MMM Group Limited

SOUTHERN RED RIVER VALLEY REVIEW OF TRADE ROUTE NETWORK AND RED RIVER CROSSINGS

FINAL REPORT

Prepared for:

Manitoba Infrastructure

Submitted by:

WSP | MMM GROUP

May 2016 | 5515004.161

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STANDARD LIMITATIONS

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1.0 INTRODUCTION

1.1 Project Background

South central Manitoba's agricultural, recreational, commercial, and business activities are an important contributor to the Province's economy. The efficient movement of truck traffic through the Red River Valley is important for the development and growth of the area as PTH #75 is the main connection to the USA via the border crossing at Emerson. The cities, towns and urban centres in the area are major contributors of traffic including trucking. Some of these centres are projected to grow in population over the next twenty years, which would result in an increase in traffic. The area is also home to a large number of agricultural producers, suppliers and exporters along with commercial and industrial operations that all require efficient routes to move their goods. Traffic to and from Winnipeg the will continue to increase with commuters from communities in the study area traveling to the City for work, personal business, education, or recreational purposes. Traffic to the United States of America (USA) is also expected to continue to increase as the population in the Province grows and as CentrePort develops.

All of the grain elevators in the study area are located along the CPR line, parallel to Provincial Trunk Highway (PTH) 75 on the west side of the Red River, which requires all producers on the east side to cross the Red River to deliver grain to the elevators. As such, efficient, RTAC rated routes to cross the Red River and access the elevators are required. Currently, the only RTAC rated routes to accommodate trips to/from the east side of the Red River to/from PTH 75 is PTH 100 (Winnipeg's Perimeter Highway) and a short portion of PR 201, which is RTAC rated from PTH 75 to PR 200 (approximately 10 km).

The Emerson-Pembina border crossing on PTH 75 is a key location for cross border traffic, both personal and commercial. The border crossing is one of the top five Canada-USA ports-of-entry in terms of truck trade value. Manitoba Infrastructure recently undertook a study to examine modifications at the crossing that will provide additional capacity, with one of the recommendations being new commercial lanes which are currently in the design phase. CentrePort Canada is experiencing industrial and commercial development, which is projected to increase in the future. This is expected to include goods movement traffic through the study area to the USA.

Manitoba Infrastructure is also making PTH 75 less flood-prone, a project which is being undertaken by KGS, with support from MMM Group Limited (MMM). Total flood proofing is not the goal, as I-29 is subject to flooding at times and the North Dakota Department of Transportation (NDDOT) does not have plans to make it less flood-prone. Therefore, PTH 75 need only remain open as long as I-29 and the border are also open to traffic. This means that there is still a need to have alternative RTAC routes that would be available to accommodate traffic diverted from PTH 75 when it is closed due to flooding (although once the PTH 75 work is completed, including new measures at Morris, the closure days should be significantly reduced over the current situation).

In order to minimize disruption to trade and commerce, as well as recreational travel, a network of RTAC rated routes is required, both for north-south travel between south central Manitoba and the US, and also for east-west travel across the Red River.

1.2 Study Goals and Objectives

MI's study goals and objectives were set out in the Terms of Reference appended to the original Request for Proposal. It identified that the three key goals/objectives of this study are:

1. Reviewing and finalizing a 'Trade Route' (RTAC) network for the study area that includes appropriate connections to the USA.
2. Determining the adequacy of existing Red River crossings to meet current and future travel demand in the study area.
3. Assessing the need for, and location of, new connections across the Red River and/or possible rationalization of existing crossings.

A key objective of this Study is the identification of a trade route network (i.e., RTAC routes) within the study area that can provide appropriate connections to the USA and across the Red River for commercial trucks. An effective trade route network must have the ability to efficiently accommodate higher vehicle weights for commercial truck traffic so as to improve trucking efficiency in support of economic and social development. In Manitoba, the highest allowable gross vehicle weight on provincial highways is referred to as RTAC loading.

Not all routes are capable of providing the necessary structural capacity (i.e., load carrying capacity) to accommodate RTAC loading. Furthermore, it is not feasible for all routes to accommodate RTAC loading, as routes that can carry RTAC loading are more expensive to construct and maintain than roads with lower allowable gross vehicle weights.

Developing a network of RTAC routes in the southern Red River Valley that accommodates heavier truck traffic will provide the following benefits:

- Encourage and support economic development throughout the region by improving transportation efficiency;
- Provide more direct routes for trucks carrying heavy loads across the Red River;
- Identify routes on which truckers can carry heavier loads;

- ➢ Focus Manitoba Infrastructure's limited funding on providing additional structural capacity (i.e., higher allowable gross vehicle weights) on the routes that have been identified; and
- ➢ Identify to business developers where new developments can locate with access to RTAC routes.

1.3 Study Area

The study area identified for this project is illustrated in **Figure 1** and extends from the southern limit of Winnipeg to the USA border and Steinbach on the east side of the river to Morden on the west side of the river.

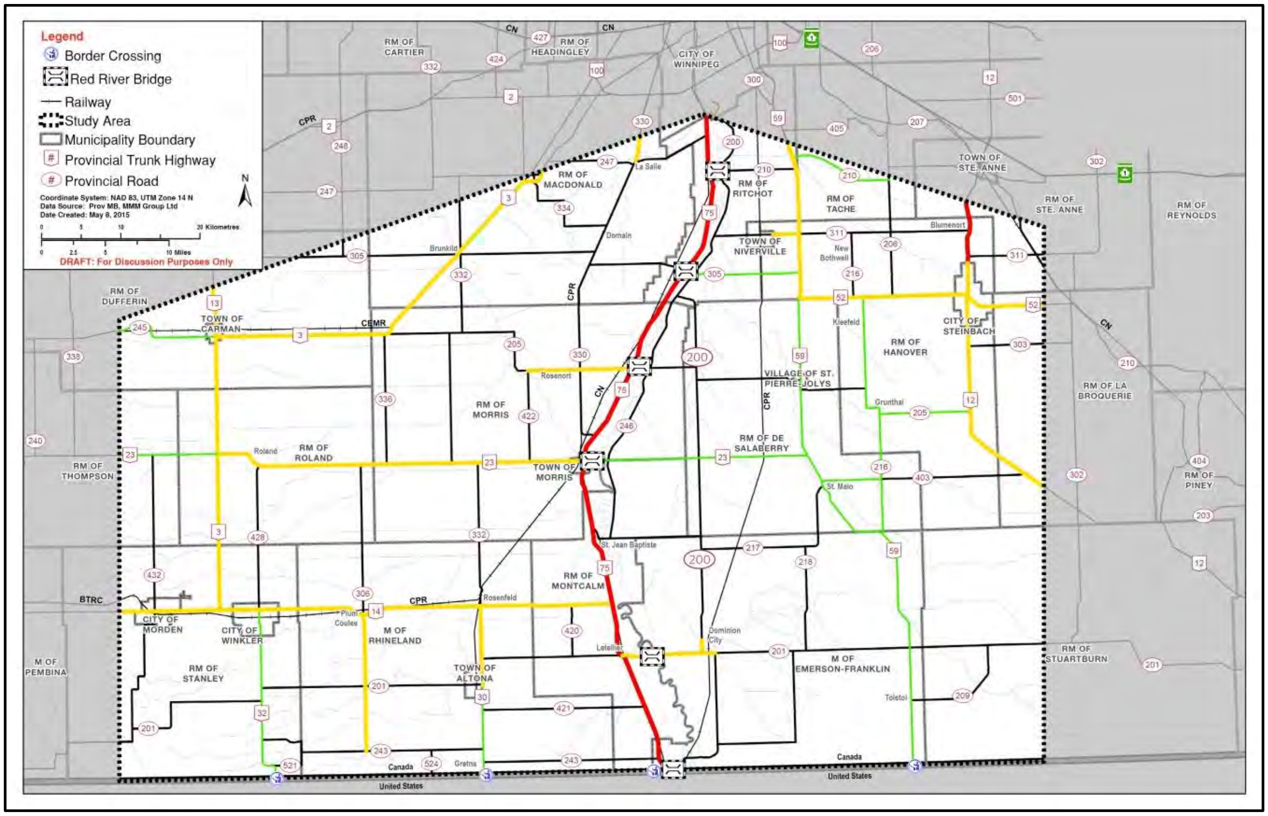


Figure 1: Study Area

1.4 Scope of Work

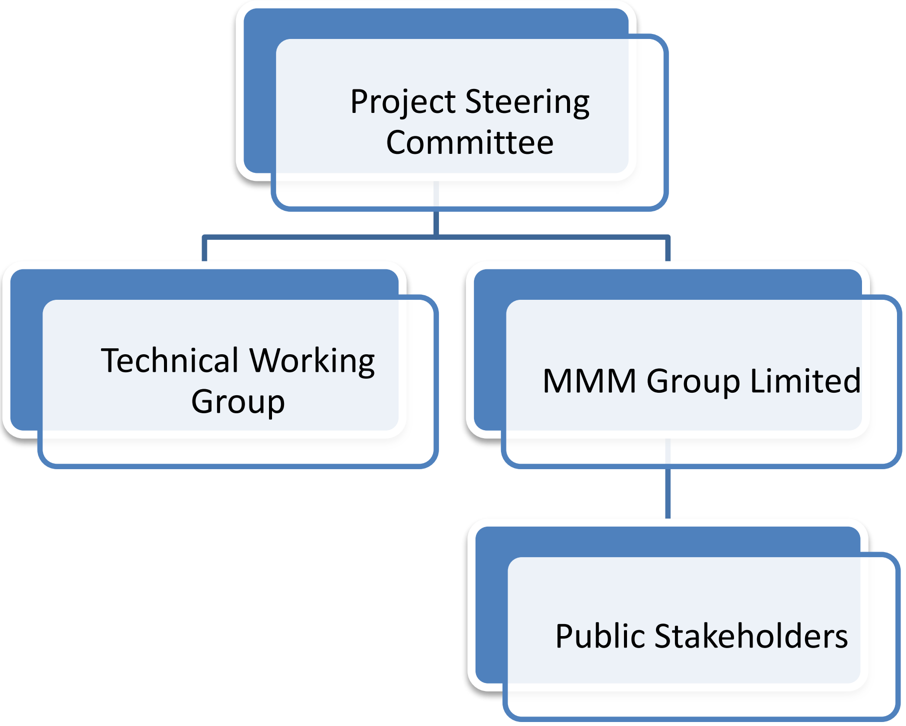
The purpose of the study is to assess the adequacy of existing Red River crossings to meet existing and future travel demands, assess the need for any additional Red River crossings and potential locations, and finalize a recommended network of RTAC routes for the study area that includes appropriate connections to the USA.

The following scope of work was completed as part of this study:

- Identify major users of the transportation network;
- Identify current and future demographic and economic profiles of major communities throughout the study area;
- Identify existing and future land uses based on available land use plans;
- Determine traffic volumes and composition on the provincial highway network in the study area;
- Catalogue the status of current river crossings between Winnipeg and the USA border;
- Conduct a scan of river crossing densities among similar North American regions;
- Determine the adequacy of existing Red River crossings to meet existing and future travel demand in the study area;
- Conduct a review of the proposed Strategic Trade Route network located within the study area;
- Review recommendations from the hydraulic study and consider the options proposed to address flooding-related highway closures;
- Review recommendations from previous Manitoba Infrastructure studies located in the study area including:
  - PTH 75 Morris by-pass;
  - Pembina-Emerson Point of Entry (PoE) Phase 1 Conceptual Study;
  - Pembina-Emerson PoE Phase 2 Functional Design Study; and
  - Manitoba Infrastructure's internal bridge analysis.
- Establish a preferred network of east-west and north-south RTAC trade routes throughout the study area that includes appropriate connections to the USA; and
- Conduct a community consultation program.

1.5 Study Organization

The study was undertaken by MMM Group Limited, with support from KGS Group, under the direction of an Manitoba Infrastructure Steering Committee. A Technical Working Group was also created to provide technical input to the study team as needed.



2.0 ENVIRONMENTAL SCAN

An environmental scan was conducted to identify the major users of the transportation network, current and future demographic and economic profiles of major communities throughout the study area, existing and future land uses based on available land use plans, traffic volume and composition on the provincial highway network, and the status of current river crossings between Winnipeg and the USA border. This information was used to assess both the existing and anticipated future needs for the transportation network within the study area.

2.1 Land Use Review

The Red River Valley Transportation Study Area includes the following 24 Municipalities and one First Nation:

1. Village of St. Pierre-Jolys
2. Town of Niverville
3. Town of Morris
4. Town of Altona (member of the RPGA Planning District)
5. Town of Carman (member of the Carman – Dufferin Planning District)
6. City of Winkler (member of the MSTW Planning District)
7. City of Morden (member of the MSTW Planning District)
8. City of Steinbach
9. Rural Municipality of Macdonald (member of the Macdonald – Ritchot Planning District)
10. Rural Municipality of Ritchot (member of the Macdonald – Ritchot Planning District)
11. Rural Municipality of Hanover
12. Rural Municipality of Morris
13. Rural Municipality of De Salaberry
14. Rural Municipality of Ste. Anne
15. Rural Municipality of La Broquerie
16. Rural Municipality of Dufferin (member of the Carman – Dufferin Planning District)
17. Rural Municipality of Thompson (member of the MSTW Planning District)
18. Rural Municipality of Roland
19. Rural Municipality of Stanley (member of the MSTW Planning District)
20. Rural Municipality of Stuartburn
21. Rural Municipality of Montcalm
22. Rural Municipality of Taché
23. Municipality of Emerson - Franklin (formerly the Town of Emerson and RM of Franklin)

24. Municipality of Rhineland (formerly the RM of Rhineland, Town of Gretna and Town of Plum Coulee and member of the RPGA Planning District)
25. Roseau River Anishinabe First Nation

The following sub-sections include land use analyses for all the Municipalities and Planning Districts in the Study Area. Population projections were developed and analyzed in conjunction with land use plans to forecast the amount and location of growth in a Municipality or Planning District. The outcome of this analysis is presented in **Table 3**, which will be considered when developing the Trade and Tourism Route network options.

2.2 Land Use Analysis

Land use and development are reviewed to highlight nodes where traffic is traveling to and from in the study area. The majority of land in the study area is designated Agricultural and is used mainly for grain farming and livestock operations. There are also multiple cities, towns, a village, urban centres and clusters of rural residential development, presented on a land use map in **Appendix A**. Some of these areas, which are within the commuter shed of Winnipeg, have people commuting to the city daily (e.g., St. Adolphe, Niverville, La Salle, etc.). There are also many designated industrial and commercial areas, generally located within cities, towns and urban centres. Some municipalities have designated commercial and industrial growth areas along major routes outside of developed areas. All of the grain elevators in the Study Area are located on the west side of the Red River, many along the CPR line, which approximately parallels the river and PTH 75. This requires all producers on the east side to cross the Red River to deliver grain to the elevators.

Development outside the study area will also generate significant traffic. Major sources of traffic include commercial traffic to and from Provinces to the east and west accessing the USA via PTH 75, and people traveling to/from the USA from central Manitoba. CentrePort Canada is experiencing industrial and commercial development, which is projected to increase substantially in the future. This is expected to include goods movement traffic through the study area to the USA.

A combined land use map representing development plan designations from all Municipal and Planning District Development Plans in the study area is presented in **Appendix A**. This generally identifies traffic generation nodes including residential growth areas and industrial/commercial growth areas.

2.3 Existing Route Designation Systems

To help guide investment in the provincial highway network, Manitoba Infrastructure has identified major trade routes that are already known to accommodate significant commercial truck traffic and freight movements. This information can be helpful in determining which routes should be upgraded to provide the necessary additional structural capacity to accommodate RTAC loading.

2.3.1 Strategic Trade Routes

Manitoba Infrastructure has identified the following routes within the study area as Major Trade and Tourism routes:

- PTH 3 from PTH 100 to west of the study area;
- PTH 12 from PTH 1 to the Canada-USA border;
- PTH 14 from PTH 75 to PTH 3;
- PTH 23 from PTH 75 to PTH 59;
- PTH 30 from PTH 14 to Canada-USA. border;
- PTH 32 from PTH 14 to the Canada-USA. border;
- PTH 52 from PTH 59 to PR 302;
- PTH 59 from PTH 100 to the Canada-USA. border; and
- PTH 75 from PTH 100 to the Canada-USA. border.

These routes are illustrated in **Figure 2**.

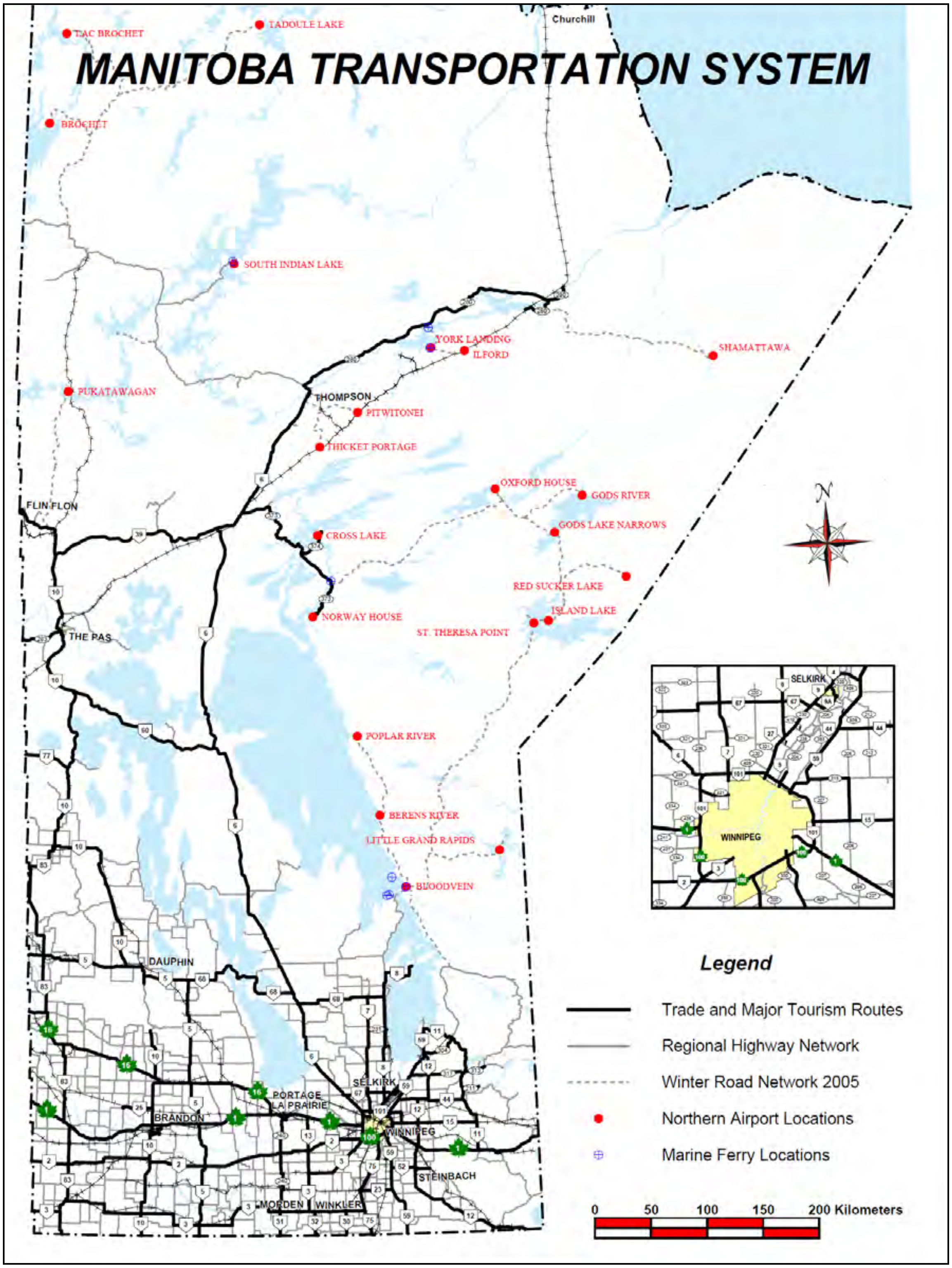


Figure 2: Manitoba Transportation System

2.3.2 RTAC Network

RTAC loading is the highest gross vehicle weight that Manitoba Infrastructure allows on the provincial highway network. Other loading categories on the provincial highway network include A1 loading and B1 loading. The maximum axle weights by truck type are illustrated in **Appendix B**.

The study area includes the following RTAC designated routes:

- PTH 3 from the City of Winnipeg to PTH 83;
- PTH 12 from PTH 1 to the USA border;
- PTH 14 from PTH 75 to PTH 3;
- PTH 23 from PTH 75 to PTH 3;
- PTH 30 from PTH 14 to the south junction with PR 201;
- PTH 52 from PTH 59 to PR 210;
- PTH 59 from the City of Winnipeg to PTH 52;
- PTH 75 from the City of Winnipeg to the USA border; and
- PR 201 from PTH 75 to PR 200.

All PTHs numbered 1 to 110 that are not designated as RTAC routes are designated Class A1. The following Provincial Roads (PR) within the study area are also Class A1 designated routes:

- PR 205 from the north junction with PR 216 to PTH 12;
- PR 210 from the north junction with PTH 59 to PR 206;
- PR 216 from PTH 52 to PTH 59;
- PR 305 from PTH 59 to PTH 75; and
- PR 403 from PTH 59 to PR 216.

Class B1 roads are all Provincial Roads numbered higher than 110 that have not been upgraded to handle RTAC or A1 loading.

All RTAC, A1 and B1 routes are illustrated in **Figure 3**.

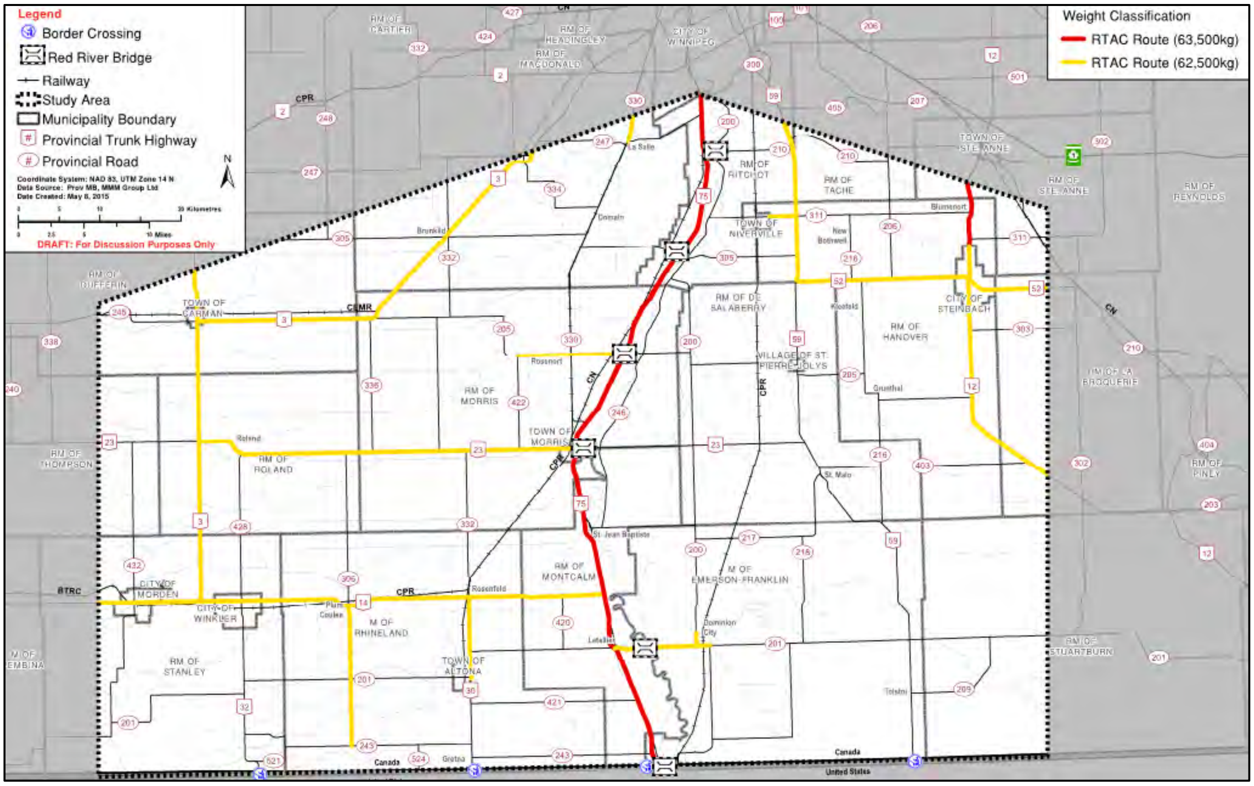


Figure 3: Existing RTAC Routes

2.4 Existing Traffic Volumes

Annual average daily traffic (AADT) is the number of vehicles passing a specific point on an average day of the year. The AADT volumes were obtained using the Manitoba Highway Traffic Information System (MHTIS) operated by the University of Manitoba Transport Information Group (UMTIG). Historical traffic volumes dating as far back as 1989 were available for the majority of the study area. The 2014 daily traffic volumes (the latest available data) throughout the study area are shown in **Figure 4**, taken from MHTIS's 2014 traffic flow map.

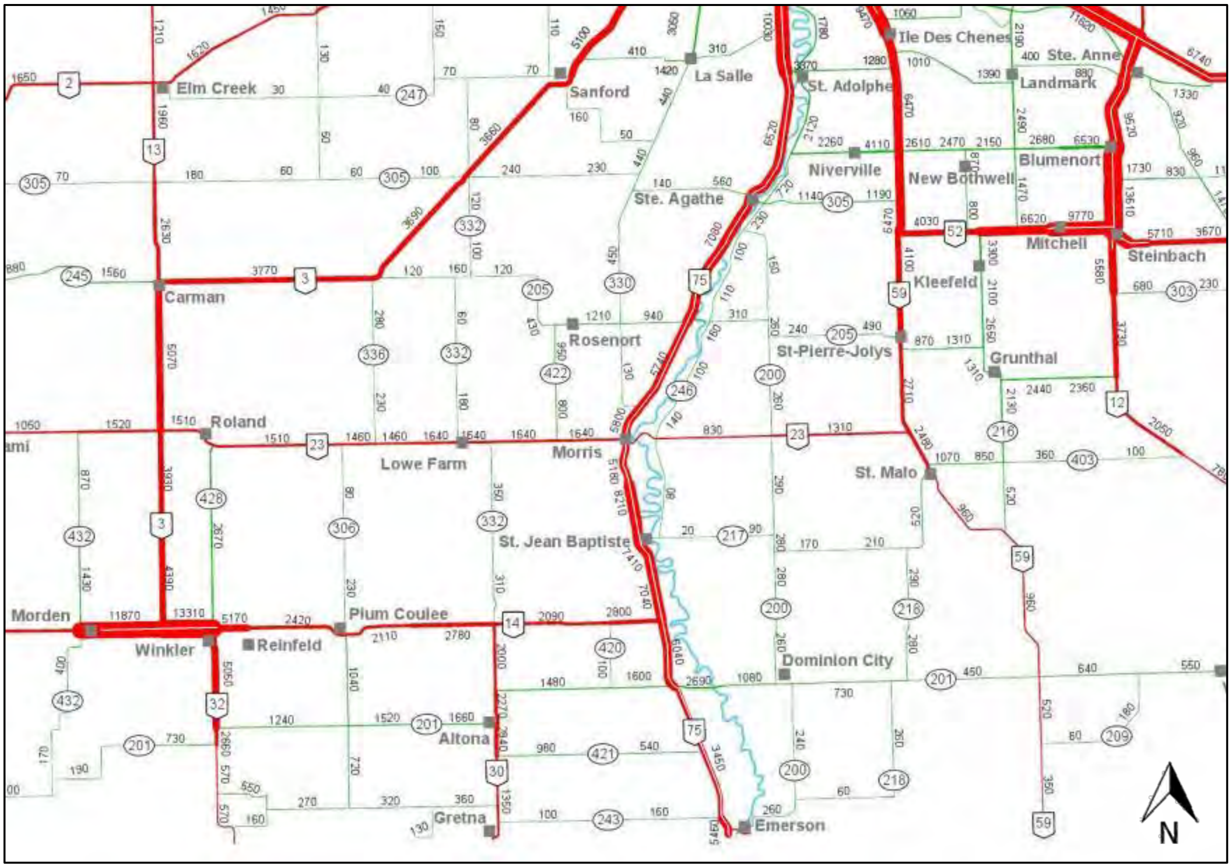


Figure 4: 2014 Traffic Flow Map

2.5 Border Crossings Review

A conceptual planning study was conducted in 2013 by Gannett Fleming in conjunction with Manitoba Infrastructure, North Dakota Department of Transportation, Transport Canada, Canada Border Services Agency, USA Customs and Border Protection, and USA General Services Agency to determine the appropriate design for the expansion of the Emerson Port of Entry (PoE). The study documented that the Pembina-Emerson border crossing is one of the top five Canada-USA PoE in terms of truck trade value at approximately $16.9 billion in 2011, out of a total of 103 border crossings (not including the Alaska border). Around 360,000 commercial trucks crossed at this location in 2011, growing to around 400,000 by 2013. The study determined that bi-directional truck traffic at the Emerson port-of-entry is forecast to increase by approximately 58% by 2035.

2.6 Assessment of Existing River Crossings

Currently, there are six river crossings over the Red River between PTH 100 and the USA border. The river crossings are located at St. Adolphe, Ste. Agathe, Aubigny, Morris, Letellier, and Emerson. The bridge on PR 246 at St. Jean Baptiste, built in 1947, was demolished in 2013 due to integrity concerns with the substructure. The structures at St. Adolphe, Morris, Letellier, and Emerson are newer or have been recently rehabilitated for compatibility to the Department's design vehicles and loadings. The locations of the Red River crossings within the study area are shown in **Figure 5**.

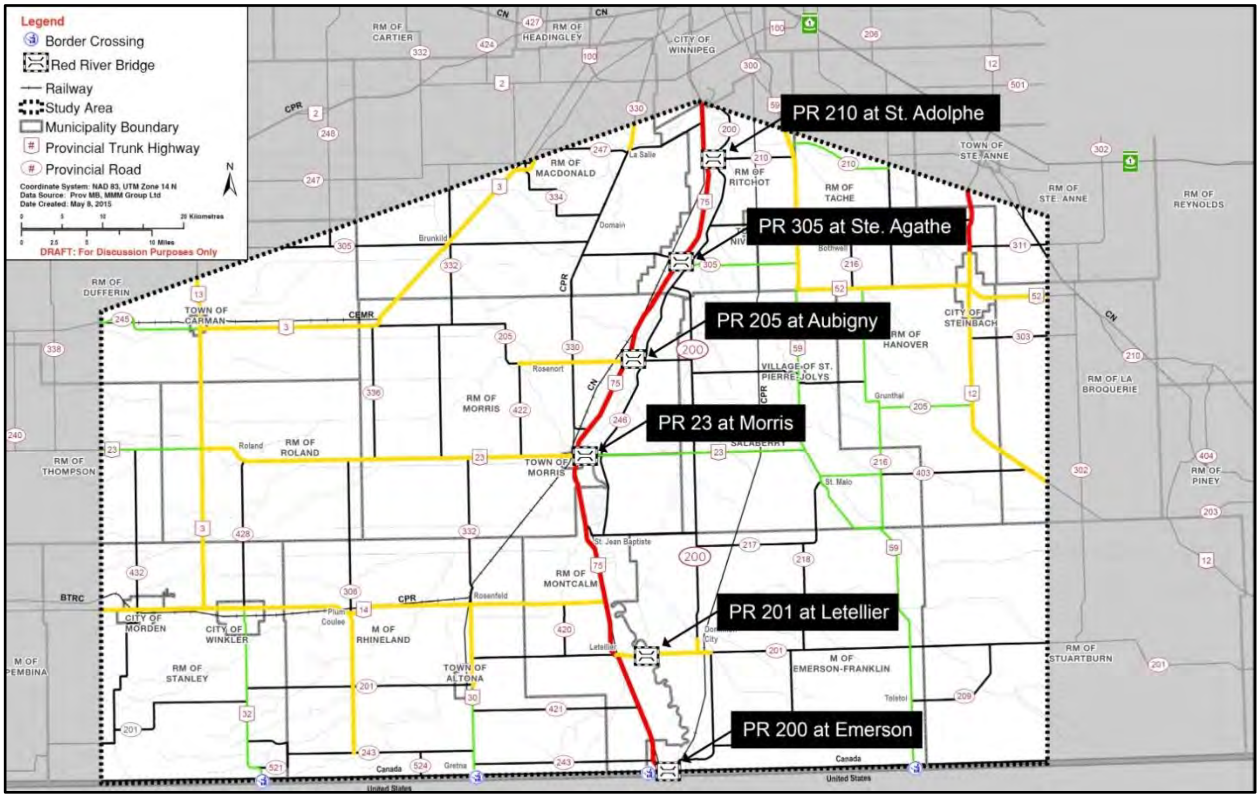


Figure 5: Red River Crossings Location Map

Table 1 summarizes the location, and age/rehabilitation date of the structures, as well as the weight limit of the connecting highways. Additional details are summarized in **Appendix C**.

Table 1: Summary of Red River Crossings

River Crossing	Year of Construction	Classification of Road Network Connections (RTAC = 63,500 kg) (RTAC = 62,500 kg) (A1 = 56,500 kg) (B1 = 47,630 kg)
PR 210 (St. Adolphe)	1975 (major rehab in 2011)	Class B1 (PTH 75 to PR 200)
PR 305 (Ste. Agathe)	1959	Class A1 (PTH 75 to PTH 59)
PR 205 (Aubigny)	1964	Class B1 (PTH 75 to PR 200)
PTH 23 (Morris)	1968 (major rehab in 2014)	Class A1 (PTH 75 to PTH 59)
PR 201 (Letellier)	2012	RTAC (PTH 75 to PR 200)
PR 200 (Emerson)	1996	Class B1 (PTH 75 to east of Emerson)

2.7 Highway Flooding Closures

Flooding is an area of concern in the Red River Valley. Flooding of the Red River has caused several closures of PTH 75 and other provincial highways in recent years, the durations of which are shown in **Table 2**. In order to reduce closures of PTH 75, Manitoba Infrastructure has committed to raising PTH 75 such that it would be closure-free for a 2009 flood event. KGS was retained by Manitoba Infrastructure to create a hydrodynamic model of the Red River from Grand Forks to Winnipeg. The model will be used to replicate major flood events and assess and mitigate the effects of raising PTH 75.

Table 2: PTH 75 Closures Since 1996

Year	PTH 75 Closures Between St. Jean and Aubigny (# of Days)
1996	14
1997	44
1999	Almost closed
2000	Almost closed
2005	Almost closed
2006	18
2009	38
2010	Almost closed
2011	28

2.8 Significant Findings

The following are some key findings from the environmental scan that were then considered in developing alternative options:

- The study area includes 24 municipalities and one First Nation. Development plan land use maps were compiled to create a combined land use map for the entire study area (see **Appendix A**). The majority of the land is designated agricultural and is used mainly for grain farming and some livestock farming. Major developed areas include the City of Steinbach and surrounding area, the City of Morden and City of Winkler area. There are a number of urban centres and towns south of Winnipeg and along the Red River/PTH 75 to the American border;
- The highest traffic levels are generally on the north-south routes at the north end of the study area. Portions of PTH 14 and 52 also experience higher traffic levels. In general, traffic volumes reduce for road segments nearer the USA border;
- There are six crossings of the Red River between PTH 100 and the USA border. PR 201 has a connecting RTAC-classed east-west roadway on both sides of the river from PTH 75 to PR 200; and

- Portions of PTH 75 have been closed due to flooding five times in the last 20 years, and almost closed another four times. Manitoba Infrastructure is upgrading PTH 75 to make it less prone to flooding, using a design flood equivalent to flood protection levels on I-29 and the USA border crossing at Pembina-Emerson.

3.0 ANALYSIS

Through analysis of population trends, historical traffic growth, and river crossing spacing in the Red River Valley and similar jurisdictions, patterns emerged that indicate where there is demand for improvements to the RTAC road network. An analysis of the adequacy of existing Red River crossings and the need for additional or the rationalization of existing Red River crossings was also conducted based on existing and projected traffic volumes.

3.1 Population Projections

Population trends were reviewed and future projections developed based upon these trends. Municipalities with the highest projected population growth are the cities of Steinbach and Winkler, the RM's of Stanley, La Broquerie and Hanover, and the Town of Niverville with the amount depending on their size and number and size of industrial/commercial operations.

Population projections are based on historical census data, using a "medium growth" forecast. Low and high growth forecasts were also developed for reference. These projections were then classified into growth rate ranges based upon percentage growth. Stable growth was defined as negative to 10% growth, moderate growth as 11% to 50% growth, and high growth as 51% growth and above. Municipalities which have recently amalgamated were analyzed individually and then combined to reflect their amalgamated status. Population projections based upon census trends do not take into account unforeseen circumstances, which could significantly change the actual population growth. Changes in development patterns, tourism, economic development programs and immigration policies could all have a substantial effect on population growth and distribution within the study area and Manitoba.

Population projections were developed and analyzed in conjunction with land use plans to forecast the amount and location of growth in a Municipality or Planning District. These areas are presented on a map found in **Appendix A**. Population projections are presented in **Table 3**. These will be considered when developing the Trade and Tourism Route network options.

Table 3: Population Trends – Population Projections

Municipality	Stats Canada 2011 Census	Projection to 2036	Population Growth 2011-2036	Percent Growth 2011 - 2036	Growth Rate Range (H) High (M) Moderate (S) Stable
City of Steinbach	13,524	30,940	17,420	129%	H
RM of Stanley	8,356	23,520	15,170	182%	H
RM of La Broquerie	5,198	18,570	13,370	257%	H
RM of Hanover	14,026	25,840	11,820	84%	H
City of Winkler	10,670	20,540	9,870	93%	H
Town of Niverville	3,540	12,160	8,620	244%	H
City of Morden	7,812	13,160	5,350	69%	H
RM of Macdonald	6,280	9,660	3,380	54%	H
Village of St. Pierre Jolys	1,099	1,690	590	54%	H
RM of Taché	10,284	15,110	4,830	47%	M
M of Rhineland	5,772	8,480	2,710	47%	M
Town of Altona	4,088	6,010	1,920	47%	M
RM of Ste. Anne	4,686	5,700	1,020	22%	M
Town of Carman	3,027	3,860	840	28%	M
RM of De Salaberry	3,450	4,200	750	22%	M
Roseau River Anishinabe First Nation	695	1,020	330	47%	M
Town of Morris	1,797	2,080	290	16%	M
RM of Roland	1,058	1,230	170	16%	M
RM of Ritchot	5,478	6,050	570	10%	S
RM of Morris	2,999	3,310	310	10%	S
RM of Thompson	1,397	1,540	150	10%	S
RM of Stuartburn	1,535	1,460	-80	-5%	S
RM of Dufferin	2,394	2,160	-230	-10%	S
M of Emerson-Franklin	2,439	2,200	-230	-10%	S
RM of Montcalm	1,309	960	-350	-27%	S
Total	122,913	221,450	98,590	80%	

Source: Stats Canada 2011 Census

Development Plans were reviewed to compare population projections. **Table 4** presents available projections from development plans. When reviewing population growth and designated land available for development, these projections were compared to the trend population projections previously presented. Where a discrepancy exists, the projection with the higher amount of growth is considered.

Table 4: Development Plans – Population Projections

Municipality or Planning District	Population Projection	Population Trends Projection	Growth Rate Range (H) High (M) Moderate (S) Stable
RPGA Planning District (PD)	Total Population of 21,389 by 2031	PD to grow by 14,490 people by 2036	H
Town of Niverville	Town to grow to between 5,000 and 10,000 people by 2018	Town to grow by 2,260 people by 2021	H
Carman-Dufferin Planning District	Approximately 7,000 people by 2035	PD to grow by 610 people by 2036	H
Macdonald Ritchot Planning District	Planning District to have a total of 13,317 people by 2031	PD to have 15,710 people by 2036	M

Source: Development Plans

A summary of land use and population growth as it relates to Development Plan Designations can be found in **Appendix A**. Residential, industrial and commercial land use areas are presented to highlight where community based traffic (work commuters, shopping, etc.) and goods movement based traffic (trucking) are located. It is important to note that most residential growth areas will also generate goods movement traffic, with the amount depending on the number and size of industrial / commercial operations.

Population and projections have been cross-referenced with residential land use designations, which were ground-truthed through air photography to reveal how much developable land exists within residential and urban centre designated areas. This reveals where in a municipality projected growth will be directed. These areas are presented on a map found in **Appendix A**. Growth areas will be analyzed when developing the Trade and Tourism Route network options. Commercial and Industrial land is much more difficult to interpret through air photography. A more general overview of where industrial and commercial designated land exists is presented in **Appendix A**.

3.2 Traffic Demands

Through analysis of the historical traffic volumes, growth rates could be determined for the major routes throughout the study area. Growth rates were determined by analysing traffic volumes over the past 20 years, where data was available, for each road segment. Using the growth rates, existing traffic volumes were forecast to the desired horizon year of 2035. The growth rates and 2035 projected traffic volumes are illustrated in **Appendix D**.

Further analysis of the projected population growth rates, proposed industrial and commercial development, and planned roadway upgrades was conducted to identify areas that may experience an increase in traffic at a rate greater than the historical growth rate. The major traffic generators within the study area are Steinbach, Winkler, and Morden. However, there is also significant growth anticipated in the town of Niverville, the RM of Hanover, the RM of Stanley, the RM of Macdonald, and the RM of La Broquerie.

Population growth projections by area are illustrated in **Figure 6** along with existing routes that have the highest projected 2035 traffic volumes.

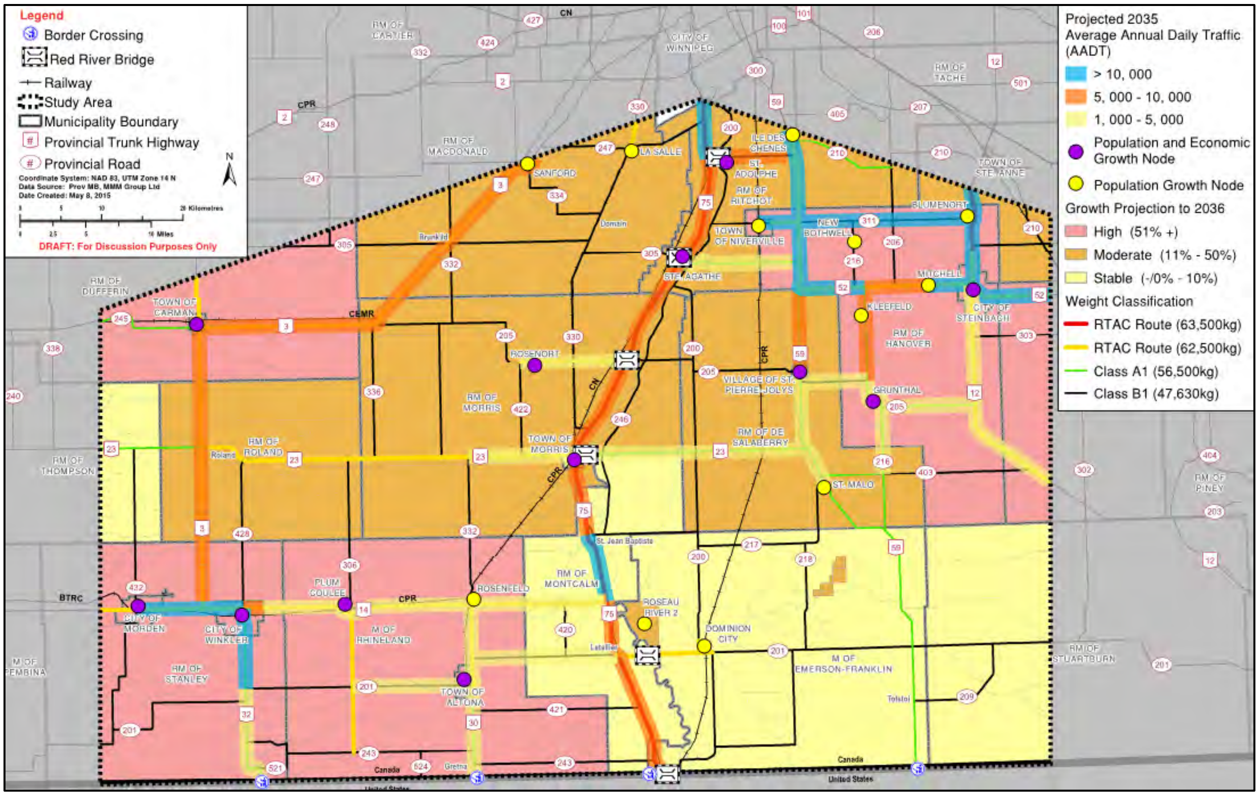


Figure 6: Projected Population and Traffic Growth

3.3 Traffic Capacity of Existing River Crossings

Manitoba Infrastructure's general guideline for the consideration of widening a roadway is an AADT of 5,000 vehicles per day or more. This is based on a level of service (LOS) B or better and is influenced by passing opportunities. Actual capacity for a two lane roadway is over 12,000 vehicles per day, although vehicle speeds decrease, delays increase, and passing opportunities diminish as volumes increase. Another factor influencing traffic capacity is the presence of intersections and the type of traffic control (e.g., stop signs, all way stop signs, traffic signals, roundabouts).

The most recently recorded AADT at each of the river crossings is shown in **Table 5**.

Table 5: Traffic Volumes on River Crossings

River Crossing	Year	AADT	2035 Background AADT	% Trucks
PR 210 (St. Adolphe)	2012	3370	6715	4.2%
PR 305 (Ste. Agathe)	2012	1830	2720	12.0%
PR 205 (Aubigny)	2011	460	600	10.1%
PTH 23 (Morris)	2011	1620	2750	31.1%
PR 201 (Letellier)	2011	1420	2520	17.5%
PR 200 (Emerson)	2011	900	900	5.0%

The AADT volumes shown in **Table 5** indicate that the current river crossings can accommodate the existing and the 2035 forecast background traffic volumes. The river crossing at PR 210 is anticipated to have the highest increase in daily traffic volumes due to the increasing development of St. Adolphe.

3.4 Truck Traffic

PTH 75 is the primary route through the area and provides an important connection between central Canada and the USA. With the development of CentrePort Canada underway, truck traffic on PTH 75 is anticipated to increase. As of 2013, the most recent year for available traffic data, the percentage of trucks versus total traffic volume on PTH 75 ranges from 11% between Winnipeg and St. Adolphe and 33% between Letellier and Emerson. The large rise in the percentage of trucks is a result of a combination of the volume of truck traffic increasing and the volume of total traffic decreasing toward the south end of PTH 75.

Through analysis of the regions with projected population, economic growth and consultation with stakeholders within the study area, desire lines for truck traffic could be determined. The truck traffic desire lines are based on regions that generate higher volumes of truck traffic and the desired direction of travel determined from historical traffic counts and through discussion with stakeholders within the study area. Population growth projections by area are illustrated in **Figure 7** along with the desire lines for RTAC trucks within the study area. The majority of truck traffic within the Red River Valley is travelling to the grain elevators along PTH 75, south to the USA via PTH 75, north to Winnipeg or PTH 1, or east/west within the study area.

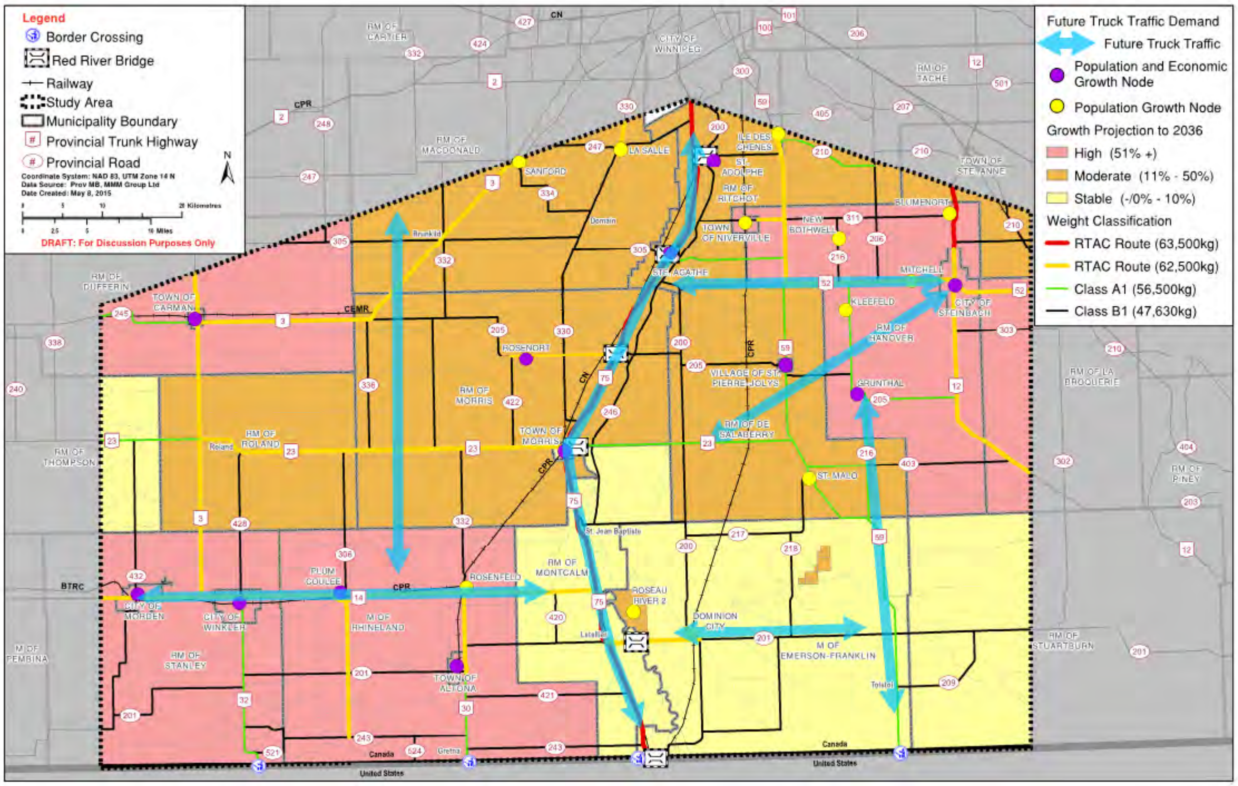


Figure 7: RTAC Truck Traffic Desire Lines

3.5 River Crossing Density Review

3.5.1 Red River Valley

The Red River runs from Winnipeg to the Canada-USA border with a width that ranges from approximately 90 m to 130 m. The industry in the area is primarily agriculture-based with grain elevators located on the west side of the river and farms located on both sides of the river.

There are a total of six river crossings between Winnipeg and the Canada-USA border. The average spacing of river crossings was measured based on the driving distance between the structures. The average spacing of river crossings in the Red River Valley is 18.7 km. Prior to the demolition of the bridge on PR 246 at St. Jean Baptiste, the average spacing of river crossings was 16.0 km. The crossings are located in the vicinity of the following communities:

- St. Adolphe (Pop. 1036)
- Ste. Agathe (Pop. 614)
- Aubigny (Pop. 143)
- Morris (Pop. 1,797)
- St. Jean Baptiste (Pop. 552)
- Letellier (Pop. 439)

- Emerson (Pop. 671)

3.5.2 Similar Jurisdictions

Several jurisdictions with similarities to the Red River Valley were reviewed in order to determine a list of common practices for the spacing of river crossings. When searching for similar jurisdictions to the Red River Valley, the following criteria were considered:

- River width;
- Population;
- Land use; and
- Proximity to a major highway.

In most cases, not all of these criteria could be met. The spacing of river crossings within cities was not included in the determination of the average spacing. The following comparison areas were reviewed:

- Assiniboine River from Winnipeg, Manitoba to Brandon, Manitoba;
- Red River from Canada-USA border to Fargo, North Dakota;
- Bow River from Calgary to its south terminus at Oldman River;
- Oldman River from Bow River to Fort MacLeod;
- Mississippi River from Brainerd, Minnesota to St. Cloud, Minnesota; and
- Yellowstone River from Billings, Montana to Big Timber, Montana.

The average spacing of river crossings within each jurisdiction is summarized in **Table 6**. Detailed information on each jurisdiction can be found in **Appendix E**.

Table 6: Average River Crossing Spacing of Similar Jurisdictions

Jurisdiction	Number of River Crossings	Average Spacing (km)
Assiniboine River – Winnipeg, MB to Brandon, MB	13	26.7
Red River – Canada-USA border to Fargo, ND	15	20.7
Bow River – Calgary to Oldman River	8	45.2
Oldman River – Bow River to Fort MacLeod, AB	9	25.1
Mississippi River – Brainerd, MN to St. Cloud, MN	7	15.2
Yellowstone River – Billings, MT to Big Timber, MT	7	20.4

3.5.3 Common Practices

Through the review of similar jurisdictions, a list of common practices was developed for the density of river crossings in a rural area:

- Locate river crossings on strategic trade routes;
- Locate river crossings in the vicinity of economic and/or population centres; and
- Maintain a spacing of approximately 20-25 km to reduce the social and economic impact due to river crossing spacing.

3.5.4 Conclusions

The average spacing of river crossings in the Red River Valley is 18.7 km, but there is a disparity between river crossing spacing north and south of Morris. This indicates that there is a disparity between the level of service of the river crossings north of Morris versus south of Morris due to the demolition of the bridge on PR 217 at St. Jean Baptiste. When examining similar jurisdictions, the average spacing of 25.2 km south of Morris (compared to 15.3 km north of Morris) is at the upper end of the 20 – 25 km range found elsewhere. Prior to the demolition of the PR 246 river crossing at St. Jean Baptiste in 2013, the average spacing of river crossings south of Morris was 16.9 km; around two-thirds of the current spacing.

The community of St. Jean Baptiste developed with the PR 246 river crossing in place during the consultation process there was significant discussion on how the removal of the river crossing has had a negative social and economic impact on the community. Numerous comments and examples of the impacts on the lives of residents were provided at both the stakeholder workshop and the open house held in St. Jean Baptiste. Since the community had long been established with a river crossing, the local stores and service providers have seen their customer base reduced due to the lack of the connection across the river.

3.6 Significant Findings

The following are some key findings from the environmental scan that were then considered in developing alternative options:

- Currently, the only east-west RTAC connection across the Red River south of PTH 100 is on PR 201 at Letellier. However, the RTAC roadway only extends from PTH 75 east to PR 200;
- Municipalities with the highest projected population growth are the cities of Steinbach and Winkler, the RM's of Stanley, La Broquerie and Hanover, and the Town of Niverville;

- A review of development plans and population forecasts found that a number of areas within the study area are expected to feature growth in population and economic activity, with a corresponding increase in traffic levels;
- The growth areas, combined with the RTAC route limitations, means that some of the highest traffic growth is expected to occur at the north end of the study area, in part because large vehicles are forced to use PTH 100 at the south end of Winnipeg, to travel between the east and west sides of the Red River. An alternative east-west RTAC route within the study area should help distribute truck traffic to other corridors;
- The average spacing of river crossings in the Red River Valley is 18.7 km;
- Although the average river crossing spacing in the Red River Valley is 18.7 km (down from 16.0 km prior to the demolition of the bridge on PR 217 at St. Jean Baptiste), the average spacing of river crossings from PTH 100 to PTH 23 at Morris is 15.3 km and the average spacing from PTH 23 at Morris to PR 200 at Emerson is 25.2 km; and
- Six other North American locations were examined along rivers with similar characteristics to the Red River valley within the study area. In general, it was found that river crossings were: located on strategic trade routes; between economic and/or population centres; and at spacing of approximately 20-25 km to reduce the social and economic impact due to river crossing spacing.

4.0 PUBLIC ENGAGEMENT

4.1 The Importance of Public Engagement

A key component to transportation planning projects is understanding public and stakeholder ideas and needs. Public engagement provides communities, including residents, business owners, property owners, stakeholder groups and organizations, with an opportunity to provide input into the process. This also allows participants to learn about a project and the complexities that go along with completing it, while the project team is able to gain an understanding of local issues directly from the end users of a possible project.

Educating and listening to people who are impacted by the project creates an inclusive environment and allows for the creation of an end result that is best able to balance the needs of the Province and the public / stakeholders. Developing a plan or design that reflects people's needs and ideas through a comprehensive public engagement process creates a shared buy-in and sense of ownership in the end result. A key component of public engagement is reporting back to people how their ideas were incorporated into the project. This is accomplished in two ways:

1. Where possible, incorporating such ideas and addressing concerns as part of the plan or design; or
2. Showing people their ideas and concerns were considered and the reason why they could not be included.

4.2 Stakeholders Roundtable

A stakeholder workshop was held in the Town of Morris on May 12, 2015 from 1:30 – 4:00 PM. The event was attended by 42 invited participants and facilitated by MMM and Manitoba Infrastructure staff. Stakeholders were identified as local governments and organizations that are directly concerned with transportation issues in the study area. The event engaged stakeholders to consider transportation issues from a regional scale while providing input based upon their particular area of interest.

The workshop included opening remarks, a background presentation and breakout group exercises. There were six breakout groups who were tasked with discussing opportunities and challenges of the transportation network and drawing their ideal RTAC route network in the study area. These two tasks were guided by a Manitoba Infrastructure or MMM facilitator who utilized a workbook, which included guiding questions and a large format map of the study area. Results of the workshop discussions were compiled into the following summary themes:

- Gaps in the RTAC route network;
- Bridges;
- Seasonal flooding;
- Canada / USA border crossings;
- PTH 75 and the Town of Morris; and
- Priorities for upgrading roads.

Also, the mapping exercise at each breakout table was analyzed and complied on a map found in **Appendix F**. This map represents conceptual RTAC connections that people identified rather than specific routes. Comments received and conceptual RTAC connections identified will be considered when developing network improvement options and priorities for the study.

The following is a summary of the comments received, based upon the common themes generated.

4.2.1 Gaps in the RTAC Route Network

A gap in the RTAC route network exists east of the Red River. There are grain farms in the area east of the Red River, however, all grain elevators are located west of the Red River. Grain haulers would benefit from east/west RTAC routes connecting to bridge(s) across the Red River. There are also livestock operations and aggregate operations in the area which would benefit from such routes. In addition, there is demand to connect the growing communities of Steinbach and Morden/Winkler via an RTAC route. Therefore, improving RTAC routes east of the Red River would be beneficial in addressing agricultural and aggregate trucking needs and population growth projections in the study area.

4.2.2 Bridges

The loss of the bridge in St. Jean Baptiste on PR 246 poses a challenge for connectivity in the area. This is an issue for community traffic, business traffic, trucking and emergency services.

There are a significant number of small bridges in the study area, particularly east of the Red River. Many of these will require upgrading to RTAC standards to create a more comprehensive network.

4.2.3 Seasonal Flooding

The study should consider east/west flood protected routes similar to current upgrades to PTH 75. Flood proofing of PTH 23 is a priority. Flooding and flood routes pose a problem for agricultural related trucking and emergency services, along with community transportation needs.

4.2.4 Canada/USA Border Crossings

The Province should work with North Dakota to identify road classifications and capacities at border crossings and ensure they match. Upgrading the border crossing on PTH 32 was indicated as important. There is some concern over congestion at the PTH 75 border crossing, however this crossing has seen significant investment and has been identified as the primary truck crossing in Manitoba.

4.2.5 PTH 75 and the Town of Morris

Participants indicated signalized intersections and the school zone in the Town of Morris slows through traffic. Also, the routing of all PTH 75 truck traffic through Morris is problematic due to the increased potential for incidents to occur. An alternate route around Morris was discussed as an option to alleviate these concerns.

4.2.6 Important Routes Identified

The following roads were identified as important routes and priorities for upgrades by workshop participants. These are presented in no particular order.

- PTH 23
- PTH 59
- PTH 32
- PTH 75
- PR 246
- PR 422
- PR 306
- PR 305
- PR 201
- PR 332
- PR 205
- PR 403

4.3 Public Open House #1

Two Public Open Houses were held, one in the City of Steinbach on May 27, 2015, and one in St. Jean Baptiste on May 28, 2015, both from 4:00 – 7:00 PM. The events introduced residents and business owners of the Southern Red River Valley to the study, provided a forum to ask questions, and an opportunity to provide feedback on the project. The sessions were attended by around 150 individuals who signed in, plus a number of others who either didn't sign in or signed in with others. Most participants indicated that they were residents of the study area, while just under half indicated that they were business owners in the study area.

Project information was displayed via 15 presentation boards (provided in both French and English) and large format maps of the study area. The event was hosted by MMM, Manitoba Infrastructure staff, and an interpreter who was available to answer questions and explain story board content. Upon review of the boards, participants were invited to complete and submit a comment sheet (provided in both French and English); the comment sheet could also be completed online. Attendees submitted 110 comment sheets; these were analyzed, sorted into common themes, and organized in a spreadsheet matrix. Participants were also encouraged to sketch out their ideal RTAC route network on the large format maps of the study area. These have been compiled on a map found in **Appendix F**. This map represents conceptual RTAC connections that people identified rather than specific routes. Comments received and conceptual RTAC connections identified were considered when developing network improvement options and priorities for the study.

The following is a summary of the comments received, based upon the common themes generated, which are as follows:

- Loss of the bridge over the Red River in St. Jean Baptiste;
- Losing road access due to flooding;
- East – west connectivity;
- PTH 75 alternative truck route and poor roads in the southeast portion of the study area;
- Important routes identified; and
- General comments.

4.3.1 Loss of the St. Jean Baptiste Bridge

The vast majority of comments received were regarding the former bridge on PR 246 in St. Jean Baptiste. There were many reasons given for their concern such as: increased length of travel to Morris or Letellier to cross the river, increased negative environmental effects, loss of community feeling, lost businesses and negative economic effects in St. Jean Baptiste, and increased response time for emergency services.

4.3.2 Losing Road Access Due to Flooding

A number of comments mentioned the closing of PTH 75 during seasonal flood events and the importance of alternate routes for residents and businesses. A few comments noted that any new bridges or roads should be built so that they don't negatively affect people upstream.

4.3.3 East-West Connectivity

Several comments concerned the ability to move goods between Steinbach and surrounding area and the Morden/Winkler area. A number also stated that having PR 217 RTAC rated, coupled with a new bridge at St. Jean Baptiste, would be helpful.

4.3.4 PTH 75 Alternative Truck Route

An alternative to trucks having to pass through the Town of Morris was suggested by a few people. There are concerns with trucks going past residential areas and school zones, as well as traffic concerns in Morris, including the reduced speed limits and signalized intersections slowing traffic. The uncontrolled intersection at PTH 75 and PTH 23 is also an issue for a number of people.

4.3.5 Highway Network in the Southeast Region of the Study Area

The lack of RTAC routes in the southeast portion of the study area was mentioned multiple times. Several people suggested that the route from Steinbach to the east side of the river (PTH 52, PTH 59, PTH 23 and PR 246) at St. Jean Baptiste should be RTAC rated, along with a new bridge at or south of St. Jean Baptiste.

4.3.6 Important Routes Identified

The following roads were identified as important routes and priorities for upgrades by open house participants. These are presented in no particular order.

- PTH 23
- PTH 59
- PTH 14
- PTH 75
- PR 246
- PR 200
- PR 217
- PR 201
- PR 422
- PR 403

4.3.7 General Comments

The vast majority of comments were regarding the loss of the bridge in St. Jean Baptiste and the need for a new bridge to connect each side of the river. Other comments included the need for 24 hour border crossings at Tolstoi and Winkler, a bridge at PTH 14 with an overpass of the train tracks, and paving PR 200.

4.4 Public Open House #2

The Public Open House was held, at the Morris Multiplex in the Town of Morris on October 14, 2015, from 4:00 – 7:00 PM. The event presented the results of the study to residents and business owners of the Southern Red River Valley, provided a forum to ask questions, and an opportunity to provide feedback on the project. The session was attended by 21 individuals who signed in, plus others who either didn't sign in or signed in with others. Fourteen comment sheets were received and have been analyzed, sorted into common themes, and organized in a spreadsheet matrix. All commenters reported being residents of the study area, while approximately half reported being also business owners in the study area. All but one indicated they attended previous engagement sessions.

Project information was displayed via 26 presentation boards (provided in both French and English). These boards presented background information and study results including east-west RTAC Route Options, Alternate Truck Route Options and Localized RTAC Routes. The event was hosted by MMM and Manitoba Infrastructure staff. Upon review of the boards, participants were invited to complete and submit a comment sheet.

The following is a summary of the comments received, based upon the common themes generated, which are as follows:

- New bridge at St. Jean Baptiste;
- PTH 75 alternative truck route;
- Implementation and timing; and
- General comments.

4.4.1 New Bridge at St. Jean Baptiste

Similar to previous events, developing a new bridge in the vicinity of St. Jean Baptiste was a common topic. Respondents were encouraged to see a study option that included a new bridge and an alternative truck route in the vicinity of Morris.

4.4.2 PTH 75 Alternative Truck Route

Respondents indicated that it is important to have an alternative for trucks to not have to travel through the Town of Morris. People indicated that having trucks passing through the Town and a school zone was considered unsafe for the community and disrupts traffic flow.

4.4.3 Implementation and Timing

It was suggested that the alternate truck route option with the new bridge at St. Jean Baptiste be prioritized with RTAC improvements. Another respondent indicated they are looking forward to a timetable for implementation.

4.4.4 General Comments

Other comments included upgrading RTAC routes around Dominion City and consider long-term growth in southeast Manitoba. Accommodation of oversized truck loads (40’ x 25’), upgrading of PR 311 to A1 standard, and bus service are needed in the study area.

4.5 Significant Findings

The public engagement program included three public open houses and a stakeholder roundtable. A total of 213 people participated and provided feedback. The most common concerns amongst participants during the stakeholder roundtable and the first two public open houses were as follows:

- Loss of the bridge in St. Jean Baptiste on PR 246 has created a challenge for connectivity for the local community and wider area;
- Many grain farms are located east of the Red River, while all grain elevators are located west of the River. Grain haulers would benefit from additional East-West RTAC routes. This would also help create a more direct connection between the growing communities of Steinbach and Morden/Winkler. Currently the only east-west RTAC connection across the Red River south of PTH 100 is on PR 201 at Letellier. However, the RTAC roadway only extends east to PR 200;
- Signalized intersections and the school zone on PTH 75 and PTH 23 in the Town of Morris slows through traffic and is a safety concern as many trucks use these routes; and
- **Appendix F** presents important routes identified by stakeholders and the public.

Upon reviewing the study options at the final public open house, the most common comments were as follows:

- Participants were encouraged by the option that included a new bridge in the vicinity of St. Jean Baptiste; and
- There was support for an alternate truck route to provide the option for trucks not having to travel through the Town of Morris.
- It was hoped that these options would be implemented in the short-term future.

5.0 DEVELOPMENT OF OPTIONS

A number of routes and highway segments were identified as potential RTAC routes through consultation with stakeholders and the general public, review of the existing strategic trade route network, and a review of current and projected land use and demographics within the study area. All routes considered in this study were developed in order to create an east-west and north-south trade route network of RTAC rated roadways.

5.1 Study Findings That Guided Option Development

The RTAC route options were developed based on the following key findings of the environmental scan and public consultation:

- The Steinbach and Morden-Winkler areas are the largest population centres within the study area and have the highest projected growth;
- The river crossing spacing south of Morris is greater than the spacing north of Morris and the loss of the St. Jean Baptiste bridge has put a significant strain on local businesses, emergency services, and community connectivity;
- Currently the only east-west RTAC connection across the Red River south of PTH 100 is on PR 201 at Letellier. However, the RTAC roadway only extends from PTH 75 east to PR 200;
- Demand exists for an alternative route around Morris, particularly for commercial traffic;
- The grain elevators within the study area are all west of the Red River, whereas several producers are east of the Red River; and
- The existing Red River crossings are RTAC rated.

5.2 RTAC Route Option Categories

The varying needs expressed by the public, and the findings of the environmental scan, resulted in three categories of route options being developed:

1. The east-west RTAC Routes.
2. PTH 75 Alternative Truck Routes.
3. Localized RTAC Routes.

The east-west RTAC routes are the number one priority of the study, as they will address the lack of an east-west connection across the Red River and will benefit businesses and residents in the overall study area.

The PTH 75 alternative truck routes are a result of the public's and Manitoba Infrastructure's desire to provide a safe route for commercial trucks around the town of Morris, to avoid the low speed and traffic signal within Morris, as well as an alternative route that may be needed during flood events.

The localized RTAC routes are a product of public engagement and benefit a sub-area within the study area, but will also provide improved connectivity for the businesses and residents of each region.

5.3 East-West RTAC Route Options

The number one priority of this study is to improve the east-west RTAC network, particularly a connection from PTH 75 to the east side of the Red River. The following options are all routes that provide an RTAC connection from the existing RTAC roadways on the east side of the Red River to PTH 75.

5.3.1 East-West RTAC Route Option 1 – PTH 59-PTH 23

The east-west RTAC Route Option 1 includes the following highway upgrades:

- PTH 59 from PTH 52 to PTH 23; and
- PTH 23 from PTH 59 to PTH 75.

This option provides an efficient route from Steinbach to PTH 75 at Morris. Both PTH 59 and PTH 23 along the proposed route are currently A1-rated highways. The east-west RTAC Route Option 1 is illustrated in **Figure 8**.

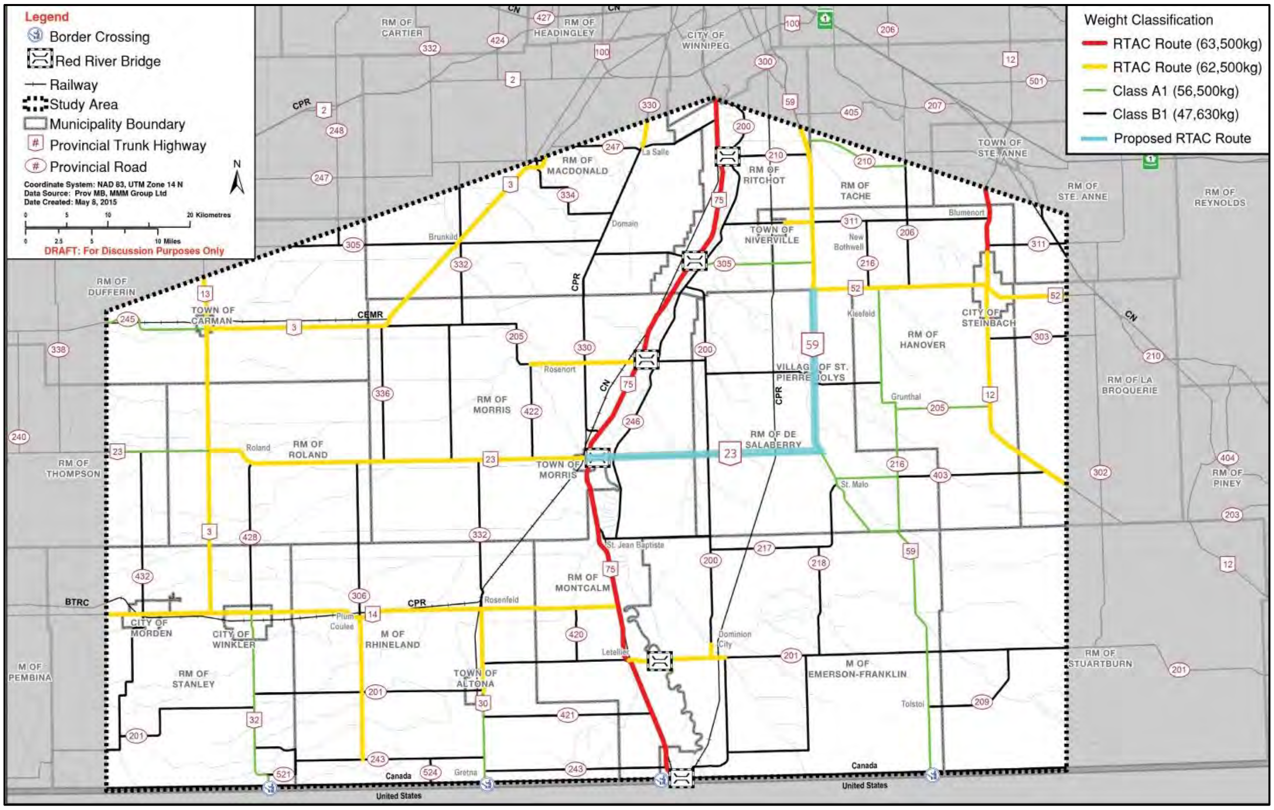


Figure 8: East-West RTAC Route Option 1

This option provides the most cost-effective solution for connecting the existing RTAC highways on the east side of the Red River to PTH 75. This option also requires minimal out-of-direction travel from the Steinbach area to the Morden-Winkler area and the Emerson-Pembina border crossing. PTH 59 and PTH 23 are both currently A1 rated highways.

There are eight structures along the route that would require an upgrade or replacement to meet RTAC standards. The structures are listed in **Table 7**.

Table 7: E/W RTAC Route Options 1 & 2 - Structures

Structure Type	Site No.	Location	Year Built	Feature Intersect
Timber Bridge	2684-00	PTH 59 - 300 m south of PTH 52	1959	Tourond Creek
Steel Culvert	2176-00	PTH 59 – 2.4 km south of PR 303	1971	Drain
Pre-Cast Pre-Stressed Box Girder Bridge	2636-10	PTH 59 – 300 m south of PR 205	1989	Joubert Creek
Reinforced Concrete Culvert	2290-10	PTH 59 – 3.6 km north of PTH 23	2009	Coulee Des Nault
Pre-Cast Pre-Stressed Concrete Channel Girder Bridge	2807-10	PTH 23 – 500 m west of PTH 59	1986	Rat River
Reinforced Concrete Culvert	2806-10	PTH 23 – 600 m west of PTH 59	1983	St. Malo Canal
Timber Bridge	1538-00	PTH 23 – 4.3 km east of PR 200	1962	Drain
Timber Bridge	2518-00	PTH 23 – 2.1 km west of PR 200	1958	Marsh River

5.3.2 East-West RTAC Route Option 2 – PTH 59-PTH 23-PR 246

The east-west RTAC Route Option 2 includes the following highway upgrades:

- PTH 59 from PTH 52 to PTH 23;
- PTH 23 from PTH 59 to PR 246; and
- PR 246 to a new crossing of the Red River in the area of St. Jean Baptiste.

This option provides an efficient route from Steinbach to PTH 75 and directs south travelling traffic away from the town of Morris. The addition of a river crossing near St. Jean Baptiste would improve the connectivity of the community of St. Jean Baptiste, act as a flood-proof route (if PR 246 is raised to flood levels), and would reduce the amount of truck traffic on PTH 23 in Morris. PTH 59 and PTH 23 are both currently A1 rated highways and PR 246 is a B1 rated highway. The east-west RTAC Route Option 2 is illustrated in **Figure 9**.

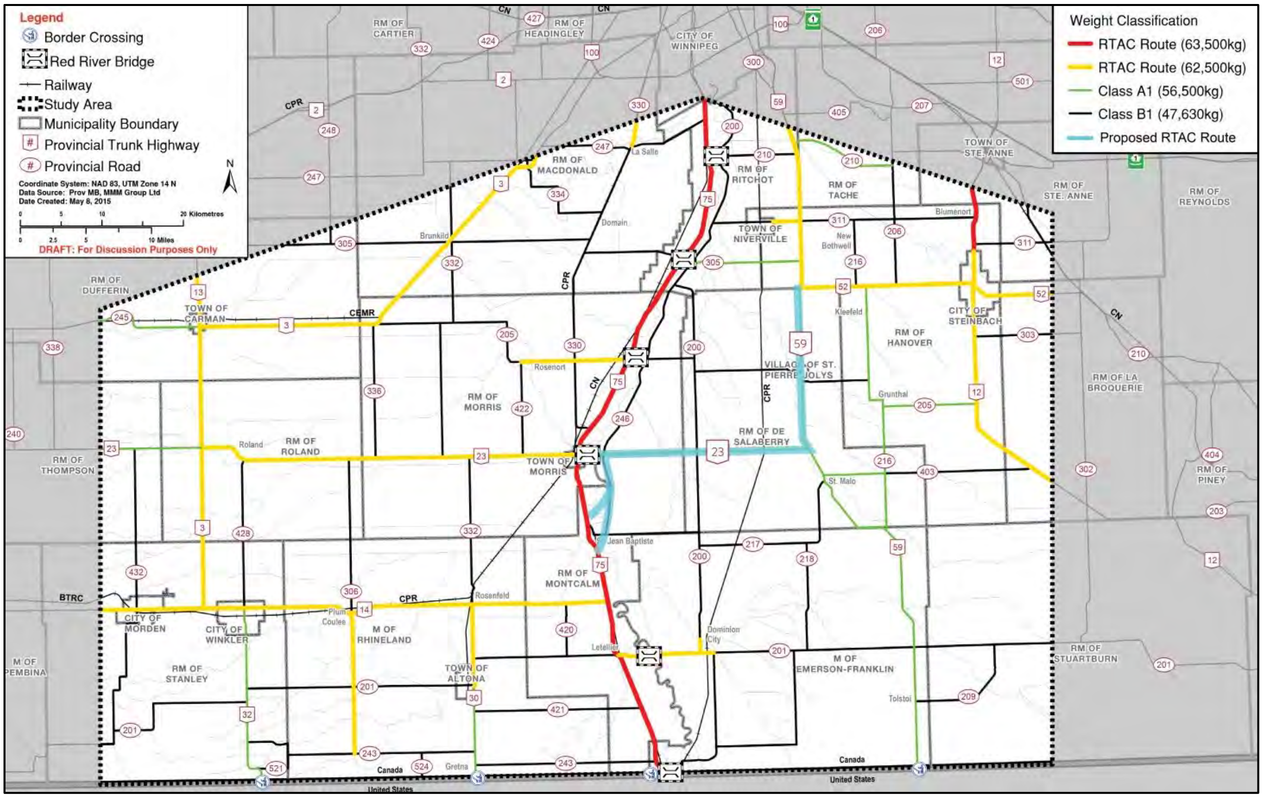


Figure 9: East-West RTAC Route Option 2

There are eight existing structures along this route that require an upgrade or replacement to meet RTAC standards. The structures that would require an upgrade to meet RTAC standards are the same for east-west RTAC Route Option 1 and 2, as shown in **Table 7.**

5.3.3 East-West RTAC Route Option 3 – PTH 59-PTH 23-PR 200

The east-west RTAC Route Option 3 includes the following highway upgrades:

- PTH 59 from PTH 52 to PTH 23;
- PTH 23 from PTH 59 to PR 200; and
- PR 200 from PTH 23 to PR 201.

This option provides an efficient route from the Steinbach area to PTH 75 at Letellier and the Emerson-Pembina border crossing. PTH 59 and PTH 23 are both currently A1 rated highways and PR 200 is a B1 rated highway. This option would allow truck traffic travelling to/from the USA border to the Steinbach area to by-pass the Morris area and would lower the amount of truck traffic on PTH 23 in Morris. The east-west RTAC Route Option 3 is illustrated in **Figure 10**.

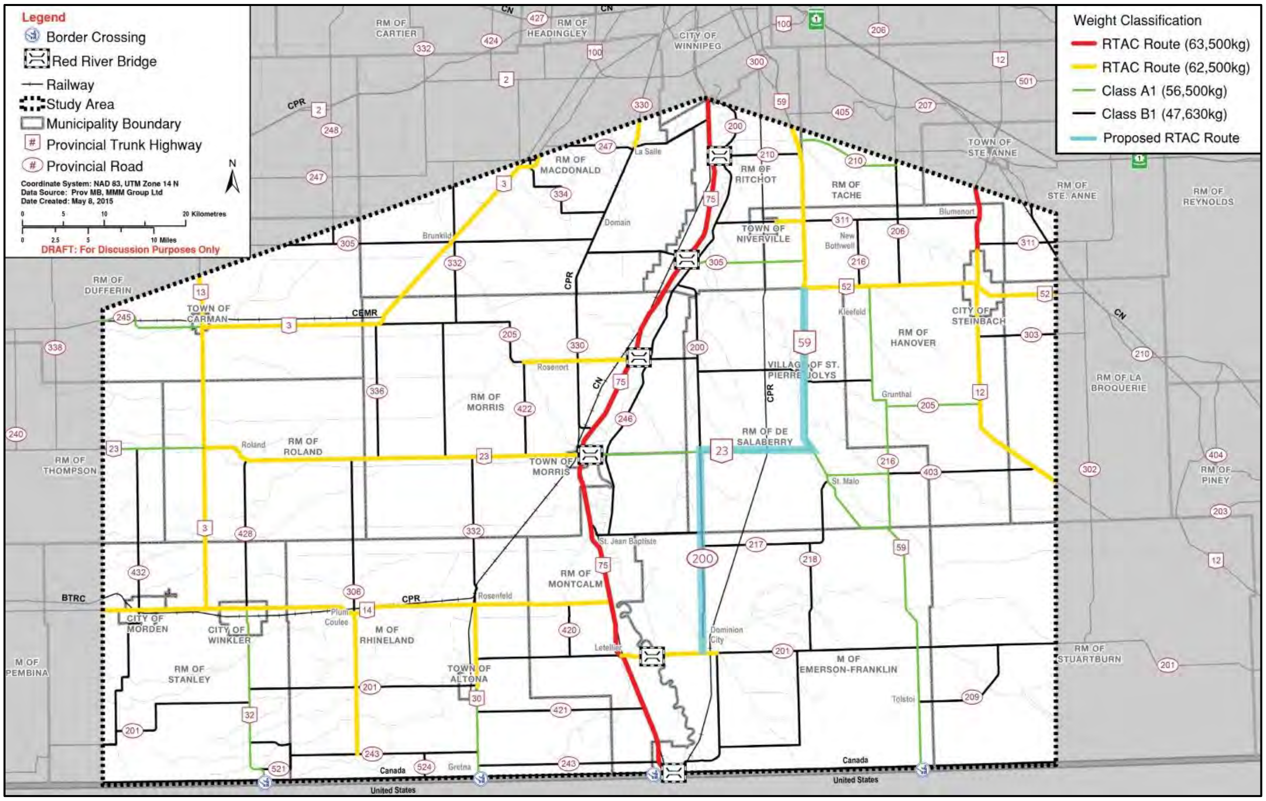


Figure 10: East-West RTAC Route Option 3

There are 10 structures along this route that would require an upgrade or replacement to meet RTAC standards. The structures are listed in **Table 8**.

Table 8: E/W RTAC Route Option 3 - Structures

Structure Type	Site No.	Location	Year Built	Feature Intersect
Timber Bridge	2684-00	PTH 59 - 300 m south of PTH 52	1959	Tourond Creek
Steel Culvert	2176-00	PTH 59 – 2.4 km south of PR 303	1971	Drain
Pre-Cast Pre-Stressed Box Girder Bridge	2636-10	PTH 59 – 300 m south of PR 205	1989	Joubert Creek
Reinforced Concrete Culvert	2290-10	PTH 59 – 3.6 km north of PTH 23	2009	Coulee Des Nault
Pre-Cast Pre-Stressed Concrete Channel Girder Bridge	2807-10	PTH 23 – 500 m west of PTH 59	1986	Rat River
Reinforced Concrete Culvert	2806-10	PTH 23 – 600 metres west of PTH 23	1983	St. Malo Canal
Timber Bridge	1538-00	PTH 23 – 4.3 km east of PR 200	1962	Drain
Pre-Cast Pre-Stressed Concrete Channel Girder	4406-10	PR 200 – 3.3 km south of PTH 23	1982	Ste. Elizabeth Drain
Timber Bridge	2339-00	PR 200 – 8.1 km south of PTH 23	1969	Arnaud Drain
Pre-Cast Pre-Stressed Concrete I-Girder Bridge	3891-00	PR 200 – 1.4 km north of PR 201	1974	Roseau River

5.3.4 East-West RTAC Route Option 4 – PTH 59-PR 201

The east-west RTAC Route Option 4 includes upgrading the following highways:

- PTH 59 from PTH 52 to PR 201; and
- PR 201 from PTH 59 to PR 200.

This option provides a route from the Steinbach area to Letellier and the Emerson-Pembina border crossing. This route would enable RTAC access to the southeast region of the study area and would also extend the RTAC road network closer to the USA border crossing on PTH 59. However, this route requires out-of-direction travel to get from the northeast region of the study area to PTH 75 and the Emerson-Pembina border crossing.

PTH 59 is currently an A1 rated highway and PR 200 is a B1 rated highway. The east-west RTAC Route Option 4 is illustrated in **Figure 11**.

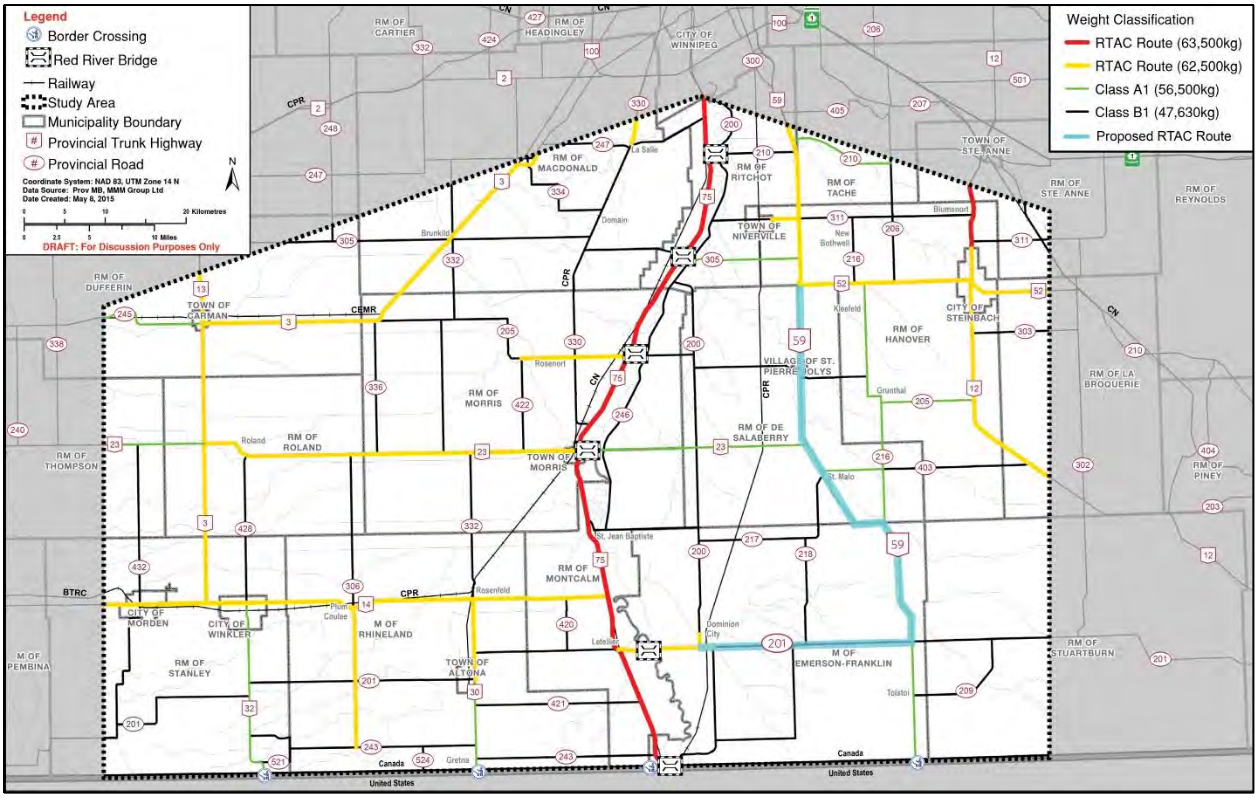


Figure 11: East-West RTAC Route Option 4

There are 13 structures along this route that would require an upgrade or a replacement to meet RTAC standards. The structures are listed in **Table 9**.

Table 9: E/W RTAC Route Option 4 - Structures

Structure Type	Site No.	Location	Year Built	Feature Intersect
Timber Bridge	2684-00	PTH 59 - 300 metres south of PTH 52	1959	Tourond Creek
Steel Culvert	2176-00	PTH 59 – 2.4 km south of PR 303	1971	Drain
Pre-Cast Pre-Stressed Box Girder Bridge	2636-10	PTH 59 – 300 metres south of PR 205	1989	Joubert Creek
Reinforced Concrete Culvert	2290-10	PTH 59 – 3.6 km north of PTH 23	2009	Coulee Des Nault
Timber Bridge with Reinforced Concrete Abutments	2983-00	PTH 59 – 4.0 km south of PTH 23	1959	Rat River
Timber Culvert	3034-00	PTH 59 – 10.5 km south of PTH 23	1959	Cattle Pass
Steel Culvert	2977-10	PTH 59 – 11.9 km north of PR 201	1999	Creek
Pre-Cast Pre-Stressed Concrete I-Girder Bridge	2397-10	PTH 59 – 6.2 km north of PR 201	1988	Roseau River
Timber Culvert	3061-00	PR 201 – 3.3 km west of PTH 59	1959	Jordan River
Steel Culvert	3060-00	PR 201 – 7.8 km west of PTH 59	1959	Jordan River
Timber Culvert	3059-00	PR 201 – 12.9 km west of PTH 59	1959	Drain
Timber Bridge	2852-00	PR 201 – 4.4 km east of PR 200 (east leg)	1957	Harlow Drain
Pre-Cast Pre-Stressed Concrete Channel Girder Bridge	2853-00	PR 201 – 200 metres east of PR 200 (east leg)	1980	Main Drain

5.4 PTH 75 Alternative Truck Route Options

Due to the large volume of commercial traffic on PTH 75 and the nature of PTH 75 through the town of Morris, demand for an alternative route to PTH 75 around Morris has increased. Although several of the east-west RTAC Route Options identified in the previous section provide an alternative route around Morris for traffic travelling to the east of PTH 75, there is still a large volume of north-south truck traffic that is destined to/from Winnipeg or PTH 1 west of Winnipeg. The following options provide an alternative route that will allow north-south traffic to circumvent the speed limit reduction, traffic signal, and pedestrian traffic along PTH 75 within the town of Morris.

5.4.1 PTH 75 Alternative Truck Route Option A – PR 205-PR 246

PTH 75 Alternative Truck Route Option A includes the following highway upgrades:

- PR 205 from PTH 75 to PR 246; and
- PR 246 from PR 205 to a new river crossing in the area of St. Jean Baptiste.

This route would provide a flood-proof RTAC rated alternative route around Morris using the existing Red River crossing on PR 205 at Aubigny and a new Red River crossing in the area of St. Jean Baptiste. The addition of a river crossing near St. Jean Baptiste would improve the connectivity of the community of St. Jean Baptiste and would provide commercial traffic with an alternative route around Morris. PR 205 and 246 are both currently B1 rated highways.

Further study would be required to determine the most optimal location for a new river crossing in the area of St. Jean Baptiste.

PTH 75 Alternative Truck Route Option A is illustrated in **Figure 12**.

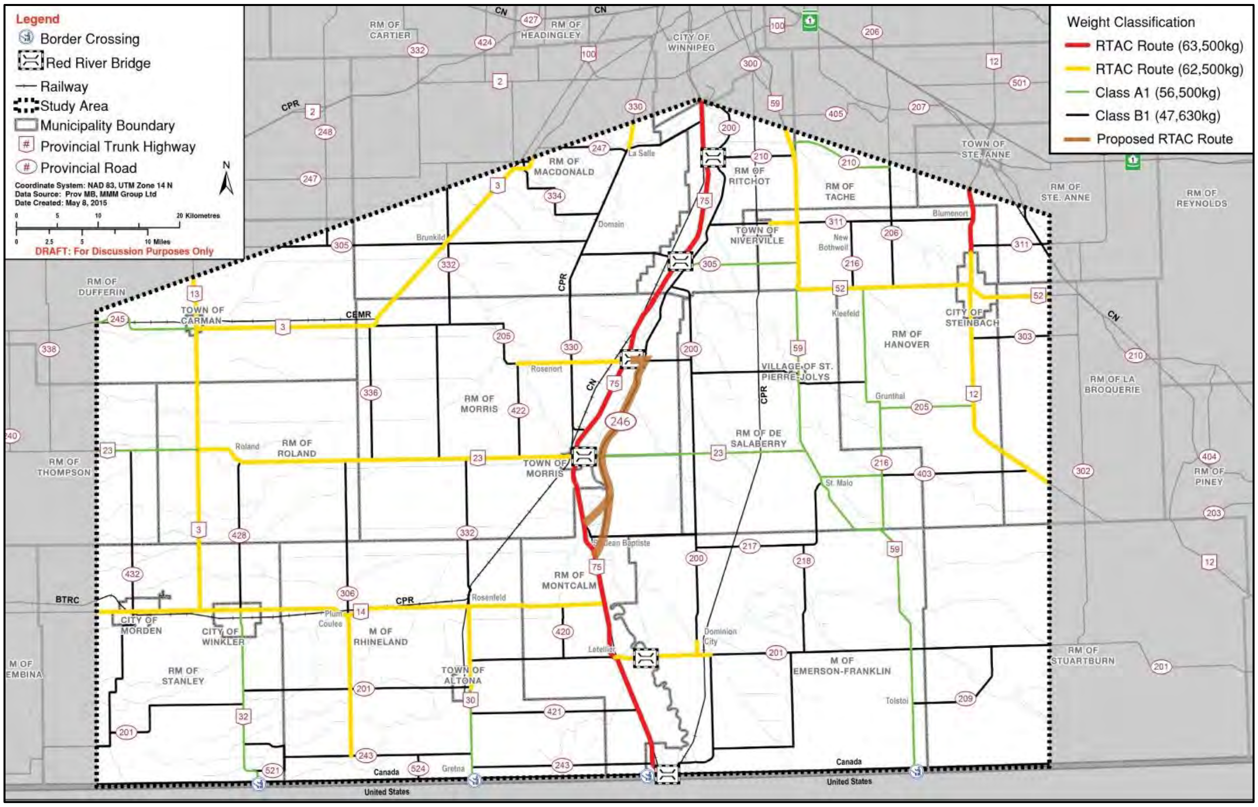


Figure 12: PTH 75 Alternative Truck Route Option A

There are two additional structures, listed in **Table 10**, along this route that would require an upgrade or a replacement to meet RTAC standards.

Table 10: PTH 75 Alternative Truck Route Option A - Structures

Structure Type	Site No.	Location	Year Built	Feature Intersect
Steel Culvert	4431-00	PR 246 – 4.8 km south of PR 205	-	Aubigny Drain
Steel Culvert	4415-10	PR 246 – 3.8 km north of PTH 23	1988	Drain

5.4.2 PTH 75 Alternative Truck Route Option B – PR 246

PTH 75 Alternative Truck Route Option B includes the following highway upgrades:

- PR 246 from a new river crossing north of Morris to a new river crossing in the area of St. Jean Baptiste.

This route would provide commercial traffic with an alternative route around Morris. The addition of a river crossing in the area north of Morris would limit the amount of truck traffic passing through the town of Aubigny and would shorten the length of the detour away from PTH 75. The addition of a river crossing near St. Jean Baptiste would improve the connectivity of the community of St. Jean Baptiste. PR 246 is currently a B1 rated highway.

Further study would be required to determine the most optimal location for a new river crossing near St. Jean Baptiste.

PTH 75 Alternative Truck Route Option B is illustrated in **Figure 13**.

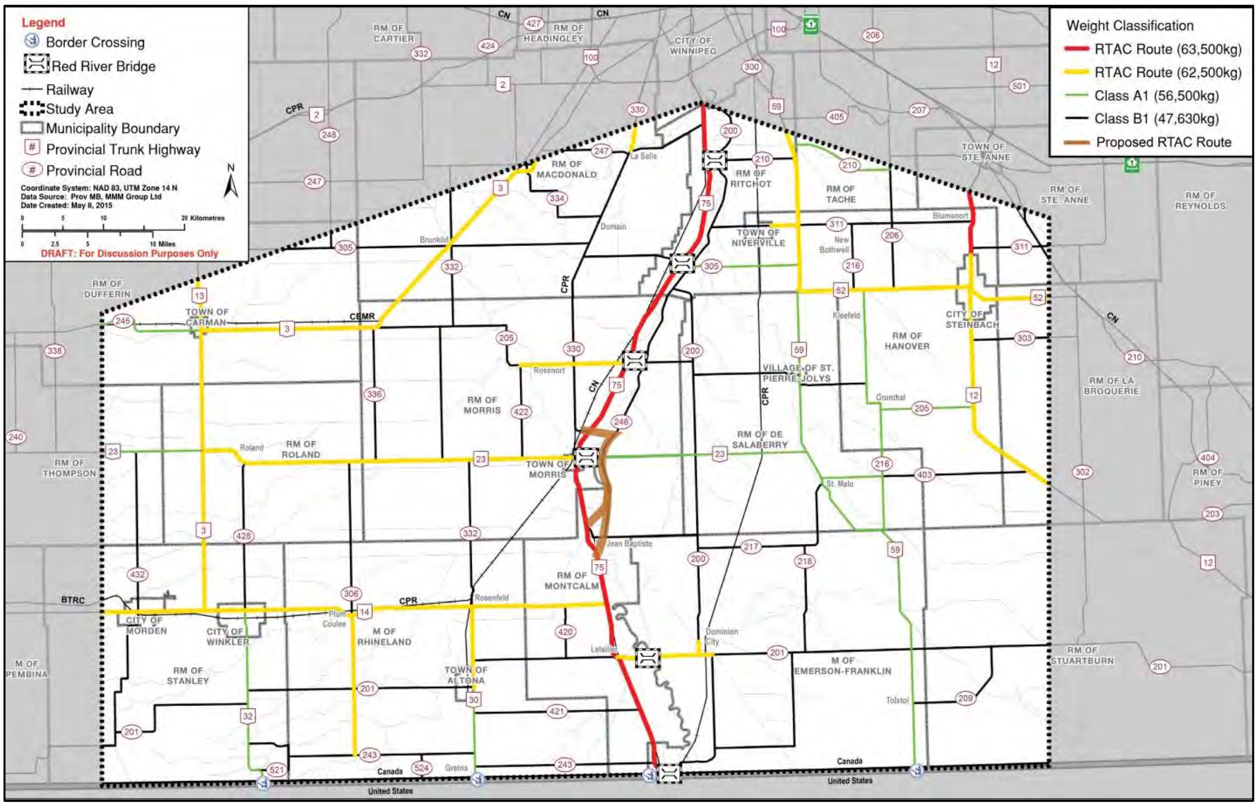


Figure 13: PTH 75 Alternative Truck Route Option B

There are no existing structures along this proposed route.

5.5 Localized RTAC Route Options

Through the public engagement process a number of routes were identified by residents and stakeholders as needing to be upgraded to RTAC. These routes would provide benefits to a sub-area within the study area, but would also provide improved connectivity for the businesses and residents of each region. The following options do not meet the requirement of provide an east-west connection across the Red River, but increase the RTAC connectivity within the study area.

5.5.1 Localized RTAC Route Option I – PR 200-PR 305

Localized RTAC Route Option I includes the following highway upgrades:

- PR 200 from PR 201 to PR 305; and
- PR 305 from PR 200 to PTH 75.

This route would provide a potential flood-route to by-pass PTH 75 from Letellier to Ste. Agathe and would provide an additional north-south RTAC route on the east side of the Red River. Localized RTAC Route Option I is illustrated in **Figure 14**.

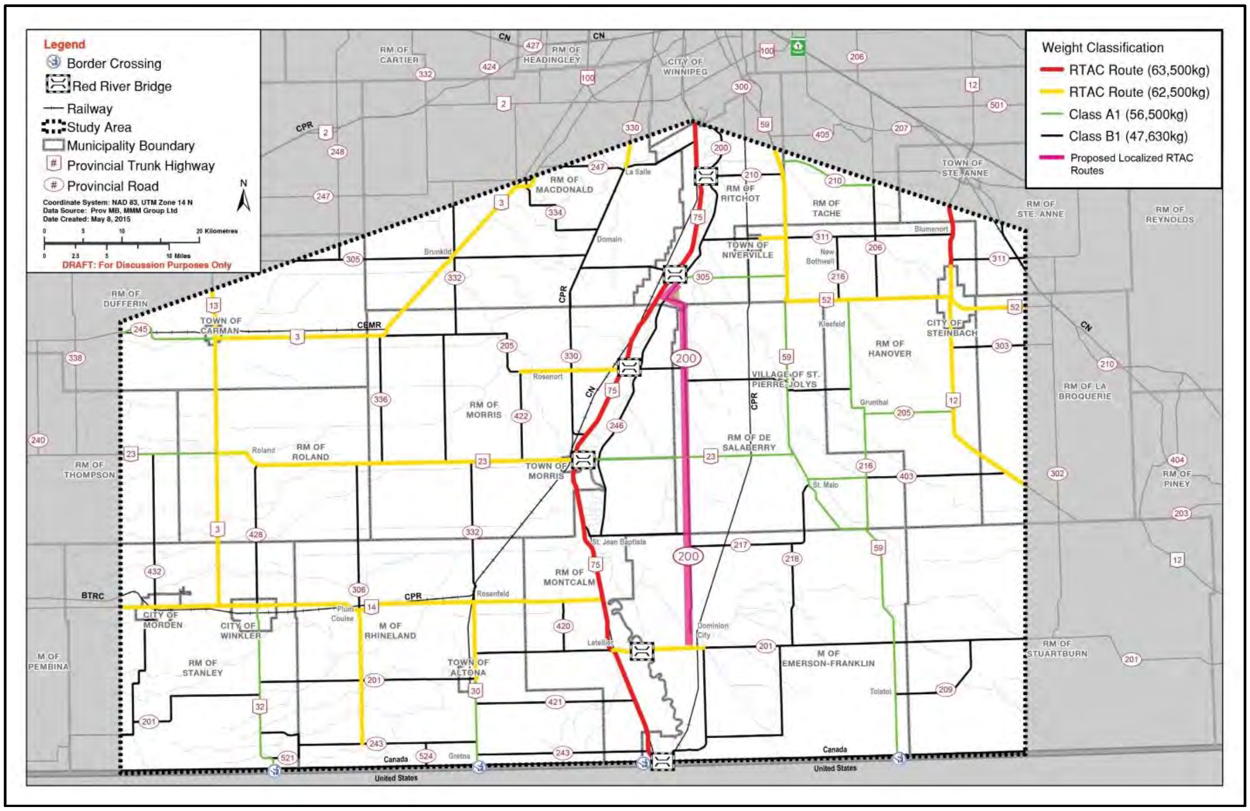


Figure 14: Localized RTAC Route Option I

There are six structures along this route that would require an upgrade or a replacement to meet RTAC standards. The structures are listed in **Table 11** below.

Table 11: Localized Route Option I - Structures

Structure Type	Site No.	Location	Year Built	Feature Intersect
Timber Bridge	3534-00	PR 200 – 1.3 km north of PR 205	1964	Marsh River
Steel Culvert	4384-10	PR 200 – 900 metres north of PR 205	1993	Drain
Steel Culvert	65-10	PR 200 – 4.8 km north of PTH 23	1962	Angle Drain
Pre-Cast Pre-Stressed Concrete Channel Girder	4406-10	PR 200 – 3.3 km south of PTH 23	1982	Ste. Elizabeth Drain
Timber Bridge	2339-00	PR 200 – 8.1 km south of PTH 23	1969	Arnaud Drain
Pre-Cast Pre-Stressed Concrete I-Girder Bridge	3891-00	PR 200 – 1.4 km north of PR 201	1974	Roseau River

5.5.2 Localized RTAC Route Option II – PR 332 and PR 422

Localized RTAC Route Option II includes the following highway upgrades:

- PR 332 from PTH 14 to PTH 23; and
- PR 422 from PTH 23 to PR 205.

This route would provide a north-south connection between PTH 14, PTH 23, and PR 205 west of PTH 75. Localized RTAC Route Option II is illustrated in **Figure 15**.

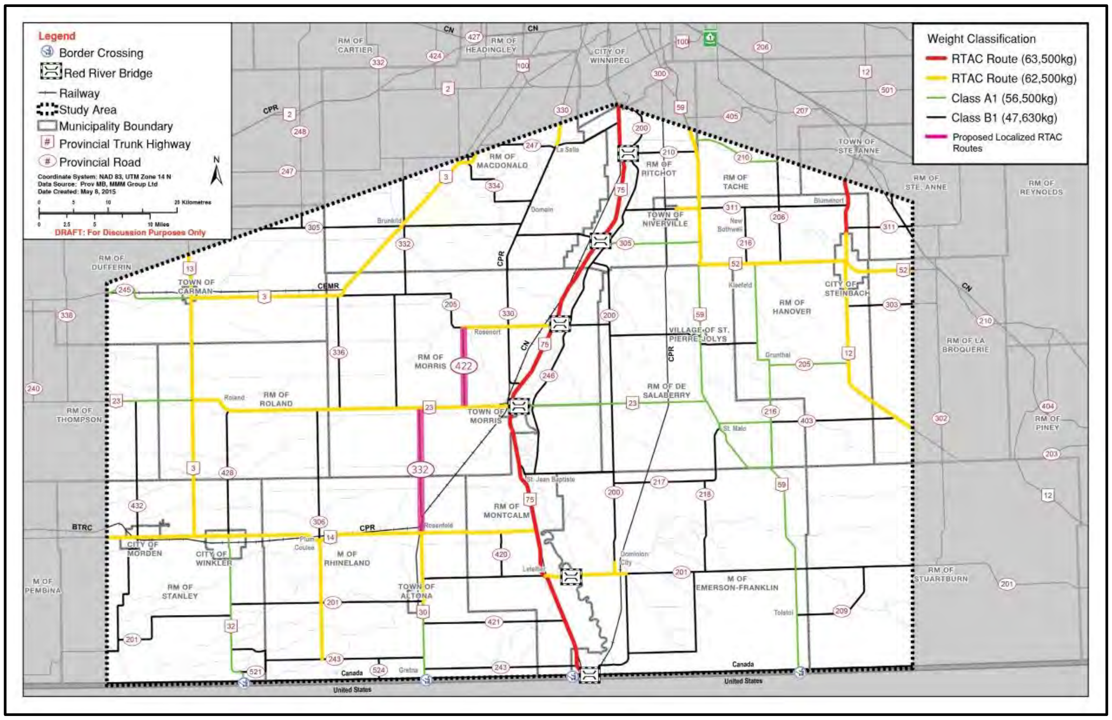


Figure 15: Localized RTAC Route Option II

There are 16 structures along this route that require an upgrade or a replacement to meet RTAC standards. The structures are listed in **Table 12** below.

Table 12: Localized Route Option II - Structures

Structure Type	Site No.	Location	Year Built	Feature Intersect
Timber Bridge	3398-00	PR 422 – 0.5 km south of PR 205	1965	Little Morris River
Pre-Cast Pre-Stressed Concrete Channel Girder Bridge	4403-10	PR 422 – 5.0 km south of PR 205	1986	Russell Drain
Pre-Cast Pre-Stressed Concrete Channel Girder Bridge	3399-10	PR 422 – 4.9 km north of PTH 23	1986	Howatt Drain
Pre-Cast Pre-Stressed Concrete Channel Girder Bridge	3400-10	PR 422 – 3.3 km north of PTH 23	1986	Bell Drain
Pre-Cast Pre-Stressed Concrete Channel Girder Bridge	3401-10	PR 422 – 1.6 km north of PTH 23	1986	Anderson Drain
Timber Bridge	3392-00	PR 332 – 900 metres south of PTH 23	1970	Shannon Creek
Timber Bridge	3393-00	PR 332 – 1.7 km south of PTH 23	1977	Drain
Timber Bridge	4149-00	PR 332 – 5.0 km south of PTH 23	1973	Janzen Drain
Pre-Cast Pre-Stressed Concrete Channel Girder Bridge	3394-00	PR 332 – 6.6 km south of PTH 23	1977	Moyer Drain
Timber Bridge	3395-00	PR 332 – 8.2 km south of PTH 23	1969	Kronsgart Drain
Timber Bridge	3457-00	PR 332 – 9.9 km south of PTH 23	1977	Boundary Drain
Timber Bridge	3456-00	PR 332 – 6.5 km north of PTH 14	1975	Hespeler Floodway
Round Concrete Pipe Culvert	3455-10	PR 332 – 4.9 km north of PTH 14	1976	Johnson Drain
Timber Bridge	3454-00	PR 332 – 3.3 km north of PTH 14	1977	Dredge Channel
Steel Culvert	4250-00	PR 332 – 2.7 km north of PTH 14	1976	Natural Run
Round Concrete Pipe Culvert	4251-10	PR 332 – 1.7 km north of PTH 14	1996	Knopf Drain

5.5.3 Localized RTAC Route Option III – PR 243-PR 521

Localized RTAC Route Option III includes the following highway upgrades:

- PR 243 from PTH 30 to PR 521; and
- PR 521 from PR 243 to PTH 32.

This route would provide an RTAC connection to PR 306 for the feed mills along PR 243. Localized RTAC Route Option III is illustrated in **Figure 16**.

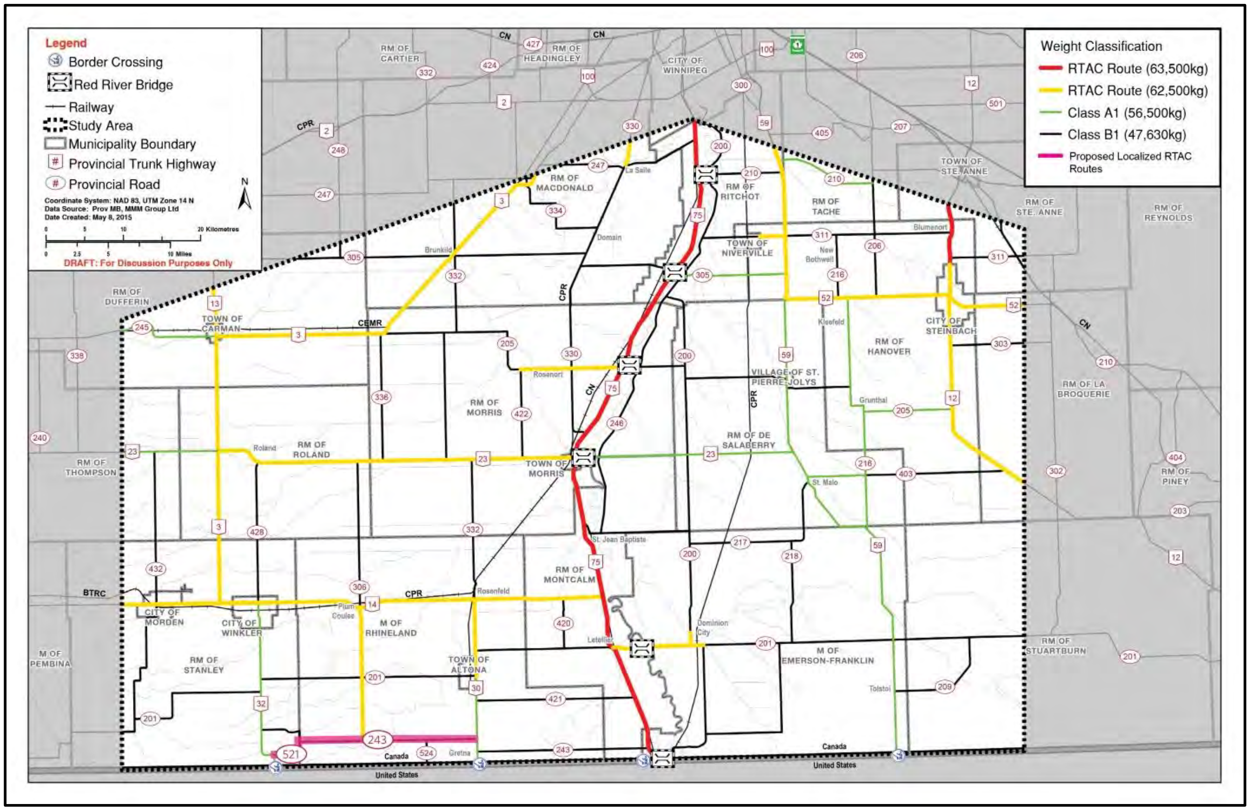


Figure 16: Localized RTAC Route Option III

There are two structures along this route that require an upgrade or a replacement to meet RTAC standards. The structures are listed in **Table 13**.

Table 13: Localized Route Option III - Structures

Structure Type	Site No.	Location	Year Built	Feature Intersect
Timber Bridge	3892-00	PR 243 – 1.2 km west of PTH 30	1971	Buffalo Lake Tributary
Timber Bridge	3440-00	PR 243 – 9.9 km west of PTH 30	1969	Buffalo Drain Tributary

5.5.4 Localized Route Option IV – PR 403

Localized RTAC Route Option IV includes upgrading PR 403 from PTH 12 to PTH 59. This route would provide an RTAC connection to PTH 12 for the producers in the region. Localized RTAC Route Option IV is illustrated in **Figure 17**.

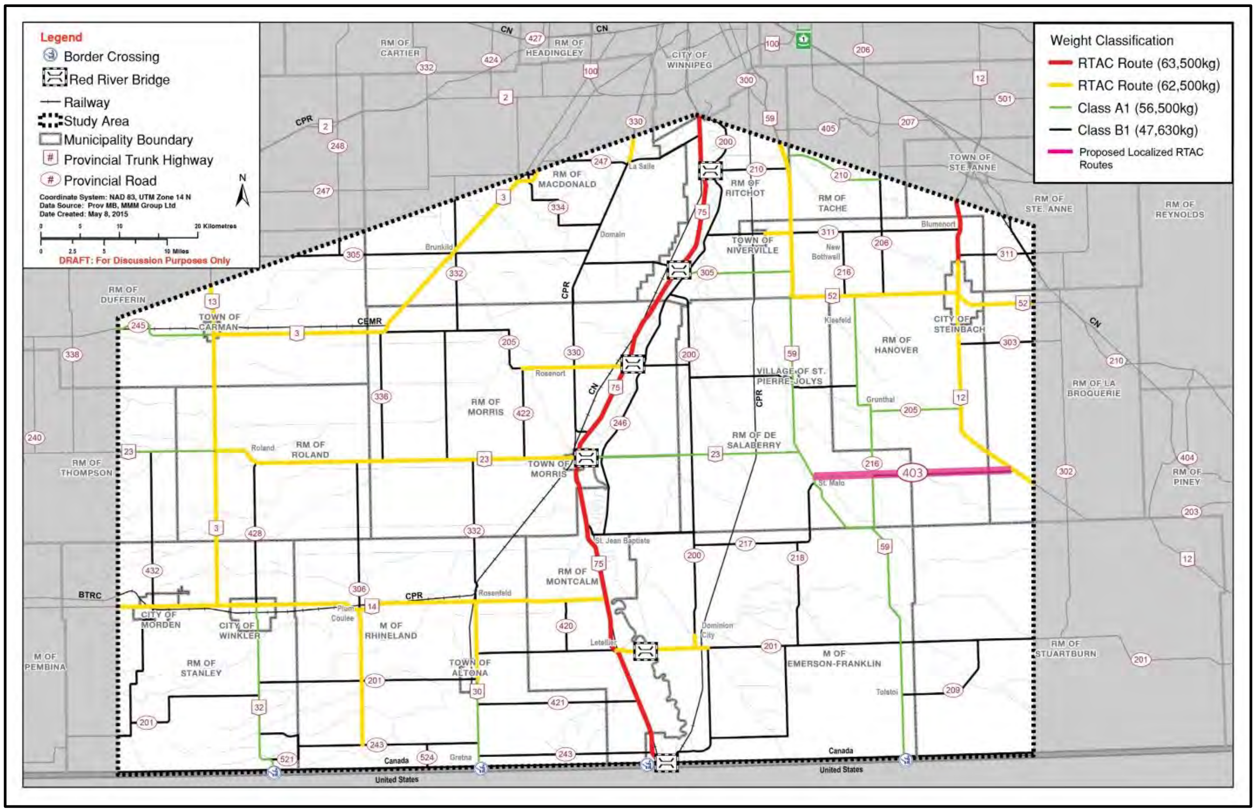


Figure 17: Localized RTAC Route Option IV

There is one structure along this route that requires an upgrade or a replacement to meet RTAC standards. The structure is listed in **Table 14.**

Table 14: Localized Route Option IV - Structures

Structure Type	Site No.	Location	Year Built	Feature Intersect
Pre-Cast Pre-Stressed Concrete Channel Girder Bridge	4581-10	PR 403 – 13.8 km east of PTH 59	1997	Joubert Creek

5.5.5 Localized RTAC Route Option V – PR 305

Localized RTAC Route Option V includes upgrading PR 305 from PTH 59 to PTH 75. This route would provide an RTAC connection between PTH 59 and PTH 75 south of PTH 100. Also, this option would provide an efficient RTAC rated route from Steinbach to PTH 75, but does not improve RTAC connectivity in the south of half of the study area. The east-west RTAC Route Option 3 is illustrated in **Figure 18**.

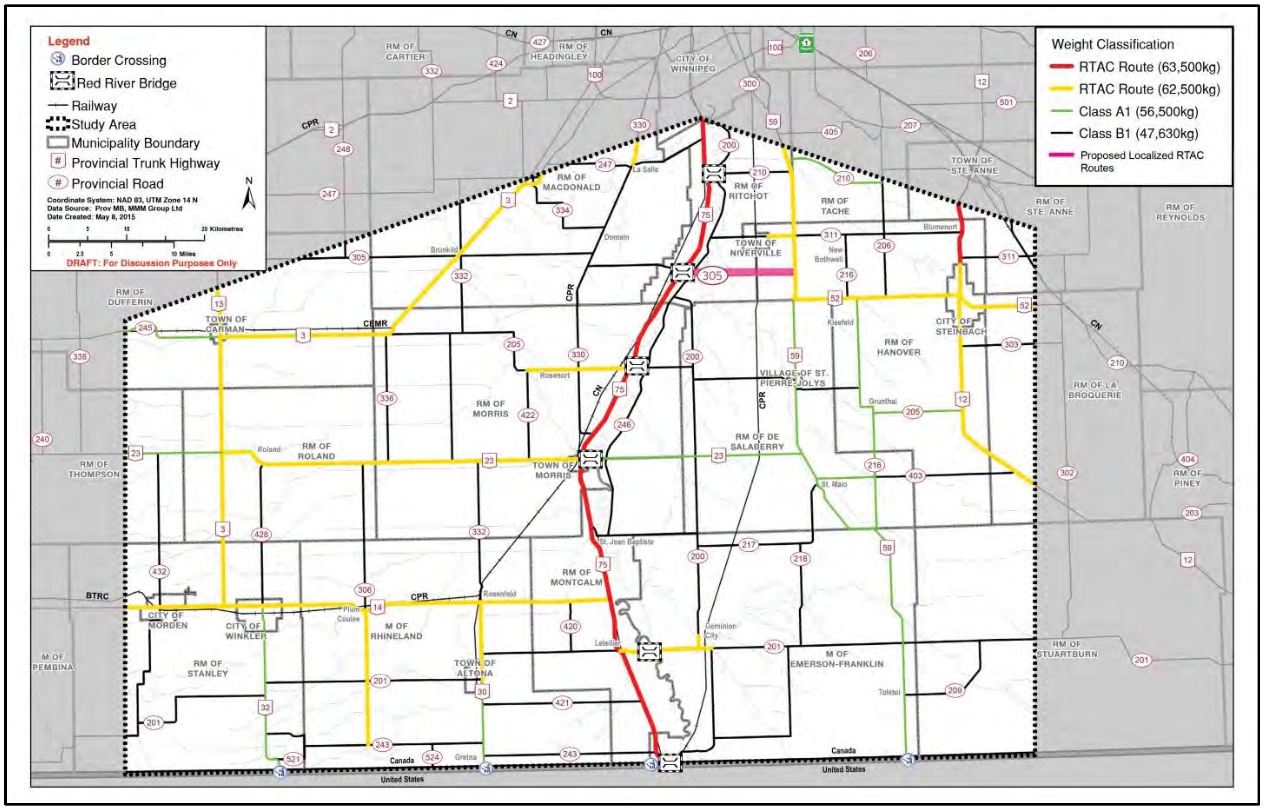


Figure 18: Localized RTAC Route Option V

There are two structures along this route that require an upgrade or a replacement to meet RTAC standards. The structures are listed in **Table 15**.

Table 15: Localized Route Option V - Structures

Structure Type	Site No.	Location	Year Built	Feature Intersect
Timber Bridge	3573-00	PR 305 – 8.2 km west of PTH 59	1976	Tourond Creek
Timber Bridge	54-00	PR 305 – 2.6 km east of PR 200	1967	Rat River

5.6 Estimated Cost of Options

A high level cost estimate was completed for each route alternative. The estimate was based on the following assumptions:

- Road Construction:
  - $800,000 per linear two lane km of highway upgrade to RTAC;
  - $3,500,000 per linear two lane km of new highway construction to RTAC;
- River Crossing Construction:
  - $8,000 per sq. m. for upgrade or replacement of structures within the Red River Valley (excluding structures crossing the Red River);
  - $10,000 per sq. m. for upgrade or replacement of structures crossing the Red River;
  - $3,000,000 per box culvert installation or replacement; and
  - $10,000,000 for slope stabilization of new Red River crossings.

The estimated cost for each option is shown in **Table 16.**

Table 16: Estimated Costs of Options

Option	E/W Option 1	E/W Option 2	E/W Option 3	E/W Option 4	PTH 75 Alternative Option A	PTH 75 Alternative Option B	Local RTAC I	Local RTAC II	Local RTAC III	Local RTAC IV	Local RTAC V
Route	PTH 59 - PTH 23	PTH 59 - PTH 23 - PR 246	PTH 59 - PTH 23 - PR 200 - PR 201	PTH 59 - PR 201	PR 205 - PR 246	PR 246	PR 200 - PR 305	PR 332, PR 422 - PR 205	PR 243 - PR 521	PR 403	PR 305
KM of Road Upgrade	50.0	55.0	60.0	75.0	10.0	0.0	50.0	50.0	30.0	25.0	10.0
Est. Cost of Upgrade to RTAC ($ Million)	$40.0	$44.0	$48.0	$60.0	$8.0	$0.0	$40.0	$40.0	$24.0	$20.0	$8.0
KM of New Road Construction	0	3.0	0	0	18.0	18.0	0	0	0	0	0
Est. Construction Cost ($ Million)	$0.00	$11.0	$0.0	$0.0	$63.0	$63.0	$0.0	$0.0	$0.0	$0.0	$0.0
No. of Structures Requiring Upgrade	8	9	10	12	2	0	6	18	2	1	2
Total Est. Cost of Structures ($ Million)	$24.0	$85.0[1]	$32.0	$40.0	$65.0[1]	$120.0[1]	$16.0	$44.0	$4.0	$4.0	$12.0
Contingency ($ Million)	$16.0	$35.0	$20.0	$25.0	$34.0	$47.0	$14.0	$21.0	$7.0	$6.0	$5.0
Total Est. Cost of Construction[2] ($ Million)	**$80.0**	**$175.0**	**$100.0**	**$125.0**	**$170.0**	**$230.0**	**$70.0**	**$105.0**	**$35.0**	**$30.0**	**$25.0**

Notes:
1. Includes cost of new crossing of the Red River.
2. Estimates include a 25 percent contingency, but exclude land costs and engineering costs.

6.0 EVALUATION

6.1 Evaluation Criteria

A set of evaluation criteria and weightings were developed by MMM, and reviewed and approved by Manitoba Infrastructure, for the analysis of the RTAC route network alternatives. The evaluation criteria and each criterion's assigned weight value are shown in **Table 17**.

Table 17: Evaluation Criteria

Evaluation Criteria		
Criteria	**Weight**	**Description**
RTAC Connectivity	20	Based on the route's ability to efficiently facilitate goods movement.
Safety	16	Based on the ability of vehicular traffic to move safely throughout the corridor including intersection conflicts, high-speed collision potential, and the interaction between trucks, vehicles, and pedestrians.
Community Impacts	16	Based on the route's potential social and economic impacts to neighbouring communities.
Economic and Environmental Sustainability	14	Based on the life-cycle costs and environmental impact of the route.
Strategic Trade Route Network Asset	14	Based on the potential improvement to the existing Strategic Trade Route Network.
Capital Cost	10	Based on the initial costs required to upgrade or construct the proposed route.
Flood Route Value	10	Based on the potential the proposed route would have to provide a by-pass route during a flood event.
Total	100	

6.2 Evaluation of Options

The east-west RTAC Routes Options and the PTH 75 Alternative Truck Route Options were evaluated to determine the recommended option for each category. For each of the alternative routes considered, a comparative analysis was conducted. The alternatives were evaluated to determine their ability to satisfy the evaluation criteria. A score between 0 (low) and 4 (high) was determined for each criterion and then factored based on the weights identified in **Table 17** to produce a 'Total Weighted Score'. The higher the compiled value, the better that alternative's ability to satisfy the project's desired outcome.

The Localized RTAC Route Options were not evaluated, as it is difficult to conduct a comparative analysis because each route serves a different region of the study area and addresses a different localized need. These routes are all recommended to be considered in the Department's planning for future highway upgrades.

The rankings of the east-west RTAC route options based on the 'Total Weighted Score' are shown in **Table 18** and the rankings of the PTH 75 Alternative Truck Route options are shown in **Table 19**.

Table 18: Evaluation of East-West RTAC Route Options

Weighted Evaluation of Options										
Points: Better----->		East-West RTAC Route Options								
0--------->4		E/W RTAC 1		E/W RTAC 2		E/W RTAC 3		E/W RTAC 4		
Evaluation Factor	**Weight**	**Points**	**Score**	**Points**	**Score**	**Points**	**Score**	**Points**	**Score**
RTAC Connectivity	20	4	80	3	60	3	60	2	40
Safety	16	1	16	3	48	4	64	3	48
Community Impacts	16	2	32	4	64	2	32	1	16
Economic and Environmental Sustainability	14	4	56	2	28	3	42	2	28
Strategic Trade Route Network Asset	14	4	56	3	42	2	28	3	42
Capital Cost	10	3	30	0	0	2	20	1	10
Flood Route Value	10	3	30	3	30	1	10	3	30
Total Weighted Score	100		**300**		**272**		**256**		**214**
Evaluation Ranking (Points)		**1**		**2**		**3**		**4**	
Comparative Upgrade Cost [$Million (2015)]		$80.0		$175.0		$100.0		$125.0	

Table 19: Evaluation of PTH 75 Alternative Truck Route Options

Weighted Evaluation of Options					
Points: Better-----> 0--------->4		PTH 75 Alternative Truck Routes			
		Option A		Option B	
Evaluation Factor	Weight	Points	Score	Points	Score
RTAC Connectivity	20	4	80	4	80
Safety	16	4	64	4	64
Community Impacts	16	2	32	3	48
Economic and Environmental Sustainability	14	3	42	2	28
Strategic Trade Route Network Asset	14	0	0	0	0
Cost	10	2	20	0	0
Flood Route Value	10	4	40	4	40
Total Weighted Score	100		**278**		**260**
Evaluation Ranking (Points)		**1**		**2**	
Comparative Upgrade Cost [$Million (2015)]		$170.0		$230.0	

7.0 RECOMMENDED PLAN

7.1 Recommended East-West RTAC Route

RTAC Route Option 1 is the recommended option for an east-west RTAC route. The option is the most cost-effective route and requires the least amount of out-of-direction travel between the northeast region of the study area and the southwest region of the study area.

Although this option received the highest overall score, it received the lowest rating for safety due to the school zone on PTH 23 within the town of Morris. It's recommended that a safety study be done to identify and address any safety issues in Morris.

7.2 Recommended PTH 75 Alternative Truck Route

PTH 75 Alternative Truck Route Option A is the recommended option. The option is the most cost-effective route due to the use of the existing structure on PR 205 at Aubigny.

A functional design study is recommended to determine the optimal location of the new river crossing near St. Jean Baptiste.

7.3 Localized RTAC Routes

It is recommended that all Localized RTAC Route Options be considered in the Department's future regional planning. These routes all provide improved connectivity within small regions of the study area and would be beneficial to the local residents and industry.

When constructing these routes, additional thought should be given to further improving RTAC connectivity. In particular, for Option III, an upgrade of PTH 30 to RTAC south of Altona would reduce out-of-direction travel for trucks on PR 243 east of PR 306. For Option IV, an upgrade of PTH 59 to RTAC from PTH 23 to PR 403, assuming PTH 59 is upgraded to PTH 23, would provide an additional RTAC connection from PTH 12 to PTH 59.

7.4 Recommended RTAC Network

The recommended network of RTAC roads is illustrated in **Figure 19**.

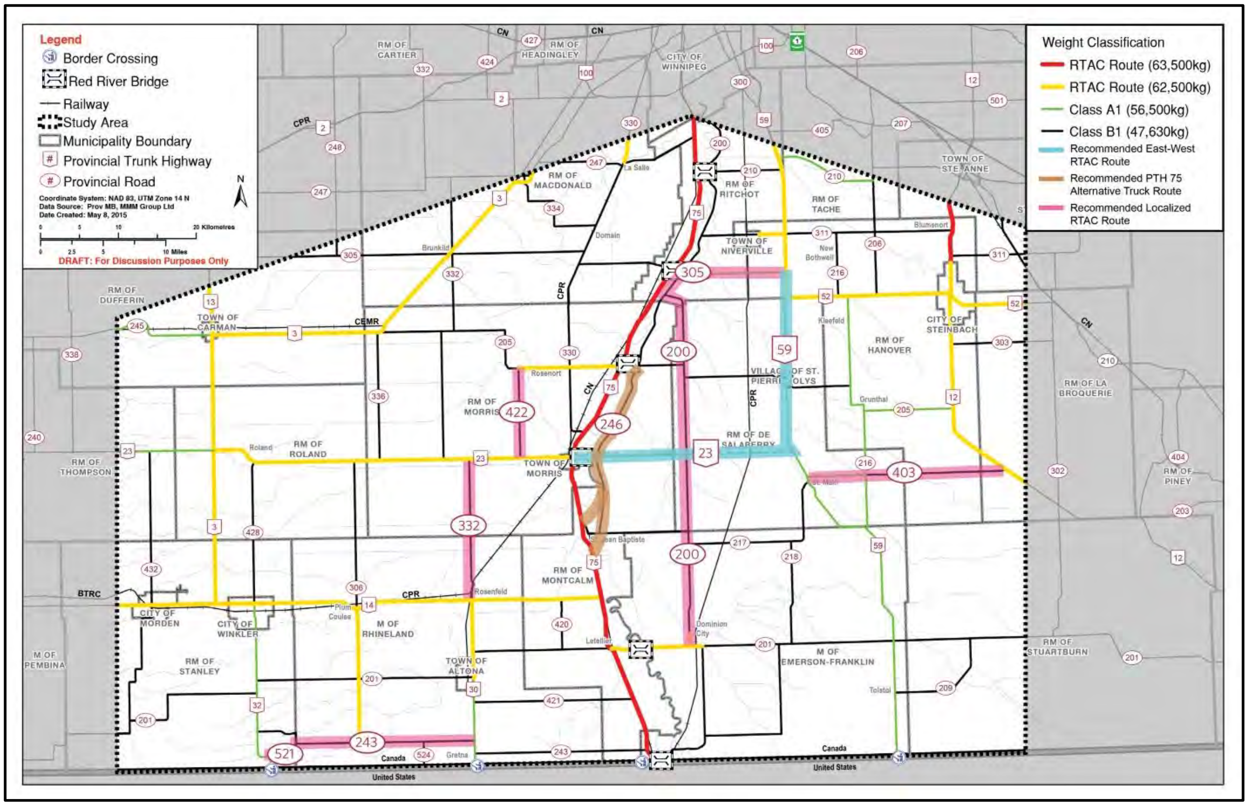


Figure 19: Recommended RTAC Network

Upon completion of these routes, east-west RTAC Route Options 1, 2, and 3 would all be in place as a by-product of PTH 75 Alternative Route A and Localized RTAC Route I. The completion of all recommended routes would significantly improve the RTAC connectivity of the entire region.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The three key goals/objectives of this study were:

1. Reviewing and finalizing a 'Trade Route' (RTAC) network for the study area that includes appropriate connections to the USA.

2. Determining the adequacy of existing Red River crossings to meet current and future travel demand in the study area.

3. Assessing the need for and location of new connections across the Red River and/or possible rationalization of existing crossings.

The conclusions of this study are:

- An RTAC connection across the Red River is necessary to facilitate goods movement from the east region of the study area to the west region, including the Pembina-Emerson border crossing and PTH 75;
- The existing river crossings are adequate to accommodate existing and future traffic volumes forecast to 2035;
- When compared to similar jurisdictions, the Red River crossings are adequately spaced. However, there is an imbalance between the spacing north of Morris and south of Morris, due to the loss of the PR 246 river crossing; and
- The loss of the Red River crossing on PR 246 had a negative social and economic impact on the community, as local stores and service providers have seen their customer base reduced due to the lack of connectivity across the river.

The recommendations of this study are:

- Upgrade PTH 59 from PTH 52 to PTH 23 and PTH 23 from PTH 75 to PTH 59 to RTAC to create an east-west RTAC route;
- Conduct a functional design study of the PTH 75 Alternative Truck Route; and
- Consider the localized RTAC route options in the Department's future regional planning.