Madawaska/Edmundston International Bridge and Border Crossing

Feasibility and Planning Study

New Nouveau Brunswick CANADA

Canada Border Services Agency | Agence des services frontaliers du Canada

Public Services and Procurement Canada | Services publics et Approvisionnement Canada

U.S. Customs and Border Protection

GSA

MaineDOT

May 2018

S.0 EXECUTIVE SUMMARY

S.1 Background

It is widely recognized that the International Bridge connecting Edmundston, New Brunswick and Madawaska, Maine is functionally obsolete, nearing the end of its useful life, and in need of rehabilitation or replacement (Exhibit S.1). Underscoring the need to rehabilitate or replace the International Bridge, the Maine Department of Transportation (MaineDOT) and New Brunswick Department of Transportation and Infrastructure (NBDTI) posted the International Bridge at five tons (4.5 tons) (the equivalent of a passenger vehicle) in October 2017. It is further recognized that the size and conditions of the existing building and overall site of the Madawaska Land Port of Entry (LPOE) are substandard, preventing the agencies assigned to the LPOE from adequately fulfilling their missions.

Exhibit S.1 - *Location Map*

In response, the federal, provincial, and state agencies responsible for the movement of people and goods across this international crossing initiated the preparation of the *Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study*. The purpose of this study is to identify a preferred location for the rehabilitation or replacement of the International Bridge and Madawaska LPOE.

The *Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study* is being performed by:

- Maine Department of Transportation (MaineDOT) – lead agency;
- U.S. General Services Administration (GSA);
- U.S. Customs and Border Protection (CBP);
- New Brunswick Department of Transportation and Infrastructure (NBDTI);
- Public Services and Procurement Canada (PSPC); and
- Canada Border Services Agency (CBSA).

S.1.1 Project Purpose

The purpose of this project is to provide for the long-term safe and efficient flow of current and projected traffic volumes, including the movement of goods and people, between Edmundston, New Brunswick and Madawaska, Maine.

S.1.2 Needs

The proposed project is needed because: 1) the existing International Bridge is nearing the end of its useful life, and 2) the size and conditions of the existing building and overall site of the Madawaska LPOE are substandard, preventing the agencies assigned to the LPOE from adequately fulfilling their respective missions.

S.2 Alternatives Development and Screening

The project sponsors identified 12 alternatives to be conceptually developed and evaluated. Alternatives included either rehabilitating the existing bridge or building a new bridge on one of several new alignments while maintaining the existing Edmundston POE, and building new border crossing facilities at various locations outside of the downtown business zone (2 upstream and 4 downstream) (Exhibit S.2). In addition to the 12 alternatives conceptually developed and evaluated, several other alternatives were identified and briefly considered but, were not advanced for detailed evaluation. Based on initial evaluations the project sponsors determined that each of these additional alternatives was impractical from a cost, impact, and/or schedule perspective.

S.2.1 Alternatives Considered in Greater Detail

After analyzing the 12 conceptual alternatives, the project sponsors concluded the alternative locations outside of the downtown business zone needed to be dismissed from further consideration and the focus needed to turn to maintaining an international crossing in the downtown business zone (Exhibit S.3).

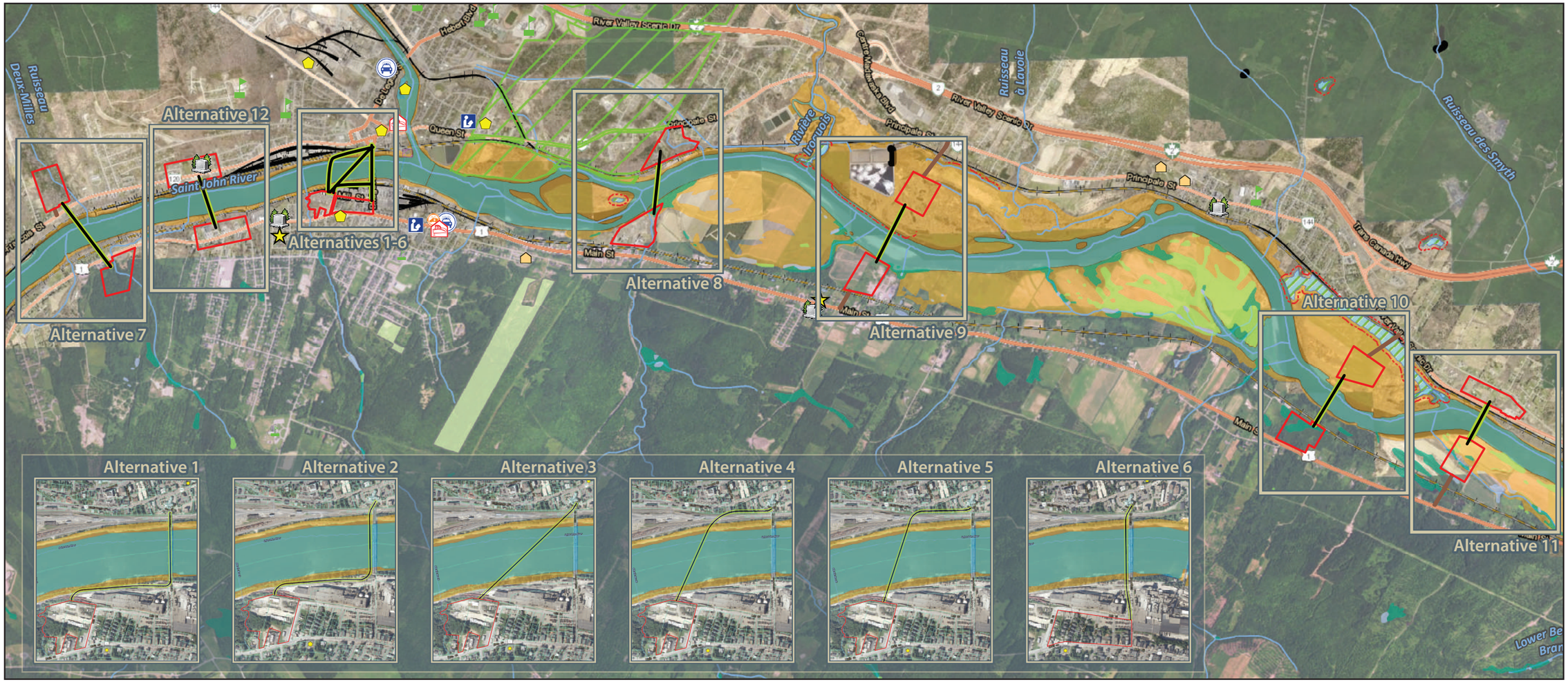
Analysis and discussion of the alternatives led to the identification of Alternatives 3, 4, and 5 for further analysis. It was determined that Alternatives 4 and 5 were substantially similar, and a new alternative, Alternative 4.5, was developed as a combination of the two.

S.2.2 Identification of a Corridor for the Preferred Alternative

Further discussion and analysis of Alternatives 3 and 4.5 led to modifying the bridge approach to both the Edmundston POE and the Madawaska LPOE to address some of the concerns with Alternative 3. The modification consisted of adding curvature to both ends of the bridge as it passes over the CNR and MNR tracks to allow for a preferable orientation approaching both POEs. The modifications to the bridge alignment for Alternative 3 created a corridor within which the preferred alternative will be developed during design (Exhibit S.4). The Preferred Alternative was estimated to cost approximately $131 million*. Some property may need to be acquired to relocate the CBSA's storage building and provide sufficient access and areas for staging during construction. The need for property acquisition, and required acquisition of property, would follow NBDTI's standard processes. Further evaluation of property needs would occur during preliminary design (Exhibit S.5).

* The $131 million cost estimate (in US dollars) primarily includes approximately $61 million for new bridge construction and old bridge demolition and $70 million for a new Madawaska LPOE construction.

Exhibit S.2 - *Alternatives Summary Map*



Inset images of Alternatives 1 through 6 not to scale

Exhibit S.3 - *Portion of the Madawaska/Edmundston Downtown Business Zone*

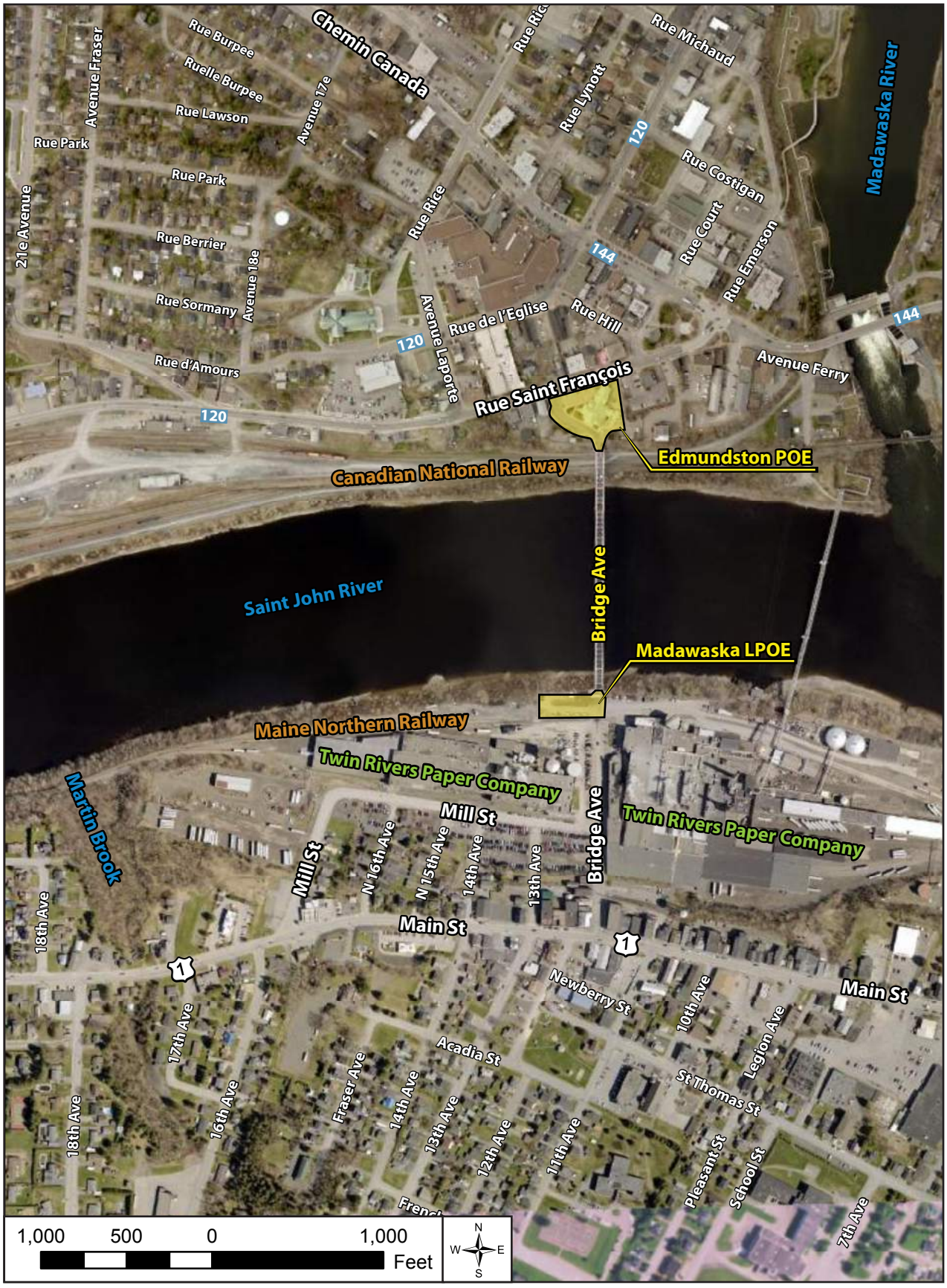


Exhibit S.4 - *Location for the Preferred Alternative*

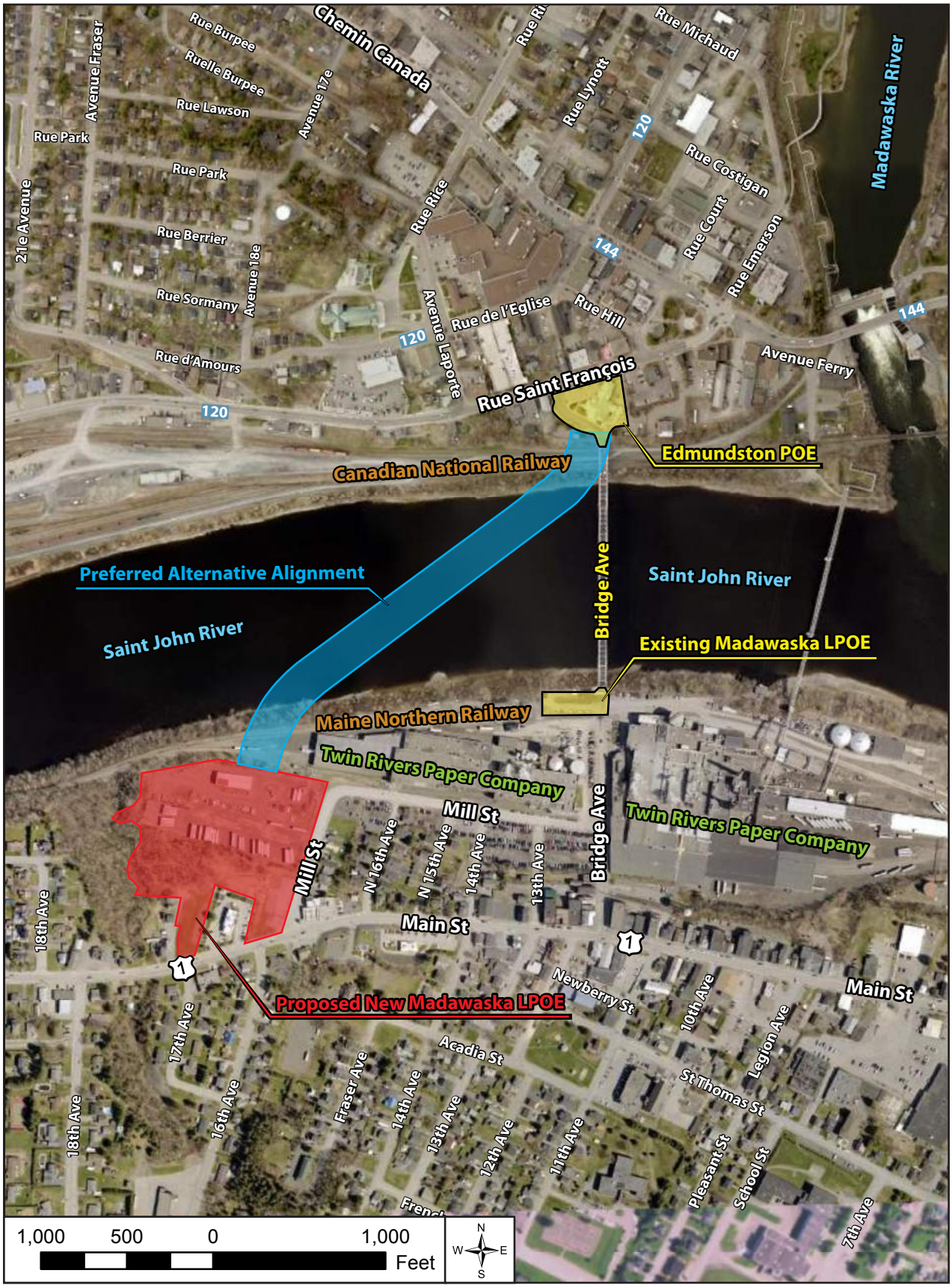


Exhibit S.5 - *Selected Alternative Specifications and Costs*

Features			Selected Alternative
Transportation	Bridge and Roadway	Project Length - feet [total (NB/ME)]	1,950 (1,000/950)
		Roadway Length - feet [total (NB/ME)]	100 (100/0)
		Bridge Length - feet [total (NB/ME)]	1,850 (900/950)
		No. of Bridge Spans [total (NB/ME)]	5 (2/2)
		No. of Bridge Piers Within River	4
		Area of Retaining Walls - square feet [total (NB/ME)]	1,800 (1,800/0)
Construction + Right-of-Way Cost (US $)	Construction Cost	Edmundston Port of Entry	$500,000
		Madawaska Port of Entry	$69,200,000
		Bridge Demolition	$4,000,000
		Approach Roadway	$300,000
		Retaining Wall Construction	$200,000
		Viaduct Construction	$0
		Bridge Construction	$57,000,000
		Total Construction Cost	$131,200,000
	Right-of-Way Cost		$0
	Total Construction + Right-of-Way Cost		$131,200,000

S.3 Coordination and Outreach

Throughout the preparation of the feasibility and planning study, NBDTI, PSPC, CBSA, MaineDOT, GSA, and the CBP coordinated with federal, provincial, state, and local agencies, the First Nations, stakeholders in the City of Edmundston and Town of Madawaska, and the public.

Two public information sessions were held during the preparation of the feasibility and planning study. Each public information session consisted of two events: one in the City of Edmundston and one in the Town of Madawaska.

A study-specific website – http://maine.gov/mdot/planning/studies/meib/ – was developed early in the process and updated as materials were developed. In addition to materials about the study, the website provided an opportunity to submit comments directly to those agencies preparing the study.

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1.0 INTRODUCTION

1.1 Background

1.1.1 Overview

It is widely recognized that the International Bridge connecting Edmundston, New Brunswick and Madawaska, Maine is functionally obsolete, nearing the end of its useful life, and in need of rehabilitation or replacement (Exhibit 1.1). Underscoring the need to rehabilitate or replace the International Bridge, the Maine Department of Transportation (MaineDOT) and New Brunswick Department of Transportation and Infrastructure (NBDTI) posted the International Bridge at five tons (4.5 tonnes) (the equivalent of a passenger vehicle) in October 2017. It is further recognized that the size and conditions of the existing building and overall site of the existing Madawaska Land Port of Entry (LPOE) are substandard, preventing the agencies assigned to the LPOE from adequately fulfilling their missions.

Exhibit 1.1 - *Location Map*

In response, the federal, provincial, and state agencies responsible for the movement of people and goods across this international crossing initiated the preparation of the *Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study*. The purpose of this study is to identify a preferred location for the rehabilitation or replacement of the International Bridge and Madawaska LPOE.

The *Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study* is being performed by:

- Maine Department of Transportation (MaineDOT) – lead agency;
- U.S. General Services Aministration (GSA);
- U.S. Customs and Border Protection (CBP);
- New Brunswick Department of Transportation and Infrastructure (NBDTI);
- Public Services and Procurement Canada (PSPC); and
- Canada Border Services Agency (CBSA).

The process used by these agencies to identify a preferred location for the rehabilitation or replacement of the International Bridge and Madawaska LPOE broadly consisted of: developing

an understanding of the purpose for rehabilitating or replacing the International Bridge and Madawaska LPOE and why it is needed; oliciting cooments from potential stakeholders; identifying the transportation, environmental, social, and cultural features in the area that could potentially be adversely impacted or enhanced by rehabilitation or replacement of the International Bridge and Madawaska LPOE; developing design criteria and performance measures for the International Bridge and Madawaska LPOE; and identifying, conceptually developing, and screening a broad range of alternatives leading to the identification of the preferred location for the rehabilitation or replacement of International Bridge and Madawaska LPOE.

The study summarizes the conceptual alternatives identification, development, and screening process leading to the identification of the preferred locations for the replacement of International Bridge and Madawaska LPOE. In support of developing a new international bridge and LPOE at these preferred locations, this feasibility and planning study also identifies:

- The anticipated permits and other approvals required,
- A master list of agencies with direct or indirect jurisdiction over the action and other interested parties and their contact information,
- An anticipated schedule of activities, and
- A preliminary estimate of costs to construct it.

1.1.2 Needs Assessment

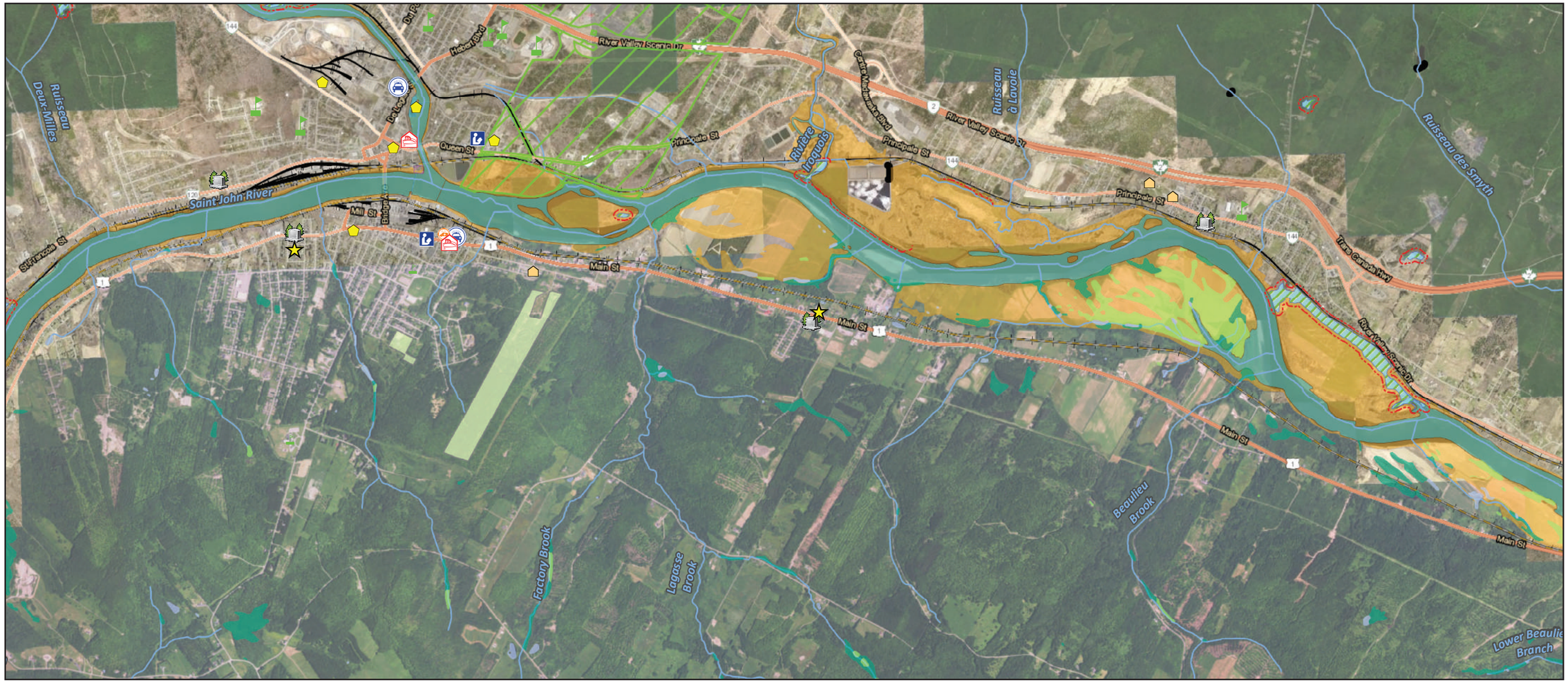
In the U.S., the purpose statement (i.e., mission statement) and needs discussion (i.e., statement of the problems warranting a search for alternative solutions) are in many ways the most important parts of a feasibility and planning study and subsequent environmental analysis and documentation, including permit applications. A clear and well-justified purpose statement and needs discussion:

- Explain to the public and decision makers that the expenditure of taxpayers' funds is necessary and worthwhile and that the priority the project is being given, relative to other needed projects, is warranted.
- Informs the public and decision makers of the wide range of alternatives considered, the alternatives' potential environmental impacts, and address why these potential impacts may be acceptable based on the project's importance.

The purpose statement and needs discussion drives the process for alternatives identification and consideration, in-depth analysis, and ultimate selection.

At the start of the feasibility and planning study, a conceptual study area was developed. This area was selected because it would encompass the range of conceptual alternatives to be developed and the areas that would experience potential direct, indirect, and cumulative impacts from them (Exhibit 1.2).

Exhibit 1.2 - *Study Area Map*



Legend

- Cultural Resource Building Point
- Libraries
- Fire Station / EMS
- Cemeteries
- Ambulance
- School
- Park
- Police
- Nursing Homes
- Railroads
- Canada Crown Lands
- Conserved Lands - ME
- Aboriginal Lands
- Stream Flowline
- Regulated Wetlands Map (RWM)-30 Meter Buffer
- Man-made Structures to Access Water
- Flood 2008 - Canada
- Protected Wellfields

Waters

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Wetlands - Canada
- Stream/River Area

N
W E
S

1 inch = 3,000 feet

0 1,500 3,000 6,000 9,000 Feet

1.1. 2.1 Project Purpose

The purpose of this project is to provide for the long-term safe and efficient flow of current and projected traffic volumes, including the movement of goods and people, between Edmundston, New Brunswick and Madawaska, Maine.

1.1.2.2 Needs

The proposed project is needed because: 1) the existing International Bridge is nearing the end of its useful life, and 2) the size and conditions of the existing building and overall site of the Madawaska LPOE re substandard, preventing the agencies assigned to the LPOE from adequately fulfilling their respective missions.

1.1.2.2.1 Existing International Bridge is Nearing the End of its Useful Life

The International Bridge (MaineDOT Bridge No. 2399, New Brunswick DTI/MTI Bridge No. E320) is a 928 foot-long (282.9 meters [m]) four-span bridge carrying Bridge Avenue over the Saint John River and Canadian National Railroad (CNR) tracks. Originally built in 1920, each span consists of a Pennsylvania Truss measuring 232 feet (ft) (70.7 m) long with a roadway width of 20 ft, 8 inches (in) (6.2 m) (MaineDOT, 2017a).

After nearly 100 years of service, the overall bridge is in poor condition. Despite efforts to maintain the bridge, the rate of deterioration has accelerated to the point that the end of the useful service life of the bridge is fast approaching. Further attempts to repair or rehabilitate the bridge will not restore the full capacity of the bridge to meet today's load requirements or geometric standards; hence, any substantial investments would be impractical. Extensive repairs will be needed in the future on a more frequent basis to maintain the usefulness of the structure, albeit in a reduced state of functionality.

The specific factors contributing to the overall inadequacy of the bridge are:

- Poor Condition of Structural Members;
- Substandard Load Carrying Capacity;
- Geometric Constraints; and
- Extensive Deteriorating Repairs and Retrofits.

Condition of Structural Members

The bridge was inspected in July 2017 in accordance with the requirements of U.S. Federal Highway Administration's (FHWA) National Bridge Inspection Standards. A hands-on fracture-critical and routine inspection was completed using an under-bridge inspection vehicle to inspect the underdeck sections of the bridge superstructure and truss, and a standard bucket truck to inspect the upper truss chords and braces.

Span 4 - Floor beam web and top flange section loss adjacent to/above stringer connection.

Stringers

Stringers are the steel beams which run the length of the bridge and support the open steel grid deck. The stringers in Spans 1 and 2 (spans are numbered 1 through 4 starting on the Canadian side of the bridge) are in poor condition and exhibit significant deterioration in several members. Approximately 50 percent of the stringers in Span 1 and 20 percent of the stringers in Span 2 exhibit significant deterioration. Most of the stringers in Spans 3 and 4 show moderate deterioration. Some stringers have significant deterioration at the connections to the floor beams and, in three cases, have corrosion cracks (MaineDOT, 2017a).

Floor Beams

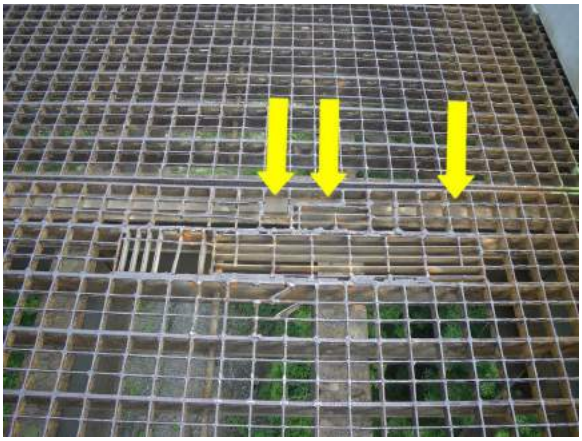
The floor beams support the stringers and distribute the loads to the trusses. The floor beams exhibit moderate to advanced deterioration throughout, particularly at the stringer connections. The bottom flange and bottom flange cover plate of the floor beams exhibit moderate to advanced deterioration throughout, particularly at the stringers (MaineDOT, 2017a).

Deck

The open steel grid deck in Spans 1 and 2 is in poor condition and exhibits many distressed areas comprised of cracked, failed, or missing sections to the extent that some areas warp under truck weight. There are many deck repairs throughout Spans 1 and 2, and these repairs are weak points which have now failed. Some of these failed repairs have become detached with sharp edges and/or warp under truck weight (MaineDOT, 2017a).

Substructures

The piers exhibit many vertical cracks, some of which extend the full height of the piers, particularly on the east and west faces. These cracks exhibit moderate to heavy discoloration and crystallization, known as efflorescence. The faces of Piers 1 and 2 exhibit cracks along the pier cap and moderate splintering or chipping. At Piers 2 and 3, the pier column noses exhibit advanced splintering at mid-height due to ice floe collision damage with missing sections



Looking South - Cracked transverse welds between the grid deck and floorbeam top flange. Note failed repairs.

of the steel angle, particularly at Pier 3. The north face of the Pier 3 nose is chipped with exposed, debonded, and twisted reinforcement, and a missing section of the steel angle (MaineDOT, 2017a).

Pier 2 Pier wall, South Face - Map/vertical cracks with moisture throughout, delamination along pier cap and scattered delaminations, spalls, and scaling.

Load Carrying Capacity

Upon completion of the bridge inspection, structural engineers evaluated the bridge in October 2017 in accordance with the *Manual for Bridge Evaluation* published by the American Association of State Highway and Transportation Officials (AASHTO). This evaluation concluded that extensive deterioration of the stringers and floor beams has significantly decreased the load carrying capacity of the bridge from the standard gross vehicle weight limit of 40 tons (35.7 tonnes). Based on the results of the load capacity evaluation MaineDOT and NBDTI collectively decided to post the bridge at five tons (4.5 tonnes). This weight limit ensures that the bridge remains safe for passenger vehicles. All vehicles weighing more than five tons (4.5 tonnes), including tractor trailer trucks, box trucks, buses, and fire trucks, are prohibited from crossing the bridge. (MaineDOT, 2017b).

In November and December of 2017 NBDTI completed a temporary strengthening initiative including the replacement of four stringers supporting the bridge roadway surface that exhibited critical amounts of deterioration. The replacement of these stringers was complex with each stringer replacement requiring approximately two weeks to replace. Currently, an additional 75 deteriorated stringers remain in place. Given the time, effort, and cost required to replace these components, MaineDOT and NBDTI do not believe it is prudent to replace them. Therefore, the five-ton limit will remain in effect until the bridge is replaced.

Geometric Constraints

The geometry of the bridge is substandard and limits the accessibility and rideability of the bridge. The width of the roadway is a major contributing factor to the inefficient movement of vehicles, particularly commercial trucks, as they approach and traverse the bridge from either direction. The approach into and out of the LPOE or Edmundston Port of Entry (POE) is cumbersome and not conducive to smooth traffic flow without affecting the oncoming traffic, especially as trucks leave Edmundston and turn onto the bridge. The roadway width of 20 ft, 8 in (6.2 m) between the curbs is extremely narrow.

The vertical clearance above the bridge is substandard at 14 ft, 3 in (4.3 m). Several overhead beams appear to have been struck by commercial trucks as indicated by several bent cross-frame members. The vertical clearance above the CNR tracks is 22 ft and 3/4 of an inch (6.7 m), which is nearly 1 foot (0.3 m) less than the required 23 ft (7.0 m) of vertical clearance (MaineDOT, 2017a).

Extensive Repairs

Many repairs to the bridge have been implemented over the last 60 years; however, the rate of deterioration has begun to exceed the rate of the repair efforts. In 1961, the original timber deck was replaced with an open steel grid deck and the floor beams were strengthened with top and bottom cover plates on the flanges. In the 1980s concrete repairs were performed on the north abutment, and stone riprap was placed around the footings of Piers 1 and 2. A significant rehabilitation effort was undertaken on Spans 3 and 4 in 2001, which consisted of replacement of steel stringers, grid deck, and connection angles between stringers and floor beams. Concrete repairs to the south abutment and Pier 3 were also completed. In 2005, the sidewalk was replaced in Spans 3 and 4 (MaineDOT, 2017a).

1.1.2.2.2 Existing Madawaska Land Port of Entry

In 2007, under the National Environmental Policy Act (NEPA) of 1969, as amended, 42 USC 4321 - 4347, GSA published the Final Environmental Impact Statement (FEIS) "Madawaska Border Station, Madawaska, Aroostook County, Maine" and subsequent "Record of Decision for the Construction of a New Border Station in Madawaska, Maine" (ROD) which assessed the potential impacts of the construction of a new Madawaska LPOE.

The Madawaska LPOE is situated on approximately 0.87 acre (3,520.8 square meters [m^2]) and has many problems and deficiencies. The size and conditions of the existing building and overall site are substandard, preventing the agencies assigned to the LPOE from adequately fulfilling their respective missions. The deficiencies with the existing facilities have led to extensive traffic delays, for vehicles entering the U.S. Specifically, the deficiencies at the Madawaska LPOE fall into two broad categories:

- Building deficiencies
- Overall site layout deficiencies

Building deficiencies

The existing LPOE is a single-story masonry building with a basement that was built in 1959. The 6,000 square feet (ft^2) (557.4 m^2) of building space at the LPOE represent approximately 25 percent of the required gross building area for a medium-sized LPOE. The agencies housed within this building lack adequate office space with no space for expansion. The lower level of the building is not compliant with the Architectural Barriers Act. The U.S. Drug Enforcement Administration and Food and Drug Administration, while not tenants of the building, frequent the port. These

The existing LPOE, looking north.
Photo shows the lack of an outbound inspection lane.

agencies do not have designated spaces within the building (GSA, 2007).

The existing LPOE, looking northwest.
Photo shows the small size of the LPOE site and building.

Overall site layout deficiencies

The site is deficient in primary and secondary inbound inspection areas, outbound inspection areas, parking and delivery areas, and building setbacks required to meet current guidelines and satisfy the needs of the agencies (GSA, 2007).

The site has substantial physical limitations. While the property is approximately 0.87 acre (3,520.8 m^2) in size, approximately half of the property consists of the steep banks along the Saint John River and is not usable area. The usable portion of the property owned by the GSA is approximately 100 ft (30.5 m) wide and 200 ft (61.0 m) long (GSA, 2007).

The small size of the LPOE site causes traffic to back up into the City of Edmundston. The two inbound primary inspection lanes are too close to the bridge to allow for the efficient queuing of inbound vehicles. The most significant operational deficiency of the existing site is the lack of space available to accommodate the secondary inspection of large commercial vehicles (GSA, 2007).

Adding to poor traffic circulation is the proximity of the primary inspection booth to the Maine Northern Railways (MNR) railroad tracks that cross Bridge Avenue about 60 ft (18.3 m) south of the primary inspection booth. While the train traffic is not heavy, when present, the trains leave little room for queuing and storage of vehicles (GSA, 2007).

1.2 Prior Studies and Conclusions

To provide a context for the *Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study*, prior studies concerning the movement of vehicles between the POE and the LPOE were reviewed. These prior studies, briefly summarized below, are:

- *International Border Crossing Feasibility Study* – 2010
- *Atlantic Gateway Border Traffic and Infrastructure Study* – 2009
- *Madawaska Border Station Final Environmental Impact Statement* – 2007
- *Border Crossing Recommendation Memorandum* – 2002

1.2.1 *International Border Crossing Feasibility Study*, 2010

In 2010 the MaineDOT, NBDTI, and the GSA performed the *International Border Crossing Feasibility Study* (MaineDOT, 2010). The goal of the study was to determine if upgraded

LPOEs at Madawaska/Edmundston and Van Buren, Maine/St. Leonard, New Brunswick could accommodate commercial traffic in the long term (the year 2030).

The study examined the current conditions of the ports to establish the current conditions and capacity of the international crossings. Once the current conditions were understood, the study examined the planned upgrades and forecasted future travel demand. The current capacity was compared to the forecasted future travel demand. For the Madawaska/Edmundston border crossing, the study concluded (MaineDOT, 2010):

- "The narrow width of the bridge creates traffic flow issues for large commercial vehicles where it is difficult for two trucks to cross at the same time."
- "There is insufficient space for commercial vehicles to efficiently access the bridge on the Canadian side of the border. Commercial vehicles accessing the bridge encroach on opposing travel lanes to complete turning maneuvers."
- "There is inadequate space for commercial vehicles to access the third booth at the Edmundston CBSA facility."
- "Large commercial vehicles turning right from the CBSA facility to Rue St. François in Edmundston require both lanes of the roadway to complete the turn due to the truck turning radius."
- "A new border station is planned for Madawaska to replace the existing facility... The new station will address a range of deficiencies including:"
    - » "Building deficiencies: The existing building is approximately 6,000 SF, which is significantly undersized and inadequate."
    - » "Site Layout Deficiencies: There is a lack of primary and secondary inspection areas, outbound inspection areas, parking, and delivery areas. The inbound primary inspection areas are too close to the bridge resulting in inefficient vehicle queuing and long traffic back-ups."
    - » "Insufficient Security: The existing facility and other locations do not meet CBP security criteria in terms of controlling the side and perimeter areas. The confined and congested location does not provide adequate separation from other facilities such as Twin Rivers Paper operations."

The Madawaska/Edmundston border crossing processed approximately 1,292,000 vehicles in 2008. A comparison of 2008 volumes to the 2030 traffic forecast shows a 10 percent (or 490 vehicles per day) increase in traffic at the Madawaska/Edmundston border crossing. The overwhelming majority (over 90 percent, 6,550 passenger vehicles per day) of traffic is passenger vehicle traffic compared to commercial vehicle traffic (under 10 percent, 200 trucks per day). This proportion of passenger vehicle traffic and commercial vehicle traffic is expected to continue to the year 2030 (MaineDOT, 2010).

This study finds that the planned improvements at Madawaska/Edmundston and Van Buren/St. Leonard ensure sufficient capacity to accommodate both passenger and commercial traffic to

the year 2030. As such, further study of a new (third) commercial border crossing in the Upper Saint John Valley was not recommended (MaineDOT, 2010).

1.2.2 *Atlantic Gateway Border Traffic and Infrastructure Study*, 2009

The purpose of the *Atlantic Gateway Border Traffic and Infrastructure Study* was to analyze the movement of goods at key locations along the Canada-U.S. border in New Brunswick and to assess the efficiency of this component of the Atlantic Gateway transportation system. An analysis of traffic and trade statistics between 1998 and 2007 revealed that the Canada-U.S. border crossings between New Brunswick and Maine serve as key gateways for trade between Atlantic Canada and the U.S. (Opus, 2009).

On an average day, approximately 18,000 passenger vehicles, 1,800 trucks, and 4 trains cross the border between New Brunswick and Maine. The two busiest crossings, in terms of passenger vehicles, are the Ferry Point crossing in downtown St. Stephen/Calais and Edmundston/Madawaska. The distribution of traffic between the border crossings has stayed relatively constant over the last eight years (Opus, 2009).

The opportunities and deficiencies identified at the LPOE and POE include:

- Queues of passenger vehicles at the LPOE block the access to the commercial inspection booths. The proposed LPOE will be located approximately 1,000 ft (300 m) from the existing building allowing additional area for separating passenger vehicles from commercial traffic.
- Limited space to maneuver large vehicles within the POE. Commercial trucks encroach on the opposite lanes when turning to and from the bridge. It was concluded insufficient space is available within the POE to improve traffic flows to and from the bridge. However, the turning radius for trucks turning right from the POE onto Rue St. François can be improved.
- Use Information Technology Systems to manage the demand by passenger vehicles. Passenger vehicle queues were notable at the LPOE; the facility should be reviewed for end-of-queue warning systems.
- Insufficient space is available at the POE to improve traffic flows to and from the bridge. However, lane markings can be changed on Rue St. François in Edmundston to increase the right turn radius.
- Investigate the feasibility of installing NEXUS lanes at the POE and the LPOE to improve the flow of passenger vehicles (Opus, 2009).

There is insufficient space available at the POEs in St. Leonard and Edmundston to make roadway improvements. As the LPOEs in Van Buren and Madawaska will be replaced within the next five years, they were not reviewed. Improvements were recommended for signage at all crossings. Recommendations at Edmundston/Madawaska included replace the LPOE as proposed, new signs on the approach to the POE, and shift the center line on Rue François in Edmundston to increase turning radius from the POE (Opus, 2009).

1.2.3 *Madawaska Border Station Final Environmental Impact Statement*, 2007

The GSA prepared an Environmental Impact Statement (EIS) in support of replacing the LPOE in accordance with the National Environmental Policy Act (NEPA) in 2007. The purpose of the EIS was to provide the GSA and the public with a full accounting of the potential environmental impacts of the alternatives developed for replacing the LPOE.

In the *Madawaska Border Station Final Environmental Impact Statement*, the GSA proposed to replace the existing LPOE. The 24-hour LPOE serves both non-commercial and commercial traffic via the International Bridge over the Saint John River, connecting Madawaska with the City of Edmundston. The LPOE is to the immediate west of the southern terminus of the International Bridge. The LPOE consists of a single building and parking areas on 0.87 acre (3,520.8 m^2) bordered by the Saint John River to the north, Bridge Avenue to the east, and the Montreal, Maine, and Atlantic (MM&A) Railroad (presently the MNR) to the south and west (GSA, 2007).

The LPOE is designated a "permit port" and has the ability to inspect and pass only those commercial vehicles with a permit — generally commercial traffic from regular importers who have local deliveries to points north of Houlton in Aroostook County. Commercial vehicles from Fraser Papers Company (presently the Twin Rivers Paper Company), traveling between its two plants on either side of the International Bridge, comprise a large portion of the commercial traffic using this crossing (GSA, 2007).

The project was proposed because the size and conditions of the existing building and overall site are substandard, preventing the agencies assigned to the LPOE from adequately fulfilling their respective missions. This condition had become more noticeable in recent years due to the increase in commercial truck traffic. The deficiencies with the existing facilities have led to extensive traffic delays, for vehicles entering the U.S. (GSA, 2007).

The GSA developed four alternatives to address the deficiencies of the LPOE.

Three alternatives – A, B, and C – were developed that attempted to locate the new LPOE within a small geographical area immediately adjacent to the existing LPOE, roughly bordered by the Fraser Papers Company mill, the Saint John River, and Bridge and Mill Streets. These three alternatives only marginally met the project's requirements. They had the general disadvantages of poor on-site traffic circulation, inadequate space, substandard security, significant disruption of Fraser Papers operations, and numerous at-grade crossings of railroad tracks and sidings (GSA, 2007).

The GSA determined that an additional alternative – Alternative D – should be developed that would better meet the project's purpose and need and eliminate as many of the disadvantages of the other alternatives as possible. Alternative D consisted of a new facility on an approximately 12.9-acre (52,204.5 m^2) site about 1,600 ft (487.7 m) west of the existing LPOE and owned by Fraser Papers, the MM&A Railroad, and the Madawaska Regional Health Center. At the time, Fraser Papers had stated this area was not critical to their operations, and they were willing to

sell this property to the federal government. The site was of a sufficient size that would permit a layout more consistent with the requirements and criteria of the GSA and the CBP than the other three alternatives. The LPOE could be expanded more easily on this site in the future, if needed, than the other alternatives (GSA, 2007).

Vehicles traveling from the International Bridge would make a 90-degree turn west, and proceed approximately 1,600 ft (487.7 m) on a secure access road and elevated roadway over the MM&A Railroad tracks to the site of the new LPOE. A portion of the proposed access road and elevated roadway would be adjacent to the Saint John River and would require a Natural Resources Protection Act permit from the Maine Department of Environmental Protection. The majority of the access road and elevated roadway would be constructed on property owned by the MM&A Railroad. The GSA would own and maintain the access road and elevated roadway. A pedestrian-only processing facility would be located at the U.S. end of the International Bridge on the site of the current LPOE (GSA, 2007).

Following the publication of the the EIS, the GSA issued a Record of Decision explaining its rationale for selecting Alternative D as the GSA's preferred alternative for replacing the LPOE.

1.2.4 *Border Crossing Recommendation Memorandum*, 2002

In 2002, MaineDOT considered suitable locations for a new commercial border crossing near Madawaska to replace the existing Madawaska/Edmundston border crossing in conjunction with the *Aroostook County Transportation Study* (ACTS) (VHB, 2002).

A secondary purpose of the analysis was to review the corridors in the ACTS for their compatibility with a potential new border crossing in Madawaska and to identify alternative routes for a new highway connecting Route 11, north of Eagle Lake, with the crossing site(s). The purpose of these new highway connections would be to provide direct trucking access to I-95 via Route 11 from the Canadian border. Ideally, this new connection would maximize the benefits of the significant improvements that MaineDOT has made to Route 11, and improve freight access to Madawaska and the TransCanada Highway (Route 2) (VHB, 2002).

Based upon preliminary findings, a new border crossing could have been most easily established in Van Buren (0.5 mile [mi] [0.8 kilometer (km)] southeast of the existing Van Buren border crossing) which would provide a direct connection between Route 1 and both the TransCanada and Route 17. A new commercial crossing in Van Buren would have offered the shortest, most direct route to points within and south of the ACTS study area from the Saint John Valley (VHB, 2002).

Of the three Van Buren crossing locations considered, Site 10 offered the best connection with the TransCanada. The site would take advantage of the infrastructure improvements in New Brunswick where the TransCanada was being upgraded to a four-lane divided highway; the roadway was four lanes from Edmundston to within one mi (1.6 km) of the proposed connector road at the border crossing with Site 10. This location would connect into the improvements

proposed for Route 1 in the ACTS (Corridors C-1and C-2). This crossing location would help reduce truck traffic along Main Street (Route 1) in Van Buren (VHB, 2002).

Of the crossing sites in Madawaska considered, Site 7 (at Grand Isle) appeared to be the best option, provided the distance from downtown Madawaska was acceptable. This site was approximately 4 mi (6.4 km) farther east than Site 5 (St. David West) for a total of 7.5 mi (12.0 km) east of downtown Madawaska. If this distance was unacceptable, Site 5 was the next most desirable location for a Madawaska crossing. It offered better connections to the TransCanada, more desirable bridge length and geometry, and less disruption to rail crossings than the Frenchville sites (VHB, 2002).

A highway corridor alternative was developed to connect the TransCanada Highway with Routes 11, 161, and 162. The highway would have had substantial, and likely prohibitive, wetland impact (VHB, 2002).

A comparison of the travel time with and without the connector indicates that if the new connector was built, it would save approximately 10 minutes between Route 11 and the border, and 3 minutes between Route 161 and Madawaska (VHB, 2002).

1.3 Policy Context

To provide a policy context for the *Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study*, other plans and legislation with potential applicability were reviewed. These other plans and legislation are:

- *United States – Canada Beyond the Border: A Shared Vision for Perimeter Security and Economic Competitiveness*
- *United States – Canada Binational Border Infrastructure Investment Plan*
- *Buy America Act*

These other plans and legislation are briefly summarized.

1.3.1 United States – Canada Beyond the Border: A Shared Vision for Perimeter Security and Economic Competitiveness

On February 4, 2011, the Prime Minister of Canada and the President of the United States issued "United States – Canada Beyond the Border: A Shared Vision for Perimeter Security and Economic Competitiveness." The declaration established a new long-term partnership built upon a perimeter approach to security and economic competitiveness. On December 7, 2011 Canada and the United States jointly released the *Beyond the Border Action Plan* which identifies 32 distinct initiatives within four areas of cooperation identified in the initial declaration (President Obama and Prime Minister Harper, 2011). These areas of cooperation are:

- Addressing threats early;
- Promoting trade facilitation, economic growth, and jobs;

- Strengthening cross-border law enforcement; and
- Protecting shared critical infrastructure, including enhancing continental and global cybersecurity (President Obama and Prime Minister Harper, 2011).

The Beyond the Border Action Plan was reviewed for references that pertain directly to the Madawaska/Edmundston border crossing. Specifically, the Beyond the Border Action Plan was reviewed for recommendations for infrastructure upgrades. No references to the Madawaska/Edmundston border crossing were found (President Obama and Prime Minister Harper, 2011).

1.3.2 United States – Canada Binational Border Infrastructure Investment Plan

On May 30, 2013, the United States and Canada released the *Border Infrastructure Investment Plan* (BIIP). The development and release of this BIIP fulfills a commitment made under the 2011 *United States-Canada Beyond the Border Action Plan*. The BIIP is an interagency and binational planning mechanism developed to establish a mutual understanding of recent, ongoing, and potential border infrastructure investments. It outlines the approach that the United States and Canada will take to coordinate plans for physical infrastructure upgrades at small and remote POEs. This initiative is updated annually (Napolitano, et al., 2013).

The BIIP works to help ensure a mutual understanding of available funding for targeted projects and the schedule, scope, and responsibilities for those projects in consultation and coordination with applicable local, state, or provincial and federal stakeholders. The BIIP covers significant upgrades that have an impact on transportation and inspection capacity. Infrastructure improvements at border crossings are expected to provide the following long-term economic benefits:

- reduced wait times;
- increased reliability of just-in-time shipments;
- decreased fuel consumption and greenhouse gas emissions, due to reduced engine idling at the border; and
- increased safety and security (Napolitano, et al., 2013).

The BIIP was reviewed for references that pertain directly to the Madawaska/Edmundston border crossing. Specifically, the BIIP was reviewed for recommendations for infrastructure upgrades. No references to the Madawaska/Edmundston border crossing were found.

1.3.3 Buy America Act

The provisions of the *Buy America Act* apply to federal-aid projects led by a state or local government agency that include funding from the FHWA or the Federal Transit Administration. *Buy America* generally refers to the domestic content requirements for iron and steel in these projects (HNTB, 2017).

The FHWA's *Buy America* policies require a domestic manufacturing process for all steel or iron products that are permanently incorporated into a state or local government led, federal-aid

highway construction project. The FHWA *Buy America* statutory provisions are in 23 U.S.C.313 and the regulatory provisions are in 23 CFR 635.410. This policy provides for:

- A domestic manufacturing process for any steel or iron products (including protective coatings) that are permanently incorporated in any project funded under Title 23;
- Alternate bid provisions;
- Minimal usage criteria for non-domestic products; and
- A waiver process based on public interest or the availability of domestic products (HNTB, 2017).

If federal funding is to be used in support of any phase of a project, *Buy America* will apply regardless of the funding source used to purchase the iron and steel products incorporated into a project. In other words, an agency cannot avoid *Buy America* requirements by making the cost of eligible iron and steel products federal-aid non-participating. Similarly, the provisions cannot be avoided by procuring the required iron and steel products through a separate contract, or by segmenting a project into multiple separate contracts (HNTB, 2017).

Domestic manufacturing process

The *Buy America* regulation requires that all manufacturing and fabricating processes for iron and steel products must take place domestically. This includes both the manufacturing of the raw steel products as well as the fabrication and assembly of the steel or iron components. Additionally, the application of all protective coatings to iron or steel products is covered by *Buy America* requirements and must occur domestically; however, the production of material being applied as a coating is not covered under *Buy America*. For clarity, a coating is considered any process that protects or enhances the value of a material or product to which it is applied, such as epoxy coatings, galvanizing, or painting (HNTB, 2017).

Buy America applies only to iron and steel products required to be permanently incorporated into a federal-aid construction project. Materials used for the construction of temporary works which are not required to remain in the completed project, such as sheeting, shoring, and temporary bridges, are exempt (HNTB, 2017).

The *North American Free Trade Agreement* does not affect the *Buy America* requirements for federal-aid highway construction projects; iron and steel products manufactured and fabricated in Canada are considered foreign products (HNTB, 2017).

Alternate Bid Provisions

The *Buy America* regulations provide for an alternate bid procedure in 23 CFR 635.410(b)(3). This procedure waives *Buy America* provisions at the time of contract award if the following two criteria are met:

- A state elects to include an alternate bidding provision in the project advertisement for foreign and domestic steel and iron products, and
- The lowest overall bid based on using domestic products is 25 percent more than the lowest overall bid based on using foreign products. In the alternate bid procedure, the comparison of bid prices is made between the total lowest bid using domestic iron/steel products and the total lowest bid using foreign iron/steel products; it is not based on the value of the iron/steel products in each individual bid (HNTB, 2017).

When alternate bid provisions are included in the contract documents, all bidders must be required to submit a bid based on furnishing domestic iron/steel. The contract must be awarded to the bidder who submits the lowest total bid based on furnishing domestic steel, unless this bid is more than 25 percent higher than the total bid based on foreign steel or iron products (HNTB, 2017).

Minimal usage criteria for non-domestic products

Per regulation, the minimum threshold for *Buy America* to apply is $2,500 (the total amount of iron and steel products as delivered to the project) or 0.1 percent of the total contract amount, whichever is greater (HNTB, 2017).

Waivers

FHWA's regulations provide that the Administrator may issue a *Buy America* waiver on a project-by-project basis if:

- The application of *Buy America* provisions would be inconsistent with the public interest.
- Iron and steel materials/products are not produced in the United States in sufficient and reasonably available quantities which are of satisfactory quality.
- Alternate bidding procedures are used and lowest overall total project bid based on using domestic steel is 25 percent more than the lowest overall total project bid based on using foreign steel (this is a standing waiver codified in regulations when alternate bidding procedures are used) (HNTB, 2017).

Information provided by FHWA indicates that waivers based on public interest are not approved very often. FHWA's *Buy America* documentation provides two examples of when public interest waivers may be granted including: during emergency situations, or where a certain steel or iron product is to be evaluated on an experimental basis (HNTB, 2017).

Buy America waivers are submitted by the state agency administering the federal-aid project. The agency submits the waiver request with supporting information to the FHWA Division Office which is responsible for ensuring that the request includes the necessary information before the information is submitted to the Office of Program Administration. Relevant supporting information includes items such as: the project number, description, and cost; the cost of the waiver item; reasons for the waiver request; a description of the efforts made by the state to locate a domestically manufactured product; and an analysis of redesign of the project using alternate or approved equal U.S. product (HNTB, 2017).

Once a waiver request has been submitted to the FHWA Office of Program Administration, the waiver request is posted on FHWA's website for a 15-day period to solicit public comments. Following the comment period, a final determination is made regarding whether the provisions of *Buy America* should be waived in accordance with Title 23, Section 313(b) (HNTB, 2017).

1.4 Transportation Facilities and Operations

The transportation facilities in the study area consist primarily of the International Bridge and the roadways leading to it, railroads, and the POE and LPOE. This section briefly describes these facilities and their operations.

1.4.1 International Bridge

The International Bridge (MaineDOT Bridge No. 2399, New Brunswick DTI/MTI Bridge No. 320) is a 928 ft (282.9 m)-long four-span thru truss bridge carrying Bridge Avenue over the Saint John River and CNR tracks. Originally built in 1920, each span measures 232 ft (70.7 m) long with a roadway width of 20 ft, 8 in (6.2 m) (MaineDOT, 2017a). The International Bridge has a 6-foot (1.8 m) sidewalk on the eastern (downstream) side which provides shared use for pedestrians and bicyclists. The International Bridge was most recently rebuilt in 1961 (MaineDOT, 2017a) (see Section 1.1.2.2.1, International Bridge).

The MaineDOT and NBDTI posted the International Bridge at five tons (4.5 tonnes) (the equivalent of a passenger vehicle) in October 2017.

1.4.2 Roadway Facilities and Operations

Major roads in the study area are the TransCanada Highway, Rue Saint François (New Brunswick Route 120), Chemin Canada/Queen Street/Principale Street (New Brunswick Route 144), Bridge Avenue, and U.S. Route 1 (Main Street) (Exhibit 1.2).

The TransCanada Highway is a federal-provincial highway system that traverses the provinces of Canada from the Pacific Ocean to the Atlantic Ocean. Within the study area, the TransCanada Highway is a four-lane freeway oriented in a northwest – southeast direction and immediately to the north of the City of Edmundston.

Rue Saint François is oriented in an east – west direction through the study area and serves as a primary connection between the border crossing and the City of Edmundston. Rue Saint François connects to the TransCanada Highway.

Within the study area, Chemin Canada/Queen Street/Principale Street is largely oriented in an east – west direction and acts as the primary route through the City of Edmundston. Route 144 (as Queen Street/Principale Street) is parallel to both the Saint John River and the TransCanada Highway throughout most of the study area, turning north (as Chemin Canada) along the Madawaska River on the western side of the City of Edmundston.

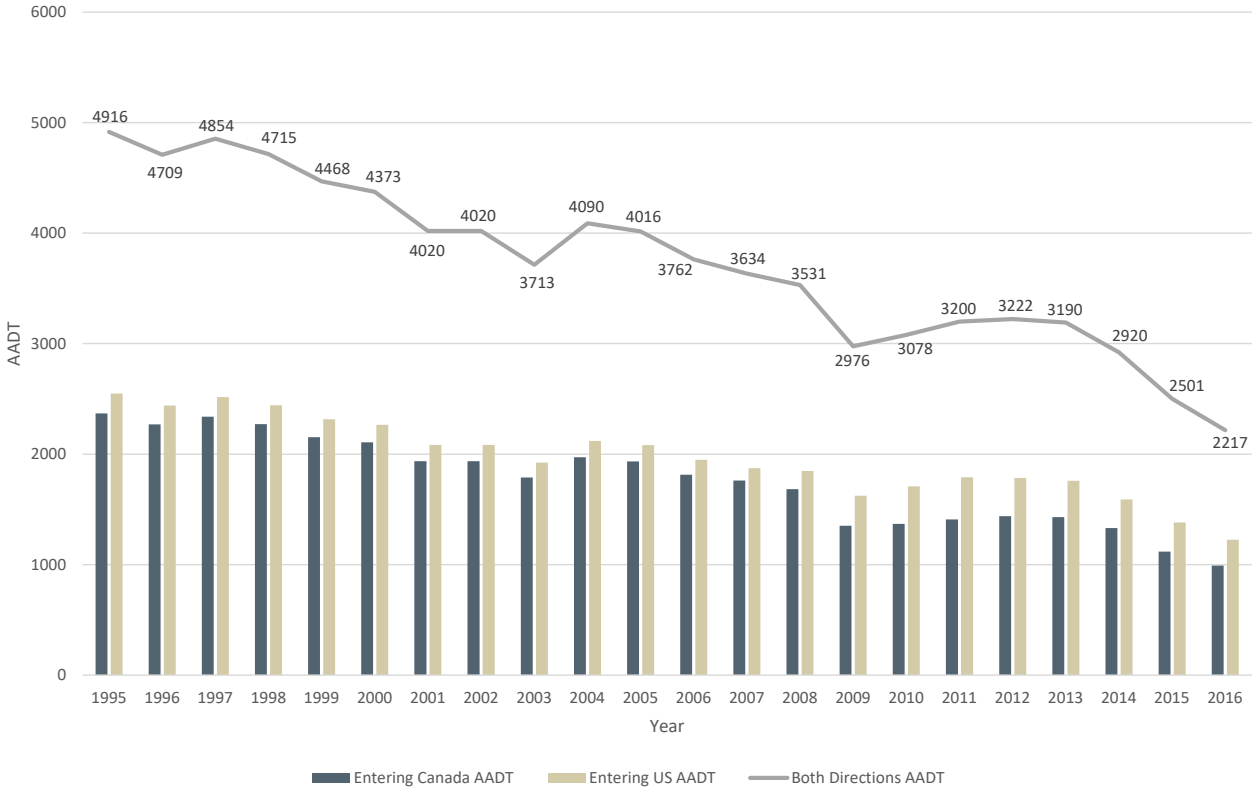
Bridge Avenue is oriented in a north – south direction from U.S. Route 1 (Main Street) across the International Bridge to Rue Saint François and is classified by the MaineDOT as a federal aid highway. The Madawaska LPOE is situated to the west of Bridge Avenue at the south end of the International Bridge. The Edmundston POE is situated to the north of the International Bridge between the International Bridge and Rue St. François. Bridge Avenue provides two-way traffic across the International Bridge with one lane of travel in each direction.

U.S. Route 1 is a two-lane road through most of the study area. While it continues south along the eastern coast of the United States, within the study area it is largely in an east-west orientation. In the Town of Madawaska, U.S. Route 1 becomes Main Street and serves as the "main street" for Madawaska's downtown central business district. The portion of U.S. Route 1 in the Town of Madawaska is part of the U.S. National Highway System.

1.4.2.1 Existing Traffic Volumes

Historical traffic volume data for the roads in the study area were prepared by the MaineDOT with input from the CBP (the CBSA did not provide input to the traffic volume data). Historical daily traffic volumes, representing average annual daily traffic (AADT) conditions, were available dating to 1995 (Exhibit 1.3). Based on a review of the historical traffic data, traffic volumes (AADTs) across the border during the 21-year period between 1995 and 2016 have decreased by almost half (MaineDOT, 2017c).

Exhibit 1.3 - *AADTs from 1995-2016*



Source: MaineDOT, 2017c

Traffic volumes entering New Brunswick at Edmundston are lower in 2016 than in 2004 for all modes of traffic (Exhibit 1.4). While the decrease has been steady overall, the last three years have shown a greater decrease in traffic volumes than prior years (MaineDOT, 2017c).

Exhibit 1.4 - *AADT for all Modes, 2004-2016*

Year	Commercial Vehicles	Buses	Personal Vehicles	Pedestrians	AADT
2004	38,291	120	737,141	9,258	2,137
2005	36,043	115	723,548	8,208	2,093
2006	34,142	163	677,150	6,684	1,960
2007	33,832	171	649,387	4,185	1,883
2008	31,105	142	644,667	2,973	1,862
2009	22,464	91	570,182	1,576	1,633
2010	22,617	80	601,125	1,752	1,719
2011	31,859	72	621,773	2,227	1,801
2012	27,764	57	625,216	1,777	1,799
2013	25,241	45	616,924	1,503	1,769
2014	19,238	52	561,103	5,952	1,599
2015	16,421	58	488,127	1,134	1,390
2016	16,226	52	431,903	1,251	1,235

Source: MaineDOT, 2017c

The former Fraser Papers Company and Twin Rivers Paper Company account for a large portion of the daily commercial truck traffic across the International Bridge (Exhibit 1.5).

The reduction in traffic in 2009 and 2010 correlates directly to the closing of the former Fraser Papers Company mill in 2009 and the opening of Twin Rivers Paper Company mill in 2010; otherwise, truck traffic follows the same trends as the rest of the traffic (MaineDOT, 2017c).

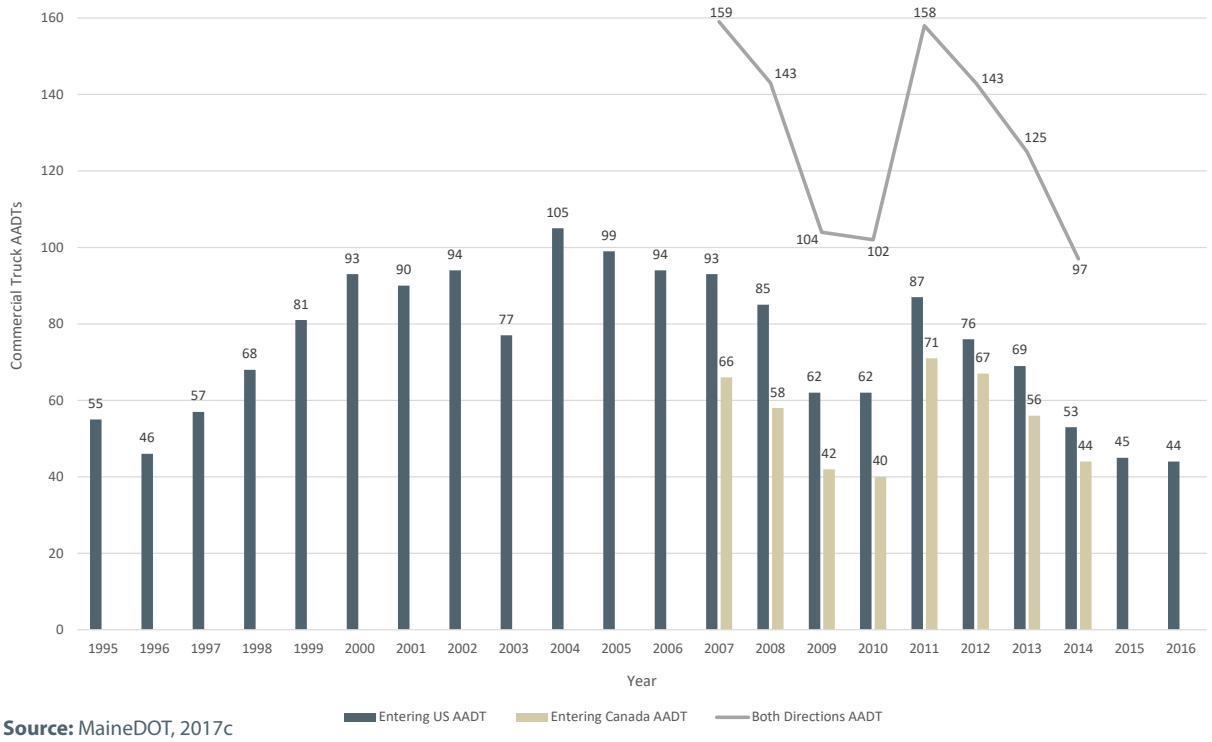
1.4.2.2 Future Traffic Volumes

The Maine Statewide Travel Demand Model forecast a five percent increase in Madawaska/Edmundston cross-border traffic volumes by the year 2040 (Exhibit 1.6) (MaineDOT, 2017c).

1.4.2.3 EMS Vehicles and Services

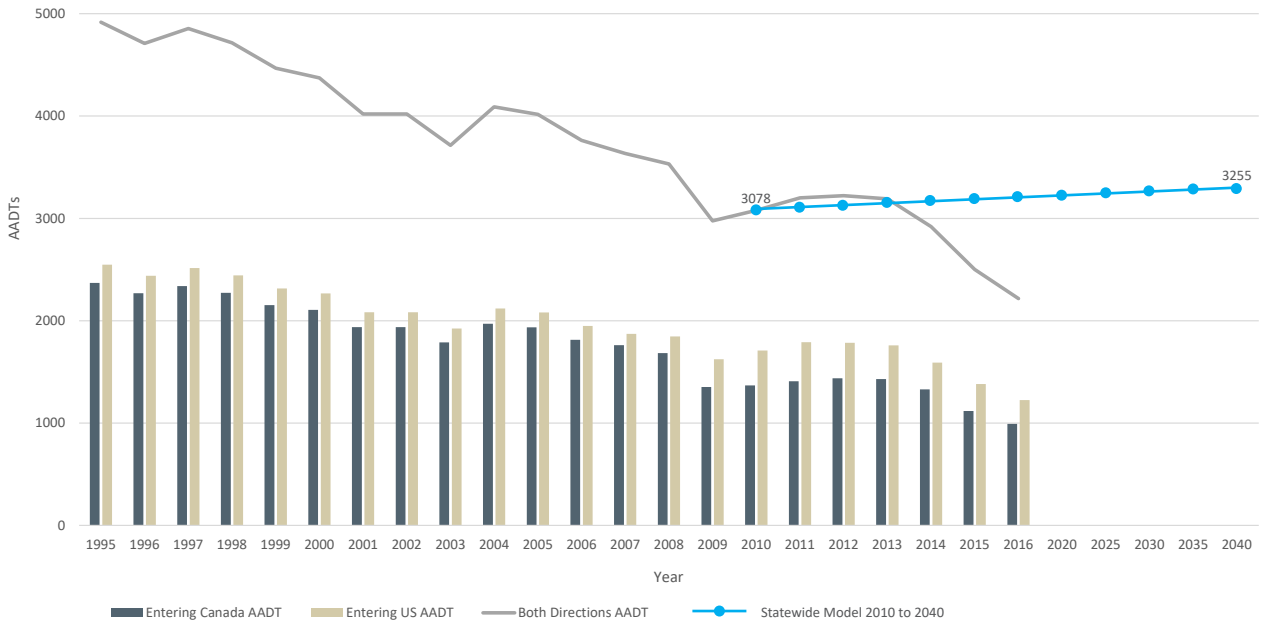
The Town of Madawaska and City of Edmundston entered into a mutual emergency aid agreement in 2012 for fire and emergency protection services. In the event of a fire or other emergency, fire departments from either the Town of Madawaska or City of Edmundston could be asked to respond (Town of Madawaska and City of Edmundston, 2012). If the Town of Madawaska or City of Edmundston fire department is asked to respond, travel would have used the International Bridge, prior to posting the International Bridge to five tons (4.5 tonnes).

Exhibit 1.5 - *Commercial Truck AADTs from 1995-2016*



Source: MaineDOT, 2017c

Exhibit 1.6 - *AADTs from 1995-2040*

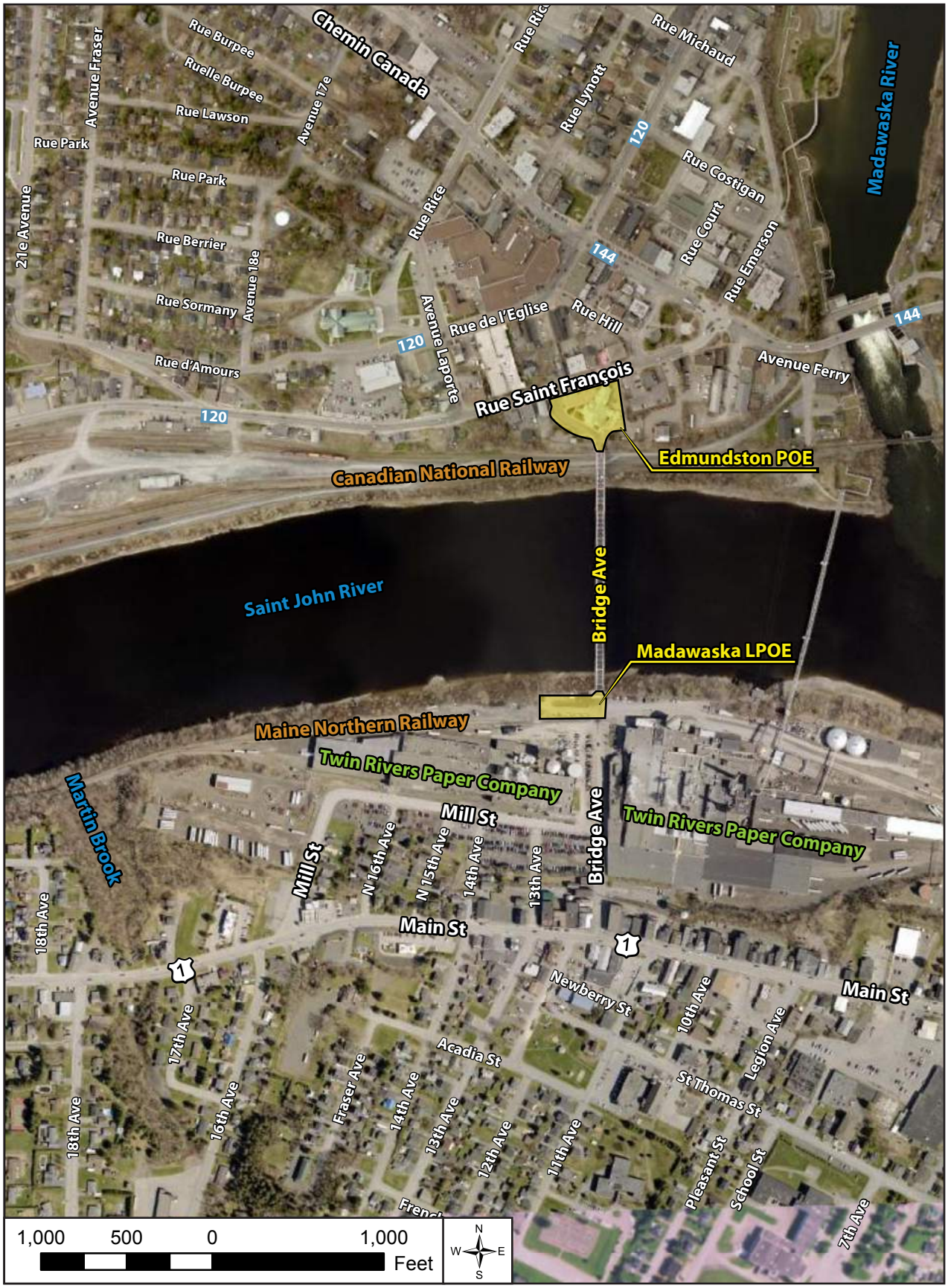


Source: MaineDOT, 2017c

1.4.3 Port Facilities and Operations

The Madawaska/Edmundston Border Crossing is open 24 hours a day, 7 days a week to passenger vehicles and pedestrians and is the 15th busiest crossing along the U.S. – Canadian border (USBorder.com, 2016) (Exhibit 1.7).

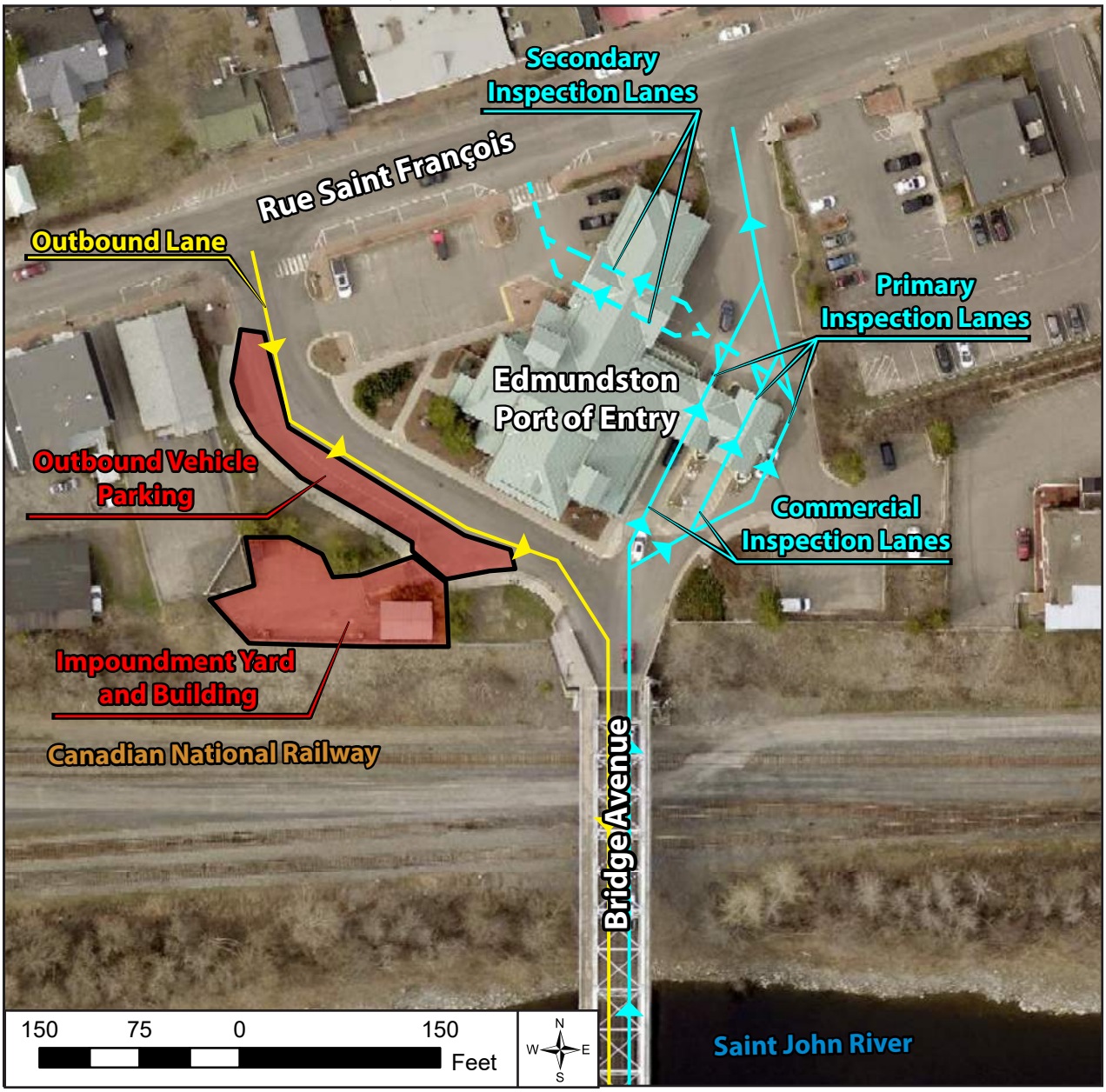
Exhibit 1.7 - *Portion of the Madawaska/Edmundston Downtown Business Zone*



1.4.3.1 Edmundston Port of Entry

The Edmundston POE was constructed in 1992 and consists of a single-story building with three traffic primary inspection lanes and two canopy-covered secondary inspection lanes for inbound traffic (Exhibit 1.8). The POE does not provide lanes for frequent traveler clearance programs (such as FAST, NEXUS, or Ready Lane services) (EZBorderCrossing, 2017).

Exhibit 1.8 - *Edmundston Port of Entry*

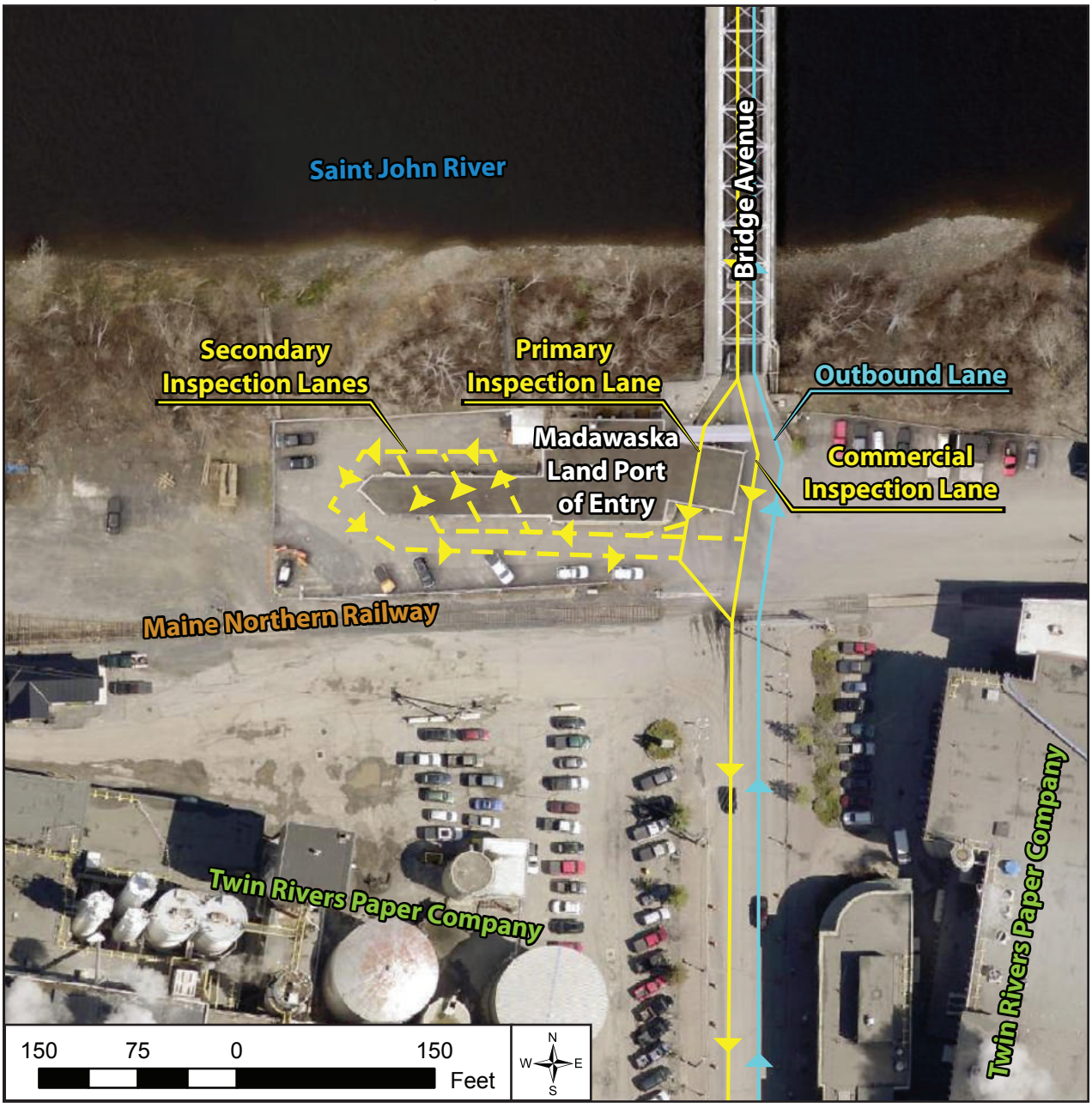


The POE provides commercial vehicle service Monday through Friday between the hours of 8:00 a.m. and 4:00 p.m. AST, except holidays. Services provided at the POE include: designated export office, highway/land border office, electronic data interchange, accounts receivable office, and HUB/central office (CBSA, 2017). According to the PSPC and CBSA, the Edmundston POE is adequate for the foreseeable future and there are no plans to modify or expand it.

1.4.3.2 Madawaska Land Port of Entry

The Madawaska LPOE was constructed in 1959 and consists of a single story brick building with two traffic lanes for inbound traffic and three canopy-covered secondary inspection lanes for inbound traffic; inbound commercial traffic uses the easternmost inspection lane (Exhibit 1.9). The LPOE does not provide lanes for frequent traveler clearance programs (such as FAST, NEXUS, or Ready Lane services) (EZBorderCrossing, 2017).

Exhibit 1.9 - *Madawaska Land Port of Entry*



Currently the Madawaska LPOE is a "permit port"; commercial vehicles must have the required permits to transport cargo in the U.S. and must verify those documents at the LPOE. A new LPOE would also be a permit port.

1.4.4 Railroads

Two railroads operate in the study area proximate to the POE and LPOE; railroad shipments are not inspected as the Madawaska/Edmundston Border Crossing is not an international rail crossing.

1.4.4.1 Canadian National Railway

CNR operates a Class 1 transcontinental freight network extending from Halifax, Nova Scotia to Vancouver, British Columbia. Most of the CNR traffic in New Brunswick is on its way to or from the port of Halifax, with branch lines between Moncton and Saint John. Forest products make up a significant part of the rail traffic originating or terminating in the province, with the remainder being consumer and intermodal traffic. CNR operates two major intermodal yards in New Brunswick: the Gordon Yard in Moncton and the Island Yard in Saint John (Traingeek, 2018).

The CNR yard in Edmundston operates as a connection point between two rail subdivisions: the CNR Pelletier subdivision from Edmundston to St. Andre Junction, Quebec and the CNR Napadogan Subdivision from Edmundston to Moncton. There is a total of 598 mi (962.4 km) of CNR rail line in New Brunswick, providing employment for 327 people in operations. In 2015 and 2016, CNR invested $23 million and $20 million respectively in the rail network to support safety, efficiency, and growth in the province (CNR, 2017).

CNR operates six to ten trains per day through the study area with the Edmundston yard operating 24 hours a day, and 7 days a week. It was noted that during some operations at the Edmundston yard (typically trains switching crews), access to some areas of the yard and the tracks is blocked (Opus and CNR, 2018).

1.4.4.2 Maine Northern Railway

MNR, a subsidiary of New Brunswick & Maine Railways, owns the rail lines located to the south of the Saint John River extending from Mile Post 260 in Frenchville south to Van Buren. MNR's facilities located within the study area include one mainline track, several sidings, and the Madawaska Rail Yard located immediately east of Twin Rivers Paper Company's facility. Numerous spur tracks and several sideline tracks in the vicinity of Twin Rivers Paper Company's facility are owned by others including the State of Maine and Twin Rivers Paper Company (MNR, et al., 2017).

MNR operates two freight trains per day that pass through the Madawaska area. This service is regular and consistent day-to-day. Local shuttling operations between Twin Rivers Paper Company's facilities are also completed to move goods and materials between the mill facilities on either side of Bridge Avenue (MNR, et al., 2017). Local representatives from the LPOE estimate a total of six trains pass by the border station on a daily basis. While several spur lines at Twin Rivers Paper Company facilities are infrequently used, there are reportedly no plans to reduce the number of lines around the mill (CBP and HNTB, 2018).

MNR reports that no expansion of their facilities is planned within the project limits. However, some maintenance and upgrade work is planned for the 2017 and 2018 construction seasons, contingent on funding. This work includes six mi (9.7 km) of track upgrades between the Madawaska Rail Yard and Van Buren. MNR reports the actual completion date for this work could be delayed to 2020 (MNR, et al., 2017).

2.0 FUTURE PLANNING CONSIDERATIONS

To further provide a context for the *Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study* and subsequent phases of project development, a brief literature search for contemporary issues and best practices for border crossings between the U.S. and Canada was performed, lessons learned from recent border crossing projects between Maine and New Brunswick were assembled, and a preliminary project risk identification matrix was created.

2.1 Contemporary Issues and Best Practices

The websites of the Transportation Border Working Group (TBWG), the Eastern Border Transportation Coalition (EBTC), and the Border Policy Research Institute were reviewed for contemporary issues and best practices for border crossings from the last few years for possible use or application at the Madawaska/Edmundston International Bridge and Border Crossing.

Transportation Border Working Group

The TBWG brings together multiple transportation and border agencies and other organizations to coordinate transportation planning, policy implementation, and the deployment of technology to enhance border infrastructure and operations (TBWG, 2017).

The TBWG library contains many papers addressing mobility, cross border traffic, trusted traveler programs, trade, security, and related subjects, most of which are addressed at a policy or strategic level. Papers were briefly reviewed for the last several years and only one was found that could help to inform those advancing the Madawaska/Edmundston International Bridge and Border Crossing. The paper is titled *Guide for Planning and Constructing Border Crossing Projects* dated February 2008, and produced by the EBTC (EBTC, 2008) (see EBTC section).

No other papers or resources were found on the TBWG website that would have specific use application at the Madawaska/Edmundston International Bridge and Border Crossing.

Eastern Border Transportation Coalition

The EBTC is a non-profit membership organization dedicated to improving the movement of people and goods between the United States and Canada. EBTC members are the transportation agencies of the U.S. States of Michigan, New York, Vermont, and Maine and the Canadian Provinces of Ontario, Quebec, New Brunswick, and Nova Scotia (EBTC, 2016).

The EBTC annual reports for 2012 to 2016 were reviewed. Each briefly reports EBTC's achievements over the prior year with a focus on monitoring transportation and cross-border issues; progress on the implementation of the *Beyond the Border Action Plan*; cross-border information needs; advancing cross-border transportation service including expanded preclearance operations to passenger rail and other modes; and monitoring opportunities for federal funding to support border-related activities. Their annual reports also provide updates to projects at specific border crossings and provide brief regulatory updates.

One paper produced by the EBTC, titled *Guide for Planning and Constructing Border Crossing Projects* dated February 2008, could inform those advancing the Madawaska/Edmundston International Bridge and Border Crossing (EBTC, 2008):

> "…planners of new border projects are not totally familiar with all of the aspects relating to it being a 'border' project as opposed to an intra-jurisdictional one. Border projects require significant inter-agency consultation and a number of approvals from various governmental agencies, at the federal, state/provincial and local levels. Therefore, EBTC created this guide as a reference document and initial primer to facilitate the planning process and provide a roadmap to the issues involved with the necessary interagency cooperation and approval processes. It briefly outlines the responsibilities of the various agencies and provides a 'link' to more complete information" (TBWG, 2017).

No papers or other reports were found on the EBTC website that would have specific use application at the Madawaska/Edmundston International Bridge and Border Crossing.

Border Policy Research Institute

The Border Policy Research Institute focuses on research that informs policy-makers on matters related to the Canada-U.S. border. Policy areas of importance include transportation and mobility, security, immigration, energy, environment, economics, and trade (BPRI, 2017). Their publications (specifically their *border briefs*, working papers, and other papers) were briefly reviewed. No information was found that would have specific use application at the Madawaska/Edmundston International Bridge and Border Crossing.

2.2 Lessons Learned

NBDTI and MaineDOT have worked together on two recent international bridge and border crossing projects. This section identifies lessons learned from the Calais, Maine/St. Stephen, New Brunswick project and the Clair, New Brunswick/Fort Kent, Maine project.

2.2.1 NBDTI

2.2.1.1 Calais/St. Stephen Border Crossing

Design and Construction

- Delegate a key contact person for both transportation departments to ensure quick decisions during design and construction (Sharpe, 2018).

Environment

- Consider additional investigation for archaeological artifacts in areas of high potential of discovery. This preliminary work would reduce the risk of encountering artifacts during construction that can lead to work stoppage and costly delays (Sharpe, 2018).

2.2.1.2 Clair/Fort Kent Border Crossing

Design and Construction

- Establish a dedicated communications person to provide information to and from design and construction personnel, local communities representatives, key stakeholders, and interest groups. This person would be responsible for the timely communication of delays or closures of the bridge during construction (Sharpe, 2018).
- Ensure experienced staff are dedicated to the project. These people should have considerable project knowledge and be given the authority to make decisions to expedite approvals and ensure communication (Sharpe, 2018).
- Consider a mandatory pre-bid meeting for potential contractors. This would include personnel from border agencies and officials to answer questions (Sharpe, 2018).
- Be diligent when combining old and new survey information (a portion of the survey area was not corrected which resulted in a construction error and claim) (MacDonald, 2018).
- Allow extra time to bid beyond what is required for national and international trade agreements. This extra time would allow potential contractors to adequately investigate the requirements for a project in both countries (Sharpe, 2018).
- There are many differences in the design codes between Canada and the U.S., making it difficult to indicate "either or" in the contract documents. To avoid the perception of an advantage to Canadian contractors on the Clair/Ft. Kent project, there was selective wording that was not limiting (MacDonald, 2011).
- Be fair and open in the tender documents to deal with labour and construction. Examples include: as worker minimum wages and holidays are different in Maine and New Brunswick, the responsible agency has to pick one; removing clauses such as local truck requirements; getting changes to environmental work window; and purchasing staging areas and allowing equipment or trestles to come from either shore (MacDonald, 2011).

Environment

- Meet with the permitting agencies to review all possible aspects of work and clearly define work that can and cannot be done. Details from this meeting should be clearly identified in tender documents, and allow no deviation (e.g., temporary trestle: can it remain into winter and if so, under which specific conditions) (Sharpe, 2018).
- Be consistent with environmental work windows. New Brunswick had established work windows, whereas Maine did not. New Brunswick contractors perceived this as a major advantage to contractors working in the U.S. This required an addendum to specify work which could be done and when, using the New Brunswick work window and the U.S. Coast Guard requirements for temporary trestle (MacDonald, 2011).
- Establish a contact person at the Office of Environment for the project. This person should be knowledgeable of the project and all environmental conditions established through permitting. This person should have the authority to deal with any issues that may arise during construction to avoid delays (Sharpe, 2018).

Other

- It will be beneficial to have a life cycle maintenance agreement for the structures so that the same interventions are done on both sides of the border at the same time (MacDonald, 2018).
- Maine and New Brunswick have to make an effort to align maintenance on international bridges so that they are both making the best use of maintenance funds (MacDonald, 2011).

2.2.2 MaineDOT

2.2.2.1 Calais/St. Stephen Border Crossing

- Identify potential tax issues early in project development (e.g., if a Canadian contractor performs work in the U.S., what taxes are paid? If an American contractor performs work in Canada, what taxes are paid?).
- Develop a firm understanding of labor laws when using foreign workers:
  - » State/Province/Federal laws;
  - » Corporate taxes;
  - » Labor taxes; and
  - » Personal income tax, Goods and Services Tax:
    - › Need to identify a mechanism for payment such as a bid item, and
    - › Don't omit information because expertise for contractor to solve translates into additional overhead and delay.
- Develop a mechanism to assist with the pre-clearance of foreign workers.
- Need to agree on a process prior to bidding; if the contractor must figure it out during construction, additional costs go into overhead, administration, and delays.
- Coordinate environmental staffing and agreement of regulations prior to advertisement to avoid delays.
- Set up a matrix and communication tree in advance to resolve environmental issues promptly. Put the environmental coordinators together at the pre-bid meeting.
- Identify parts of specification book for items that did not work.
- Make sure resident engineers are consulted and help determine protocols, relationships, and method of invoicing and frequency for Maine to reimburse.
- Bring the right people to the progress meetings.
- Have a clear organization chart and communication tree and protocols prior to advertisement.
- Allow time for adequate construction review.
- Geotechnical investigations:
  - » Clarify rock quality as this can be a difficult number to reach agreement;
  - » Decide if we have to go to solid bedrock or reach a specific rock quality; and

  - » Get enough borings at piers to ensure an adequate profile, rock quality, etc.

- Responsibility is on the contractor to determine which laws apply.
- Set up an understanding of transportation/use of nuclear gauges at and between border stations (Kittredge, 2017).

2.2.2.2 Clair/Fort Kent Border Crossing

- It is impossible to over-communicate on an international bridge project.
- Follow one set of bridge design standards, guidelines, codes; use either MaineDOT or NBDTI codes, but don't try and blend codes on the bridge.
- Have Canadian and U.S. environmental agencies communicate early and often.
- Acquisition of property for use as right-of-way, property transfers, and relocations are time consuming; understand their schedule impacts.
- Identify stakeholders up front and be exact regarding their role and responsibilities. Consider developing lists of agencies' goals and items that are non-starters.
- Have stakeholders in the room who are the respective decision makers for their organizations. Share relevant information in advance of meetings and insist that attendees review prior to attending. All action items can receive support from multiple people, but only one person should be on the hook to deliver the finished item/product; it's all about schedule and accountability.
- Furnish adequate required information, in advance, to all those that need to be involved in issue discussion to provide a decision in real time, rather than seeing the material for the first time at the meeting.
- Have regular follow-up meetings and/or status updates; meetings should be facilitated, if needed.
- Agreements need to be bulletproof when defining approach, bridge, and POE work and costs; all must be defined with respect to exact limits, electronic payment, exchange rates, type of currency, banking fees, cost share, time, etc.
- Identify any "hidden" requirements. Have at least two bridge agreements, one for preliminary engineering and one for construction/construction engineering.
- Each side needs to understand what vendors, subcontractors, and state/federal requirements need to be addressed.
- All design and construction funding and participation agreements need to have language addressing escalation of costs and currency of transactions. The right decision makers need to be in the room to commit to partnering contributions when additional costs become a reality.
- Develop agency (federal, state, and provincial) definitions and process flow charts as needed for key tasks, achievement of milestones (who, what, when, etc.), and funding controls of agencies. This allows identifying critical path(s) and required individuals.
- Need a master schedule.

- Develop a strict quality control management plan or process for agreements, engineering documents, and estimates.
- Develop minutes of all meetings with effective action items. Provide a schedule update at all meetings.
- Develop early relationships with the affected trucking industry and local governments.
- Come up with a plan to address agency security protocol for sharing government e-mails, computer-aided drafting files, content, reports, etc.
- Need instruction book for construction contracting regarding international workers and taxation.
- Identify if there are utilities in the river and who owns them.
- Identify if dredged materials from the river will need to be disposed, where they will be trucked, and the applicable permits and costs (Kittredge, 2017).

2.3 Risk Register

At the beginning of the feasibility and planning study, a preliminary risk identification register was developed to help identify and classify potential issues (Appendix A). The purpose of the preliminary risk identification register was to highlight potential specific challenges and quantitatively assign risk values to each issue to determine which risks could have adverse impacts on the project's cost and schedule. The risks were organized by agency or other interested party. The preliminary risk identification register helped to identify potential high risk elements at the onset of the feasibility and planning study and find ways to mitigate potential issues throughout the development of the study.

3.0 ENVIRONMENTAL FEATURES AND CONSIDERATIONS

Prior to developing the conceptual alternatives (see Section 4.0), a desktop study of the environmental features in the study area was conducted to identify those features that should be avoided, or would potentially be impacted by the conceptual alternatives. As the study area for the feasibility and planning study is much larger than the area that would potentially be impacted by construction of a preferred alternative, this section focuses on the downtown business zone (see Exhibit 1.7) where it was determined that the project would be constructed (see Section 4.2.2).

3.1 Land Use

Edmundston

Land use in the downtown Edmundston business zone is a mix of commercial, industrial, and residential properties. The area nearest to the existing International Bridge is classified as the Central Zone (Edmundston, 2008). Businesses dominate in the Central Commercial component. Most of the zoning east of the bridge and east of the Madawaska River are municipal zones. There are also public and institutional zones in the downtown and east.

The CNR tracks run along the Saint John River with the Edmundston Yard located west of the existing bridge. The Edmundston POE facility at the north side of the existing bridge has a residential/commercial property located to the west and a commercial property to the east.

Madawaska

The downtown area contains a mix of industrial, transportation, commercial, and residential properties, with some undeveloped lands present along the Saint John River and Martin Brook (see Exhibit 1.7). The Twin Rivers Paper Company mill facility is the single largest land use in the downtown business zone. The paper mill has been in its present location since the early 1930s (R.W. Gillespie & Associates, 2005). The MNR railroad tracks parallel the Saint John River in the downtown business zone. There are railroad sidings adjacent to the Twin Rivers Paper Company mill on its west and east sides. The area bordered by Mill Street, Bridge Street and Main Street includes commercial and residential properties, as well as vacant land for Twin Rivers Paper Company employee parking. Commercial properties primarily line Main Street. The LPOE is at the southern end of the International Bridge.

The downtown business zone is zoned for industrial and commercial uses, except for the land bordering the Saint John River and Martin Creek, which is in a resource protection zone governed by Madawaska's Shoreland Zoning Ordinance. The resource protection zone prohibits most structures except for single family residences, which are allowed by special exception (Town of Madawaska, 2009). Consequently, the land in the resource protection zone is the only land in the downtown business zone that has not been cleared and developed.

3.2 Natural Resources

3.2.1 Waters and Wetlands

Edmundston

The New Brunswick Department of the Environment and Local Government (DELG) is the responsible agency for the protection of watercourse and wetland environments in the Province. DELG administers the Watercourse and Wetland Alteration (WAWA) Regulation of the Clean Water Act for any work within 30 m of a watercourse or wetland.

Watercourses are defined as:

> "the full width and length, including the beds, banks, sides and shoreline, or any part, of a river, creek, stream, spring, brook, lake, pond, reservoir, canal, ditch or other natural or artificial channel open to the atmosphere, the primary function of which is the conveyance or containment of water whether the flow be continuous or not" (GNB, 2018b).

The watercourses within the study area are the Saint John River, the Madawaska River, and the Iroquois River.

Wetlands are defined under the Clean Water Act as the:

> "land that (a) either periodically or permanently, has a water table at, near or above the land's surface or that is saturated with water, and (b) sustains aquatic processes as indicated by the presence of hydric soils, hydrophytic vegetation and biological activities adapted to wet conditions" (GNB, 2018b).

Review of the GeoNB mapped wetland areas (and 30 m buffer zones) indicates two regulated wetlands and one provincially significant wetland, all of which are located outside of the downtown business zone.

Once a bridge type and configuration have been established, additional field investigation will be required to determine if any watercourse or unmapped wetland areas are present. WAWA permitting and approval will be required for the area of the bridge piers and for construction activities. Compensation would be required for any impacts to wetland areas.

Madawaska

The Maine Geological Survey has identified an area bordering the Saint John River as having surface deposits with moderate to good potential groundwater yield, with yields generally greater than 10 gallons (37.9 liters) per minute to a properly constructed well. Deposits consist primarily of sand and gravel but can include areas of sandy till and alluvium (MGS, 2003). There are no private or public water supply groundwater wells in the downtown business zone.

The Saint John River flow is measured at the U.S. Geological Survey Gauging Station at Fort Kent, Maine. The gauging station is downstream of the confluence with the Fish River and is approximately 12 mi (19.3 km) upstream of the study area. The flow in the Saint John River is fairly constant, ranging between 5,667 and 15,420 cubic feet per second (160.5 and 436.7 cubic meters per second [m^3/s]). The average annual discharge over a 90-year period of record is 9,842 cubic feet per second (278.7 m^3/s) (USGS, 2016).

The water quality of the Saint John River upstream of Martin Creek is designated as Class B (Maine Legislature, 2018). Class B waters are defined to be:

> "of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation and navigation; and as habitat for fish and other aquatic life. The habitat shall be characterized as unimpaired" [Title 38, Chapter 3, section 465].

Discharges to Class B waters are allowed, so long as no detrimental changes occur to the resident biological community [Title 38, Chapter 3, section 465]. The paper mill is identified by the Maine Department of Environmental Protection as a "significant point source" of wastewater discharge to the Saint John River (MDEP, 2018).

The water quality of the Saint John River downstream of the International Bridge is designated as Class C (Maine Legislature, 2018). The designated uses of Class C waters include fishing; drinking water supply after treatment; recreation in and on the water; industrial processes and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as a habitat for fish and other aquatic life [Title 38, Chapter 3, section 465].

Generally, Class C waters may not have a dissolved oxygen content of less than 5 parts per million or 60 percent of saturation, whichever is higher. In salmon spawning areas, the water quality must remain at the existing higher standards. From May 15 through September 30, the amount of Escherichia coli may not exceed a geometric mean of 142 per 100 milliliters or an instantaneous level of 949 per 100 milliliters. Discharges to Class C waters are allowed to cause some changes to aquatic life, provided the receiving waters can still support indigenous fish species and maintain the structure and function of the resident biological community [Title 38, Chapter 3, section 465].

Martin Creek is approximately 0.75 mi (1.2 km) long. It flows almost directly north through Madawaska and discharges into the Saint John River. Martin Creek is a Class B water (Maine Legislature, 2018).

The downtown business zone is not in the coastal zone and not subject to the regulations governing coastal zone management. The Saint John River is not classified as a wild or scenic river (National Park Service, 2018).

The National Wetland Inventory is a program administered by the U.S. Fish & Wildlife Service (USFWS) for mapping and classifying wetlands in the United States. The USFWS has classified the Saint John River as a riverine, lower-perennial, unconsolidated bottom, permanently flooded wetland. Riverine systems include freshwater wetland and deepwater habitats contained within a channel. No palustrine wetlands were identified on National Wetland Inventory mapping within the downtown business zone (USFWS, 2018). A reconnaissance of the downtown business zone was performed; no palustrine wetlands were observed.

One locally listed hydric soil was identified within the downtown business zone. Located along the steep slopes between the Saint John River and the MNR, mixed alluvial soils are listed as local hydric soil for Aroostook County (NRCS, 2018). No state or federally listed hydric soils were identified within the study area.

3.2.2 Floodplains

Edmundston

The Saint John River within the study area is considered floodplain and flood-risk, with the floodplain extending up the Madawaska River, Iroquois River, and the Green River. Flood stage level for the Edmundston area is 139.0 m geodetic. It is noted that flood levels in 2008 reached an elevation of 143.1 m (ELG, 2012).

Mapped floodplain for the study area shows that the floodplain limits in the downtown business zone are constrained to the steep banks of the Saint John River above the confluence of the Madawaska River. Below the confluence, the floodplain area widens on both the New Brunswick and Maine sides of the river (SNB, 2011).

Typically, any construction works within floodplains can be permitted providing there is adequate assessment and mitigation of impacts to flood levels or upstream ice jamming.

Madawaska

Federal protection of floodplains is afforded by Executive Order 11988, "Floodplain Management" and by implementation of federal regulations at 44 CFR 9.00. These regulations direct federal agencies to undertake actions to avoid impacts on floodplain areas.

According to the Federal Emergency Management Agency (FEMA), the area along the Saint John River downstream of the International Bridge is prone to inundation by a 100-year flood (i.e., a flood with a probability of occurring one time in 100 years). FEMA maps indicate that the 100-year flood is contained upstream of the International Bridge within the steep banks along the Saint John River. Martin Creek does not have a floodplain.

3.2.3 Terrestrial Habitat

Edmundston

The terrestrial habitat in the downtown business zone is limited to the riverbanks as the remaining area is highly developed. Development includes commercial areas and the CNR tracks and yard.

Key federal and provincial legislation and policies protecting terrestrial habitat include: New Brunswick Fish and Wildlife Act, Species at Risk Act (SARA), Migratory Birds Convention Act, and the New Brunswick Species at Risk Act (NB SARA).

An assessment of the downtown riverbank area would need to be performed as part of the Provincial Environmental Impact Assessment (EIA) to determine if the area sustains any birds, mammals, or herpetofauna, including any species at risk (SAR), and species of conservation concern (GNB, 2018a).

Madawaska

Most of the downtown business zone is developed and only sparsely vegetated. The downtown business zone adjacent to Martin Creek and the Saint John River is vegetated with deciduous trees. The vegetated area is primarily inside the resource protection zone governed by Madawaska's Shoreland Zoning Ordinance.

3.2.4 Threatened and Endangered Species

Edmundston

Both the SARA and the NB SARA prohibit listed wildlife species or their habitats from being destroyed, disturbed, or interfered with. The New Brunswick SAR Public Registry indicates 59 species that are threatened or endangered (GNB, 2018). Several threatened or endangered species are associated with the Saint John River and its riverbanks (Kidd, Curry, & Munkittrick, 2011).

The area of the preferred alternative will need to be investigated by experts in identifying possible SAR. This investigation will be performed as part of the Provincial EIA that will be required for the project.

Madawaska

There are species and critical habitat in the area that receive federal and state protection to help repair previous damage to populations and attempt to return a species population to self-sustaining levels.

Federal Species

The U.S. Endangered Species Act of 1973, as amended (ESA), provides protection for those species that are listed as endangered or threatened under the ESA. The ESA grants the USFWS prime responsibility in administering the species designations and protections granted under the Act. "Endangered" means that a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means that a species is likely to become endangered in the foreseeable future.

Two species listed as endangered by the USFWS may exist in the area: the Canada Lynx and the Northern Long-eared Bat (NLEB) (MaineDOT, 2017d). The Canada Lynx and its designated critical habitat are not present in the downtown business zone of the Town of Madawaska.

Critical habitat for the NLEB is not currently designated. The NLEB is dependent on forests, using trees as summer and maternity roosts. Specific NLEB summer and maternity roost location information is unavailable for Maine, but USFWS asserts that NLEB roosts occur throughout the entire state and, therefore, could be present in the area.

State Species

In the state of Maine, "endangered" is defined as rare and in danger of being lost from the state in the foreseeable future, or is federally listed as endangered. "Threatened" is defined as rare and, with further decline, could become endangered, or is federally listed as threatened.

There are no known, listed, or proposed, state threatened or endangered species in the downtown business zone other than the two listed at the federal level (MaineDOT, 2017d).

Natural Communities

The Maine Natural Areas Program (MNAP) maintains records of natural communities that contain habitat conducive to rare or uncommon plant and animal communities. The MNAP defines natural communities as "an assemblage of interacting plants and animals and their common environment, recurring across the landscape, in which the effects of recent human intervention are minimal"(MNAP, 2018).

The MNAP identified one rare plant community containing multiple species of rare plants on the bank of the Saint John River starting approximately 0.3 mi (0.5 km) upstream of the International Bridge and extending approximately 1 mi (1.6 km) upstream (MaineDOT, 2017d). This rare plant community is ranked as S2; S2 is defined as "imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres [m^2]) or because of other factors making it vulnerable to further decline" (MNAP, 2018).

3.3 Social Resources

3.3.1 Population

Edmundston

The City of Edmundston is part of Madawaska County and has a total population of 16,580 according to the 2016 Census. The average age of the community is 47 years old, with nearly 30 percent of the residents 65 years of age or older (Statistics Canada, 2017) (Exhibit 3.1).

Exhibit 3.1 - *Age Distribution of the City of Edmundston*

Age (Years)	Percentage (%)
0 – 14	13.0
15 – 64	61.4
65 – 85	22.3
85 +	3.3

Source: Statistics Canada, 2017

Madawaska

Madawaska is located in Aroostook County, which is Maine's northernmost county, bordered to the east, west, and north by New Brunswick. The county is predominantly rural, accounting for less than 6 percent of the state's population (69,405 of 1,329,923 persons) but approximately 22 percent of the state's total land area. The town of Madawaska is the fourth largest incorporated area in Aroostook County, with a population of 3,889 persons (U.S. Census Bureau, 2017) (Exhibit 3.2).

From 1980 through 2016, the population of Madawaska fell approximately 26 percent. Aroostook County's overall population decreased by approximately 23 percent. In contrast, the State of Maine's population grew by approximately 34 percent (Exhibit 3.2).

Exhibit 3.2 - *Population*

	1980	1990	2000	2010	2016	% Change 2010-2016	% Change 1980-2016
Study Area	--	--	619	511	495	-3%	--
Madawaska	5,282	4,803	4,534	4,035	3,889	-4%	-26%
Aroostook County	90,609	89,494	85,838	71,870	69,405	-3%	-23%
Maine	993,722	1,125,043	1,227,900	1,328,361	1,329,923	0.1%	34%

Note: The study area encompasses Block Group 2, Census Tract 9503 in Aroostook County.

Source: U.S. Census Bureau, 2017.

More recent population trends between 2010 and 2016 show that population continues to decline in Madawaska and Aroostook County, while remaining stable in Maine overall. From 2010-2016, Madawaska and Aroostook County's populations decreased by 4 and 3 percent, respectively, while Maine's population grew by 0.1 percent. Downtown area trends are similar to Madawaska and Aroostook County; population declined 3 percent in the downtown business zone from 2010-2016.

Madawaska's population is projected to continue declining from 2016-2024 at a rate of approximately 1.5 percent. Aroostook County's population is also projected to decline by approximately 1.4 percent over the period (Maine State Planning Office, 2018).

The age distribution of a population is a key factor which can affect population growth and the type of services required for residents. The median age of Madawaska residents is 52.9 years, which is substantially older than the median age of residents in Aroostook County (46.9 years), and the state (44.0 years). More than one-third of the population of Madawaska is composed of residents 60 years of age or older (U.S. Census Bureau, 2017).

3.3.2 Employment

Edmundston

Major employers in the area are the Edmundston Regional Hospital, numerous retail and hotel businesses (Gateway community of Atlantic Canada), IPL (plastics manufacturing), Universite de Moncton (Edmundston Campus), New Brunswick Community College (Edmundston Campus), and the Twin Rivers Paper Company which has a mill property on both the New Brunswick and the Maine sides of the border adjacent to the existing International Bridge. According to recent regional Census (Statistics Canada, 2016), Health Care and Social Assistance is the largest employer in the region, representing 21.2% of the employment. Other top industry categories include: Retail trade at 13.4% of employment, Manufacturing at 12.5%, Accommodation and food services at 8.8% of employment, and Public Administration at 7.3% of employment (Statistics Canada, 2017).

The median total income of families is $71,851 and the unemployment rate in the Edmundston-Woodstock region is 6.5 percent (Statistics Canada, 2017).

Madawaska

More than half of the residents 16 years and older in Madawaska were in the labor force in 2016. Madawaska had a total labor force of approximately 1,775 persons or 52.7 percent of persons 16 years and older.

In 2016, the unemployment rate in Madawaska was 3.4 percent. This rate was lower than Aroostook County (6.2 percent) and the state (6.0 percent) (U.S. Census Bureau, 2017).

Madawaska's per capita income was approximately 17 percent below the state average in 2016. However, Madawaska residents had a 5 percent higher per capita income level in comparison to Aroostook County overall (Exhibit 3.3). The rate of income growth in Aroostook County has consistently lagged behind the state as a whole. In 2016, Aroostook County had the fourth lowest per capita income among Maine's 16 counties.

Exhibit 3.3 - *Income*

	Per Capita Income (2016 $)	Median Household Income (2016 $)
Madawaska	$23,603	$39,412
Aroostook County	$22,483	$38,087
Maine	$28,473	$50,826

Source: U.S. Census Bureau, 2017.

In 2016, the median household income for Madawaska was $39,412, approximately 23 percent below the state average of $50,826. Although substantially lower than the state average, Madawaska's median household income was greater than Aroostook County overall ($38,087) (Exhibit 3.3).

The manufacturing sector is the largest employment sector in Madawaska (Exhibit 3.4). Twin Rivers Paper Company in downtown Madawaska employs approximately 500 area residents (Twin Rivers Paper Company, 2018). Other major employment sectors are education, health care, and retail trade.

Agricultural sector employment has been in decline in Madawaska and Aroostook County over the past several decades, a trend consistent with most of the United States. The agricultural community in Madawaska has retained a strong identity however, largely based on the Maine potato industry. The agricultural sector supports employment related to processing, wholesaling, and transporting locally grown crops.

Aroostook County is designated a Historically Underutilized Business Zone by the U.S. Small Business Administration. This federal designation assists small businesses in qualified zones to gain preferential access to federal procurement opportunities (SBA, 2018). At the state level, Aroostook County is designated a Pine Tree Zone. Maine offers business incentives including financing, tax reimbursements, credits, and exemptions to qualifying businesses located in

Exhibit 3.4 - *Employment by Industry, Madawaska*

Industry	Percent Employed
Agriculture, forestry, fishing, and hunting	3%
Construction	7%
Manufacturing	23%
Retail trade	22%
Transportation and Warehousing	5%
Information	3%
Finance and insurance	3%
Professional, scientific, and technical services	3%
Administrative and support, waste management, and remediation services	2%
Educational services	11%
Health care and social assistance	11%
Accommodation and food services	1%
Other services	4%
Public administration	3%

Source: U.S. Census Bureau, 2017.

Note: Table sums to 101% due to rounding.

designated zones. The Northern Maine Development Commission (NMDC) and Aroostook Partnership for Progress are partner economic development agencies for the Pine Tree Zone (NMDC, 2017).

Madawaska also links economic development investments with its sister, the City of Edmundston, New Brunswick by providing international events in leisure, tourism, and recreation.

Aroostook County, in conjunction with the NMDC, has been working to diversify the area economy. The county is focusing economic development initiatives on the forest products, information processing and other business services, and manufacturing sectors. Recently, the county has also strengthened efforts to develop a tourism industry, especially winter-based recreation and ecotourism activities (Town of Madawaska, 2018).

3.3.3 Community Cohesion

A strong degree of community cohesion is present between the communities of Madawaska and Edmundston, New Brunswick. The two communities border either side of the Saint John River, and share an Acadian cultural heritage. Cultural events reinforce cohesion between the two communities. The annual Acadian Festival, celebrated for more than 30 years, is a week-long festival that features a re-enactment of the first Acadian landing in northern Maine, traditional cultural displays, a golf tournament, and festival parade. The International Snowmobile Festival features events on both the U.S. and Canadian sides of the river, and many snowmobiles cross the International Bridge to ride the top-rated trails in the area. The two communities are also linked

economically. The Twin Rivers Paper Company, the major regional employer, has production facilities on both sides of the river.

3.3.4 Minority and Disadvantaged Populations

Edmundston

According to the 2016 Census, nearly 5 percent of the Edmundston population consists of immigrants while nearly 3 percent of the population is Aboriginal. Visible minorities comprise 2.5 percent of the population (Statistics Canada, 2017).

Madawaska

In the U.S., Environmental Justice is defined by the U.S. Environmental Protection Agency's Office of Environmental Justice as:

> "…the fair and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies" (EPA, 2017).

Approximately 2.4 percent of the population in Madawaska consisted of minority persons in 2016. Of these minority residents, approximately 2.1 percent were American Indian/Alaska Native, 0.1 percent were African American, and 0.2 percent of the population defined themselves as belonging to two or more races. In Aroostook County, 4.8 percent of the population consisted of minority persons, and in Maine overall, the minority population was 5.2 percent in 2016 (U.S. Census Bureau, 2017).

Within the downtown business zone (a subset of Madawaska defined for the socioeconomic analysis as Block Group 2, Aroostook County Census Tract 9503), 11 percent of the population consists of American Indian/Alaska Native residents, a higher proportion than Madawaska, Aroostook County, or the state. Other minority groups were not present in the downtown area in 2016 (U.S. Census Bureau, 2017).

The number of residents living below the poverty level in the downtown area was 11.7 percent, similar to the poverty level in Madawaska overall (10.4 percent). Poverty levels in Aroostook County (17.7 percent) and the state (13.5 percent) were higher than in Madawaska (U.S. Census Bureau, 2017).

3.4 Cultural Resources

3.4.1 Archaeological Resources

Edmundston

The New Brunswick Heritage Conservation Act stipulates that all archaeological objects found anywhere in New Brunswick after August 19, 2010 must be reported as soon as possible to Provincial Archaeological Services Authorities (GNB, 2010).

The mandate of the Archaeological Services Group is to "use the tools provided by the Heritage Conservation Act to protect, preserve and interpret New Brunswick's non-renewable archaeological resources" (GNB, 2010). This group has a spatial database of known and predicted archaeological sites located in the province. This database would be accessed to assess the potential of the proposed bridge location for archaeological artifacts or resources. Areas classified as high potential for archaeological resources would require field investigation of any undisturbed areas to ensure no artifacts are present or that the potential risk of encountering artifacts during work/construction is reduced.

It is expected that due to the history of First Nations in the region, and downtown Edmundston being the confluence between two rivers, this area will be classified as high potential. Further investigation on any impacted area that is previously undisturbed will be required as part of the Provincial EIA for the project.

Madawaska

According to the Maine Historic Preservation Commission, "there will be no archaeological properties affected by the proposed undertaking" and no further investigation is required (MHPC, 2018).

3.4.2 Historic Structures

Edmundston

There are five provincial historic sites in Edmundston and designated as such by the Government of New Brunswick (GNB, 2001):

- Edmundston Canadian Pacific Railway Station (Protected in 1998) – Constructed in 1930 associated with efforts to link the St. Lawrence valley to the Port of Saint John. It is located at 121 Rue Victoria, 1.5 km from the bridge.
- P'tit Sault Blockhouse (Designated historic in 1998) – Location of the 1841 fort constructed during the bloodless Aroostook War (1830-1842). The Ashburton-Webster Treaty of 1842 settled the border conflict and divided the population of the Madawaska region between Maine and New Brunswick. It is located at 10 Avenue St. Jean, 750 m from the bridge.
- St. Paul's United Church (Designated historic in 1999) – Constructed in 1926 in the Gothic style, to replace a smaller Presbyterian church. It is one of the first United churches built in New Brunswick. It is located at 82 Chemin Canada, 600 m away from the bridge. (The Church was removed from the Heritage Sites list in 2014 due to fire damage [Foran, 2018]).
- L'Hotel-Dieu Saint-Joseph (Designated historic in 2000) – Started in 1885, this edifice was built with locally made bricks. Architect F.X. Berlinguet designed the first two sections. Managed by the Religious Hospitallers of Saint Joseph, the convent provided patient and education services. It is located at 429 Rue Principale, 7.5 km from the bridge.
- Cathedral of the Immaculate Conception (Designated historic in 2001) – Constructed from 1925 to 1927, and became the cathedral of the new Diocese of Edmundston in 1944. A blend of Romanesque and Gothic styles, the interior features over 20 varieties of stone from Canada, United States, Europe, and North Africa. It is located at 175 Rue de l'Eglise, 400 m from the bridge.

Madawaska

The International Bridge is considered eligible for listing on the National Register of Historic Places because 1) "it is a significant example of its type and design as it is the oldest, extant, riveted field connection Pennsylvania thru truss bridge in the state" and 2) "it aided materially in the development of Madawaska and the region's pulp and paper industry" (MaineDOT, 2003b). There are no other historic resources in the downtown business zone. No further investigation is required (MHPC, 2018).

There are two sites in Madawaska listed on the National Register of Historic Places. The Acadian Landing Site, located approximately 3 mi (4.8 km) east of downtown Madawaska, commemorates the landing of the first Acadian settlers in the Upper Saint John River Valley. A large marble cross recently replaced a wooden cross erected in 1922 to represent the first cross erected in 1785. Religious and ceremonial services are occasionally held at the site (University of Maine, 2005a).

Saint David's Roman Catholic Church, located approximately 3 mi (4.8 km) east of downtown Madawaska on Main Street adjacent to the Acadian Landing Site, is significant to local people for a number of reasons. The original church at this location, built in 1871, marked the successful conclusion of Madawaska residents' long struggle for their own parish and priest (University of Maine, 2005b). The brick and stone structure serves as a symbol of rising affluence among early twentieth century Acadians (Town of Madawaska, 2000).

3.5 Navigation

Edmundston

In accordance with the *Government of Canada Navigation Protection Act 2012 Amendment*, only the portion of the Saint John River below the Mactaquac Dam is included in the List of Scheduled Waters. Scheduled waters are defined as "navigable waters that support busy commercial or recreation-related navigation" (GOC, 2012).

Although this portion of the Saint John River at Edmundston is not included in the list of scheduled waterways and may not require federal approval, there is a public right of navigation (defined as "the right to use navigable waters as a highway"), which continues to be protected in Canada by Common Law (GOC, 2012). As such, the design of the proposed bridge should maintain existing waterway clearances as a minimum.

The option to "Opt in" the proposed bridge project as a navigable project is a decision to be made by the NBDTI, as owner.

Madawaska

The Saint John River has not been determined to be a navigable waterway by the U.S. Army Corps of Engineers, and is therefore not subject to Section 10, Rivers and Harbors Act jurisdiction (USACE, 2006).

4.0 ALTERNATIVES IDENTIFICATION, DEVELOPMENT, AND ANALYSIS

4.1 Introduction

The alternatives identification, development, and analysis phase began with environmental features identification, followed by the development of project design criteria, a design charrette to identify conceptual alternatives, and the creation of a matrix to compare and analyze the conceptual alternatives. Analysis of the conceptual alternatives led to the selection of two alternatives to evaluate futher and, ultimately, to the identification of a preferred alternative.

4.2 Conceptual Alternatives Development Process

The alternatives identification process began with the selection of a study area and the identification of transportation, natural, social, and cultural features in the study area. Once the features were identified, a design charrette was held to develop the range of conceptual alternatives and the design criteria upon which the alternatives would be evaluated.

4.2.1 Alternatives Identification Process

4.2.1.1 Features Identification

At the start of the feasibility and planning study, a conceptual study area was developed; this area would encompass the range of conceptual alternatives to be developed (Exhibit 1.2).

Aerial photography of the study area was used to help identify the transportation, natural, social, and cultural features and as a base map for adding other features information, the conceptual alternatives, and quantifying potential adverse impacts (USGS, 2008).

Features data for the portion of the study area in New Brunswick were downloaded from GeoNB (New Brunswick, 2016). Specific information collected consisted of:

- Crown Lands – updated 2016;
- Conservation Areas – updated 2015;
- Ecosites – updated 2015;
- Federal Parks and Protected Areas – updated 2012;
- Flood Risk Areas and Historical Floods – updated 2011 boundary shown on mapping is a flood boundary updated from 2008;
- Forest – updated 2016;
- Protected Natural Areas – updated 2014;
- Provincial Parks – updated 2011;
- Wetlands – updated 2011 and compiled from aerial photography; and
- Wildlife Refuges – updated 2013.

Features information for the portion of the study area in Maine were downloaded from the Maine Office of Geographic Information Systems (GIS) (Maine Office of GIS, 2017). Specific information collected consisted of:

- Town Boundaries – updated 2006;
- Parcel Boundaries – updated 2011;
- Cemeteries – updated 2017;
- Airports – updated 2011;
- Ambulance Stations – updated 2013;
- Fire/EMS Stations – updated 2014;
- Hospitals – updated 2016;
- Libraries – updated 2013;
- Nursing Homes – updated 2013;
- Police Stations – updated 2014;
- Red Cross Facilities – updated 2013;
- Schools – updated 2013;
- National Wetlands Inventory – updated 2016;
- Railroads – updated 2011; and
- DOT Roads – updated 2017.

In addition to the information collected from GeoNB and the Maine Office of GIS, the features information was supplemented with select information based on visual observations in the study area.

4.2.1.2 Design Charrette

On March 22, 2017, following the development of the project's purpose and need and the identification and understanding of land use, transportation, and environmental and social features in the study area, the project sponsors held a design charrette to identify a conceptual range of alternatives to be considered further. The agencies present at the design charrette were the NBDTI, CBSA, MaineDOT, GSA, and CBP. It was noted at the design charrette that if one of the project sponsors could not support an alternative, it would be very difficult to identify it, ultimately, as the preferred alternative for satisfying the project's purpose and need.

To acquaint attendees with the results of the targeted outreach to major stakeholders and others in the study area, a high-level summary of the results of the outreach was provided (Section 5.3). This background provided stakeholder and other interested parties' suggestions, concerns, and desires and assisted in identifying a reasonable range of conceptual alternatives for development. It was noted that

additional outreach to stakeholders, interested parties, and the public would continue throughout the development of the bridge and border crossing feasibility and planning study.

The CBSA noted that the Edmundston POE was adequate for the foreseeable future and there are no plans to modify or expand it. The Edmundston POE was constructed in 1992.

As potential alternatives were discussed, the project sponsors began by grouping the proposed alternatives into two categories: 1) alternatives within the downtown portion of the City of Edmundston and Town of Madawaska, and 2) alternatives outside the downtown portion of the City of Edmundston and Town of Madawaska.

The project sponsors first discussed alternatives within the downtown business zones of the City of Edmundston and the Town of Madawaska (which included rehabilitating the existing International Bridge):

- MaineDOT would be willing to build/own/operate an alternative near the existing International Bridge with the exception of rehabilitating the existing bridge.
- The GSA and the CBP were generally only willing to build/own/operate a new crossing further upstream, in the area of the U.S. government-owned property. They cited the existing LPOE location and its immediate vicinity as spatially inadequate for a modern LPOE.
- The NBDTI would be willing to build/own/operate a new crossing immediately upstream, immediately downstream, or further upstream. They felt construction on the alignment of the existing International Bridge was not feasible considering the needs for the Twin Rivers Paper Company to maintain its operations and the need to maintain the use of the International Bridge during construction. They were not supportive of rehabilitating the International Bridge since the existing bridge geometry does not meet current needs and the condition of the bridge would make this alternative unsustainable in the long term. They expressed a desire to avoid an excessively skewed crossing of the river.
- The CBSA was amenable to each alternative and location with the exception of reconstructing the bridge on the existing alignment as traffic would continue to queue into Edmundston.

The project sponsors then discussed alternatives outside the downtown portion of the City of Edmundston and Town of Madawaska either upstream or downstream:

- Three of the four project sponsors would be willing to build/own/operate facilities outside of downtown; the CBSA believes the Edmundston POE is adequate for the foreseeable future and has no plans or funding to relocate the POE to maintain two POEs in proximity to one another.
- No agency would support maintaining the existing international crossing if a new crossing was constructed out of downtown.
- MaineDOT, the GSA, and the CBP would be willing to build/own/operate a new facility either upstream or downstream.

- The NBDTI would be willing to build/own/operate a new facility downstream and potentially upstream.
- All project sponsors agreed moving forward that an out of downtown option would significantly increase the project schedule and cost.

At the design charrette, the project sponsors identified 12 alternatives – in the downtown business zone portion of the City of Edmundston and Town of Madawaska, upstream, and downstream – to be conceptually developed and evaluated. It was noted the Madawaska LPOE would remain a "permit port."

4.2.1.3 Design Criteria and Minimum Performance Criteria for Ports of Entry

Concurrent with the identification and understanding of land use, transportation, and environmental and social features in the study area, criteria for developing the conceptual alternatives to satisfy the project's purpose and need were developed.

Highway and Bridge Criteria

For the International Bridge and the highways approaching it, the MaineDOT's and the NBDTI's highway and bridge design guides, requirements, and standards were reviewed and a set of project-specific standards was created for developing the conceptual alternatives (Exhibit 4.1).

Exhibit 4.1 - *Highway and Bridge Design Criteria for Conceptual Alternatives*

Topic or Item	Maine Standard	New Brunswick Standard	Project Standard
General			
Construction plan units of measurement	English or U.S. customary inch-pound units	Metric (SI or International) system of units	English, with a soft metric conversion included in parentheses. [e.g.,12.00 feet (3.66 m)]
Bridge			
Design Codes	AASHTO Load Resistance Factor Design (LRFD) Bridge Design Specifications (BDS) and MaineDOT Bridge Design Guide MaineDOT Engineering Instructions MaineDOT Highway Design Guide 2016 American Railway Engineering and Maintenance-of-way Association (AREMA) Manual for Railway Engineering.	CAN/CSA S6-14	Designed to MaineDOT standards and using the governing load case from AASHTO LRFD BDS and CAN/CSA S6-14.

continued on following page

Exhibit 4.1 - *Highway and Bridge Design Criteria for Conceptual Alternatives (Continued)*

Topic or Item	Maine Standard	New Brunswick Standard	Project Standard
Live Load	AASHTO Truck - HL-93 Modified Truck Load: 72 K (Increased by 25% for Strength I Cases) Lane Load: 0.64 K/Ft Max. Axial Load: 32 K Axial Spacing: 14'+14'-30' Width: 10' Wheel Spacing: 6'	CAN/CSA-S6-14 Truck - CL-625-ONT Truck Load: 140.6 K Lane Load: 0.62 K/Ft Max. Axial Load: 39.4 K Axial Spacing: 11.81'+3.94'+21.65'+21.65' Width: 9.84' Wheel Spacing: 5.9'	
Design Life - years	100	75	75 - 100
Lane Width	12 feet	3.66 meters	12 feet
Shoulder Width	4-10 feet	2.5 meters	5 feet (greater in some areas to satisfy snow storage requirements)
Sidewalk Width	5 feet, 6 inches (plus railing or barrier width)	2.0 meters	5 feet, 6 inches
Seismic Load	Anticipate that bridge will be in Seismic Zone 1, no seismic analysis required.	Bridge may be in Seismic Performance Zone 2 which requires multi-mode spectral analysis.	Both design codes will be checked, controlling seismic analysis will be noted for future design.
Railroad Horizontal Clearance	Provide AREMA clearance if possible, maintain existing as a minimum.		
Railroad Vertical Clearance	23 feet, 0 inches	7.163 meters	23 feet, 0 inches; verify with CNR.
Railroad Collision			CNR will require a collision wall to protect any substructure elements.
Bridge Freeboard	4 feet minimum with 10 feet preferred.		4 feet minimum with 10 feet preferred.

continued on following page

Exhibit 4.1 - *Highway and Bridge Design Criteria for Conceptual Alternatives (Continued)*

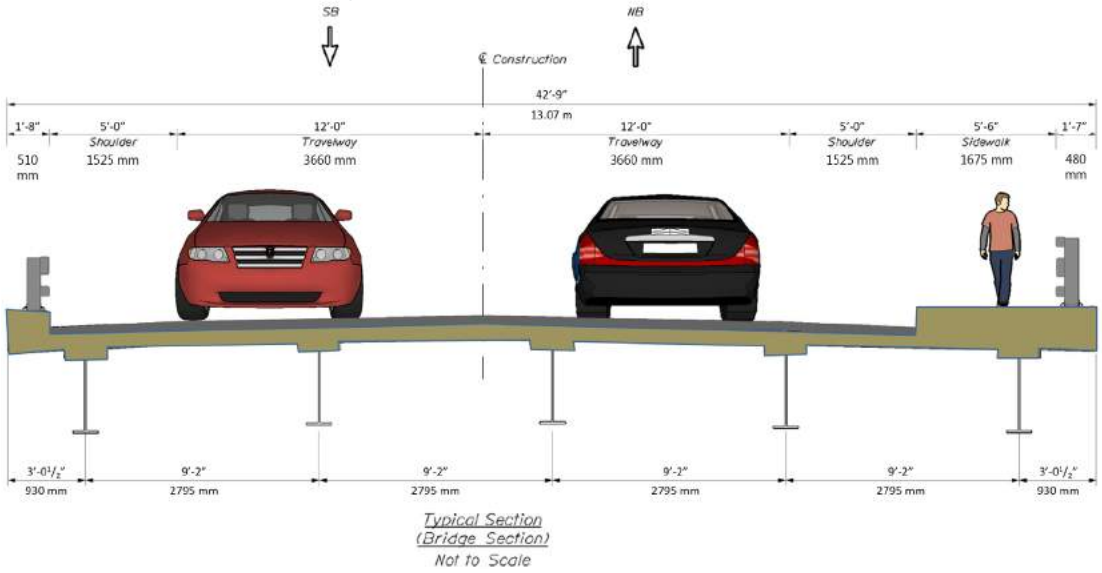
Topic or Item	Maine Standard	New Brunswick Standard	Project Standard
Concrete Strength (CIP)	4,000 pounds per square inch (psi) at 28 days for most cast-in-place elements.	45 MPa (6,500) at 28 days.	4,000 psi at 28 days for most cast-in-place elements.
Girder Design	50 kilograms per square inch (ksi) or 70 ksi weathering steel with the ends painted in accordance with FHWA T5140.22.		50 ksi or 70 ksi (if required) weathering steel.
Future Wearing Surface Load	Project specific	20 pounds per square foot (1.25 load factor)	
Minimum Thickness of Deck Slabs	Minimum of 8 inches to allow for partial depth deck panels.	Minimum 225 millimeters (mm) (9 inches).	Provide a 9-inch minimum deck thickness.
Performance Levels and Approved Barrier Types	TL-3	AASHTO and Maine Bridge Design Guide for barriers.	MaineDOT 2-bar steel railing on roadside, MaineDOT 3-bar steel railing on sidewalk side.
Ice Loading	To be determined.	To be determined.	To be determined.
Highway			
Design Speed	25 mph	40 km/hr	25 mph (40 km/hr)
Lane Width	12 feet	3.66 meters	12 feet (3.66 m)
Shoulder Width	4-10 feet	2.50 meters	5 feet (possibly greater to satisfy snow storage and off-tracking requirements)
Sidewalk Cross Slope	1%	2%	1%
Curb Reveal	9 inches	Possible concrete barrier walls adjacent to traffic.	9 inches
Minimum Radius	144 feet (43 meters)	55 meters (183 feet)	183 feet (55 meters)
Stopping Sight Distance	155 feet (46.5 meters) @ level grade	45 meters (150 feet)	155 feet (46.50 meters)
Maximum Grade %	5%	5%	5%
Design Vehicle	WB-67	WB-20	WB-67
Pavement Structure			8 inches

Source: BBIX, et al., 2017

Note: CAN/CSA are the Canadian Standards Association national standards.

In general, the conceptual designs for the International Bridge and the highways approaching it consisted of two travel lanes, each 12 ft (3.7 m) wide, shoulders approximately 5 ft (1.5 m) wide, and on the International Bridge, a sidewalk approximately 5 ft, 6 in (1.7 m) wide (Exhibit 4.2). When crossing over the railroads, a minimum vertical clearance of 23 ft (7.0) was used. Over the Saint John River, the height of the existing International Bridge or greater was used.

Exhibit 4.2 - *Conceptual Bridge Cross Section*



Ports of Entry

For the alternatives in the downtown business zone of the City of Edmundston, the PSPC and CBSA have stated the existing Edmundston POE meets their current needs and no changes are required or planned for the foreseeable future.

For the alternatives in the downtown business zone of the Town of Madawaska, it was assumed that approximately 10 acres (40,468.6 m^2) would be needed to accommodate a modern LPOE that satisfies the GSA's and the CBP's requirements.

For the alternatives outside the downtown business zone of the City of Edmundston and Town of Madawaska, the POEs were conceptually planned using properties approximately 20 acres (80,937.1 m^2) in size within which approximately 15 acres (60,702.8 m^2) would be impacted and converted to government use.

4.2.2 Alternatives Development and Screening

On March 22, 2017, representatives of GSA, CBP, MaineDOT, CBSA, and NBDTI attended a charrette to identify preliminary alternatives for the project. The outcome of the meeting was the identification of several potential locations for new border crossings outside of the downtown business zone, and several potential alignments for new bridges in the downtown business zone. Alternatives included building a new bridge on one of several new alignments downtown (maintaining the existing Edmundston POE), and building new border crossing facilities at various locations outside of the downtown area (2 upstream and 4 downstream).

These preliminary alternatives were further refined into 12 feasible alternatives, 6 downtown alternatives, and 6 out of downtown alternatives (Exhibit 4.4). An alternatives analysis matrix was created and used to compare and contrast the alternatives (Appendix B).

Probable costs were developed for six primary construction elements associated with the entirety of this project: Edmundston POE, Madawaska LPOE, bridge demolition, approach roadway, viaduct construction, and bridge construction (Exhibit 4.3). Not all construction elements applied to each alternative. For each alternative, the probable cost of the Madawaska LPOE is assumed to be $90 million*. Except for Alternative 1, the probable cost of bridge demolition is $4 million. The probable costs for this project were estimated to be $101 million to $165 million.

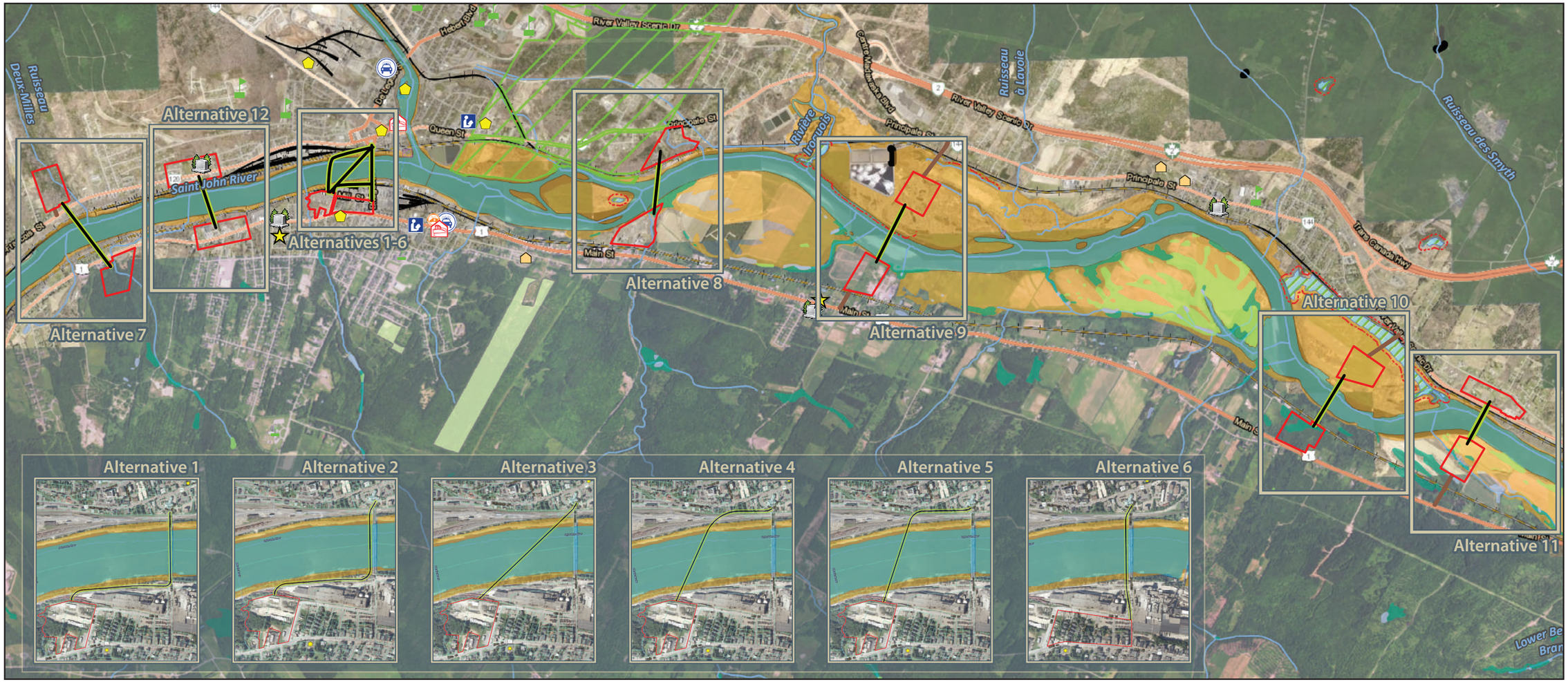
* All costs are in U.S. dollars

Exhibit 4.3 - *Probable Costs of Alternatives*

Initial Alternatives Identified	Probable Costs
Alternative 1: Bridge Rehabilitation	$100,800,000
Alternative 2: New Bridge Immediately Upstream with Viaduct on the U.S. Side	$109,900,000
Alternative 3: New Bridge Directly Connecting the POEs	$103,400,000
Alternative 4: New Bridge with Viaduct on the Canadian Side	$105,100,000
Alternative 5: New Bridge with Viaduct on the Canadian Side	$101,500,000
Alternative 6: New Bridge with Downtown Property Acquisition	$102,500,000
Alternative 7: New Border Crossing Upstream of the Downtown Area	$154,000,000
Alternative 8: Public Works Site	$139,200,000
Alternative 9: Water Treatment Plant Site	$164,700,000
Alternative 10: Acadian Cross Trail	$151,000,000
Alternative 11: Industrial Park Road	$138,600,000
Alternative 12: NBDTI District Offices	N/A
First Iteration and Refinement of Alternatives: October 04, 2017	
Alternative 3: New Bridge Directly Connecting the POEs	$119,000,000
Alternative 3B: Altered New Bridge Directly Connecting the POEs	$119,600,000
Alternative 4.5: Combination of Alternative 4 and Alternative 5	$108,200,000
Alternative 4.5B: Altered Combination of Alternative 4 and Alternative 5	$109,700,000
Second Iteration and Refinement of Alternatives: January 19, 2018	
Refined Alternative 3: New Bridge Directly Connecting the POEs	$119,000,000
Refined Alternative 4.5: Combination of Alternative 4 and Alternative 5	$108,200,000
Third and Final Iteration and Refinement of Alternatives: April 10, 2018	
Further Refined Alternative 3: New Bridge Directly Connecting the POEs	$126,400,000
Further Refined Alternative 4.5: Combination of Alternative 4 and Alternative 5	$112,200,000
Preferred Alternative: Alternative 3 with Curvature Added	$131,200,000

The U.S. House Committee on Transportation and Infrastructure and the Senate Committee on Environment and Public Works have authorized prospectus funding for a new U.S. LPOE project in downtown Madawaska, Maine though various Public Laws dating from 2004 to 2009, and totaling approximately $69.2M. Therefore, the estimated total project cost for each of the downtown U.S. LPOE alternatives reflects this existing funding as authorized by the U.S. Congress. Out of town alternatives for a new U.S. LPOE have been assumed at $90M to reflect increased CBP program requirements since the enacted Public Laws, as well as to respond to the uncertainties and site constraints of the alternative out of town site locations identified in this study.

Exhibit 4.4 - *Alternatives Summary Map*



Legend

- Cultural Resource Building Point
- Libraries
- Fire Station / EMS
- Cemeteries
- Ambulance
- School
- Park
- Police
- Nursing Homes

Alternative Bridge Options

- Bridge
- Bridge ROW
- Port of Entry Property
- Road
- Railroads

- Stream Flowline
- Regulated Wetlands Map (RWM)-30 Meter Buffer
- Man-made Structures to Access Water
- Canada Crown Lands
- Conserved Lands - ME
- Aboriginal Lands
- Flood 2008 - Canada
- Protected Wellfields

Waters

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Wetlands - Canada
- Stream/River Area

N
W E
S

1 inch = 3,000 feet

0 1,500 3,000 6,000 9,000 Feet

Inset images of Alternatives 1 through 6 not to scale

4.2.2.1 Alternatives 1-12

Downtown Alternatives Summary

The six downtown alternatives were focused on maintaining the existing Edmundston POE and building a new Madawaska LPOE. Leaving the Edmundston POE in place and constructing the new Madawaska LPOE on developed land lowers the overall cost, construction timeframe, and environmental impacts as compared to the out of downtown alternatives. The probable costs of these alternatives are approximately $101-110 million. The downtown alternatives require limited Canadian funding for changes to the POE and federal funding for the LPOE has been secured.

Keeping the border crossing downtown maintains community cohesion between Madawaska and Edmundston, causing the fewest disruptions to the community. While traffic patterns will be altered due to the change in location of the Madawaska LPOE, the overall commute time between Madawaska and Edmundston would not increase significantly.

Alternatives 1 through 5 propose relocating the Madawaska LPOE to a U.S. government-owned parcel to the west of the existing Madawaska LPOE (Exhibits 4.5-4.9). To construct the LPOE, the parcel would need to be graded extensively and the sensitive environmental area to the west of the property would need to be avoided. The U.S. government-owned parcel was purchased from Twin Rivers Paper Company in 2011. Since then, Twin Rivers Paper Company has continued to operate on the parcel under a license agreement with the U.S. These operations would need to cease before construction could begin. Businesses and residences surrounding the parcel, including Twin Rivers Paper Company and the railroad, would be disrupted by construction activities at the new LPOE. Twin Rivers Paper Company would no longer be bisected by Bridge Avenue and the Madawaska LPOE, which could lead to improved shipping operations.

Alternatives 3, 4 and 5 provide separation between the new and existing bridge, and between the new and existing Madawaska LPOE and would allow the existing border crossing to remain operational during construction.

Alternative 6 proposes acquiring land in downtown Madawaska to the south of the existing LPOE (Exhibit 4.10). This alternative would also disrupt surrounding businesses and residences during construction of the LPOE.

The following is a summary of each downtown alternative, the pros and cons of constructing each alternative, and a map of each alternative.

Alternative 1: Bridge Rehabilitation

Alternative 1 proposes rehabilitating the existing International Bridge, moving the Madawaska LPOE to the U.S. government-owned parcel, and building a 1,500-foot-long (457.2 m) viaduct overtop the railroad, connecting the bridge to the new POE (Exhibit 4.5).

During the identification, development, and screening of alternatives, the project sponsors noted the following:

Pros

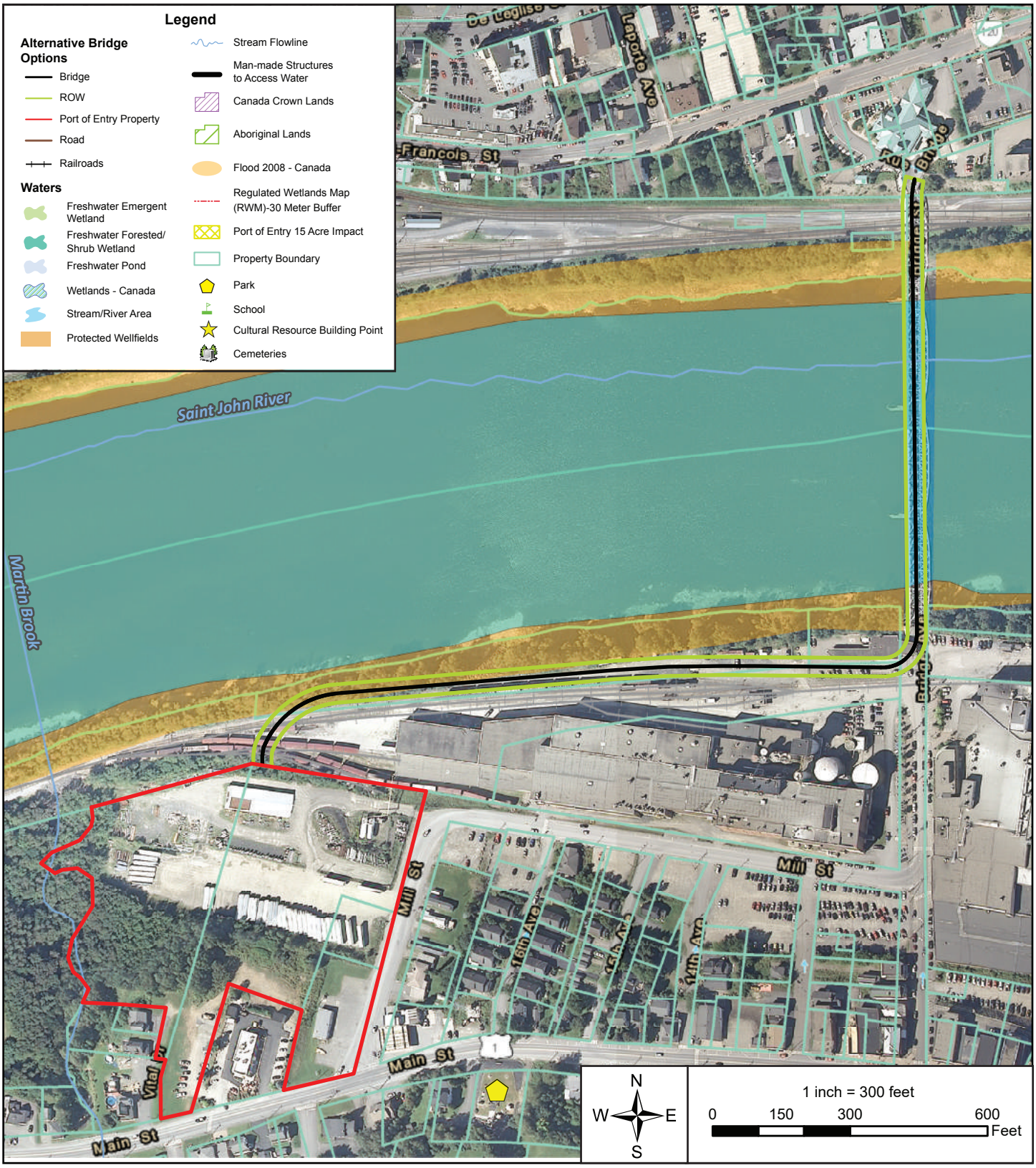
- Already studied extensively.
- Allows for current POE operations to continue during construction.
- Improved traffic flow across the bridge could result in improved economic development opportunities.
- Bridges over the MNR tracks reducing vehicle conflicts and interference.
- Maintains utilities on the bridge.
- Shortest construction timeframe.
- A rehabilitated bridge could be implemented in about 3 years.

Cons

- Previous studies dismissed this as a viable alternative.
- Corner connecting the bridge and viaduct is too narrow for transports and tandem trailers to make the turn, making this alternative ineffective.
- The length and cost of the viaduct are prohibitive.
- Maintenance and snow removal are problematic and cost-prohibitive.
- Poor security visibility on the U.S. side creates border security and safety issues.
- Increased security staff would be required to process pedestrians and patrol the bridge and viaduct.
- Significant interference with railroad and Twin Rivers operations.
- Lengthy bridge closures would be required.
- MaineDOT would not support this alternative unless GSA owns and maintains the viaduct.
- Service life of the rehabilitated bridge would be approximately 30 years, much less than a new bridge.
- The cost for this alternative with a rehabilitated bridge is commensurate with the cost of other alternatives with new bridges and much longer service life.

Following the inspection and evaluation of the bridge, the NBDTI tried to repair some damage on the northern end of the bridge to try to increase or raise the weight restriction on the bridge. NBDTI replaced four stringers supporting the bridge deck that exhibited the most critical amounts of deterioration. The replacement of these stringers was complex and each stringer took about two weeks to replace. There are approximately 75 stringers that are limiting the capacity of the bridge. Given the time, effort, and cost required to replace the four stringers, MaineDOT and NBDTI decided it was not prudent to continue to replace them. Therefore, the five-ton weight limit won't be changed.

Exhibit 4.5 - *Alternative 1*



Alternative 2: New Bridge Immediately Upstream with Viaduct on the U.S. Side

Alternative 2 proposes building a new bridge immediately upstream of the existing International Bridge, moving the Madawaska LPOE to the U.S. government-owned parcel, and building a 1,500-foot-long (457.2 m) viaduct overtop the railroad, connecting the bridge to the new POE (Exhibit 4.6).

During the identification, development, and screening of alternatives, the project sponsors noted the following:

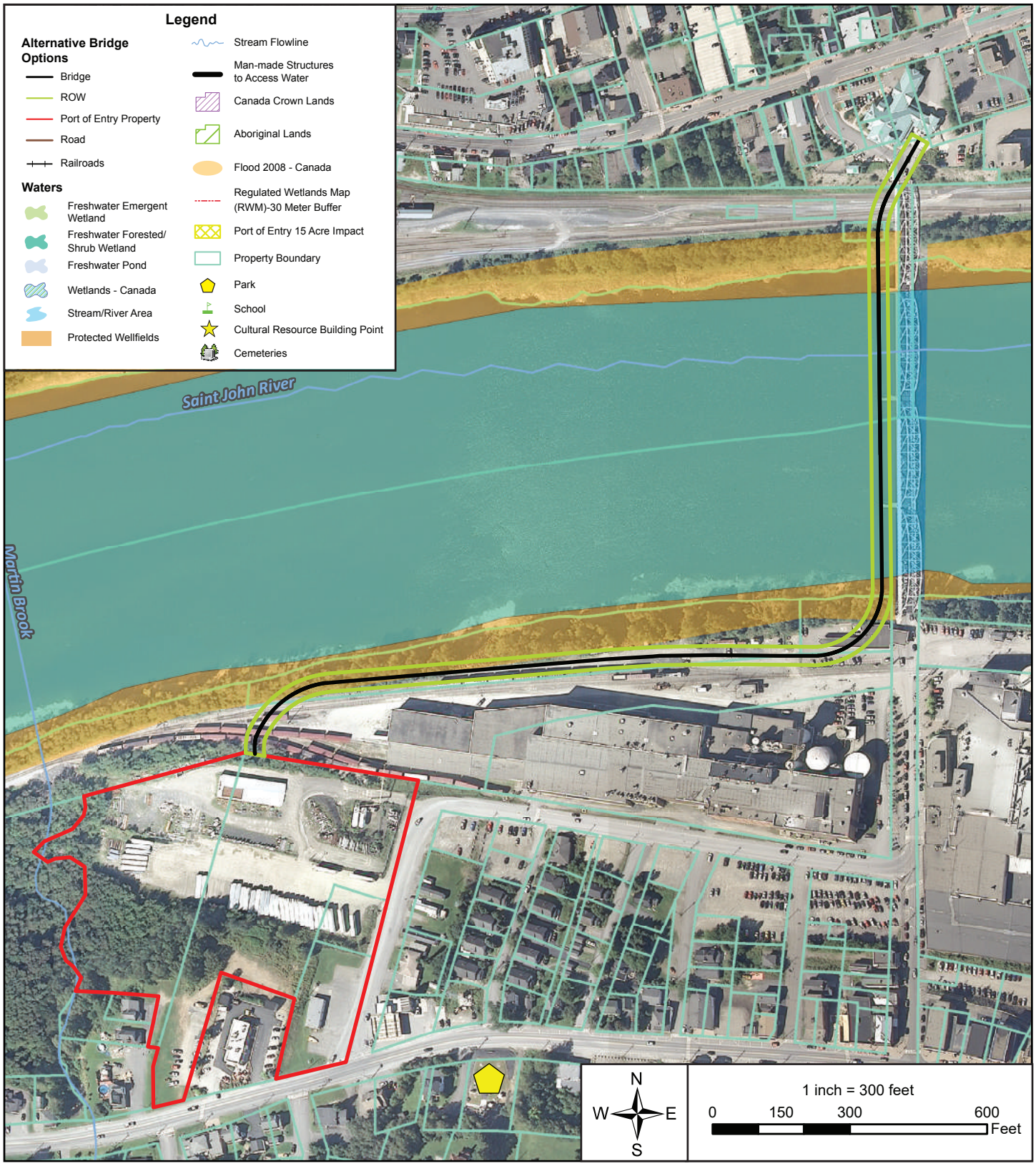
Pros

- Already studied extensively.
- Allows for current POE operations to continue during construction.
- Bridges over MNR reducing vehicle conflicts and interference.
- Minor impacts to the Edmundston POE.
- Opportunity to correct the bridge entry and exit to better accommodate truck traffic.
- Good security line of site from the Canadian side to the Edmundston POE.

Cons

- Previous studies dismissed this as a viable alternative.
- Corner connecting the bridge and viaduct is too narrow for transports and tandem trailers to make the turn.
- The length and cost of the viaduct are prohibitive.
- Maintenance and snow removal are problematic and cost-prohibitive.
- Poor security visibility on the U.S. side creates border security and safety issues.
- Increased security staff would be required to process pedestrians and patrol the bridge and viaduct.
- Lengthy bridge closures would be required during construction.
- MaineDOT would not support this alternative unless GSA owns and maintains the viaduct.
- Utility lines would need to be moved from the existing bridge to the new bridge.
- Most expensive downtown alternative.

Exhibit 4.6 - *Alternative 2*



Alternative 3: New Bridge Directly Connecting the POEs

Alternative 3 proposes moving the Madawaska LPOE to the U.S. government-owned parcel and building a new bridge on a skew angle, directly connecting the existing Edmundston POE to the new Madawaska LPOE (Exhibit 4.7).

During the identification, development, and screening of alternatives, the project sponsors noted the following:

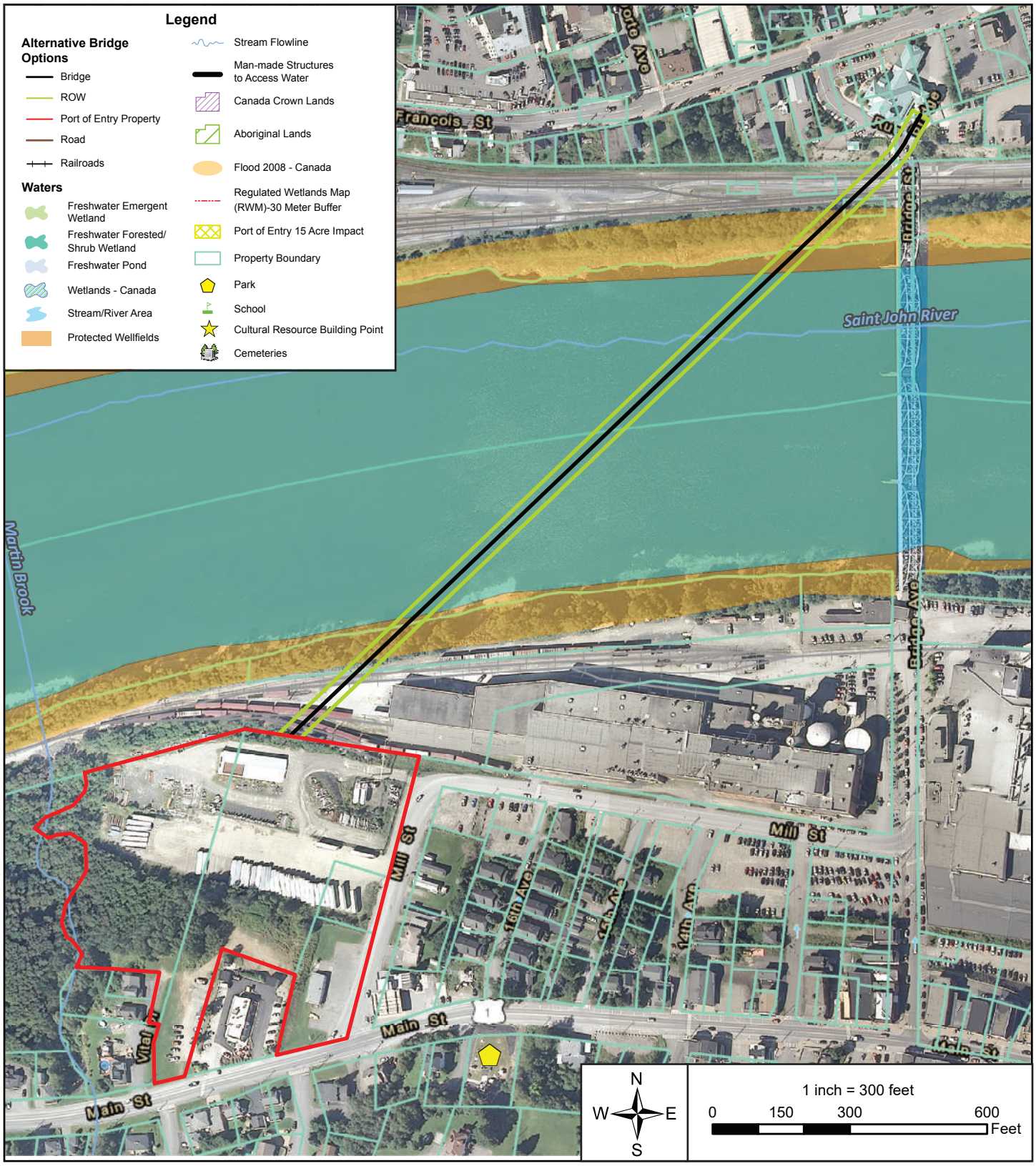
Pros

- Bridge alignment offers the prerequisite line of sight and approach distances on both sides of the border.
- Provides opportunity for visibility across Twin Rivers' property from the new LPOE.
- Allows for current LPOE operations to continue during construction.
- Does not require PSPC, CBSA, or NBDTI to acquire land.
- Minor impacts to the Edmundston POE.

Cons

- Requires a longer bridge than the existing bridge.
- Largest number of piers in the Saint John River of all the downtown alternatives considered.
- Higher operation and maintenance costs.
- Unknown impact to utilities.

Exhibit 4.7 - *Alternative 3*



Alternative 4: New Bridge with Viaduct on the Canadian Side

Alternative 4 proposes moving the Madawaska LPOE to the U.S. government-owned parcel and building a new bridge on a skew angle, connecting to the existing Edmundston POE via a viaduct over the CNR rail line (Exhibit 4.8).

During the identification, development, and screening of alternatives, the project sponsors noted the following:

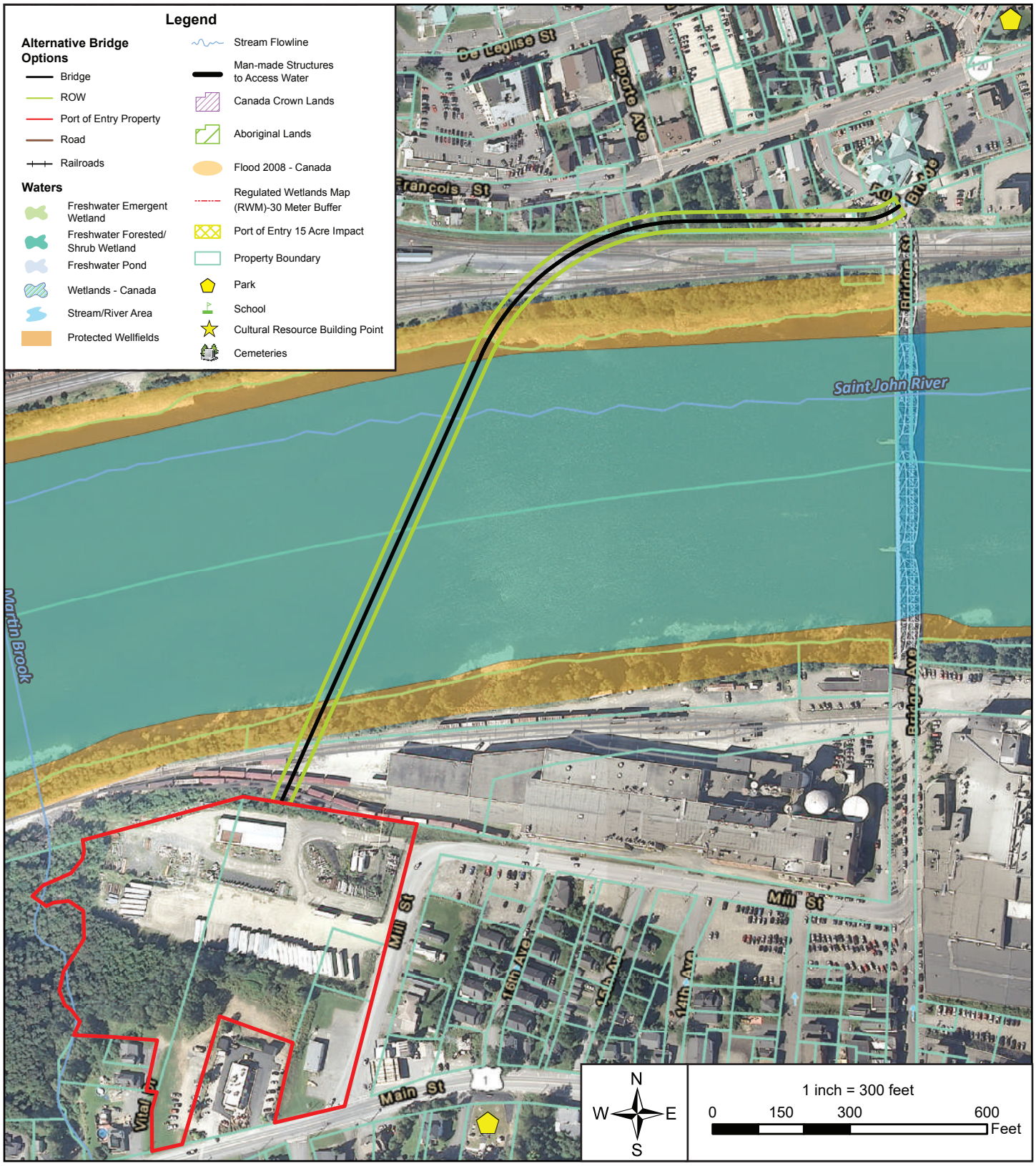
Pros

- Angle of the bridge allows for best visibility for CBP.
- Allows for possible best orientation of bridge landing for preferred building alignments and site circulation for the Madawaksa LPOE.
- Allows for current POE operations to continue during construction.
- Acquisition of property on the Canadian side may allow for future expansion.

Cons

- Requires a longer bridge span than the existing bridge.
- Angle of the bridge reduces visibility approaching the Edmundston POE.
- Impacts to businesses and residences on the Canadian side in Edmundston.
- Maintenance and snow removal over the CNR tracks and within the Edmundston POE are problematic and potentially cost-prohibitive.
- The construction of the retaining wall will increase the cost of the project.
- Need for increased security measures and infrastructure approaching the Edmundston POE due to the viaduct.
- Interference with CNR rail line.
- Would displace properties in Edmundston consisting of dentist office, an apartment building, a motel, a private residence, and 3 vacant lots.
- Unknown impacts to utilities.

Exhibit 4.8 - *Alternative 4*



Alternative 5: New Bridge with Viaduct on the Canadian Side

Alternative 5 proposes moving the Madawaska LPOE to the U.S. government-owned parcel and building a new bridge on a skew angle, connecting to the existing Edmundston POE via a viaduct over the CNR rail line (Exhibit 4.9).

During the identification, development, and screening of alternatives, the project sponsors noted the following:

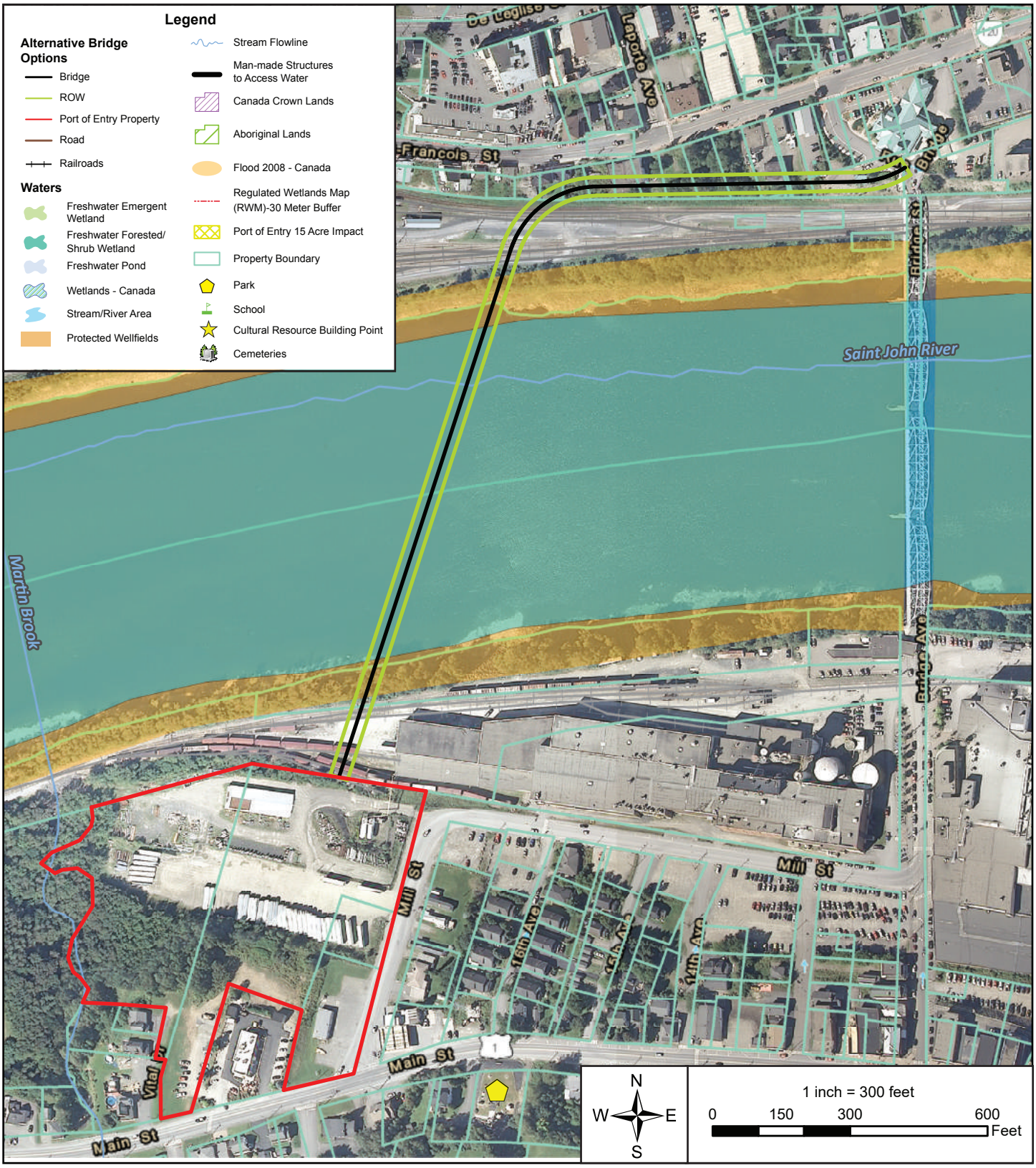
Pros

- Angle of the bridge allows for best visibility for CBP.
- Allows for possible best orientation of bridge landing for preferred building alignments and site circulation for the Madawaksa LPOE.
- Allows for current POE operations to continue during construction.
- Acquisition of property on the Canadian side may allow for future expansion.

Cons

- Requires a longer bridge span than the existing bridge.
- Angle of the bridge reduces visibility approaching the Edmundston POE.
- Impacts to businesses and residences on the Canadian side in Edmundston.
- Maintenance and snow removal over the CNR tracks and within the Edmundston POE are problematic and potentially cost-prohibitive.
- The construction of the retaining wall will increase the cost of the project.
- Need for increased security measures and infrastructure approaching the Edmundston POE due to the viaduct.
- Interference with CNR rail line.
- Would displace properties in Edmundston consisting of an apartment building and 2 vacant lots.
- Unknown impacts to utilities.

Exhibit 4.9 - *Alternative 5*



Alternative 6: New Bridge with Downtown Property Acquisition

Alternative 6 proposes building a new bridge immediately upstream of the existing bridge and placing the new Madawaska LPOE on property in downtown Madawaska between Main Street and Mill Street that would need to be acquired before construction could begin (Exhibit 4.10).

During the identification, development, and screening of alternatives, the project sponsors noted the following:

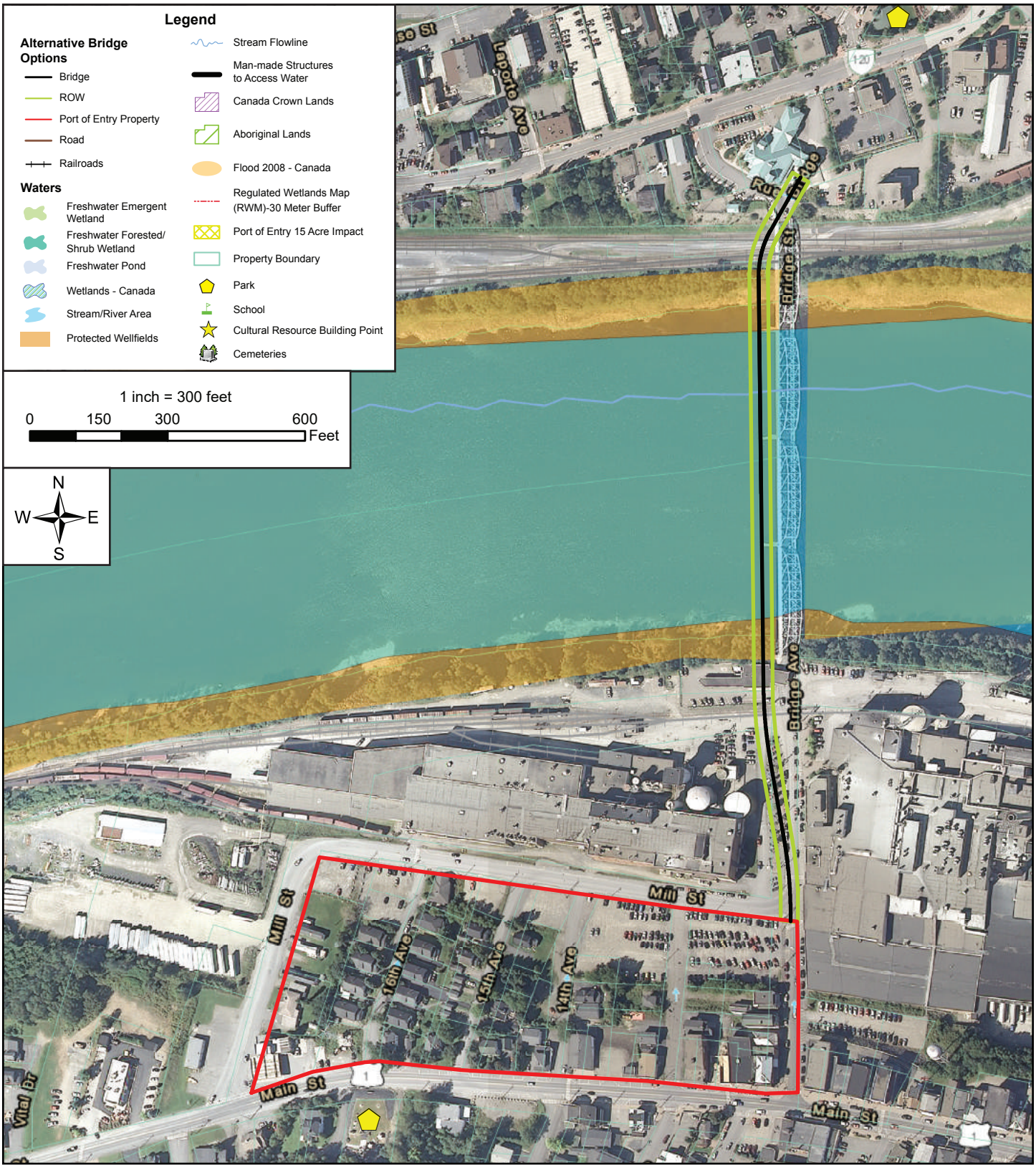
Pros

- Does not require PSPC, CBSA, or NBDTI to acquire land.
- Possible easy transfer of utilities from existing bridge to the new bridge.
- Opportunity to correct the bridge entry and exit to better accommodate truck traffic.
- Good security line of site approaching the Edmundston POE.

Cons

- Requires moving utilities to the new bridge.
- Significant land, including residential, commercial and Twin Rivers Paper Company properties, would need to be acquired prior to construction.
- Significant impacts to residences and businesses, including Twin Rivers Paper Company, in Madawaska.
- Poor security visibility approaching the Madawaska LPOE creates border security and safety issues. Significant security complications on the U.S. side.
- Longer viaduct increases cost to CBP and GSA.
- Significant constriction of traffic circulation in Madawaska.
- Unknown environmental risks and site cleanup costs.
- Maintenance and snow removal are problematic and cost-prohibitive.

Exhibit 4.10 - *Alternative 6*



Out of Downtown Alternatives Summary

The six out of downtown alternatives would move the border crossing and all related facilities out of the downtown business zone. Moving the border crossing out of downtown would require constructing two new POEs (U.S. and Canada) and a new bridge.

Alternatives 7 through 12 would include more space for the POEs, improved traffic circulation on the POE sites, few to no direct impacts to Twin Rivers facilities and railroad lines, and would not cause the existing border crossing to shut down during construction (Exhibits 4.11-4.16).

The new border crossing facilities would be constructed on land that would need to be acquired, increasing the overall cost, construction timeframe, and environmental impacts when compared to the downtown business zone alternatives. In addition, PSPC and CBSA have no plans or funding for a new POE.

The probable costs of the out of downtown alternatives range from approximately $139 million to $164 million, and would be contingent on concurrent federal funding authorization and appropriation of both the United States and Canadian governments for a new LPOE and POE, respectively, further risking delayed opening of a new border crossing.

MaineDOT and NBDTI have agreed that if any of the out of downtown alternatives would be constructed, the existing bridge and border crossing facilities in the downtown business zone would be removed from service (Section 4.3.3). Removing the existing border crossing would reduce community cohesion between Madawaska and Edmundston, causing significant disruption to the community, and significantly increasing overall commute time between Madawaska and Edmundston. The increased travel time would increase shipping costs to businesses such as Twin Rivers Paper Company which operates on both sides of the border.

The following is a summary of each out of downtown alternative, the unique pros and cons of constructing each alternative, and a map of each alternative.

Alternative 7: New Border Crossing Upstream of the Downtown Area

Alternative 7 proposes building new border crossing facilities approximately 1.5 miles (2.4 km) upstream of the existing border crossing (Exhibit 4.11). The new Edmundston POE would be located north of Rue Saint François (Route 120) between Rossignol Road and Avenue Phillipe. The International Bridge would be extended over Route 120 before touching down on the POE property. A new access road would be required to connect the POE to Route 120. The new Madawaska LPOE would be located south of Main Street (Route 1) between Hill Avenue and 26th Avenue. The new International Bridge would be extended over the MNR rail line and Route 1 before touching down on the LPOE property.

During the identification, development, and screening of alternatives, the project sponsors noted the following:

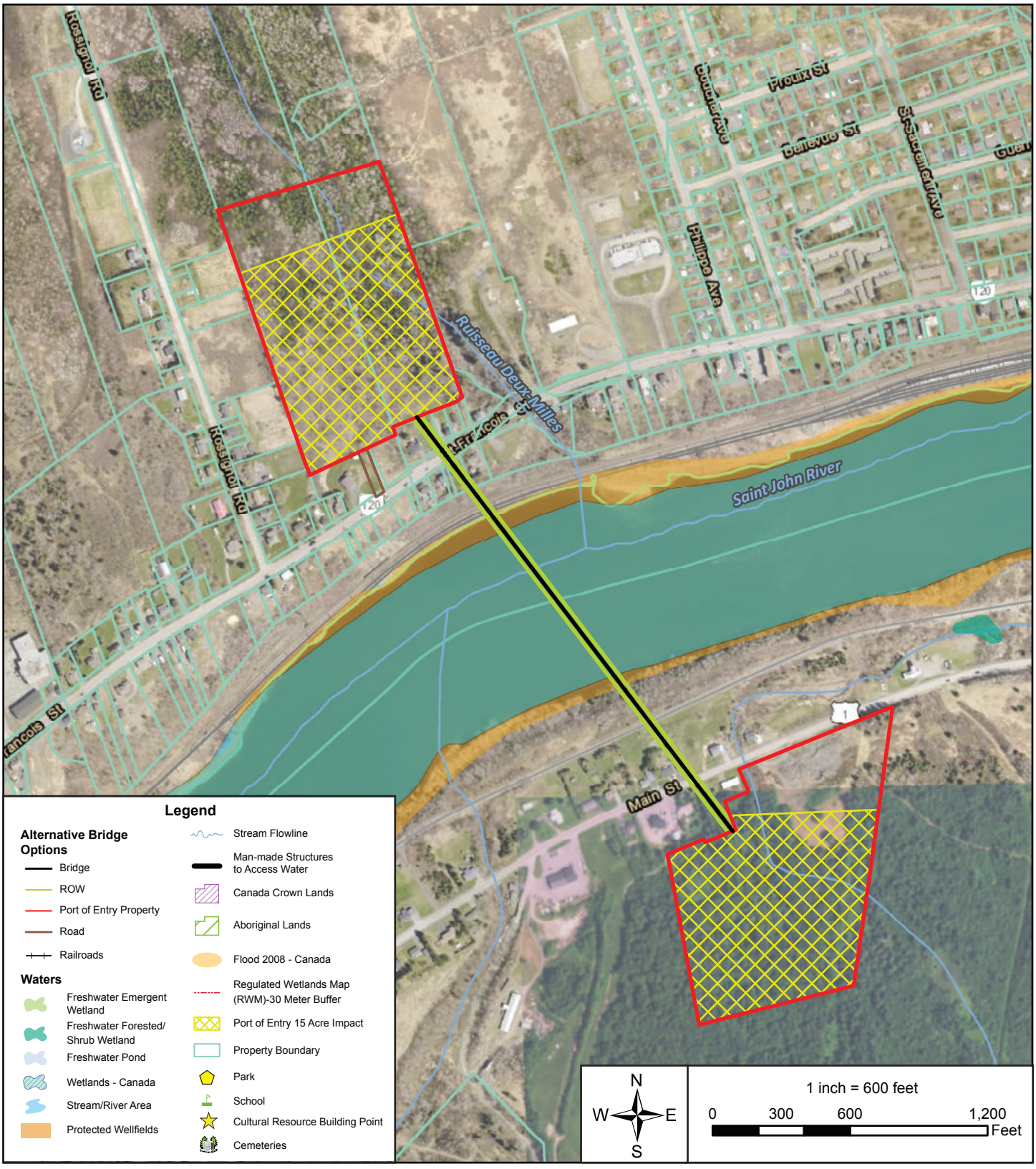
Pros

- Increased space for all POE operations as well as potential for future expansion.
- Few to no impacts to Twin Rivers or railroad facilities.
- Allows for current POE operations to continue during construction.
- Would reduce truck traffic in the downtown areas.
- Offers the prerequisite line of sight and approach distances.

Cons

- The community cohesion and connectivity in the downtown portions of the City of Edmundston and Town of Madawaska would be severed as the existing International Bridge would be removed and not replaced.
- Significant amount of property would need to be acquired.
- Bicyclists and pedestrians would be severely impacted by the increased travel distance as the International Bridge in the downtown portions of the City of Edmundston and Town of Madawaska would be removed. In most cases, the increase in travel distance would be prohibitive to both bicyclists and pedestrians.
- Construction cost is substantially higher than the downtown alternatives.
- Potential contaminated site from industrial area up gradient.
- Introduces new sources of noise from vehicles to rural portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to residential land uses or undeveloped.
- Increased truck traffic on local roads due to distance from TransCanada Highway.
- Introduces new lighting to rural portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to residential land uses or undeveloped.
- Insufficient land between river and roadways.
- May take approximately 10 years to implement.
- Necessary to "fly over" roads on both sides, requiring a longer bridge.
- POE needs to be raised above the railroad.
- Increased security presence and infrastructure for bridge over land would increase security risks.

Exhibit 4.11 - *Alternative 7*



Alternative 8: Public Works Site

Alternative 8 proposes building new border crossing facilities approximately 1.7 mi (2.7 km) downstream of the existing border crossing (Exhibit 4.12). The new Edmundston POE would be located adjacent to First Nation property between the CNR rail line and Principale Street. An access road would be required to connect the POE to Principale Street. The International Bridge would need to fly over the railroad tracks before touching down on the POE property. The new Madawaska LPOE would be located between the river and the MNR rail line. The International Bridge would need to be extended to carry traffic over wetlands in the northern portion of the LPOE property. An access road crossing the railroad tracks would be required to connect the LPOE to Main Street (Route 1).

During the identification, development, and screening of alternatives, the project sponsors noted the following:

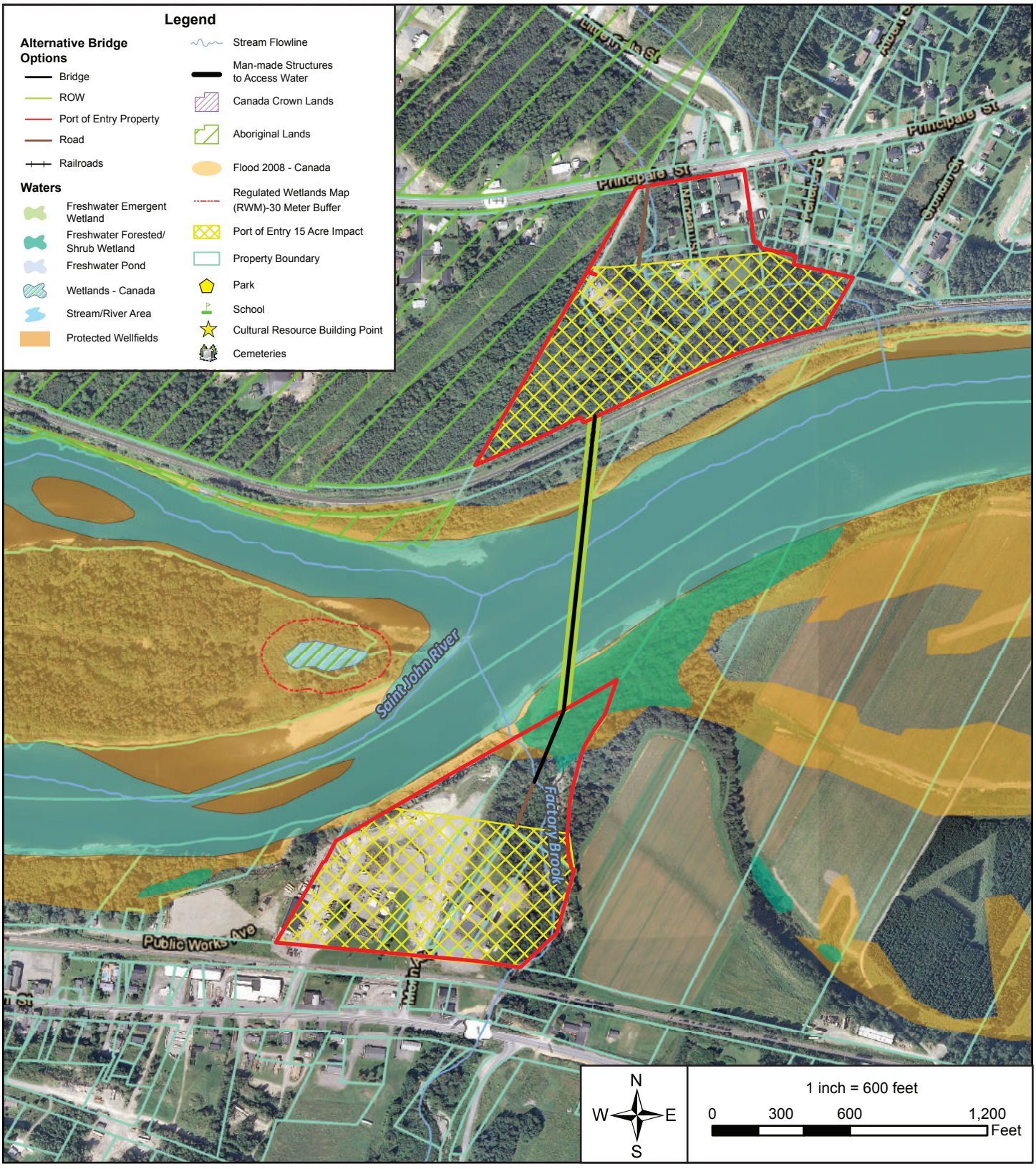
Pros

- Increased space for all POE operations as well as potential for future expansion.
- Few to no impacts to Twin Rivers facilities.
- Allows for current POE operations to continue during construction.
- Would reduce truck traffic in the downtown areas.
- CNR narrow lane crossing.
- Ample grounds between river and railroad tracks.
- Offers the prerequisite line of sight and approach distances.

Cons

- The community cohesion and connectivity in the downtown portions of the City of Edmundston and Town of Madawaska would be severed as the existing International Bridge would be removed and not replaced.
- Significant amount of property would need to be acquired.
- Bicyclists and pedestrians would be severely impacted by the increased travel distance as the International Bridge in the downtown portions of the City of Edmundston and Town of Madawaska would be removed. In most cases, the increase in travel distance would be prohibitive to both bicyclists and pedestrians.
- Immediately adjacent to property owned by First Nations; operation of the POE at this location could detract from current and future uses of the First Nations property.
- Construction cost is substantially higher than the downtown alternatives.
- Introduces new sources of noise from vehicles to rural portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to residential land uses or undeveloped.
- Introduces new lighting to rural portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to residential land uses or undeveloped.
- May take approximately 10 years to implement.
- Would require approximately five residential displacements.

Exhibit 4.12 - *Alternative 8*



Alternative 9: Water Treatment Plant/Acadian Cross Trail

Alternative 9 proposes building new border crossing facilities approximately 4.0 mi (6.4 km) downstream of the existing border crossing (Exhibit 4.13). The new Edmundston POE would be located in the floodplain between the river and Principale Street, next to an existing wastewater treatment plant. A second bridge would be required to carry traffic over floodplain and wetland areas between the POE and Principale Street. The new Madawaska LPOE would be located between the river and the MNR rail line. An access road across the railroad tracks would be required to connect the LPOE to Main Street (Route 1).

During the identification, development, and screening of alternatives, the project sponsors noted the following:

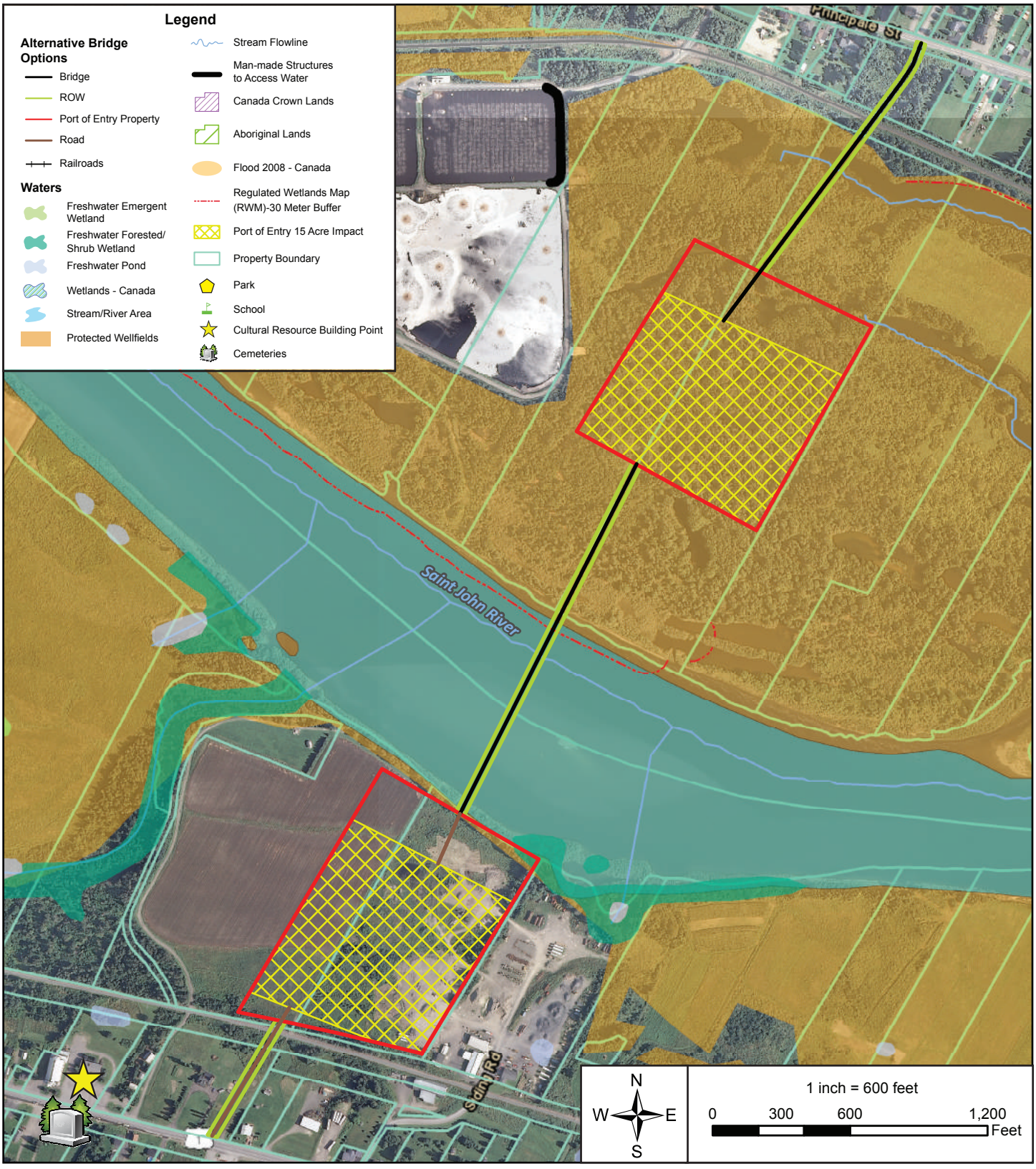
Pros

- Increased space for all POE operations as well as potential for future expansion.
- Few to no impacts to Twin Rivers or railroad facilities.
- Allows for current POE operations to continue during construction.
- Would reduce truck traffic in the downtown areas.
- Offers the prerequisite line of sight and approach distances.

Cons

- The community cohesion and connectivity in the downtown portions of the City of Edmundston and Town of Madawaska would be severed as the existing International Bridge would be removed and not replaced.
- Significant amount of property would need to be acquired.
- Bicyclists and pedestrians would be severely impacted by the increased travel distance as the International Bridge in the downtown portions of the City of Edmundston and Town of Madawaska would be removed. In most cases, the increase in travel distance would be prohibitive to both bicyclists and pedestrians.
- Would impact approximately 15 acres (60,702.8 m^2) of floodplain.
- Adverse effect to the Acadian Landing & Tante Blanche Museum property listed on the National Register of Historic Places.
- Construction cost is substantially higher than the downtown alternatives.
- Introduces new sources of noise from vehicles to rural portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to residential land uses or undeveloped.
- Introduces new lighting to rural portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to residential land uses or undeveloped.
- May take approximately 10 years to implement.
- Nearby wastewater treatment center could complicate construction, design, and operations.
- May impact festivals and other gatherings at the Acadian Landing.
- Potential issues with water and sewer services at the site.

Exhibit 4.13 - *Alternative 9*



Alternative 10: Industrial Park Road

Alternative 10 proposes building new border crossing facilities approximately 5.0 mi (8.0 km) downstream of the existing border crossing (Exhibit 4.14). The new Edmundston POE would be built in the floodplain between the river and River Valley Scenic Drive (Route 144). A second bridge would be required to carry traffic over a sizable wetland area between the POE and Route 144. The new Madawaska LPOE would be located between the MNR rail line and Main Street (Route 1). The new International Bridge would need to carry over the rail line before touching down on the LPOE property.

During the identification, development, and screening of alternatives, the project sponsors noted the following:

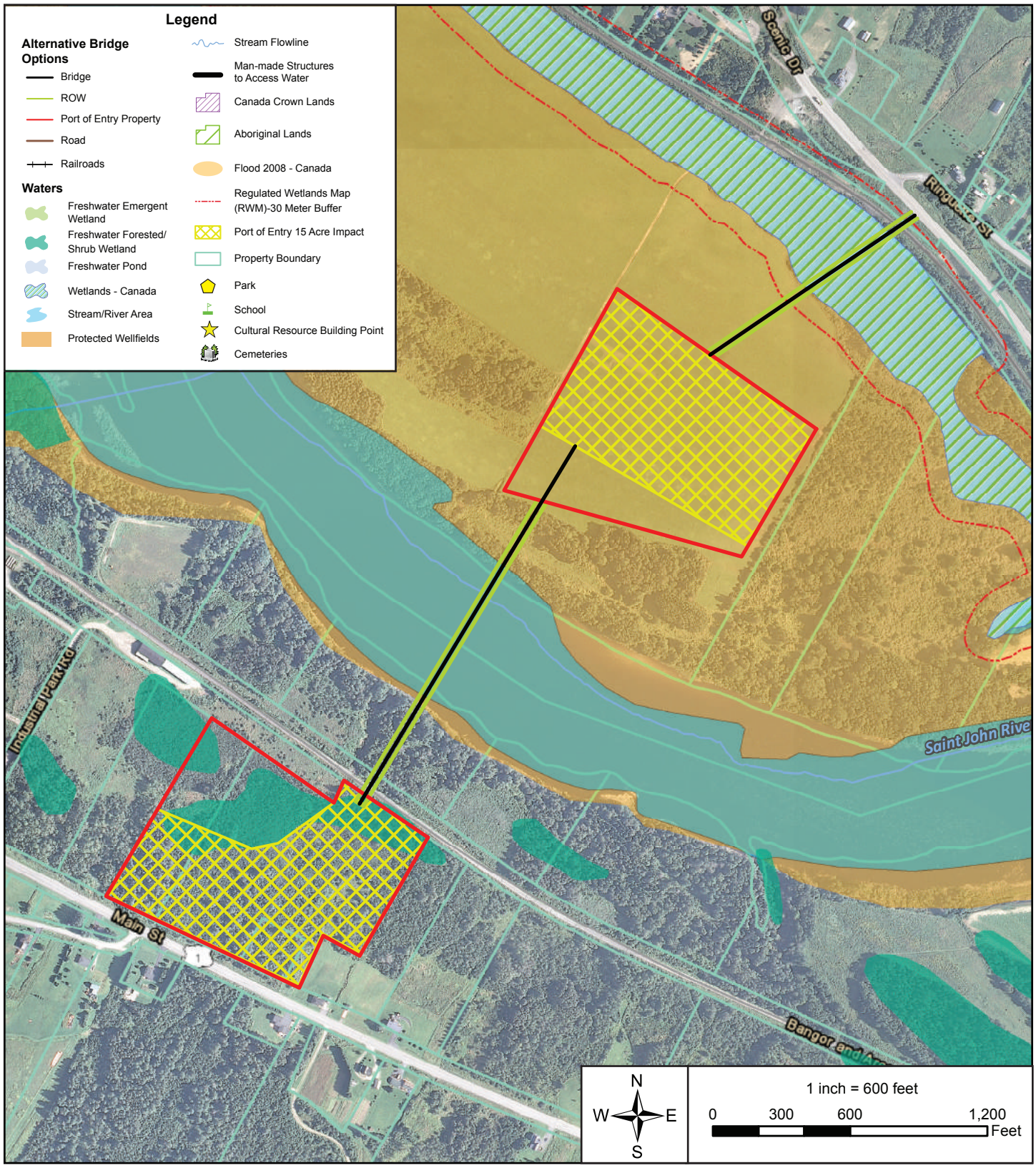
Pros

- Increased space for all POE operations as well as potential for future expansion.
- Few to no impacts to Twin Rivers or railroad facilities.
- Allows for current POE operations to continue during construction.
- Would reduce truck traffic in the downtown areas.
- Good access to highways.
- Offers the prerequisite line of sight and approach distances.

Cons

- The community cohesion and connectivity in the downtown portions of the City of Edmundston and Town of Madawaska would be severed as the existing International Bridge would be removed and not replaced.
- Significant amount of property would need to be acquired.
- Bicyclists and pedestrians would be severely impacted by the increased travel distance as the International Bridge in the downtown portions of the City of Edmundston and Town of Madawaska would be removed. In most cases, the increase in travel distance would be prohibitive to both bicyclists and pedestrians.
- Would impact approximately 15 acres (60,702.8 m^2) of floodplain.
- Construction cost is substantially higher than the downtown alternatives.
- Introduces new sources of noise from vehicles to rural portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to residential land uses or undeveloped.
- Introduces new lighting to rural portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to residential land uses or undeveloped.
- May take approximately 10 years to implement.
- Potential issues with water and sewer services at the site.
- Distance from downtown complicates Emergency Services.
- Close to Van Buren border crossing.

Exhibit 4.14 - *Alternative 10*



Alternative 11: Former Scales Site

Alternative 11 proposes building new border crossing facilities approximately 5.5 mi (8.9 km) downstream of the existing border crossing at a site previously occupied by commercial vehicle scales (Exhibit 4.15). The new Edmundston POE would be located between River Valley Scenic Drive (Route 144) and Ringuette Street; the new bridge would need to fly over the CNR rail line and Route 144 before touching down on the POE property. On the U.S. side, the new Madawaska LPOE would be located between the river and the MNR rail line. An access road from the new LPOE to Main Street (Route 1) would be built and would need to cross the railroad tracks.

During the identification, development, and screening of alternatives, the project sponsors noted the following:

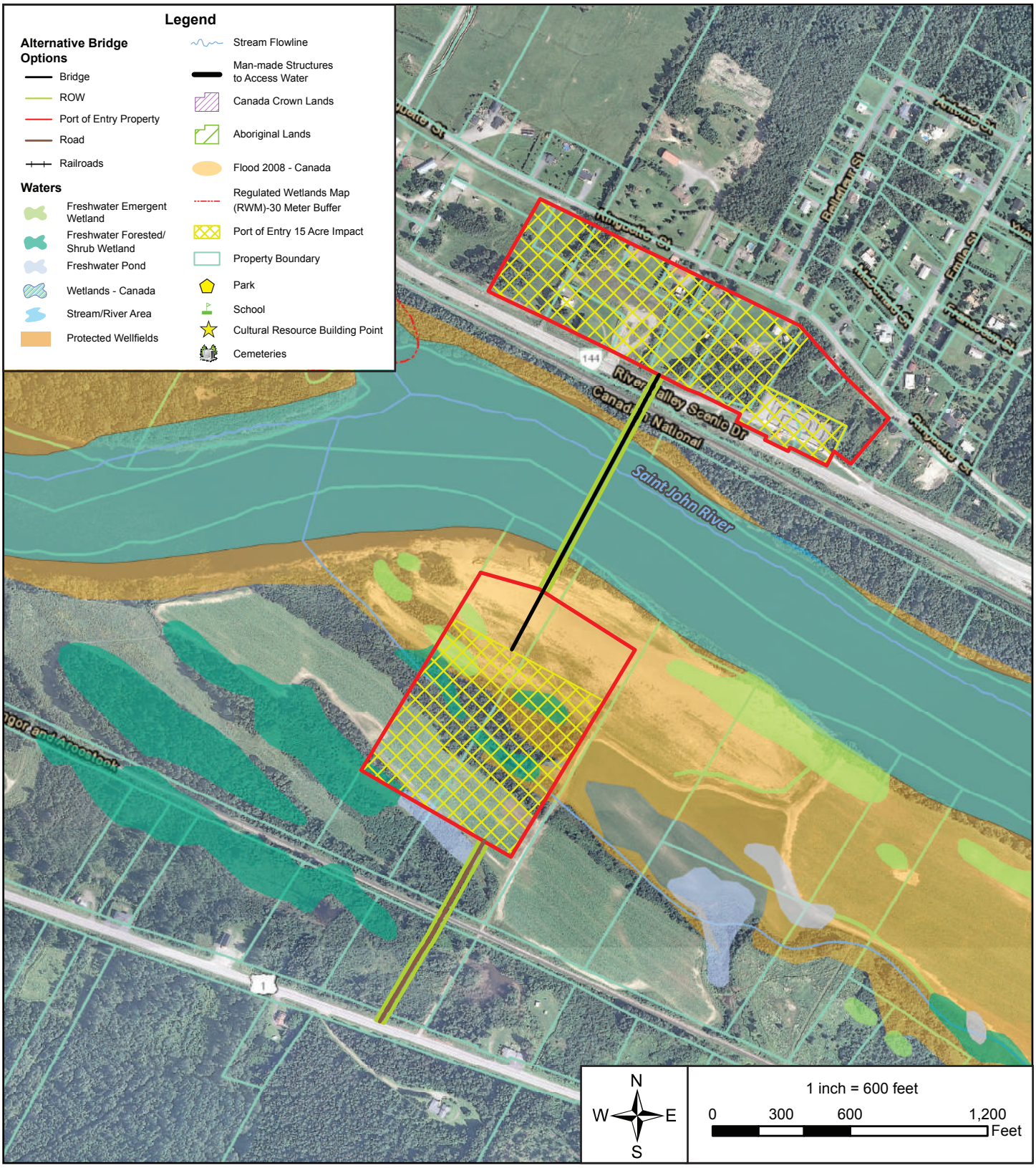
Pros

- Increased space for all POE operations as well as potential for future expansion.
- Few to no impacts to Twin Rivers or railroad facilities.
- Allows for current POE operations to continue during construction.
- Would reduce truck traffic in the downtown areas.
- Good access to highways.
- Offers the prerequisite line of sight and approach distances.

Cons

- The community cohesion and connectivity in the downtown portions of the City of Edmundston and Town of Madawaska would be severed as the existing International Bridge would be removed and not replaced.
- Significant amount of property would need to be acquired.
- Bicyclists and pedestrians would be severely impacted by the increased travel distance as the International Bridge in the downtown portions of the City of Edmundston and Town of Madawaska would be removed. In most cases, the increase in travel distance would be prohibitive to both bicyclists and pedestrians.
- Would impact approximately 10 acres (40,468.6 m^2) of floodplain.
- Construction cost is substantially higher than the downtown alternatives.
- Introduces new sources of noise from vehicles to rural portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to residential land uses or undeveloped.
- Introduces new lighting to rural portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to residential land uses or undeveloped.
- May take approximately 10 years to implement.
- Potential issues with water and sewer services at the site.
- Close to Van Buren border crossing.
- Furthest from downtown.
- Distance from downtown complicates Emergency Services.

Exhibit 4.15 - *Alternative 11*



Alternative 12: NBDTI District Office

Alternative 12 proposes building new border crossing facilities approximately 0.9 mi (1.5 km) upstream of the existing border crossing (Exhibit 4.16). The new Edmundston POE would be located at the current NBDTI District Offices and adjoining properties; the new bridge would need to fly over the CNR rail line before touching down on the POE property. This alternative would require bridging over or moving a portion of Rue St. François. On the U.S. side, the new Madawaska LPOE would be centered on property occupied by Paradis Shop 'n Save; the new bridge would need to bridge over the MNR rail line. This alternative would likely require bridging over or moving a portion of Main Street (U.S. Route 1).

During the identification, development, and screening of alternatives, the project sponsors noted the following:

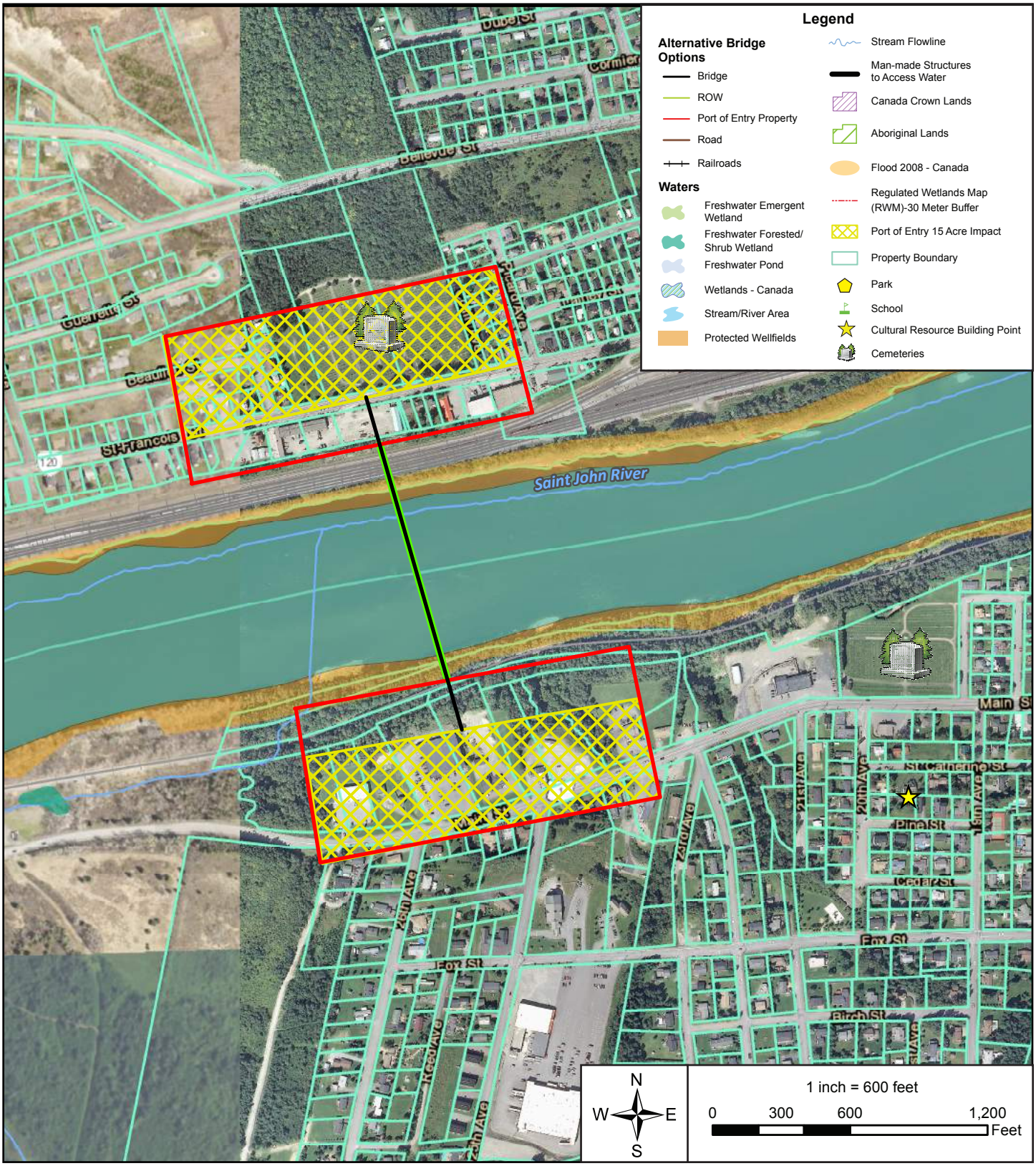
Pros

- Increased space for POE operations as well as potential for future expansion.
- Few to no impacts to Twin Rivers or railroad facilities.
- Allows for current POE operations to continue during construction.
- Would reduce truck traffic in the downtown areas.
- Offers the prerequisite line of sight and approach distances.

Cons

- The community cohesion and connectivity in the downtown portions of the City of Edmundston and Town of Madawaska would be severed as the existing International Bridge would be removed and not replaced.
- Significant amount of property would need to be acquired.
- Bicyclists and pedestrians would be severely impacted by the increased travel distance as the International Bridge in the downtown portions of the City of Edmundston and Town of Madawaska would be removed. In most cases, the increase in travel distance would be prohibitive to both bicyclists and pedestrians.
- Relocation of the cemetery would be required.
- Construction cost is substantially higher than the downtown alternatives.
- May take approximately 10 years to implement.
- May equire relocation of Rue St. François and Route 1.
- Construction of a new bridge approximately 1,500 feet (457.2 m) long would be required making this alternative cost prohibitive.

Exhibit 4.16 - *Alternative 12*



4.2.2.2 Alternatives Considered in Greater Detail

After analyzing the 12 conceptual alternatives, the project sponsors concluded the alternative locations outside of the downtown business zone needed to be dismissed from further consideration and the focus needed to turn to maintaining an international crossing in the downtown business zone.

The reasons for choosing to focus attention only on the alternatives in the downtown business zone were overall practicality, adverse impacts to people and natural resources, cost, and schedule:

- Keeping the border crossing in the downtown business zone respects the needs and requests of PSPC and the CBSA to use the existing Edmundston POE in its present form to the extent possible;
- It maintains the direct connectivity and community cohesion that exists between Madawaska and Edmundston business zones;
- Many of the out of downtown locations would have resulted in prohibitive impacts to wetlands, floodplains, or both and would not have received approval from the federal, provincial, or state agencies charged with their protection;
- The overall cost of the project – considering the new bridge, POEs, and roadway connections – is substantially lower in the downtown business zone than at an out of downtown location;
- A new border crossing in the downtown business zone can be delivered several years sooner than an out of downtown location.

Madawaska LPOE

The GSA and CBP previously considered replacing the Madawaska LPOE (see Section 1.2.3). In 2009, after completing its Madawaska Border Station Final Environmental Impact Statement, GSA issued a Record of Decision. It had determined that the Madawaska LPOE should be relocated to land southwest of the Twin Rivers Paper Company and Mill Street. The U.S. Government then purchased properties from Twin Rivers Paper Company and the Aroostook Medical Center as the future LPOE site. As part of this current Study, GSA and CBP reviewed the FEIS and ROD site determination, and considered other possibilities in the downtown business zone within a reasonable distance upstream and downstream of the Edmundston POE. The GSA and CBP ultimately re-affirmed the FEIS and ROD site as their preferred location because:

- Other sites in the downtown business zone are too small and would not provide sufficient space, are too costly, and/or too disruptive to the operations of the Twin Rivers Paper Company.
- Constructing the new LPOE on this site away from the existing LPOE would allow CBP operations to continue during construction.
- Constructing the new LPOE on this site would provide better traffic circulation, shorter traffic queues, and faster processing times than the other alternatives considered in the downtown business zone.

Bridge Alignments

Concurrent with the GSA's and CBP's considerations and analysis of a location for a new LPOE in the downtown business zone, the MaineDOT and NBDTI used the project alternatives evaluation matrix to complete an initial screening of the remaining downtown alternatives.

Based on the initial screening, MaineDOT and NBDTI dismissed the bridge rehabilitation alternative, Alternative 1. The evaluation concluded Alternative 1 was not reasonable and prudent based on the following:

- **Bridge Condition:** A detailed inspection and assessment of the existing bridge, completed in July 2017, identified numerous areas of advanced deterioration and corrosion. Following the inspection, a structural evaluation of the bridge was completed. The evaluation concluded the observed deterioration significantly decreased the load carrying capacity of the structure. Based on the evaluation results a load restriction was placed on the bridge limiting traffic to vehicles weighing 5 tons (4.5 tonnes) or less. Rehabilitating the bridge to safely carry heavier loads was deemed impractical given the widespread level of deterioration, the lengthy bridge closures required to complete the work, and the significant financial investment required to address structural deficiencies.
- **Bridge Geometry:** The geometry of the existing bridge is narrow, does not meet current standards, and limits traffic operations. The narrow roadway and tight turns at each end of the structure do not accommodate the turning movements of large trucks.
- **Connectivity with new Madawaska LPOE:** The new LPOE will be approximately 1,500 ft (457.2 m) to the southwest of the existing LPOE. If rehabilitation of the bridge in its existing location were pursued, construction of an elevated viaduct along the bank of the Saint John River linking the existing bridge with the new LPOE would be required. The construction of a viaduct would add significant cost to the construction of the LPOE; result in significant impacts to Twin Rivers Paper Company and MNR during consruction; significantly impact paper mill and railroad operations after construction; increase long-term maintenance, operations and security costs; and hinder CBP from safely and effectively securing the border.

Alternative 2, which consisted of construction of a new bridge parallel to, and immediately upstream of, the existing bridge, was also dismissed. The evaluation concluded Alternative 2 was not reasonable and prudent based on the same challenges associated with connecting the new bridge and LPOE cited for Alternative 1.

The significant similarity between Alternatives 4 and 5 was discussed and evaluated. It was concluded that the radius of Alternative 5 was likely smaller than desirable, and the radius of Alternative 4 was likely larger than desirable. Based on this assessment Alternatives 4 and 5 were dismissed and a new Alternative 4.5 was created representing a hybrid of the two.

Following the initial screening of the downtown alternatives a more refined evaluation of the two remaining alternatives, Alternatives 3 and 4.5 was conducted. Alternative 4.5B was developed to minimize property impacts in Edmundston. Alternative 3B was created to provide a more desirable angle of entry into the two POEs. The alignment graphic and evaluation matrix was subsequently

updated to assist in comparing and analyzing the four alternatives (Appendix C). MaineDOT and NBDTI concluded Alternatives 3B and 4.5B did not provide significant improvements over the original alignments. Therefore Alternatives 3 and 4.5 were the most feasible and prudent options to retain for detailed evaluation.

Detailed evaluation of Alternatives 3 and 4.5 included the development of conceptual horizontal and vertical roadway geometries, discussions with MaineDOT and NBDTI regarding bridge type, conceptual bridge pier and abutment layouts, establishment of conceptual limits of retaining walls and slope grading, completion of initial assessments of constructability and utility impacts, and development of refined project cost estimates. The project cost estimates were developed assuming Alternative 3 would be a five-span segmental concrete structure. The use of segmental concrete was assumed to allow for longer span lengths which, in turn, minimizes both the number of piers in the river and ice jamming potential. Alternative 4.5 was assumed to include construction of a seven-span steel plate girder or steel tub girder structure due to the shorter bridge and span lengths required.

Following the refinement of Alternatives 3 and 4.5, and a closer evaluation of constructability and access constraints, and updated bridge construction cost estimates for both alternatives were developed. In both cases the bridge construction cost estimates increased from the estimates developed during the initial alternatives screening. However, even with the higher bridge construction costs considered, both alternatives remained more cost effective than the out of downtown alternatives. Conceptual graphics for both options were prepared and another evaluation matrix was developed to assist in further evaluation and discussion (Appendix D).

The MaineDOT and the NBDTI provided many observations on both alternatives, and lists of positives and negatives of each alternative were created (HNTB, et al., 2017):

Alternative 3

Pros

- Direct line of sight for CBSA officers;
- Less property impacted in Edmundston;
- Minimizes the number and size of retaining walls in Edmundston; and
- Does not require significant modifications to the Edmundston POE.

Cons

- Cost is greater than Alternative 4.5;
- Approach angle of bridge creates an inefficient orientation for the Madawaska LPOE;
- Very little queueing area between bridge and inspection booths at the Edmunston POE;
- Constructability in Edmundston could add cost and/or require additional property acquisition; and
- More piers required unless a bridge type with longer spans is used.

Alternative 4.5

Pros

- Lower initial cost;
- Approach angle of bridge allows for more effective orientation of the Madawaska LPOE;
- Approach roadway allows for longer queueing area for vehicles and potential for two lanes between bridge and inspection booths;
- Improved constructability – larger lay down area in Edmundston; and
- Fewer piers.

Cons

- Size of retaining wall in Edmundston;
- The use of closed-circuit television would be required to offset the loss of line of sight of CBSA personnel;
- Greater property impacts in Edmundston; and
- A pier would be required within CNR's rail yard.

4.2.2.3 Identification of a Corridor for the Preferred Alternative

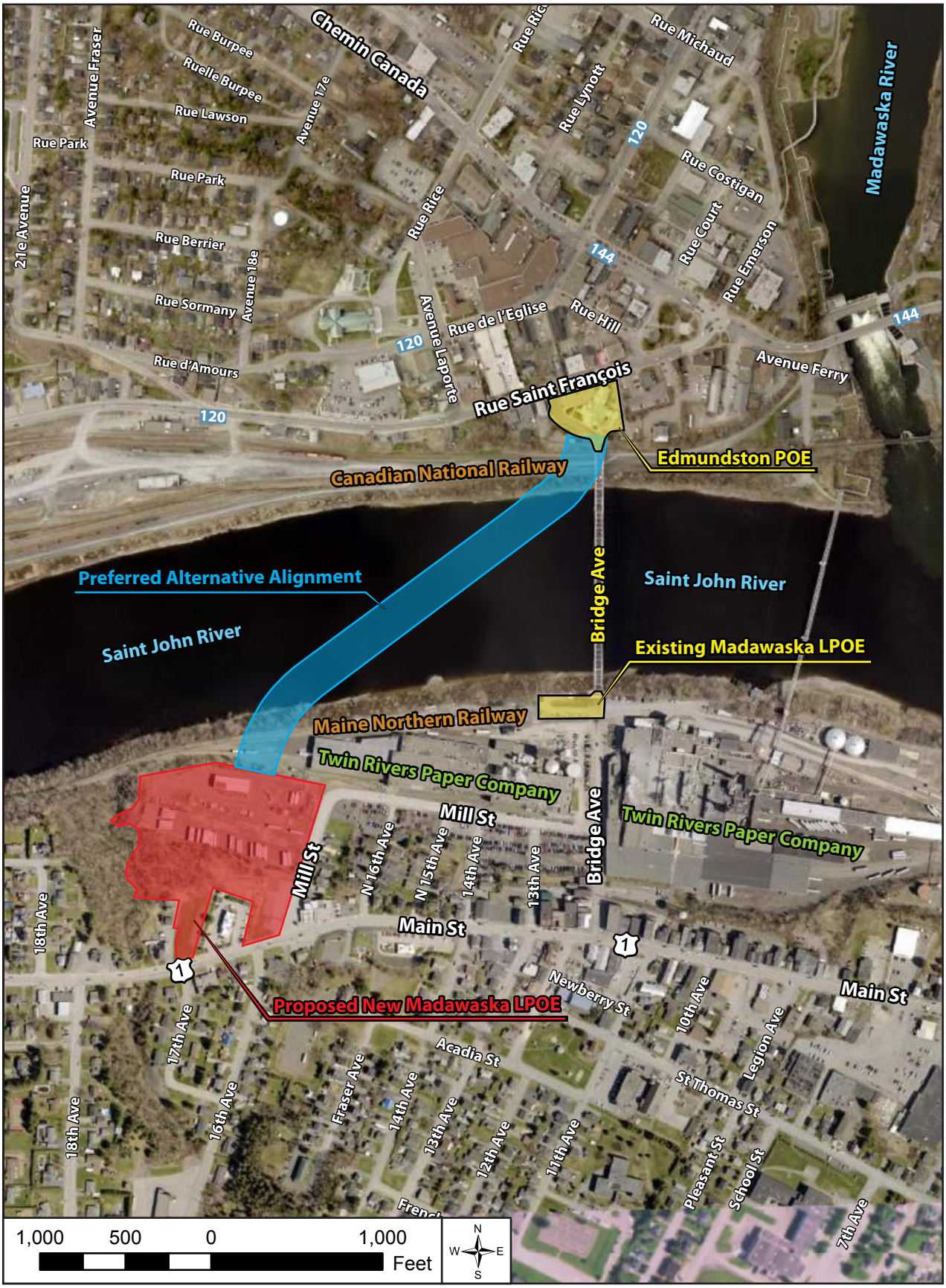
Further discussion and analysis of Alternatives 3 and 4.5 identified several concerns associated with Alternative 4.5. Alternative 4.5 provided the lowest-cost solution of the two remaining alternatives however, it would also result in more significant property impacts in Edmundston and require an extensive retaining wall along the property owned by CNR. Additionally, the alternative was undesirable for the CBSA because it would not provide adequate line of sight for their officers, require the installation of a Closed Circuit Television system, and require additional security measures along the access road which would parallel Rue Saint François.

An analysis of Alternative 3 identified a potential improvement for this alternative consisting of the addition of curvature to both end of the bridge as it passes over the CNR and MNR tracks. The modification would allow for a more desirable orientation approaching both POEs and improved line of sight for border security personnel.

Following detailed evaluation and review the modified Alternative 3 was identified as the preferred alternative. Considering the conceptual nature of the work and uncertainty surrounding the final layout of the Madawaska and Edmundston POEs, a 150-foot-wide corridor (extending 75 ft (22.9 m) left and right of the anticipated bridge centerline) was created (Exhibit 4.17) (Appendix E). The corridor illustrates the anticipated bridge alignment while recognizing that future coordination, design, and constructability assessments may necessitate minor changes to bridge skew, curvature, and location of abutments.

For Alternative 3, some property may need to be acquired to relocate the CBSA's storage building and provide sufficient access and areas for staging during construction. The need for property acquisition, and required acquisition of property, would follow NBDTI's standard processes. Further evaluation of property needs would occur during preliminary design.

Exhibit 4.17 - *Location for the Preferred Alternative*



No significant modifications to the rail infrastructure owned by CNR or MNR would be required. Significant coordination will be required during the design phase of the project regarding design details (e.g., the inclusion of crash walls at abutments and piers), track outages, and temporary access required for construction of the project.

4.2.2.4 Considerations for Future Bridge Evaluations

Conceptual bridge replacement options were developed and evaluated as part of the planning study to identify feasibility, appropriateness, and budget. This evaluation included assessments of geotechnical conditions, hydrology and hydraulics, bridge horizontal and vertical alignment, span configuration, foundation and substructure type, and superstructure type. Additionally, assessments of constructability and access were completed. For brevity, assessments specific to the preferred alignment are presented herein. Additional evaluations and refinement of these items is planned during preliminary design.

Geotechnical Conditions

Information consisting of surficial geology, previous geotechnical explorations, and original design drawings for the existing international bridge was reviewed (GZA GeoEnvironmental, 2009). Limited foundation analyses were completed as part of the planning-level screening of substructure and foundation options for the proposed bridge.

The surficial geology at the proposed bridge location mainly consists of alluvial flood plain deposits and lodge moraine deposits. The alluvial deposits are typically composed of fine sand found at or slightly below the surface, and silty sand with some minor organic material. The lodge moraine deposits are predominately composed of compact silt and clay till with sub-rounded pebbles; there are also boulders that could be found near the surface as well as exposed bedrock in some areas. Based on the geotechnical explorations completed along the top of the streambank in Madawaska, bedrock was encountered at elevations ranging from 408 to 530 ft (124 to 162 m), with an average top of bedrock elevation of approximately 413 ft (126 m) (GZA GeoEnvironmental, 2009).

Bedrock typically consisted of hard, fresh, aphanitic, gray Slate with rock quality designations (RQD) ranging from 0 to 78 percent, with an average of approximately 23 percent. Given the lack of existing subsurface information in the river channel in the vicinity of the proposed crossing, it has been assumed for the purposes of this assessment that the elevation of bedrock in the river channel is at an approximate average elevation of 413 ft (126 m). The existing river channel elevation ranges from roughly 440 ft (134 m) to 445 ft (136 m) (GZA GeoEnvironmental, 2009).

Hydrology and Hydraulics

Anecdotal information was received during the planning study indicating the highest contemporary flood water elevation on the Saint John River was caused by a heavy spring melt and minor ice jamming near the project area (Twin Rivers Paper Company, 2017). During this flood event, the water surface crested at an elevation above the outfall manhole for Twin Rivers Paper Company. The elevation of the outfall manhole cover is 467 ft (142 m). The low chord of the existing international bridge is at an approximate elevation of 500 ft (152 m).

Horizontal and Vertical Alignment and Layout

A conceptual horizontal and vertical alignment was prepared for the preferred alternative based on current AASHTO and MaineDOT guidance, and in accordance with the initial design criteria accepted by MaineDOT and NBDTI. A design speed of 25 mph was used with a WB-67 design vehicle.

The conceptual horizontal alignment was developed using curve radii that allowed the design truck turning movement to be fully contained within the proposed 12-foot (3.7 m)-wide lane. Turning movements were also generated at the Edmundston POE and determined that flared bridge ends will likely be required. Due to similar site constraints and facility needs, a flared bridge end may be required at the Madawaska LPOE. The layout of the Madawaska LPOE is undefined and therefore the location of the abutment will require coordination with GSA once the layout is established. GSA has indicated that the addition of a second southbound lane or additional tapering or widening of the bridge landing at the U.S. Government-owned property, to minimize queuing on the bridge, may be desirable to improve their LPOE operations.

The conceptual vertical alignment was developed to provide a minimum vertical clearance of 23 ft (7.0 m) over all rail lines with an assumed structure depth of 12 ft (3.7 m). A minimum bridge grade of one percent was used. The resulting profile places the low chord of the proposed bridge at, or above, the low chord of the existing bridge.

Bridge Span Configuration

Although variances in span lengths are anticipated to accommodate different structure types, two general configurations were selected for this conceptual evaluation. Four-span and five-span bridge configurations were evaluated in conjunction with the preferred alternative, both with an overall bridge length of 1,850 ft (563.9 m). The layout of the four-span configuration places all three piers in the river: two in U.S. waters and one in Canadian waters. The middle pier would be located near the center of the river. The interior and exterior span lengths for this configuration are 515 ft (157.0 m) and 410 ft (125.0 m) respectively. The layout of the five-span configuration places all piers in the river: two on each side of the international border. The interior and exterior span lengths for this configuration are 400 ft (121.9 m) and 325 ft (99.1 m) respectively.

For reference, the existing International Bridge includes three river piers.

A qualitative evaluation of each span configuration was completed to assess key criteria including future maintenance, cost, constructability, and potential for ice jamming. This evaluation determined the five-span configuration provided several notable benefits including reduced temporary works for construction access, smaller foundation elements, and improved constructability of the superstructure. A quantitative evaluation of span configuration will be required during preliminary design to assess the feasibility and cost-effectiveness of each option, and to assess potential effects on floodwater elevations and ice jam potential.

Foundations and Substructure

In support of conceptual evaluations and cost estimating, four foundation types were considered for the conceptual bridge alternatives: spread footings, driven piles, drilled shafts, and micropiles. These foundation types were assessed from a qualitative perspective regarding axial and lateral load carrying capacity, constructability, and cost.

Spread footing foundations are generally larger than pile/shaft supported foundations and may be required to be set at deeper elevations to satisfy scour conditions. Overall the use of a spread footing would require deeper, and more widespread excavation limits which would increase cofferdam size, concrete seal volume, and overall cost.

Driven piles were assessed for bridge pier foundations but a pile foundation would likely not achieve sufficient embedment to adequately resist lateral loads before encountering bedrock which would require socketing the foundation into bedrock. Micropiles provide high axial capacity, but resist very little lateral load. Due to their load characteristics, it does not appear the use of micropiles would provide an economic foundation solution to resist anticipated lateral loads.

Drilled shafts are well suited to a variety of soil conditions and have a very high axial and lateral load carrying capacity and are therefore the recommended pier foundation for use in future phases of design. Drilled shafts were selected based on the relatively shallow depth to bedrock beneath the river channel and the anticipated high lateral load demands placed on the bridge foundations.

Above the foundation level the piers are assumed to consist of a single rectangular pier shaft. An evaluation of precast pier segments should be considered as a means to reduce cost and accelerate construction.

For foundation consistency among substructure types, drilled shafts were assumed for each abutment location. However, driven pile or shallow foundations may be a feasible alternative for the abutments. Above the foundation level the abutments are assumed to consist of full height cantilever abutments.

Stub abutments supported by mechanically stabilized earth retaining walls were initially considered but were ultimately dismissed. Full height abutments were judged to provide better protection against railroad collision forces.

Superstructure Type

An initial planning-level screening of multiple superstructure types was completed to identify preferable superstructure types, including steel and prestressed concrete girders, segmental concrete, trusses, and tied arches. A qualitative assessment was completed considering project constraints including: construction cost and complexity, construction schedule, aesthetics and the natural surroundings, and long-term maintenance. For brevity, an assessment of each superstructure type specific to the preferred alignment is presented below.

- **Steel Plate Girders:** A non-prismatic steel plate girder option was developed and qualitatively evaluated as part of the planning study. Consideration was given to cross sections consisting of either four or five girders that would accommodate two lanes of traffic. The conceptual evaluation concluded a four-girder cross section was more cost effective and, considering the proposed bridge typical section, would also accommodate future deck replacement in two construction phases.

  Following the cross section evaluation, an assumed design was developed consisting of four non-prismatic weathering steel plate girders spaced at twelve feet (3.7 m) on center. Girder depths were assumed to range from approximately nine feet (2.7 m) at midspan to fourteen feet (4.3 m) at pier locations. Eight temporary shoring towers are assumed to be required during construction to accommodate temporary support and splicing of the girders, corresponding to a five-span configuration.

  Additional evaluation of a steel girder superstructure option is suggested as part of the preliminary design phase. A more detailed quantitative assessment should be completed to establish the optimal span configuration and girder depth considering factors such as material quantities, fabrication complexity, temporary shoring requirements, substructure cost, influence of bridge curvature, girder shipping lengths, construction schedule, and other critical factors. The use of tub girders at the bridge end spans, and potentially along the full bridge length, may also be considered to reduce shoring requirements over the railroads and to simplify erection.

- **Prestressed Concrete Girders:** Prestressed concrete girders were briefly considered but were dismissed. The required span lengths and the curved bridge geometry makes the use of conventional or spliced prestressed girders impractical.

- **Segmental Concrete:** Qualitative evaluations of both precast and cast-in-place, variable depth segmental concrete superstructure solutions were considered. Balanced cantilever construction was assumed for both options.

  Considering the significant access limitations present on site, and the varying segment depth and bridge curvature, the use of cast-in-place segments may be desirable. However, on-site construction for a cast-in-place option is estimated to take approximately one year longer than a comparable segmental concrete bridge constructed using precast segments. In addition, the form travelers required for cast-in-place construction will reduce vertical clearance over the railroad during construction. Therefore, it may be necessary to raise the bridge profile above what is necessary in the final condition.

  More detailed evaluations of both precast and cast-in-place segmental concrete solutions is suggested as part of the preliminary design phase. A quantitative assessment should be completed to establish the optimal span configuration and structure depth considering factors such as material quantities, fabrication complexity, temporary shoring requirements, substructure cost, bridge curvature, segment and/or material delivery, construction duration and overall constructability.

- **Trusses:** Consideration was given to the use of a "gussetless truss" design, similar to the design used on the Portsmouth Memorial Bridge linking Portsmouth, New Hampshire and Kittery, Maine. This structure type can cost-effectively achieve long spans. However, the curvature included in the preferred alignment, combined with the construction

staging and shoring necessary to erect the trusses, presents a series of technical challenges. Consideration of a truss superstructure should be removed from future evaluations.

- **Tied Arches:** A structural solution including tied arch main spans with steel plate or tub girder back spans was briefly considered. The benefits and challenges of tied arches were judged to be similar to a truss superstructure. However, the use of tied arches is expected to be more cost effective than trusses. Consideration of a tied-arch superstructure should be removed from future evaluations.

Constructability and Access

The proposed bridge location is heavily constrained by existing transportation infrastructure and buildings, steep terrain, and the Saint John River. Limited space is available at each end of the bridge to accommodate construction access and laydown. Temporary or permanent property rights will be required to provide contractors with adequate space for access and laydown. Additionally, an off-site staging yard will likely be required.

Water depths in the Saint John River are most likely not sufficient to support barge construction. Therefore, the construction of temporary trestles or rock roads extending from both the U.S and Canadian shorelines is assumed. In Edmundston, permission from CNR will be required to cross the existing active rail yard. In Madawaska, a temporary access road from Bridge Avenue to the river level could be built along the existing riverbank. Constructing the road from roughly the existing LPOE, to the river level at the new bridge location, would provide more reasonable grades. Access rights from MNR may be required. Coordination with Twin Rivers Paper Company will be required to minimize impacts to their day-to-day operations.

Construction of the new International Bridge and Madawaska LPOE is expected to occur with the existing border crossing open to traffic. Short closures of the existing bridge may be necessary during critical construction activities and to make the final connections between the proposed bridge and the existing Edmundston POE.

4.2.3 Alternatives Briefly Mentioned and Dismissed without Further Development and Consideration

Other alternatives for replacing the International Bridge and Madawaska LPOE have been considered, over time, and dismissed.

4.2.3.1 Other Alternatives Considered for the Madawaska Land Port of Entry

During the development of the 2007 *Final EIS on the Madawaska Border Station*, three alternatives – known as A, B, and C – were considered for replacing the Madawaska LPOE. Each of these alternatives relied upon the existing International Bridge for cross-border travel or the rehabilitation or replacement of the International Bridge in its present location.

Alternative A

Alternative A consisted of demolishing the existing Madawaska LPOE building, building new ones on the existing site, and expanding them in an attempt to meet CBP's required space standards

and increased security requirements. This alternative located the LPOE between the Twin Rivers Paper Company and the Saint John River, straddling the MNR tracks.

Alternative A was not considered further because the LPOE building and site layout were not ideal, on-site traffic circulation was cumbersome, and security, while improved over existing conditions, would not fully meet the CBP's requirements. Additionally, Alternative A would likely have resulted in substantial disruption to operations of the Twin Rivers Paper Company and the MNR. Due to the many problems associated with this alternative and because other alternatives existed with substantially less adverse impact, Alternative A was dismissed from further consideration.

Alternative B

Alternative B consisted of demolishing the existing LPOE building and constructing a new LPOE immediately south of the MNR tracks within Bridge Avenue and on property owned by the Twin Rivers Paper Company along Bridge Avenue and Mill Street.

Alternative B was not considered further because the LPOE building and site layout were not ideal, on-site traffic circulation was cumbersome, and security, while improved over existing conditions, would not fully meet the CBP's requirements. Additionally, this alternative would likely have resulted in substantial disruption to operations of Twin Rivers Paper Company. Due to the many problems associated with this alternative and because other alternatives exist with substantially less adverse impact, Alternative B was dismissed from further consideration.

Alternative C

Alternative C consisted of demolishing the existing LPOE building and constructing a new one along the MNR tracks, Bridge Avenue, and a portion of the Twin Rivers Paper Company parking areas adjacent to Mill Street.

Alternative C was not considered further because the site layout was not ideal, on-site traffic circulation was cumbersome, and security, while improved over existing conditions, would not fully meet the CBP's requirements. Additionally, this alternative would likely have resulted in substantial disruption to operations of Twin Rivers Paper Company. Due to the many problems associated with this alternative and because other alternatives existed with less adverse impact, Alternative C was dismissed from further consideration.

Madawaska Port of Entry over a Portion of the Saint John River

The GSA considered an alternative at the site of the existing LPOE that consisted of a raised platform extending over a portion of the Saint John River and a shorter International Bridge. The new LPOE would be sited on the platform integral with the shorter bridge and extend above the existing LPOE.

This alternative had many distinct disadvantages compared to other alternatives:

- It provided limited space for the LPOE. The maximum platform size that could be feasibly erected without major impact on the river or crossing the international boundary is less than 2.5 acres (10,117.1 m^2), which is far below the CBP's minimum operational requirements. It would have very limited space for on-site parking, traffic circulation, maintenance and delivery on site, and emergency vehicle access.
- It would require additional piers in the Saint John River, contributing to additional ice jamming.
- Snow removal would have been difficult and costly.
- It would have very high initial construction, operating, and life cycle costs.
- It would have required property from the Twin Rivers Paper Company and railroad.
- It would require shutdown of the existing LPOE, requiring the construction and operation of temporary facilities.

This alternative was dismissed due to the substantial concerns regarding overall viability, complexity of design and overall logistics including operation and maintenance, significant hydrologic and other environmental impacts, and high costs.

Tunnel

A tunnel under the Saint John River connecting the Edmundston POE to the proposed site of the Madawaska LPOE was suggested but not conceptually developed. The concept of the construction of a tunnel connecting the POEs was dismissed due to significant environmental impacts, complexity of design and construction, and prohibitive costs.

Relocation of CBSA Facility to Canadian National Rail Yard

An alternative which uses the property occupied by CNR's rail yard approximately 0.5 mi (0.8 km) upstream from the existing International Bridge was suggested but not conceptually developed. Relocating the Edmundston POE to the rail yard would allow for construction of a shorter bridge. However, this option was dismissed from further consideration because it would require PSPC and CBSA to fund and construct a new POE, and because the time and cost required to relocate the existing CNR yard would be prohibitive.

4.3 Other Considerations

4.3.1 Utilities

A license was issued to Fraser Companies Limited (currently Twin Rivers Paper Company) in 1925 by the government of Canada to install utility lines on the existing International Bridge. The license has been updated several times, adding an agreement with the State of Maine, and allows the (now) Twin Rivers Paper Company to own and operate several utility lines, attached to the existing International Bridge. The license agreement states that the utility lines can occupy space on the structure, however, installation, maintenance, and removal costs would be the sole responsibility of the Twin Rivers Paper Company (GOC, 1925).

The International Bridge currently supports: four utility lines, two 24-inch (61.0 centimeters [cm]), one 18-inch (45.7 cm), and one 16-inch (40.6 cm) diameter, on the downstream side of the bridge, and one 12-inch (30.5 cm) diameter utility line as well as a 10-inch by 10-inch wooden duct bank on the upstream side of the bridge. Only the two 24-inch (61.0 cm) diameter utility lines are believed to be operational. Therefore, the relocation of only these two lines is assumed to be required.

The options for relocating the two 24-inch (61.0 cm) bridge-mounted utility lines are:

- Conversion of existing bridge to a utility structure to be owned by Twin Rivers Paper Company,
- Relocation to the downstream utility bridge owned by Twin Rivers Paper Company,
- Directional drilling new utilities under the river,
- Direct burial of new utilities under the river, and
- Relocation to the new International Bridge (HNTB, 2018).

Conversion of the Existing Bridge to a Utility-only Structure

This relocation approach leaves the utilities in their existing location. Upon completion of the new International Bridge, ownership of the existing bridge would be transferred to the Twin Rivers Paper Company. The Twin Rivers Paper Company would become responsible for future bridge inspection, maintenance, operations, and bridge removal costs (HNTB, 2018).

A significant investment would be needed to convert the existing bridge into an acceptable utility-only structure. Both the CBP and the CBSA would require that the existing bridge deck be completely removed at one end of the bridge or otherwise rendered impassable to prevent its use as a bridge. Moreover, neither agency has resources available to cover the cost of required security upgrades including cameras, gates, access control, and security monitoring (HNTB, 2018).

Additional concerns include how snow removal operations would impact the Edmundston POE, potential confusion for users unfamiliar with the crossing, and potential conflicts between the existing bridge and the proposed replacement bridge at the Edmundston POE (HNTB, 2018).

The NBDTI has expressed concerns that allowing the existing bridge to remain would increase the possibility of ice jamming in the river. There is no way to effectively mitigate this concern because it is derived from the proximity, location, and number of piers in the river for the existing and replacement bridges (HNTB, 2018).

Given the significant uncertainty regarding the required bridge modifications and security improvements required for this option, a conceptual cost was not developed.

Relocation to the Existing Utility Bridge

Twin Rivers Paper Company owns and maintains a utility crossing located approximately 900 ft (274.3 m) downstream of the existing International Bridge. Relocation would require installation

of a utility trench of approximately 750 ft (228.6 m) from the bridge abutment at the Madawaska LPOE to the pipeline bridge. The two utility lines would be supported by the pipeline bridge across the river. An additional 50 ft (15.2 m) of utility trench is assumed on the Canadian side to match into the existing line location. (HNTB, 2018).

This option decouples the utilities from the bridge replacement and allows increased flexibility in timing of the relocation. Furthermore, relocating the existing utility lines to the pipeline bridge does not have the concerns associated with conversion of the existing bridge. However, the existing utility bridge was not designed to carry these utility lines and would likely require strengthening to safely carry the utilities. The cost excluding required strengthening is estimated to be approximately $3 million (HNTB, 2018).

Directional Drilling

Directional drilling is a steerable trenchless construction method that allows the installation of pipes or conduits without disturbing the surrounding area. The method uses a drilling rig to install the conduit or pipe in a shallow arc and is used when traditional excavation is not feasible or cost effective. One advantage of this option is that the utilities are no longer impacted by replacement of the bridge or bridge maintenance (HNTB, 2018).

Directional drilling was investigated for relocation of the existing bridge-mounted utilities under the river and adjacent railroad tracks. The cost of this option was determined to be the most expensive of the relocation options. Additionally, there are technical issues that are difficult to fully evaluate at this stage which result in a significant contingency cost for this alternative. The cost to perform directional drilling for large pipes on the order of 12-inch (30.5 cm) diameter is approximately $1,000 per linear foot (0.35 m) per pipe, which does not include mobilization costs and site preparation for construction. While not all pipes on the bridge are of this size, it is commonly the maximum size that most contractors can perform. To provide an equivalent flow for the existing pipes on the bridge, Twin Rivers Paper Company would need approximately eight 12-inch (30.5 cm) diameter pipes. Overall, the estimated cost for this alternative is $17 million (HNTB, 2018).

Direct Burial

This option entails the excavation of a trench parallel to the existing bridge and placing the existing utilities into the utility trench. This option decouples the utilities from the bridge and minimizes the operational impact to Twin Rivers Paper Company. The trench could be constructed using conventional excavation for the entire length except for the portions where the lines must cross the railroad tracks on both the U.S. and the Canadian sides of the river. In those locations, some other method would be required, such as directional drilling, to avoid an outage for an extended period of time (HNTB, 2018).

However, there are several complications with direct burial. First, if directional drilling under the railroad tracks is used, it would be expensive to mobilize the drilling rig to locations on both river banks. Additionally, the steep slopes on both sides of the river make access, construction,

and installation of the utility lines difficult. Furthermore, the restrictions typically required by railroads to prevent fouling the tracks and the difficult access due to the steep embankment slopes would complicate future maintenance activities that may be required. The estimated cost of this relocation option could be as high as $7 million (HNTB, 2018).

Relocation to the New International Bridge

Under this relocation option, the utilities would be moved from the existing bridge to the proposed bridge. This option may require the installation of a utility trench of approximately 1,500 ft (457.2 m) from the existing bridge abutment at the Madawaska LPOE to the proposed abutment depending on the final location of these utilities on the Twin Rivers Paper Company property (HNTB, 2018).

This option requires the utility relocation to occur after construction of the proposed superstructure is complete and prior to the demolition of the existing bridge; close coordination during design and construction would be required. Furthermore, by remaining on the bridge, Twin Rivers Paper Company would potentially be affected by bridge maintenance activities and the final selection of superstructure type. The cost of this option is estimated to be $6 million (HNTB, 2018).

Conclusion

Based on evaluation of the relocation alternatives, the two relocation alternatives that appear to be the most feasible are relocation of the utility lines to the existing downstream utility bridge ($3 million) and relocation to the proposed new bridge ($6 million). The remaining three options present significant challenges with respect to cost, constructability, security, and long-term maintenance and operations.

Coordination with Twin Rivers Paper Company during preliminary design would be required to understand the preferred option and to refine accommodations that may be required on the new International Bridge.

The relocation of utilities to the new bridge may or may not be possible. Relocating the utilities may require a Presidential Permit from the U.S. Department of State.

4.3.2 City of Edmundston Truck Route Option Study

In 2013, the City of Edmundston commissioned a study of the high volumes of truck traffic in the downtown area associated with the International Bridge crossing and the routes used by truck traffic. The study focused on seven intersections in downtown Edmundston and included review of past studies, the collection of 24-hour traffic data, review of major intersections, and estimation of truck destinations. In-depth analyses were performed for each of the seven intersections and several potential solutions were explored (exp Services, 2013).

The ultimate goal of the study was to develop an alternate connection between Route 2/chemin Canada and Route 120/Rue Saint François and remove as much truck traffic as possible from the downtown area, increasing the level of safety and livability, as well as decreasing congestion.

The range of potential solutions was constricted by steep grades within the study area. Roadways with grades exceeding six percent can cause operational and safety issues for trucks, especially during winter weather (exp Services, 2013).

Four new truck routes were explored: one medium-term option and three long-term bypass routes.

The medium-term option consisted of upgrading several streets in the downtown area and diverting trucks away from the downtown core. It was estimated that this improvement option would divert up to 49 percent of truck traffic; however, this alternative would not remove truck traffic from downtown completely. The upgrades would have significant impacts to businesses, residences, and parking garages, and, due to steep slopes in the area, would still include grades exceeding six percent. The estimated cost for this improvement option was $740,000, not including property acquisition. (exp Services, 2013).

The three bypass routes investigated by the study were located to the west of the downtown area of Edmundston. Each of these alternatives has a similar impact on diverting truck volumes from downtown. Based on the truck traffic counts completed as part of the study, it was estimated that approximately 30 percent of total truck traffic would be removed from the downtown area. Truck traffic associated with the Twin Rivers Paper Company mill or originating or destined to the east would still pass through the downtown area. The truck bypass routes investigated in the study would be less attractive than the existing downtown routes due to the large vertical grades on each of the potential bypass routes. Cost estimates for the three bypass routes ranged from $9.3 million to $21.8 million.

The results of the study suggested that none of the options investigated would be preferable to the existing truck routes, though one bypass corridor alignment (identified as Corridor Route 1 – Alternative D), with further refinement, would potentially be an acceptable solution.

In 2016, the City of Edmundston commissioned further investigation of the Corridor Route 1 – Alternative D. The investigation resulted in two potential alternatives: one with a maximum grade of six percent and a probable cost of $39.3 million and a second with a maximum grade of nine percent with a probable cost of $24.8 million (exp Services, 2016). NBDTI representatives met with the City of Edmundston on January 29, 2018 to discuss the truck bypass route. NBDTI committed to consider the potential for a truck bypass for future funding.

4.3.3 Final Disposition of the Existing International Bridge

The MaineDOT and NBDTI have stated they would not support maintaining the existing bridge in their respective bridge inventories; the agencies cited concerns regarding the deteriorated condition of the structure and the significant long-term maintenance and operation costs of operating the bridge (BBIX, et al., 2017).

The MaineDOT and NBDTI recognize the Twin Rivers Paper Company owns and operates several significant utilities on the existing bridge (see Section 4.3.1). To minimize impacts to these facilities, the MaineDOT and NBDTI would consider closing the bridge to the public and transferring ownership of the bridge, as well as all responsibility for future maintenance, operations, and demolition, to the Twin Rivers Paper Company. However, the feasibility of any such agreement would be subject to a thorough technical review, acceptance by U.S. and Canadian border agencies, and the negotiation of final terms and conditions.

A limited investigation into maintaining the existing bridge was completed. The investigation identified potential conflicts between the existing bridge and a new bridge at the Edmundston POE; resolving these conflicts may necessitate removing the existing bridge. In addition, adding a new bridge in the downtown business zone will increase the number of piers in the river which will increase the potential for ice jams on the Saint John River. These items, and potentially others, would require detailed review and resolution if the existing bridge is to remain.

The CBSA and CBP have no plans to operate or maintain staff presence at the existing bridge if a new bridge is built. Both agencies note an agreement to maintain the existing bridge would be subject to their review and approval; approval would require the installation of security devices such as gates, fences, and surveillance and monitoring devices. The cost to install these devices and for subsequent monitoring will likely be the responsibility of others (BBIX, et al., 2017).

It is the preference of MaineDOT, NBDTI, CBSA, GSA, and CBP to demolish the bridge if a new crossing is built (BBIX, et al., 2017).

5.0 COORDINATION AND OUTREACH

Throughout the preparation of the feasibility and planning study, MaineDOT, GSA, CBP, NBDTI, PSPC, and the CBSA coordinated with federal, provincial, state, and local agencies, the First Nations, stakeholders in the City of Edmundston and Town of Madawaska, and the public.

5.1 Federal, Provincial, and State Agencies

5.1.1 Canada

5.1.1.1 Federal

- Transport Canada
- Canadian Environmental Assessment Agency (CEAA)
- Global Affairs Canada

5.1.1.2 Provincial

- Intergovernmental Affairs (IGA)
- Executive Council Office
- Department of Environment and Local Government
- Aboriginal Affairs Secretariat
- Opportunities New Brunswick

5.1.2 United States

The U.S. Government requires several permits potentially necessary for work on the Madawaska/Edmundston International Bridge and Border Crossing to commence. The U.S. Department of State (DOS) was contacted to determine the requirements and the necessity for a Presidential Permit for the new International Bridge and to assist with potentially relocating utilities. Other federal agencies will need to be contacted in the future, such as the U.S. Army Corps of Engineers or the U.S. Coast Guard, regarding permits for work on the International Bridge, but no other agencies have been identified at this time.

At the state level, MaineDOT is leading the *Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study*. Regionally, no organizations with interest in the project have been identified.

5.1.2.1 Federal

U. S. Department of State

The Secretary of State has the authority to receive applications for and to issue Presidential Permits for land border crossing facilities and states, in part, that:

> "...the proper conduct of the foreign relations of the United States requires that executive permission be obtained for the construction and maintenance at the

> borders of the United States of facilities connecting the United States with a foreign country" (DOS, 2018).

This authority applies to all new border crossings and to all substantial modifications of existing crossings at the international border. Working with other agencies, the DOS determines whether a proposed border crossing project is in the U.S. national interest. The DOS coordinates closely with concerned state and local agencies, consults with tribes, and invites public comment in arriving at this determination (DOS, 2018).

In support of the feasibility and planning study and advancing the rehabilitation or replacement of the International Bridge, MaineDOT coordinated with the DOS to clarify 1) the need for a Presidential Permit from the DOS under the International Bridge Act and 2) the extent to which the DOS should be involved in the process of developing and reviewing agreements between the State of Maine and the Province of New Brunswick and the timing for involvement.

The DOS is considering the information presented and a response is pending.

5.1.2.2 State

According to the Maine Historic Preservation Commission, "there will be no archaeological properties affected by the proposed undertaking" and no further investigation is required (MHPC, 2018).

Coordination with the Maine Department of Economic and Community Development is ongoing.

5.1.3 First Nations

The Madawaska Maliseet First Nations (MMFN) community is in Northern New Brunswick, a few kilometers from the Edmundston central business district. The MMFN, is one of six First Nations communities with a long history along the Saint John River and its major tributaries. At one time, Maliseet First Nations occupied land that extended the entire reach of the Saint John River, extending into Maine, and even to the St. Lawrence River (GOC, et al., 2016).

The MMFN community has a population of 151 on-reserve and 223 off-reserve. Workforce occupation is identified as a mix of manufacturing, retail, health services, business, and other services. The reserve lands occupy approximately 343 hectares of land with commercial development, Grey Rock Power Centre, located adjacent to NB Route 2, TransCanada Highway. The Governance of MMFN is in accordance with the First Nations Election Act with the selection of a Chief and Councilors to represent the community (GOC, et al., 2016).

In the past, the MMFN and the City of Edmundston had limited levels of cooperation on regional economic development. However, recently these communities have collaborated and developed communication plans to promote economic development in the region as the Gateway Community to Atlantic Canada. In October of 2014, the communities held a workshop to define

joint community economic development priorities, which resulted in the signing of a Friendship Accord at a special ceremony (CEDI, 2016).

As part of the consultation process for the *Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study,* a letter was drafted and sent from the NBDTI to all six Maliseet First Nations, including MMFN. This letter advised of the need for the project and offered to meet and discuss any concerns or questions that the First Nations may have. The six Maliseet First Nations include Madawaska, Tobique, Woodstock, Kingsclear, St. Mary's, and Oromocto (CEDI, 2016).

5.2 Initial Stakeholder Consultations

Following the development of an understanding of the purpose for the project and why it is needed and prior to developing a range of conceptual alternatives in response, the federal, provincial, and state agencies performing the study contacted others with jurisdiction or an interest in the study to identify concerns and potential issues to be considered during the process of conceptually identify, developing, and screening alternatives. Those contacted were:

- The City of Edmundston;
- The Edmundston Chamber of Commerce;
- The Downtown Edmundston Group;
- Canadian National Railways;
- The Town of Madawaska;
- Twin Rivers Paper Company; and
- Maine Northern Railways.

5.2.1 City of Edmundston

The City of Edmundston (the City) provided the following comments:

- The International Crossing is the key connection point connecting the communities of the Town and the City and their downtown areas.
- If the International Crossing is relocated, it should be as close to the downtown area of the two communities as possible.
- The City is concerned with truck traffic downtown and the geometry entering the Edmundston LPOE. The City has been considering a bypass of the western part of the city to alleviate this traffic.
- A recent inter-modal transportation study noted that other modes of transportation (i.e., pedestrians, snowmobiles, and trains) should be considered in the development and evaluation of alternatives.

5.2.2 City of Edmundston Chamber of Commerce

The City Chamber of Commerce (the "Chamber") provided the following comments:

- The Chamber supports the rehabilitation or replacement of the International Crossing.
- It prefers siting the International Crossing in the downtown area, as it is a key economic link to the City and the Town and for the businesses in the region.
- If the International Crossing is relocated, the Chamber would prefer it is sited close enough to maintain a downtown-to-downtown connection: a bridge in the vicinity of Verret/St. Hilaire (west of existing site) more than a bridge in the vicinity of St. Basille (south-east).
- Similar to the City's comments, the Chamber noted that truck traffic is an issue in the City (issues with street deterioration), and it supports the City truck-bypass.
- The Chamber suggested a second bridge for truck traffic only.
- Similar to the City, the Chamber noted growing interest in the area for snowmobile and ATV transportation and preferred the International Crossing accommodates those modes of transportation in the planning effort.

5.2.3 Downtown Edmundston Group

The Downtown Edmunston Group (the "Downtown Group") is a local interest group in the City. The Downtown Group had the following comments:

- Similar to the City and the Chamber, the Downtown Group considers the International Crossing a key economic link to the City and the Town and for the businesses in the region which rely heavily on traffic for customers.
- The Downtown Group also agreed that truck traffic is an issue downtown, and would prefer the existing International Bridge and its approaches, are rehabilitated/redesigned for better truck movement, but maintain the downtown economic link.
- If the International Crossing is relocated, the Downtown Group would prefer it is sited close enough to maintain a downtown-to-downtown connection to the west of the existing location.
- The Downtown Group suggested an inter-modal facility to the west.

5.2.4 Canadian National Railway

CNR provided the following comments:

- CNR stated it would provide more specific comments as the International Bridge's location alternatives are narrowed.
- A new International Crossing should avoid adversely impacting its rail yard to the west and all its rail lines in the area.
- Piers should be designed to be protected from derailment impact.
- A new International Bridge will need to adhere to vertical clearance requirements.

- A new International Bridge will need to ensure there are no issues with snow removal or other debris falling onto the rail lines.

5.2.5 Town of Madawaska

The Town of Madawaska (the Town) provided the following comments:

- A new International Crossing is desired by the public.
- There is a perception that the International Bridge is unsafe.
- The geometry and capacity of the bridge and both LPOEs are substandard.
- The existing bridge and Madawaska LPOE are unattractive.
- There are consistently long wait times and queues in both directions**.
- Maintaining a downtown International Crossing is critical to the wellbeing of the Town and City of Edmundston.
- Snowmobile accommodations are desired at the International Crossing
- Flood elevations of the Saint John River are well below the International Bridge.

5.2.6 Twin Rivers Paper Company

The Twin Rivers Paper Company (Twin Rivers) is the major employer in the area, and maintains operations in the Town and the City of Edmundston. Twin Rivers' property and facilities in the Town are bisected by Bridge Street and the existing Madawaska LPOE. Twin Rivers provided the following comments:

- Overall, Twin Rivers is concerned that any change to the existing International Bridge or Madawaska LPOE might adversely impact its operations.
  - » Twin Rivers estimates that daily operations are worth approximately $1 million dollars with thin margins. Shipments, by both truck and rail, are made on a constant basis, 24 hours a day, seven days a week, 365 days a year.
  - » Twin Rivers owns and maintains four utility lines connected to the existing International Bridge, and prefers to retain them as-is where-is. It has no funds to relocate these utility lines. For more details on these utilities, see **Section 4.3.1 Utilities**.
  - » Nearly all rail lines and spur lines on and around its property are active. Disruption to activity on those lines during construction and/or operation of a new [larger] International Crossing downtown would be very costly.
  - » Regardless of which alternative is chosen, If downtown, vibrations during construction and/or operation of a new [larger] International Crossing may adversely affect the alignment of Twin Rivers' equipment.
  - » Regardless of which alternative is chosen, Twin Rivers would prefer the existing International Crossing remain open during rehabilitation/relocation/construction.

** The CBP strenuously disputes the opinion of the Town.

- In discussing potential alternatives, Twin Rivers provided the following comments:
  - » Rehabilitating the existing International Bridge is its preferred alternative, as that would cause the least disruption to its operations[***].
  - » If the new International Crossing is to be relocated, Twin Rivers would prefer it be relocated outside of the downtown areas the Town of Madawaska and City of Edmundston as the current queues for vehicles are an operational issue. However, Twin Rivers at the same time, prefers that the existing International Bridge also remains as a utility-only structure.
  - » The new International Bridge should not land on, and the new Madawaska LPOE should not be sited on, property owned by USA and located southwest of Twin Rivers' facility. Siting the International Crossing at this location would adversely impact its operations. Twin Rivers strongly prefers to continue its operations on the USA Property rather than continue these operations at another location *(Note: In 2011, after the publication of GSA's NEPA EIS and ROD and in furtherance of that project, USA acquired approximately 8 acres of land from Twin Rivers (f/k/a Fraser Papers) (the "USA Property"). The USA Property is delineated in red in* ***Exhibits 4.5 through 4.9****. Since USA's land acquisition, Twin Rivers has continued to operate on the USA Property under a GSA-issued License Agreement).*
  - » Siting the International Crossing at the USA Property would alter the flow of traffic in the area, which may adversely impact its operations.
- There are additional buried utility lines throughout its Twin Rivers' property and the surrounding area, some of which are not mapped.

5.2.7 Maine Northern Railways

MNR is the sole operator on the rail lines south of the Saint John River. MNR provided the following comments:

- Two trains per day operate through the Town, with additional local shuttling operations occurring daily between the buildings on Twin Rivers property .
- MNR has plans for approximately $5.5 million in track and related improvements between 2017 and 2020, including the rail yard on and around Twin Rivers property.
- A new International Crossing will need to maintain the horizontal and vertical clearances required by the American Railway Engineering and Maintenance-of-Way Association.
- There are currently no plans to expand the railroad.

5.3 Public Outreach

Two public information sessions were held during the preparation of the feasibility and planning study. Each public information session consisted of two events: one in the City of Edmundston and one in the Town of Madawaska. At each session and event, the same material was presented.

*** The CBP strenuously disputes the opinion of Twin Rivers.

5.3.1 Public Information Session Number One

On June 28, 2017, public information sessions for the *Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study* were held to consult with and obtain input from the public prior to developing conceptual alternatives that satisfied the project's purpose and need. The agencies represented at these meetings were the NBDTI, PSPC, CBSA, MaineDOT, GSA, and CBP.

Two separate sessions were held: one in the City of Edmundston which was attended by about 50 people and one in the Town of Madawaska which was attended by about 40 people. The sessions were presented in an open house format with displays and handouts; comment forms were available for people to submit more formal comments for consideration. Representatives from the agencies present answered questions and gathered input to help facilitate the process of identifying, developing, and screening conceptual alternatives.

The display boards and handouts were provided in both English and French and covered topics such as:

- Welcome to the Meeting;
- Purposes of this Information Session;
- Purpose and Need for the Project;
- Basic Facts about the Project;
- Regional Context Map;
- Existing Conditions Map;
- Typical Project Timeline; and
- Staying Informed.

Suggestions and comments received during the information sessions were to be addressed in the feasibility and planning study; they primarily consisted of the following:

- The replacement of the International Bridge and Madawaska LPOE is critical for the survival of Northern Maine;
- Many attendees stated the International Bridge and border crossing should be kept downtown; an equal number of attendees suggested it be moved out of downtown, either upstream or downstream;
- The Madawaska LPOE is severely outdated and a modern LPOE is needed as soon as reasonably possible;
- The International Bridge should be designed with multiple lanes in each direction to accommodate future growth in traffic;
- The International Bridge should be designed with oversized lanes to accommodate commercial traffic;

- The International Bridge should be designed to accommodate ATVs and snowmobiles;
- The existing International Bridge should be kept and used for pedestrians and, during daylight, for passenger vehicles; and
- Noise and light pollution should be minimized where possible.

5.3.2 Public Information Session Number Two

Following the identification, development, and screening of conceptual alternatives, a second set of public information sessions was held on January 31, 2018. The meetings were held to present the general findings of the *Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study* as well as the preferred option. The agencies represented at these meetings were: the NBDTI, PSPC, CBSA, MaineDOT, GSA, and CBP.

The session in the City of Edmundston was attended by about 90 people and the one in the Town of Madawaska was attended by about 95 people. The sessions were broken into two parts, one was an open house format with displays and handouts, while the other part consisted of a slide presentation; comment forms were available for people to submit more formal comments for consideration. Representatives from the agencies present answered questions and gathered input to help facilitate the study.

Suggestions and comments received during the information sessions primarily consisted of the following:

- Concerns regarding the safety of the existing International Bridge due to the posting of the five ton weight limit.
- Requests for more communication from the project team.
- Concerns for Edmundston POE being difficult for turn movements by large trucks.
- Questions about how the public can express concerns and provide feedback.
- Requests for architectural features on the new proposed bridge as it would be a landmark bridge in the Saint John River Valley.
- Requests for a observation/rest area on the new bridge.
- Requests for a bridge that allows for scenic viewing of the Saint John River Valley and the two communities.
- Concerns over the longer bridge and accessibility for pedestrians during cold weather.
- Concerns over traffic congestion, traffic controls, and new patterns around the new Madawaska LPOE.
- Requests for snowmobile access to the new International Bridge.
- Concerns regarding the location of the Edmundston POE and future truck traffic.
- Suggestions to move the POE to the CNR yard.

- General support for the preferred option that was presented.

5.3.3 Other

A study-specific website – http://maine.gov/mdot/planning/studies/meib/ – was developed early in the process and updated as materials were developed. In addition to materials about the study, the website provided an opportunity to submit comments directly to those agencies preparing the study.

6.0 SUMMARY OF PERMITS AND APPROVALS REQUIRED FOR THE PREFERRED ALTERNATIVE

The ability to efficiently prepare and submit complete applications for required permits and approvals and, in return, receive timely permits and approvals is a critical activity during project development.

To help identify permits and approvals that may be required in support of the preferred alternative, the project team prepared a master list of permits and approvals potentially required (Appendix F). To help inform and raise awareness of the requirements of specific permits and approvals, the master list of permits and approvals potentially required includes the suggested phase of project development to submit them, predecessor activities, anticipated review and processing times following submission of a complete application, and comments that may help improve coordination and overall efficiencies.

This master list of permits and approvals potentially required for the preferred alternative should only be viewed as a starting point, and it is suggested that this list be periodically reviewed and updated throughout project development and shared between the project sponsors.

7.0 ESTIMATE OF PROBABLE COSTS

Initial planning-level construction cost estimates were developed for each alternative following the preparation of conceptual plans for the 12 alternatives (Exhibits 4.5 - 4.16). Each construction cost estimate included costs related to replacement and/or modification of the existing Madawaska and Edmundston POE facilities, bridge demolition, and the construction of approach roadways, retaining walls, viaducts, and the new international bridge.

Construction costs for replacement or modification of the existing LPOE facilities were provided by GSA and CBP. Bridge construction costs were developed using square foot costs derived from other similarly large bridge projects in the region. Where appropriate, a premium was applied to the square foot costs to reflect the additional cost associated with a project spanning an international border and the difficult construction access present at most alternative locations.

After Alternatives 3 and 4.5 were identified for further analysis, updated bridge construction cost estimates were prepared based on the conceptual bridge type and span configuration identified for each alternative. Where practical, conceptual sizes were developed for major components to support the development of project quantities. Unit pricing was applied to generate project

estimates and a multiplier was added to account for items not quantified. The resulting bridge costs were compared to square foot costs of comparable projects to validate the reasonableness of the planning-level estimate.

All construction cost estimates have been prepared assuming a construction start date of 2020 and, therefore, project values are presented in 2020 dollars based on an annual inflation rate of 2 percent.

8.0 SCHEDULE

The Federal, State, and Provincial agencies are working to quickly advance the design and construction of this project. Under the current schedule the design for the new International Bridge will be completed in 2019 followed by the start of construction in 2020, pending the approval of permit applications in both countries. Constructing the new international bridge is expected to take approximately two years. This is an ambitious schedule and it would have the new bridge ready to open in 2022.

Construction of the LPOE will take several years. The construction of the LPOE will be timed so the new LPOE will be opened and become operational when the bridge is complete. Portions of the LPOE may remain under construction after the new facility opens.

Unless the existing International Bridge is to remain in place in some reduced form, removal of the existing bridge would occur after the new bridge is opened and would take up to an additional year to complete.

9.0 PRELIMINARY CONTRACTOR INFORMATION GUIDE

The construction of a new international bridge over a waterway can be a complex undertaking and requires great consideration and compliance with many laws, regulations, and rules associated with the movement of goods and people across the international border during construction.

To inform and raise awareness of these requirements and the complexities involved with the construction of this international project, a preliminary *Contractor Information Guide* was prepared (Appendix G). This *Guide* provides a general overview of some of the requirements associated with the movement of goods and people across the international border and sources for additional information that may help inform contractors when preparing to bid on this project. This *Guide* should only be viewed as a starting point for gathering information on the requirements associated with the movement of goods and people across the international border.

10.0 OTHER CONSIDERATIONS AND NEXT STEPS

To help maximize the efficiencies and effectiveness for all agencies during the preliminary design and environmental studies phase of project development and minimize the risk of not achieving the overall schedule, some high-level considerations were prepared. These considerations address facets of preliminary design, environmental studies and compliance, permit applications and other approvals, and communication and coordination.

10.1 Design

Completion of Baseline Data Collection. Additional coordination will be required early in preliminary design regarding the collection of any remaining baseline data for the project including ground survey, bathymetry, geotechnical, hydrology, natural resources, utility types and sizes, existing right-of-way, and traffic volumes.

Agreement on Bridge Types for Evaluation. Prior to beginning preliminary design additional coordination will be required between MaineDOT and NBDTI to build consensus regarding the structure types that will be advanced through preliminary design. In addition, agreement should be reached regarding the specific evaluation and selection criteria that will be used to select the preferred bridge alternative.

Establish Design Criteria. Following the selection of bridge types for evaluation, the design criteria developed for the study phase will be expanded to include criteria for Preliminary and Final Design. Coordination will be necessary to develop agreement on critical design criteria including general design approach, bridge design life, snowmobile accommodations (if any), roadway geometrics, seismic design, ice loading, hydraulics, evaluations of ice jamming, and critical clearances.

This effort will include evaluating applicable provisions from the U.S. and Canadian design codes to identify areas of similarity and divergence. The results of this effort will serve as the basis for identifying the specific design codes and/or provisions used for preliminary design.

Refinement of Bridge Alignment and Abutment Locations. Additional coordination will be required regarding the bridge alignment and abutment locations at both POEs. The project team recognizes that minor adjustments to the proposed bridge grades, curvature, and abutment locations may be proposed as part of preliminary design. However, the risk of major changes late in preliminary design can be reduced through early coordination with CBP and CBSA to reconfirm the preferred alignment shown herein is satisfactory from a port operations and security standpoint.

10.2 Environmental Studies and Compliance

Unsolicited Exchange of Analysis and Results. Throughout environmental analysis and the preparation of documentation, MaineDOT and NBDTI should consider sending unsolicited draft and final technical analysis and results to one another. Sending draft and final technical analysis and studies to one another serves many purposes:

- It serves as a communication tool to report progress;
- It helps to close gaps in terminology, requirements, and in general, "demystify" the others' project development process;
- When dealing with shared resources such as the Saint John River and potential transboundary issues, it provides data and results which may be useful to the other, thereby creating synergies and economies;

- If forwarded to others with jurisdiction over a resource, it can serve as a mechanism to build or maintain momentum.

Circulate Environmental Documents at the Same Time. When completing the environmental documents for the International Bridge, stakeholders and constituents may ask how the environmental studies will be documented, packaged, and distributed; although MaineDOT's and NBDTI's respective actions stop at the international border, many stakeholders will ask about documentation, packaging, and distribution being performed in the other country simply out of curiosity. Moreover, the National Environmental Policy Act (NEPA) requires the consideration of transboundary impacts. While MaineDOT and NBDTI will prepare separate documents to their own legislative requirements and quality standards, consider circulating the completed environmental documents at the same time for the following reasons:

- To synthesize the material together to present one holistic environmental document takes additional time and effort and potentially creates confusion among reviewers, precipitating additional comments from those with direct or indirect jurisdiction by law;
- Precedent exists for preparing and circulating border crossing studies separately, particularly where the international border is over a waterway;
- Preparing one study inhibits the ability and opportunity for other agencies (such as the U.S. Coast Guard) to adopt and apply MaineDOT's and NBDTI's results as their own;
- Circulating separate studies at the same time would help to address NEPA's requirements for the consideration of transboundary impacts.

10.3 Permit Applications and Approvals

Keep the DOS Well Informed. The International Bridge was authorized by the U.S. Congress in 1919. MaineDOT has contacted DOS to determine the requirements and the necessity for a Presidential Permit for the new International Bridge and to assist with potentially relocating utilities. A response from DOS is pending.

Regardless of whether a Presidential Permit is required, the DOS has jurisdiction and will have a keen interest in the proposed project as they must approve agreements between the two countries. Additionally, keeping the DOS well informed throughout project development and construction may provide potential benefit in the event their assistance is needed to secure timely assistance or minimize diplomatic concerns.

U.S. Coast Guard Bridge Permit. The U.S. Coast Guard will need to issue a bridge permit for the proposed project. Typically, the U.S. Coast Guard asks that copies of other permits be submitted with the bridge permit application, making it one of the last permits issued prior to advertisement for construction. To help ensure the U.S. Coast Guard can issue their bridge permit in a timely manner, consideration should be given to scheduling a pre-application conference with the U.S. Coast Guard. As one action item following the pre-application conference, consideration could be given to submitting the required 8.5-by-11 inch plans to accompany their public notice for initial review for completeness and acceptability well in advance of submitting the bridge permit application, as this item is often subject to rework.

10.4 Coordination and Communication

Periodic International Stakeholder Workshops throughout Project Development. The design charrette held in March 2017 greatly facilitated the advancement of the identification of conceptual alternatives in the feasibility study. To complement the monthly project team meetings, consider holding periodic international stakeholder workshops throughout the remainder of project development. These periodic international stakeholder workshops serve many purposes:

- They gather the right stakeholders at the right time in project development to close gaps in understanding and requirements, provide input, review completed tasks, make decisions, and plan short-term tasks to be performed;
- They promote agility, flexibility, and a spirit of cooperation to respond to changing conditions and issues;
- They create a way to get and keep stakeholders involved in the project development process and promote accountability for results in a friendly but professional setting;
- They encourage stakeholders to communicate and coordinate activities and work independently;
- They create a mechanism to encourage stakeholders to adopt the actions and results of others as their own, creating efficiencies within all agencies and promoting the consistency of the message;
- They inform stakeholders of the future activities before they occur, so stakeholders can anticipate and program their agency's involvement in future tasks and fulfill their roles, when needed, and as they determine appropriate;
- They help to prevent potential problems from occurring, maximizing efficiency; and
- They provide a simple mechanism to communicate with stakeholders and stay visible, in small doses, and keep them informed when they either can't participate in person or their participation isn't needed.

During each international stakeholder workshop, individual agencies' project development processes should be compared and examined to help engage attendees and identify critical path items and timelines for completion.

Throughout project development, the need for international stakeholder workshops will vary, but a recommended frequency would be approximately every six to nine months. The workshops would be programmed and planned well in advance to guarantee attendance and results. The responsibilities of hosting the meetings should alternate between MaineDOT and the NBDTI.

Peer Exchange. Other states and provinces are advancing international border crossing projects over waterways. Consideration could be given to taking advantage of others' experiences by periodically exchanging information in different ways and on a variety of topics.

11.0 PREPARERS

The *Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study* was prepared by many individuals within different agencies with support from the HNTB Corporation team under contract to MaineDOT.

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APPENDIX A

Preliminary Risk Register

Click on a column header to see a description of what should go into the cell - Hover over a column header for definitions related to entries.

Risk Register: -- TOP 25 RISKS: Madawaska Bridge Replacement - Feasibility and Planning Study

Project Manager: T. Cote
Project Executive: R. Lavallee

Risk Identification								Qualitative Baseline Assessment					Current Assessment					Response				Monitoring & Control	
No.	Name	Risk Group	Phase	Type	Description (Cause, Effect)	Risk Trigger	Internal Only	Probability of Occurrence	Impact to Cost	Impact to Schedule	On or near CP?	Rank	Probability of Occurrence	Impact to Cost	Impact to Schedule	On or near CP?	Rank	Owner	Approach	Response plan	Next Action Due By	Status	
1	Coordination between Agency Sponsors: Location	Organizational	Concept	Threat	Agency sponsors can't reach timely concensus on location for the Preferred Alternative	Meeting with Agencies	Yes	Moderate	Low	High	Yes	18	Moderate	Low	High	Yes	18						
2	Coordination between Agency Sponsors: Timing to Start Construction	Organizational	Concept	Threat	Agency sponsors can't reach timely concensus on the start of construction for the Preferred Alternative	Meeting with Agencies	Yes	Moderate	High	High	Yes	24	Moderate	High	High	Yes	24						
3	Coordination between Agency Sponsors: Funding Share & Agreement	Organizational	Concept	Threat	Agency sponsors can't reach timely concensus on individual share of cost of construction, operation, and maintenance of the Preferred Alternative	Meeting with Agencies	Yes	Moderate	High	High	Yes	24	Moderate	High	High	Yes	24						
4	Agency Sponsors: Funding	Organizational	Concept	Threat	Agency can't secure funding for the next phase or construction when needed	Meeting with Agencies	Yes	Moderate	High	High	Yes	24	Moderate	High	High	Yes	24						
5	MaineDOT: Funding Sources	Organizational	Concept	Threat	Use of federal funds for construction of the International Bridge	Meeting with Agencies	Yes	Low	High	High	Yes	16	Low	High	High	Yes	16						
6	Twin Rivers: Executive Staff Concerns	Technical	Concept	Threat	Avoid interruptions to operations	Meeting with Twin Rivers	No	Moderate	High	High	Yes	24	High	High	High	Yes	32						
7	Twin Rivers: Track Realignments	Technical	Concept	Threat	Realignment of the tracks adjacent to the buildings might not be possible.	Meeting with Twin Rivers	No	High	High	High	Yes	32	High	High	High	Yes	32						
8	NBDTI: Executive Staff	Organizational	Concept	Threat	Executves might want a greater voice/role in the direction of the findings/study.	Meeting with NBDTI	No	Moderate	Low	Moderate	No	15	Moderate	Low	Moderate	No	15						
9	GSA: Facility Location and Size	Technical	Concept	Threat	Location of the GSA facility might not be completely finalized. Size could increase due to CBP's new POR.	Meeting with GSA	No	Low	Low	Moderate	No	10	Low	Low	Moderate	No	10						
10	GSA: Internal Traffic Flows	Technical	Concept	Threat	The internal traffic flow could create a challenge for bridge touchdown solutions.	Meeting with GSA	No	Moderate	Moderate	Low	No	15	Moderate	Moderate	Low	No	15						
11	GSA: Line-of-Site Criteria	Technical	Concept	Threat	Providing line of sight between POE facilities could result in a longer bridge; may need to preliminarily investigate use of cameras and monitors to provide converage.	Meeting with GSA	No	Moderate	High	Low	No	18	Moderate	High	Low	No	18						
12	GSA: Grade Differentials	Technical	Concept	Threat	Differential grades throughout the site may cause additional site evaluations by GSA resulting in delays.	Meeting with GSA	No	Moderate	Low	High	No	18	Moderate	Low	High	No	18						
13	PSPC and CBSA: Funding and/or Land Takings	Processes	Concept	Threat	The need for land takings on the Canadian side can result in project delays.	Meeting with CSBA	No	Moderate	Low	High	No	18	Moderate	Low	High	No	18						
14	Railroads: Vertical Clearances	Technical	Concept	Threat	Vertical clearance requirements force a more expensive structure	Meeting with Pan Am and CN	No	Moderate	High	High	No	24	Moderate	High	High	No	24						
15	Railroads: Executive Decisions	Organizational	Concept	Threat	Executive decisions are untimely or stiffle relations.	Meeting with Pan Am and CN	No	Low	Moderate	High	No	14	Low	Moderate	High	No	14						
16	Railroads: Additional Concessions	Organizational	Concept	Threat	Additional tracks and concessions might be requested as trade-offs	Meeting with Pan Am and CN	No	Moderate	High	Low	No	18	Moderate	High	Low	No	18						
17	Permitting Agencies: Unknown Resources	Technical	Concept	Threat	Previously unknown resources (such as areas of plant species or native archeological sites) could be discovered.	Meeting with Agencies	No	Moderate	High	Low	No	18	Moderate	High	Low	No	18						
18	Town of Madawaska: Traffic Changes	Organizational	Concept	Threat	The Town might not accept the suggested traffic pattern for Bridge Street and Mill Street.	Meeting with the Town	No	Low	High	Moderate	No	14	Low	High	Moderate	No	14						
19	Town of Madawaska: Project Approval	Processes	Concept	Threat	The Town's site plan approval process could pose delays.	Meeting with the Town	No	Low	Low	High	No	12	Low	Low	High	No	12						
20	Site Parameters: Steep Riverbanks	Technical	Concept	Threat	Steep riverbanks could ultimately require ground strengthening.	Geotechnical evaluations	Yes	Moderate	High	Low	No	18	Moderate	High	Low	No	18						
21	Site Parameters: River velocities	Technical	Concept	Threat	River velocities and ice floes could require a longer bridge midspan.	Structural evaluations	Yes	Moderate	Moderate	Low	No	15	Moderate	Moderate	Low	No	15						
22	Site Parameters: Contaminated Soils	Technical	Concept	Threat	Clinker material from the railroads could increase the cost of ground work	Geotechnical evaluations	Yes	High	High	Low	No	24	High	High	Low	No	24						
23	Town of Madawaska and Edmunston: Public Opposition	Processes	Concept	Threat	Public opposition to the project could require additional attention on behalf of the study team	Meetings with the Towns	No	Very High	High	High	No	40	Very High	High	High	No	40						
24	First Nations: Project Opposition	Processes	Concept	Threat	First Nations might oppose the project if deemed adversely affected.	Meeting with First Nations	No	Very High	Moderate	High	No	35	Very High	Moderate	High	No	35						
25	City of Edmundston: Desire to Remove Truck Traffic from Downtown	Technical	Concept	Threat	Truck traffic evaluation might be needed as part of the project.	Meeting with NBDTI	No	Moderate	Low	Low	No	12	Moderate	Low	Low	No	12						

Rank Field
The Rank field calculates a value to be used in ranking the significance of a risk in terms of its potential impact to the project. The higher the ranking, the more significant the potential impact to the project.

Probability of Occurrance Values (P):
1 = Very Low
2 = Low
3 = Moderate
4 = High
5 = Very High

Impact to Cost Values (C):
1 = Very Low
2 = Low
3 = Moderate
4 = High
5 = Very High

Impact to Schedule Values (S):
1 = Very Low
2 = Low
3 = Moderate
4 = High
5 = Very High

Rank (R):
R = P x (C + S)

Lowest value possible = 2
Highest value possible = 50

APPENDIX B

Alternatives Comparison Matrix: Initial Alternative Identification, Screening & Cost Estimating

Madawaska - Edmundston International Bridge and Border Crossing Feasibility and Planning Study

Alternatives Comparison Matrix: Initial Alternative Identification, Screening & Cost Estimating

Features			Downtown Alternatives						Out of Town Alternatives[1]					
			Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8	Alternative 9	Alternative 10	Alternative 11	Alternative 12
Purpose & Need		Satisfies Purpose of the Study?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Alternative dismissed prior to detailed evaluation. The initial review of this alternative identified significant impacts to businesses, residences, and a cemetery in Edmundston.
		Satisfies Need of Project Sponsors?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Transportation	Bridge and Roadway	Total Length - feet [total (NB/ME)]	2,550 (550/2,000)	2,550 (600/1,950)	1,950 (1,000/950)	2,150 (1,450/700)	2,150 (1,450/700)	1,700 (650/1,050)	2,500 (1,200/1,300)	1,600 (800/800)	3,525 (2,425/1,100)	2,600 (1,775/825)	2,125 (700/1,425)	
		Roadway Length - feet [total (NB/ME)]	50 (50/0)	100 (100/0)	100 (100/0)	575 (575/0)	700 (700/0)	100 (100/0)	200 (200/0)	300 (0/300)	625 (25/600)	575 (575/0)	1,000 (0/1,000)	
		Viaduct Length - feet [total (NB/ME)]	1,500 (0/1,500)	1,450 (0/1,450)	0 (0/0)	0 (0/0)	0 (0/0)	450 (0/450)	900 (300/600)	0 (0/0)	1200 (1200/0)	500 (500/0)	0 (0/0)	
		Bridge Type	Truss	Plate Girder	Plate Girder	Plate Girder	Plate Girder	Plate Girder	Plate Girder	Plate Girder	Plate Girder	Plate Girder	Plate Girder	
		Bridge Length - feet [total (NB/ME)][9]	1,000 (500/500)	1,000 (500/500)	1,850 (900/950)	1,575 (875/700)	1,450 (750/700)	1150 (550/600)	1,400 (700/700)	1,300 (800/500)	1,700 (1200/500)	1525 (700/825)	1125 (700/425)	
		No. of Bridge Spans (excluding viaduct) [total (NB/ME)]	4 (2/2)	4 (2/2)	6 (3/3)	5 (3/2)	5 (3/2)	4 (2/2)	5 (3/2)	4 (2/2)	6 (4/2)	5 (2/3)	4 (2/2)	
		No. of Bridge Piers Within River	3	3	5	4	3	3	3	3	4	3	3	
		Bridge Service Life	30	75 to 100	75 to 100	75 to 100	75 to 100	75 to 100	75 to 100	75 to 100	75 to 100	75 to 100	75 to 100	
		Area of Retaining Walls - square feet [total (NB/ME)][5]	0	0	0	16,250 (16,250/0)	21,250 (21,250/0)	0	0	0	0	0	0	
		Impacts to Utilities[6]	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
	Railroads	Length of Track Reconstruction - feet [total (NB/ME)]	3,000 (3,000/0)	3,000 (3,000/0)	1,600 (1,600/0)	2,000 (0, 2,000)	2,000 (0, 2,000)	0	0	50 (0/50)	50 (0/50)	0	50 (0/50)	
		No. of Grade-Separated Crossings [total (NB/ME)]	2 (1/1)	2 (1/1)	2 (1/1)	2 (1/1)	2 (1/1)	2 (1/1)	2 (1/1)	1 (1/0)	1 (1/0)	2 (1/1)	1 (1/0)	
		No. of At-Grade Crossings [total (NB/ME)]	0	0	0	0	0	0	0	1 (0/1)	1 (0/1)	0	1 (0/1)	
	ROW	Area of Acquisitions- acres [total (NB/ME)]	1.5 (0/1.5)	2.5 (1.0/1.5)		3.1 (1.6/1.5)	3.4 (1.9/1.5)	9.0 (0.5/8.5)	45 (25/20)	45 (20/25)	90 (62/28)	87 (57/30)	54 (21/33)	
		No. of Parcels Impacted [total (NB/ME)]	2 (0/2)	4 (2/2)		13 (11/2)	16 (14/2)	55 (2/53)	7 (5/2)	14 (10/4)	5 (3/2)	4 (1/3)	16 (14/2)	
		No. of Residential Takings [total (NB/ME)]	0 (0/0)					48 (0/48)	4 (3/1)	5 (5/0)	0 (0/0)		5 (5/0)	
		No. of Business Takings [total (NB/ME)]	0 (0/0)			3 (3/0)	4 (4/0)	5 (0/5) - Rick's Burgers & Wings, Madawaska House of Pizza, Mr. Computer service and repair, Koiffure Unique Hair and Nails, and Dan the Tire Man	0 (0/0)	2 (0/2)	1 (0/1)	0 (0/0)		
	Traffic	Personal Vehicles												
		Commercial Vehicles												
		Bicyclists and Pedestrians	Bicyclists and pedestrians would benefit from an improved sidewalk on the bridge. Depending on their destination, bicyclists and pedestrians entering Madawaska may have a longer distance to travel.					Bicyclists and pedestrians would benefit from an improved sidewalk on the bridge.	Bicyclists and pedestrians would be severely impacted by the increased travel distance as the international bridge in the downtown portions of the City of Edmundston and Town of Madawaska would be removed. In most cases, the increase in travel distance would be prohibitive to both bicyclists and pedestrians.					
		Snowmobiles and ATVs												
Port of Entry	Edmundston	Size of Port/New Property to be Acquired - acres	Existing /1.0					Existing	15/25	15/17	15/62	16/57	15/17	
		Configuration	The Port of Entry would remain essentially unchanged; changes to some pavement, lighting, and signage may be required			The Port of Entry would remain essentially unchanged; changes to some pavement, lighting, and signage may be required A bridge over the CN railroad tracks and a raised roadway along the banks of the St. John River and to the west of the Port of Entry would be required. Additional property would need to be acquired for snow storage.		The Port of Entry would remain essentially unchanged; changes to some pavement, lighting, and signage may be required	The Port of Entry would be of sufficient size to function and have opportunities for further expansion, if needed.	The Port of Entry would be of sufficient size to function and have limited opportunities for further expansion, if needed.	The Port of Entry would be of sufficient size to function and have opportunities for further expansion, if needed.			
		Area of Retaining Walls - square feet	0	0	0	0	0	0	0	0	57,000	40,000	24,000	
	Madawaska	Size of Port/New Property to be Acquired - acres	9.0/1.5					10.5/10.5	15/20	15/25	15/28	15/30	15/33	
		Configuration	The Port of Entry would be of sufficient size to function and have limited opportunities for further expansion, if needed. A viaduct along the banks of the St. John River and over the railroad tracks to the west of the Twin Rivers Paper Company would be required to provide access to the Port of Entry. Snow removal from the viaduct is problematic and substantially increases the annual maintenance costs of the Port of Entry by approximately $500,000 per year		The Port of Entry would be of sufficient size to function and have limited opportunities for further expansion, if needed.				The Port of Entry would be of sufficient size to function and have opportunities for further expansion, if needed.	The Port of Entry would be of sufficient size to function and have limited opportunities for further expansion, if needed.	The Port of Entry would be of sufficient size to function and have opportunities for further expansion, if needed.			
		Area of Retaining Walls - square feet	22,000	22,000	22,000	22,000	22,000	13,000	0	0	0	8,000	27,000	

If the POEs are moved out of the downtown area, the existing bridge will be removed from service.

Madawaska - Edmundston International Bridge and Border Crossing Feasibility and Planning Study

Alternatives Comparison Matrix: Initial Alternative Identification, Screening & Cost Estimating

	Features	Downtown Alternatives						Out of Town Alternatives[1]					
		Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8	Alternative 9	Alternative 10	Alternative 11	Alternative 12
Social Environment	Community Cohesion and Connectivity	No change as an international bridge would remain in the downtown portions of the City of Edmundston and Town of Madawaska						The community cohesion and connectivity in the downtown portions of the City of Edmundston and Town of Madawaska would be severed as the existing international bridge would be removed and not replaced					Alternative dismissed prior to detailed evaluation. The initial review of this alternative identified significant impacts to businesses, residences, and a cemetery in Edmundston.
	Community Facilities and Services	No impact					Displace the Seventh Day Adventist Church in the Town of Madawaska	No impact					
	Employment	No change in employment in the City of Edmundston. A slight increase in employment may result in the Town of Madawaska as additional staff would be assigned to the Madawaska Port of Entry.					No change in employment in the City of Edmundston. The slight increase in employment that may result in the Town of Madawaska as additional staff would be assigned to the Madawaska Port of Entry would be offset by the displacement of businesses along the northern portion of Main Street - Rick's Burgers & Wings, Madawaska House of Pizza, Mr. Computer service and repair, Koiffure Unique Hair and Nails, and Dan the Tire Man.	No change in employment in the City of Edmundston. A slight increase in employment may result in the Town of Madawaska as additional staff would be assigned to the Madawaska Port of Entry			No change in employment in the City of Edmundston. A slight increase in employment may result in the Town of Madawaska as additional staff would be assigned to the Madawaska Port of Entry		
	Archaeological Resources	No known impact; research into the potential impact to archaeological resources to be performed after the selection of the preferred alternative						No known impact; research into the potential impact to archaeological resources to be performed after the selection of the preferred alternative					
	Historic Resources	Adverse effect to the International Bridge[2]						Adverse effect to the International Bridge[2]		Adverse effect to the International Bridge[3] Adverse effect to the Acadian Landing & Tante Blache Museum property listed on the National Register of Historic Places	Adverse effect to the International Bridge[2]		
	Cultural Heritage	No impact						No impact	Immediately adjacent to property owned by First Nations and operation of the Port of Entry could detract from current and future uses of the property	May impact festivals and other gatherings at the Acadian Landing	No impact		
	Impacts to Public Property	As the International Bridge is considered eligible for the National Register of Historic Places,[3] it is a feature with a public interest associated with it and its removal would result in an adverse impact						As the International Bridge is considered eligible for the National Register of Historic Places,[3] it is a feature with a public interest associated with it and its removal would result in an adverse impact		As the International Bridge is considered eligible for the National Register of Historic Places,[3] it is a feature with a public interest associated with it and construction of the Bridge and Port of Entry adjacent to it would be an adverse impact As the Acadian Landing & Tante Blache Museum property is listed on the National Register of Historic Places, it is a feature with a public interest associated with it and its removal would result in an adverse impact.	As the International Bridge is considered eligible for the National Register of Historic Places,[3] it is a feature with a public interest associated with it and its removal would result in an adverse impact		
	Aesthetics/Visual Impacts	The International Bridge would be removed and replaced with a modern bridge altering the aesthetic appearance of the downtown portions of the City of Edmundston and Town of Madawaska The residents along Vital Drive and the portion of Mill Street closest to Madawaska Port of Entry would have their view altered by the Port of Entry					The International Bridge would be removed and replaced with a modern bridge altering the aesthetic appearance of the downtown portions of the City of Edmundston and Town of Madawaska The residents to the south of Main Street in the Town of Madawaska would have their view altered by the Port of Entry	The International Bridge would be removed altering the aesthetic appearance of the downtown portions of the City of Edmundston and Town of Madawaska Construction would introduce a dominant feature to rural and large undeveloped area altering the views of the area for nearby residents					
	Business Impacts	Twin Rivers no longer be bisected by Bridge Ave and U.S. LPOE, could result in improved shipping operations for trucks and trains servicing Twin Rivers. Improved traffic flow across the border could result in improved economic development opportunities in the downtown area.	Dr. Gilles Pelletier Dentistry office Twin Rivers no longer be bisected by Bridge Ave and U.S. LPOE, could result in improved shipping operations for trucks and trains servicing Twin Rivers. Improved traffic flow across the border could result in improved economic development opportunities in the downtown area.		Twin Rivers no longer be bisected by Bridge Ave and U.S. LPOE, could result in improved shipping operations for trucks and trains servicing Twin Rivers. Improved traffic flow across the border could result in improved economic development opportunities in the downtown area.		Businesses along the northern portion of Main Street would be displaced - Rick's Burgers & Wings, Madawaska House of Pizza, Mr. Computer service and repair, Koiffure Unique Hair and Nails, and Dan the Tire Man. Bridge viaduct would bisect Twin Rivers Facililty and potentilaly limit the movement of material shipments.	Traffic would be diverted away from existing downtown businesses	Madawaska public works facility would be displaced Traffic would be diverted away from existing downtown businesses	Traffic would be diverted away from existing downtown businesses		

If the POEs are moved out of the downtown area, the existing bridge will be removed from service.

Madawaska - Edmundston International Bridge and Border Crossing Feasibility and Planning Study

Alternatives Comparison Matrix: Initial Alternative Identification, Screening & Cost Estimating

	Features	Downtown Alternatives						Out of Town Alternatives[1]					
		Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8	Alternative 9	Alternative 10	Alternative 11	Alternative 12
Natural Environment	Fish and Aquatic Habitat - acres [total (NB/ME)][2]	0.6 (0.3/0.3)		1.1 (0.5/0.6)	0.8 (0.4/0.4)		0.6 (0.3/0.3)	0.9 (0.5/0.4)	0.6 (0.4/0.2)	0.9 (0.5/0.4)	0.6 (0.3/0.3)		If the POEs are moved out of the downtown area, the existing bridge will be removed from service. Alternative dismissed prior to detailed evaluation. The initial review of this alternative identified significant impacts to businesses, residences, and a cemetery in Edmundston.
	Threatened and Endangered Species	A rare plant community - the bluebell-balsam ragwort - occurs on the bank of the St. John River in the downtown portion of the Town of Madawaska					No impact	No impact					
	Wildlife and Terrestrial Habitat - acres [total (NB/ME)]	4.1 (0.3/3.8)		2.3 (0.3/2)			0.2 (0.1/0.1)	23 (10/13)	16 (13/3)	16 (16/0)	16 (1.0/15)	10 (3/7)	
	Wetlands - acres [total (NB/ME)][2]	0 (0/0)						0 (0/0)	0.1 (0/0.1)	0 (0/0)	2.5 (0.5/2)	1 (0/1)	
	Hydraulics/Floodplain - acres [total (NB/ME)]	0.4 (0.1/0.3)		0.2 (0.1/0.1)				0 (0/0)	0.1 (0/0.1)	16 (16/0)	16.5 (16.5/0)	3 (0/3)	
	Noise	No perceptible change in noise is anticipated. Overall there may be a slight reduction in noise levels resulting from the improved throughput of vehicles through both Ports of Entry. The residents along Vital Drive and the portion of Mill Street closest to the Madawaska Port of Entry could experience a slight increase in noise levels					No perceptible change in noise is anticipated. Overall there may be a slight reduction in noise levels resulting from the improved throughput of vehicles through both Ports of Entry. The residents to the south of Main Street could experience a slight increase in noise levels.	Introduces new sources of noise from vehicles to rural portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to residential land uses or undeveloped					
	Lighting	Introduces additional lighting to the downtown portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to commercial and industrial land uses						Introduces new lighting to rural portions of the City of Edmundston and Town of Madawaska that are primarily dedicated to residential land uses or undeveloped					
	Air Quality	No perceptible change in air quality is anticipated. Potentially a slight improvement in localized air quality could result from the improved throughput of vehicles through both Ports of Entry						No perceptible change in air quality is anticipated. Potentially a slight decrease in localized air quality could result from the increase in the number of vehicles through both Ports of Entry					
Construction Cost[4]	Edmundston Port of Entry[6]	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$24,000,000	$24,000,000	$24,000,000	$24,000,000	$24,000,000	
	Madawaska Port of Entry	$69,200,000	$69,200,000	$69,200,000	$69,200,000	$69,200,000	$69,200,000	$90,000,000	$90,000,000	$90,000,000	$90,000,000	$90,000,000	
	Bridge Demolition	$0	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$4,000,000	$4,000,000	
	Approach Roadway[8]	$100,000	$200,000	$300,000	$1,100,000	$1,300,000	$200,000	$200,000	$300,000	$500,000	$500,000	$1,000,000	
	Viaduct Construction	$18,500,000	$18,500,000	$0	$0	$0	$7,100,000	$11,900,000	$3,200,000	$17,600,000	$6,600,000	$0	
	Bridge Construction[7]	$12,500,000	$17,500,000	$29,400,000	$30,300,000	$26,500,000	$21,500,000	$23,900,000	$17,700,000	$28,600,000	$25,900,000	$19,600,000	
	Total Cost	$100,800,000	$109,900,000	$103,400,000	$105,100,000	$101,500,000	$102,500,000	$154,000,000	$139,200,000	$164,700,000	$151,000,000	$138,600,000	
Schedule	Design Duration	1½ yrs	3 yrs	3 yrs	3 yrs	3 yrs	3 yrs	6 yrs	6 yrs	6 yrs	6 yrs	6 yrs	
	Construction Duration	1½ yrs	3 yrs	3 yrs	3 yrs	3 yrs	3 yrs	4 yrs	4 yrs	4 yrs	4 yrs	4 yrs	
	Total Project Duration	3 yrs	6 yrs	6 yrs	6 yrs	6 yrs	6 yrs	10 yrs	10 yrs	10 yrs	10 yrs	10 yrs	

Notes:

[1] Public Works and Government Services Canada has stated the existing Edmundston Port of Entry is adequate and they have no plans or desire to relocate it or maintain two Ports of Entry

[2] To receive a permit from the U.S. Army Corps of Engineers, among other criteria, the alternative must have the least impact to Waters of the United States; waters include wetlands

[3] According to the Maine Historic Preservation Commission, the International Bridge is considered eligible for listing on the National Register of Historic Places

[4] Excludes design engineering, construction inspection, right-of-way and permitting costs. Estimated construction values are in 2020 U.S. Dollars and assume construction starting in 2020.

[5] Excludes Retaining Walls that are required for raising grade at the LPOE facilities.

[6] Construction cost for building a new Edmundston Port of Entry out of downtown is based on a CBSA cost estimate of $30 million (Canadian dollars). This value has been adjusted to $24 million U.S. dollars based on an assumed exchange rate of $0.80 (CAD) per $1.00 (USD).

[7] Includes Railroad negotiations costs

[8] Includes Railroad costs for at-grade crossings

[9] Bridge length is primarily over water, Viaduct length is primarily over land.

APPENDIX C

First Iteration & Refinement of Alternatives

CONCEPTUAL ALTERNATIVES
OCTOBER 04, 2017

RUE ST FRANCOIS - ROUTE 120

ALT 4.5
R=300'
(31° SKEW)

ALT 4.5B
R=300'
(42° SKEW)

ALT 3B
R=3400'

ALT 3
(52° SKEW)

R=200'

ST. JOHN RIVER

PAROISSE DE MADAWASKA
STATE OF MAINE

120 0 120 240
Scale of Feet

Madawaska - Edmundston International Bridge and Border Crossing Feasibility and Planning Study

Alternatives Comparison Matrix: First Iteration & Refinement of Alternatives

Features			Alternative			
			Alternative 3	Alternative 3B	Alternative 4.5	Alternative 4.5B
Purpose & Need	Satisfies Purpose of the Study?		Yes	Yes	Yes	Yes
	Satisfies Need of Project Sponsors?		Yes	Yes	Yes	Yes
Transportation	Bridge and Roadway	Project Length - feet [total (NB/ME)]	1,950 (1,000/950)		2,250 (1,550/700)	
		Roadway Length - feet [total (NB/ME)]	100 (100/0)		800 (800/0)	
		Viaduct Length - feet [total (NB/ME)]	0 (0/0)		0 (0/0)	
		Bridge Type	Segmental Concrete	Segmental Concrete	Plate Girder	Plate Girder
		Bridge Length - feet [total (NB/ME)]	1,850 (900/950)	1875 (1075/800)	1,450 (750/700)	1600 (775/825)
		No. of Bridge Spans [total (NB/ME)]	4 (2/2)	4 (2/2)	7 (4/3)	7 (4/3)
		No. of Bridge Piers Within River	3	2	3	3
		Bridge Service Life	100	100	75 to 100	75 to 100
		Area of Retaining Walls - square feet [total (NB/ME)][5]	1,800 (1,800/0)	2,400 (2,400/0)	19,500 (19,500/0)	12,000 (12,000/0)
		Impacts to Utilities	Yes	Yes	Yes	YEs
	Railroads	Length of Track Reconstruction - feet [total (NB/ME)]	0 (0/0)	0 (0/0)	0 (0/0)	0 (0/0)
		No. of Grade-Separated Crossings [total (NB/ME)]	2 (1/1)	2 (1/1)	2 (1/1)	2 (1/1)
		No. of At-Grade Crossings [total (NB/ME)]	0 (0/0)	0 (0/0)	0 (0/0)	0 (0/0)
	ROW	Area of Acquisitions- acres [total (NB/ME)][9]	1.5 (0.6/0.9)		3.2 (2.5/0.7)	
		No. of Parcels Impacted [total (NB/ME)]	4 (2/2)		14 (12/2)	
		No. of Residential Takings [total (NB/ME)]	0 (0/0)		3 (3/0)	
		No. of Business Takings [total (NB/ME)]	0 (0/0)		1 (1/0)	
Port of Entry	Edmundston	Property to be Acquired or easement- acres	1.0	1.0	1.0	1.0
		Configuration	Without changes to the POE,the line of sight from Primary Inspection Lanes would be limited to appromately 100 feet The substantial reduction in line of sight would require the installation and operation of CCTV; using CCTV is the least preferred method of the CBSA to maintain line of sight Turning radii for trucks entering and exiting Canada may require flaring the bridge end to accommodate turning movements	Without changes to the POE,the line of sight from Primary Inspection Lanes would be limited to appromately 100 feet The substantial reduction in line of sight would require the installation and operation of CCTV; using CCTV is the least preferred method of the CBSA to maintain line of sight Turning radii for trucks entering and exiting Canada may require flaring the bridge end to accommodate turning movements	Without changes to the POE,the line of sight from Primary Inspection Lanes would be limited to appromately 100 feet The substantial reduction in line of sight would require the installation and operation of CCTV; using CCTV is the least preferred method of the CBSA to maintain line of sight Oversized shoulders would be required for snow storage; using oversized shoulders for snow storage reduces line of sight, even when using CCTV, and precludes use of the shoulder in case of vehicle breakdown Approach provides opportunity for passengers to throw objects from vehicles over security fencing	Without changes to the POE,the line of sight from Primary Inspection Lanes would be limited to appromately 100 feet The substantial reduction in line of sight would require the installation and operation of CCTV; using CCTV is the least preferred method of the CBSA to maintain line of sight Oversized shoulders would be required for snow storage; using oversized shoulders for snow storage reduces line of sight, even when using CCTV, and precludes use of the shoulder in case of vehicle breakdown Approach provides opportunity for passengers to throw objects from vehicles over security fencing
		Area of Retaining Walls - square feet	0	0	0	0
	Madawaska	Property to be Acquired or Easment- acres	1.5	1.5	1.5	1.5
		Configuration	Turning radii for trucks exiting the U.S. may require flaring the bridge end to accommodate turning movements. Angle of entry into the POE allows for a less orthagonal layout and less efficient use of space. Adding additional lanes to end fo bridge may be requierd to support LPOE operations.	Turning radii for trucks exiting the U.S. may require flaring the bridge end to accommodate turning movements. Adding additional lanes to end fo bridge may be requierd to support LPOE operations.	Turning radii for trucks exiting the U.S. may require flaring the bridge end to accommodate turning movements. Adding additional lanes to end fo bridge may be requierd to support LPOE operations.	Turning radii for trucks exiting the U.S. may require flaring the bridge end to accommodate turning movements. Adding additional lanes to end fo bridge may be requierd to support LPOE operations.
		Area of Retaining Walls - square feet	22,000	22,000	22,000	22,000
Construction + Right-of-Way Cost (US $)	Construction Cost[4]	Edmundston Port of Entry	$500,000	$500,000	$1,000,000	$1,000,000
		Madawaska Port of Entry	$69,200,000	$69,200,000	$69,200,000	$69,200,000
		Bridge Demolition	$4,000,000	$4,000,000	$4,000,000	$4,000,000
		Approach Roadway	$300,000	$300,000	$1,200,000	$700,000
		Retaining Wall Construction[5,6]	$200,000	$300,000	$1,500,000	$900,000
		Viaduct Construction	$0	$0	$0	$0
		Bridge Construction[7]	$44,800,000	$45,300,000	$29,800,000	$32,900,000
		Total Construction Cost	$119,000,000	$119,600,000	$106,700,000	$108,700,000
	Right-of-Way Cost[8]		$0	$0	$1,500,000	$1,000,000
	Total Construction + Right-of-Way Cost		$119,000,000	$119,600,000	$108,200,000	$109,700,000
Schedule	Design Duration		3 yrs	3 yrs	3 yrs	3 yrs
	Construction Duration		3 yrs	3 yrs	3 yrs	3 yrs
	Total Project Duration		6 yrs	6 yrs	6 yrs	6 yrs

Notes:

[4] Excludes design engineering, construction inspection, right-of-way and permitting costs. Estimated construction values are in 2020 U.S. Dollars and assume construction starting in 2020.

[5] Excludes Retaining Walls that are required for raising grade at the LPOE facilities.

[6] Retaining wall costs only include the area of walls required to support the bridge and roadway. The use of MSE retaining walls with a RR crash wall is assumed. A unit cost of $75/SF is assumed.

[7] Bridge square foot costs are $480/sf for plate girder structure and $566/sf for a segmental concrete structure

[8] Right-of-way costs are conceptual and only reflect costs for permanent property acquisitions on the Canadian side of the river.

[9] Area of ROW acquisition includes both fee simple acquisitions and easements for aerial rights (bridge over railroad). Additional ROW required for LPOEs not included.

APPENDIX D

Second Iteration & Refinement of Alternatives

CONCEPTUAL ALTERNATIVES
OCTOBER 04, 2017

RUE ST FRANCOIS - ROUTE 120

1500' Cone of Vision

ALT. 4.5

ALT. 3

ST. JOHN RIVER

PAROISSE DE MADAWASKA
STATE OF MAINE

LAND ACQUIRED
FOR US LPOE

120 0 120 240
Scale of Feet

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SIGNATURE

P.E. NUMBER

DATE

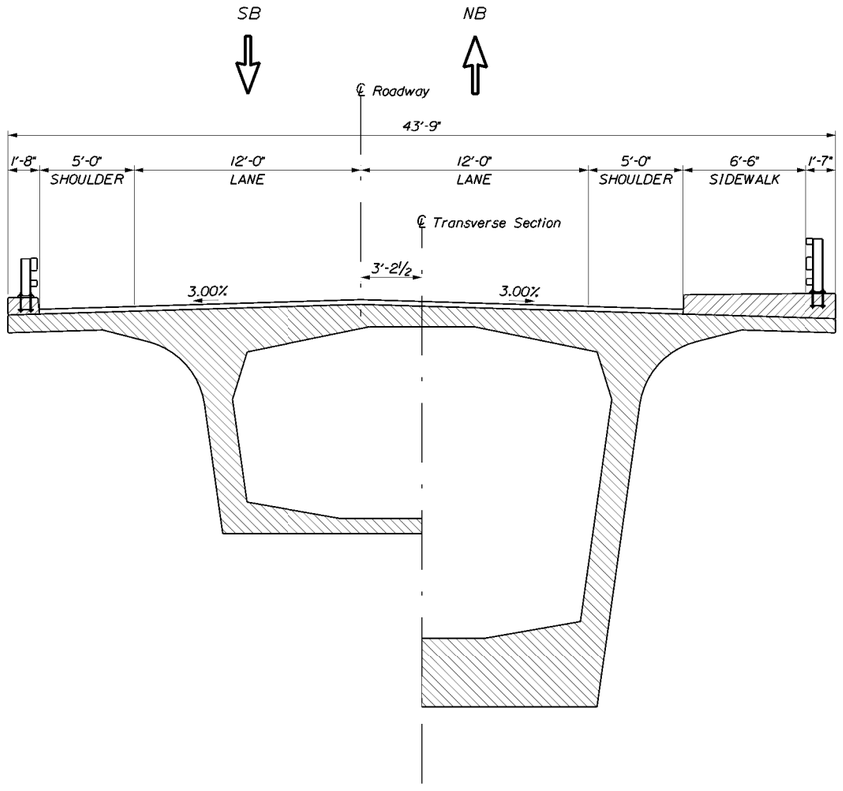
	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED		
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

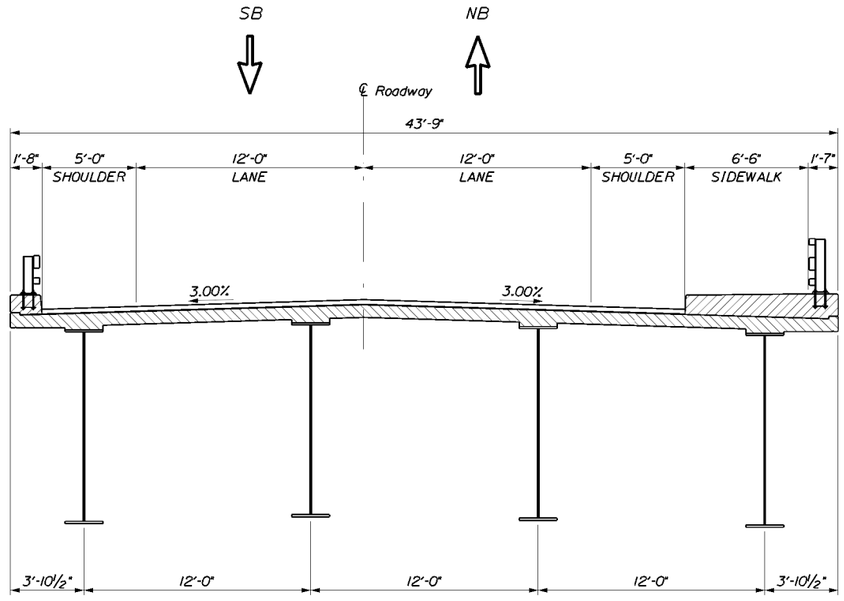
ALTERNATIVES 3 & 4.5

SHEET NUMBER
1
OF 13

CONCEPTUAL ALTERNATIVES
OCTOBER 04, 2017



Transverse Section
(Segmental Concrete)
Not to Scale



Transverse Section
(Steel Plate Girder)
Not to Scale

NOTES:

1. *Conceptual Segmental Concrete And Steel Plate Girder Superstructures Shown. Actual Superstructure Type Will Be Determined During Preliminary Design*

2. *Final Number of Girders and Girder Proportions Have Not Been Established. A Four Girder Cross Section Is Shown For Illustrative Purposes.*

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

	DATE	BY	P.M.
PROJ. MANAGER	-	-	
DESIGN-DETAILED	-	-	
CHECKED-REVIEWED	-	-	
DESIGN2-DETAILED2	-	-	
DESIGN3-DETAILED3	-	-	
REVISIONS 1	-	-	
REVISIONS 2	-	-	
REVISIONS 3	-	-	
REVISIONS 4	-	-	
FIELD CHANGES	-	-	

SIGNATURE

P.E. NUMBER

DATE

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

BRIDGE TYPICAL SECTIONS

SHEET NUMBER

2

OF 13

Filename: 002_Bridge_Typical.dgn Division: Username: Date:2/20/2018

CONCEPTUAL ALTERNATIVES
OCTOBER 04, 2017

RUE ST FRANCOIS - ROUTE 120

RETAINING WALL

R=200'

R=500'

315+00

310+00

305+00

300+00

BRIDGE
(SEGMENTAL CONCRETE
STRUCTURE ASSUMED
FOR SPAN LAYOUT)

52"

PIER (TYP.)

ST. JOHN RIVER

PAROISSE DE MADAWASKA
STATE OF MAINE

RETAINING WALL
WITHIN LPOE
SITE

LAND ACQUIRED
FOR US LPOE

MILL STREET

BRIDGE STREET

MAIN STREET - ROUTE 1

120 0 120 240
Scale of Feet

LEGEND:
BRIDGE
APPROACH
U.S. LPOE SITE
SECURITY FENCING

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SIGNATURE

P.E. NUMBER

DATE

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED		
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

ALTERNATIVE 3
CONCEPTUAL PLAN

SHEET NUMBER
3
OF 13

Date: 2/20/2018
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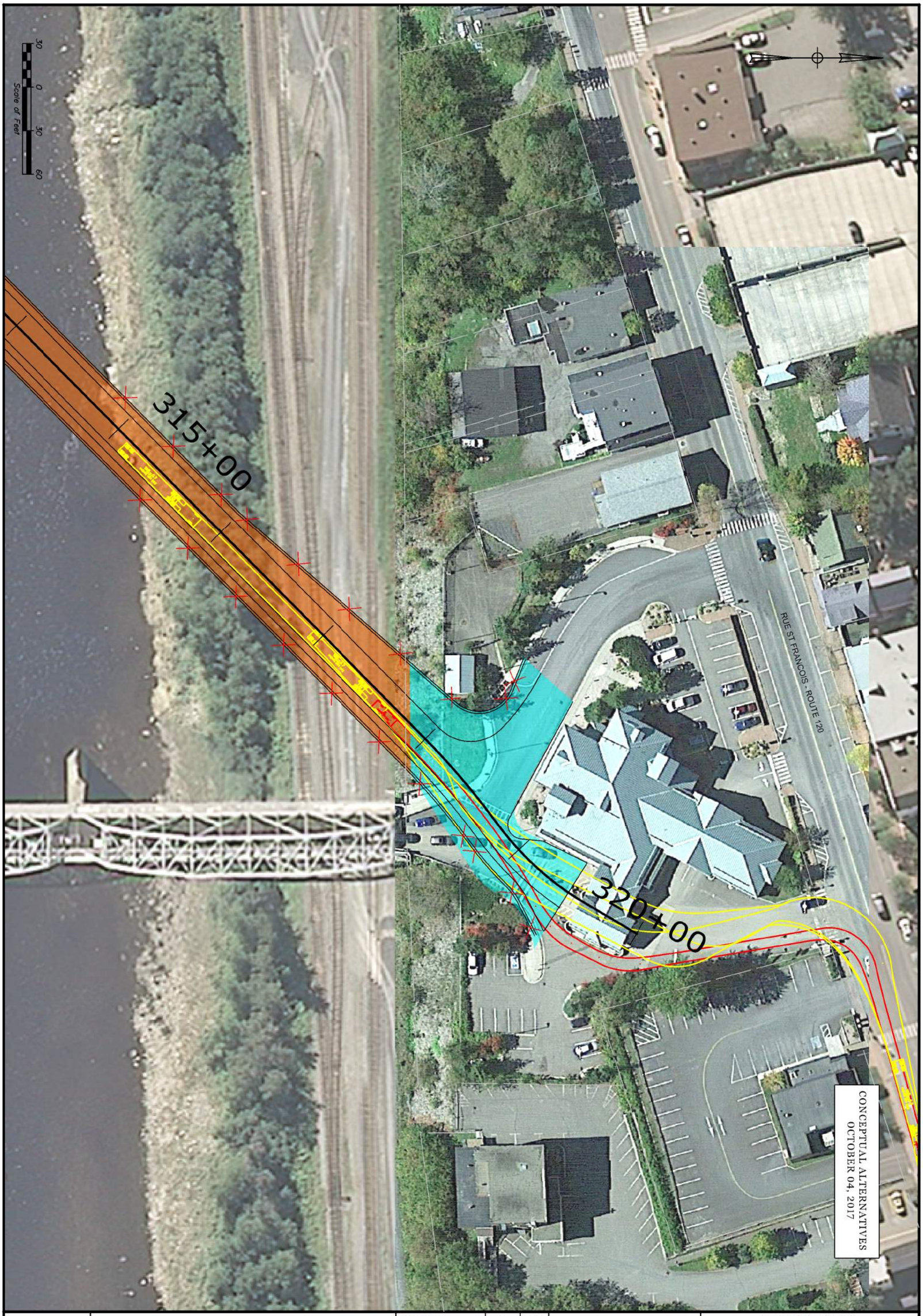
Division:
Filename: 003_ALT3A.dgn

Filename: 004_Alt 3A CAN Site.dgn Division: Username: Date:2/20/2018



SHEET NUMBER 4 OF 13

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

DESIGN VEHICLE WB 67
CONCEPTUAL ALTERNATIVE 3

		BY	DATE
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CHECKED-REVIEWED		-	-
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DESIGN3-DETAILED3	-	-	-
REVISIONS 1	-		-
REVISIONS 2	-		-
REVISIONS 3	-		-
REVISIONS 4	-		-
FIELD CHANGES	-		-

SIGNATURE

P.E. NUMBER

DATE

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

CONCEPTUAL ALTERNATIVES
OCTOBER 04, 2017

RUE ST FRANCOIS - ROUTE 120

30'

14'

CONSTRUCTION ACCESS

TEMPORARY CONCRETE BARRIER

CONSTRUCTION EQUIPMENT (TYP)

SHEET PILING

ABUTMENT & RETAINING WALLS

LIMITS OF PROPOSED
BRIDGE AND ROADWAY

LIMIT OF PHASE I
CONSTRUCTION

30 0 30 60
Scale of Feet

Date:2/20/2018

User name:

Division:

Filename: 005_Alt3ATCanada_TRC.dgn

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

	P.M.	BY	DATE
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CHECKED-REVIEWED	-	-	-
DESIGN2-DETAILED2	-	-	-
DESIGN3-DETAILED3	-	-	-
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REVISIONS 2	-	-	-
REVISIONS 3	-	-	-
REVISIONS 4	-	-	-
FIELD CHANGES	-	-	-

SIGNATURE

P.E. NUMBER

DATE

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

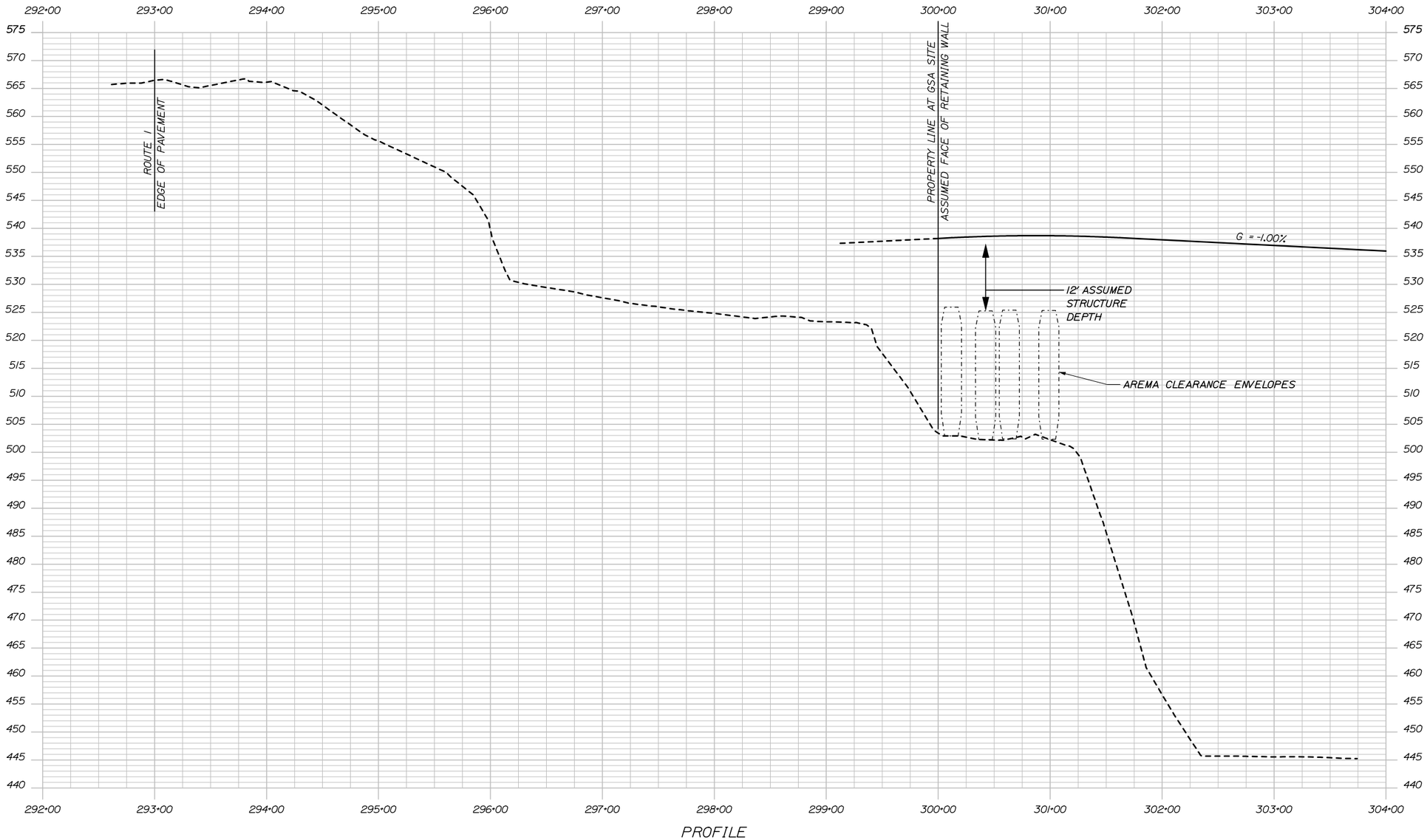
CONCEPTUAL ALTERNATIVES ALT 3 CONSTRUCTABILITY

SHEET NUMBER

5

OF 13

CONCEPTUAL ALTERNATIVES
OCTOBER 04, 2017



PROFILE

PROFILE

Horiz. 50 0 50 100

Vert. 10 0 10 20

Scale of Feet

Date:2/20/2018

Username:

Division:

Filename: profile.dgn

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

	RAL	BY	DATE
PROJ. MANAGER	-	-	-
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CHECKED-REVIEWED	-	-	-
DESIGN2-DETAILED2	-	-	-
DESIGN3-DETAILED3	-	-	-
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REVISIONS 2	-	-	-
REVISIONS 3	-	-	-
REVISIONS 4	-	-	-
FIELD CHANGES	-	-	-

SIGNATURE

P.E. NUMBER

DATE

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

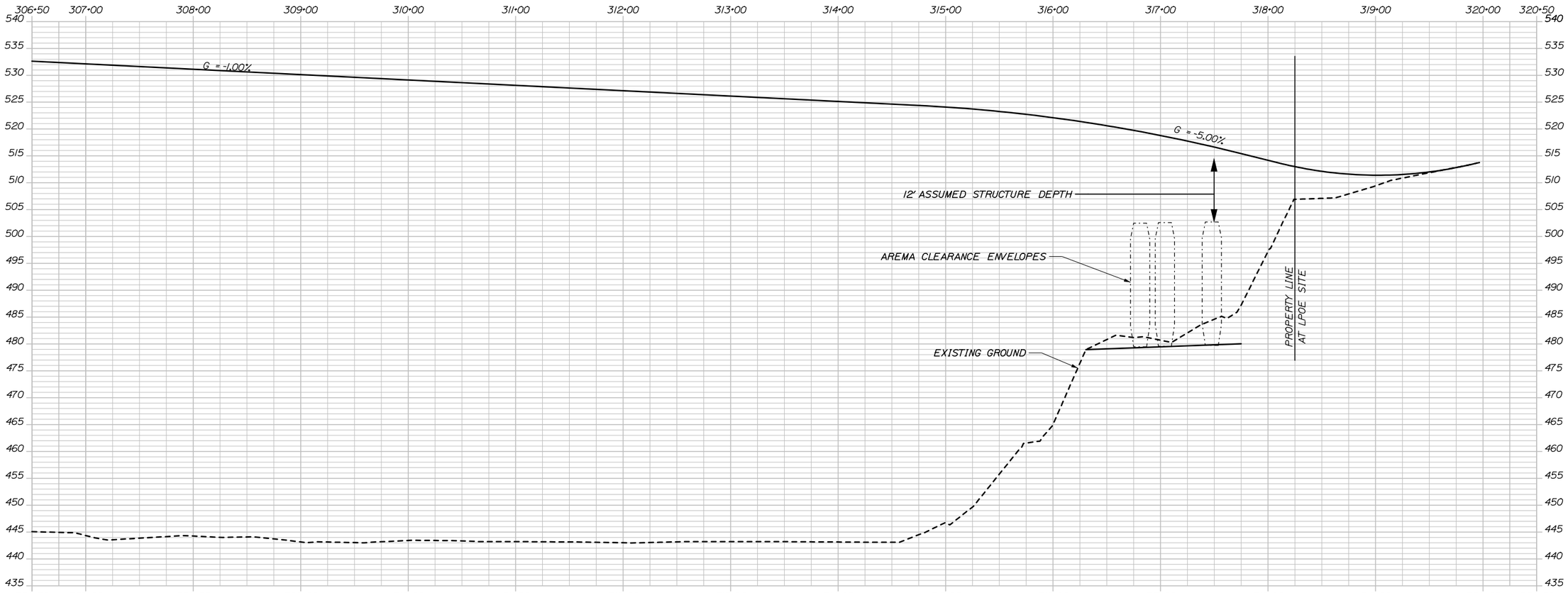
ALTERNATIVE 3
CONCEPTUAL PROFILE

SHEET NUMBER

6

OF 13

CONCEPTUAL ALTERNATIVES
OCTOBER 04, 2017



PROFILE

PROFILE

Horiz. 50 0 50 100

Vert. 10 0 10 20

Scale of Feet

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SIGNATURE

P.E. NUMBER

DATE

	RAL	BY	DATE
PROJ. MANAGER	-	-	-
DESIGN-DETAILED	-	-	-
CHECKED-REVIEWED	-	-	-
DESIGN2-DETAILED2	-	-	-
DESIGN3-DETAILED3	-	-	-
REVISIONS 1	-	-	-
REVISIONS 2	-	-	-
REVISIONS 3	-	-	-
REVISIONS 4	-	-	-
FIELD CHANGES	-	-	-

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

ALTERNATIVE 3
CONCEPTUAL PROFILE

SHEET NUMBER

7

OF 13

Date:2/20/2018

Username:

Division:

Filename: profile.dgn

CONCEPTUAL ALTERNATIVES
OCTOBER 04, 2017

POTENTIAL DOWNTOWN PARKING LOT

RUE ST FRANCOIS - ROUTE 120

465+00

WIDENED SHOULDER FOR SNOW STORAGE

RETAINING WALL

CONCRETE BARRIER

R=350'

R=200'

POTENTIAL SHED AND PARKING LOT RECONFIGURATION

460+00

BRIDGE (STEEL PLATE GIRDER ASSUMED FOR SPAN LAYOUT)

ST. JOHN RIVER

PAROISSE DE MADAWASKA
STATE OF MAINE

455+00

34'

PIER (TYP.)

RETAINING WALL WITHIN LPOE SITE

LAND ACQUIRED FOR US LPOE

MILL STREET

BRIDGE STREET

MAIN STREET - ROUTE 1

120 0 120 240
Scale of Feet

LEGEND:
BRIDGE
APPROACH
U.S. LPOE SITE
SECURITY FENCING

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SIGNATURE

P.E. NUMBER

DATE

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED		
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

ALTERNATIVE 4.5
CONCEPTUAL PLAN

SHEET NUMBER
8
OF 13

Date:2/20/2018
Username:
Division:
Filename: 008_ALT4.5A.dgn

Date:2/20/2018

User name:

Division:

Filename: 009_Alt 4.5A CAN Site.dgn

CONCEPTUAL ALTERNATIVES
OCTOBER 04, 2017

POTENTIAL DOWNTOWN PARKING LOT

RUE ST FRANCOIS - ROUTE 120

470+00

WIDENED SHOULDER FOR SNOW STORAGE

R=200'

POTENTIAL SHED AND PARKING LOT RECONFIGURATION

RETAINING WALL

CONCRETE BARRIER

30 0 30 60
Scale of Feet

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

	P.M.	BY	DATE
PROJ. MANAGER	-	-	-
DESIGN-DETAILED	-	-	-
CHECKED-REVIEWED	-	-	-
DESIGN2-DETAILED2	-	-	-
DESIGN3-DETAILED3	-	-	-
REVISIONS 1	-	-	-
REVISIONS 2	-	-	-
REVISIONS 3	-	-	-
REVISIONS 4	-	-	-
FIELD CHANGES	-	-	-

SIGNATURE

P.E. NUMBER

DATE

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

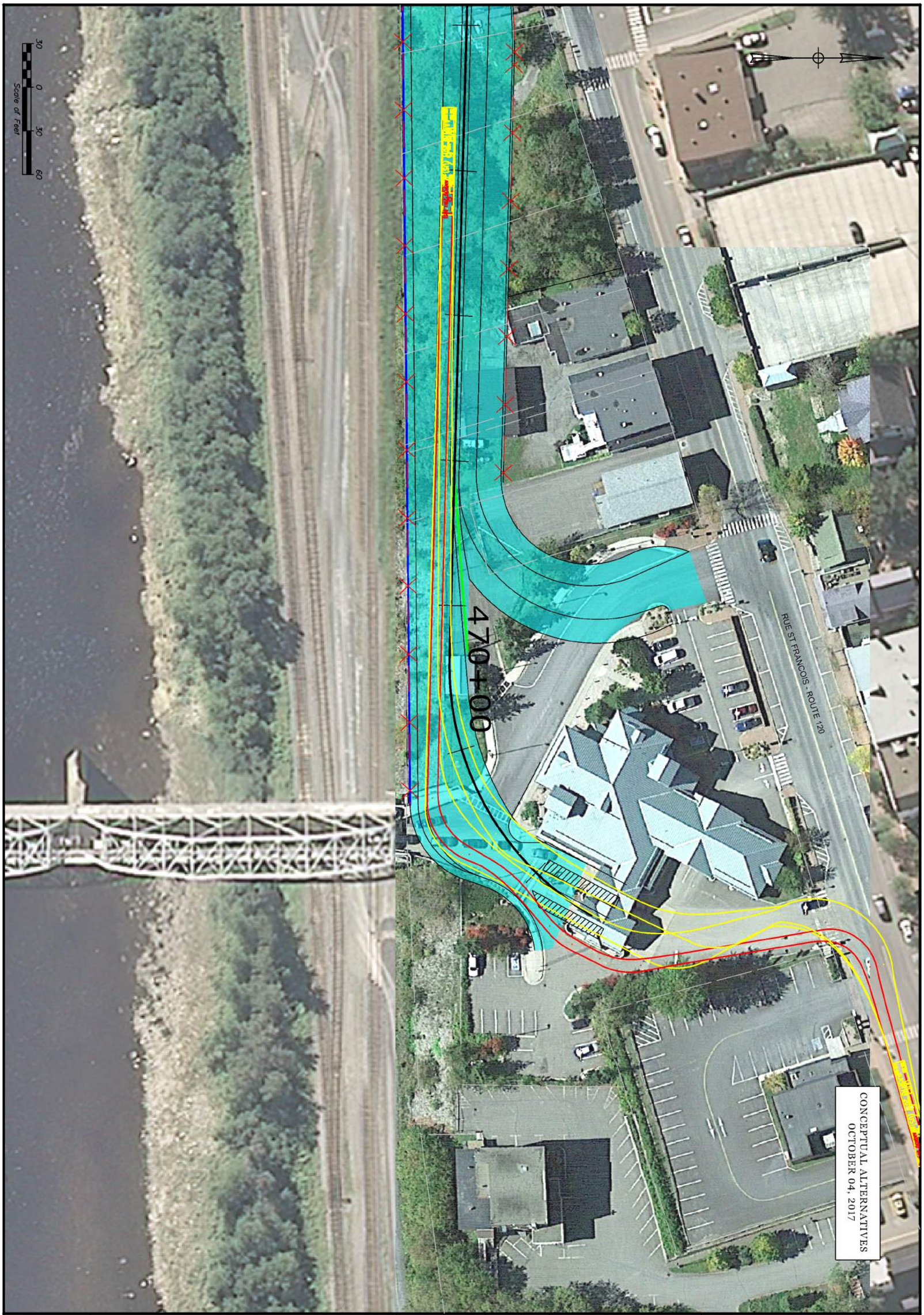
CONCEPTUAL ALTERNATIVES
ALTERNATIVE 4.5

SHEET NUMBER

9

OF 13

Filename: 010_Alt 4.5A CAN Site.dgn Division: Username: Date:2/20/2018



MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

DESIGN VEHICLE WB 67
CONCEPTUAL ALTERNATIVE 4.5

		BY	DATE
PROJ. MANAGER	RAL		
DESIGN-DETAILED	-	-	-
CHECKED-REVIEWED	-	-	-
DESIGN2-DETAILED2	-	-	-
DESIGN3-DETAILED3	-	-	-
REVISIONS 1	-		-
REVISIONS 2	-		-
REVISIONS 3	-		-
REVISIONS 4	-		-
FIELD CHANGES	-		-

SIGNATURE

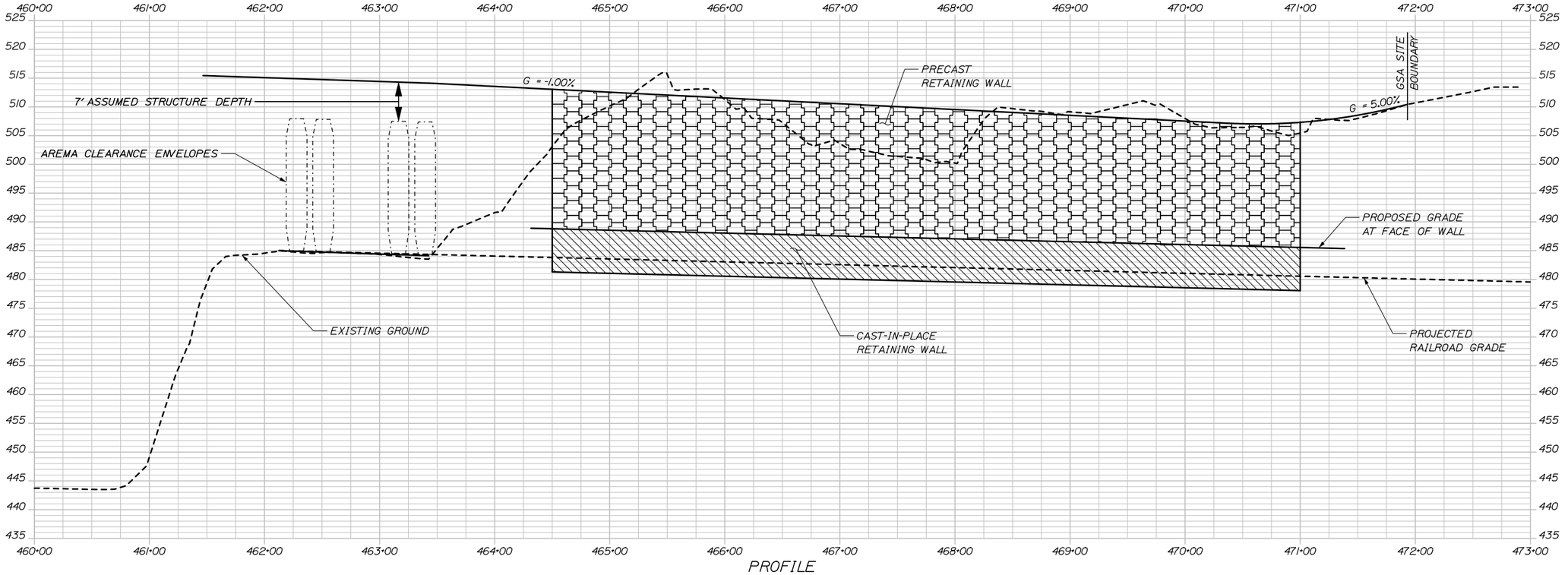
P.E. NUMBER

DATE

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SHEET NUMBER 10 OF 13

CONCEPTUAL ALTERNATIVES
OCTOBER 04, 2017



PROFILE

PROFILE

Horiz. 50 0 50 100

Vert. 10 0 10 20

Scale of Feet

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

	BY	DATE
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PROJ. MANAGER	-	-
DESIGN-DETAILED	-	-
CHECKED-REVIEWED	-	-
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REVISIONS 1	-	-
REVISIONS 2	-	-
REVISIONS 3	-	-
REVISIONS 4	-	-
FIELD CHANGES	-	-

SIGNATURE

P.E. NUMBER

DATE

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

ALTERNATIVE 4.5
RETAINING WALL PROFILE

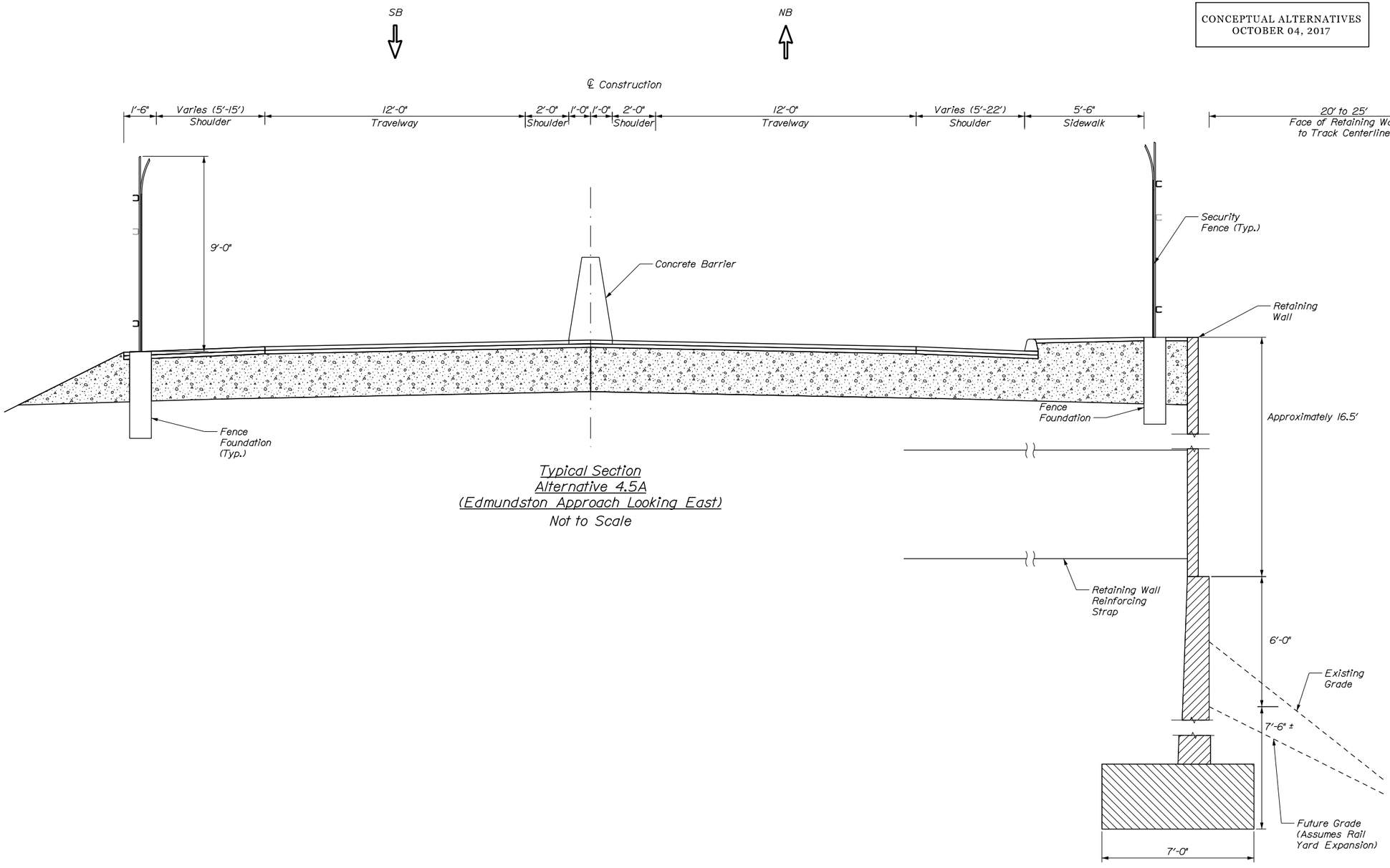
SHEET NUMBER

11

OF 13

Date:2/20/2018
Username:
Division:
Filename: profile.dgn

CONCEPTUAL ALTERNATIVES
OCTOBER 04, 2017



Typical Section
Alternative 4.5A
(Edmundston Approach Looking East)
Not to Scale

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SIGNATURE

P.E. NUMBER

DATE

	RAL	BY	DATE
PROJ. MANAGER		-	-
DESIGN-DETAILED		-	-
CHECKED-REVIEWED		-	-
DESIGN2-DETAILED2		-	-
DESIGN3-DETAILED3		-	-
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REVISIONS 2		-	-
REVISIONS 3		-	-
REVISIONS 4		-	-
FIELD CHANGES		-	-

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

ALTERNATIVE 4.5
RETAINING WALL TYPICAL SECTION

SHEET NUMBER

12

OF 13

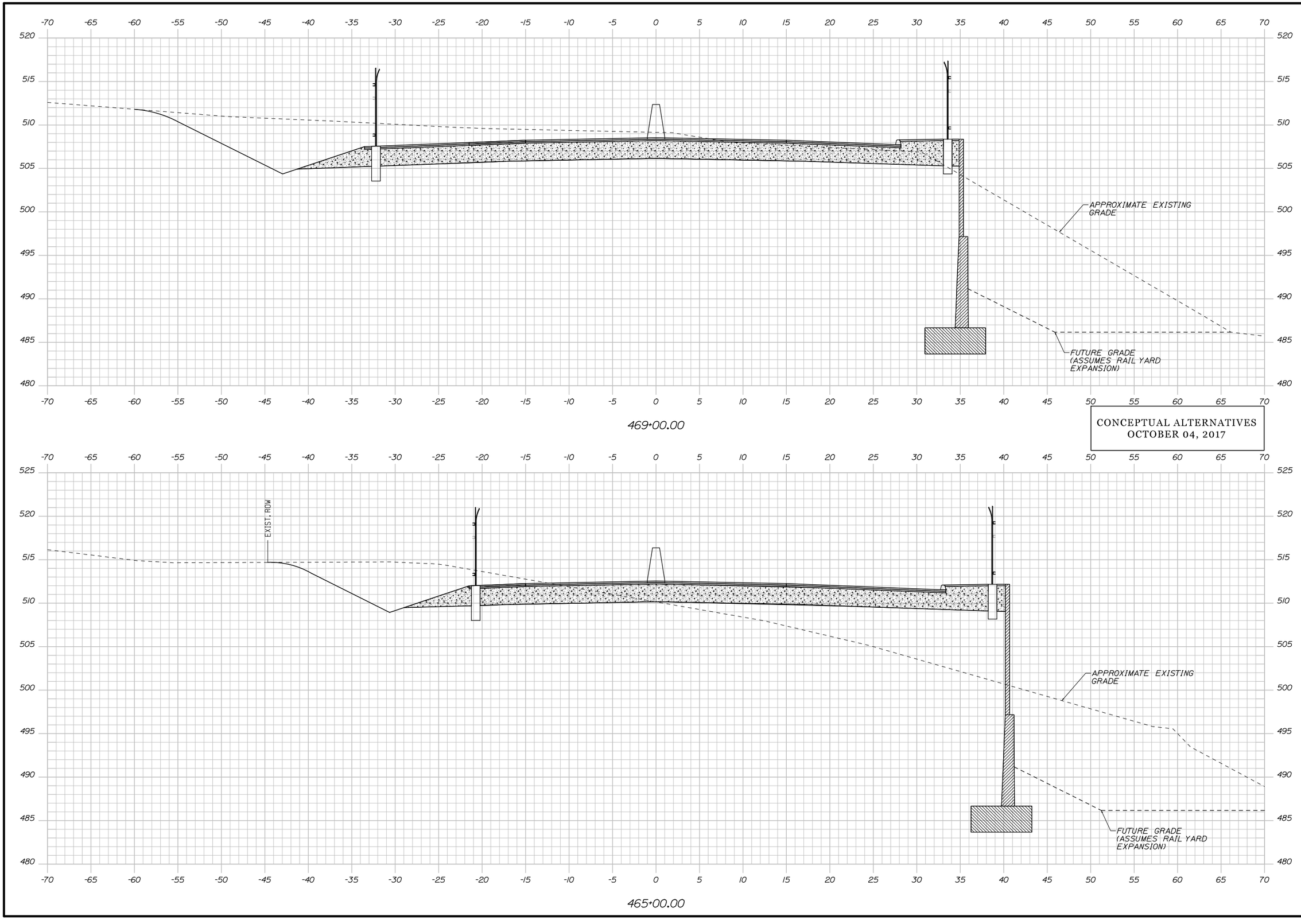
Username:
Division:
Date:2/20/2018
Filename: 012_Alt4_5A_Typical.dgn

Username:

Division:

Filename: 013_Xsect.dgn

Date:2/20/2018



CONCEPTUAL ALTERNATIVES
OCTOBER 04, 2017

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SIGNATURE

P.E. NUMBER

DATE

	RAL	BY	DATE
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DESIGN-DETAILED	-	-	-
CHECKED-REVIEWED	-	-	-
DESIGN2-DETAILED2	-	-	-
DESIGN3-DETAILED3	-	-	-
REVISIONS 1	-	-	-
REVISIONS 2	-	-	-
REVISIONS 3	-	-	-
REVISIONS 4	-	-	-
FIELD CHANGES	-	-	-

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

ALTERNATIVE 4.5
RETAINING WALL CROSS SECTIONS

SHEET NUMBER

13

OF 13

Madawaska - Edmundston International Bridge and Border Crossing Feasibility and Planning Study

Alternatives Comparison Matrix: Second Iteration & Refinement of Alternatives

Features			Alternative 3	Alternative 4.5
Purpose and Need	Satisfies Purpose of the Study?		Yes	Yes
	Satisfies Need of Project Sponsors?		Yes	Yes
Transportation	Bridge and Roadway	Project Length - feet [total (NB/ME)]	1,950 (1,000/950)	2,250 (1,550/700)
		Roadway Length - feet [total (NB/ME)]	100 (100/0)	800 (800/0)
		Viaduct Length - feet [total (NB/ME)]	0 (0/0)	0 (0/0)
		Bridge Type	Segmental Concrete	Plate Girder
		Bridge Length - feet [total (NB/ME)]	1,850 (900/950)	1,450 (750/700)
		No. of Bridge Spans [total (NB/ME)]	4 (2/2)	7 (4/3)
		No. of Bridge Piers Within River	3	3
		Bridge Service Life	100	75 to 100
		Area of Retaining Walls - square feet [total (NB/ME)][5]	1,800 (1,800/0)	19,500 (19,500/0)
		Impacts to Utilities	Yes	Yes
	Railroads	Length of Track Reconstruction - feet [total (NB/ME)]	0 (0/0)	0 (0/0)
		No. of Grade-Separated Crossings [total (NB/ME)]	2 (1/1)	2 (1/1)
		No. of At-Grade Crossings [total (NB/ME)]	0 (0/0)	0 (0/0)
	ROW	Area of Acquisitions- acres [total (NB/ME)][9]	1.5 (0.6/0.9)	3.2 (2.5/0.7)
		No. of Parcels Impacted [total (NB/ME)]	4 (2/2)	14 (12/2)
		No. of Residential Takings [total (NB/ME)]	0 (0/0)	3 (3/0)
		No. of Business Takings [total (NB/ME)]	0 (0/0)	1 (1/0)
Construction + Right-of-Way Cost (US $)	Construction Cost[4]	Edmundston Port of Entry	$500,000	$1,000,000
		Madawaska Port of Entry	$69,200,000	$69,200,000
		Bridge Demolition	$4,000,000	$4,000,000
		Approach Roadway	$300,000	$1,200,000
		Retaining Wall Construction[5,6]	$200,000	$1,500,000
		Viaduct Construction	$0	$0
		Bridge Construction[7]	$44,800,000	$29,800,000
		Total Construction Cost	$119,000,000	$106,700,000
	Right-of-Way Cost[8]		$0	$1,500,000
	Total Construction + Right-of-Way Cost		$119,000,000	$108,200,000
Schedule	Design Duration		3 yrs	3 yrs
	Construction Duration		3 yrs	3 yrs
	Total Project Duration		6 yrs	6 yrs

Notes:

[4] Excludes design engineering, construction inspection, right-of-way and permitting costs. Estimated construction values are in 2020 U.S. Dollars and assume construction starting in 2020.

[5] Excludes Retaining Walls that are required for raising grade at the LPOE facilities.

[6] Retaining wall costs only include the area of walls required to support the bridge and roadway. The use of MSE retaining walls with a RR crash wall is assumed. A unit cost of $75/SF is assumed.

[7] Bridge square foot costs are $480/sf for plate girder structure and $566/sf for a segmental concrete structure

[8] Right-of-way costs are conceptual and only reflect costs for permanent property acquisitions on the Canadian side of the river.

[9] Area of ROW acquisition includes both fee simple acquisitions and easements for aerial rights (bridge over railroad). Additional ROW required for LPOEs not included.

APPENDIX E

Third and Final Iteration & Refinement of Alternatives

CONCEPTUAL PLANS
JANUARY 19, 2018

RUE ST FRANCOIS - ROUTE 120

R=325'

115+00

110+00

105+00

100+00

PREFERRED ALTERNATIVE
(59°SKEW)

POTENTIAL VARIATION
(±75 FEET)

R=550'

ST. JOHN RIVER

PAROISSE DE MADAWASKA
STATE OF MAINE

RETAINING WALL
WITHIN LPOE
SITE

LAND ACQUIRED
FOR US LPOE

MILL STREET

BRIDGE STREET

MAIN STREET - ROUTE 1

120 0 120 240
Scale of Feet

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

	DATE
BY	
PM	
PROJ. MANAGER	
DESIGN-DETAILED	
CHECKED-REVIEWED	
DESIGN2-DETAILED	
DESIGN3-DETAILED	
REVISIONS 1	
REVISIONS 2	
REVISIONS 3	
REVISIONS 4	
FIELD CHANGES	

SIGNATURE

P.E. NUMBER

DATE

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

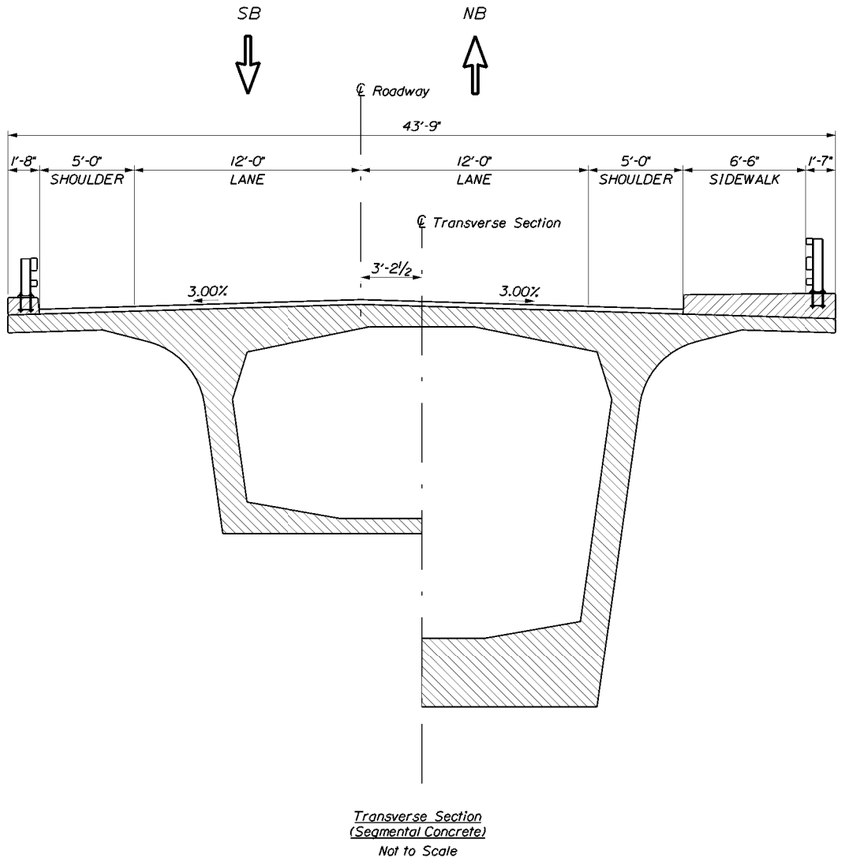
PREFERRED ALTERNATIVE ALIGNMENT ENVELOPE

SHEET NUMBER

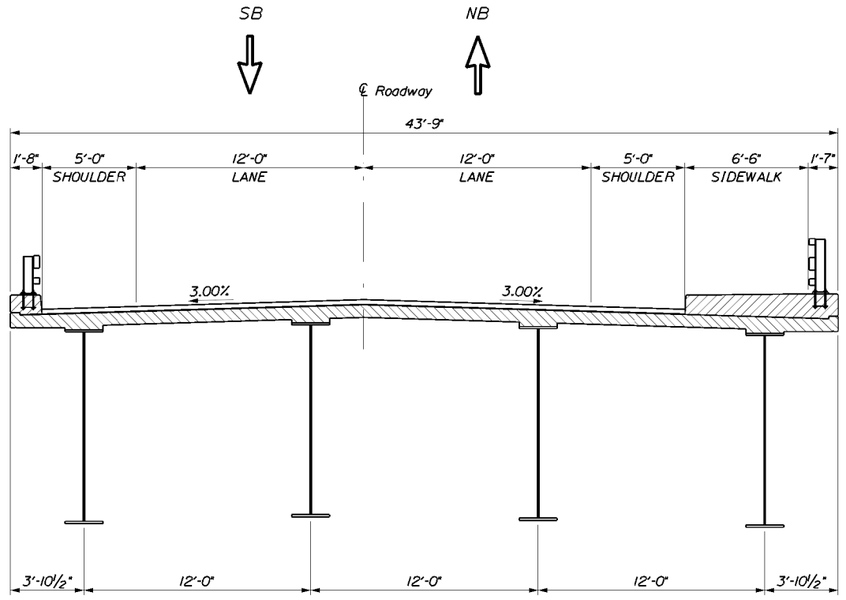
1

OF 5

CONCEPTUAL PLANS
JANUARY 19, 2018



Transverse Section
(Segmental Concrete)
Not to Scale



Transverse Section
(Steel Plate Girder)
Not to Scale

NOTES:

1. *Conceptual Segmental Concrete And Steel Plate Girder Superstructures Shown. Actual Superstructure Type Will Be Determined During Preliminary Design*

2. *Final Number of Girders and Girder Proportions Have Not Been Established. A Four Girder Cross Section Is Shown For Illustrative Purposes.*

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

	DATE	BY	SIGNATURE
PROJ. MANAGER	-	-	
DESIGN-DETAILED	-	-	P.E. NUMBER
CHECKED-REVIEWED	-	-	
DESIGN2-DETAILED2	-	-	
DESIGN3-DETAILED3	-	-	DATE
REVISIONS 1	-	-	
REVISIONS 2	-	-	
REVISIONS 3	-	-	
REVISIONS 4	-	-	
FIELD CHANGES	-	-	

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

BRIDGE TYPICAL SECTIONS

SHEET NUMBER
2
OF 5

Filename: 002_Bridge_Typical.dgn Division: Username: Date:2/20/2018

CONCEPTUAL PLANS
JANUARY 19, 2018

RUE ST FRANCOIS - ROUTE 120

R=325'

115+00

BRIDGE
(SEGMENTAL CONCRETE
STRUCTURE ASSUMED
FOR SPAN LAYOUT)

110+00

ST. JOHN RIVER

PAROISSE DE MADAWASKA
STATE OF MAINE

PREFERRED ALTERNATIVE
(59°SKEW)

105+00

PROPOSED PIER
(TYPE TO BE
DETERMINED) (TYP.)

R=550'

100+00

RETAINING WALL
WITHIN LPOE
SITE

LAND ACQUIRED
FOR US LPOE

MILL STREET

BRIDGE STREET

MAIN STREET - ROUTE 1

120 0 120 240
Scale of Feet

LEGEND:
BRIDGE
APPROACH
U.S. LPOE SITE
SECURITY FENCING

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SIGNATURE

P.E. NUMBER

DATE

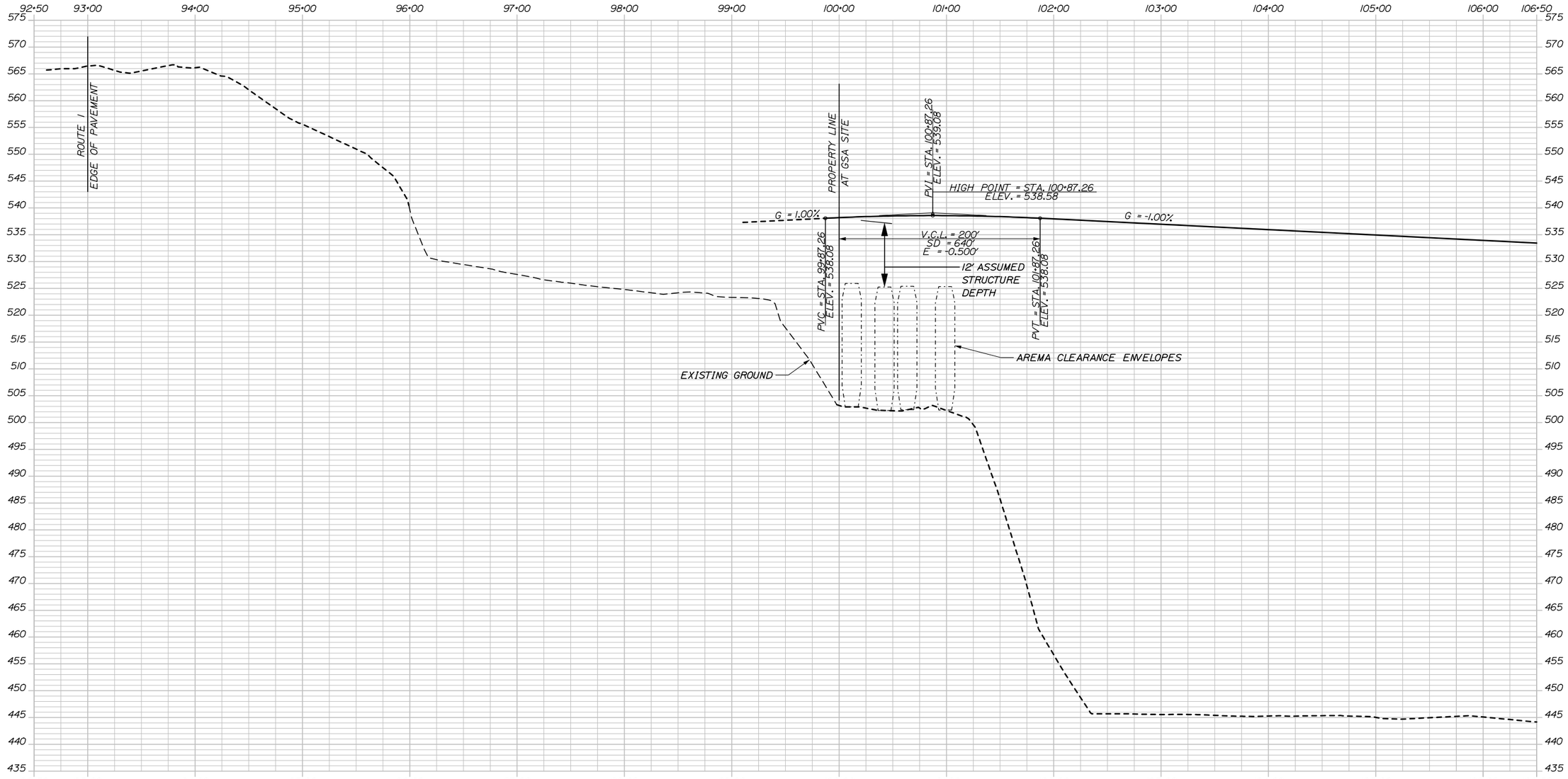
	BY	DATE
P.M.	-	-
PROJ. MANAGER	-	-
DESIGN-DETAILED	-	-
CHECKED-REVIEWED	-	-
DESIGN2-DETAILED2	-	-
DESIGN3-DETAILED3	-	-
REVISIONS 1	-	-
REVISIONS 2	-	-
REVISIONS 3	-	-
REVISIONS 4	-	-
FIELD CHANGES	-	-

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

PREFERRED ALTERNATIVE CONCEPTUAL PLAN

SHEET NUMBER
3
OF 5

CONCEPTUAL PLANS
JANUARY 19, 2018



PROFILE

PROFILE
Horiz. 50 0 50 100
Vert. 10 0 10 20
Scale of Feet

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

	BY	DATE
PROJ. MANAGER	-	-
DESIGN-DETAILED	-	-
CHECKED-REVIEWED	-	-
DESIGN2-DETAILED2	-	-
DESIGN3-DETAILED3	-	-
REVISIONS 1	-	-
REVISIONS 2	-	-
REVISIONS 3	-	-
REVISIONS 4	-	-
FIELD CHANGES	-	-

SIGNATURE

P.E. NUMBER

DATE

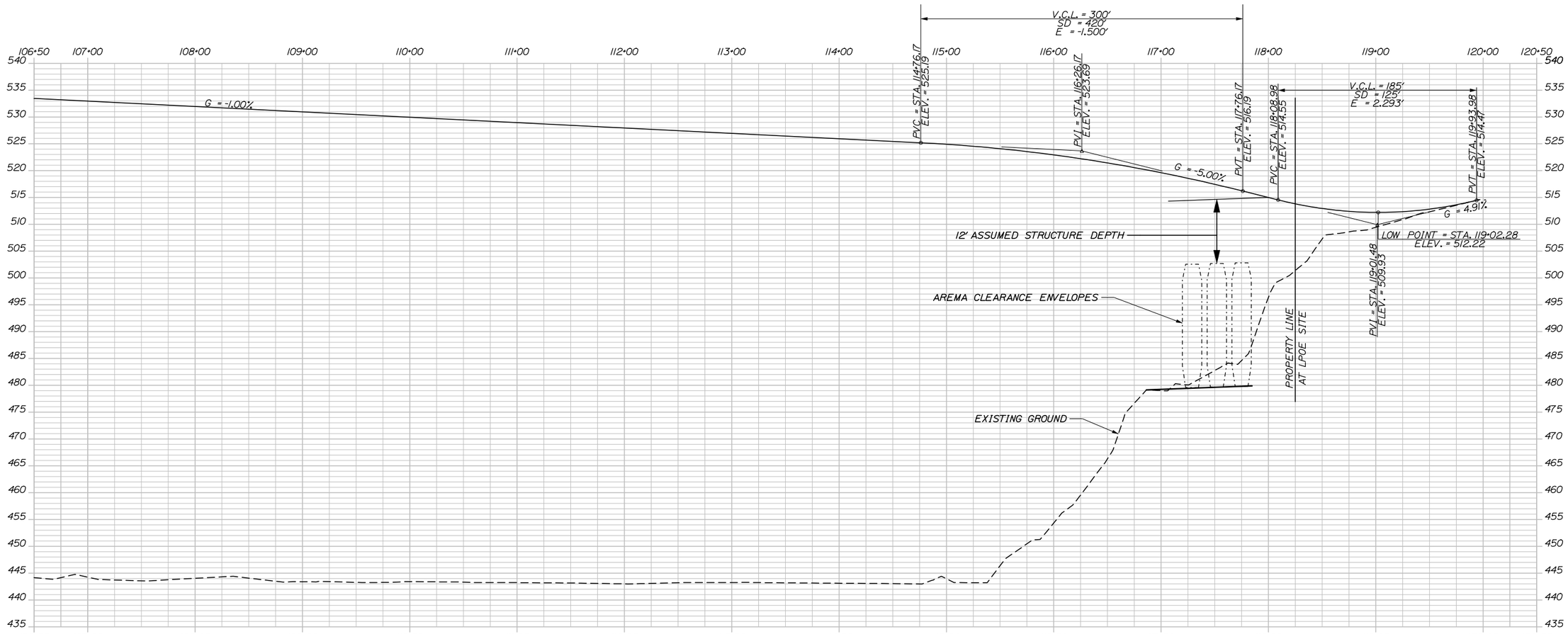
MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

PREFERRED ALTERNATIVE
CONCEPTUAL PROFILE

SHEET NUMBER
4
OF 5

Date:2/20/2018
Username:
Division:
Filename: profile.dgn

CONCEPTUAL PLANS
JANUARY 19, 2018



PROFILE

PROFILE

Horiz. 50 0 50 100

Vert. 10 0 10 20

Scale of Feet

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

	BY	DATE
PROJ. MANAGER	RAL	-
DESIGN-DETAILED	-	-
CHECKED-REVIEWED	-	-
DESIGN2-DETAILED2	-	-
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REVISIONS 2	-	-
REVISIONS 3	-	-
REVISIONS 4	-	-
FIELD CHANGES	-	-

SIGNATURE

P.E. NUMBER

DATE

MADAWASKA - EDMUNDSTON
INTERNATIONAL BRIDGE CROSSING
PLANNING AND FEASABILITY STUDY

PREFERRED ALTERNATIVE
CONCEPTUAL PROFILE

SHEET NUMBER

5

OF 5

Date:2/20/2018
Username:
Division:
Filename: profile.dgn

Madawaska - Edmundston International Bridge and Border Crossing Feasibility and Planning Study

Alternatives Comparison Matrix: Third and Final Interation & Refinement of Alternatives

Features			Preferred Alternative (Modified Alt. 3)	Alternative 3 (Dismissed)	Alternative 4.5 (Dismissed)
Purpose and Need	Satisfies Purpose of the Study?		**Yes**	Yes	Yes
	Satisfies Need of Project Sponsors?		**Yes**	Yes	Yes
Transportation	Bridge and Roadway	Project Length - feet [total (NB/ME)]	**1,950 (1,000/950)**	1,950 (1,000/950)	2,250 (1,550/700)
		Roadway Length - feet [total (NB/ME)]	**100 (100/0)**	100 (100/0)	800 (800/0)
		Viaduct Length - feet [total (NB/ME)]	**0 (0/0)**	0 (0/0)	0 (0/0)
		Bridge Type	**Segmental Conc. (Curved)**	Segmental Conc. (Straight)	Plate Girder
		Bridge Length - feet [total (NB/ME)]	**1,850 (900/950)**	1,850 (900/950)	1,450 (750/700)
		No. of Bridge Spans [total (NB/ME)]	**5 (2/2)**	4 (2/2)	7 (4/3)
		No. of Bridge Piers Within River	**4**	3	3
		Bridge Service Life	**100**	100	75 to 100
		Area of Retaining Walls - square feet [total (NB/ME)][5]	**1,800 (1,800/0)**	1,800 (1,800/0)	19,500 (19,500/0)
		Impacts to Utilities	**Yes**	Yes	Yes
	Railroads	Length of Track Reconstruction - feet [total (NB/ME)]	**0 (0/0)**	0 (0/0)	0 (0/0)
		No. of Grade-Separated Crossings [total (NB/ME)]	**2 (1/1)**	2 (1/1)	2 (1/1)
		No. of At-Grade Crossings [total (NB/ME)]	**0 (0/0)**	0 (0/0)	0 (0/0)
	ROW	Area of Acquisitions- acres [total (NB/ME)][9]	**1.5 (0.6/0.9)**	1.5 (0.6/0.9)	3.2 (2.5/0.7)
		No. of Parcels Impacted [total (NB/ME)]	**4 (2/2)**	4 (2/2)	14 (12/2)
		No. of Residential Takings [total (NB/ME)]	**0 (0/0)**	0 (0/0)	3 (3/0)
		No. of Business Takings [total (NB/ME)]	**0 (0/0)**	0 (0/0)	1 (1/0)
Construction + Right-of-Way Cost (US $)	Construction Cost[4]	Edmundston Port of Entry	**$500,000**	$500,000	$1,000,000
		Madawaska Port of Entry	**$69,200,000**	$69,200,000	$69,200,000
		Bridge Demolition	**$4,000,000**	$4,000,000	$4,000,000
		Approach Roadway	**$300,000**	$300,000	$1,200,000
		Retaining Wall Construction[5,6]	**$200,000**	$200,000	$1,500,000
		Viaduct Construction	**$0**	$0	$0
		Bridge Construction[7]	**$57,000,000**	$52,200,000	$32,900,000
		Total Construction Cost	**$131,200,000**	$126,400,000	$109,800,000
	Right-of-Way Cost[8]		**$0**	$0	$2,400,000
	Total Construction + Right-of-Way Cost		**$131,200,000**	$126,400,000	$112,200,000
Schedule	Design Duration		**3 yrs**	3 yrs	3 yrs
	Construction Duration		**3 yrs**	3 yrs	3 yrs
	Total Project Duration		**6 yrs**	6 yrs	6 yrs

Notes:

[4] Excludes design engineering, construction inspection, right-of-way and permitting costs. Estimated construction values are in 2020 U.S. Dollars based on the assumed 2020 construction start date for the project.

[5] Excludes Retaining Walls that are required for raising grade at the LPOE facilities.

[6] Retaining wall costs only include the area of walls required to support the bridge and roadway. The use of MSE retaining walls with a RR crash wall is assumed. A unit cost of $75/SF is assumed.

[7] Bridge square foot costs are $530/sf for plate girder structure, $660/sf for a straight segmental concrete structure, and $720/sf for a curved segmental concrete structure. These unit prices reflect the anticipated cost premium associated with difficult site access and complexities of constructing an international bridge.

[8] Right-of-way costs are conceptual and only reflect costs for permanent property acquisitions on the Canadian side of the river.

[9] Area of ROW acquisition includes both fee simple acquisitions and easements for aerial rights (bridge over railroad). Additional ROW required for LPOEs not included.

APPENDIX F

Anticipated Permits and Approvals Required for the Preferred Alternative

Master List of Permits and Approvals Potentially Required for the Selected Alternative

Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study

01/23/18

Agency	Name of Permit or Approval	Action Required During the Feasibility and Planning Study	Project Phase to Submit Permit Application or Approval Request	Activities or Permits Required Before Agency Approval	Approximate Time to Process Permit Application or Approval Following Submission	Comments
International						
International Boundary Commission	International Boundary Commission Approval		Preliminary or Final Design	Initiate discussion and keep advised of project development	3 months	International Boundary Commission regulates land uses and is responsible for maintaining a 10-foot clear zone on both sides of the border. Typically only a letter requesting approval and plan view of proposed condition is required. Typically any agency (on either side of the border) can submit and approval is sufficient or applicable to all.
International Joint Commission	Order of Approval in accordance with the International Boundary Waters Treaty Act of 1909		Preliminary or early in Final Design	Initiate discussion and keep advised of project development	1 year	International Joint Commission makes decisions on projects that affect the natural level and flow of water across the boundary to help prevent and resolve disputes over shared waters. Either federal government may transmit an application. In leiu of an application, a special agreement between countries, such as the exchange of diplomatic notes, may suffice.
State of Maine						
U.S. Coast Guard	Bridge Permit		Preliminary or early in Final Design	Pre-application conference(s) strongly encouraged. Initiate discussions and keep advised of project development. Application is normally submitted following the issue and approval of all other permit applications and approvals; the USCG will typically accept mostly complete applications.	2 years	Application is normally submitted following the issue and approval of all other permit applications and approvals. Submit application as soon as possible following compliance with the National Environmental Policy Act. If the U.S. Coast Guard is not the lead Federal agency, consider asking them to join and fulfill the role of a cooperating agency. One frequent challenge is satisfying the U.S. Coast Guards requirements for plans to accompany the public notice; submit plans for review and approval prior to submitting the application. The USCG recently issued new guidance for applicants performing navigation studies.

Master List of Permits and Approvals Potentially Required for the Selected Alternative

Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study

01/23/18

Agency	Name of Permit or Approval	Action Required During the Feasibility and Planning Study	Project Phase to Submit Permit Application or Approval Request	Activities or Permits Required Before Agency Approval	Approximate Time to Process Permit Application or Approval Following Submission	Comments
U.S. Department of State	Presidential Permit or waiver of permit	Confirmation a Presidential Permit or waiver of permit, based on the range of alternative locations to be considered, is required	Preliminary Design	Compliance with the National Environmental Policy Act	2 years, if required	The location for the existing international bridge was approved by the U.S. Congress in 1919 suggesting a Presidential Permit is not required. The U.S. GSA or MaineDOT should confirm with the U.S. Department of State that a Presidential Permit is not required if the international bridge is replaced at or near its existing location. Throughout project development, the U.S. GSA and MaineDOT should periodically reflect on the need for a Presidential Permit based on the preferred location for the bridge. A letter asking for clarification of the need for a Presidential Permit or waiver was sent to the Department of State in November 2017. The Department of State needs to approve agreements between countries.
U.S. Department of State	Secretary of State approval of agreements between countries		Preliminary and Final Design As agreements are drafted, they should be forwarded to the U.S. Department of State for review and approval.		variable	U.S. Department of State must approve agreements between countries, before they are finalized. Examples of agreements that require approval are those governing design, construction, operation, and maintenance.
Federal Highway Administration	Compliance with the National Environmental Policy Act (if federal funds are used in the replacement of the international bridge)	Confirm sources of funding	Preliminary Design		1 year	Only applicable to MaineDOT if federal funds are used in the replacement of the international bridge. The U.S. Coast Guard will need to comply with the National Environmental Policy Act when issuing the Bridge Permit as issuing the permit is a separate federal action subject to compliance with the National Environmental Policy Act.
U.S. General Services Administration	Compliance with the National Environmental Policy Act		Preliminary Design		1 year	U.S. General Services Administration prepared and Environmental Impact Statement and issued a Record of Decision for the replacement of the POE in 2007. Based on the passage of time and scope of the Preferred Alternative, the GSA will need to re-visit compliance with the National Environmental Policy Act by preparing a Supplemental EIS.
Federal Highway Administration	Compliance with Section 4(f) of the U.S. Department of Transportation Act of 1966 for use of public properties / properties with a public interest (if federal funds are used in the replacement of the international bridge)	Confirm sources of funding	Preliminary Design		1 year	Only applicable if federal funds are used in the replacement of the international bridge. Typically done in advance of or concurrent with complying with the National Environmental Policy Act.

Master List of Permits and Approvals Potentially Required for the Selected Alternative

Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study

01/23/18

Agency	Name of Permit or Approval	Action Required During the Feasibility and Planning Study	Project Phase to Submit Permit Application or Approval Request	Activities or Permits Required Before Agency Approval	Approximate Time to Process Permit Application or Approval Following Submission	Comments
Maine Historic Preservation Commission	Compliance with Section 106 of the National Historic Preservation Act	Confirm sources of funding	Feasibility Study or Preliminary Design		1 year	Typically done in advance of or concurrent with complying with the National Environmental Policy Act or during preparation of a permit application.
U.S. Army Corps of Engineers and Maine Department of Environmental Protection	Natural Resource Protection Act Permit	Identify permit tier (1, 2, or 3) based upon size of impact to open waters and wetlands	Final Design	Pre-application meeting(s) strongly encouraged. Initiate discussion and keep advised of project development. Pre-submission meeting strongly encouraged.	6 months	Single application form is used for both the U.S. Army Corps of Engineers and Maine Department of Environmental Protection.
Maine Department of Environmental Protection	Section 401 (of the Clean Water Act) Water Quality Certification		Final Design		6 months	Typically issed by the Maine Department of Environmental Protection concurrently with the Natural Resources Protection Act Permit.
Province of New Brunswick						
New Brunswick Department of Environment and Local Government	Watercourse and Wetland Alteration (WAWA) Permit		Final Design		2 months	Timing of construction needed for permit dates.
New Brunswick Department of Environment and Local Government	Environmental Impact Assessment (EIA)	Initiate field work following identification of preliminary options.	Preliminary Design		2 to 3 years including field program	Lengthy process; approval of field program would improve efficiency.
New Brunswick Department of Environment and Local Government	Wetlands Compensation Approval	Initiate to avoid potential delay identifying an acceptable compensation project.	Preliminary Design if impact to wetlands or floodplain habitat will occur.	Consult when have preliminary options and potential impacts are identified.	2 months (no impacts), to 1 year (impacts needing compensation option)	Can be a lengthy process.
Transport Canada	Navigable Waters Approval	Determine if necessary	Preliminary Design	NBDTI to consult and advise whether required or not.	1 month (for opt out) to 1 year (for opt in and requires study)	Potentially applicable. Typically can opt in to get approval or opt out (no approval and risk stays with the Province. Should consider local needs for navigation clearances for recreation and commercial use.
Canadian Environmental Assessment Agency (CEAA)	CEAA Approval, Decision Statement	Project Description (PD) review, Determination of EA, Obtain Environmental Impact Statement (EIS) Guideline, Initiate Field Work Components	Preliminary Design	NBDTI to consult	2 to 3 years including field program: 1 year (EA Review by Agency) or 2 year (EA Review by Panel). Both timelines initiate after completion of field program and report submission, estimate of 1 year	Lengthy CEAA review process which can be extended and poses a risk to project timelines. Review process does not include time required for field program and associated reporting.

Master List of Permits and Approvals Potentially Required for the Selected Alternative

Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study

01/23/18

Agency	Name of Permit or Approval	Action Required During the Feasibility and Planning Study	Project Phase to Submit Permit Application or Approval Request	Activities or Permits Required Before Agency Approval	Approximate Time to Process Permit Application or Approval Following Submission	Comments
Department of Fisheries and Oceans Canada	Authorization to Proceed		Preliminary Design		4 months	Compensate for fish habitat impact through a Provincial Bank (no delays to authorization, but will need a local habitat compensation project. Need to minimize significant impacts to fish habitat.

APPENDIX G

Preliminary Contractor Information Guide

Contractor Information Guide

Madawaska/Edmundston International Bridge and Border Crossing

May 2018

Contractor Information Guide

Madawaska, Maine to Edmundston, New Brunswick International Bridge and Border Crossing

Maine Department of Transportation &
New Brunswick Department of
Transportation and Infrastructure

in coordination with the
Canada Border Services Agency,
Public Services and Procurement Canada,
U.S. General Services Administration,
and U.S. Customs and Border Protection

December 2017

TABLE OF CONTENTS

ACRONYMS

AMPS	Administrative Monetary Penalty System
AUT	Australia Tariff
BIS	Business Information Service
BN	Business Number
BRO	Business Registration Online
CAED	Canadian Automated Export Declaration
CBP	U.S. Customs and Border Protection
CBSA	Canada Border Services Agency
CCCT	Commonwealth Caribbean Countries Tariff
CGP	Controlled Goods Program
CIAT	Canada-Israel Agreement Tariff
CIC	Citizenship and Immigration Canada
COLT	Columbia Tariff
CRA	Canada Revenue Agency
CRT	Canada-Costa Rica Tariff
CT	Chile Tariff
CTA	Canadian Transport Agency
DPA	Defence Production Act
EDI	Electronic Data Interchange
ESDC	Employment and Social Development Canada
GPT	General Preferential Tariff
GSA	General Services Administration
GST	Goods and Services Tax
HNT	Honduras Tariff
HRSDC	Human Resources and Skills Development Canada
HS	Harmonized System
HST	Harmonized Sales Tax
IRCC	Immigration, Refugees and Citizenship Canada
IT	Iceland Tariff
JT	Jordan Tariff
KRT	Korea Tariff
LDCT	Least Developed Country Tariff
LMIA	Labour Market Impact Assessment
LPOE	Land Port of Entry
MFN	Most-Favoured-Nation
MaineDOT	Maine Department of Transportation
NBDTI	New Brunswick Department of Transportation and Infrastructure
MT	Mexico Tariff
MUST	Mexico-United States Tariff
NAFTA	North American Free Trade Agreement
NDR	No Declaration Required
NT	Norway Tariff
NZT	New Zealand Tariff
OGD	Other Government Departments and Agencies
OHS	Occupational Health and Safety
ORS	Office of the Revisor of Statutes
OSH Act	Occupational Safety and Health Act of 1970
OSHA	U.S. Occupational Safety and Health Administration
PAT	Panama Tariff
POE	Port of Entry
PT	Peru Tariff
PSPC	Public Services and Procurement Canada
SIMA	Special Import Measures Act
SLT	Switzerland-Liechtenstein Tariff
TFW	Temporary Foreign Worker
TH	Trunk Highway
USCIS	U.S. Citizenship and Immigration Services
UST	United States Tariff
WSIB	Workplace Safety and Insurance Board

I. INTRODUCTION

The Maine Department of Transportation (MaineDOT) and the New Brunswick Department of Transportation and Infrastructure (NBDTI), in coordination with the Canada Border Services Agency (CBSA), Public Services and Procurement Canada (PSPC), U.S. General Services Administration (GSA), and U.S. Customs and Border Protection (CBP), are continuing the planning and design for the replacement of the Madawaska/ Edmundston International Bridge Crossing on Bridge Street between the Town of Madawaska and the City of Edmundston. With construction planned for 2020 (pending required approvals), MaineDOT and NBDTI will be soliciting a contractor to replace the International Bridge Crossing over the Saint John River.

The construction of the new international bridge over a waterway between Maine and New Brunswick is a complex undertaking and requires great consideration and compliance with many laws, regulations, and rules associated with the movement of goods and people across the international border.

This *Contractor Information Guide* provides a general overview of some of the requirements associated with the movement of goods and people across the international border and sources for additional information that may help inform contractors when preparing to bid on this project. This *Guide* should only be viewed as a starting point for gathering information on the requirements associated with the movement of goods and people across the international border. The purpose of this *Guide* is simply to inform and raise awareness of these requirements and the complexities involved with the construction of this international project.

Although this *Guide* mentions laws, regulations, and rules associated with the movement of goods and people across the international border and provides web sites and other sources of information, it is not intended to function as legal research, or an interpretation of these laws, regulations, and rules, nor is it intended to serve as legal advice.

MaineDOT and NBDTI strongly suggest contractors consult a qualified attorney when preparing to bid. Reliance on any information contained in this *Guide* must be done at the user's

own risk and cannot be used in support of a future claim against the MaineDOT and NBDTI. MaineDOT and NBDTI assume no responsibility for the accuracy and reliability of the information in this *Guide*. MaineDOT and NBDTI will not be liable for any losses caused by reliance on the information in this *Guide*.

Resources:

- Madawaska/Edmundston International Bridge and Border Crossing Feasibility and Planning Study Website

II. WORKING IN THE UNITED STATES

Port of Entry Operations

U.S. Customs and Border Protection (CBP) has a complex mission at Land Ports of Entry (LPOE) with broad law enforcement authority tied to screening all foreign visitors, returning American citizens, and imported cargo that enters the U.S. LPOE operations. CBP is authorized and expected to: conduct immigration inspections of people entering the country including visitors, Legal Permanent Residents, and U.S. citizens; as well as examine and secure all cargo and agricultural products entering the U.S. (CBP, 2016).

Resources:

- Immigration Inspection Program
- Cargo Security Examinations
- Protecting Agriculture
- At Ports of Entry

Immigration for Foreign Workers

To visit the United States for business purposes, individuals may need to obtain a visa as a temporary visitor for business (B-1 visa), unless qualifying for admission under another visa program or without a visa under the Visa Waiver Program (USCIS, 2015).

A contractor who desires Canadian citizens to work in the United States would have to apply for and receive approval from U.S. Citizenship and Immigration Services (USCIS, 2015).

Employers must verify that individuals whom they plan to employ in the United States are authorized to accept employment in the United States and generally must file a non-immigrant

petition on the individual's behalf with USCIS[1]. An H-1B visa – workers in a specialty occupation – may be the appropriate nonimmigrant classification for a temporary worker (USCIS, 2015).

Resources:

- B-1 Temporary Business Visitor
- Temporary (Nonimmigrant) Workers

Taxes

Maine generally imposes an income tax on all individuals that have Maine-source income. As of 2017 the income tax rates are graduated, with rates ranging from 5.8% to 7.15% (MRS, 2017).

Maine imposes an income tax on all entities organized as corporations and that have Maine-source income. As of 2017 the corporate income tax is graduated, with rates ranging from 3.5% (for income up to $25,000) to 8.93% (for income in excess of $250,000). The tax generally does not apply to S corporations unless the corporation has federal taxable income at the corporate level (MRS, 2017).

Contractors or subcontractors may be required to pay sales or use tax on the cost of all materials, supplies and equipment purchased in the U.S. Goods, materials, and services procured in Maine may be subject to the state's sales and use tax (MRS, 2017). Goods and services procured in states other than Maine, would be subject to the sales tax rates of those states, and not additionally subjected to Maine sales tax.

Resources:

- Maine Revenue Services

Worker Safety

The U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) assures safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education, and

[1] Only a few nonimmigrant classifications allow you to obtain permission to work in the United States without an employer having first filed a petition on your behalf. Such classifications include the nonimmigrant E-1, E-2, E-3 and TN classifications, as well as, in certain instances, the F-1, M-1 student, and J-1 exchange visitor classifications (USCIS, 2016).

assistance (U.S. Department of Labor, 2016). The Occupational Safety and Health Act of 1970 (OSH Act) was passed to prevent workers from being killed or seriously harmed at work. Under the OSH Act, employers have the responsibility to provide a safe workplace (U.S Department of Labor, 2016).

Maine

Safety in Maine is governed by the Maine Department of Labor, Occupational Safety Rules and Regulations Board, with rules published in Maine Revised Statutes, Title 26, Chapter 6 (Maine Legislature, 2017).

Resources:

- Occupational Safety and Health Administration OSHA
- OSHA At-A-Glance
- Occupational Safety Rules and Regulations Board Statutes
- Maine Department of Labor

III. WORKING IN CANADA

Port of Entry Operations

Travelers arriving in Canada are obligated by Canadian law to present themselves to a border services officer, respond truthfully to all questions, and accurately report their goods. Travelers must follow the signs to Primary Inspection where a border services officer would examine identification and other travel documents, and take verbal declarations of goods being brought into Canada (CBSA, 2016).

Resources:

- What to Expect at the [Canadian] Border

Taxes

Income Tax Rates for Individuals

New Brunswick imposes an income tax on all federally-defined New Brunswick taxable income. The income tax rates are graduated, with rates ranging from 9.68% to 20.3% (CRA, 2017a).

Corporation Income Tax

New Brunswick imposes an income tax on all entities organized as corporations and that have New Brunswick-sourced income. Generally, provinces in Canada have two corporation income tax

rates – a lower rate and a higher rate. The lower rate applies to the income eligible for the federal small business deduction, while the higher rate applies to all other income. In New Brunswick, the lower rate is 3.5%, and the higher rate is 14%. The income eligible for the lower rate is determined using the New Brunswick business limit of $500,000 (CRA, 2017a).

Importation of Goods

Goods, materials, and supplies imported during the construction of the International Bridge may enter under two scenarios: 1) permanent importation to be brought into the country and permanently installed in the Bridge, or 2) temporary importation, such as machinery and equipment.

Generally, a formal entry would be required by the Canada Border Services Agency (CBSA) to account for the importation of these goods and Customs duties and Federal taxes may be applicable.

Permanent Importation of Goods

Goods that would be permanently imported such as materials brought into and used in the construction of the bridge would require the presentation of accounting documentation to CBSA. The importer or their Customs Broker can complete the accounting documentation, which would declare the correct classification and tariff treatment applicable, both of which would determine the rate of duty to be applied.

The CBSA has a step-by-step guide with an overview of the commercial importing process for businesses importing goods into Canada. It is intended to complement and not replace existing regulations, acts, and references detailed in Memoranda Series D1 to D22 dated June 2016 (CBSA, 2017a). The steps for businesses importing goods into Canada include:

Preparing to Import

1. Obtain a Business Number

Before importing commercial goods into Canada, contractors would need to obtain a Business Number (BN) issued by the Canada Revenue Agency (CRA) for an import/export account. This import/export account is free of charge and can usually be obtained in a few minutes. To register for a BN, contractors can

either call the CRA's Business Window at 1-800-959-5525 or visit the CRA's Business Registration Online (BRO) (CBSA, 2015).

Resources:

- Business Registration Online (BRO)

2. Identify goods to be imported

Contractors should gather information about the goods to be imported. Obtain descriptive literature, product composition information and, whenever possible, product samples. This information would be crucial when determining the tariff classification of the goods to be imported. The tariff clarification number would be used to determine the rate of duty that would be applied to the goods (CBSA, 2015).

3. Determine if a licensed customs broker would be used

The CBSA licenses customs brokers to carry out customs-related responsibilities to clear goods across the Canadian border. A broker's service typically includes:

- Obtaining the release of the imported goods;
- Paying duties;
- Obtaining, preparing, and presenting or transmitting documents or data;
- Maintaining records; and
- Responding to CBSA concerns after payment (CBSA, 2015).

Contractors can prepare their own release and accounting documentation and transact business directly with the CBSA, or contractors can authorize a Licensed Customs Broker to act as their agent to transact business. It is important to remember that contactors are ultimately responsible for the accounting documentation, payment of duties and taxes, and subsequent corrections such as re-determination of classification, origin, and valuation, even if they use the services of a broker (CBSA, 2015).

Consult the CBSA's licensed customs broker list should you wish to use the services of a broker.

Resources:

- List of Licensed Customs Brokers

- Licensed Customs Brokers

4. Determine the country of origin for the goods to be imported

Contractors must identify the country of origin for goods. It is important to remember that this does not simply mean the country from which the product was shipped. It may also include where individual parts of the product are from, as well as where it was assembled into the final product (CBSA, 2015).

Requirements for proof of origin can be found in Memorandum D11-4-2, *Proof of Origin* (CBSA, 2015).

Resources:

- Memorandum D11-4-2, *Proof of Origin*

5. Ensure the goods to be imported are permitted into Canada

Certain goods are not allowed to be imported into Canada. For more information on prohibited products, contractors should consult Memoranda Series D9, *Prohibited Importations* (CBSA, 2015).

Resources:

- Memoranda Series D9, *Prohibited Importations*

6. Determine whether the goods to be imported are subject to any permits, restrictions, or regulations by the CBSA or other government departments

Many goods are subject to the requirements of other government departments and agencies (OGDs) and may require permits, certificates, and/or inspection. The CBSA is responsible for administering the legislated import requirements on behalf of other government departments. More than one government department may have a role to play in the requirements and regulations pertaining to the importation of certain goods. (CBSA, 2015).

Contractors would need to determine if goods to be imported are subject to regulations, restrictions, permits, or other requirements. The CBSA's Other Government Departments and Agencies: Reference List for Importers provides a list of some of the most commonly imported commodities that may require permits and/or certificates. More comprehensive information can be

found in Memoranda Series D19, *Acts and Regulations of Other Government Departments* (CBSA, 2015).

The CBSA requires certain goods to be clearly marked with the country of origin. More information on marking requirements is found in Memorandum D11-3-1, *Marking of Imported Goods* (CBSA, 2015).

Some goods are subject to measures under the *Special Import Measures Act* (SIMA). The special measures available under the SIMA include anti-dumping duties, countervailing duties, and undertakings. Consult the monthly index of products subject to SIMA and refer to Memoranda Series D14, *Special Imports Measures Act* (CBSA, 2015).

Before certain goods are imported into Canada, contractors must determine whether they are subject to domestic controls. Under the *Defence Production Act* (DPA) and the *Controlled Goods Regulations*, any person who examines, possesses or transfers controlled goods domestically is legally required to register with Public Services and Procurement Canada's (PSPC) Controlled Goods Program (CGP). A list of controlled items in Canada is available in the Schedule to the DPA and to further establish if the goods contractors may be importing are controlled in Canada, refer to PSPC's *Guide to the New Schedule to the Defence Production Act* (CBSA, 2015).

Resources:

- Other Government Departments and Agencies: Reference List for Importers
- Memoranda Series D19, *Acts and Regulations of Other Government Departments*
- Memorandum D11-3-1, *Marking of Imported Goods*
- Special Import Measures Act (SIMA)
- SIMA - Measures in Force
- Memoranda Series D14, *Special Imports Measures Act*
- *Schedule to the Defence Production Act*
- Guide to the New Schedule to the *Defence Production Act*

Classifying your goods

7. Determine the 10-digit tariff classification number for each item to be imported

Once contractors are sure that goods may be imported, contractors would need to determine the correct tariff classification number.

These numbers, along with the country of origin, are used to determine the rate of duty contractors must pay when importing (CBSA, 2015).

Most trading countries, including Canada, the United States, China, and India, use the Harmonized System (HS) as the basis of their classifications systems. The first six digits are a common identifier across countries using the HS for a particular good. The following four digits are unique to Canada and are used to establish the duty rates and for statistical purposes (CBSA, 2015). Tariff classification numbers can be determined by:

- Consulting the *Customs Tariff*;
- Contacting the Border Information Service (BIS);
- Requesting an advance ruling on a tariff classification by mail from a CBSA trade office.

Resources:

- Harmonized Commodity Description and Coding System (HS)
- *Customs Tariff*
- Border Information Service (BIS)
- CBSA Trade Operations Divisions
- Memorandum D10-13-1, *Classification of Goods*

Determining duties and taxes

8. Determine the applicable tariff treatment and rate of duty.

Once contractors have determined the correct tariff classification number, contractors would need to establish the tariff treatment that applies to goods before the rate of duty can be determined. When viewing the *Customs Tariff* Schedule, contractors should note two columns on the right hand side entitled "Most-Favoured-Nation (MFN) Tariff" and "Applicable Preferential Tariffs."

Most-Favoured-Nation (MFN) Tariff: Goods originating from all countries, except North Korea, are entitled to use the rate of duty specified under this column.

Applicable Preferential Tariffs: This column lists reduced rates of duty for goods based on trade agreements including:

- North American Free Trade Agreement (NAFTA): United States Tariff (UST), Mexico Tariff (MT), Mexico-United States Tariff (MUST);

- Chile Tariff (CT);
- Canada-Israel Agreement Tariff (CIAT);
- Canada-Costa Rica Tariff (CRT);
- Canada-European Free Trade Association Free Trade Agreement: Iceland Tariff (IT), Norway Tariff (NT), Switzerland-Liechtenstein Tariff (SLT);
- Canada-Peru Free Trade Agreement: Peru Tariff (PT);
- Canada-Colombia Free Trade Agreement: Colombia Tariff (COLT);
- Canada-Jordan Free Trade Agreement: Jordan Tariff (JT);
- Canada-Panama Free Trade Agreement: Panama Tariff (PAT);
- Canada-Honduras Free Trade Agreement: Honduras Tariff (HNT); and
- Canada-Korea Free Trade Agreement: Korea Tariff (KRT).

Or rates of duty based on special tariff provisions such as the:

- General Preferential Tariff (GPT);
- Least Developed Country Tariff (LDCT);
- Commonwealth Caribbean Countries Tariff (CCCT);
- Australia Tariff (AUT); and
- New Zealand Tariff (NZT).

The requirements of the particular trade agreement or tariff treatment must be satisfied to benefit from a preferential duty rate. Contractors must possess proof of origin for the specific trade agreement at the time of importation. A complete list of countries eligible for the above tariff treatments can be found at the beginning of the *Customs Tariff*. General tariff information and guidelines can be found in Memorandum D11, *General Tariff Information* (CBSA, 2015).

Resources:

- *Customs Tariff*
- Rules of Origin Regarding the Most-Favoured-Nation (MFN) Tariff
- Memorandum D11, *General Tariff Information*
- Memorandum D11-4-2, *Proof of Origin of Imported Goods*

9. Determine if goods are subject to the goods and services tax (GST), excise tax or excise duty

The GST is payable on most goods at the time of importation under Part IX, Division III of the *Excise Tax Act*. Tax exemption codes to use on the Canada Customs Coding Form B3, are listed in Memorandum D17-1-10, *Coding of Customs Accounting Documents*, Appendix H, List 4 (GST Status Codes) and List 7 (Excise Tax Exemption Codes). If goods are tax exempt, contractors must quote the tax exemption code on import documentation (CBSA, 2015).

Resources:

- *Excise Tax Act*, Part IX, Division III
- Canada Customs Coding Form B3
- Memorandum D17-1-10, *Coding of Customs Accounting Documents*
- Canada Revenue Agency (CRA)

10. Determine the value of the goods you are importing

Once the tariff classification number and the tariff treatment of imported goods is determined, the value for duty can be determined. In most cases, the value for duty is the amount paid for the goods. The declaration of value for duty should be supported by receipts or sales invoices. Documents must include a complete description of the goods, the selling price and conditions, and terms of the sale. The value for duty must be in Canadian funds (CBSA, 2015).

The *Customs Act* identifies six legislated methods of valuation. The method applicable to imported goods is the first method, considered in sequential order, for which all requirements of the method can be satisfied. For example, most goods are imported to Canada as a result of a sale for export to a purchaser in Canada. The value for duty would be based on the price paid or payable for the goods in that sale, if all the requirements of the transaction value method are met (CBSA, 2015).

Resources:

- Memorandum D1-4-1, *CBSA Invoice Requirements*
- *Customs Act*
- Memoranda Series D13, Valuation

11. Estimate in advance how much duty and taxes would be required

To convert the value into Canadian dollars using the exchange rate from the date of direct shipment (the date the goods began their direct and continuous journey to a specific destination in Canada). To obtain the proper exchange rate, call the BIS (CBSA, 2015).

Resources:

- Memorandum D13-1-2, *Direct Shipment of Goods*
- Border Information Service (BIS)

Shipping, examining, and reporting your goods

12. Select a method of shipping

Place orders with the vendor, shipper, or exporter and identify the mode of shipping that would be used (highway, marine, rail, air); then determine the CBSA office where goods would be released. Most shipments are released at the CBSA office where they arrive in Canada; however, if contractors use a CBSA bonded carrier, they may choose another inland service point (CBSA, 2015).

Resources:

- Directory of CBSA Offices and Services
- Commercial Carrier and Freight Forwarder Identification and Eligibility - Highway Carriers

13. Report goods

Commercial goods must be reported to the CBSA. Shipments may be monitored for compliance with CBSA requirements or other government department regulations. This is done without charge; however, if there is a need to hire a transport company to move or handle your goods, you may receive an invoice from that company for their services (CBSA, 2015).

Getting goods released

14. Obtain release of goods

There are two options for releasing goods: full accounting and payment of duties and release of goods prior to payment of duties. With both options, contractors may prepare the release and accounting documents or use a licensed customs broker. Regardless of method used, the CBSA would assign each shipment a 14-digit transaction number to identify your goods throughout the clearance process (CBSA, 2015).

Resources:

- Licensed Customs Brokers
- Memorandum D17-1-5, *Registration, Accounting and Payment for Commercial Goods*

After goods are released

15. Adjusting errors in the accounting information submitted

If contractors make an error in the accounting information, and the CBSA has not already made the corrections, contractors are required to correct the information within 90 days after discovery of the error. If a change in the accounting information results in a refund of duties or taxes paid, an application for a refund can be filed (in most cases up to four years from the date the goods were accounted) (CBSA, 2015).

Resources:

- Memorandum D17-2-1, *Coding of Adjustment Request Forms*
- Updated D17-2-1 – B2 Adjustment Request
- Memorandum D11-6-6, *"Reason to Believe" and Self-Adjustments to Declarations of Origin, Tariff Classification, and Value for Duty*
- Memorandum D6-2-3, *Refund of Duties*

16. Keep records of imports

Contractors must keep records of importations; this includes information relating to the quantities received, price paid, the country of origin, vendor, product, and all other related information (CBSA, 2015).

Resources:

- Memorandum D17-1-21, *Maintenance of Records in Canada by Importers*

Temporary Importation of Goods

There is provision in the Customs Tariff for goods imported temporarily, providing duty relief when the imported goods are not for sale, lease or for further processing. Therefore equipment (such as cranes, backhoes, bull dozers, etc.) may enter under the provisions of the Temporary Importation Regulations and receive full duty relief (CBSA, 2017d).

Generally, there is no provision for relief of GST and therefore the customs accounting documentation would account for GST on the

full value of the machinery being imported. The contractor may be required to self-assess the provincial component of the Harmonized Sales Tax (HST).

Resources:

- Temporary Importation of Conveyances

Temporary Importation of Vessels such as Barges

The CBSA, in association with the Canadian Transportation Agency (CTA) and Transport Canada, is responsible for administering a temporary admission program for commercial vessels. The program provides for the temporary, short-term market needs that cannot be met from existing fleet capacity in Canada. Under the program, foreign and non-duty paid vessel operators may apply (through a representative Canadian resident) to operate these vessels temporarily in Canada under a *Coasting Trade license* (Form C48), and on a duty-reduced basis when no suitable Canadian vessel is available to carry out a specific movement or provide a particular service.

The CTA is responsible for determining whether a suitable Canadian vessel is available to perform the coasting trade activity specified in the application. Once the CTA determines that no suitable Canadian vessel is available, the CBSA issues a letter of authority allowing the applicant to complete the process for a *Coasting Trade License* and start operations.

Reduction or Removal of Duties

Duties reduction and removal provisions for vessels are found in the *Vessel Duties Reduction or Removal Regulations*. These Regulations are set under an authority in a supplementary note to Chapter 89 of the *Customs Tariff* (CBSA 2016d).

Duty and tax relief may be available if vessels are temporarily imported for repair or other work. Tariff item No. 9993.00.00 of the Schedule to the *Customs Tariff* and Memorandum D8-1-1, *Amendments to Temporary Importation (Tariff Item No. 9993.00.00) Regulations*, provide information regarding duty relief for vessels temporarily admitted to Canada for repair or alteration (CBSA 2016d).

If vessels are temporarily imported into Canada for further processing, customs duty relief may be available through the

CBSA Duty Deferral program. Further information is available in Memoranda D7-4-1, *Duties Relief Program*, D7-4-2, *Duty Drawback Program,* and D7-4-3, *NAFTA Requirements for the Duty Drawback and the Duties Relief Programs* (CBSA 2016d).

Tariff item No. 9803.00.00 provides duty and tax relief for non-residents' conveyances and baggage, including non-commercial non-resident vessels imported for leisure use. For additional information see D2-1-1, *Temporary Importation of Baggage and Conveyances by Non-residents* (CBSA 2016d).

For vessels temporarily admitted to the coasting trade, the *Vessel Duties Reduction or Removal Regulations* provide for the reduction or removal of duties that apply under the *Customs Tariff* when certain terms and conditions are met (CBSA 2016d).

The duties reduction for vessels authorized to operate temporarily in the coasting trade are under what is referred to as the "1/120 provision." The exceptions to the above are vessels authorized to operate in the coasting trade of Canada in an "intercoastal movement" on condition that no suitable Canadian vessel is available. In such cases, duties on the vessel would be reduced to zero for that movement (CBSA 2016d).

In addition, the *Vessel Duties Reduction or Removal Regulations*, under specified conditions, reduce or remove duties that apply to certain vessels returning to Canada after being repaired or modified. These regulations also provide tax relief for vessels temporarily imported for storage (tariff item No 9993.00.00 provides customs duty relief for such vessels) (CBSA 2016d).

Resources:

- *Vessel Duties Reduction or Removal Regulations*
- *Customs Tariff*
- Memorandum D8-1-1, Amendments *to Temporary Importation (Tariff Item No. 9993.00.00) Regulations*
- D7-4-1, *Duties Relief Program*
- D7-4-2, *Duty Drawback Program*
- D7-4-3, *NAFTA Requirements for the Duty Drawback and the Duties Relief Programs*
- D2-1-1, *Temporary Importation of Baggage and Conveyances by Non-residents*

Export of Goods

Goods, materials, and supplies exported from Canada during the construction of the International Bridge falls under the jurisdiction of the CBSA. The CBSA has a step-by-step guide with an overview of the commercial exporting process for businesses exporting goods from Canada. It is intended to complement and not replace existing regulations, acts, and references detailed in Memoranda Series D1 to D22 dated June 2016 (CBSA, 2017c). The steps for businesses importing goods into Canada include:

Preparing to Export

1. Obtain a Business Number

Before exporting commercial goods from Canada, contractors would need to obtain a BN issued by the CRA for an import/export account. This import/export account is free of charge and can usually be obtained in a matter of minutes. To register for a BN, contractors can either call the CRA's Business Window at 1-800-959-5525 or visit the CRA's BRO (CBSA, 2017c).

Resources:

- Business Registration Online (BRO)

2. Identify goods to be exported

Contractors should have an accurate description of the goods to export before proceeding. An accurate description would help determine if the goods are regulated, controlled or prohibited by other government departments or if a permit or license is required. The CBSA assists OGDs by applying their legislation relating to the exportation of various commodities (CBSA, 2017c).

Resources:

- Other Government Departments and Agencies: Reference List for Exporters

3. Determine if a licensed customs broker would be used

The CBSA licenses customs brokers to carry out customs-related responsibilities. A broker's service in relation to exporting typically includes:

- Obtaining, preparing and presenting or transmitting the necessary documents or data;
- Maintaining records; and

- Responding to any CBSA concerns (CBSA, 2017c).

Contractors prepare their own export documentation and transact business directly with the CBSA, or contractors can authorize a Licensed Customs Broker to act as their agent to transact business. It is important to remember that as the exporter, you are ultimately responsible for completing and presenting the exporting documentation, and any subsequent corrections to the documentation, even if you use the services of a broker (CBSA, 2017c).

Consult the CBSA's licensed customs broker list should you wish to use the services of a broker (CBSA, 2017c).

Resources:

- Licensed Customs Brokers
- List of Licensed Customs Brokers

4. Determine the country of origin for the goods to be exported

The origin of goods to be exported can affect permit requirements. A permit is not required to export United States origin goods back into the United States.

Resources:

- Memoranda Series D11, General Tariff Information

5. Ensure the goods are permitted to be exported from Canada

Certain goods cannot be exported from Canada.

Resources:

- Export Controls

6. Determine whether the goods to be exported are subject to any permits, restrictions or regulations by the CBSA or other government departments

Some goods may be subject to the requirements of OGDs and may require permits, certificates, and inspection. The CBSA is responsible for administering export requirements on behalf of OGDs. It should be noted that more than one government department may have a role to play in the requirements and

regulations pertaining to the export of certain goods; it is therefore beneficial to contact any that may play a role (CBSA, 2017c).

Contractors should verify whether the goods to be exported are controlled, regulated or prohibited by any government department or agency. Contractors should obtain an export permit if required (CBSA, 2017c).

Resources:

- Other Government Department and Agencies: Reference List for Exporters
- Memoranda Series D19, *Acts and Regulations of Other Government Departments*

7. Ensure goods to be exported are allowed entry into the U.S.

Contractors should verify that their products meet the import requirements of the U.S. (CBSA, 2017c).

Determining if an Export Declaration is Required

8. Determine whether or not goods need to be declared on an export declaration

Certain goods are not required to be reported on an export declaration. The exempted goods are listed in Memoranda Series D20 and are further explained in Memorandum D20-1-1, *Export Reporting* (CBSA, 2017c).

If the export matches one of the exemptions on the list, contractors should advise their carrier and indicate "No Declaration Required" (NDR) with the proper explanation or corresponding numerical code on the transport documentation (cargo control document, manifest, bill of lading, etc.) (CBSA, 2017c).

Resources:

- Memorandum D20-1-1, Export Reporting
- Export Reporting - No Declaration Required

Classifying Exports

9. If an export declaration is required, determine the appropriate export code

Once contractors have determined that the goods may be exported, and that submitting an export declaration is required, contractors must classify the goods. Depending on the method of reporting, either the Statistics Canada eight-digit Canadian Export

Classification number or the ten-digit Canadian Tariff Classification number is used. If contractors are using the Canadian Automated Export Declaration (CAED) to submit their declaration, they must use the eight-digit Canadian Export Classification number (CBSA, 2017c).

The Canadian Export Classification number is based on an international six-digit 'root' with an additional two digits for Canadian domestic purposes for a total of eight digits. To obtain the eight-digit Canadian Export Classification number, contractors can call Statistics Canada at 1-800-257-2434 or consult the Statistics Canada, Canadian Export Classification online (CBSA, 2017c).

To obtain the ten-digit Tariff Classification Number, contractors can consult the Customs Tariff or contact the BIS (CBSA, 2017c).

Resources:

- Canadian Export Classification
- Customs Tariff
- Border Information Service (BIS)
- Memorandum D10-13-1, *Classification of Goods*

Shipping and Reporting Goods

10. Determine shipping method and identify the reporting time frame

If contractors are required to report their export to the CBSA, they are required to do so prior to export, and according to specific timeframes depending on the mode of transportation used. When more than one mode of transportation is used to export goods, the timeframes for reporting for each of these modes apply concurrently (CBSA, 2017c).

Goods are to be reported at a designated export office inland or at the border. Export permits, licenses, or certificates must be presented before the goods are exported and the location would be specified on the permit. If the permit, license, or certificate does not name a place of exit, the permit, license, or certificate and the export declaration (if required) must be presented to the export reporting office closest to the place of exit (CBSA, 2017c).

Shipments may be examined by government officials to monitor compliance with CBSA requirements or other government department regulations (CBSA, 2017c).

Resources:

- Memorandum D20-1-1, *Export Reporting*
- Directory of CBSA Offices and Services
- Offload Policy for Highway Examinations

11. Submit export declaration if required

If contractors are required to report exports, contractors must submit an export declaration by:

- **Canadian Automated Export Declaration (CAED):** An electronic method of reporting exports allowing quick preparation of export declarations.
- **G7 Electronic Export Declaration Process:** This process allows exporters or their agents to file their export declaration using Electronic Data Interchange (EDI).
- **Summary Reporting:** This method is reserved for approved exporters of low-risk goods who export on a regular basis and have met specific CBSA requirements. It enables contractors or agents to summarize required export data, which can be submitted on a monthly basis, in writing, after the goods have left Canada.
- **B13A, *Export Declaration*:** When electronic permit reporting options are not available; the requirement to present a paper copy of the electronic export declaration and OGD permit at the CBSA office closest to the point of exit remains unchanged using the B13A, Export Declaration (CBSA, 2017c).

Resources:

- Canadian Automated Export Declaration (CAED)
- G7 Electronic Data Interchange Export Reporting
- Summary Reporting (#34 and #35)
- B13A, *Export Declaration*

12. Present proof of export if required.

In some cases, the CBSA requires exporters to produce proof of export that the goods have been exported or have been destroyed. This would apply to goods that were initially imported into Canada under a temporary importation agreement such as a Temporary Admission Permit (form E29B) or the ATA Carnet program (CBSA, 2017c).

Resources:

- Memorandum D20-1-4, *Proof of Export, Canadian Ownership, and Destruction of Commercial Goods*
- Temporary Admission Permit (form E29B)
- ATA Carnet

After Goods are Exported

13. Provide a Certificate of Origin to the receiver of the goods if requested

The certificate of origin is a signed declaration from the manufacturer that the goods are of Canadian origin and meet the requirements of a free trade agreement. The exporter forwards a copy of the certificate of origin to the importer and retains a copy for his records (CBSA, 2017c).

Resources:

- Memorandum D11-4-14, *Certificate of Origin Under Free Trade Agreements*

14. Procedures to follow to cancel or amend an export declaration

Contactors may have to cancel a shipment or modify information about a shipment already reported. If so, contractors must submit an amended declaration to an export reporting office clearly identifying the changes. There are different procedures depending on the original reporting method:

- **CAED or G7 EDI Export Reporting –** use the "amend" feature in the program to submit an amended declaration;
- **Summary Reporting –** notify Statistics Canada; and
- **Form B13A –** submit an amended Export Declaration to the export reporting office where you presented your original export document (CBSA, 2017c).

Resources:

- Canadian Automated Export Declaration (CAED)
- G7 Electronic Data Interchange Export Reporting
- Summary Reporting (#34 and #35)
- Statistics Canada
- B13A, *Export Declaration*

15. Keep all records pertaining the export

Contractors must keep records of exportations.

Resources:

- Memorandum D20-1-5, *Maintenance of Records and Books in Canada by Exporters and Producers.*

16. Be aware that the CBSA uses an Administrative Monetary Penalty System (AMPS)

The CBSA uses the Administrative Monetary Penalty System (AMPS) to assess monetary penalties against businesses that do not comply with customs legislation (CBSA, 2017c).

Resources:

- Administrative Monetary Penalty System (AMPS)

Foreign Workers

Immigration

Individuals working in Canada must be Canadian citizens, permanent residents, or hold a current work authorization issued by Citizenship and Immigration Canada (CIC) or CBSA.

Human Resources and Skills Development Canada (HRSDC) is the department of the Canadian government responsible for developing, managing, and delivering social programs and services (CCSD, 2017). If there are insufficient numbers of qualified workers, the contractor may seek foreign worker Employment Validation from HRSDC. The contract may need to satisfy HRSDC that a reasonable attempt has been made to secure Canadian labor.

Under the Temporary Foreign Worker Program, employers can apply for a Labour Market Impact Assessment (LMIA) before a temporary foreign worker (TFW) has been identified. LMIA applications that do not contain the names of the TFWs would be assessed by Employment and Social Development Canada (ESDC)/Service Canada and employers who meet the requirements would receive a positive "Unnamed LMIA," valid for 6 months (ESDC, 2017).

The process for an unnamed LMIA application consists of:

I. The employer submits a LMIA application without completing the "Foreign Worker Information" section or by indicating "Unnamed" in that section.

II. The application must be accompanied by all supporting documentation as the assessment is the same as a standard LMIA application.
III. The employer must continue to make efforts to recruit Canadians and permanent residents until the names of the TFWs have been provided.
IV. ESDC/Service Canada verifies that the LMIA application meets the criteria for an unnamed LMIA, and assesses the application according to the Program requirements.
V. If the result of the assessment is positive, a positive LMIA letter labelled "Unnamed LMIA" would be sent to the employer for a given number of positions, and a specific period of employment. The letter would include a "Foreign Worker Name Template".
VI. As soon as the TFWs have been identified, the employer must complete and submit the "Foreign Worker Name Template" to ESDC/Service Canada.
VII. ESDC/Service Canada would add the names of the TFWs into the system and issue an official positive LMIA letter to the employer within 5 to 10 business days. The official positive LMIA letter would include the same expiry date as the unnamed positive LMIA letter (ESDC, 2017).

TFWs must apply for a work permit from Immigration, Refugees and Citizenship Canada (IRCC) before the expiry date of the positive LMIA. Their applications for a work permit must include a copy of the official positive LMIA letter, the annexes, and the employment contract (ESDC, 2017).

Resources:

- Human Resources and Skills Development Canada (HRSDC)
- What is a Labour Market Impact Assessment (LMIA)

Work Authorizations

Individuals working in Canada must be Canadian citizens, permanent residents or hold a current work authorization issued by CIC or CBSA. Work authorizations are issued for a fixed period of time (temporary) and are specific to the work being done, the individual doing the work and the work location. There is a fee for issuing a work authorization (CIC, 2017).

In the majority of cases, CIC and CBSA would insist on having ESDC LMIA to support requests for work authorizations (CIC, 2017).

Resources:

- Work in Canada Temporarily

Labour Market Impact Assessment (LMIA)

At the request of an employer, ESDC would issue a LMIA to support a request for work authorization. ESDC can also issue a LMIA at the direct request of CIC/CBSA Officers (ESDC, 2017).

To request a LMIA, an employer must complete the Request for a LMIA application form and submit it to the Service Canada location where the work is being done (ESDC, 2017).

In response to the request, ESDC can issue either a positive or negative opinion depending on the potential impact on the Canadian Labor market (ESDC, 2017).

Resources:

- What is a Labour Market Impact Assessment (LMIA)

Worker Safety

Contractors are responsible for preventing workplace accidents and injuries, and promoting safe and healthy workplaces. These responsibilities and obligations fall under Part II of the *Canada Labour Code* and apply to workplaces under federal jurisdiction only (Labour Program, 2016).

Contractors would need to ensure that employees have the necessary information, training and supervision to perform their jobs safely. Managers, supervisors, health and safety committees, and representatives must understand their roles and responsibilities under the Canada Labour Code. Additional areas of obligations and responsibilities under the Canada Labour Code are investigations, inspections, accident reporting, and the Hazard Prevention Program (Labour Program, 2016).

Contractors are responsible for:

- An appropriate understanding of overall work safety procedures;

- Knowledge of the safe use of workplace tools and equipment;
- Awareness of known or foreseeable workplace hazards; and
- (Whenever possible) training sessions should include documentation (Labour Program, 2016).

Contractors would need to ensure that health and safety committees/representatives understand their duties with respect to:

- Maintaining regular meetings (this applies to committees only);
- Conducting monthly inspections; and
- Participating in accident investigations and job hazard analyses (Labour Program 2016).

Contractors would need to ensure that managers and supervisors understand their duties related to the internal complaint resolution process, refusals to work, and accident investigations and reporting (Labour Program, 2016).

New Brunswick

WorkSafeNB (Travail Sécuritaire NB) enforces the New Brunswick *Occupational Health and Safety Act* (OHS). The OHS Act sets out the rights and duties of all parties in the workplace. It establishes procedures for dealing with workplace hazards and it provides for enforcement of the law where compliance has not been achieved voluntarily by workplace parties. Employers should note that the OHS Act makes it clear that the employers have the greatest responsibilities with respect to health and safety in the workplace (WorkSafeNB, 2017).

Contractors will need Workplace Safety and Insurance Board (WSIB) coverage. The WSIB is a government agency that provides no-fault compensation for New Brunswick workplaces covered under the *Workplace Safety and Insurance Act, 1997* (WSIB, no date).

Resources:

- Federally Regulated Businesses and Industries
- Health and Safety Committees and Representatives
- Hazard Prevention Program
- Workplace Safety
- WorkSafeNB
- New Brunswick Occupational Health and Safety Act
- Guide to OHS Legislation

- Bill 119 Mandatory Coverage for the Construction Industry

IV. ADDITIONAL INFORMATION

For additional information, please contact:

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V. VISITING THE PROJECT SITE

It is suggested that persons traveling to the Madawaska LPOE or Edmundston POE for purposes of viewing the International Bridge and adjoining areas carry their passport at all times even if they don't anticipate leaving their home country and observe the following protocols.

Madawaska LPOE

- When planning to visit the International Bridge and the LPOE, contact Mr. Cyr at least a few days in advance and provide the names of the individuals and their birthdates.
- When arriving at the LPOE, proceed directly to the front desk and ask to speak to Mr. Cyr (he may or may not be on duty and available).
- For Canadian citizens visiting the U.S. for meetings, a U.S. Visa is not required.
- A photo permit is not required to take photos. When taking photos, under no circumstances should any officers or their vehicles appear in any photographs.
- When taking photos or videotaping, respect other's privacy and do not include their license plate numbers in the photo or videotape.

Mr. Scott Cyr
U.S. Customs and Border Protection
LPOE Director
(207) 728-4565 or mobile (207) 538-6797
Scott.P.Cyr@Cbp.Dhs.Gov

Edmundston POE

- When planning to visit the International Bridge and the POE, contact Mr. Poitras at least a few days in advance with: names of individuals, purpose of visit, dates of visit.
    - If a group of people would be visiting the International Bridge and the POE, provide a "master list" of persons to the CBSA. The master list should include: full name, citizenship and birthday.
- When arriving at the POE, proceed directly to the front desk. Inform the officer on duty of your arrival.
- All persons visiting the International Bridge and the POE must check in/check out with the office at the front desk every day.
- A photo permit is not required to take photos. When taking photos, please respect the officers, their vehicles, and their privacy.
- When taking photos or videotaping, respect other's privacy and do not include their license plate numbers in the photo or videotape.
- For U.S. citizens visiting the International Bridge and the POE, a work permit is not required. If arriving in Canada via an airport, others may not have the same understanding and a work permit from IRCC may be required.

Sylvain Poitras
Chief of Operations
Canada Border Services Agency
Chief of the Edmundston POE
(506) 739-0360
Sylvain.Poitras@cbsa-asfc.gc.ca

Port of Entry Phone: (506) 739-1820

General Inquiries visit Border Information Services (BIS) at: https://www.cbsa-asfc.gc.ca/contact/bis-sif-eng.html
Phone:
Calls within Canada Toll Free: 1-800-461-9999

Calls outside Canada: 1-204-983-35001-506-636-5064
Media Inquiries: communicationsatl@cbsa-asfc.gc.ca

Please understand these are only guidelines for purposes of viewing the International Bridge and adjoining areas and subject to others' interpretation and change.

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