 5A, 5B, and 5C. Alternative 5 is located within the Skowhegan Historic District, Arnold Trail to Quebec Historic District and Arnold Trail to Quebec Historic Area. There is a property eligible for listing on the National Register of Historic places south of the river within the footprint of Alternative 5B. There is also the potential for impacts to a listed historic property north of the river within the footprint. There is the potential for approximately 0.4 acres of wetland impacts, which includes the Kennebec River and shoreline wetlands as mapped on NWI mapping. There are no mapped NHD streams within the footprint of Alternative 5. Field surveys would be necessary to determine the actual extent of wetlands and streams. The town Parks that could be impacted include the Veterans Park north of the river, and Debe Riverwalk south of the river. The proposed Run of River Park is located on both sides of the Kennebec River in this area and could also be impacted by Alternative 5. Alternative 5 would also potentially impact a MNAP Exemplary Natural Community -Bluebell Shoreline Outcrop located along the banks of the Kennebec River.

Alternative 6

Alternative 6 is located west of downtown Skowhegan, within the Arnold Trail to Quebec Historic District and Arnold Trail to Quebec Historic Area. There are no potential impacts to any listed or eligible historic structures. There is the potential for approximately 1.42 acres of wetland impacts, which includes the Kennebec River and shoreline wetlands as mapped on NWI mapping. There are no mapped NHD streams within the footprint of Alternative 6. Field surveys would be necessary to determine the actual extent of wetlands and streams. The Yankee Woodlot State conserved lands would be impacted north of the river, and the Town of Skowhegan Marti Stevens Learning Center would be impacted south of the river. There are no identified impacts to rare, threatened, or endangered species, species of concern, or exemplary habitats.

8.5 Cost Estimates of Alternatives (Current Dollars)

Alternative 3 - Total Estimated Cost - $36.6M

Alternative 3 consists of widening the existing corridor from the intersection of Island Avenue and West Front Street to the intersection of Island Avenue and Water Street. These two intersections will also be modified to accommodate the additional lane. Conceptually, the southern bridge (BR#2785) would be widening on the downstream side only, whereas the northern bridge (BR#2617) would need be widened on both sides, keeping the baseline fixed to reduce impacts to the buildings at the intersection with Water Street. While accomplishing this widening, the existing decks would be replaced. The construction cost of re-decking of existing structures is estimated to cost $4,471,000. However, this figure is not included in the cost estimate of any alternative, as this endeavor will be necessary with any option, as part of MaineDOT's efforts to maintain the existing system. Approach work and improvements to the intersections for this option are estimated to cost approximately **$4,440,000**. Work associated with widening both structures is estimated to cost approximately **$18,800,000**. Right-of-way acquisition, necessary to accommodate the additional corridor width, is estimated to cost **$250,000**. Engineering for design and construction administration, each estimated at 10% of the construction total, combine for an estimated **$6,000,000**.

One of the largest ancillary costs 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.

Alternative 4 - Total Estimated Cost - $25.5M

Alternative 4 consists of a new alignment downstream of the existing crossing. A new signalized intersection would be constructed on Route 201 on the south side of the river to convey traffic to the new crossing. The proposed bridge is conceptualized to consist of steel girders with 2 piers, and approximately 725' in length. Because of the disparate elevations of the riverbanks either side of the river and the flood elevations in this location as they relate to potential bridge elevations, the proposed bridge will also span over Route 2 and the corridor will wrap back around to touch down along the northerly side of Route 2 with a signalized intersection. This "wrap-around" is anticipated to involve a relatively large amount of excavation into the hill and fill near Route 2. The approach work, including intersections is estimated to cost approximately **$6,500,000.** The bridge cost for this alternative is estimated to be approximately **$14,300,000.** Right-of-way acquisition necessary to accommodate this new alignment is estimated to be **$500,000.** Engineering for design and construction administration, each estimated at 10% of the construction total, combine for an estimated **$4,200,000**.

Alternative 5 - Total Estimated Cost - $55.3M

Alternative 5 consists of a new alignment just downstream of the existing pedestrian bridge. A signalized intersection will be created on Route 201 on the south side of the river and the existing intersection of Route 2 and Route 150 on the north side of the river would be modified to become a signalized four-way intersection, with the fourth leg being this new crossing. The bridge was initially proposed as a steel girder structure with a pier in the river. This structure was estimated to cost approximately $13,700,000. However, it was discovered that such a structure was not compatible with town plans and had impact to the proposed "Run of River" recreational park. As such, the bridge concept was revised to relocate the pier from the water, and adopt a through-arch design, approximately 380' in length, that will include sidewalks. This structure is estimated to cost approximately **$38,700,000.** The associated approach work and intersection improvements are estimated to cost approximately **$6,300,000.** Right-of-way acquisition to accommodate this corridor is estimated to cost **$1,250,000.** Engineering for design and construction administration, each estimated at 10% of the construction total, combine for an estimated **$9,000,000**.

Alternative 6 - Total Estimated Cost - $30.5M

Alternative 6 consists of a new crossing upstream, of the existing crossing and dam. A new signalized intersection would be constructed on Route 201A on the south side of the river. A new signalized intersection would be constructed on Norridgewock Avenue on the north side of the river and Norridgewock Avenue would be realigned to tee into the new corridor. The bridge is proposed to be a steel girder with 3 piers, approximately 900' in length. The approach work, including the intersection improvements, is estimated to cost approximately **$4,700,000**. The cost to construct the bridge is estimated to be approximately **$20,200,000.** Right-of-way acquisition to accommodate this corridor is estimated to cost **$500,000.** Engineering for design and construction administration, each estimated at 10% of the construction total, combine for an estimated **$5,000,000**.

Detailed back up cost estimates are provided in the **Appendix**.

8.6 Benefit-Cost Analysis

A Benefit-Cost Analysis was performed for the study Alternatives according to MaineDOT standard operating procedures. Benefits and costs of alternative actions were quantified in current dollars. The analysis included:

- Benefits included savings in travel time, travel distance, and crash costs, using current conversion factors to estimate dollar values. Negative savings (increases) in travel time, travel distance, and crash costs were also be quantified. Benefits were summarized for 1-year periods. The annual benefits were calculated for the forecast (2045) year for use in determining economic feasibility.
- Costs included any capital, maintenance, and operating costs anticipated during the life of the project, expressed in current dollars. Future costs were converted to present worth by using the standard discount rate. The total present worth of costs were converted into an annualized cost by using the standard discount rate and the life of the project.

The analysis resulted in the following Benefit-Cost ratios for the Alternatives:

Alternative 3: Widen or Improve the Existing Route 201 Bridges – 0.79

Alternative 4: Downstream Bridge Crossing – 0.79

Alternative 5:Downtown Bridge Crossing – 0.92

Alternative 6: Upstream Bridge Crossing – 0.77

9.0 Alternatives Evaluation Criteria

The evaluation of Alternatives was based on the following criteria.

9.1 - Transportation Measures

- Vehicle Miles Traveled (VMT) – The VMT values represent annual reductions (daily multiplied by 365 days/year divided by a seasonal/weekday factor) divided by the number of year 2045 daily vehicles crossing the Smith Bridges under the base condition.
- Vehicle Hours Traveled (VHT) – The VMT and VHT values represent annual reductions (daily multiplied by 365 days/year divided by a seasonal/weekday factor) divided by the number of year 2045 daily vehicles crossing the Smith Bridges under the base condition.
- Improves Level of Service (LOS) and Delay at Key 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 – Providing addition river crossings or additional width on existing bridges for managing traffic.
- Potential for Improving Downtown Mobility.
- Provides Regional River Crossing Redundancy – VMT and VHT changes between a No-Build option, bridge closure and alternatives.
- Potential for Improving Bicycle and Pedestrian Conditions – Consideration of traffic volume levels and roadway capacity expansion which likely degrades bicycle and pedestrian conditions.

9.2 - Land Use Measures

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

9.3 - Environmental Resource Measures

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

9.4 - 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.

9.5 - Purpose and Need

Is the study purpose addressed using this alternative?

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.

9.6 - Evaluation Matrix

Table 9.1 presents a comparison matrix and includes the following measures for assessing outcomes of each Alternative. In addition, the measures were qualitatively color-coded for positive impacts (green), negative impacts (red) and neutral impacts (yellow).

A detailed matrix is provided in the **Appendix**.

Table 9-1
Evaluation Matrix

Category / Alternative	Future (2045) No-Build - Benchmark	Alternative 1: Transportation Demand Management (TDM)	Alternative 2: Transportation System Management (TSM)	Alternative 3: Improve 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
TRANSPORTATION MEASURES								
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
LAND USE MEASURES								
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
ENVIRONMENTAL RESOURCE MEASURES								
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
TOWN PLANNING GOALS								
Meets Downtown Planning Goals	No	No	No	No	Some	No	Yes	No
COST AND FUNDING MEASURES								
Estimated Cost	N/A	N/A	Low	Moderate	Moderate	Moderate	High	Moderate

9.7 - Comparison Matrix Summary

The following presents a summary of each Alternative as documented in the matrix.

No-Build

As noted in **Table 9.2** this Alternative will not have a significant impact on many of the evaluation metrics.
This Alternative does not meet study purpose and need.

TABLE 9.2 NO-BUILD COMPARISON MATRIX SUMMARY	
Impact Description	**Outcome**
Improves Congestion at Key Intersections	No
Reduces Truck Traffic Through Downtown	No
Improves River Crossing Redundancy	No
Improves Downtown Mobility	No
Impact to River Recreation	No
Potential to Improve Bicycle and Pedestrian Conditions	No
Property Impacts	No
Environmental Impacts	No
Historic Resource Impacts	No
Cost/Benefit	N/A
Meet Purpose and Need	No
Cost	N/A

A1 – Transportation Demand Management

As noted in **Table 9.3** this Alternative will not have a significant impact on many of the evaluation metrics.
TDM strategies should be considered as a compliment to the recommended Alternative. This Alternative does not meet study purpose and need.

TABLE 9.3 ALTERNATIVE 1 TRANSPORTATION DEMAND MANAGEMENT COMPARISON MATRIX SUMMARY	
Impact Description	**Outcome**
Improves Congestion at Key Intersections	No
Reduces Truck Traffic Through Downtown	No
Improves River Crossing Redundancy	No
Improves Downtown Mobility	No
Impact to the River Recreation	No
Potential to Improve Bicycle and Pedestrian Conditions	No
Property Impacts	No
Environmental Impacts	No
Historic Resource Impacts	No
Cost/Benefit	N/A
Meet Purpose and Need	No
Cost	N/A

A2 – Transportation System Management

As noted in **Table 9.4** this Alternative will not have a significant impact on changes to volumes patterns and thus does not meet many of objectives of this study. This Alternative mostly does not meet study purpose and need.

TABLE 9.4 ALTERNATIVE 2 TRANSPORTATION SYSTEM MANAGEMENT COMPARISON MATRIX SUMMARY	
Impact Description	**Outcome**
Improves Congestion at Key Intersections	Minor reduction in delay at Island/W. Front/Main, Madison/Elm and Madison/High intersections
Reduces Truck Traffic Through Downtown	No
Improves River Crossing Redundancy	No
Improves Downtown Mobility	Some improvement in mobility associated with intersection improvements
Impact to the River Recreation	No
Potential to Improve Bicycle and Pedestrian Conditions	Some enhancement as part of improvement concepts, but wider intersections make crossings more difficult
Property Impacts	Some impacts with intersection widening at Madison Avenue and Water Street
Environmental Impacts	No
Historic Resource Impacts	Some Impact to Downtown Historic District with wider intersections
Cost/Benefit	10.3
Meet Purpose and Need	No – although some mobility improvements would be expected
Cost	$200,000

A3 – Improve Existing Bridges

As noted in **Table 9.5** this Alternative will not have positive impacts on reducing traffic volumes in the Downtown but will improve mobility. This Alternative generally does not meet study purpose and need.

TABLE 9.5 ALTERNATIVE 3 IMPROVE EXISTING BRIDGES COMPARISON MATRIX SUMMARY	
Impact Description	**Outcome**
Improves Congestion at Key Intersections	Some reduction in delay at Island/W. Front/Main and Madison/High and Elm intersections
Reduces Truck Traffic Through Downtown	No
Improves River Crossing Redundancy	Some improvement as a wider bridge provides additional width for managing traffic
Improves Downtown Mobility	Some improvement in mobility associated with intersection improvements and increased bridge lane capacity
Impact to the River Recreation	No
Potential to Improve Bicycle and Pedestrian Conditions	Some enhancement as part of improvement concepts, but wider intersections make crossings more difficult
Property Impacts	Some impacts with bridge/intersection widening at Water Street and at Island/W. Front/Main
Environmental Impacts	No
Historic Resource Impacts	Some Impact to Downtown Historic District at Madison/Water intersection
Cost/Benefit	0.79
Meet Purpose and Need	No – although some mobility improvements would be expected
Cost	$36.6M

A4 – Downstream Bridge Crossing

As noted on **Table 9.6** this Alternative will have positive impacts on removing truck traffic through downtown and providing river crossing redundancy. This Alternative partially meets study purpose and need.

TABLE 9.6 ALTERNATIVE 4 DOWNSTREAM BRIDGE CROSSING ALTERNATIVE COMPARISON MATRX	
Impact Description	**Outcome**
Improves Congestion at Key Intersections	Some reduction in delay at Island/Front/Main and Madison/High intersections
Reduces Truck Traffic Through Downtown	Yes, 200 less daily trucks
Improves River Crossing Redundancy	Yes
Improves Downtown Mobility	Some improvement, particularly by the removal of trucks, but volumes will not be reduced significantly (-18% average in peak hours)
Impact to the River Recreation	Some Impact – but not at key Run of the River water feature
Potential to Improve Bicycle and Pedestrian Conditions	No
Property Impacts	Some property impacts on the south side approaching Route 201
Environmental Impacts	Yes
Historic Resource Impacts	No
Cost/Benefit	0.79
Meet Purpose and Need	Partially meets some purpose and need metrics
Cost	$25.5M

A5 – Downtown Bridge Crossing

As noted on **Table 9.7** this Alternative will have positive impacts on reducing traffic volumes in the Downtown, improving congestion, and providing river crossing redundancy. Property, historic and park land impact would occur. This Alternative generally does meet study purpose and need.

TABLE 9.7
ALTERNATIVE 5 DOWNTOWN BRIDGE CROSSING COMPARISON MATRIX

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

A6 – Upstream Bridge Crossing

As noted on **Table 9.8** this Alternative will have positive impacts on reducing traffic volumes on area roadways and combined with the Connector Road has neighborhood traffic reduction benefits. This Alternative generally does not meet study purpose and need.

TABLE 9.8 ALTERNATIVE 6 UPSTREAM BRIDGE CROSSING COMPARISON SUMMARY MATRIX	
Impact Description	**Outcome**
Improves Congestion at Key Intersections	Some reduction in delay at Island/W. Front/Main intersection
Reduces Truck Traffic Through Downtown	No
Improves River Crossing Redundancy	Yes
Improves Downtown Mobility	Little to no improvement
Impact to the River Recreation	No
Potential to Improve Bicycle and Pedestrian Conditions	Little or no improvement, although connectivity to school campus enhanced
Property Impacts	Some impact
Environmental Impacts	Yes
Historic Resource Impacts	No
Cost/Benefit	0.77
Meet Purpose and Need	Partially meets purpose and need
Cost	$30.5M

10.0 Public Involvement

The following summarizes the extensive public process for the study. The study schedule and meeting format was impacted by the COVID-19 pandemic. However, the virtual meetings had a greater turnout when compared to similar studies.

Study Team Meetings

There were several Study Team meetings during the conduct of the study. The Study Team comprised of the following:

Martin Rooney	MaineDOT
Nate Howard	MaineDOT
Ed Hanscom	MaineDOT
Steve Bodge	MaineDOT
Kristen Chamberlain	MaineDOT
Mark Hume	MaineDOT
Haley Jaramillo	MaineDOT
Jason Stetson	MaineDOT
Christine Almand	Town of Skowhegan
Gregory Dore	Town of Skowhegan
Joel Greenwood	KVCOG
Tom Errico	T.Y. Lin International
Shawn Davis	T.Y. Lin International
Chris Taylor	T.Y. Lin International
Kevin Hooper	Kevin Hooper Associates
Dana Valleau	TRC
Jessica Murray	TRC

Meetings were held on the following dates and notes are provided in the **Appendix**.

- Thursday May 16, 2019 (Kick-Off Meeting)
- Thursday July 11, 2019
- Friday December 13, 2020
- Wednesday February 26, 2020
- Tuesday August 4, 2020
- Friday September 4, 2020
- Tuesday December 29, 2020 (partial Team cost)
- Friday February 5, 2021 (partial Team cost)
- Thursday April 8, 2021

Town Bridge Committee Meetings

There were three Bridge Committee meetings during the study. The Bridge Committee comprised of the following members:

Christine Almand - Chairman
Betty Austin – Vice Chairman
Greg Dore
Jason Gayne
Steve Govoni
Joel Greenwood
Sam Hight
Christian Savage
Roger Staples
Mark Wilson
Rod Whittemore

Tuesday, August 20, 2019

This was the introductory meeting (part of their agenda) and included the following:

1. Invite their input on the design of the September 10 public meeting

2. Enlist their assistance with publicity for the September 10 public meeting

3. Establish rapport with them - get to know each other

Wednesday, May 13, 2020 (ZOOM)

Agenda

1. Introductions
2. Existing Conditions Summary
3. Alternatives under Consideration
4. Future Traffic Volumes
    a. 2045 No-Build
    b. Downstream Bridge Alternative
    c. Upstream Bridge Alternative
    d. Intown Bridge Alternative
5. Future Truck Volumes with Alternatives
6. Initial Highway/Bridge Concept Design Summary
7. Transportation System Management Alternative Status Summary
8. Public Meeting #2 Feedback
9. Project Schedule

Questions, Comments, Clarifications

- Discussion about a "magic number" for traffic on the Smith Bridges
    - There is no magic number (low volume at which there are no problems)
    - And – it's not just about the number – there's more to it than that – the purpose and needs statement addresses several factors
- Demand Management?
    - Could we offset the hours of the School and New Balance to reduce congestion at the south side intersection
    - We have tried shift changes in the past, but it didn't make a huge difference
- Let's make sure that funding for the solutions includes fixing the intersections
    - Let's make sure we don't solve just part of the problem – there needs to be a whole solution, and funding for it
- Likely the study will result in a list of both short term and long term solutions
- COVID Implications
    - At DOT we are treating this like the great recession of 2008-09.
    - We expect things to come back but slowly.
- We are analyzing future truck traffic
    - We are estimating a 15% growth in truck traffic over the next 20 years

Meeting #3

PENDING

First Public Meeting: September 10, 2019

The purpose of this meeting was to:

1. Explain to the general public about the study.
2. Share with the public what the study team has learned so far about existing conditions.
3. Gather input from the public on the following questions:

- What are your most significant concerns that you think a new bridge could address? In other words: what would be the advantages of a new bridge?
- What concerns might a new bridge create? In other words: what would be the disadvantages of a new bridge?
- What are your ideas for solutions to these concerns?
- If a new bridge were to be built, where do you think it should it be located, including constraints and opportunities with each location idea? If you don't think a new bridge should be built, what are your other ideas for solutions to these concerns?

The meeting was facilitated by Study Team Member Craig Freshley of Good Group Decisions. Study Team Member Tom Errico of TY Lin made a presentation. Nathan Howard was also on hand, representing the Maine Department of Transportation.

Town Manager Christine Almand introduced members of the Skowhegan Bridge Committee. About 60 people were in attendance.

Public Input Key Points

Concerns that could be addressed

- Fewer trucks
- Safety
- Reduce the chance of spills from trucks
- Improve pedestrian safety
- Better emergency response
- Perception of safety
- A new bridge could be high enough for future floods
- Mobility
- Increased redundancy (another way across the river if a bridge is blocked)
- Reduce traffic congestion
- Improve downtown traffic flow
- People from the east could get to Waterville
- People from the south could more easily get into town

Concerns that could be created

- If a new bridge is too close to the existing bridge, it might not have the intended effect
- Impact the local roads near a new bridge
- Could require road improvements
- Could increase traffic in other places
- The high levels of vehicular traffic could just be redirected to become someone else's problem
- If the citizens don't resolve this, MDOT might "resolve it" for us Or MDOT might not do anything
- Property taken off the tax rolls
- More or same congestion at the intersections that are already congested
- Could impact trail designs

Ideas for solutions

- Bypass just the trucks and not the cars
- Upgrade existing roads
- A new bridge to the east (near where the eagle was)
- A bridge that connects 2 existing roads (not a bypass)
- Upgrade the existing bridges
- Add to existing bridges
- Would require upgrading adjacent roads
- Take land from Skowhegan Plaza and improve the adjacent intersection
- Roundabouts

Additional Outreach – October 2019 Public Survey

Question #1 - In your opinion, what are the problems with the current bridge in Skowhegan?

	% Response	Count
Traffic Congestion	89.95%	346
Traffic Safety	53.98%	210
Pedestrian Safety	48.07%	187
Downtown Traffic Flow	69.41%	270
Other	15.68%	61

Question #2 – How should these problems be solved?

	% Response	Count
Widen the existing bridge and add an additional lane	9.51%	37
Add a second bridge over the Kennebec River in Skowhegan	79.69%	310
Other	10.8%	42

Question #3 – What are your concerns about the addition of a second bridge in Skowhegan?

	% Response	Count
Private lots/businesses impacted	31.36%	122
Impacts on waterway	18.77%	73
Compatibility with local plans	15.68%	61
Adverse economic impact on the downtown	23.65%	92
Other	22.11%	86

Question #4 – What are some advantages to a second bridge in Skowhegan?

	% Response	Count
Pedestrian safety	50.39%	196
Downtown traffic flow	76.35%	297
Improved emergency vehicle response time	77.12%	300
Less traffic congestion	84.58%	329
Other	8.48%	84

Question #5 – If a second bridge is constructed, where should it be located?

	% Response	Count
No-Build	2.22%	7
TSM Improvements	0.32%	1
Demand Changes	0%	0
Widen Existing Bridges	1.58%	5
Downstream Bridge	30.56%	110
Downtown Bridge	18.35%	58
Upstream Bridge	2.85%	9
Other	12.03%	38
Downtown or Downstream	6.33%	20
Engineers/DOT decide	3.48%	11
No answer	18.04%	57

Second Public Meeting: June 23, 2020

The second public input meeting included a focus on alternatives. This meeting addressed two things: (1) The Study Team presented findings to date and alternatives for going forward, (2) The public asked questions and provided input.

Attendance

Panelists

- Christine Almand, Town Manager
- Nate Howard, Maine DOT Planning
- Tom Errico, T.Y. Lin International
- Greg Dore, Skowhegan Road Commissioner
- Craig Freshley, Good Group Decisions, Facilitator

Viewers

- 17 members of the public on Zoom
- 29 members of the public via Facebook Live

Planned Agenda

1. Opening and Introductions
2. Meeting Agenda
3. Study Team
4. Study Area
5. Purpose and Need
6. What we heard at the first public meeting
7. Existing Transportation Conditions Update
8. Explanation of Alternatives
9. Public Input
10. Schedule/Next Steps

Questions and Discussion from Zoom Q&A

When discussing these options what is the projected impact at the Southside Intersection. It seems that three of the four options still rely on that intersection to move the vehicular traffic. That seems to defeat the purpose.

- Tom answered by saying that they have not quite gotten to a conclusion, but that this statement is pretty fair. It is likely that there would have to be other improvements in addition building a new bridge up or down stream. The downtown bridge build is likely to have a positive impact on the traffic.

If you just make the current bridge larger, what about the businesses that are on the Island currently?

- To answered that there would be impact, we have not laid this alignment out – but we will look closely and define these impacts.

What about using the current walking bridge as the downtown?

- The existing bridge would not carry traffic.

There are several people talking about ATVs, is there a way to also look at adding an ATV lane in like Norridgewock bridge? Just looking at the future, and maybe a bicycle lane?

- We will take this comment under consideration, great comment.

Craig asked for comments from the viewers, stating that they could contribute questions on Facebook Live, or share on Zoom directly. Craig asked for any other questions or comments from the public. He acknowledged the uniqueness of being on Zoom.

Questions and Discussion from Facebook Live and Zoom

Mention of the white-water park and concerns about impacts on this park, specific to the surf wave section.

Suggestion to do the public forum in another way. Off of Zoom. Suggestion to think of another way to gather public input. Another way and another time.

- Craig acknowledged that we are doing the best we can, and that we do have 40 people viewing tonight. The video will remain on the town's Facebook Page as well. The survey will be open and collecting comments over the next two weeks. There are opportunities to give more feedback. There were about the same amount of folks participating at the first meeting in September, and we do have another public input meeting planned.

The solutions presented do not seem to address the heavy commercial traffic coming down the avenues, which has had an impact on the historic structure of the town. The best presented option seems to bracket downtown more. This will make having the downtown as a historic place to visit a challenge. It seems that we should be more forward looking.

Craig asked for an idea in response to this issue?

- Yes, there has been a dialogue about upgrading 201 to interstate standards (this has been done in Quebec) – which actually drove traffic out of Maine and into update New York.
- This would be expensive in the short-term but would have long-term benefits for the town.

Craig asked if this would bypass downtown Skowhegan?

- Yes. Also, the town is conducting the process of creating a new comprehensive plan – perhaps this bridge study is premature.
- As you move forward in this process, it seems like there needs to be a more comprehensive plan. Does the funding source for this project include these other items? Example: the big dig, you find a solution, but it doesn't create a whole solution.
- The simple answer is that there is not funding right now for the next step. There will be a wide array of costs for each recommendation.
- Cost will be a factor that we will consider but cannot speak to specific funding right now. Projects like this generally get funded from additional funding scenarios.
- Agree that we will have to look wider at some of our alternatives.
- We are looking at big picture recommendations, we will also likely provide some short- term recommendations as well. Short term improvement strategies, that could be considered for implementation.

Craig prompted the viewers to continue to ask questions and to make comments. He stated that this was a great time to ask the experts. Craig stated that it was critical to get the public opinions before considering next steps. He prompted the public with the following questions. What alternative did they you prefer? What should guide us in determining next steps?

- Put the bridge where it will lessen downtown traffic the most.
- Wondering if there are examples of successful bypass projects in the state?
- Yes, the most relevant one has not been built yet. Thoughts on transportation and mobility has changed. Funding and thinking have changed, so bypasses have become less popular. There is a connection being built that will connect 395 to Route 9 in Brewer. The study began in 1999 and has still not gone to construction but was recently fully funded. Other examples appear up coastal route 1.
- Perhaps bypass is not the correct term, it would be more of a tourist gateway to this part of Maine and into Canada. Thinking long-term about Skowhegan as a tourist and eco-tourism destination, we would want to encourage a livable and attractive downtown. Current traffic does not encourage population density downtown.
- Regarding conversation around a bypass, when this discussion happened back in 2018 – there is an agreement with the state that alternatives that bypass downtown are not to be included. Our study team is not considering a bypass – it is not in the scope of this agreement.
- The crossing that goes through the white-water park, would really ruin the park. This is personal to people.

Can we start the other improvement projects now? Getting funding through the state to get some of this stuff done before waiting for the bridge to be done?

- Yes, MPI is a program where town-lead projects can get state money. This is a great way to get smaller short-term projects done quicker.

The pandemic is impacting some of the other funding opportunities.

Are we going to do design work? Could we get design work to submit to an MPI project?

- Yes, something to talk about offline.

Craig poses a question about the impacts of COVID-19 and the economic impacts of the pandemic. Will this impact funding? Is it impacting traffic?

- Yes, DOT relies on gas tax and right now traffic is down 30-40% which brings revenue down 30-40%. Undoubtedly, there will be short term effects on our revenue. On the other hand, after the great recession there was a lot of stimulus funding – if something like this happens there could be more opportunities.

How can we know what is the best way forward, before the Town's Comprehensive Plan is complete?

- You can argue this the other way too – the comprehensive planner could benefit from the bridge study information.
- Hope is to start the comprehensive plan this fiscal year, and it could take about 18 months to complete.
- A second river crossing has been identified as a need in previous comprehensive plans.

Could we get grants and other funding?

- Local dollars would only kick-in if we are looking to do more improvements greater than the agreement and plan.
- State and federal funds would cover the big project, generally a bridge alternative would be state and federal funding.

Additional Outreach – June 2020 Public Survey

The response rate was limited but the results are summarized as follows with the full survey results provided in the **Appendix**.

Question #1 – Which of the following alternatives do you most prefer		
	% Response	**Count**
No build. No changes	10.17%	6
A1 TSM	0%	0
A2 TDM	1.69%	1
A3 Upgrade Existing Crossing	13.56%	8
A4 New Downstream Crossing	47.46%	28
A5 New Downtown Crossing	25.42%	15
A6 New Upstream Crossing	1.69%	1

Question #2 – Please rank the following in terms of importance to you		
	Total	**Score**
Safety	53	4.87
Congestion	54	5.33
Reducing trucks through downtown	58	5.21
Environmental impact	55	3.35
Cost and funding	54	3.24
River crossing redundancy	54	2.8
Property impact	55	3.27

Third Public Meeting:

Pending

11.0 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.

11.1 - 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 - C**onvert 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

11.2 - 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.

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

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

APPENDIX

Appendix A – Detailed Comparison Matrix

Category	Transportation Measures									Property Impacts					Environmental Impacts					Cost					Meet Purpose and Need
Description of Alternative	Vehicle Miles Traveled (VMT)	Vehicle Hours Traveled (VHT)	Safety	Level of Service and Delay	Truck Traffic In Downtown	Emergency Service Access	Downtown Mobility	Regional River Crossing Redundancy	Bicycle and Pedestrian Conditions	Direct Building Impacts	Private Lots Impact	Address with Comprehensive Plan Policy	Right-of-Way Acquisition	Impacts to Recreation Waterway Use	Potential for Impacts to Cultural Resources	Potential for Impacts to Ecological Resources	Wetland Impacts	Potential for Impacts to Recreational Resources	Potential for Impacts to Watershed	Total Estimated Cost	Estimated Highway Cost	Estimated Bridge Cost	Traffic Management Cost (included in Bridge and Highway Totals and broken out for reference)	Benefit/Cost Measure	
Future (2045) No-Build	No Change	No Change	No Change	1) LOS = F (194) 2) LOS = F (211)	1,100 daily Trucks	No Change	1,415 vehicles	23.4% (29.1%)	No Change	None	None	No	None	No	None	None	None	None	None	N/A				N/A	No
Alternative 1: Transportation Demand Management (TDM)	No Change	No Change	No Change	1) LOS = F (194) 2) LOS = F (211)	No Change	No Change	No Change	23.4% (29.1%)	No Change	None	None	No	None	No	None	None	None	None	None	$0				N/A	No
Alternative 2: Transportation System Management (TSM)	No Change	No Change	No Change	1) LOS = F (163) 2) LOS = F (206)	No Change	No Change	No Change	23.4% (29.1%)	No Change	None	None	No	None	No	None	None	None	None	None	$200,000				10.3	No
Alternative 3: Widen or Improve the Existing Route 201 Bridges	No Change	No Change	No Change	1) LOS = F (96) 2) LOS = F (97)	No Change	Wider bridge creates space for travel	No Change	23.4% (29.1%)	Improved Bridge Conditions but bigger intersection	Potentially some	Up to 16 *number of lots impacted is high, but area impacted is relatively low per lot	No	< 0.5 Acres	No	Skowhegan Historic District	None	None	None	HUC 12 Watershed - Kennebec River (8) at Hinkley - Contains portion of Urban Impaired Streams Watershed - Whitten Brook	$36,600,000	$5,600,000	$31,000,000	$7,880,000	0.79	Partially
Alternative 4: Downstream Bridge Crossing	-28	-4.3	-2132	1) LOS = D (55) 2) LOS = F (168)	300 fewer daily trucks	Alternative Route	1,210 vehicles	4.6% (5.8%)	Fewer trucks and vehicles in Downtown	None	7	Fewer trucks and vehicles in Downtown	~5.5 Acres	Potentially	Arnold Trail to Quebec Historic District	No NHD identified streams, Potential impacts to edge of Exemplary Natural Community - Hardwood Seepage Forest, Just outside of 0.25 mile Bald Eagle Nest Significant Habitat	1.17 ac NWI wetland impacts	Private Conserved Lands - Governor Coburn Drive Scenic Turnout, Governor Coburn Drive Larch Plantation, Kennebec Pines	HUC 12 Watershed - Kennebec River (8) at Hinkley - Contains portion of Urban Impaired Streams Watershed - Whitten Brook	$25,500,000	$8,300,000	$17,200,000	$240,000	0.79	Partially
Alternative 5: Downtown Bridge Crossing	-42	-3.9	-3243	1) LOS = E (59) 2) LOS = E (70)	400 fewer daily trucks	Alternative Route	1,073 vehicles	0.4% (1.6%)	Fewer trucks and vehicles in Downtown/improved connectivity	Up to 6	Up to 18	Greatest reduction of trucks and vehicles in Downtown	~2.2 Acres	Yes	Listed Historic Property- Municipal Building/ Opera House, Skowhegan Historic District, Arnold Trail to Quebec Historic District, Arnold Trail to Quebec Area	No NHD identified streams, Exemplary Natural Community -Bluebell shoreline outcrop	0.4 ac NWI wetland impacts	Town Parks - Veterans Park, Debe Riverwalk, Wearhouse Canoe Portage Park, Run of River Park (Proposed)	HUC 12 Watershed - Kennebec River (8) at Hinkley - Contains portion of Urban Impaired Streams Watershed - Whitten Brook	$55,300,000	$8,800,000	$46,500,000	$325,000	0.92	Yes
Alternative 6: Upstream Bridge Crossing	-5	-2.2	-413	1) LOS =E (73) 2) LOS = F (92)	50 fewer daily trucks	Alternative Route	1,248 vehicles	3.7% (12.1%)	Fewer vehicles in Downtown	None	2	Fewer vehicles in Downtown	~2.2 Acres	No	Arnold Trail to Quebec Historic District, Arnold Trail to Quebec Area	No NHD identified streams	1.42 ac NWI wetland impacts	Town Park - Marti Stevens Learning Center, State Conserved Land - Yankee Woodlot	HUC 12 Watershed - Kennebec River (7) at Hinkley - Contains portion of Urban Impaired Streams Watershed - Whitten Brook	$30,500,000	$6,200,000	$24,300,000	$220,000	0.77	Partially
How Alternative will be measured	Annual Reduction per River Crossing Vehicle	Annual Reduction per River Crossing Vehicle	Change in Daily VMT	LOS/Delay at: Island/Main/W. Front: 1)AM 2)PM	Changes in Daily Truck Volumes on Existing Bridge	Additional width or route across river	PM Peak Hour Volume on Water St.	Change in VMT (VHT) if Existing Bridges Closed	Improved Connectivity Intersection Size Downtown Volumes	Number of Buildings with Direct Impact	Number of Lots	Improve Downtown transportation aesthetics and quality - change in traffic volume	Acres	Impacts to Run of the River	Identification of Historic and Cultural Resources Impacted	Identification Ecological Resources Impacted	Quantification of NWI Wetlands Affected	Identification of Recreational Resources Impacted	Identified Watershed	2020 Dollars					Address Study Purpose

Evaluation Summary by MOE

	Reduced VMT	Reduced VHT	Reduced VMT	Moderate Reduction in	Reduced Volume	Improved	Reduced from 2019	Little Change	Improved	Reduced Volume	Fully Address Study Purpose
	Little or No Change in VMT	Little or No Change in VHT	Little or No Change in VMT	Some Reduction in Delay	Little Change in Volume	Some Improvement	Similar to 2019	Some Increase	Some Improvement	Similar to 2019	Partially Address Study Purpose
	Increased VMT	Increased VHT	Increased VMT	Little Reduction in Delay	No Change	No Change	Greater from 2019	Significant Increase	No Change/ Worsen	No Change	Does Not Address Study Purpose

Appendix B - Detailed Existing Level of Service Results

Table 2.4
Existing Intersection Level of Service and 95th Percentile Queue

	AM Delay (sec/ veh)	AM LOS/ Delay	PM Delay (sec/ veh)	PM LOS/ Delay	AM 95th% Queue (feet)	PM 95th% Queue (feet)
Main Street/Island Avenue/W. Front Street/Waterville Road (S)						
W. Front Street EBL	78.1	E	74.3	E	233	240
W. Front Street EBTR	689.0	F	344.7	F	2121	1204
Waterville Road WBLT	52.7	D	106.9	F	152	623
Waterville Road WBR	17.7	B	54.1	D	183	363
Main Street NBL	30.3	C	37.5	D	137	448
Main Street NBTR	60.1	E	175.4	F	364	1239
Island Avenue SBL	42.8	D	183.5	F	604	836
Island Avenue SBT	99.9	F	39.2	D	1085	451
Island Avenue SBR	0.7	A	0.0	A	318	254
Overall	92.5	F	105.4	F		
Island Avenue/Water Street/Madison Avenue (U)						
Madison Avenue SBL	2.3	A	4.6	A	45	75
Madison Avenue SBR	0.2	A	0.2	A	50	26
Island Avenue NET	0.2	A	0.2	A	6	12
Overall	0.3	A	0.5	A		
Madison Avenue/Elm Street/Commercial Street (U)						
Elm Street EBL	68.1	F	21.4	C	31	56
Elm Street EBR	26.0	D	14.1	B	46	50

Table 2.4
Existing Intersection Level of Service and 95th Percentile Queue

	AM Delay (sec/ veh)	AM LOS/ Delay	PM Delay (sec/ veh)	PM LOS/ Delay	AM 95th% Queue (feet)	PM 95th% Queue (feet)
Commercial Street WBL	26.8	D	10.2	B	150	117
Commercial Street WBT	26.8	D	8.1	A	216	92
Commercial Street WBR	0.6	A	0.1	A	87	0
Madison Avenue SBT	0.3	A	0.2	A	16	3
Madison Avenue SBTR	0.2	A	0.1	A	43	13
Overall	6.3	A	2.6	A		
Water Street/Court Street/Commercial Street (U)						
Water Street WBTR	3.4	A	6.4	A	117	119
Pattern Court NBLTR	5.5	A	14.4	A	33	51
Court Street SBR	6.4	A	8.2	A	37	41
Water Street NEL	0.0	A	0.0	A	18	26
Water Street NBLTR	0.0	A	0.1	A	0	0
Overall	1.1	A	1.5	A		
Water Street/North Avenue (U)						
Water Street EBLT	1.3	A	0.6	A	142	104
Water Street WBTR	0.0	A	0.0	A	8	7
North Avenue SBLR	5.7	A	6.0	A	58	65
Overall	1.5	A	1.3	A		
Madison Avenue/High Street (S)						

Table 2.4
Existing Intersection Level of Service and 95th Percentile Queue

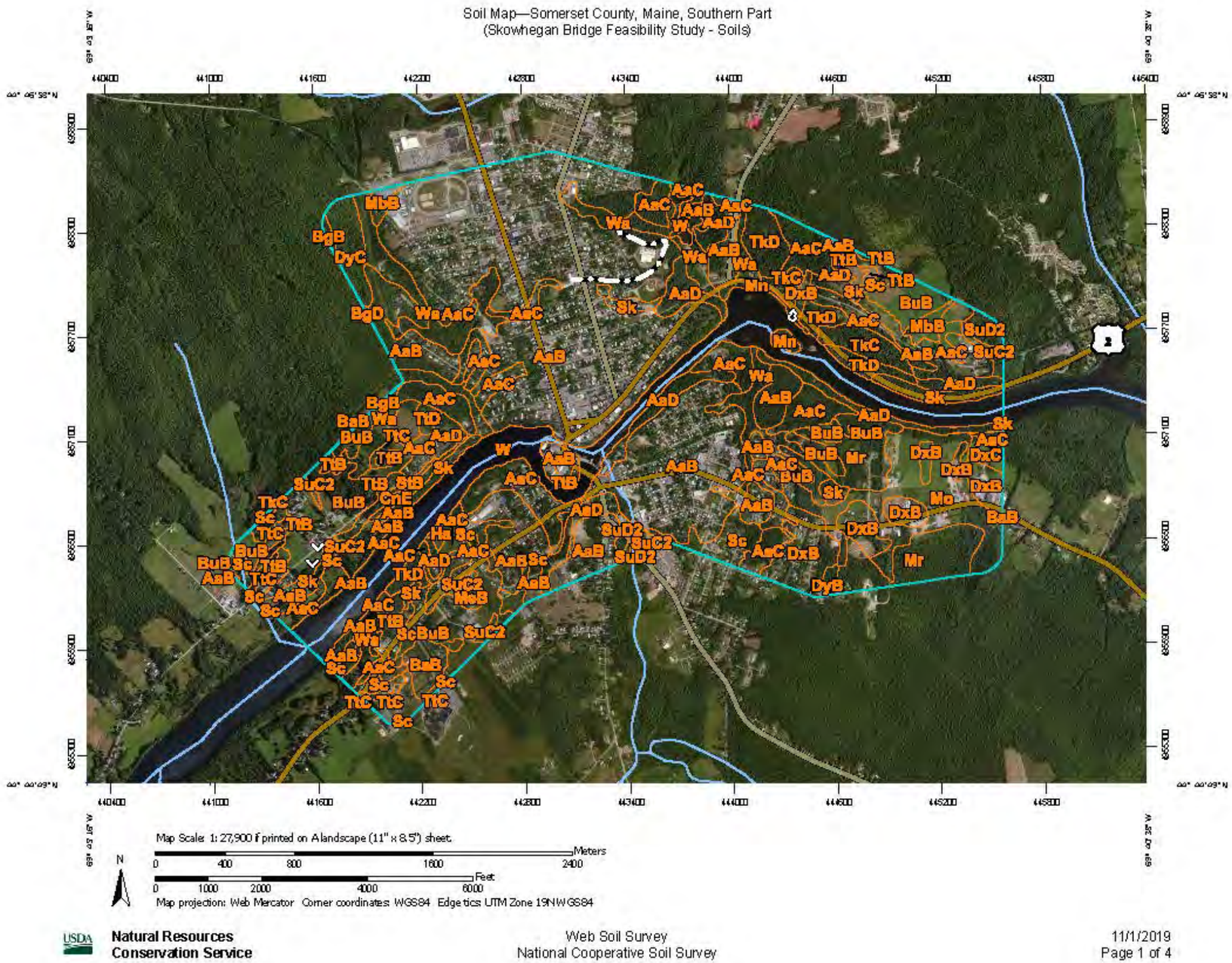
	AM Delay (sec/ veh)	**AM** LOS/ Delay	**PM** Delay (sec/ veh)	**PM** LOS/ Delay	**AM 95th%** Queue (feet)	**PM 95th%** Queue (feet)
High Street EBLTR	21.3	C	23.1	C	144	163
High Street WBL	34.9	C	29.3	C	204	125
High Street WBTR	15.0	B	12.8	B	242	127
Madison Street NBLT	8.1	A	6.4	A	81	107
Madison Street NBTR	8.8	A	4.3	A	106	115
Madison Avenue SBLT	8.8	A	12.2	B	176	168
Madison Avenue SBTR	6.2	A	5.6	A	231	207
Overall	13.1	B	10.4	B		
North Avenue/High Street (S)						
High Street EBLTR	18.2	B	20.3	C	110	184
High Street WBLTR	14.5	B	12.7	B	183	144
North Avenue NBLTR	5.2	A	6.9	A	142	157
North Avenue SBLTR	4.5	A	5.7	A	115	131
Overall	9.7	A	10.9	B		
Court Street/High Street (U)						
High Street EBLTR	0.8	A	0.3	A	43	26
High Street WBLTR	0.2	A	0.3	A	4	15
Court Street NBLTR	4.7	A	5.0	A	49	51

Table 2.4
Existing Intersection Level of Service and 95th Percentile Queue

	AM Delay (sec/ veh)	**AM** LOS/ Delay	**PM** Delay (sec/ veh)	**PM** LOS/ Delay	**AM 95th%** Queue (feet)	**PM 95th%** Queue (feet)
Court Street SBLTR	4.6	A	4.4	A	36	52
Overall	0.8	A	1.1	A		
Madison Street/Jewett Street (S)						
Jewett Street WBLR	15.8	B	14.5	B	237	157
Madison Street NBT	4.8	A	3.8	A	108	128
Madison Street NBTR	4.3	A	3.6	A	129	138
Madison Street SBLT	5.7	A	6.8	A	172	185
Madison Street SBT	4.3	A	3.2	A	111	127
Overall	7.5	A	6.3	A		
North Avenue/Jewett Street (U)						
Jewett Street EBLR	5.8	A	8.4	A	68	69
North Avenue NBLT	1.6	A	1.1	A	113	123
North Avenue NBTR	0.0	A	0.0	A	13	12
Overall	1.1	A	1.6	A		
Water Street/High Street (U)						
Water Street EBLT	0.1	A	0.0	A	28	6
Water Street WBTR	0.0	A	0.0	A	10	12
High Street SBLR	4.7	A	6.7	A	67	87
Overall	0.8	A	1.7	A		

Appendix C – Existing Environmental Resource Information

Skowhegan Bridge Feasibility Study Soils



Soil Map—Somerset County, Maine, Southern Part
(Skowhegan Bridge Feasibility Study - Soils)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Somerset County, Maine, Southern Part
Survey Area Data: Version 19, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 17, 2010—Aug 31, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AaB	Adams loamy sand, 0 to 8 percent slopes	803.2	35.9%
AaC	Adams loamy sand, 8 to 15 percent slopes	206.1	9.2%
AaD	Adams loamy sand, 15 to 25 percent slopes	89.7	4.0%
BaB	Bangor silt loam, 3 to 8 percent slopes	15.3	0.7%
BgB	Bangor very stony silt loam, 3 to 8 percent slopes	1.9	0.1%
BgD	Bangor very stony silt loam, 15 to 25 percent slopes	0.3	0.0%
BuB	Lamoine-Buxton complex, 0 to 8 percent slopes	181.6	8.1%
CnE	Colton gravelly sandy loam, 25 to 45 percent slopes	10.1	0.5%
DxB	Dixmont silt loam, 0 to 8 percent slopes	76.1	3.4%
DxC	Dixmont silt loam, 8 to 15 percent slopes	6.4	0.3%
DyB	Dixmont very stony silt loam, 0 to 8 percent slopes	4.6	0.2%
DyC	Dixmont very stony silt loam, 8 to 20 percent slopes	21.9	1.0%
Gp	Gravel pits	0.1	0.0%
Ha	Hadley silt loam	3.3	0.1%
MbB	Madawaska fine sandy loam, 0 to 8 percent slopes	13.0	0.6%
MeB	Melrose fine sandy loam, 3 to 8 percent slopes	4.1	0.2%
Mn	Mixed alluvial land	8.9	0.4%
Mo	Monarda silt loam, 0 to 3 percent slopes	93.5	4.2%
Mr	Monarda silt loam, 0 to 3 percent slopes, very stony	74.5	3.3%
Sc	Scantic silt loam, 0 to 3 percent slopes	76.5	3.4%
Sk	Skowhegan loamy fine sand	40.3	1.8%
StB	Stetson fine sandy loam, 0 to 8 percent slopes	2.6	0.1%
SuC2	Suffield silt loam, 8 to 15 percent slopes, eroded	16.2	0.7%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
SuD2	Suffield silt loam, 15 to 25 percent slopes, eroded	13.2	0.6%
TkC	Thorndike silt loam, 3 to 15 percent slopes, very rocky	25.6	1.1%
TkD	Thorndike silt loam 15 to 30 percent slopes, very rocky	45.0	2.0%
TtB	Thorndike-Bangor silt loams, 0 to 8 percent slopes	41.5	1.9%
TtC	Thorndike-Bangor silt loams, 8 to 15 percent slopes	18.5	0.8%
TtD	Thorndike-Bangor silt loams, 15 to 30 percent slopes	4.4	0.2%
W	Water	206.5	9.2%
Wa	Walpole fine sandy loam	135.0	6.0%
Totals for Area of Interest		**2,240.0**	**100.0%**

Maine Department of Inland Fish and Wildlife Environmental Review

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

October 25, 2019

Jessica Murray
TRC Companies, Inc.
14 Gabriel Dr
Augusta, ME 04330

RE: Information Request - Skowhegan Bridge Feasibility Study, Skowhegan

Dear Jessica:

Per your request received October 08, 2019, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and fisheries habitat concerns within the vicinity of the *Skowhegan Bridge Feasibility Study Project* in Skowhegan. Note that as project details are lacking, and due to the general nature and scale of the map that was provided, our comments are non-specific and should be considered preliminary.

Our Department has not mapped any Essential Habitats that would be directly affected by your project.

Endangered, Threatened, and Special Concern Species

Bats

Of the eight species of bats that occur in Maine, the three *Myotis* species are protected under Maine's Endangered Species Act (MESA) and are afforded special protection under 12 M.R.S §12801 - §12810. The three *Myotis* species include little brown bat (State Endangered), northern long-eared bat (State Endangered), and eastern small-footed bat (State Threatened). The five remaining bat species are listed as Special Concern: big brown bat, red bat, hoary bat, silver-haired bat, and tri-colored bat.

While a comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the project area during migration and/or the breeding season. However, our Agency does not anticipate significant impacts to any of the bat species as a result of this project.

Rare mussels

Three State Threatened species of rare freshwater mussels--the brook floater, the yellow lampmussel, and the tidewater mucket--have been documented in the Kennebec River. These rare animals have experienced declines throughout their ranges, with populations being extirpated due to low population densities, fragmented distributions, and limited or no evidence of recruitment. Freshwater mussels are

PHONE: (207) 287-5254
FISH AND WILDLIFE ON THE WEB: www.maine.gov/ifw
EMAIL ADDRESS: John.Perry@maine.gov

especially vulnerable to impacts from pollution, sedimentation, dams, and surrounding land use practices that degrade or alter aquatic habitat.

As the site of the proposed location continues to evolve, please contact us to discuss project details and the need for additional surveys and other protective measures for these species. We recommend that you work closely with MDIFW staff to design a project that minimizes the risk for potential Take and Harassment of MESA-protected species.

Bald Eagle

Until recently, bald eagles were listed as a Species of Special Concern in Maine. However, eagles continue to be protected under the federal Bald Eagle and Golden Eagle Protection Act ("Eagle Act") as well as other federal laws. Therefore, as there is an eagle nest within the project search area we recommend that you contact the U.S. Fish and Wildlife Service--Maine Fish and Wildlife Complex ((207)-469-7300) for further guidance.

Significant Wildlife Habitat

Significant Vernal Pools

At this time MDIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of SWHs subject to protection under the Natural Resources Protection Act (NRPA) within the project area, which include Waterfowl and Wading Bird Habitats, Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed. Therefore, we recommend that surveys for vernal pools be conducted within the project boundary by qualified wetland scientists prior to final project design to determine whether there are Significant Vernal Pools present in the area. These surveys should extend up to 250 feet beyond the anticipated project footprint because of potential performance standard requirements for off-site Significant Vernal Pools, assuming such pools are located on land owned or controlled by the applicant. Once surveys are completed, survey forms should be submitted to our Agency for review well before the submission of any necessary permits. Our Department will need to review and verify any vernal pool data prior to final determination of significance.

Fisheries Habitat

Construction Best Management Practices should be closely followed to avoid erosion, sedimentation, alteration of stream flow, and other impacts as eroding soils from construction activities can travel significant distances as well as transport other pollutants resulting in direct impacts to fish and fisheries habitat. In addition, we recommend that any necessary instream work occur between July 15 and October 1.

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas

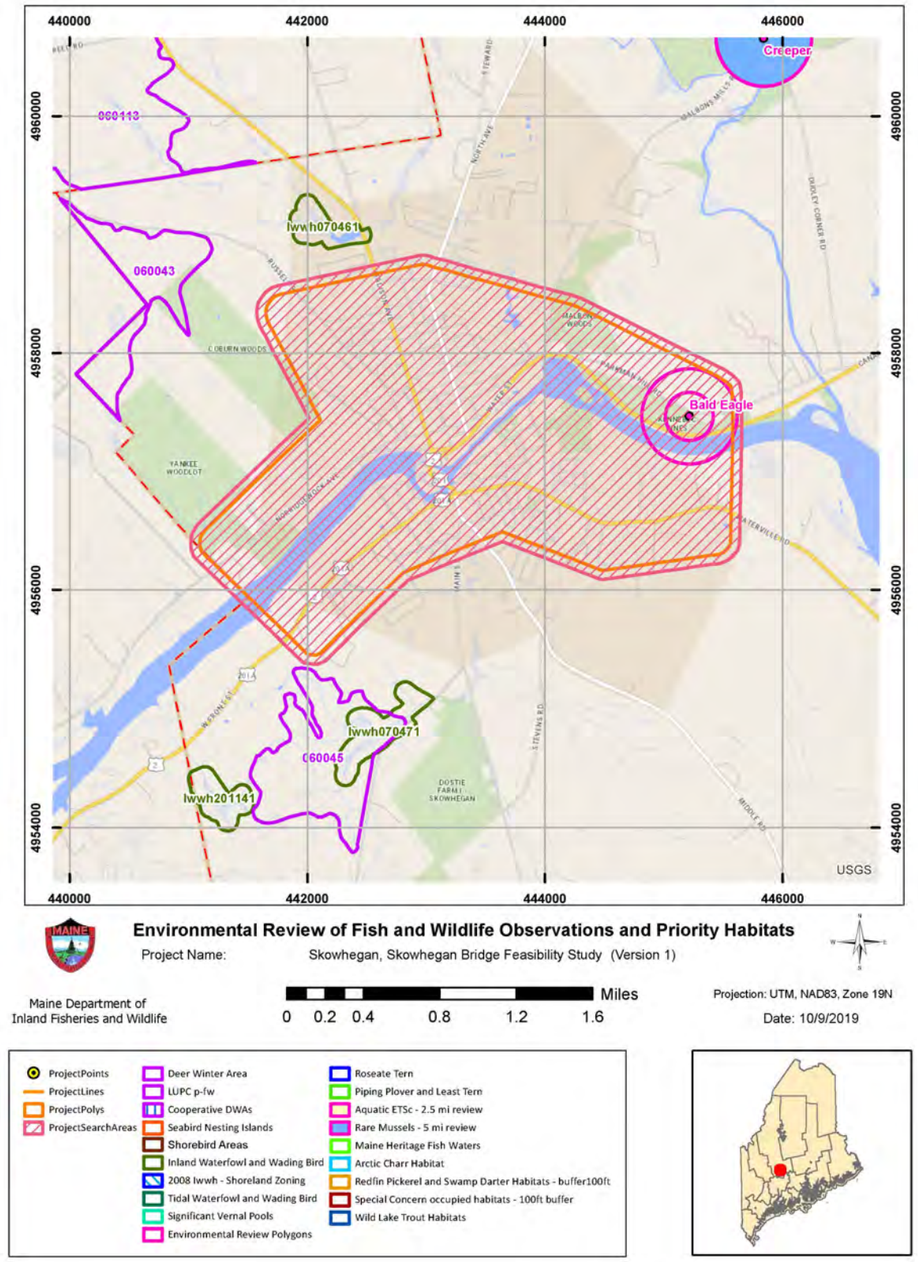
Letter to Jessica Murray
Comments RE: Skowhegan Bridge Feasibility Study, Skowhegan
October 25, 2019

Program and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

Becca Settele
Wildlife Biologist



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Appendix 3: Maine Natural Areas Program Consultation

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
177 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

October 21, 2019

Jessica Murray
TRC
14 Gabriel Drive
Augusta, ME 04330

Via email: jmurray@trccompanies.com

Re: Rare and exemplary botanical features in proximity to: Skowhegan Bridge Feasibility Study, Skowhegan, Maine

Dear Ms. Murray:

I have searched the Maine Natural Areas Program's Biological and Conservation Data System files in response to your request received October 8, 2019 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Skowhegan, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are several rare botanical features documented the study area. Please see the table below, attached map and factsheets, and shapefile included in the email response. If you are planning work in any areas near these features, please contact MNAP for further recommendations.

Feature	State Status	State Rank	Global Rank	Occurrence Rank	Site Name
Rivershore Outcrop *Bluebell – balsam ragwort shoreline*	N/A	S2	G3	BC Good-Fair	Kennebec River Great Eddy
Clinton's Bulrush *Trichophorum clintonii*	SC	S3	G4	C Fair	Kennebec River Great Eddy
Garber's Sedge *Carex garberi*	SC	S2	G5	C Fair	Kennebec River Great Eddy
Indian Grass *Sorghastrum nutans*	E	S1	G5	C Fair	Kennebec River Great Eddy
Long-leaved Bluet *Houstonia longifolia*	SC	S2S3	G5TNR	C Fair	Kennebec River Great Eddy

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM
90 BLOSSOM LANE, DEERING BUILDING

PHONE: (207) 287-8044
WWW.MAINE.GOV/DACF/MNAP

Letter to TRC
Comments RE: Skowhegan Bridge Feasibility
October 21, 2019
Page 2 of 2

Pale Green Orchis *Platanthera flava* var. *herbiola*	SC	S2	G4?TQ	H Historical	Kennebec River Great Eddy
Wild Garlic *Allium canadense*	SC	S2	G5	C Fair	Kennebec River Great Eddy
Hardwood Seepage Forest	N/A	S3	GNR	C Fair	Kennebec River MDOT Potential Corridor

This finding is for project scoping purposes only and should not be considered as a final review of the proposed project. When specific location options for the project or projects have been determined and updated environmental assessments have been completed, a subsequent review request should be submitted to us for recommendations regarding impacts to significant natural features prior to application submittal. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

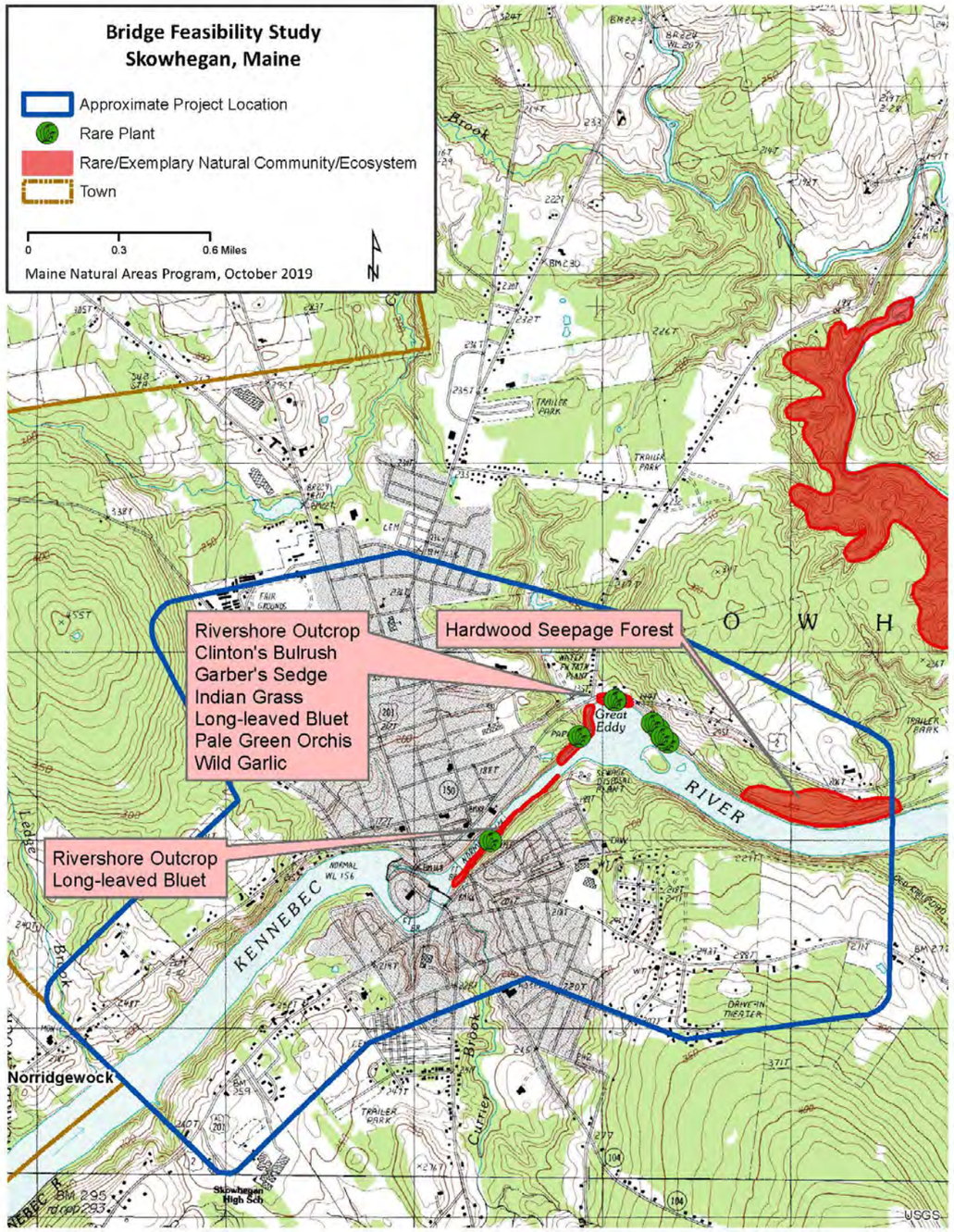
The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by MNAP are to be published in any form, the Program should be informed at the outset and credited as the source.

The Maine Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $225.00 for three hours of our services.

Thank you for using MNAP in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

Kristen Puryear | Ecologist | Maine Natural Areas Program
207-287-8043 | kristen.puryear@maine.gov


Bridge Feasibility Study
Skowhegan, Maine
Approximate Project Location
Rare Plant
Rare/Exemplary Natural Community/Ecosystem
Town
0
0.3
0.6 Miles
Maine Natural Areas Program, October 2019
N
Rivershore Outcrop
Clinton's Bulrush
Garber's Sedge
Indian Grass
Long-leaved Bluet
Pale Green Orchis
Wild Garlic
Hardwood Seepage Forest
Great Eddy
Rivershore Outcrop
Long-leaved Bluet
O W H
RIVER
KENNEBEC
Norridgewock
USGS

Rivershore Outcrop

Bluebell - Balsam Ragwort Shoreline Outcrop

State Rank S2

Community Description

Sparse rivershore vegetation is dominated by herbs with occasional low shrubs. Total cover rarely exceeds 25%. Typical herbs include three-toothed cinquefoil, common hairgrass, hairy goldenrod, silverrod, bluebell, balsam ragwort, and narrow false oats. Shrubs include dwarf bilberry, lowbush blueberry, shrubby cinquefoil, and shadbush; poison ivy may be locally abundant. Where soil allows the growth of taller shrubs (e.g., at the upland transition into adjacent shrub vegetation), red osier dogwood, round-leaved dogwood, and willows may occur. The rare species associated with most of these ledges show an affinity to northern areas; in central Maine, one may find more temperate indicator species, such as Indian grass and little bluestem.

Soil and Site Characteristics

This type occurs on dry ledges and outcrops along rivershores. Substrate is typically circumneutral or calcareous slate, with plants growing in vertical fissures. Sites are subject to annual flooding and ice scour, which allows at least a small amount of silt to accumulate in the rock crevices.

Rivershore Outcrop

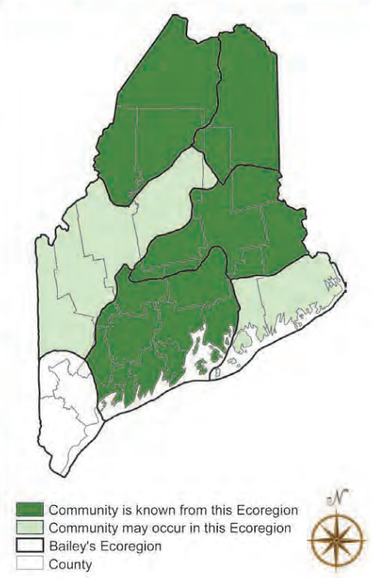
Diagnostics

Herb dominated sparse vegetation occurs on rivershore outcrops.

Similar Types

This is the only herb dominated rivershore ledge community type. Circumneutral Riverside Seeps share many species with moist pockets of these outcrops, but occur on gravelly (unconsolidated) substrates. The geographic transition seen from northern Maine rivers to those in central Maine may warrant splitting the central Maine occurrences into a "Bluestem Shoreline Outcrop" type, but more information is needed from both within and outside of Maine.

Location Map



Conservation, Wildlife, and Management Considerations

Many sites are visited on foot for recreation. In sites with moderate to heavy foot traffic, some degradation of the vegetation is apparent. A few sites show some degradation by exotic species such as Japanese knotweed. Several sites are in public ownership or private conservation ownership; many are privately owned.

These rivershore shrublands provide habitat for common bird species that inhabit open shrublands such as common yellowthroat, alder flycatcher, Wilson's warbler, and Lincoln's sparrow.

Distribution

Along the major rivers from central Maine northward and eastward. Extends east and north into New Brunswick and west into New Hampshire and Vermont.

Landscape Pattern: Small Patch. Linear.

Examples on Conservation Lands You Can Visit

- Allagash Lake, Allagash Wilderness Waterway – Piscataquis Co.
- Allagash Public Lands – Aroostook Co.
- Coburn Park – Somerset Co.
- Rocky Island Preserve – Aroostook Co.

Characteristic Plants

These plants are frequently found in this community type. Those with an asterisk are often diagnostic of this community.

Sapling/shrub
Meadowsweet
Morrow's honeysuckle
Poison-ivy
Red osier dogwood
Round-leaved dogwood
Shining willow

Dwarf Shrub
Dwarf bilberry
Lowbush blueberry
Velvet-leaf blueberry

Herb
Balsam ragwort
Bluebell
Common pussytoes
Dwarf raspberry
Early goldenrod
Field pussytoes
Kalm's lobelia
Narrow false oats
Silverrod
Stiff aster
Tufted hairgrass
Wild chive

Associated Rare Plants

Alpine milk-vetch
Clinton's bulrush
Cut-leaved anemone
Indian grass
Mistassini primrose
New England violet
Pale green orchis
Purple clematis
Soft-leaf muhly
St. John oxytrope

Maine Natural Areas Program

Maine Natural Areas Program Rare Plant Fact Sheet for Trichophorum clintonii

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Maine Natural Areas Program

Trichophorum clintonii (Gray) S.G. Smith

Clinton's Bulrush

- State Rank: S3
- Global Rank: G4
- State Status: Special Conern

Habitat: Dry or springy argillaceous or slaty ledges, gravel or open woods and turfy shores. [Open wetland, not coastal nor rivershore (non-forested, wetland); Non-tidal rivershore (non-forested, seasonally wet)]

Range: Quebec and New Brunswick to New York and Minnesota .

Aids to Identification: Members of the genus *Trichophorum* are sedges with solitary, terminal spikelets subtended by an enlarged scale. The achenes, which lack tubercles possessed by spikerushes, are subtended by 3-6, brown or white, perianth bristles. This short bulrush characteristically grows in dense, low tufts. The lower sheaths are bladeless, the upper bearing leaves shorter than the stem. The terminal spikelet is 4-5 mm wide and has 4-7 flowers. The achenes (fruits) are pale brown, 3-angled, and 1.4-2 mm wide. The triangular stem (in cross section) separates this from the very similar *T. cespitosum*, which has a round stem. Also closely related to *T. alpinum*, it can be distinguished by its brown bristles about 2 mm long.

Ecological characteristics: This species has been found in Maine growing on calcareous, ledgy shores.

Phenology: Perennial. Fruits May - July.

Family: Cyperaceae

Synonyms: *Baeothryon cespitosum* (L.) A. Dietr.; *Scirpus clintonii* Gray.

Known Distribution in Maine: This rare plant has been documented from a total of 23 town(s) in the following county(ies): Aroostook, Kennebec, Penobscot, Piscataquis, Somerset.

Reason(s) for rarity: At southern limit of range.

Conservation considerations: Known populations are small, but not currently subject to any particular human threat; it seems to persist on the few river ledges where it grows. Heavy recreational use of ledges could pose problems.

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http://www.maine.gov/dacf/mnap/features/tricli.htm[4/4/2017 11:08:18 AM]

Maine Natural Areas Program Rare Plant Fact Sheet for Carex garberi

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Maine Natural Areas Program

Carex garberi Fern.

Garber's Sedge

- State Rank: S2
- Global Rank: G5
- State Status: Special Concern

Habitat: Circumneutral shores and fens, in openings [Open wetland, not coastal or rivershore (non-forested wetland), non-tidal rivershore (non-forested, seasonally wet)]

Range: New Brunswick south to Maine, west to British Columbia, north to Alaska.

Aids to Identification: Members of this genus can be difficult to identify without careful examination of microscopic features and knowledge of general groups of species. Garber's Sedge is a member of the section *Bicolores*, a group recognized by its white and gold-orange lenticular-elliptical perigynia with a long sheath on the lowest carpellate bract. Garber's sedge closely resembles *Carex aurea*. Garber's sedge can be recognized by its blunt carpellate scales (acute in *C. aurea*). *Carex garberi* also retains its white perigynia in maturity; the perigynia turn orange at maturity for *C. aurea*.

Ecological characteristics: None noted

Phenology: Fruits in summer.

Family: Cyperaceae

Synonyms: *C. garberi* Fern. var. *bifaria* Fern. Also commonly known as Elk Sedge.

Known Distribution in Maine: This rare plant has been documented from a total of 27 towns in the following counties: Aroostook, Kennebec, Lincoln, Penobscot Piscataquis, Somerset .

Reason(s) for rarity: At southern limit of range. Circumneutral habitat in Maine is scarce.

Conservation considerations: The populations are persisting at known locations.

https://www.maine.gov/dacf/mnap/features/carxgar.htm[8/13/2018 9:18:19 AM]

Maine Natural Areas Program Rare Plant Fact Sheet for Carex garberi

For more information, see the New England Wild Flower Society's Conservation Plan for *Carex garberi* -pdf link- 268 KB.

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Department of Agriculture, Conservation and Forestry
22 State House Station
18 Elkins Lane
Augusta, ME 04333
More Locations

Phone: (207) 287-3200
Fax: (207) 287-2400
TTY Users Call Maine Relay 711
DACF@Maine.gov

Maine Natural Areas Program Rare Plant Fact Sheet for Sorghastrum nutans

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Maine Natural Areas Program

Sorghastrum nutans (L.) Nash

Indian Grass

- State Rank: S1
- Global Rank: G5
- State Status: Endangered

Habitat: Dry slopes, prairies, and borders of woods. [Non-tidal rivershore (non-forested, seasonally wet)]

Range: Quebec and Maine to Manitoba and North Dakota, south to Florida and Arizona.

Aids to Identification: Indian grass grows to a height of 1-2.5 m in loose tufts. The blades are 5-10 mm wide tapering to a narrow base. The golden panicle is 10-30 cm long and rather narrow with many branches. The spikelets are 6-8 mm long with awns of 1-1.5 cm. The florets, borne in pairs, are distinctive. One flower (sessile) is bisexual and will produce fruit. The second flower is represented only by a silky-pubescent pedicel.

Ecological characteristics: This species of grass is an important component of the tall-grass prairies in the Great Plains. In Maine, it has been documented from very few rivershores and lakeshores.

Phenology: Perennial. Fruits August - September.

Family: Poaceae

Synonyms: *Andropogon nutans* L.

Known Distribution in Maine: This rare plant has been documented from a total of 10 town(s) in the following county(ies): Androscoggin, Aroostook, Hancock, Kennebec, Oxford, Penobscot, Somerset, Waldo, York.

Reason(s) for rarity:
At northern limit of range.

Conservation considerations:
Known populations are small and subject to the vagaries of small populations like random fluctuations or localized disturbance events.

Maine Natural Areas Program Rare Plant Fact Sheet for Sorghastrum nutans

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Phone: (207) 287-3200
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https://www.maine.gov/dacf/mnap/features/sornut.htm[10/21/2019 9:30:28 AM]

Maine Natural Areas Program Rare Plant Fact Sheet for Houstonia longifolia

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Maine Natural Areas Program

Houstonia longifolia Gaertn.

Long-leaved Bluet

- State Rank: S2S3
- Global Rank: G4G5TNR
- State Status: Special Concern

Habitat: Slaty ledges or rivershore gravels, not strongly acidic. [Non-tidal rivershore (non-forested, seasonally wet)].

Range: Maine to Saskatchewan, south to Georgia, Oklahoma.

Aids to Identification: Bluets are small, slender plants with opposite stem leaves, small 4-petaled flowers, and inferior ovaries. The common bluet, *Houstonia caerulea*, found growing on lawns, has flowers that have a yellow center and horizontally spreading corolla lobes. *Houstania longifolia* has uniform colored white to pale blue flowers and ascending corolla lobes and occurs in different habitats.

Ecological characteristics: Usually found growing in slight cracks or depressions on rivershore ledges. Maine populations although apparently persistent are not large and the plants tend to be small.

Phenology:
Herbaceous perennial, flowers July - September.

Family: Rubiaceae

Synonyms: *Hedyotis longifolia* (Gaertn.) Hook.; *Hedyotis longifolia* (Gaertn.) Hook. var. *tenuifolia* (Nutt.) Torr. & Gray; *Hedyotis purpurea* (L.) Torr. & Gray var. *longifolia* (Gaertn.) Fosberg; *Houstonia longifolia* Gaertn. var. *glabra* Terrell; *Houstonia longifolia* Gaertn. var. *tenuifolia* (Nutt.) Wood; *Houstonia tenuifolia* Nutt.; *Oldenlandia purpurea* (L.) Gray var. *tenuifolia* (Nutt.) Gray *ex* Chapman.

Known Distribution in Maine: This rare plant has been documented from a total of 24 town(s) in the following county(ies): Cumberland, Kennebec, Penobscot, Piscataquis, Sagadahoc, Somerset.

Reason(s) for rarity: Habitat naturally scarce, at northern limit of range.

Conservation considerations: Known populations are small, but the plant seems to persist on the few river ledges where it grows. Heavy recreational use of ledges could pose problems.

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Maine Natural Areas Program

Platanthera flava (L.) Lindl. var. *herbiola* (R. Br. *in* Ait. & Ait. f.) Luer

Pale Green Orchis

- State Rank: S2
- Global Rank: G4T4Q
- State Status: Special Concern

Habitat: Swampy woods, bottomlands, swales, and wet shores. [Non-tidal rivershore (non-forested, seasonally wet); Open wetland, not coastal nor rivershore (non-forested, wetland)]

Range: Nova Scotia and New Brunswick, southern Ontario, Minnesota south to upland Virginia, Tennessee to Missouri.

Aids to Identification: Members of the genus *Platanthera* are known by their uniformly colored, spurred flowers. The lowermost petal, called the labellum, is highly modified in these orchids and does not resemble the other sepals and petals. *Platanthera flava* grows 10-60 cm high with several large, alternate leaves along the stem, terminating in a compact, slender floral raceme. The long-lasting greenish and fragrant flowers have a slender spur longer than the lip (the larger, modified, lower petal). The oblong lip curving under the flower is neither 3-lobed nor fringed but has a tubercle (a fin-like protuberance) near the center. The northern variety, *herbiola*, is distinguished from the southern, typical variety (which is not known to occur in Maine but does occur in Nova Scotia) by its large leaves extending up the stem and floral bracts more than twice as long as the flowers.

Ecological characteristics: The habitat in which this orchid is found is quite variable across the species's range. In some parts, it is most frequent in low wet woods where it may stand in shallow water thick with decaying leaves; in others, it may be found in dry sterile soil or salt marshes. In our area, it is most often found in the damp circumneutral soil of either ledgy river shores or alluvial woods. The tubercle on the lower lip and a matching ridge on the roof of the flower divide the entrance of the nectary into two channels which direct the small moth and mosquito pollinators under one or the other of the diverging anther-sacs.

Maine Natural Areas Program Rare Plant Fact Sheet for Platanthera flava

Phenology: In Maine, flowers in July.

Family: Orchidaceae

Synonyms: *Habenaria flava* (L.) R. Br.; Perularia flava (L.) Farw.

Known Distribution in Maine: This rare plant has been documented from a total of 39 town(s) in the following county(ies): Aroostook, Cumberland, Franklin, Hancock, Kennebec, Knox, Lincoln, Oxford, Penobscot, Piscataquis, Somerset, Waldo, York.

Reason(s) for rarity: In Maine, habitat depletion.

Conservation considerations: Maintain hydrologic integrity of its rivershore habitat, including the natural disturbance by water and ice. Orchids are popular among some speciality gardeners, and populations are vulnerable to unscrupulous or uneducated collectors. Plants dug from the wild usually do not survive; moreover, removing these plants harms the natural population and may cause its eventual disappearance. This plant has not been propagated successfully, and any plants offered for sale have been dug from the wild.

http://www.maine.gov/dacf/mnap/features/plafla.htm[12/5/2016 11:25:01 AM]

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Maine Natural Areas Program

Allium canadense L.

Wild Garlic

- State Rank: S2
- Global Rank: G5
- State Status: Special Concern

Habitat: Alluvial woods, thickets, and meadows. [Forested wetland; Hardwood to mixed forest (forest, upland)]

Range: New Brunswick to North Dakota, south to Florida and Texas.

Aids to Identification: Tight clumps of soft, linear, not hollow, keeled leaves with a distinctly onion-like smell. The bulbs are 1-3 cm long and have a fibrous outer coat with diamond-shaped spaces between the nerves. The flowers are pink or white, but are often replaced by sessile bulblets.

Ecological characteristics: Usually found in rich wooded bottomlands (hardwood floodplain forests), in alluvial soils near streams. Vegetative reproduction, both by the inflorescence bulblets and underground bulbs, is common and the plant may become dominant, its leaves forming dense mats over small areas.

Phenology: Flowers in early summer.

Family: Alliaceae

Synonyms: Represented in Maine by *Allium canadense* var. *canadense*. Synonyms include *Allium canadense* L. var. *robustum* Farw.

Known Distribution in Maine: This rare plant has been documented from a total of 17 town(s) in the following county(ies): Aroostook, Cumberland, Kennebec, Knox, Penobscot, Somerset, York.

Reason(s) for rarity: At northern limit of its range, not rare southward.

Conservation considerations: Effects of logging are not well known; partial removal of the canopy would be less likely to adversely affect the plant than would complete removal.

Maine Natural Areas Program Rare Plant Fact Sheet for Allium canadense

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http://www.maine.gov/dacf/mnap/features/allcan.htm[11/2/2016 3:41:13 PM]

Hardwood Seepage Forest

State Rank S3

Hardwood Seepage Forest

Community Description

These closed canopy to partial canopy forests support a mixture of mostly deciduous overstory trees. Yellow birch, red maple, and/or green, black, or white ash are usually prominent species (35-85% cover each, sometimes lower). Hemlock or, less often, red spruce may create a mixed canopy (>25% conifer), with locally dense conifers. Sugar maple, beech, and red oak are occasional. The understory is usually open, with few shrubs and patches of tree regeneration. The herb layer is typically patchy, and reflects the underlying seepage gradients. Skunk cabbage, jewel weed, sensitive fern, and cinnamon fern occur in the wettest areas, and species less restricted by soil moisture occur elsewhere. Bryoids are sparse.

Soil and Site Characteristics

Sites occur on slight slopes (<15%) and adjacent bottoms where an impervious soil layer (~30 cm deep), such as marine clay or packed till, forces seepage water near the surface. Sites often occur at breaks in slope – either at the base of a slope, or on a slope bench. Soils are loamy, or grading to silty in flats, and moderately acidic to neutral (pH 5.2-7.0). Soils place this as a wetland type, but some sites may grade from wetland to upland as one moves upslope. Small sites, or 'forest seeps' (i.e., less than one acre) are frequent and are typically considered as inclusions within the broader forest rather than distinct natural communities.

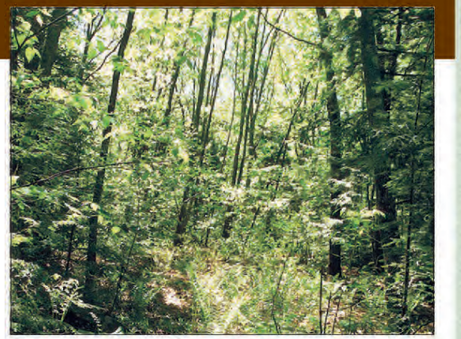
Diagnostics

Ash and/or yellow birch are common in the canopy (red oak is prominent at some sites). Red maple may be present but is not dominant. Wetland species are common in the herb layer. Soils are saturated and often temporarily flooded.

Similar Types

Hemlock - Hardwood Pocket Swamps feature hemlock and/or red maple as dominants, have heaths or winterberry in the shrub layer, and typically occur in distinct basins. Some Maple - Basswood - Ash Forests may have areas of wet soils, but have very different herb layer composition. Red Maple - Sensitive Fern Swamps can occur in similar settings but have different canopy composition.

Location Map



Hardwood Seepage Forest

Conservation, Wildlife, and Management Considerations

Many sites are on land with a long settlement history and have been either cleared or harvested in the past. Because these tend to occur as small forest patches, their conservation depends in part on maintaining some surrounding forest cover (both upslope and downslope) as a buffer. Like vernal pools, recognition of this type is more difficult in the winter, when snow cover and plant senescence may make it difficult to distinguish these sites from upland forest. Seeps may remain unfrozen through the winter, making it difficult to operate logging equipment.

Birds using a variety of hardwood types may use these communities. Cool, well oxygenated forested seeps provide habitat for the northern spring salamander. Occurrences of this community type in southern Maine may host the rare spicebush swallowtail butterfly, whose larvae feed only on spicebush and sassafras.

Distribution

Statewide, though not well documented

Landscape Pattern: Small Patch. Occurrences less than one acre are generally considered inclusions rather than distinct natural communities.

Characteristic Plants

These plants are frequently found in this community type. Those with an asterisk are often diagnostic of this community.

Canopy
American beech
Eastern hemlock*
Green ash*
Red oak
Red spruce
Sugar maple
Yellow birch*

Sapling/shrub
American beech
Red spruce*

Herb
Bluejoint
Cinnamon fern*
Common speedwell
Goldthread
Jack-in-the-pulpit
New York fern
Sensitive fern*
Spinulose wood fern

Bryoid
Dicranum moss
Sphagnum mosses*

Associated Rare Plants

Spicebush
Swamp saxifrage

Associated Rare Animals

Northern spring salamander
Spicebush swallowtail

Examples on Conservation Lands You Can Visit

- Dickwood IFW Lot – Aroostook County
- Sears Island – Penobscot Co

Maine Natural Areas Program

STATE RARITY RANKS

S1 Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
S2 Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
S3 Rare in Maine (20-100 occurrences).
S4 Apparently secure in Maine.
S5 Demonstrably secure in Maine.
SU Under consideration for assigning rarity status; more information needed on threats or distribution.
SNR Not yet ranked.
SNA Rank not applicable.
S#? Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

Note: **State Rarity Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines State Rarity Ranks for animals.

GLOBAL RARITY RANKS

G1 Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.
G2 Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
G3 Globally rare (20-100 occurrences).
G4 Apparently secure globally.
G5 Demonstrably secure globally.
GNR Not yet ranked.

Note: **Global Ranks** are determined by NatureServe.

STATE LEGAL STATUS

Note: State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered** and **Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

E ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
T THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

NON-LEGAL STATUS

SC SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
PE Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

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http://www.maine.gov/dacf/mnap

ELEMENT OCCURRENCE RANKS - EO RANKS

Element Occurrence ranks are used to describe the quality of a rare plant population or natural community based on three factors:

- **Size**: Size of community or population relative to other known examples in Maine. Community or population's viability, capability to maintain itself.
- **Condition**: For communities, condition includes presence of representative species, maturity of species, and evidence of human-caused disturbance. For plants, factors include species vigor and evidence of human-caused disturbance.
- **Landscape context**: Land uses and/or condition of natural communities surrounding the observed area. Ability of the observed community or population to be protected from effects of adjacent land uses.

These three factors are combined into an overall ranking of the feature of **A**, **B**, **C**, or **D**, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

Note: **Element Occurrence Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines Element Occurrence ranks for animals.

Visit our website for more information on rare, threatened, and endangered species!
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Information for Planning and Consultation Unofficial Species List

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

Last login November 01, 2019 05:51 AM MDT

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Skowhegan Bridge Feasibility Study

LOCATION

Somerset County, Maine

DESCRIPTION

Maine Department of Transportation (MaineDOT) and the Town of Skowhegan have identified the need to improve the resiliency and sustainability of the state transportation system in the Skowhegan area. This Study is a collaboration between the Town of Skowhegan and MaineDOT that will examine the alternatives involving a second bridge across the Kennebec River in Skowhegan to reduce traffic congestion along Routes 2 and 201.

Local office

Maine Ecological Services Field Office

(207) 469-7300
(207) 902-1588

MAILING ADDRESS

P. O. Box A
East Orland, ME 04431

PHYSICAL ADDRESS

306 Hatchery Road
East Orland, ME 04431

http://www.fws.gov/mainefieldoffice/index.html

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Atlantic Salmon *Salmo salar* There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/2097	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Atlantic Salmon *Salmo salar* https://ecos.fws.gov/ecp/species/2097#crithab	Final

NOT FOR CONSULTATION

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Canada Warbler *Cardellina canadensis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Evening Grosbeak *Coccothraustes vespertinus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Aug 10

Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Jul 20
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

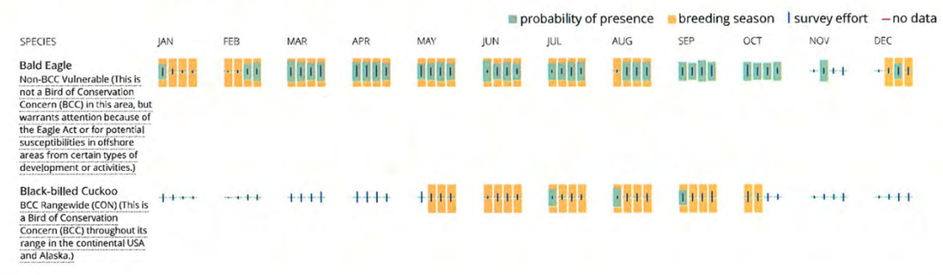
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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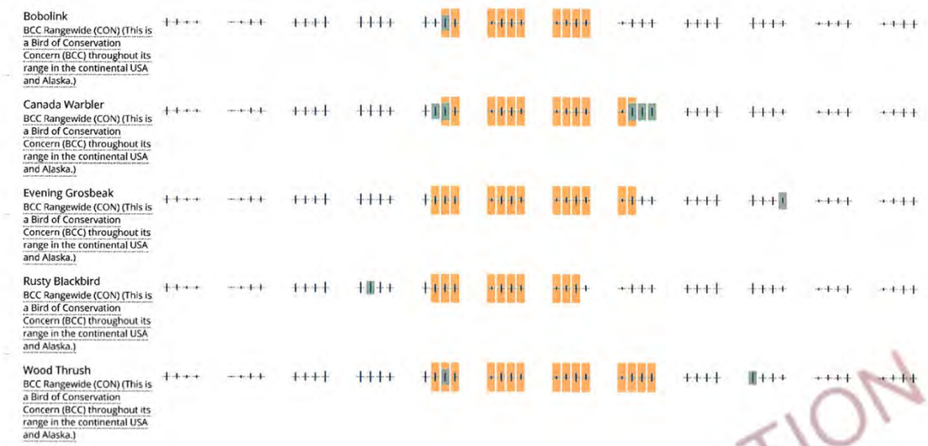

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND
- PEM1C
- PEM1Cd
- PEM1Fh

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PEM1E

FRESHWATER FORESTED/SHRUB WETLAND

PSS1C
PFO1C
PFO4E
PSS1/4E
PSS1E

FRESHWATER POND

PUBHh
PUBHx

LAKE

L1UBHh

RIVERINE

R2UBH
R4SBC
R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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Appendix D - Detailed Future Level of Service Results

Table 9.1 – Level of Service Summary														
Intersection/Approach Lane	2019 Existing		2045 No-Build		Alternative 2 TSM Improvements (Three Lane Bridge)		Alternative 3 TSM Improvements (Four Lane Bridge)		Alternative 4 Downstream Bridge Crossing		Alternative 5 Downtown Bridge Crossing		Alternative 6 Upstream Bridge Crossing	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Main Street/Island Avenue/West Front Street/Waterville Road (S)														
West Front Street EBL	D	E	E	F	E	F	C	D	D	D	D	D	D	F
West Front Street EBLT	N/A	N/A	N/A	N/A	N/A	N/A	D	D	N/A	N/A	N/A	N/A	N/A	N/A
West Front Street EBT	N/A	N/A	F	F	F	F	N/A	N/A	E	E	D	F	D	E
West Front Street EBTR (for Existing 2019 Only)	F	F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
West Front Street EBR (Future Right Turn Lane Improvement)	N/A	N/A	A	A	A	A	A	A	A	A	A	A	A	A
Waterville Road WBLT	D	E	E	F	E	F	D	E	F	D	D	F	D	F
Waterville Road WBR	C	C	C	E	C	E	B	C	B	C	B	C	B	D
Main Street NBL	D	E	E	E	N/A	N/A	N/A	N/A	F	D	F	E	D	D
Main Street NBLT	N/A	N/A	N/A	N/A	E	D	F	F	N/A	N/A	N/A	N/A	N/A	N/A
Main Street NBTR	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Island Avenue SBL	N/A	N/A	N/A	N/A	N/A	N/A	E	D	N/A	N/A	N/A	N/A	N/A	N/A
Island Avenue SBL	E	D	F	F	F	F	E	D	D	C	C	D	D	D
Island Avenue SBT	D	C	E	D	F	D	D	C	E	C	F	D	D	C
Island Avenue SBR	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Overall	E	F	F (194)	F (211)	F (163)	F (206)	F (96)	F (97)	D (55)	F (168)	E (59)	E (70)	F (73)	F (92)
Island Avenue/Water Street/Madison Avenue (U)														
Madison Avenue SBL	A	A	A	A	N/A	N/A	N/A	N/A	A	A	A	A	A	A
Madison Avenue SBLR	N/A	N/A	N/A	N/A	A	A	A	A	N/A	N/A	N/A	N/A	N/A	N/A
Madison Avenue SBR	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Island Avenue NET	N/A	N/A	N/A	N/A	A	A	A	A	N/A	N/A	N/A	N/A	N/A	N/A
Island Avenue NET	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Overall	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Madison Avenue/Elm Street/Commercial Street (S), (U, for Existing 2019)														

Table 9.1 – Level of Service Summary

Intersection/Approach Lane	2019 Existing		2045 No-Build		Alternative 2 TSM Improvements (Three Lane Bridge)		Alternative 3 TSM Improvements (Four Lane Bridge)		Alternative 4 Downstream Bridge Crossing		Alternative 5 Downtown Bridge Crossing		Alternative 6 Upstream Bridge Crossing	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Elm Street EBL	F	D	E	D	F	D	F	D	F	F	D	C	B	C
Elm Street EBR	E	B	C	C	C	B	C	B	F	E	C	B	C	C
Commercial Street WBL	D	A	B	A	B	A	B	A	B	A	A	A	A	A
Commercial Street WBT	F	A	B	B	B	B	B	B	B	B	A	A	B	B
Commercial Street WBR	A	A	A	A	A	A	A	A	A	A	A	A	A	B
Madison Avenue SBT	A	A	F	C	A	A	B	A	F	B	C	A	E	D
Madison Avenue SBTR	A	A	C	B	A	A	B	A	D	B	B	B	C	B
Overall	C	A	C	B	A	A	B	A	D	B	B	A	C	C
Water Street/Court Street/Commercial Street (U)														
Water Street WBTR	A	A	A	A	A	B	A	B	A	A	A	A	A	A
Pattern Court NBLTR	A	B	A	B	B	D	A	B	A	B	A	B	A	B
Court Street SBR	A	A	A	A	A	B	A	B	A	A	A	A	A	A
Water Street NEL	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Water Street NBLTR	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Overall	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Water Street/North Avenue (U)														
Water Street EBLT	A	A	A	A	A	A	A	A	A	A	N/A	N/A	A	A
Water Street WBTR	A	A	A	A	A	A	A	A	A	A	N/A	N/A	A	A
North Avenue SBLR	A	A	A	A	A	B	B	B	A	A	N/A	N/A	B	A
Overall	A	A	A	A	A	A	A	A	A	A	N/A	N/A	A	A
Madison Avenue/Pleasant Street/High Street														
Pleasant Street EBLTR	B	B	C	B	B	B	B	B	C	B	B	B	C	C
High Street WBL	C	C	E	C	C	C	C	C	F	C	B	C	C	C
High Street WBTR	A	A	E	A	A	A	A	A	F	A	A	B	A	A
Madison Avenue NBLT	A	A	A	A	B	A	A	A	A	A	A	A	B	B

Table 9.1 – Level of Service Summary														
Intersection/Approach Lane	2019 Existing		2045 No-Build		Alternative 2 TSM Improvements (Three Lane Bridge)		Alternative 3 TSM Improvements (Four Lane Bridge)		Alternative 4 Downstream Bridge Crossing		Alternative 5 Downtown Bridge Crossing		Alternative 6 Upstream Bridge Crossing	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Madison Avenue NBTR	A	A	B	A	B	A	B	A	A	A	A	A	B	B
Madison Avenue SBLT	A	B	F	B	B	B	B	C	F	A	B	F	E	D
Madison Avenue SBTR	A	A	F	A	A	A	A	A	F	A	A	A	E	B
Overall	B	B	F	B	B	B	B	B	F	A	A	C	D	C
North Avenue/High Street (S)														
High Street EBLTR	A	B	B	B	B	B	B	B	A	A	A	B	A	B
High Street WBLTR	A	A	B	A	A	A	A	A	A	A	C	A	A	A
North Avenue NBLTR	A	A	A	A	A	A	A	A	A	A	B	B	A	B
North Avenue SBLTR	A	A	B	A	A	A	A	A	A	A	A	A	A	B
Overall	A	A	B	A	A	A	A	A	A	A	B	B	A	A
Court Street/High Street (U)														
High Street EBLTR	A	A	A	A	A	A	A	A	A	A	A	A	A	A
High Street WBLTR	A	A	B	A	A	A	A	A	D	A	A	A	A	A
Court Street NBLTR	A	A	C	A	A	A	A	A	F	A	A	A	A	A
Court Street SBLTR	A	A	D	A	A	A	A	A	E	A	A	A	A	A
Overall	A	A	B	A	A	A	A	A	D	A	A	A	A	A
Madison Street/Jewett Street (S)														
Jewett Street WBLR	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Madison Street NBT	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Madison Street NBTR	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Madison Street SBLT	A	A	A	A	A	B	B	B	A	A	A	A	A	B
Madison Street SBT	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Overall	A	A	A	A	A	A	A	A	A	A	A	A	A	A
North Avenue/Jewett Street (U)														
Jewett Street EBLR	A	A	A	B	A	B	A	B	A	A	A	B	A	B

Table 9.1 – Level of Service Summary														
Intersection/Approach Lane	2019 Existing		2045 No-Build		Alternative 2 TSM Improvements (Three Lane Bridge)		Alternative 3 TSM Improvements (Four Lane Bridge)		Alternative 4 Downstream Bridge Crossing		Alternative 5 Downtown Bridge Crossing		Alternative 6 Upstream Bridge Crossing	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
North Avenue NBLT	A	A	A	A	A	A	A	A	A	A	A	A	A	A
North Avenue NBTR	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Overall	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Water Street/High Street (U)														
Water Street EBLT	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Water Street WBTR	A	A	A	A	A	A	A	A	A	A	A	A	A	A
High Street SBLR	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Overall	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Proposed Downstream Bridge/Route 2(S)														
Route 2 SEL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Route 2 SET	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Route 2 NWT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	N/A	N/A	N/A	N/A
Route 2 NWR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Proposed Downstream Bridge SWL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	N/A	N/A	N/A	N/A
Proposed Downstream Bridge SWR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Overall	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Proposed Downstream Bridge/Waterville Road (S)														
Waterville Road EBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	B	N/A	N/A	N/A	N/A
Waterville Road EBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Waterville Road EBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Waterville Road EBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Proposed Downstream Bridge SWBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	N/A	N/A	N/A	N/A
Proposed Downstream Bridge SWBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Overall	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A	N/A	N/A
Water Street/North Avenue/Proposed Downtown Bridge (S)														

Table 9.1 – Level of Service Summary														
Intersection/Approach Lane	2019 Existing		2045 No-Build		Alternative 2 TSM Improvements (Three Lane Bridge)		Alternative 3 TSM Improvements (Four Lane Bridge)		Alternative 4 Downstream Bridge Crossing		Alternative 5 Downtown Bridge Crossing		Alternative 6 Upstream Bridge Crossing	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Water Street EBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	N/A	N/A
Water Street EBTR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	N/A	N/A
Water Street WBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	N/A	N/A
Water Street WBTR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C	C	N/A	N/A
Proposed Downtown Bridge NBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	N/A	N/A
Proposed Downtown Bridge NBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C	A	N/A	N/A
Proposed Downtown Bridge NBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A
North Avenue SBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	A	N/A	N/A
North Avenue SBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	N/A	N/A
North Avenue SBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A
Overall	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	N/A	N/A
Free Street/Proposed Downtown Bridge/Waterville Road (S)														
Waterville Road EBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	B	N/A	N/A
Waterville Road EBTR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A
Waterville Road WBTL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A
Waterville Road WBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A
Free Street NBLTR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B	N/A	N/A
Proposed Downtown Bridge SBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	E	N/A	N/A
Proposed Downtown Bridge SBTR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A	N/A	N/A
Overall	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	C	N/A	N/A
Proposed Upstream Bridge/Norridgewock Avenue (S)														
Norridgewock Avenue EBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	A
Norridgewock Avenue EBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A
Norridgewock Avenue WBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A
Norridgewock Avenue WBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A

Table 9.1 – Level of Service Summary														
Intersection/Approach Lane	2019 Existing		2045 No-Build		Alternative 2 TSM Improvements (Three Lane Bridge)		Alternative 3 TSM Improvements (Four Lane Bridge)		Alternative 4 Downstream Bridge Crossing		Alternative 5 Downtown Bridge Crossing		Alternative 6 Upstream Bridge Crossing	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Proposed Upstream Bridge NBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B
Proposed Upstream Bridge NBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A
Overall	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A
Proposed Upstream Bridge/West Front Street (S)														
West Front Street EBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A
West Front Street EBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A
West Front Street NBT	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	B
West Front Street NBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A
Proposed Upstream Bridge SBL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	B	B
Proposed Upstream Bridge SBR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A
Overall	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	A

Appendix E – Meeting Notes

Skowhegan Bridge Feasibility Study

Joint Planning Study between the Town of Skowhegan and Maine Department of Transportation

Public Meeting Highlights Report

Tuesday, September 10, 2019

Skowhegan Community Center, 39 Poulin Drive, Skowhegan, Maine

This report contains notes taken on the spot by Facilitator Craig Freshley. It is not a complete reflection of all that was discussed, has not been checked for accuracy, and has not been approved by the group.

About the Meeting

The purpose of this meeting was to:

1. Explain to the general public about the study.
2. Share with the public what the study team has learned so far about existing conditions.
3. Gather input from the public on the following questions:
    - What are your most significant concerns that you think a new bridge could address?
        - In other words: what would be the advantages of a new bridge?
    - What concerns might a new bridge create?
        - In other words: what would be the disadvantages of a new bridge?
    - What are your ideas for solutions to these concerns?
        - If a new bridge were to be built, where do you think it should it be located, including constraints and opportunities with each location idea? If you don't think a new bridge should be built, what are your other ideas for solutions to these concerns?

The meeting was facilitated by Study Team Member Craig Freshley of Good Group Decisions. Study Team Member Tom Errico of TY Lin made a presentation. Nathan Howard was also on hand, representing the Maine Department of Transportation.

Town Manager Christine Almand introduced members of the Skowhegan Bridge Committee. About 60 people were in attendance.

Public Input Key Points

Concerns that could be addressed

- Fewer trucks
- Safety
    - Reduce the chance of spills from trucks
    - Improve pedestrian safety
    - Better emergency response
    - Perception of safety
    - A new bridge could be high enough for future floods
- Mobility
    - Increased redundancy (another way across the river if a bridge is blocked)
    - Reduce traffic congestion
    - Improve downtown traffic flow
    - People from the east could get to Waterville
    - People from the south could more easily get into town

Concerns that could be created

- If a new bridge is too close to the existing bridge, it might not have the intended effect
- Impact the local roads near a new bridge
    - Could require road improvements
    - Could increase traffic in other places
- The high levels of vehicular traffic could just be redirected to become someone else's problem
- If the citizens don't resolve this, MDOT might "resolve it" for us
    - Or MDOT might not do anything
- Property taken off the tax rolls
- More or same congestion at the intersections that are already congested
- Could impact trail designs

Ideas for solutions

- Bypass just the trucks and not the cars
- Upgrade existing roads

- A new bridge to the east (near where the eagle was)
- A bridge that connects 2 existing roads (not a bypass)

- Upgrade the existing bridges
- Add to existing bridges
    - Would require upgrading adjacent roads

- Take land from Skowhegan Plaza and improve the adjacent intersection

- Round-a-bouts

MaineDOT

Skowhegan Bridge Feasibility Study Public Input

Meeting Report

Thursday, June 25, 2020
Zoom
7:00- 8:30PM

Good Group Decisions

98 Maine Street, Brunswick, Maine, 04011 207-729-5607 www.GoodGroupDecisions.com

About the Meeting

Purpose

The Town of Skowhegan is partnering with the Maine Department of Transportation on a Joint Planning Study to look at the feasibility of a second bridge over the Kennebec River in Skowhegan. The Study Team has been evaluating current conditions and future alternatives and has considered public input provided at the first Public Input Meeting on September 10, 2019.

This was the second public input meeting with a focus on alternatives. This meeting addressed two things: (1) The Study Team presented findings to date and alternatives for going forward, (2) The public asked questions and provided input.

Attendance

- Panelists
  - Christine Almand, Town Manager
  - Nate Howard, Maine DOT Planning
  - Tom Errico, T.Y. Lin International
  - Greg Dore, Skowhegan Road Commissioner
  - Craig Freshley, Good Group Decisions, Facilitator

- Viewers
  - 17 members of the public on Zoom
  - 29 members of the public via Facebook Live

Planned Agenda

1. Opening and Introductions
2. Meeting Agenda
3. Study Team
4. Study Area
5. Purpose and Need
6. What we heard at the first public meeting
7. Existing Transportation Conditions Update
8. Explanation of Alternatives
9. Public Input
10. Schedule/Next Steps

Opening and Introductions

Christine Almand, Town Manager, began the meeting and made a few opening statements. She welcomed everyone and thanked the public for joining. She stated that this was a joint effort between the town and the State of Maine. She noted that this was the 2nd Public Meeting for the Skowhegan Bridge Feasibility Study.

Christine introduced the other study team members that were joining by video. Study team members were as follows:

- Nate Howard from Maine DOT Planning
- Tom Errico from T.Y. Lin International
- Craig Freshley from Good Group Decisions
- Greg Dore the Skowhegan Road Commissioner

Christine introduced the Bridge Committee Members as well, by reading their names, as follows:

- Christine Almand
- Greg Dore
- Betty Austin
- Jason Gayne
- Steve Govoni
- Joel Greenwood
- Sam Hight
- Christian Savage
- Roger Staples
- Mark Wilson
- Rod Whittemore

Christine outlined that the Study would identify recommendations based on factors like mobility, safety, environmental constraints, cost, etc. She stated that after the study, Selectman would formally request that Maine DOT move forward with recommendations. And after that, Maine DOT Commissioner would make decision to include funding for permitting and preliminary design in 3-year Workplan.

Christine handed the meeting over to facilitator Craig Freshley. Craig then introduced himself, his role on the study team, Good Group Decisions, and his Associate Marlene Flaherty as note taker.

Craig added that the two primary purposes of the meeting were to explain what we have come up with so far in regards to conditions and needs, and to create an opportunity for public input.

Craig explained that those participating via Zoom could ask questions and make comments in the meeting. He added that there would also be an online survey available, and that the link to access the survey appeared in the chat on Zoom as well as on the town website.

He reminded everyone that the Study Team was quite large and that they were doing analysis and providing recommendations. He clarified that the study area was quite limited, only looking at the areas close to downtown.

Purpose and Need

Craig began the presentation by reading aloud and showing on the screen the purpose and need of the study, as follows:

- 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.

Craig stated that what the study was trying to do was to find an alternative that would satisfy the study's purpose and need.

What we heard at the first public meeting

Craig reminded everyone that this was the second meeting, with the first held back in September. He then shared the following summary of highlights gathered in the first meeting.

- Key concerns that could be addressed
  - <u>Better Safety</u>
    - Chance of spills from trucks
    - Pedestrian safety
    - Better emergency response
  - <u>Better Mobility</u>
    - Increased redundancy (another way across the river if a bridge is blocked)
    - Reduce traffic congestion
    - Improve downtown traffic flow
  - <u>Fewer trucks</u>
    - More attractive downtown experience, a big concern with trucks going through downtown

Public Input

To start, Craig asked Tom to look at the questions that had been posed in the Q&A during the presentation and to answer them the best that he could.

Questions and Discussion from Zoom Q&A

- When discussing these options what is the projected impact at the Southside Intersection. It seems that three of the four options still rely on that intersection to move the vehicular traffic. That seems to defeat the purpose.
  - Tom answered by saying that they have not quite gotten to a conclusion, but that this statement is pretty fair. It is likely that there would have to be other improvements in addition building a new bridge up or down stream. The downtown bridge is likely to have a positive impact on the traffic.

- If you just make the current bridge larger, what about the businesses that are on the Island currently?
  - To answered that there would be impact, we have not laid this alignment out – but we will look closely and define these impacts.

- What about using the current walking bridge as the downtown?
  - The existing bridge would not carry traffic.

- There are several people talking about ATVs, is there a way to also look at adding a ATV lane in like Norridgewock bridge? Just looking at the future, and maybe a bicycle lane?
  - We will take this comment under consideration, great comment.

Craig asked for comments from the viewers, stating that they could contribute questions on Facebook Live, or share on Zoom directly. Craig asked for any other questions or comments from the public. He acknowledged the uniqueness of being on Zoom.

Questions and Discussion from Facebook Live and Zoom

- Mention of the white-water park and concerns about impacts on this park, specific to the surf wave section.
- Suggestion to do the public forum in another way. Off of Zoom. Suggestion to think of another way to gather public input. Another way and another time.
    - Craig acknowledged that we are doing the best we can, and that we do have 40 people viewing tonight. The video will remain on the town's Facebook Page as well. The survey will be open and collecting comments over the next two weeks. There are opportunities to give more feedback.
        - There were about the same amount of folks participating at the first meeting in September, and we do have another public input meeting planned.
- The solutions presented do not seem to address the heavy commercial traffic coming down the avenues, which has had an impact on the historic structure of the town. The best presented option seems to bracket downtown more. This will make having the downtown as a historic place to visit a challenge. It seems that we should be more forward looking.
    - Craig asked for an idea in response to this issue?
        - Yes, there has been a dialogue about upgrading 201 to interstate standards (this has been done in Quebec) – which actually drove traffic out of Maine and into update New York.
            - This would be expensive in the short-term, but would have long-term benefits for the town.
    - Craig asked if this would bypass downtown Skowhegan?
        - Yes. Also, the town is conducting the process of creating a new comprehensive plan – perhaps this bridge study is premature.
- As you move forward in this process, it seems like there needs to be a more comprehensive plan. Does the funding source for this project include these other items? Example: the big dig, you find a solution but it doesn't create a whole solution.
    - The simple answer is that there is not funding right now for the next step. There will be a wide array of costs for each recommendation.
    - Cost will be a factor that we will consider, but cannot speak to specific funding right now. Projects like this generally get funded from additional funding scenarios.
        - Agree that we will have to look wider at some of our alternatives.
- We are looking at big picture recommendations, we will also likely provide some short- term recommendations as well. Short term improvement strategies, that could be considered for implementation.

Craig prompted the viewers to continue to ask questions and to make comments. He stated that this was a great time to ask the experts. Craig stated that it was critical to get the public opinions before considering next steps. He prompted the public with the following questions. What alternative did they you prefer? What should guide us in determining next steps?

- Put the bridge where it will lessen downtown traffic the most.
- Wondering if there are examples of successful bypass projects in the state?
    - Yes, the most relevant one has not been built yet. Thoughts on transportation and mobility has changed. Funding and thinking has changed, so bypasses have become less popular. There is a connection being built that will connect 395 to Route 9 in Brewer. The study began in 1999 and has still not gone to construction, but was recently fully funded. Other examples appear up coastal Route 1.
    - Perhaps bypass is not the correct term, it would be more of a tourist gateway to this part of Maine and into Canada. Thinking long-term about Skowhegan as a tourist and eco-tourism destination, we would want to encourage a livable and attractive downtown. Current traffic does not encourage population density downtown.
    - Regarding conversation around a bypass, when this discussion happened back in 2018 – there is an agreement with the state that alternatives that bypass downtown are not to be included. Our study team is not considering a bypass – it is not in the scope of this agreement.
- The crossing that goes through the white-water park, would really ruin the park. This is personal to people.
- Can we start the other improvement projects now? Getting funding through the state to get some of this stuff done before waiting for the bridge to be done?
    - Yes, MPI is a program where town-lead projects can get state money. This is a great way to get smaller short-term projects done quicker.
    - The pandemic is impacting some of the other funding opportunities.
- Are we going to do design work? Could we get design work to submit to an MPI project?
    - Yes, something to talk about offline.
- Craig poses a question about the impacts of COVID-19 and the economic impacts of the pandemic. Will this impact funding? Is it impacting traffic?
    - Yes, DOT relies on gas tax and right now traffic is down 30-40% which brings revenue down 30-40%. Undoubtedly, there will be short term effects on our revenue. On the other hand, after the great recession there was a lot of stimulus funding – if something like this happens there could be more opportunities.
- How can we know what is the best way forward, before the Town's Comprehensive Plan is complete?
    - You can argue this the other way too – the comprehensive plan could benefit from the bridge study information.
    - Hope is to start the comprehensive plan this fiscal year, and it could take about 18 months to complete.

    - A second river crossing has been identified as a need in previous comprehensive plans.
- Could we get grants and other funding?
    - Local dollars would only kick-in if we are looking to do more improvements greater than the agreement and plan.
    - State and federal funds would cover the big project, generally a bridge alternative would be state and federal funding.

Craig offered that the group could end the meeting early if there were not enough comments or questions to fill the time. Craig offered time for the panelists to share their thoughts and more information.

Schedule/Next Steps

The schedule and next steps were outlined as follows:

- Town Bridge Committee Meeting #2 - May 13, 2020
- Public Meeting #2 - Jun 25, 2020
- Planning and Estimating for Feasible Alternatives - July
- Develop Draft Report - July
- Study Team Meeting #5 - July/August
- Town Bridge Committee Meeting #3 - August
- Submit Draft Final Report - October
- Public Meeting #3 - October
- Town Board of Selectmen to make recommendation to MaineDOT - TBD

Skowhegan Bridge Committee

Joint Planning Study between the Town of Skowhegan and Maine Department of Transportation

Draft Meeting Notes

Zoom, Wednesday, May 13, 2020

Attendance

Cara or Christine – please put in here.

Agenda

1. Introductions
2. Existing Conditions Summary
3. Alternatives under Consideration
4. Future Traffic Volumes
    a. 2045 No-Build
    b. Downstream Bridge Alternative
    c. Upstream Bridge Alternative
    d. Intown Bridge Alternative
5. Future Truck Volumes with Alternatives
6. Initial Highway/Bridge Concept Design Summary
7. Transportation System Management Alternative Status Summary
8. Public Meeting #2 Feedback
9. Project Schedule

Existing Conditions Report

- The report is 98% complete
- Keep in mind the Purpose and Need statement
- Diagrams that portray traffic timing at intersections
- Analysis of time-of-day traffic
- Weekdays are busiest, especially Fridays
- Seasonally, summertime is a little busier
- Annual Average Daily Traffic
    - 23000/day over the bridge
- Truck traffic distribution leaving the bridges
- High crash locations designated
- Level of service ratings for key intersections – based on delays

- Provided documentation about bike safety and alternative modes such as busses
- Environmental Resources
- Historic, archaeological, and cultural resources

Alternatives

- No Build
  - Evaluate conditions in 2045 assuming no infrastructure changes
  - Traffic will grow by 15% over the next 20 years
  - Congestion will increase
- Transportation System Management
  - Improvements to roadways and intersections that would improve safety and mitigate congestion
  - Solving problems without substantial infrastructure changes
- Transportation Demand Management
  - Doesn't seem promising but we will look at
- Widen Existing Smith Bridges
- New Bridge #1 – Upstream
- New Bridge #2 - Downtown
- New Bridge #3 - Downstream

- Clarifications
  - We have located the alternatives around the eagle's nest
  - We're not evaluating any alternatives that include a bypass

- Pros and Cons of various Alternatives
  - Tom briefly explained the pros and cons of each option

Future Traffic Scenarios Over the Bridges

- Smith Bridge traffic will increase to 29,000/day by 2045
- If you constructed an upstream bridge
  - It would take 6,500 vehicles off the Smith Bridges
- If you constructed a downtown bridge
  - It would take 10,000 vehicles off the Smith Bridges
- If you constructed a downstream bridge
  - It would take 2,000 vehicles off the Smith Bridges

Questions, Comments, Clarifications

- Discussion about a "magic number" for traffic on the Smith Bridges
  - There is no magic number (low volume at which there are no problems)
  - And – it's not just about the number – there's more to it than that – the purpose and needs statement addresses several factors
- Demand Management?
  - Could we offset the hours of the School and New Balance to reduce congestion at the south side intersection
  - We have tried shift changes in the past but it didn't make a huge difference
- Let's make sure that funding for the solutions includes fixing the intersections
  - Let's make sure we don't solve just part of the problem – there needs to be a whole solution, and funding for it
- Likely the study will result in a list of both short term and long term solutions
- COVID Implications
  - At DOT we are treating this like the great recession of 2008-09.
  - We expect things to come back but slowly.
- We are analyzing future truck traffic
  - We are estimating a 15% growth in truck traffic over the next 20 years

Focus on Transportation System Management

- Commercial/Water/Court – safety
- Island/Front/Madison/Main – safety, mobility
  - More lanes on or off the existing bridge?
  - Perhaps a roundabout?
- Madison/Commercial/Elm
- Triangle One-Way – keep
- Madison/High

Next Steps

- Idea: Show the alternatives in the form of a matrix and show costs as part of that.

- Much discussion about the pros and cons of doing a Zoom public meeting in June.

- General agreement on the following:
  - The public input meeting will be by Zoom (unless we are able to meeting in groups larger than 50 by that time) on Thursday, May 25 from 7:00pm to 8:30pm.
  - We will broadcast the meeting live on several platforms.
  - We will record the meeting and make it available via several platforms for a week or more, and collect written comments and input following the public input meeting.

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Subject: Skowhegan Bridge Feasibility Study Kickoff Meeting WIN 23831.00

Date: May 16, 2019

Place: MaineDOT Augusta

By: S. Davis

Copy: T. Errico, File

MEETING NOTES

The kickoff meeting was held to discuss the general scope of work, need for data collection, the public outreach process, and preliminary purpose & need. The following points were noted:

1. Marty Rooney gave a summary of relevant project history, briefly outlining the effort undertaken in 1998. The 1998 project included the study of both a bridge crossing and a bypass, and was part of the much larger MaineDOT study of an East/West Corridor. It largely lacked local support and the town would not adopt a stance in favor of an alternative. Coupled with the lack of funding, this led to the discontinuation of the effort in 2010. In 2018, the MaineDOT Commissioner met with Skowhegan Municipal Officials and agreed to begin a partnership with the town the resulted in this current Study.
2. Tom Errico outlined the General Scope of Work pertaining to this study. A broad overview of data collection, environmental reviews, origin – destination traffic patterns, current local issues, and baseline issues was discussed. Tom conveyed the need to project future "no build" conditions out to the year 2045, to establish a future baseline against which outcomes of each determined alternative can be analyzed and evaluated, and from which the consultant team can develop preliminary recommendations.
3. Traffic Data collection methods and locations were discussed. Ed Hanscom recommended collection points at the intersections of Court Street & High Street, Water Street & High Street, and JEWETT STREET & Madison Avenue.
4. The town noted the importance of collecting traffic data while school was still in session to capture the volume it generates.
5. The following approach to collecting traffic data was discussed:
   - Counter tubes placed on/near the bridge for a one week period
   - Visual detection placed for a 12 hour period (6 AM to 6 PM) one either a Tuesday, Wednesday, or Thursday
6. Kevin Hooper discussed the concept and approach to gathering origin – destination traffic data. Previous studies in this location utilized mail-back questionnaires to solicit information regarding destinations. This study will utilize GPS data from cell phone apps to determine time and origin destination of trips. The sense is that this data will prove very accurate for through trips (with origins and destinations away from Skowhegan). The study area will be broken into zones to help determine movement from one zone to another for more local traffic. Some data will need to be checked and verified to determine the sensibleness and accuracy.

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7. The concept of altering the one-way traffic through the downtown triangle was discussed, and it was decided that this issue would not be part of this study.
8. MaineDOT Environmental office advised that correspondence with MHPC should go through MaineDOT.
9. The public outreach effort and schedule were discussed. The town would like to get citizens on board with moving forward with a second hope to see a great deal of participation at public meetings. A local Bridge Committee has been formed (list of members to be distributed in later correspondence) and can be seen as an ally to the project, and should be involved in separate meetings prior to public meetings. The tentative schedule is to hold a Bridge Committee meeting in July, a Study Team meeting in August, and the first public meeting in September.
10. MaineDOT is still responsible for adhering to the public process. While the town and the Bridge Committee will be valuable in assisting with soliciting local participation, other stakeholders must be apprised of progress and involved in the process.
11. There was much discussion regarding the purpose & need statement. MaineDOT Environmental Office advised that the desired outcomes within the purpose & need statement should be measurable. Kristen Chamberlain noted that a list of desired project outcomes should be generated to help guide toward a purpose & need statement. It was noted that this study can't be focused on fixing every little detail and should be focused on addressing the most prevalent needs of the transportation system. The following concerns were voiced:
    - The town noted that truck traffic through the downtown area caused safety issues for pedestrians and mobility (congestion issues).
    - The lack of an additional crossing causes some concern regarding access from public safety should an event occur that causes a closure at the existing crossing.
    - The town noted current congestion in the AM and PM associated with school traffic.
    - Current traffic pattern and truck traffic may deter some investment and development downtown.
    - Current issues exist for the town's Fire Department (located on the island) as mobility issues can hinder their response time. There is potential for this issue to be remediated if the town moves forward with relocating the Fire Department.
    - The purpose & need statement should mention the that the preferred alternative would be supported by reasonably available state, federal, and local monies.
12. The town noted that there are future plans to establish river rafting (runofriver.org) in the area near and downstream of the pedestrian bridge crossing.
13. Action Items:
    a. **TYLI** and subconsultants will begin data collection.
    b. **TYLI** will create and distribute a draft purpose & need statement.
    c. **TYLI** will update and distribute the project schedule
    d. **TYLI** will work with the study team to schedule the first meetings.

2/3

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Skowhegan Kickoff Meeting Attendance

Martin Rooney	MaineDOT	martin.rooney@maine.gov	624-3317
Ed Hanscom	MaineDOT	ed.hanscom@maine.gov	
David Gardner	MaineDOT	David.gardner@maine.gov	
Kristen Chamberlain	MaineDOT	Kristen.chamberlain@maine.gov	
Dana Valleau	TRC	dvalleau@trccompanies.com	215-4582
Haley Jaramillo	MaineDOT	Haley.jaramillo@maine.gov	
Christine Almand	Skowhegan	calmand@skowhegan.org	474-6907
Kevin Hooper	Kevin Hooper Assoc.		878-5790
Shawn Davis	T.Y. LIN	Shawn.davis@tylin.com	271-0002
Tom Errico	T.Y. LIN	Thomas.errico@tylin.com	347-4354
Nate Howard	MaineDOT	Nathan.howard@maine.gov	624-3310
Jessica Murray	TRC	jmurray@trcsolutions.com	462-1841
Craig Freshley	Good Group Decisions	craig@freshley.com	
Gregory Dore	Skowhegan	gdore@skowhegan.org	
Jason Stetson	MaineDOT	Jason.b.stetson@maine.gov	215-8818

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Subject: Skowhegan Bridge Feasibility Study Team Meeting #2 WIN 23831.00

Date: July 11, 2019

Place: MaineDOT Augusta

By: Shawn Davis

Copy: Tom Errico, File

MEETING NOTES

The second study team meeting was held to discuss progress, review traffic and environmental data collected to date, discuss the draft purpose and need statement, and review the proposed public process approach. The following points were noted:

1. TRC presented environmental data collected to date and distributed applicable resource maps. The Cultural Resource map needs to be updated and the wetlands need to be digitized. The data gives an idea of what is out there and what was studied previously. For example, the previous study evaluated the possible removal of a still-present eagles' nest and revealed that this was not allowed. TRC inquired about the existence of a companion plan to the Town's comprehensive plan referenced in the previous study. The sense was no companion plan was developed.
2. Kristen mentioned the need to refine the corridor areas within the study area, such that efforts can later be concentrated on reviewing historic properties that may be impacted by alternatives, rather than every historic property in the larger study area.
3. Not all parks and trails have been identified on the resource maps. This needs to be updated and Doug Beck must be contacted to determine the presence of any 6(f) properties.
4. TRC needs to write consultation letters to the agencies seeking information.
5. Discussion occurred regarding Run of River. The preference is to avoid impacts to the proposed attraction. If impacts are unavoidable, more research must be done to determine the 4(f) eligibility of this park, as it is currently in the documented planning phase.
6. Impacts to land purchased with Lands for Maine's Future grants should be avoided.
7. Maps for proposed multi-use trails exist and the Town will forward them to the Study Team.
8. MaineDOT has collected traffic data at all of the previously identified intersections and is in the process of processing it. Should have the data available next week.
9. Much discussion occurred regarding origin-destination traffic data that had been collected. Kevin Hooper shared the data as it relates to traffic that had crossed the bridge and the destination of this traffic by percentage. For the most part, the percentages correlated well to the mailer O-D study from 1998. It was noted that the data considered a destination to be reached if the traveler stopped somewhere for 15 minutes or greater. For this reason, the data shows zero to few trips for destinations farther away from

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Skowhegan, as the likelihood of someone stopping increases. The data showed 0% of trips to Quebec, which at first seemed counter-intuitive. The Town suggested that perhaps they stopped at a store on the way out of town. The study area will further be split apart into sub-regions and analyzed to help verify this data.

10. Kevin Hooper also shared data of traffic traveling from a point outside of the study area to a point outside of the study area, while passing through the study area (though not necessarily using the crossing). This data helps to reveal trends of how traffic aggregates/disperses from corridors coming to and leaving Skowhegan. Such data will be analyzed to help predict how proposed alternatives may affect corridor use.
11. The draft purpose and need statement was reviewed and edits were suggested. TYLI will make the necessary revisions and distribute.
12. The first Public Meeting is scheduled for September 10, 2019 at 7PM. Tom distributed a draft Agenda for the meeting. It was noted that this study is a MaineDOT/Town collaborative effort and the meeting should be led by the town. Nate will provide some comments on the Agenda. A Bridge Committee meeting will be scheduled by the town prior to this public meeting (preferably mid August) to discuss the format of the public meeting and topics to present. It is anticipated that Nate, Tom and Craig will attend this meeting.
13. The Study schedule was discussed. Presently the Study Team is on schedule.
14. Action Items:
    a. **TYLI** and subconsultants will continue data collection.
    b. **TYLI** will revise the draft purpose & need statement.
    c. **TRC** will update Resource Maps
    d. **TRC** will send consultation letters to the agencies
    e. **The Town** will send along proposed multi-use trail maps
    f. **The Town** will work with the study team to schedule the Bridge Committee meeting
    g. **MaineDOT** will provide comments on Draft Public Meeting Agenda

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Kristen Chamberlain	MaineDOT	Kristen.chamberlain@maine.gov	
Dana Valleau	TRC	dvalleau@trccompanies.com	215-4582

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Subject: Skowhegan Bridge Feasibility Study Team Meeting #3 WIN 23831.00

Date: December 13, 2019

Place: MaineDOT Augusta

By: Shawn Davis

Copy: Tom Errico, File

MEETING NOTES

The third study team meeting was held to discuss progress, review the Draft Existing Conditions Report, review the results of the public survey, discuss potential alternatives analysis and traffic volume forecasts, and discuss steps forward. The following points were noted:

1. Tom discussed current schedule. Tasks have been completed up to investigating alignment alternatives. Current projections place the study about one month behind schedule, with hope to make up the that time moving forward. Still hope to proceed with second public meeting and Bridge Committee meeting in February or early March. Depending on progress, we may need to push the second public meeting out a bit. The Town did not have concerns about the schedule given the details are not public.
2. The Draft Final Existing Conditions Report was discussed. Some highlights are:
   - SB traffic across the bridge is heavy at AM peak (~ 900 vehicles from 7-8AM)
   - NB traffic across the bridge is heavy at PM peak (~910 vehicles from 4-5PM)
   - Friday is the heaviest traffic day of the week
   - Weekends generally experience less traffic than weekdays
   - Summer experiences the seasonally highest traffic
   - Island Avenue currently experiences about 23,330 AADT
   - There is generally growth in traffic from 2014 to present, though this growth may be slightly flatter than projected due to a sewer project on North Avenue in 2014 redistributing traffic during those counts
   - Regarding general traffic across the bridge, 22% of vehicles start and end their trip in Skowhegan, 28% either start or end their trip in Skowhegan, and 50% start and end their trip external to Skowhegan (passing through). Greg did note that there was more internal trip percentages were noted in the old study.
   - There are about 1000 trucks on the bridge in a 12 hour period
3. TYLI should check to see how the above traffic data correlates to the study from the 90's.
4. Discussion regarding truck distribution occurred (and can be seen in the Existing Conditions Report). It was decided that this section of the report should show distribution of the 3 major routes both north and south of the river to arrive at the 9 potential combinations of flow and help to assess truck movements through the study area.

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5. There are currently two other intersection improvement projects within the study area. The first is the addition of a slip lane to accommodate right turns from Route 2 onto Route 104 and is an MPI administered by the town. The second is signal improvement at Commercial Street and Madison Avenue and Aurele Gorneau is the MaineDOT Project Manager.
6. The Town noted that KVCAP has a different schedule in the summer than in the winter and the Town will provide a link to the information.
7. Environmental review was discussed and the following noted:
   - From a Historic and Archeological perspective, there are no evident fatal flaws at this time, only items that will require further consultation
   - Several historic sites were documented along the river bank
   - There are two urban impaired streams within the study area: Whitten Brook and Currier Brook
   - There are several rare, threatened/endangered plants near the river, particularly around Great Eddy and on ledge outcrops along the river banks, and a hardwood seepage forest community north of the river on the easterly side of the study area
   - An eagles' nest may be present near Route 2 near the easterly boundary of the study area. Further investigation will be required to determine its presence and level of activity.
   - 4(f) Parcels and recreation sites need to be added back into the report mapping
8. Household growth factors of approximately 15% in 20 years have been acquired from the state and will be utilized in projections. New Balance has indicated no plans for future growth other than a possible new retail store at the current campus. Hospital has no immediate plans of expansion. Still awaiting contact with Sappi. Dan Doran believes large truck numbers today, as they relate to the logging industry are indicative of what to expect over the next 20 years, and may in fact be a high number.
9. There is currently an RFP seeking evaluation of relocation of some elementary schools to the high school campus. This could impact future traffic flow. The traffic forecasts will account of this change.
10. Alternatives were discussed and include the following:
    - Year 2045 No-Build
    - Alternative 1 – Year 2045 Transportation System Management improvements
    - Alternative 2 – Year 2045 Transportation Demand Management
    - Alternative 3 – Widen or improve existing crossing
    - Alternative 4 – New Bridge Crossing #1 downstream of town
    - Alternative 5 – New Bridge Crossing #2 in vicinity of downtown
    - Alternative 6 – New Bridge Crossing #3 upstream of town

    Alternative 4 is projected to result in a 20-25% reduction of traffic on existing crossing

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Alternative 5 is projected to result in a 40% reduction of traffic on existing crossing

Alternative 6 is projected to result in a 10% reduction of traffic on existing crossing

11. There will be a 2 week comment period for the Existing Conditions Report. Nate Howard will compile comments from MaineDOT. Christine Almand will compile comments from the town.
12. There was a brief discussion on the public survey results and Christine summarized the results of Question 5 (where should a bridge be located). Her summary, which she will provide, noted the following:

N/A	No-Build	7
1	TSM Improvements	1
2	Demand Changes	0
3	Widen Existing Bridges	5
4	Downstream Bridge	110
5	Downtown Bridge	58
6	Upstream Bridge	9
	Other	38
	Downtown or Downstream	20
	Engineers/DOT decide	11
	No answer	57
	Total	316

13. The next study team meeting will be in February 2020.
14. Action Items:
    - **TYLI** and subconsultants will correlate traffic data against 90's study
    - **TYLI** will review KVCAP's schedule – as provided by the Town
    - **TRC** will update Resource Maps to include 4(f)
    - **The Town and MaineDOT** will provide comments to the Existing Conditions Report

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Subject: Skowhegan Bridge Feasibility Study Kickoff Meeting WIN 23831.00

Date: September 4, 2020

Place: MaineDOT Augusta

By: Tom Errico

Copy: File

MEETING NOTES

1. Joel asked how the Comp Plan was reviewed. Tom noted that there wasn't anything specific regarding a second bridge and mostly used downtown impacts as the metric. Joel noted that there may be other CP elements that should be considered, and he will help identify those.
2. Shawn noted that Dunkin Donuts will be constrained under Alt 5. Queues onto the street is a concern and accordingly DD may not be able to operate.
3. Greg noted the Somerset Land Trust land and this 4F impacts to Alt. 4. Kristen said it needs to be reviewed.
4. Tom noted the TSM improvements to permit two lanes from Madison Ave to the bridge. Greg note that a 2008 plan exists that includes a left from Madison onto Commercial. Greg will provide the plan.
5. One reason the cost for Alt.5 is greater than Norridgewock is it is wider.
6. Chris noted that there will be a pier on the south side that allows a span over the bike path.
7. The assumption is that the Alt. 5 bridge is an Arch/Truss.
8. A meeting with the Environmental Agencies should be schedule to brief them on the study.
9. Bridge Committee can be scheduled anytime.
10. Jason noted that he will work with his staff and Chris on cost estimates.
11. Greg noted impact to the Opera House without taking building. Kristen noted that adverse impacts will be considered and may comprise of adding traffic signals, loss of trees, change in character and ROW impacts.
12. Joel asked if the pier had to be eliminated for the ROR project. Christine said the pier can't exist with the ROR.
13. The next meeting will be 9/22/20 at 2pm.
14. Action Items:
    a. **MaineDOT** and TYLI to revise cost
    b. **MaineDOT** to schedule meetings with Environmental Agencies
    c. **Town** to provide concept plan at Madison and Commercial.

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Skowhegan Meeting Attendance

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Mark Hume	MaineDOT	Mark.Hume@maine.gov

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Appendix F – Cost Estimate Information

Quantity Computations

SKOWHEGAN 2ND BRIDGE PLANNING
MTA P.I.N. : 23831.

Filename: Highway Quantities.xlsx
Date: 2/1/2021

ITEM NO.	ITEM	UNIT	UNIT COST	QUANTITY 3	QUANTITY 4	QUANTITY 5	QUANTITY 6	ALT 3	ALT 4	ALT 5	ALT 6
201.11	CLEARING	AC	$ 12,000.00	0.00	6.00	3.00	3.00	$ -	$ 72,000.00	$ 36,000.00	$ 36,000.00
202.08	REMOVE BUILDING NO. X	LS	$ 20,000.00	0	0	4	0	$ -	$ -	$ 80,000.00	$ -
202.202	REMOVING PAVEMENT SURFACE	SY	$ 6.00	15250	4250	14250	10700	$ 91,500.00	$ 25,500.00	$ 85,500.00	$ 64,200.00
203.20	COMMON EXCAVATION	CY	$ 28.00	1900	9000	3800	6700	$ 53,200.00	$ 252,000.00	$ 106,400.00	$ 187,600.00
203.21	ROCK EXCAVATION	CY	$ 165.00	206	3000	500	500	$ 33,970.59	$ 495,000.00	$ 82,500.00	$ 82,500.00
203.24	COMMON BORROW	CY	$ 30.00	120	120	4000	9550	$ 3,600.00	$ 3,600.00	$ 120,000.00	$ 286,500.00
203.25	GRANULAR BORROW	CY	$ 40.00	50	50	50	50	$ 2,000.00	$ 2,000.00	$ 2,000.00	$ 2,000.00
206.0611	STRUCTURAL EARTH EXCAVATION - DRAINAGE AND MINOR STRUCTURES	CY	$ 45.00	50	50	50	50	$ 2,250.00	$ 2,250.00	$ 2,250.00	$ 2,250.00
304.10	AGGREGATE SUBBASE COURSE - GRAVEL	CY	$ 49.00	1900	10400	4000	4200	$ 93,100.00	$ 509,600.00	$ 196,000.00	$ 205,800.00
403.208	HOT MIX ASPHALT - 12.5 mm HMA SURFACE	Ton	$ 150.00	990	1640	890	790	$ 148,500.00	$ 246,000.00	$ 133,500.00	$ 118,500.00
403.213	HOT MIX ASPHALT - 12.5mm BASE	Ton	$ 150.00	510	3270	1540	1570	$ 76,500.00	$ 490,500.00	$ 231,000.00	$ 235,500.00
409.15	BITUMINOUS TACK COAT, APPLIED	G	$ 10.00	50	400	140	170	$ 500.00	$ 4,000.00	$ 1,400.00	$ 1,700.00
606.1301	31" W-BEAM GUARDRAIL - MID-WAY SPLICE (STEEL POST, 8" OFFSET BLOCKS, SINGLE FACED)	LF	$ 25.00	240	580	400	120	$ 6,000.00	$ 14,500.00	$ 10,000.00	$ 3,000.00
606.1721	BRIDGE TRANSITION - TYPE I	EA	$ 2,183.85	8	4	4	4	$ 17,470.80	$ 8,735.40	$ 8,735.40	$ 8,735.40
606.265	TERMINAL END - SINGLE RAIL - GALVANIZED STEEL	EA	$ 141.00	8	4	4	4	$ 1,128.00	$ 564.00	$ 564.00	$ 564.00
608.26	CURB RAMP DETECTABLE WARNING FIELD	SF	$ 100.00	103.92	0	86.6	0	$ 10,392.00	$ -	$ 8,660.00	$ -
609.21	CONCRETE SLIPFORM CURB	LF	$ 12.00	1890	0	1200	0	$ 22,680.00	$ -	$ 14,400.00	$ -
610.08	PLAIN RIPRAP	CY	$ 90.00	110	60	60	50	$ 9,900.00	$ 5,400.00	$ 5,400.00	$ 4,500.00
615.07	LOAM	CY	$ 70.00	120	960	560	1580	$ 8,400.00	$ 67,200.00	$ 39,200.00	$ 110,600.00
618.13	SEEDING METHOD NUMBER 1	UN	$ 75.00	4	31	45	51	$ 300.00	$ 2,325.00	$ 3,375.00	$ 3,825.00
618.14	SEEDING METHOD NUMBER 2	UN	$ 65.00	11	93	0	153	$ 715.00	$ 6,045.00	$ -	$ 9,945.00
619.12	MULCH	UN	$ 65.00	15	124	45	204	$ 975.00	$ 8,060.00	$ 2,925.00	$ 13,260.00
627.18	12" SOLID WHITE PAVEMENT MARKING	LF	$ 5.00	132	24	24	24	$ 660.00	$ 120.00	$ 120.00	$ 120.00
627.733	4" WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	LF	$ 0.60	3900	12640	4740	6940	$ 2,340.00	$ 7,584.00	$ 2,844.00	$ 4,164.00
629.05	HAND LABOR - STRAIGHT TIME	HR	$ 45.00	50	50	50	50	$ 2,250.00	$ 2,250.00	$ 2,250.00	$ 2,250.00
631.10	AIR COMPRESSOR (INCLUDING OPERATOR)	HR	$ 55.00	24	24	24	24	$ 1,320.00	$ 1,320.00	$ 1,320.00	$ 1,320.00
631.11	AIR TOOL (INCLUDING OPERATOR)	HR	$ 55.00	24	24	24	24	$ 1,320.00	$ 1,320.00	$ 1,320.00	$ 1,320.00
631.12	ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	HR	$ 150.00	50	50	50	50	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
631.14	GRADER (INCLUDING OPERATOR)	HR	$ 150.00	50	50	50	50	$ 7,500.00	$ 7,500.00	$ 7,500.00	$ 7,500.00
631.172	TRUCK, LARGE (INCLUDING OPERATOR)	HR	$ 90.00	50	50	50	50	$ 4,500.00	$ 4,500.00	$ 4,500.00	$ 4,500.00
631.22	FRONT END LOADER (INCLUDING OPERATOR)	HR	$ 110.00	50	50	50	50	$ 5,500.00	$ 5,500.00	$ 5,500.00	$ 5,500.00
631.221	SMALL FRONT END LOADER (INCLUDING OPERATOR)	HR	$ 100.00	0	0	0	0	$ -	$ -	$ -	$ -
631.32	CULVERT CLEANER (INCLUDING OPERATOR)	HR	$ 250.00	0	0	0	0	$ -	$ -	$ -	$ -
634.160	HIGHWAY LIGHTING	LS	--					$ -	$ -	$ -	$ -
639.18	FIELD OFFICE TYPE A	EA	$ 20,000.00	1	1	1	1	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00
643.80	TRAFFIC SIGNAL AT:	LS	$ 250,000.00	2	2	2	2	$ 500,000.00	$ 500,000.00	$ 500,000.00	$ 500,000.00
652.30	FLASHING ARROW BOARD	EA	$ 1,500.00	4	0	4	0	$ 6,000.00	$ -	$ 6,000.00	$ -
652.31	TYPE I BARRICADE	EA	$ 120.00	0	0	0	0	$ -	$ -	$ -	$ -
652.312	TYPE III BARRICADE	EA	$ 190.00	6	6	12	6	$ 1,140.00	$ 1,140.00	$ 2,280.00	$ 1,140.00
652.33	DRUM	EA	$ 45.00	50	20	20	20	$ 2,250.00	$ 900.00	$ 900.00	$ 900.00
652.34	CONE	EA	$ 17.00	225	133	133	100	$ 3,825.00	$ 2,261.00	$ 2,261.00	$ 1,700.00
652.35	CONSTRUCTION SIGNS	SF	$ 15.00	1050	600	1800	600	$ 15,750.00	$ 9,000.00	$ 27,000.00	$ 9,000.00
652.36	MAINTENANCE OF TRAFFIC CONTROL DEVICES	CD	$ 100.00	1500	1100	1100	1100	$ 150,000.00	$ 110,000.00	$ 110,000.00	$ 110,000.00
652.38	FLAGGERS	HR	$ 27.00	25200	3400	5525	2725	$ 680,400.00	$ 91,800.00	$ 149,175.00	$ 73,575.00
652.41	PORTABLE CHANGEABLE MESSAGE SIGN	EA	$ 4,800.00	4	4	5	4	$ 19,200.00	$ 19,200.00	$ 24,000.00	$ 19,200.00
656.75	TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL	LS	$ 20,009.37	1	1	1	1	$ 50,000.00	$ 150,358.72	$ 102,213.97	$ 107,333.42
659.10	MOBILIZATION	LS	--	1	1	1	1	$ 165,162.91	$ 252,602.65	$ 171,719.47	$ 180,320.15
xxxx	*Estimate for cost of intersection modifications including turning lanes*	0	--					$ 1,000,000.00	$ 1,000,000.00	$ 2,000,000.00	$ 750,000.00
							COSTS	3,229,699	4,338,136	4,202,213	3,148,322

		3	4	5	6
Misc items	20.00%	$322,970	$867,627	$840,443	$629,664
Planning Level Contingecy	20.00%	$888,167	$1,301,441	$1,260,664	$944,497
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
(from companion sheet)		$7,000,000		$13.7M with a pier	
Prelim Engineering	10.00%	$3,025,084	$2,076,720	$4,499,332	$2,493,248
Construction engineering	10.00%	$3,025,084	$2,076,720	$4,499,332	$2,493,248
ROW (prelim)		$250,000	$500,000	$1,250,000	$500,000
TOTAL		$36,551,004	$25,420,644	$55,241,983	$30,418,980
TOTAL		**$36,600,000**	**$25,500,000**	**$55,300,000**	**$30,500,000**
MOT Cost (included in above total but broken out for reference)		**$ 7,878,565.00**	**$ 234,301.00**	**$ 321,616.00**	**$ 215,515.00**

Concept Level Cost Estimate
Summary

PROJECT:	Skowhegan	**WIN:**	23831.00
Summary:		**ESTIMATED BY:**	CPT 1/29/2021

STRUCTURE SUBTOTALS	
Baseline: Re-deck Existing Bridges	**$7,190,000**
Alternative 3: Widen Existing Bridges	**$18,810,000**
Alternative 4: New Bridge - Downstream Alignment	**$14,260,000**
Alternative 5a: New Bridge - Downtown Alignment - Steel Girder	**$13,680,000**
Alternative 5b: New Bridge - Downtown Alignment - Though Arch	**$38,690,000**
Alternative 6: New Bridge - Upstream Alignment	**$20,210,000**

Concept Level Cost Estimate
Baseline

PROJECT:	Skowhegan	**WIN:**	23831.00
Baseline:	Re-deck Existing Bridges Deck Area: 128' x58.33' + 227' x 49.17' = 18,628 SF Temporary Bridge: 900' x 32' = 28,000 SF	**ESTIMATED BY:**	CPT

EXISTING SUPERSTRUCTURE REDECK:	18,628	SF	×	$240.00	=	$4,471,000
SUPERSTRUCTURE:		SF	×		=	$0
TEMPORARY BRIDGE ABUTMENTS	2	EA	×	$400,000.00	=	$800,000
TEMPORARY BRIDGE PIERS	5	EA	×	$500,000.00	=	$2,500,000
COFFERDAMS		EA	×		=	$0
STRUCTURAL EXCAVATION & BORROW		CY	×		=	$0
PLAIN RIPRAP		CY	×		=	$0
EXISTING BRIDGE REMOVAL		SF	×		=	$0
TEMPORARY BRIDGE SUPERSTRUCTURE	28,000	SF	×	$55.00	=	$1,540,000
REHABILITATION CONTINGENCIES				5%	=	$242,000
MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.)				30%	=	$1,452,000
MOBILIZATION				10%	=	$654,000
				STRUCTURE SUBTOTAL	=	**$7,190,000**

Concept Level Cost Estimate
Alternative 3

PROJECT:	Skowhegan			**WIN:**		23831.00
Alternative 3:	Widen Existing Bridges Re-Deck Area: 128' x19' + 227' x 10.25' = 4,759 SF Widened Deck Area: 128' x12' + 227' x 12' = 4,759 SF			**ESTIMATED BY:**		CPT
SUPERSTRUCTURE REDECK:	18,628	SF	×	$240.00	=	$4,471,000
SUPERSTRUCTURE WIDENING:	4,260	SF	×	$345.00	=	$1,470,000
ABUTMENTS	4	EA	×	$640,000.00	=	$2,560,000
PIERS	1	EA	×	$760,000.00	=	$760,000
COFFERDAMS	3	EA	×	$725,000.00	=	$2,175,000
STRUCTURAL EXCAVATION & BORROW		CY	×		=	$0
PLAIN RIPRAP		CY	×		=	$0
EXISTING BRIDGE REMOVAL	4,759	SF	×	$180.00	=	$857,000
DETOUR AND/OR TEMPORARY BRIDGE		LS	×		=	$4,840,000
REHABILITATION CONTINGENCIES				5%	=	$634,000
MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.)				30%	=	$3,799,000
MOBILIZATION				10%	=	$1,710,000
				STRUCTURE SUBTOTAL	=	**$18,810,000**

Concept Level Cost Estimate
Alternative 4

PROJECT:	Skowhegan			**WIN:**		23831.00
Alternative 4:	New Bridge - Downstream Alignment Steel Girder Deck Area: 725' x 37' = 26,825 SF			**ESTIMATED BY:**		CPT
EXISTING SUPERSTRUCTURE REDECK:	18,628	SF	×	$240.00	=	$4,471,000
SUPERSTRUCTURE:	26,825	SF	×	$230.00	=	$6,170,000
ABUTMENTS	2	EA	×	$820,000.00	=	$1,640,000
PIERS	2	EA	×	$770,000.00	=	$1,540,000
COFFERDAMS	2	EA	×	$310,000.00	=	$620,000
STRUCTURAL EXCAVATION & BORROW		CY	×		=	$0
PLAIN RIPRAP		CY	×		=	$0
EXISTING BRIDGE REMOVAL	0	LS	×		=	$0
DETOUR AND/OR TEMPORARY BRIDGE	0	LS	×		=	$0
REHABILITATION CONTINGENCIES					=	$0
MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.)				30%	=	$2,991,000
MOBILIZATION				10%	=	$1,297,000
				STRUCTURE SUBTOTAL	=	**$14,260,000**

Concept Level Cost Estimate
Alternative 5a

PROJECT:	Skowhegan			**WIN:**		23831.00
Alternative 5a:	New Bridge - Downtown Alignment - Steel Girder 4 Lanes, Sidewalks both sides Deck Area: 380' x 71' = 26,980 SF			**ESTIMATED BY:**		CPT
EXISTING SUPERSTRUCTURE REDECK:	18,628	SF	×	$240.00	=	$4,471,000
SUPERSTRUCTURE:	26,980	SF	×	$230.00	=	$6,206,000
ABUTMENTS	2	EA	×	$885,000.00	=	$1,770,000
PIERS	1	EA	×	$1,155,000.00	=	$1,155,000
COFFERDAMS	1	EA	×	$435,000.00	=	$435,000
STRUCTURAL EXCAVATION & BORROW		CY	×		=	$0
PLAIN RIPRAP		CY	×		=	$0
EXISTING BRIDGE REMOVAL	0	LS	×		=	$0
DETOUR AND/OR TEMPORARY BRIDGE	0	LS	×		=	$0
REHABILITATION CONTINGENCIES					=	$0
MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.)				30%	=	$2,870,000
MOBILIZATION				10%	=	$1,244,000
				STRUCTURE SUBTOTAL	=	**$13,680,000**

Concept Level Cost Estimate
Alternative 5b

PROJECT:	Skowhegan			**WIN:**		23831.00
Alternative 5b:	New Bridge - Downtown Alignment - Though Arch Steel Girder over Trail Deck Area: 380' x 71' = 26,980 SF			**ESTIMATED BY:**		CPT
EXISTING SUPERSTRUCTURE REDECK:	18,628	SF	×	$240.00	=	$4,471,000
SUPERSTRUCTURE - MAIN, EXCEPT ARCH:	21,300	SF	×	$550.00	=	$11,715,000
SUPERSTRUCTURE - MAIN, ARCH:	300	LF	×	$46,272.55		$13,882,000
SUPERSTRUCTURE - APPROACH:	5,680	SF	×	$230.00	=	$1,307,000
ABUTMENTS	2	EA	×	$885,000.00	=	$1,770,000
PIERS	1	EA	×	$630,000.00	=	$630,000
COFFERDAMS	0	EA	×		=	$0
STRUCTURAL EXCAVATION & BORROW		CY	×		=	$0
PLAIN RIPRAP		CY	×		=	$0
EXISTING BRIDGE REMOVAL	0	LS	×		=	$0
DETOUR AND/OR TEMPORARY BRIDGE	0	LS	×		=	$0
REHABILITATION CONTINGENCIES					=	$0
MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.)				20%	=	$5,861,000
MOBILIZATION				10%	=	$3,517,000
				STRUCTURE SUBTOTAL	=	**$38,690,000**

Concept Level Cost Estimate

Alternative 6

PROJECT:	Skowhegan			**WIN:**	23831.00	
Alternative 6:	New Bridge - Upstream Alignment Steel Girder Deck Area: 900' x 37' = 33,300 SF			**ESTIMATED BY:**	CPT	
EXISTING SUPERSTRUCTURE REDECK:	18,628	SF	×	$240.00	=	$4,471,000
SUPERSTRUCTURE:	33,300	SF	×	$230.00	=	$7,659,000
ABUTMENTS	2	EA	×	$820,000.00	=	$1,640,000
PIERS	3	EA	×	$1,030,000.00	=	$3,090,000
COFFERDAMS	3	EA	×	$580,000.00	=	$1,740,000
STRUCTURAL EXCAVATION & BORROW		CY	×		=	$0
PLAIN RIPRAP		CY	×		=	$0
EXISTING BRIDGE REMOVAL	0	LS	×		=	$0
DETOUR AND/OR TEMPORARY BRIDGE	0	LS	×		=	$0
REHABILITATION CONTINGENCIES					=	$0
MISCELLANEOUS (TCP'S, FIELD OFFICE, ETC.)				30%	=	$4,239,000
MOBILIZATION				10%	=	$1,837,000
				STRUCTURE SUBTOTAL	=	**$20,210,000**