North Battleford

City of North Battleford

Transportation Master Plan
FINAL

December 2017

CA000196

Government of Saskatchewan

CIMA+ Partners in excellence

City of North Battleford
Transportation Master Plan

FINAL

Project n°CA000196

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Introduction

A Transportation Master Plan (TMP) is a long-range transportation planning document that provides a picture of how a community would like to see its mobility needs met. A TMP encompasses a relevant range of mobility components, it should be integrated into an overall vision of the community, have strategic goals and policies to guide its implementation, and action plans that can be further translated into short-term plans and budget documents. This TMP has been prepared by the City of North Battleford (City) in cooperation with the Saskatchewan Ministry of Highways and Infrastructure (MHI) based on the requirements of the Urban Highway Connector Program (UHCP). The UHCP is intended to support the efficient movement of long-distance travel through Saskatchewan's urban municipalities. Representatives from the surrounding municipalities of the Town of Battleford, Regional Municipality of North Battleford, and the Regional Municipality of Battle River, were included as study stakeholders. The involvement of these stakeholders and the public at the beginning of the study provided the team with an understanding of future growth in the region as a whole, as well as local and regional transportation needs, concerns and goals.

The Transportation Master Plan focuses on the 25,000 regional population horizon, which is currently estimated to occur around the 2038 horizon but also considers future connections for long-term network planning. The Transportation Master Plan will complement the City's Official Community Plan, and these two documents together will provide guidance for the development process. **Figure 1** shows the Transportation Master Plan study area.

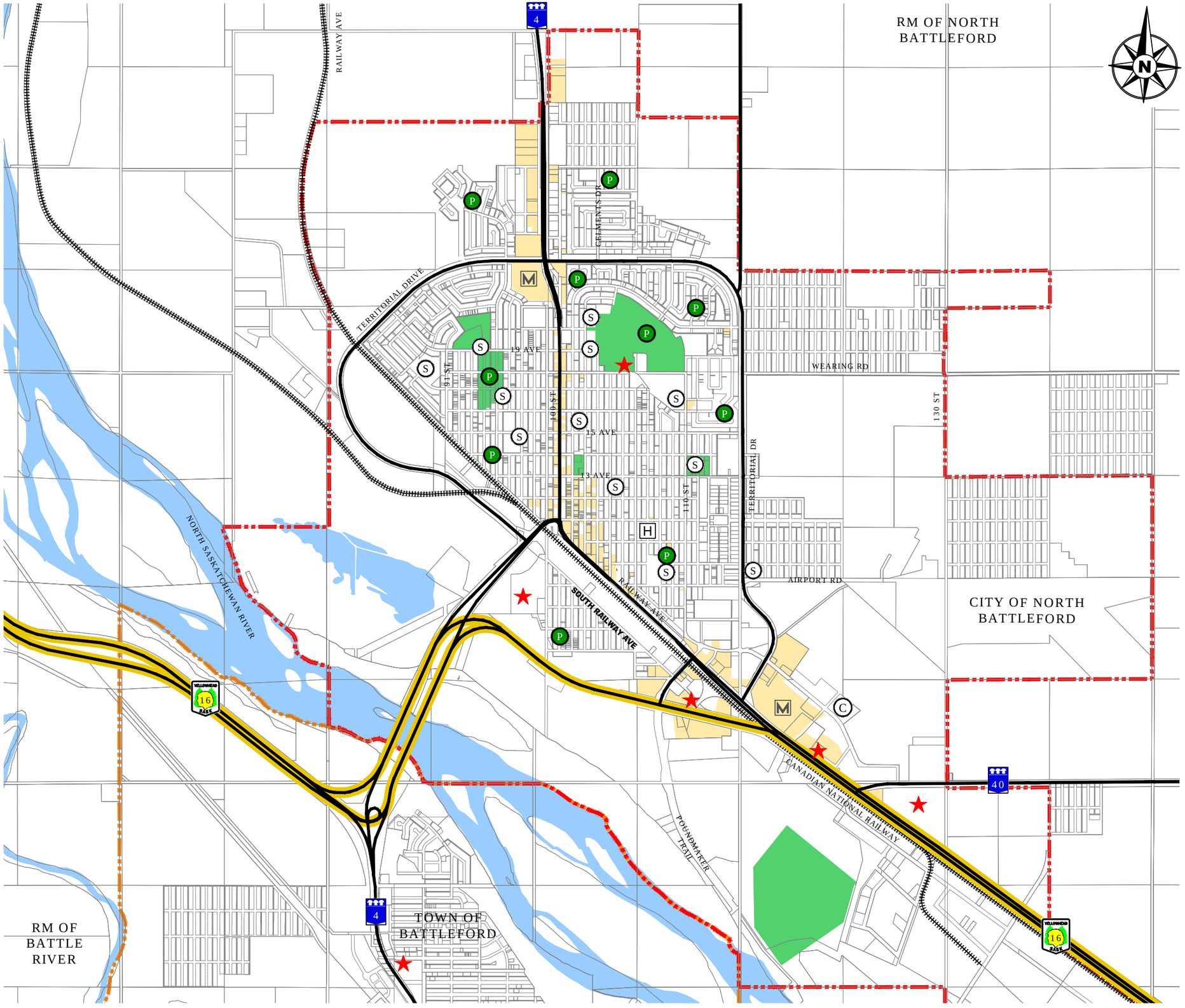
The Transportation Master Plan address two primary study purposes:

1. Provides the City with a long-range transportation planning document to guide planning, upgrading and managing the operation of its transportation networks.
2. Provides MHI and the City with a current understanding of how effectively the UHCP roadway classifications, and associated performance levels, have been maintained in support of inter-regional travel through the City of North Battleford.

Furthermore, the Transportation Master Plan:

+ Refines the Official Community Plan transportation objectives and policies
+ Assesses provincial level-of-interest in urban connector routes through North Battleford
+ Defines long-range transportation networks
+ Determines infrastructure, program, and service needs

The policies, plans and recommendations outlined in this TMP are elaborated on and supported in a TMP Technical Report submitted to City and MHI administration under separate cover.



City of North Battleford

TRANSPORTATION

MASTER PLAN

LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY
- COMMERCIAL AREA
- PARKS & FIELDS
- (S) SCHOOL
- [M] SHOPPING MALL
- ★ CONVENTION CENTER
- (C) CUPLEX
- (P) PLAYGROUND
- [H] HOSPITAL

FIGURE 1

STUDY AREA

North Battleford

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NOT TO SCALE

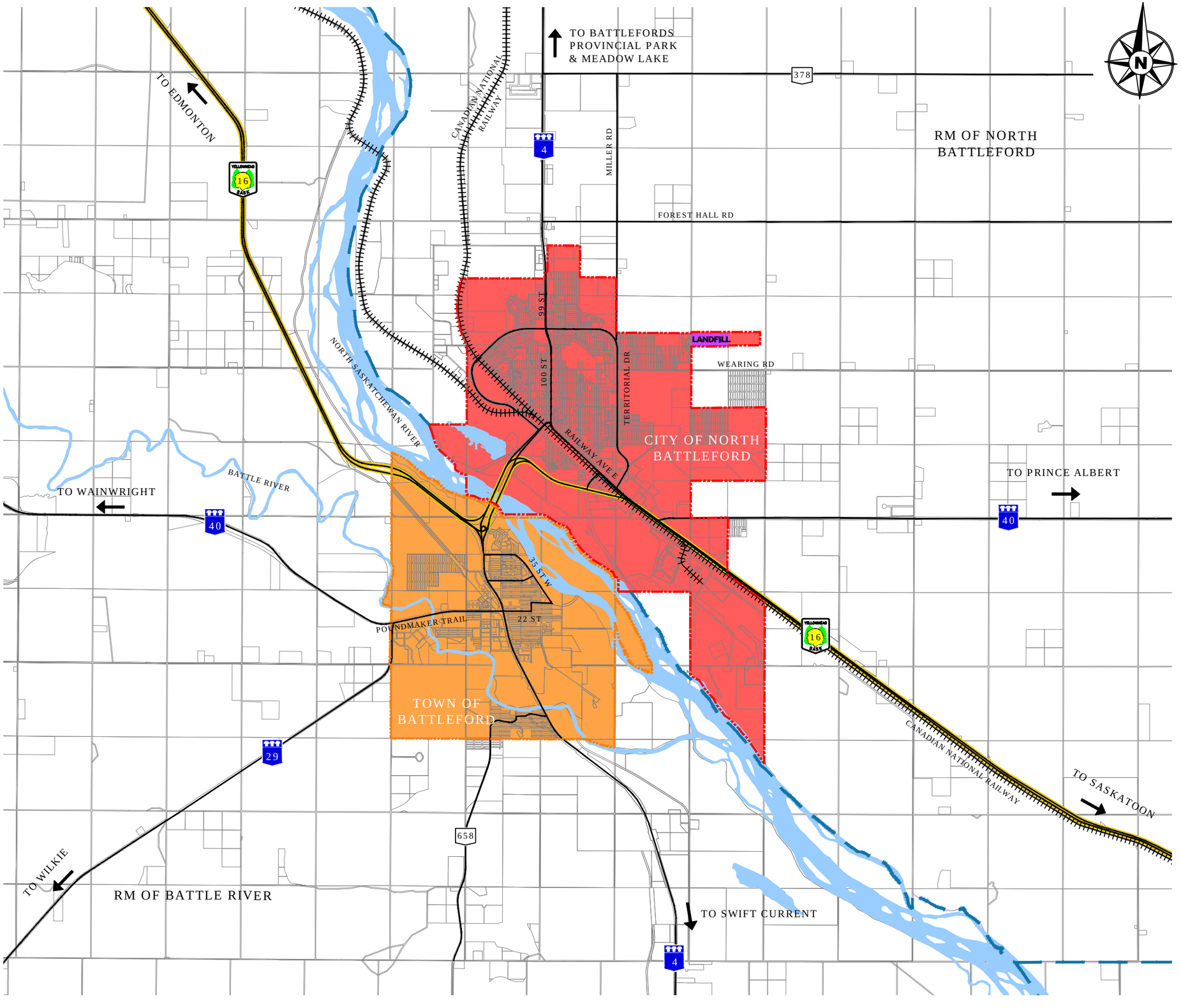
Regional Context

The 2015 urban population of the Battlefords was estimated to be approximately 20,000 split mainly between the City of North Battleford with a 2011 population of 13,888, and the Town of Battleford with a 2011 population of 4,065. Between 2006 and 2011 the population of North Battleford increased by 5.3%. A population growth rate of 1% per year is anticipated to continue into the future. Statistics Canada indicates that in 2011, the median age in North Battleford was 36.9 years. In comparison, the median age of Saskatchewan was 38.2 years. The City's boundary currently encompasses 33.6 square kilometers.

The Battlefords are located at a major junction, or "hub", in the Provincial highway network, midway between Saskatoon (130 km to the southeast) and the Alberta border (140 km to the west). The "hub" spokes include Yellowhead Highway 16 northeast and southwest, Highway 4 north and south, Highway 40 east and west, and Highway 29 southwest. However, regional travel in and out of North Battleford is primarily limited to three approaches: Highways 16 and 40 join to enter from the southeast; Highways 16, 4, 40 and 29 converge on the river crossing to enter from the south; and Highway 4 enters from the north. Travel on the study area road network varies from interprovincial traffic on the Yellowhead Highway to local "commuter" traffic between Battleford and North Battleford, as well as to/from other nearby communities. North Battleford's location in this "hub" area means that the community's growth needs to be understood in a local, regional, and provincial context. The North Saskatchewan River runs to the west and south of the City, creating the boundary with the Town of Battleford. **Figure 2** shows the location of the City of North Battleford in the regional context.

The City of North Battleford features many parks, a beautiful North Saskatchewan River Valley and area lakes surrounded by the richest agricultural land in the world. A variety of recreation and leisure opportunities are available to all. Transportation options in the City include public transit, a Handi-Bus System and taxis, as well as a number of active modes trails and pathways. Greyhound Canada provides daily service from North Battleford to Saskatoon (three daily departures), Meadow Lake (one daily departure), and Lloydminster (two daily departures), with one-way fares ranging from $26.00 to $35.00.

City of North Battleford
TRANSPORTATION
MASTER PLAN



LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY
- EXISTING ROAD NETWORK
- YELLOWHEAD HIGHWAY
- REGIONAL MUNICIPALITY BOUNDARY

FIGURE 2
REGIONAL CONTEXT

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Previous Plans and Studies

The recently completed Official Community Plan provides the City with goals, objectives and policies to guide development over the next 20 years.

Official Community Plan

The City of North Battleford Official Community Plan, completed in 2013, developed a vision for 2030 of a City that is ***Healthy***, ***Green***, ***Safe***, and ***Strong***. The purpose of the Official Community Plan is to provide direction for establishing by-laws, programs, and decision making for future land use and development proposals. The vision, goals, objectives, and policies developed in the Official Community Plan will be incorporated into the Transportation Master Plan and are discussed in more detail throughout this report.

The Official Community Plan also developed a future land use concept for the City. **Figure 3**, adapted from the plan, shows the land use concept. Future residential development is located primarily to the north side of the city, with the majority of future industrial and commercial development anticipated in the southeast quadrant of the city.

Other previously completed studies include area master plans, traffic studies and functional planning studies. The following relevant plans and studies were reviewed in development of the Transportation Master Plan:

+ Downtown Revitalization Action Plan, Draft June 2016, Crosby Hanna & Associates Landscape Architecture and Community Planning
+ Fairview Heights Master Plan, November 2013, AECOM
+ Parsons Industrial Park Land Use Study, Draft May 2010, AECOM
+ Carlton Trail Transportation Impact Assessment, April 2016, CIMA+
+ Battleford Highway 16 Functional Planning Report, April 2014, Watt Consulting Group
+ Traffic Study for Territorial Drive between 95th Street and 100th Street, September 2013, AECOM
+ Frontier Mall Access Review, June 2010, AECOM
+ South East Quadrant Traffic Study, December 2003, UMA Engineering Ltd.
+ Highway 16/40 Intersection Analysis, December 1999, Reid Crowther & Partners Ltd.
+ Battlefords Regional Traffic Study, February 1994, Reid Crowther & Partners Ltd.
+ Traffic Study, March 1998, DELCAN
+ Functional Report Interchange at Junction of Highways 4 & 16 Battleford, March 1981, DELCAN

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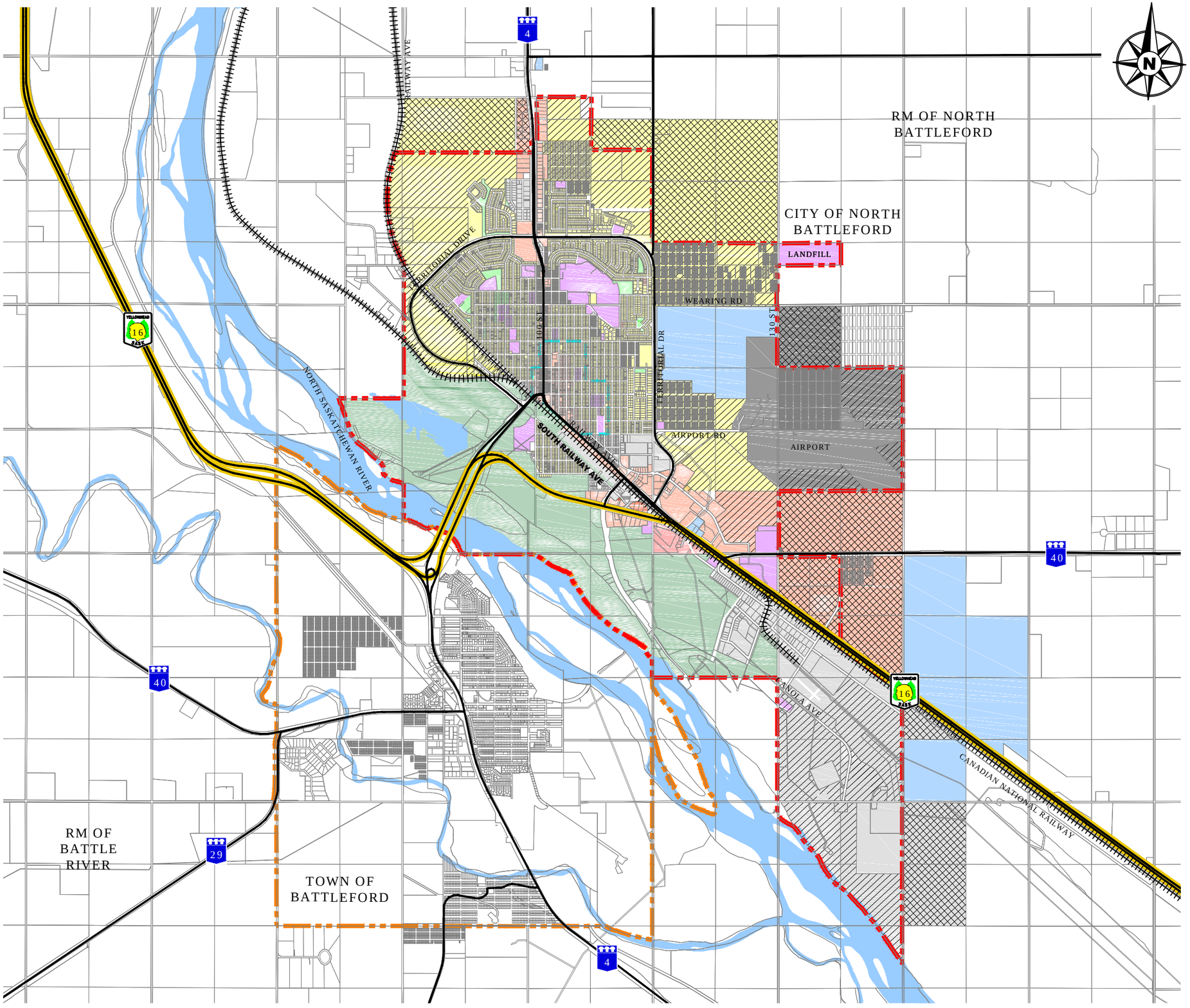

LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY
- CORE INFILL DEVELOPMENT AREA
- EXISTING ROAD NETWORK

EXISTING	FUTURE	POTENTIAL	
			RESIDENTIAL
			COMMERCIAL
			INDUSTRIAL
			COMMUNITY SERVICE
			OPEN SPACE
			RESTRICTED DEVELOPMENT
			AIRPORT
			URBAN RESERVE

SOURCE: NORTH BATTLEFORD OFFICIAL COMMUNITY PLAN

FIGURE 3

FUTURE LAND USE CONCEPT

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Public & Stakeholder Engagement

Public engagement is important to assist in determining the vision for the City's transportation networks, to educate the public as to the purpose and use of the Transportation Master Plan, and to inform the project team as to issues, concerns, wants and needs. Consultation activities have served to introduce the study and gather feedback from the public on what aspects of transportation are most important to them, their concerns regarding transportation in and around North Battleford today and in the future, and their ideas for improvement. A public open house was held in December 2015 and an online survey was conducted in January 2016.

Stakeholder Meetings

Initial stakeholder meetings with the Regional Municipality of North Battleford, Saskatchewan Ministry of Highways and Infrastructure, Town of Battleford and Regional Municipality of Battle River were held at the beginning of July in 2016. The purpose of these initial stakeholder meetings was to introduce the study and learn about any interests or concerns which may influence the development of the Transportation Master Plan for the City of North Battleford.

Open House

A public open house was held the afternoon/evening of December 15, 2015 from 3:00 P.M. – 7:00 P.M. at Discovery Co-op Mall. An advertisement for the open house was posted two weeks prior to the event in the local newspaper, as well as on Facebook and Twitter, and the City's web page.

NOTICE OF PUBLIC PARTICIPATION OPPORTUNITY

TRANSPORTATION MASTER PLAN

The City of North Battleford would like to invite you to join us for a conversation about the future of transportation in and around North Battleford. The Transportation Master Plan study team will be at the Discovery Co-op Mall and we want to hear from you:

What: City of North Battleford Transportation Master Plan Open House

When: Tuesday, December 15, 2015 - 3:00 pm to 7:30 pm

Where: Discovery Co-Op Mall
9800 Territorial Drive
North Battleford, SK

The Transportation Master Plan is being created to give the City an overarching document that provides planning and implementation recommendations while setting context and guidelines for development of transportation networks within the City.

Study information, as well as a link to an online survey for the study, will be available on the City website starting on December 15, 2015. Alternatively, you can contact Bob Anthony at banthony@cityofnb.ca or 306-445-1742 for more information.

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The open house presented information on the study objectives and provided the public with an opportunity to express their existing transportation concerns and their vision for the future of transportation in and around North Battleford. Staff from the City and CIMA+ attended to answer any questions and discuss concerns with the public.

Approximately 20 people attended the open house and 12 comment forms were received. Following the open house some of the material was displayed in City Hall and a further 10 comment forms were collected.

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Open House Comments

From the 22 comment sheets received, most respondents indicated that they lived (66.7%) and worked (76.2%) within the City of North Battleford. Travel by auto was ranked as the primary mode of transportation and most respondents indicated that they are currently generally satisfied with how they currently travel within the City.

When asked to provide their general feedback on existing transportation within and outside of North Battleford, the desire for roadway twinning, particularly along Highway 4, and improved local transit service were recurring themes.

Online Survey

An online survey was conducted to obtain a general understanding of the public's opinion on the existing state of transportation and what elements of transportation they would like to see in the future in the City of North Battleford, as well as their current travel habits.

The online user survey was made available to the public beginning on Thursday, January 14, 2016 and closed at the end of the day on Wednesday, February 3, 2016. Announcements for the survey were made at the open house, as well as distributed via newspaper advertisements, social media (Facebook and Twitter), and the City's web page. Note that the information gathered is not statistically valid; rather it was used to provide general insight into the respondents' travel activity and feedback on transportation issues.


TRANSPORTATION MASTER PLAN

ONLINE SURVEY

Help us define what is important for the future of transportation in and around North Battleford.

An online survey is now available, this is your opportunity to provide the City with valuable information on how you travel, your thoughts on the existing state of transportation, and what you would like to see considered in the development of future transportation networks.

Please complete the online survey by January 31, 2016

http://cityofnb.tmp.sgizmo.com/s3/

Additional information is available on the City of North Battleford website - www.cityofnb.ca. Alternatively, you can contact Bob Anthony at banthony@cityofnb.ca or 306-445-1742 for more information.

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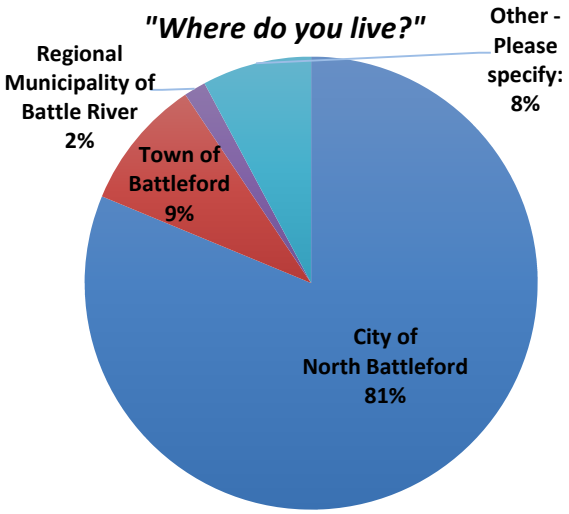
The survey collected information to provide general insight into residents' travel patterns and attitudes towards transportation in North Battleford. Through the survey, members of the public were provided an opportunity to provide information on their current travel modes, frequent destinations, and their thoughts on the existing state of transportation, and their vision for the future of transportation

in North Battleford. A total of 64 completed survey responses were received. Results of key themes of the survey are summarized below.

LOCATION OF SURVEY RESPONDENTS

Most (81.3%) survey respondents identified themselves as ***residents of the City North Battleford***, 9.4% identified as residents of the Town of Battleford, and 1.6% as residents of the Rural Municipality of Battle River. 7.8% of respondents indicated they were residents of municipalities other than the above-listed areas, including: Rabbit Lake (1), Little Pine First Nations (1), Mosquito Reserve (1), and Town of Wilke (1). No respondents were residents of the Rural Municipality of North Battleford.



WORK / SCHOOL PLACE OF RESPONDENTS

Most (81.3%) survey respondents indicated that they work or attend school within the City of North Battleford, 6.3% of respondents indicated they work or attend school outside of North Battleford (Town of Battleford, RM of North Battleford, Lloydminster). The remaining respondents indicated that they work from home, or do not work or attend school.

MAIN DESTINATIONS

Main destinations of travellers varied depending on whether they were travelling within or outside of North Battleford.

"What are the primary destinations for your trips <u>within</u> the City of North Battleford?"

Rank	Item	Score
1	Work / School	244
2	Commercial Destinations (i.e. Shopping centres, grocery stores)	231
3	Community Destinations (i.e. Church, Libraries, Hospital, Post Office)	109
4	Recreational Destinations (i.e. cuplex, golf, casino, parks)	94
5	Other. Please specify in comment box below.	15

"What are the primary destinations for your trips <u>outside</u> the City of North Battleford?"

Rank	Item	Score
1	Commercial Destinations (i.e. Shopping centres, grocery stores)	103
2	Recreational and Tourist Destinations (i.e. Camping, Golf, Jackfish Lake)	65
3	Other. Please specify in the comment box below.	55
4	Community Destinations (i.e. Church, Medical Services, Hospitals)	49
5	Work / School	36

Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

Work and school were ranked as the most frequent destination within North Battleford, followed by commercial destinations such as shopping centres and grocery stores, community destinations, and then recreational destinations. Other common destinations included residential areas (visiting family and/or friends).

Outside of North Battleford, ***commercial destinations*** were ranked as primary destinations, followed by recreational and tourist destinations (such as camping, golf, and Jackfish Lake), residential visits to family residing outside of the City.

TRANSPORTATION MODES

Travel by ***single occupant vehicle (driver)*** was ranked as the primary mode of transportation within and outside of the City. Approximately 60% of respondents indicated that to travel to their most frequent destination takes less than 10 minutes.

What are your primary modes of transportation when travelling to your destinations within the City of North Battleford?

Rank	Mode	Score
1	Auto - Single Occupant (Driver)	153
2	Auto - Carpool (two or more passengers)	73
3	Walking	58
4	Taxi	19
5	Cycling	11
6	Public transit	6
7	Other	2

When asked if they were satisfied with their existing travel mode *within* the City, 71% of respondents indicated that they are currently satisfied. The remaining 29% indicated that they would like to see improvements with respect to transit, roadway conditions and maintenance, walkability, traffic control, and safety. Other network concerns included improvements to access on to Territorial Drive and law enforcement.

"What are your primary modes of transportation when travelling to your destinations outside the City of North Battleford?"

Rank	Mode	Score
1	Auto - Single Occupant (Driver)	142
2	Auto - Carpool (two or more passengers)	105
3	Bus	15
4	Cycling	4
5	Taxi	3
6	Other	2

Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

90% of respondents indicated that they are satisfied with their current mode of travel to destinations *outside* of North Battleford. When those who responded that they were not satisfied were asked to elaborate, five (5) respondents indicated a desire for improved and/or cheaper regional bus service.

TRANSIT

Most (88.7%) respondents indicated that they do not use public transit. When asked what prevented them from using transit, the top three reasons cited were: ***travelling by car was more convenient*** (74.6%), followed by long transit travel times (25.5%), and transit service times (18.2%). Notably, 5.5% of those not using transit indicated that they lacked transit information or were unaware that the City provided transit service.

"What prevents you from using public transit?"

Reason	Count	
Car is more convenient	41	74.6%
Long transit travel times	14	25.5%
Other	11	20.0%
Transit service times	10	18.2%
Prefer to walk or cycle	8	14.6%
Infrequent buses	8	14.6%
Neighbourhoods / areas not covered by the route	5	9.1%
Work at home	0	0.0%

Of the 11.3% of respondents that indicated that they use the City of North Battleford transit services, 14.3% indicated they use the service daily, 28.6% indicated they use the service weekly, and 57.1% indicated they use the service on a monthly basis. 85.7% of those who use transit indicated that they were not satisfied with the existing state of transit services. When asked what would improve their experience, extended service hours, service on Sundays and holidays, and shorter travel times (all three tied at 66.7%) were cited.

Commercial destinations, such as shopping centres and grocery stores, were ranked as the most frequent transit destinations within and outside of North Battleford, followed by recreational destinations, and then work and school.

LONG-TERM TRANSPORTATION PLANNING

When asked what was most important for long-term transportation planning in North Battleford, the top five issues were:

1. Roadway network safety
2. Increased local transit
3. Economy – Attracting business
4. Pedestrian & cyclist networks safety
5. Walkability

What is most important to you for long-term transportation planning in and around the City of North Battleford?"

Rank	Item	Score
1	Roadway Network Safety	129
2	Increased Local Transit	113
3	Economy – Attracting Business	90
4	Pedestrian & Cyclist Networks Safety	87
5	Walkability	83
6	Optimization - Maximize Use of Existing Infrastructure	67
7	Reduced Delay at Intersections	66
8	Expanded Roadway Network	60
9	Cycling Facilities	32
10	Environmental Impacts	28
11	Other	4

Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

When asked for any additional comments regarding existing transportation concerns and the future of transportation in North Battleford, two main themes reoccurred:

+ The desire for additional / improved walking cycling facilities (10)
+ The desire for improved local transit (8)

Vision, Goals and Objectives

In 2013, the City of North Battleford undertook an Official Community Plan exercise, which resulted in a vision, goals, and objectives for the City. The vision, goals, and objectives outlined in the Official Community Plan lead the development of the Transportation Master Plan and the Transportation Master Plan policies. The vision is to create a City that is Healthy, Green, Safe, and Strong as it moves forward towards 2030.

> ***FORWARD 2030: HEALTHY, GREEN, SAFE, STRONG***

The following goals from the Official Community Plan influenced the development of the Transportation Master Plan:

- To direct City development and growth towards a diversification of land uses in a manner that will maintain a positive relationship with the North Saskatchewan River Valley, the rich diversity of its people, the City's resource capabilities and broader regional interests.
- To improve the aesthetics of the key City entryways and use them to promote the City and its businesses, attractions and culture.
- To obtain the support and assistance of senior governments in realizing the goals and objectives of this plan, consistent with the protection and maintenance of federal and provincial interest.
- To facilitate neighbourhood and commercial development that provides for a high quality of life for residents, by providing healthy transportation options, mixed use developments, and consistent development standards across jurisdictions.
- To support and complement the Statements of Provincial Interest.

The City's transportation network plays a role in reaching the vision and goals, by promoting economic development through safe and efficient travel and access to businesses, and by encouraging active transportation modes through a pathway system that provides access to key destinations and landmarks. The transportation objective developed in the Official Community Plan is:

> ***To protect and facilitate the various functions of the provincial highway and municipal road system in North Battleford in order to maintain safe and efficient traffic movement that promotes land use and development patterns, which ensures pedestrian and traffic safety, while providing opportunities for the further development of walking, cycling and transit facilities.***

Policies

Transportation policies have been divided into four categories – Administration, Active Modes, Transit, and Vehicular Mobility. The policies outlined in each of the categories incorporate, complement, and build on the policies relating to mobility in the Official Community Plan. Transportation networks should be developed in a complete manner that considers all transportation modes and is compatible with adjacent land uses and land use objectives. The blended application of the transportation policies will require consideration of the specific local context, and judgement to determine the optimum balance between them when they impact each other. For example, the ability to separate travel modes for comfort and safety, may require different solutions in existing constrained right-of-way, than in new development areas.

Administration

A transportation system is a vital asset to the social and economic well-being of a community, stewardship of the system in a manner that is comprehensive, cost-effective and creative will provide the best mobility benefits for the residents of North Battleford.

Policy A.1 Review transportation infrastructure continuously as North Battleford grows, adapting current best transportation service practices and intelligent transportation systems to the characteristics and needs of the City.

Policy A.2 Maintain the Transportation Master Plan as a relevant policy document by undertaking periodic reviews and updates to reflect community values and aspirations. Maintain an awareness of mobility needs and issues through ongoing dialogue with residents.

Policy A.3 Liaise with the Town of Battleford, Regional Municipality of North Battleford, Regional Municipality of Battle River, and the Canadian National Railway (CN Rail) on transportation matters of mutual interest.

Policy A.4 Ensure that transportation decisions, strategies and investments are coordinated with and support the City's land use objectives, with consideration given to compatibility of uses (e.g. directing land uses associated with heavy truck traffic away from pedestrians and to areas where their impact on municipal roads will be minimized).

Policy A.5 Provide for appropriate public consultation in the delivery of transportation services, resulting in a fair distribution that reflects community desires.

Policy A.6 Implement the principles of Crime Prevention Through Environmental Design (CPTED) to enhance the development of a safe and sustainable city.

Policy A.7 Administer various dangerous goods, traffic, and taxi bylaws to regulate the operation of the transportation system in a safe and orderly manner

Policy A.8 Seek opportunities for coordination of transportation infrastructure projects with the development of enhanced streetscapes, public spaces, and gateways into

the City of North Battleford. Work with CN Rail in improving the aesthetics of the rail corridor and yards within the City of North Battleford.

Policy A.9 Streets should provide multi-purpose public spaces that are designed to balance their role for traffic with other roles as community spaces, pedestrian environments, parking, and as settings for residential and commercial uses.

Policy A.10 Landscape the street environment at entry and exit points into the City, the downtown area and other key transportation corridors and destination sites. Encourage development with urban design principles in mind and promote North Battleford as a pleasing and inviting urban environment for people to stop shop and play in.

Policy A.11 Incorporate environmental best practices into infrastructure planning and management activities.

Policy A.12 Manage transportation infrastructure through operations, maintenance, rehabilitation and replacement in a manner that ensures that infrastructure is safe, reliable and achieves its optimum life-cycle.

Policy A.13 Participate in regular and ongoing dialog with the Saskatchewan Ministry of Transportation to discuss matters of mutual interest and periodically review statements of provincial interest on urban connectors.

Vehicular Mobility

Streets provide access to properties and businesses, accessibility throughout the City and the region, and facilitate the movement of trucks, service vehicles, transit and personal vehicles. Safe and efficient travel and access is important to vehicular mobility. Vehicular mobility plays an important role in promoting economic development.

Policy VM.1 Consider connectivity and traffic safety for vehicles in all land use and development decisions.

Policy VM.2 Recognize the importance of intermodal facilities and a connected goods movement network for reliable goods movement and land accessibility.

Policy VM.3 Evaluate intensification within existing residential neighbourhoods and development in new areas in terms of potential off-site transportation infrastructure requirements. Developers shall be responsible for the cost of such upgrades.

Policy VM.4 Design street layouts to provide safe spaces for all users, including pedestrians, cyclists, vehicles and emergency response services.

Policy VM.5 Develop a framework for designating roadways that creates a hierarchy and considers accommodation of active modes.

Policy VM.6 Apply access management principles based on the functional characteristics of a roadway and surrounding uses.

Policy VM.7 Provide roadway network signage that directs people to key destinations and allows for informed decisions on route selection.

Policy VM.8 Develop a traffic calming process that identifies the need, allows for prioritization of roadways, and the development of traffic calming plans, in a consistent and well-documented manner. Consider placement of speed observation signs to advise drivers of speed and educate them regarding posted speed limits. When habitual traffic law offenders are not responsive to passive traffic speed control measures, enforcement is needed.

Policy VM.9 Develop a Transportation Noise Policy that would provide guidance on dealing with transportation noise issues and on the responsibility of new development proposals to mitigate the possibility of noise problems to proposed developments.

Active Modes

Active transportation, such as walking and cycling, provides many health and exercise benefits to users while also providing environmental, social, and financial benefits to society, and strengthening a sense of community. Accommodation for pedestrians and cyclists, should consider varying levels of experience and comfort levels.

Policy AM.1 Consider connectivity and traffic safety for pedestrians and cyclists in all land uses and development decisions.

Policy AM.2 Facilitate the development of a walkable community, through consideration for the provision of adequate sidewalks, pathways in linear parks and adequate lighting. Integrate the development of new parks and open space into existing areas to foster connectivity throughout the City as a whole.

Policy AM.3 Increase pedestrian access by providing important linkages between residential areas and destinations sites, including cultural and recreational areas, downtown and commercial areas.

Policy AM.4 Provide interesting and attractive surroundings on streets and pathways with supportive street furniture and amenities such as garbage receptacles, benches, and bike racks at municipal destinations.

Policy AM.5 Provide wayfinding signage on pathways that directs people to key destinations and allows for informed decisions on route selection.

Policy AM.6 Consider walking and cycling transportation options for residents in the design of new and revitalization of existing neighbourhoods.

Policy AM.7 Advocate for increased active modes, support programs that encourage active mode travel, such as safe route to school programs and bike to work initiatives, and investigate and embrace City opportunities for promotion, education and leadership.

Policy AM.8 Include key pedestrian and cycle facilities in the snow removal program.

Transit

Transit provides an important sustainable mode of travel to residents and benefits the economy, the environment and provides opportunity to residents[1]. Transit systems can provide access to educational, employment, recreational, and social opportunities and can help attract young families looking to raise their children outside of an urban environment to communities by providing an alternative to two-car ownership[2].

Policy T.1 Continue to support the delivery of transit services by the Battlefords Transit System.

Policy T.2 Continue to support the delivery of the Handi-Bus Service.

Policy T.3 Review the delivery of transit and Handi-Bus services periodically through a collaborative approach with key stakeholder groups.

Policy T.4 Ensure that new development plans include consideration for potential future transit routes to provide service coverage to the community.

Growth

The 2015 estimated urban area population for the Battlefords is 20,000 people. The planning horizon for the Transportation Master Plan is 25,000 people. With a currently anticipated 1% annual growth rate, the population will likely reach this horizon within the next 20 years or so. Based on a current

[1] Public Transit in Small Communities, Canadian Urban Transit Association (CUTA), 2005. Pg 1
[2] Improving Travel Options in Small & Rural Communities, Transport Canada, 2009. Pg 23.

average persons per dwelling of 2.2 and population and employment ratios from the 2011 census data for the area, 2,275 residences and 2,500 jobs will be needed to accommodate the additional population.

Figure 3 shown previously, illustrates the future land use concept for the City of North Battleford developed through the Official Community Plan.

Figure 4 shows the anticipated regional residential, commercial and industrial growth areas for the 25,000 population horizon. The existing boundary of the City of North Battleford can accommodate growth up to and beyond the 25,000 population horizon.

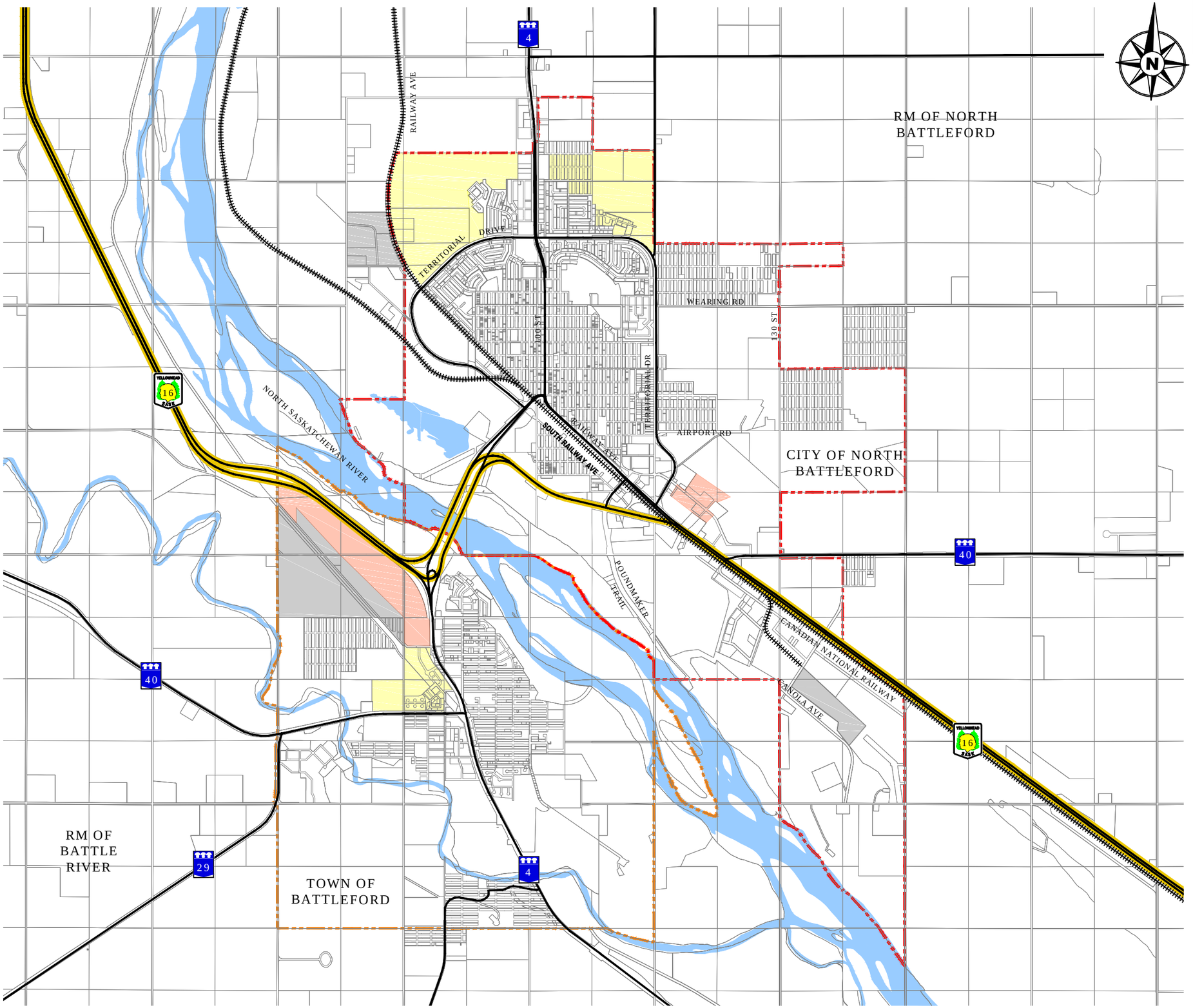
Residential growth is focused on three major areas, on the northeast (Fairview) and northwest (Killdeer) sides of North Battleford, and the west side of Battleford (Battleford West). The City of North Battleford Official Community Plan has some general policy statements regarding support for infill development but there are no specific plans or programs for this therefore, for the purposes of this study, it is assumed that it will be minimal and is not factored into the projected growth. The existing residential areas plus the full build-out of the three growth areas will accommodate in excess of 28,000 residents. As such, it is assumed that all growth to a population of 25,000 will occur proportionally, based on full build-out population, within the three main growth areas. Proportional distribution of growth resulted in 335 people in the Town of Battleford, 2450 in Killdeer and 2215 in Fairview.

Commercial development is anticipated to occur mainly within the City of North Battleford and the Town of Battleford. 1,100 new commercial jobs were assumed, 250 in Battleford and the remainder in North Battleford.

Industrial development is anticipated to occur within the City of North Battleford, the Town of Battleford, and the RM of North Battleford. 425 industrial jobs were assumed, 125 in Battleford, 150 in the R.M of North Battleford, and 150 in North Battleford.

Public services, health, education and agriculture jobs will also be created with growth to the 25,000 population horizon. 975 new jobs in these categories were assumed to be added, all falling within the City of North Battleford. Additional public services jobs are assumed to occur mainly within the downtown area, as the municipalities increase employment to serve the growing needs of the populations. New education employment is anticipated to be mainly in the new communities of Fairview and Killdeer in North Battleford, serving new schools in the neighbourhoods. Health jobs will be focused mainly at the existing hospital and the Saskatchewan hospital that is currently under construction. Agriculture jobs are assumed in the RM of North Battleford.

The growth scenario developed based on these assumptions was used to forecast traffic volumes for the 25,000 population horizon.



City of North Battleford
TRANSPORTATION
MASTER PLAN

LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY
- BLUETOOTH COLLECTION LOCATION
- RESIDENTIAL
- COMMERCIAL/LIGHT INDUSTRIAL
- INDUSTRIAL

FIGURE 4

REGIONAL GROWTH
AREAS

North Battleford

Government of Saskatchewan

CIMA

Project No. CA000196 Drawn by: RKG
Date: DECEMBER 21, 2017 Checked by: RR

NOT TO SCALE

Traffic Patterns

Existing and forecasted transportation data provides information on how a transportation system is working, how and where people travel, and assists with the identification of needs for improvement. To determine traffic patterns, a comprehensive set of 2015 transportation data was collected. Using this 2015 data as a base, and considering the anticipated growth in the region, a 25,000 population forecast was developed.

Existing

Figure 5 illustrates the existing 2015 morning and afternoon peak hour traffic volumes at the study intersections. The overall peak morning and afternoon hours were identified as 8:00 A.M. to 9:00 A.M. and 4:30 P.M. to 5:30 P.M., respectively. **Figure 6** illustrates peak hour traffic patterns throughout the City. **Figure 7** shows the estimated weekday 24-hour traffic volumes.

The collected traffic data was also used to determine regional travel patterns. Estimates of the portions of trips on the highway network which are destined to North Battleford and which are passing though, travel routes for trips passing through the City and the portion of these trips that make a short stop in the City before continuing to their destinations were developed. **Figure 8** shows the average regional trip distribution on a weekday over a 24-hour period. The 24-hour traffic volumes shown represent two-way volumes.

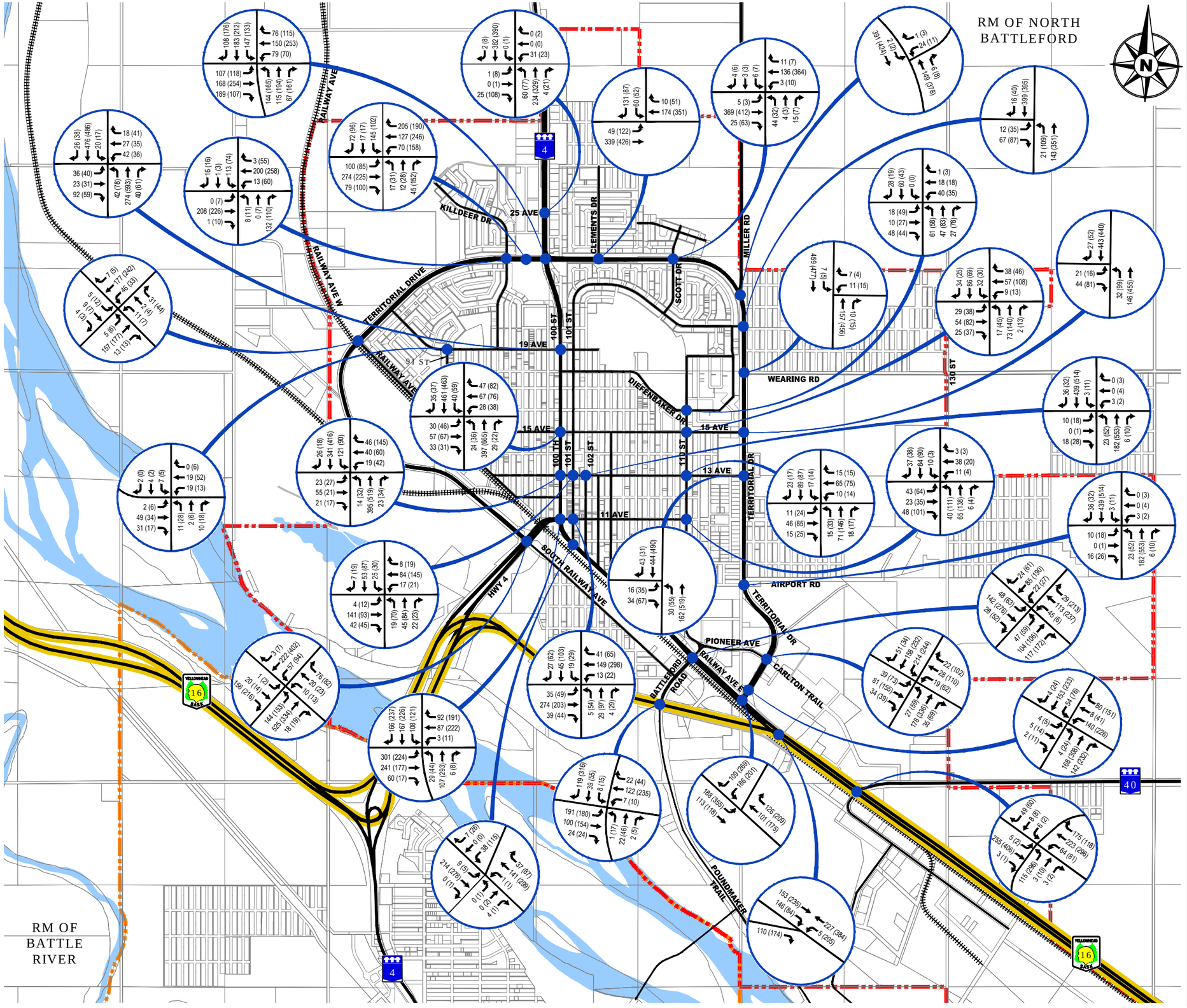
Overall, approximately 20% of trips passing through North Battleford on the regional road network are estimated to make a stop in the City before continuing on to their destination.

Future

To create the 25,000 population horizon forecast, growth in both regional and urban traffic volumes were considered. Existing highway traffic volumes and growth factors were used to estimate future regional background traffic volumes, and combined with existing urban City traffic volumes and estimated traffic from urban growth areas.

Figure 9 illustrates the forecasted morning and afternoon peak hour turning movement volumes for the 25,000 population forecast horizon and **Figure 10** illustrates the forecasted weekday 24-hour traffic volumes.

The results of the forecasting exercise indicates that overall 24-hour weekday traffic volumes are anticipated to increase 54%, or roughly by 2% per year linearly, at the 25,000 population forecast horizon as a result of the new trips generated by the 5,000-person population increase. A comparison of traffic flow at the 25,000 population forecast horizon versus the existing 2015 traffic flow is illustrated in **Figure 11**. Although the City is anticipated to experience an overall 54% increase in traffic, most of the increase is expected to be concentrated to the arterial and expressway network, particularly along Territorial Drive. Local and collector streets in existing residential areas are expected to see relatively low increases in traffic volume.



City of North Battleford
TRANSPORTATION
MASTER PLAN

LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY
- AM (PM) PEAK HOUR TRAFFIC VOLUME
- INTERSECTION

FIGURE 5

2015 MORNING AND AFTERNOON PEAK HOUR TURNING MOVEMENT VOLUMES

North Battleford

Government of Saskatchewan

CIMA

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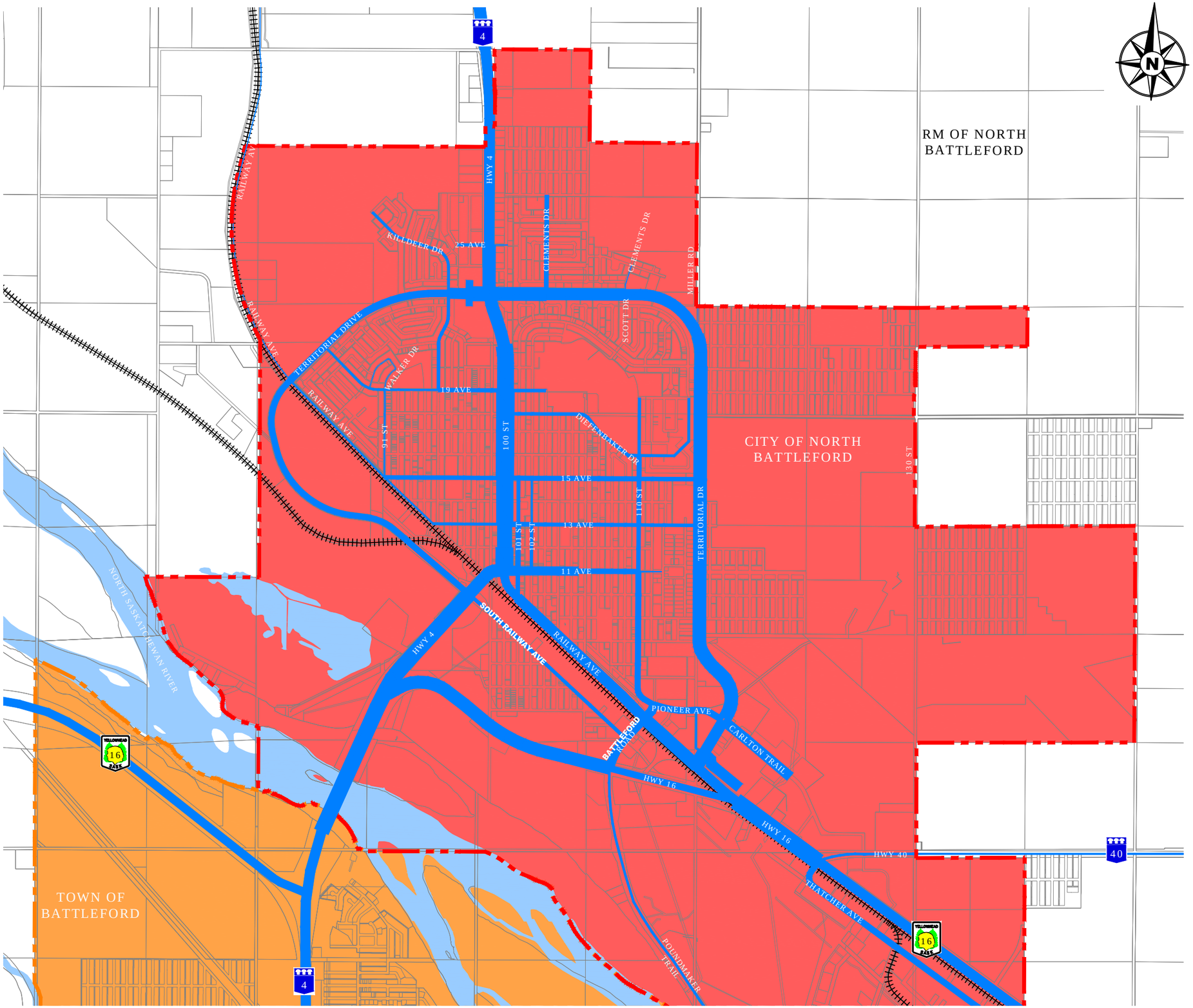

City of North Battleford
TRANSPORTATION
MASTER PLAN

LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY

2015 TWO-WAY PEAK HOUR TRAFFIC VOLUMES:

- 50
- 100
- 500
- 1000

FIGURE 6
2015 PEAK HOUR TRAFFIC PATTERNS

North Battleford

Government of Saskatchewan

CIMA

Project No. CA000196 Drawn by: RKG
Date: DECEMBER 21, 2017 Checked by: RR

NOT TO SCALE

City of North Battleford
TRANSPORTATION
MASTER PLAN

LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY

FIGURE 7

ESTIMATED 2015 WEEKDAY 24-HOUR TRAFFIC VOLUMES

North Battleford

Government of Saskatchewan

CIMA

Project No. CA000196 Drawn by: RKG

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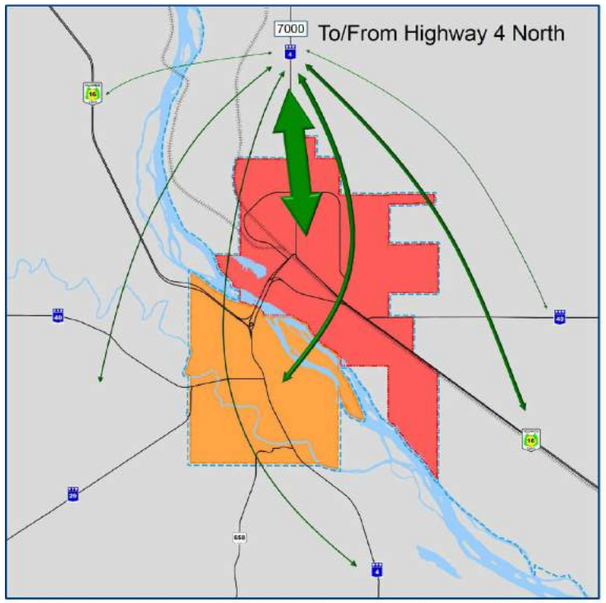
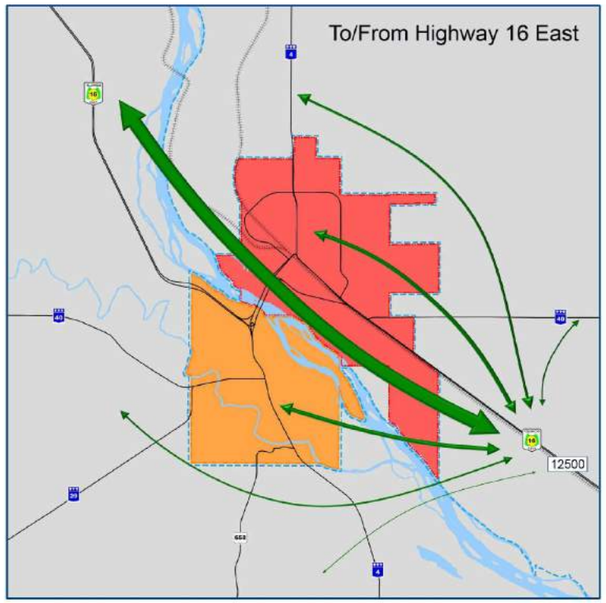
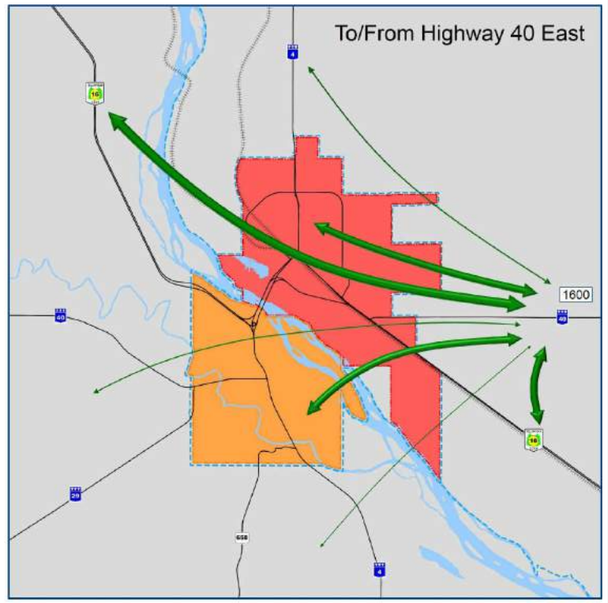
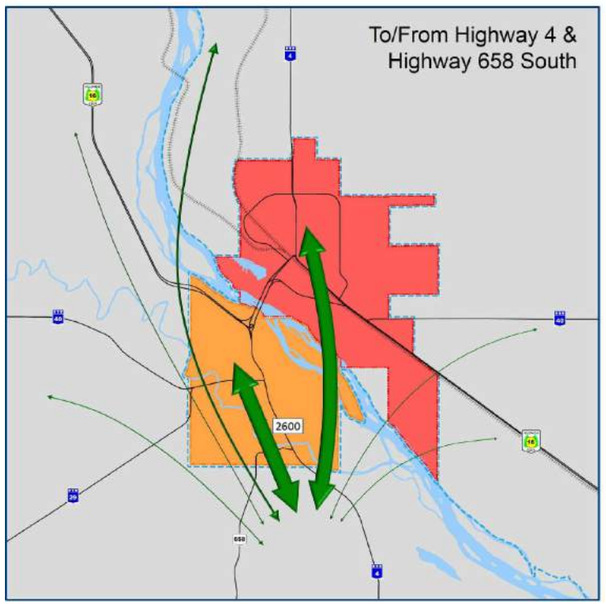
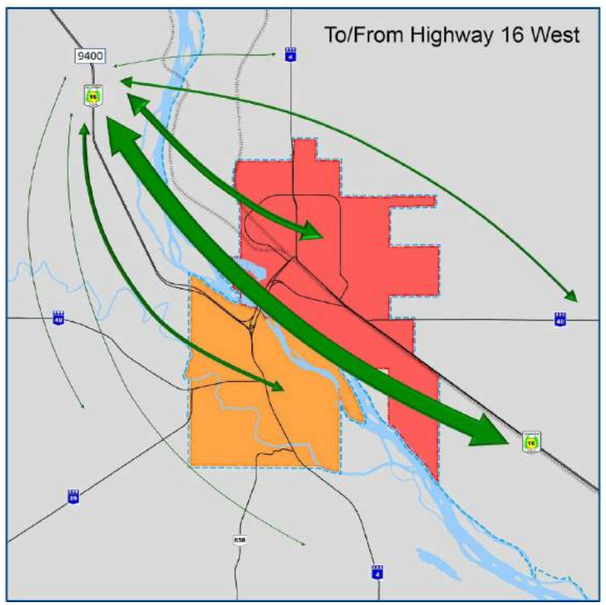
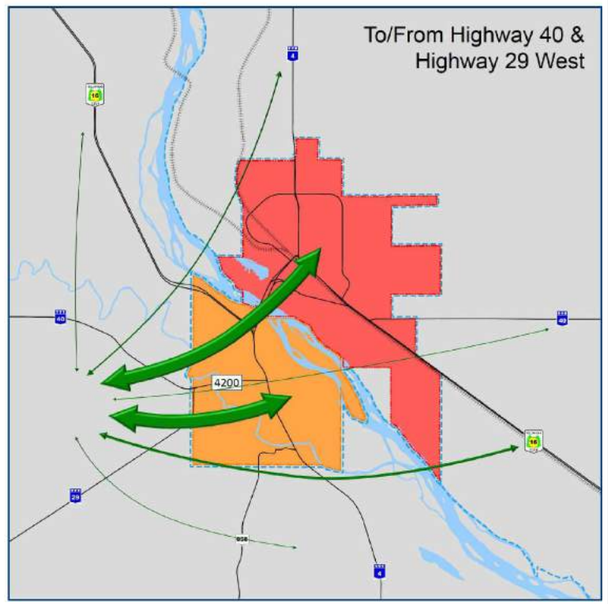












City of North Battleford
TRANSPORTATION
MASTER PLAN

LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY
- RM BOUNDARY
- EXISTING ROAD

TRAFFIC DISTRIBUTION

- # 2015 24hr TOTAL WEEKDAY TRAFFIC VOLUME
- 10%
- 25%
- 50%

NOTE: ARROWS REPRESENT PERCENT TRIP DISTRIBUTION AND ARE NOT PORPORTIONAL TO TRAFFIC VOLUMES BETWEEN GRAPHICS.

FIGURE 8

REGIONAL TRAVEL **PATTERNS**

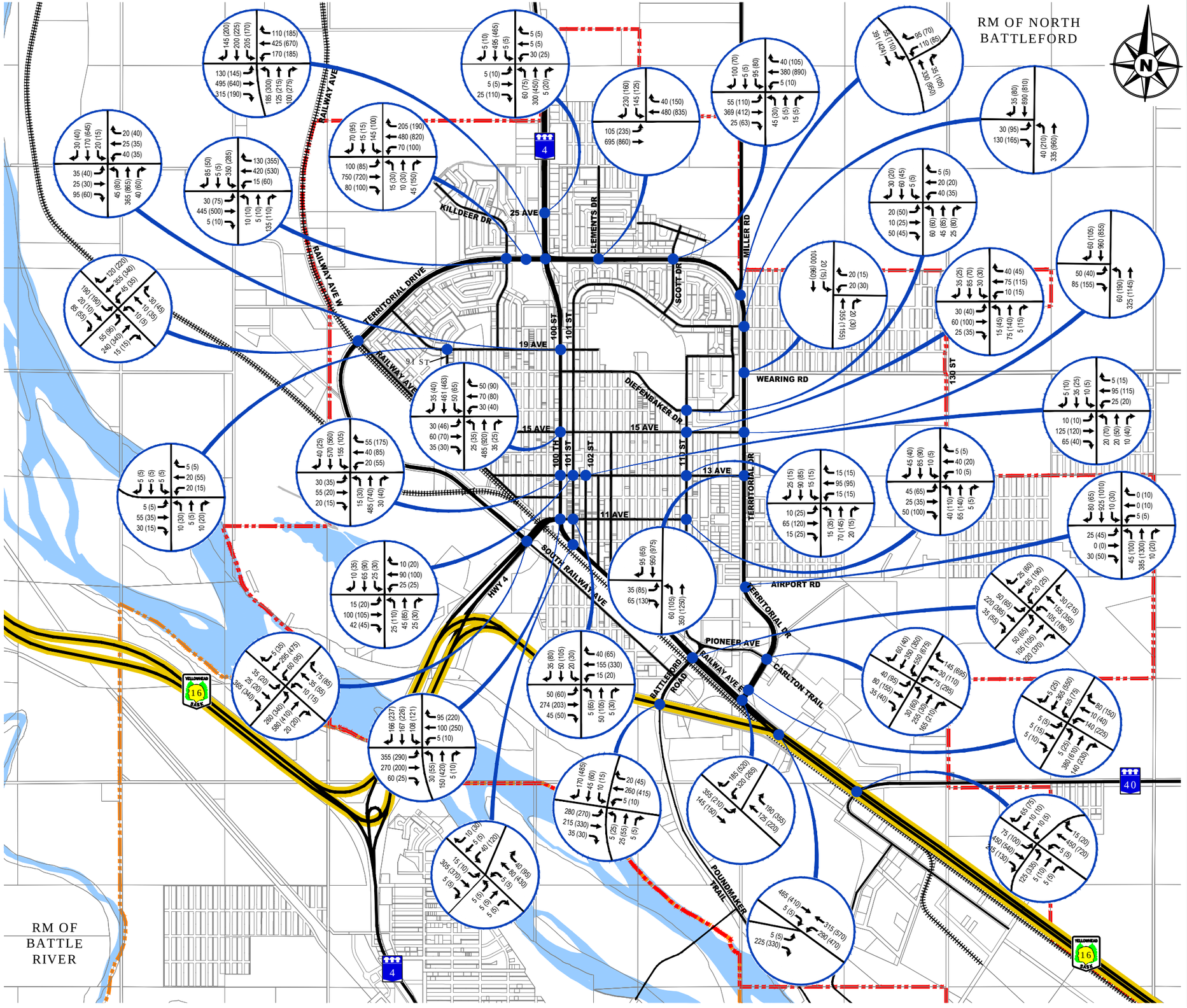
North Battleford

Government of Saskatchewan

CIMA

Project No. CA000196 Drawn by: RKG
Date: DECEMBER 21, 2017 Checked by: RR

NOT TO SCALE



City of North Battleford
TRANSPORTATION
MASTER PLAN

LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY
- AM (PM) PEAK HOUR TRAFFIC VOLUME
- INTERSECTION

FIGURE 9
25,000 POP. HORIZON
MORNING AND AFTERNOON
PEAK HOUR TURNING MOVEMENT VOLUMES

North Battleford

Government of Saskatchewan

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Date: DECEMBER 21, 2017 Checked by: RR

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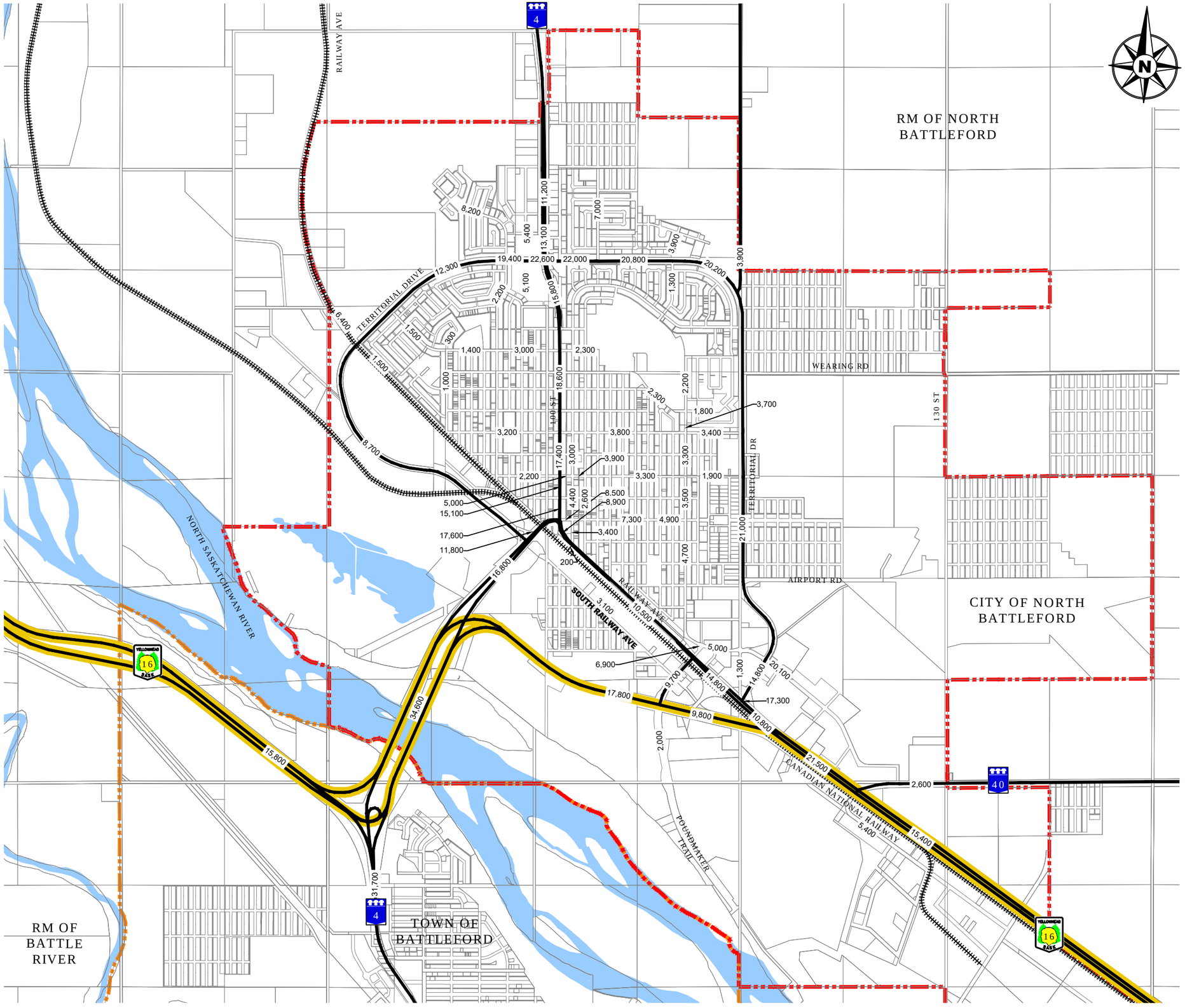
City of North Battleford
TRANSPORTATION
MASTER PLAN



LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY

FIGURE 10
25,000 POPULATION HORIZON
WEEKDAY 24-HOUR VOLUMES

North Battleford

Government of Saskatchewan

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Project No. CA000196 Drawn by: RKG
Date: DECEMBER 21, 2017 Checked by: RR

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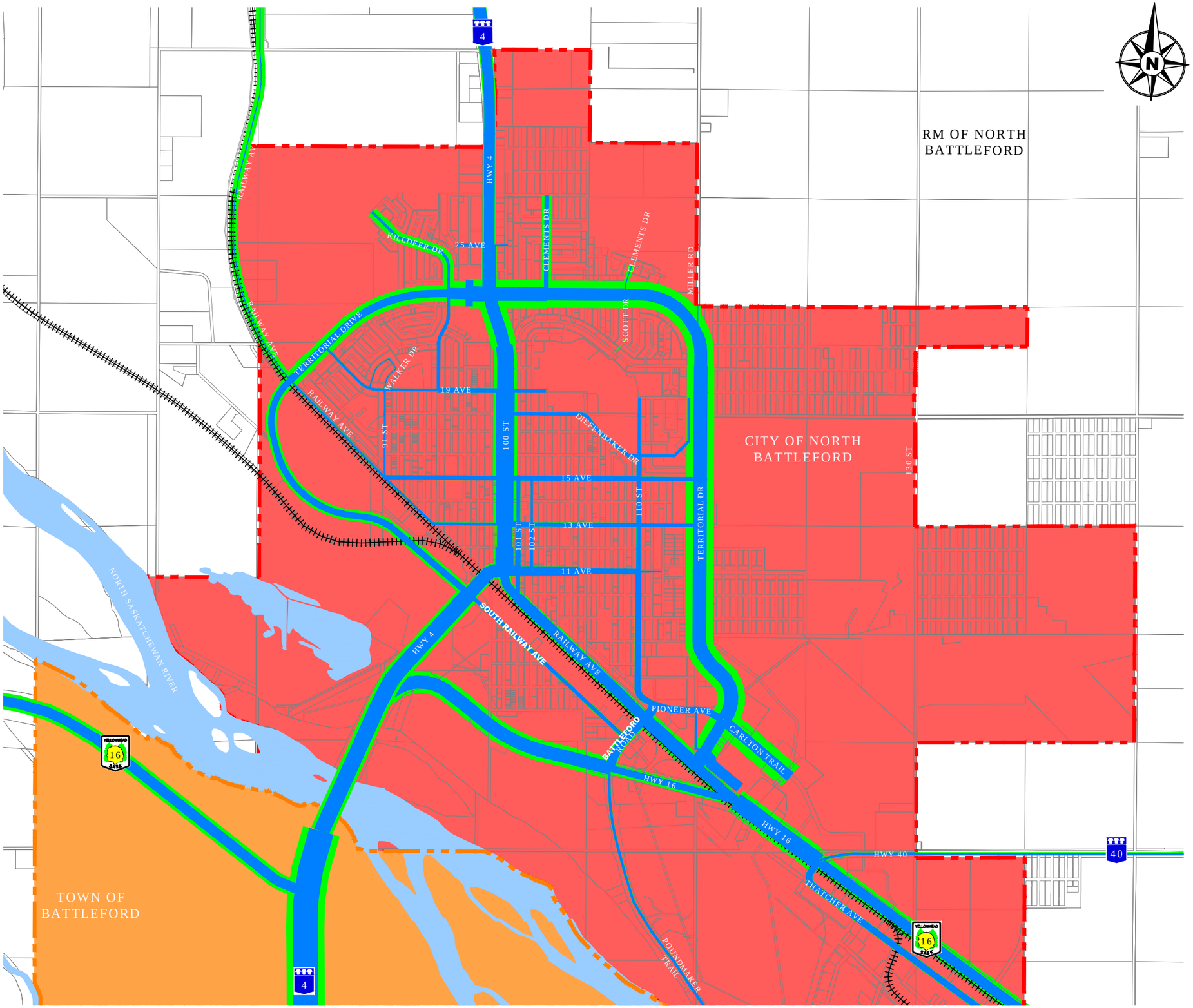
City of North Battleford

TRANSPORTATION MASTER PLAN



LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY

2015 TWO-WAY PEAK HOUR TRAFFIC VOLUMES:

- 50
- 100
- 500
- 1000

TWO-WAY PEAK HOUR TRAFFIC VOLUMES 25,000 POPULATION HORIZON:

- 50
- 100
- 500
- 1000

FIGURE 11
25,000 POPULATION HORIZON
PEAK HOUR TRAFFIC PATTERNS

North Battleford

Government of Saskatchewan

CIMA

Project No. CA000196 Drawn by: RKG
Date: DECEMBER 21, 2017 Checked by: RR

NOT TO SCALE

Roadway Network

Roadways provide access to property and accessibility throughout the City and the region for a variety of users ranging from pedestrians to heavy commercial vehicles. The existing roadway network within the limits of the City of North Battleford consist of a hierarchy of roads, which includes local, collector, arterial and expressways. The current roadway classifications are shown in **Figure 12**. Expressways within City limits include Highway 16 and Highway 4 North. Territorial Drive and Highway 4 South are the only roadways classified as arterials. The Transportation Association of Canada (TAC) provides the following descriptions for the types of roadways:

+ **Freeway** – freeways are designed for optimum mobility, full access control is required and no at-grade access is permitted.
+ **Expressway** – Traffic movement is the primary consideration on an expressway. Some at-grade access may be permitted, however, expressways are often planned for ultimate upgrading to a freeway.
+ **Arterial** – Roads where traffic movement is the primary consideration and land access is a secondary function.
+ **Collector** – Roadways serving residential, industrial and commercial properties. Traffic movement and land access are of equal importance.
+ **Local** – Roadways which allow vehicles to reach residential, commercial and industrial properties. The main function of a local roadway is access.

In addition to the urban roadway network, the Battlefords are located at a major junction, or “hub”, in the Provincial highway network; Highway 16, Highway 4, Highway 40, and Highway 29 all converge around the City and Town. Highway 16 also forms part of the National Highway System. The Saskatchewan Ministry of Highways and Infrastructure has two classification systems for its roadways – Functional and Access Management. Functional classifications for the Highways around the Battlefords, based on Standard Plan No. 20000 are:

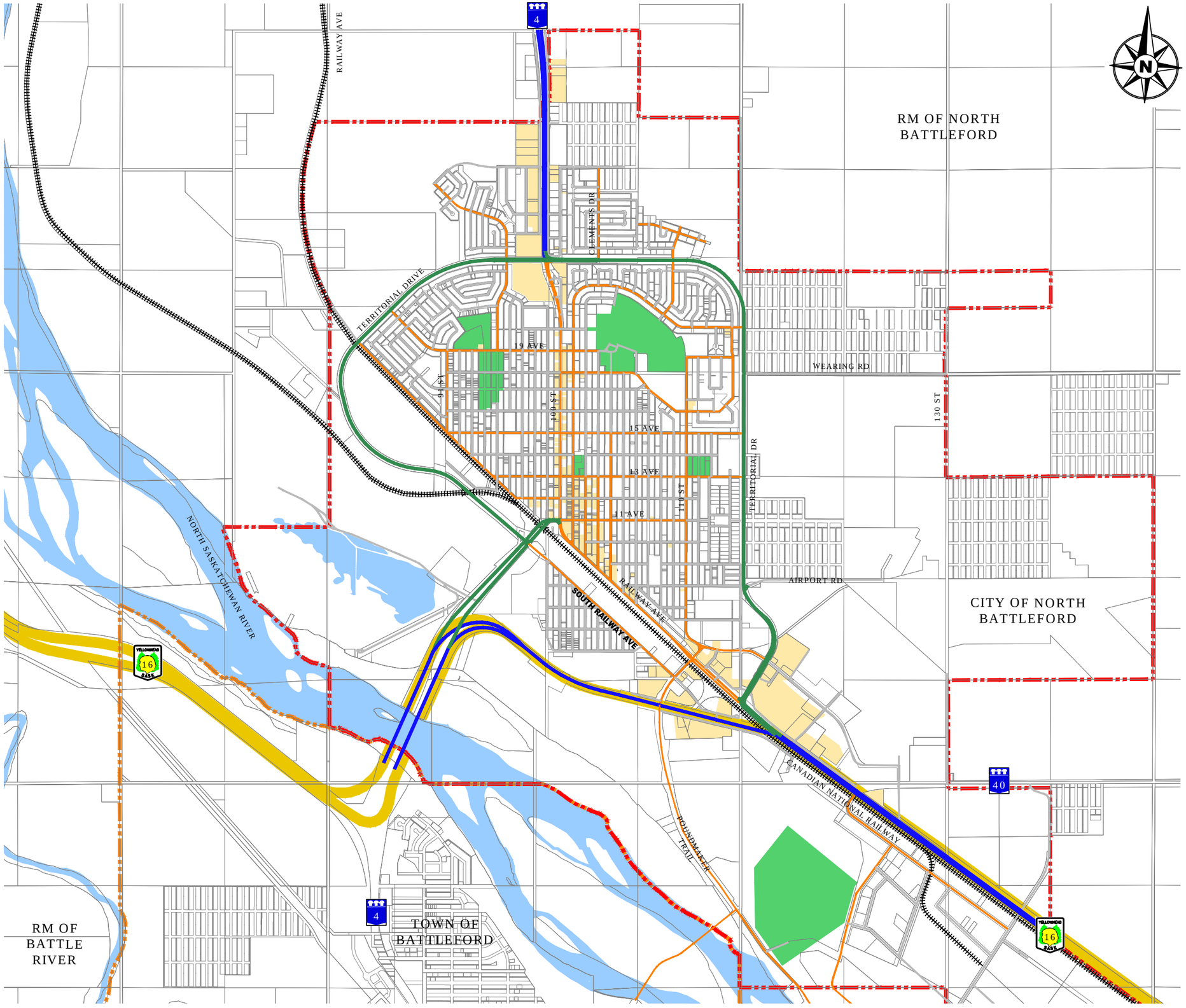
+ Highway 16 – Major Arterial
+ Highway 4 North – Major Arterial
+ Highway 4 South – Minor Arterial
+ Highway 40 – Minor Arterial
+ Highway 29 – Minor Arterial

The MHI Roadside Management Manual indicates that the main purpose/function of the arterial system is to provide a high level of mobility for through movements, it is divided into major and minor arterials and consists of divided and undivided Highways. The size of urban population centres served, service of areas of regional significance, traffic volumes, and route continuity are factors in determination of the functional classification.

City of North Battleford

TRANSPORTATION

MASTER PLAN



LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY
- EXPRESSWAY
- ARTERIAL
- COLLECTOR
- LOCAL

FIGURE 12

EXISTING ROAD

NETWORK CLASSIFICATIONS

North Battleford

Government of Saskatchewan

CIMA

Project No. CA000196 Drawn by: RKG

Date: DECEMBER 21, 2017 Checked by: RR

NOT TO SCALE

The access management classifications were established to achieve uniformity and consistency in allowing access to the system and protection of the main corridors, and efficient administration and implementation of access management policies. Access management classifications for the rural highway system range from R-1 to R-5, with R-1 representing the highest level of control. The access management level is determined based on the 20-year projected AADT. For the urban highway system, classifications range from U-1 to U-3. **Table 1** summarizes MHI's access management levels. Additional details for each level can be found in Section 430-30 of the Roadside Management Manual.

Table 1: MHI Roadside Management Manual Access Management Levels

MHI Access Management Level	Rural	Urban
Level 1	+ AADT > 9000 + No at-grade intersections allowed + Interchanges are allowed at a minimum spacing of 3.2 km (8 km desirable)	+ No at-grade intersections allowed + Interchanges are allowed at a minimum spacing of 3.2 km
Level 2	+ 7000 < AADT < 9000 + At-grade intersections are allowed only at road allowances at minimum spacing of 3.2 km (8 km desirable)	+ Permanent access points are located at a minimum of 3.2 km to protect right-of-way for future interchange
Level 3	+ 2000 < AADT < 7000 + Permanent at-grade intersections are allowed at a minimum spacing of 3.2 km (8 km desirable)	+ Permanent access points are 2 to 5 blocks apart
Level 4	+ 1000 < AADT < 2000 + Permanent access is allowed at most public road allowances with minimum spacing of 1.6 km	N/A
Level 5	+ AADT < 1000 + Under normal rural conditions, one approach may be allowed to each separate parcel	N/A

The existing access management levels were determined with a base year of 1996 and a 2016 horizon. The classifications for highways in and around the Battlefords are:

+ Highway 16 East (east of Highway 40) – Level 3
+ Highway 16: Highway 40 to Highway 4 (bypass) – Level 1
+ Highway 16 West – Level 3
+ Highway 4 North (including bridge) – Level 3
+ Highway 4 South – Level 4
+ Highway 40 – Level 4
+ Highway 29 – Level 4

These existing levels were reviewed against the 25,000 population horizon volume forecasts determined for this Transportation Master Plan and upgraded access management levels are recommended where they are warranted by the forecasted volumes. **Table 2** summarizes the existing, actual, and recommended upgraded access management levels for the highways in and around the Battlefords.

Table 2: Battlefords Highways Access Management Levels

Control Section Highway		Current Access Management Level (RSMM 430-30, 20-year projection from 1996)	Access Management Level based on Existing Volumes (Estimated 2015 24-Hour Volumes)	Upgraded Access Management Level (25,000 population forecast projection from 2015)
01626	Highway 16 East (east of Highway 40)	Level 3	Level 1	Level 1
	Highway 16: Highway 40 to Highway 4 (bypass)	Level 1		
01627	Highway 16 West	Level 3	Level 2	Level 1
00414	Highway 4: Bridge River Crossing to 25th Avenue	Level 3	Level 1	Level 1
	Highway 4 North: North of 25th Avenue		Level 2	
00413	Highway 4 South	Level 4	Level 3	Level 3
04003	Highway 40 East	Level 4	Level 4	Level 3
04004	Highway 40 West: West of Highway 29 Junction	Level 4	Level 4	No Forecast data
	Highway 40 West: Highway 29 to Highway 4 South	Level 4	Level 3	Level 3
02902	Highway 29	Level 4	Level 4	No Forecast data

Based on the classification system outlined in the Roadside Management Manual and the projected traffic volumes at the 25,000 population horizon forecast, the classifications of Highway 16 East, Highway 16 West, and Highway 4 North, should be upgraded to Level 1. Additionally, Highway 4 South, and Highway 40 will should be upgraded to Level 3 highways.

Under existing conditions, access along these highways does not follow the guidelines as prescribed in the Roadside Management Manual. Moving forward as the City of North Battleford continues to grow and new development is being considered near these highways, it is important for both the City and MHI to keep these access levels in mind and minimize the impact from the competing land access and mobility functions of each highway level.

Roadway Cross-Sections

Roadway cross-section standards provide guidance for the City and developers when upgrading existing and planning new roadways. Roadways that are complete streets accommodate all users, including pedestrians, bicyclists, motorists, and transit. Roadway rights-of-way also accommodate underground and overhead utilities, overland drainage, and other miscellaneous items that must be considered in the allocation of roadway space.

In development of roadway cross-section recommendations for the City, the TAC and MHI guidelines, and the guidelines of other municipalities were reviewed. Complete Street concepts were also considered and incorporated into the recommendations.

Complete Streets

Complete Streets are streets built for everyone. They are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. Complete Streets make it easy to cross the street, walk to shops, and bicycle to work. [3] The focus of the complete streets designation is the mobility function of various types of roads. The main function of roads is to provide access to property and accessibility between various destinations.

A key feature of complete streets is promotion of multi-modal transportation and encouraging the use of active modes of transportation. This implies providing a higher quality of facilities rather than simply accommodating pedestrians and cyclists. Consideration of safe and comfortable user space and attractive surroundings with suitable amenities, and connectivity are paramount in the design of complete streets. Recent planning in the City of North Battleford, such as the development

[3] Smart Growth America – National Complete Streets Coalition

of the Downtown Master Plan, has placed increased importance on accommodation and encouragement of active modes. In the online survey, when asked what is most important for long-term transportation planning, pedestrian and cyclist safety and walkability ranked #4 and #5, respectively.

User space and segregation are related matters. At present, North Battleford has no exclusive space for cycling. Cyclists either mix with other vehicular traffic or share the multi-use trails with other active modes. Many jurisdictions are adding exclusive and semi-exclusive cycling facilities into their roadway standards, especially when developing complete streets initiatives. The different facilities have various advantages/disadvantages related to user service, operational service, and cost. Key considerations in selecting facilities are acknowledgement of the range of ability and user expectations that need to be accommodated; and the understanding and respect that drivers/parkers will accord to vulnerable users on street facilities. The context of the application is also important – traffic volumes, speed, active modes volumes, and street/community character.

Grid Network Example
Source: Calgary Transportation Plan –Connectivity Handbook, Draft 2010

To provide comfortable user spaces, active modes facilities should be lit, have attractive amenities such as benches, bike racks, and garbage cans. Landscaping and wayfinding signage are also important features when promoting multi-mode travel.

The success of a complete streets framework also depends largely on the arrangement of the active modes travel. Connectivity refers to "the density of connections in path or road network and the directness of links. A well-connected road or path network has many short links, numerous intersections, and minimal dead-ends (cul-de-sacs). As connectivity increases, travel distances decrease and route options increase, allowing more direct travel between destinations, creating a more accessible and resilient system that reflects Complete Streets principles."[4] Connectivity principles apply to both neighbourhood and overall transportation networks.

Curvlinear Network Example
Source: Calgary Transportation Plan –Connectivity Handbook, Draft 2010

[4] Victoria Policy Institute, http://www.vtpi.org/tdm/tdm116.htm

Connectivity of the active modes network is also a key component for encouraging increased active modes use. Benefits of increased connectivity include increased accessibility for emergency services, increase viability of active modes transportation, increased accessibility to regional roadway systems, and improved adaptability for communities to respond to changes in economic, social and environmental conditions. Grid networks provide the highest levels of connectivity for both vehicles and active modes, whereas curvilinear networks provide the lowest levels of connectivity. Combinations of these layouts have been used to balance active modes connectivity with concerns of speeding and shortcutting. Within the limits of Territorial Drive, the roadways were constructed in a grid network; the newer neighbourhoods of Killdeer and Fairview follow a more curvilinear pattern.

Table 3 outlines proposed cross-section guidelines for the City of North Battleford. This is a general guideline that should be applied adaptively to both new and existing roadways taking into account the local context. Since on-street accommodation of bicycles is not comfortable for all users and exclusive lanes can be expensive and require additional space, the recommended option for the City of North Battleford is accommodation of cyclists with pedestrians on multi-use trails on collector and arterial roadways, and on-street for local roadways. A standard lane width of 3.5 metres for collector and arterial roadways allows for increased boulevard width and provides space for multi-use trails instead of sidewalks.

Effective application of these guidelines would be appropriate to create an attractive and pleasant environment to encourage active modes users. In addition, landscaping, corner cuts, bulb-outs, and human level lighting can be applied to encourage walking and cycling. These cross-section guidelines should be carried forward into the development of design guidelines for the City.

CA000196

Table 3: North Battleford Cross-Section Guidelines

Classification	Sub-Classification	Typical Mobility Function	Active Modes Accommodation	Landscaped Boulevard Buffer	Target Volume	Traffic Lanes	Parking	Transit	Posted Speed
Arterial	Divided	Serves heavier volumes of longer distance travel than collectors. Direct access is generally not permitted.	Separated Pathway One or Two Sides Sidewalk One Side	Both Sides	<30,000	One or two lanes each direction [4] [5]	Optional [6]	Yes	60 km/hr [7] to 80 km/hr [8]
	Undivided				<20,000				
Collector	Residential Divided	Collects and distributes traffic from local streets. Provides circulation within neighbourhoods, direct access to abutting property is permitted except where there is a median divider in the road.[9]	Separated Pathway One Side Sidewalk One Side	Both Sides	<15,000	One lane each direction [4]	Permitted on both sides	Yes	50 km/h
	Residential Undivided				<5,000				
	Industrial		Separated Pathway (one side) [3]	One Side	<10,000				
Local	Residential	Provides direct access to abutting property. Street design is focused on the needs of local users and the character of the neighbourhood. Most streets in the community are local streets serving residential and industrial land.	Pedestrians – Sidewalks (both sides) Cyclists – On Street [1] [2]	Optional	<1,000	One lane each direction [10]	Permitted on both sides	No	50 km/h
	Industrial		Separate Pathway (one side) [3]	One Side	<3,000				
Lane	N/A	Provides secondary access to property. Often used for garbage collection.	Shared Space	N/A	<500	N/A	N/A	No	20 km/hr

Notes:

(1) Trails may be required on local roads to provide network continuity
(2) Signed bike routes may be located on local roads [9]
(3) Minimum trail widths of 2.5m are generally acceptable.
(4) Traffic lane widths are 3.5m
(5) Number of traffic lanes on arterial roadways will be determined by a traffic study
(6) The need for parking lanes on arterials should be determined on a case by case basis and will be dependent on adjacent land uses
(7) Lower speed limits for arterial roadways should be considered where adjacent land uses front onto the roadway and/or in areas of significant pedestrian/cyclist activity
(8) For an arterial roadway with a posted speed limit greater than 60 km/hr, travel lane widths are 3.7m.
(9) Driveway access from a collector or local road is not desirable on the side of the street with a separate trail.
(10) Traffic lane widths for local roads are minimum 3.1m, 3.5m minimum when no parking is permitted.

Urban Highway Connectors

MHI developed the Urban Highway Connector Program (UHCP) in 2008 to provide a consistent policy framework for handling public highways through urban municipalities that connect two provincial highways, known as "Urban Connectors". The program was intended to address inconsistencies in service and funding levels to urban municipalities, based on guiding principles of safe and efficient movement, transparency, equity and long-term planning; maximizing benefits to the provincial economy. The June 2008 Policy document defined an urban connector as a public highway located in an *Urban Municipality* that connects two provincial highways. The *provincial interest* in the urban connector was defined as the level of commitment that the province has in an urban connector, based on the functionality, mobility and continuity of an urban connector.

The UHCP provides urban municipalities with funding based on the 'Provincial Level-of-Interest' in a roadway. It defines five roadway classification levels using a sliding scale, where Level 1 has the highest Provincial Level-of-Interest and is fully (100%) funded by MHI. Funding decreases by 25% for each level (i.e. Level 2 – 75%, Level 3 – 50%, Level 4 – 25%). The fifth level is a 'Non-Connector', has no Provincial Level-of-Interest, and receives no funding. The 'Provincial Level-of-Interest' in the highways through North Battleford was identified in 2011 as follows (also shown in **Figure 13**):

+ Highway 16 – Level 1
+ Highway 4 – Level 2
+ Territorial Drive – Level 2
+ Highway 40 – Level 2 (within North Battleford)

The desired Urban Highway Connector Program outcomes are defined as:

+ Improved route continuity for traffic passing through urban areas
+ Enhanced traffic safety in urban areas
+ Equitable treatment for urban municipalities
+ Improved level of service on urban connectors
+ Enhanced transportation planning to meet future requirements
+ Enhanced management of transportation infrastructure including targeting of resources to maximize benefits for the provincial economy.

To protect traffic mobility on urban connectors, the urban municipality and MHI agreed to the following five requirements:

+ Maintain the current weight regime, or mutually agree to change it.
+ Maintain the currently designated dangerous goods routes, or mutually agree to change them.
+ Allow oversize and overweight vehicles if provincial permits have been issued.
+ Maintain current speed limits, or mutually agree to change them.
+ Maintain the current access points/traffic control devices, or mutually agree to change them.

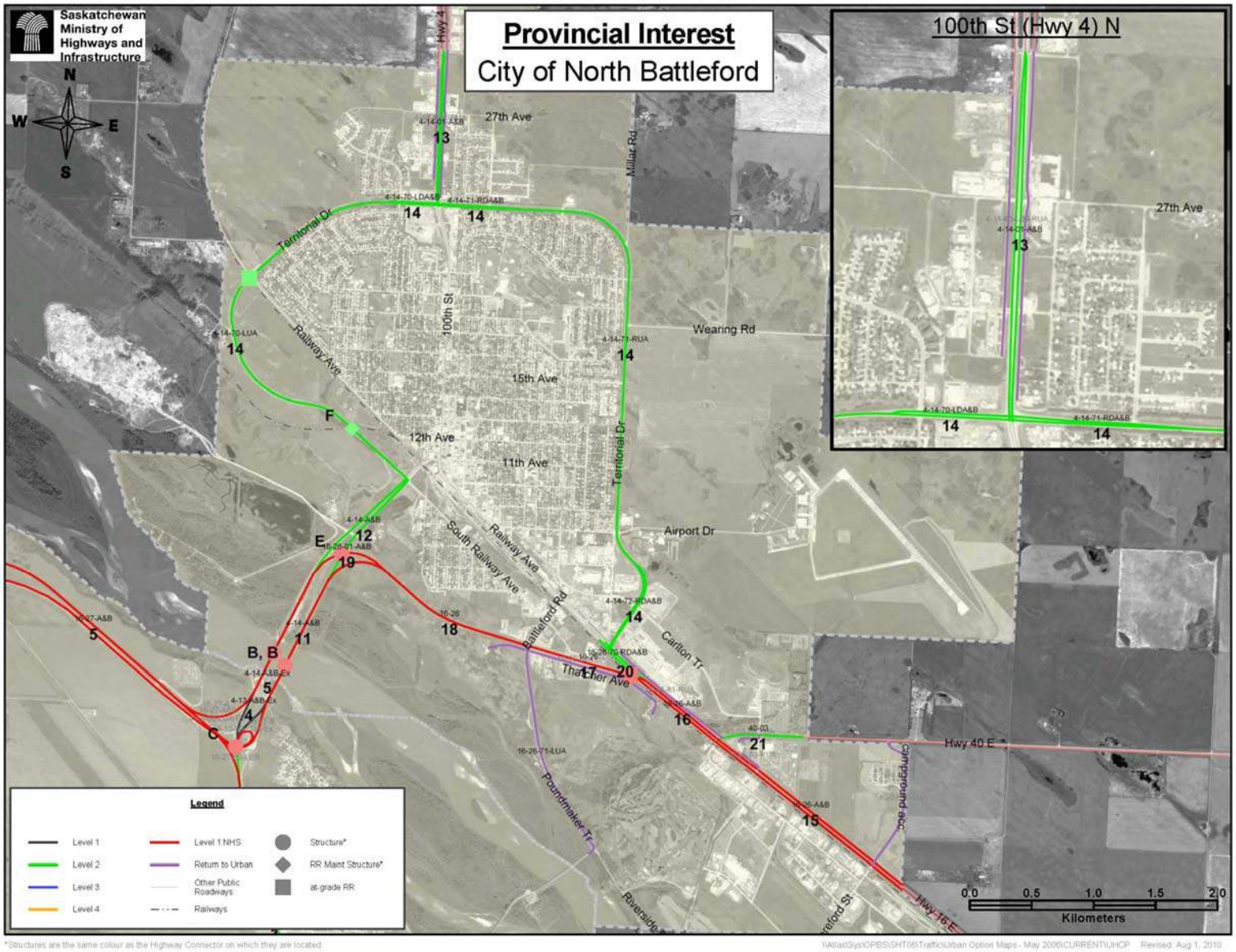


Figure 13: Provincial Level of Interest Map

Provincial Level-of-Interest Review

Confirming the province's level-of-interest in the urban connectors and associated improvements is based on existing UHCP policy and criteria, regarding functionality, mobility and continuity. A number of key factors include the National Highway classification, the province's Functional Classification, the province's desired long-term Access Management Level compared with the existing degree of access management, the split between 'through' and 'local' traffic volumes, and the roadway's long-term ability to serve provincial requirements.

The provincial interest level is determined using the following sub-components and associated *classification levels*:

+ *Functionality* – In the classification process, the primary function of the urban street is identified. This category consists of three subcomponents:
    - The existing functional classification system for the highway network
    - Urban municipal size (proxy measure of traffic mix)
    - Roadway usage
+ *Mobility* – Continued mobility through an urban municipality is of significant provincial interest. To quantify mobility, the following are considered:
    - The street classification as designated by the municipality
    - Character of the roadway
    - Operational characteristics represented by level-of-access
+ *Continuity* – Urban connectors are essential in providing continuity to the provincial highway system and include:
    - The National Highway System (NHS)
    - The extension of the rural road classification system through the urban municipality

Through the provincial interest, the province recognizes the importance of creating an integrated transportation system for the province. The provincial interest level is determined using the eight criteria defined above, related to the functionality of the connector route, the level of mobility provided, and the level of continuity or connectivity that exists with the adjoining rural highway system.

The assessment of provincial level-of-interest for the City of North Battleford showed that the provincial interest levels have not changed.

Guide Signage

Traffic Control Devices such as signs, signals, and pavement markings provide instructions to drivers. Signs provide regulatory, warning and guidance information to the driver to allow decisions to be made on an ongoing basis. Proper guidance though the use of guide and information signage is very important to the driving task. This task can be made safe, more efficient, convenient and comfortable by ensuring that directional route information is conveyed to motorists in clear concise, simple and understandable form[5].

The key to guide signage is consistency in messaging. In a situation such as around North Battleford, where there is convergence of many highways and also the City of North Battleford and Town of Battleford, driver workload can be high, increasing the importance of clear, consistent, and efficient messaging. The presence of left-hand side exits, which are not typical, also add to driver workload.

A high-level review of existing signage was completed to confirm if drivers are able to make informed decisions regarding route selection and to provide recommendations to improve information regarding access to North Battleford. Based on this review it is recommended that a full analysis of the current guide signage is completed for existing conditions and that a guide sign plan is developed along with functional planning for ultimate grade separation of the Highway 16 corridor. Some of the items that should be considered in a detailed review are:

+ Consistency in the use of the highway shields on the ground-mount signs.
+ Consistency in messaging is key. Guide signage is always more challenging when dealing with a dual or multiple designation routes, such as Highway 16 West and Highway 4 South.
+ Increasing the priority and prominence of North Battleford in signage on the east and west approaches of Highway 16, including consistency in wording.
+ Add a sign westbound on the Highway 16 bypass, indicating access to North Battleford services via Battleford Road. This will notify drivers of a second opportunity to access North Battleford, if they did not exit at Railway Avenue.

In addition to standard Highway Guide Signage, the City of North Battleford should consider the development of a wayfinding plan, with a consistent look and messaging indicating key destinations and services throughout the City, priority for wayfinding signage should be on westbound Railway Avenue between Highway 16 and Battleford Road, Battleford Road between Highway 16 and Railway Avenue, and Highway 4, prior to the intersection with 100 Street.

[5] Highway Guide and Information Sign Manual, Alberta Transportation, October 2006

Network Recommendations

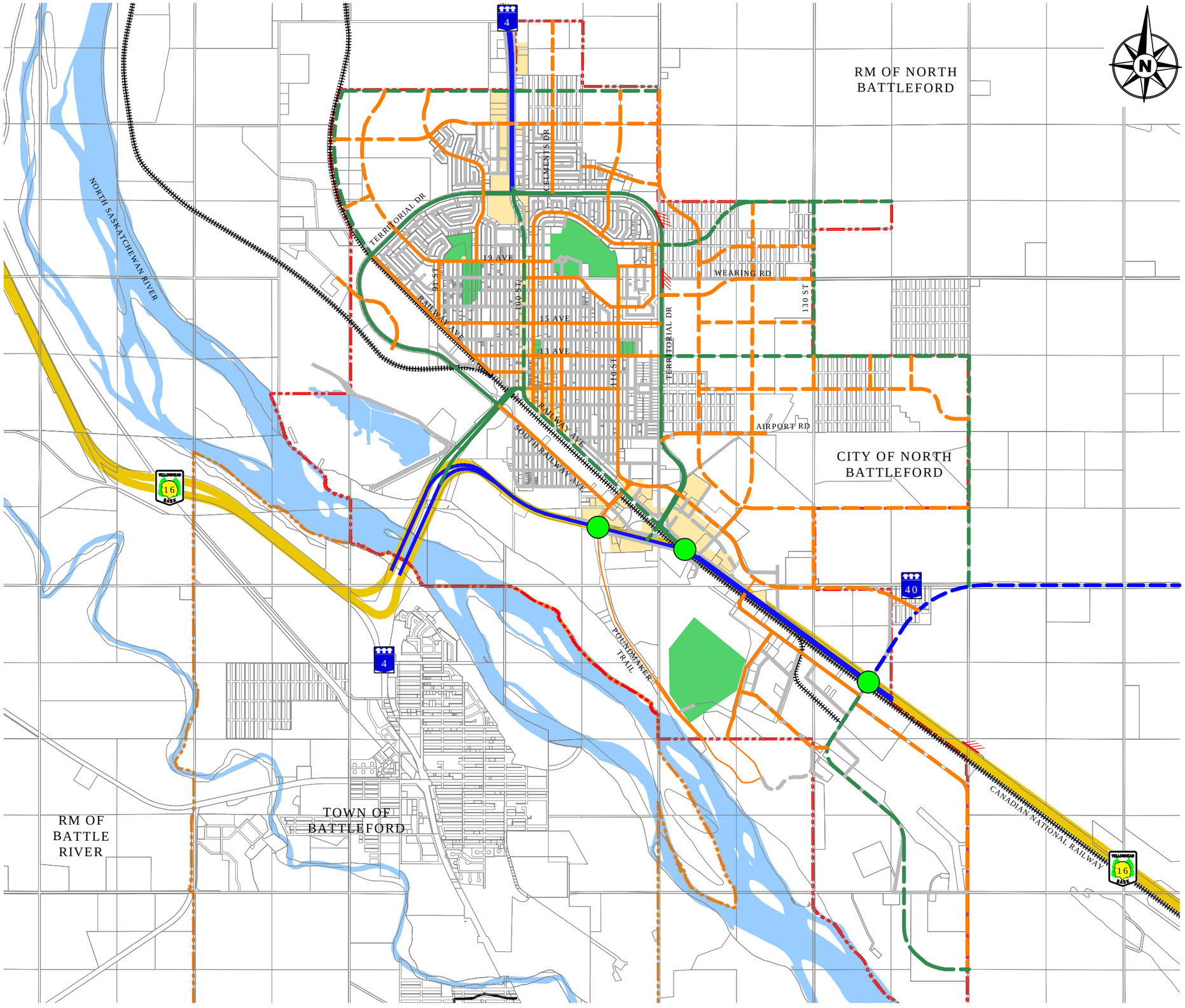
Figure 14 shows conceptual extensions of the roadway network to serve future land development (further study is needed to define roadway alignments at a functional level), and also shows proposed changes to network classifications on existing corridors. The plan includes roadways currently designated in community plans, as well as a conceptual plan for roadways serving up to the current City boundaries. The long-term roadway network plan identifies a core grid network that will serve future development areas and provide the basis for a well-connected roadway system. Topography and development constraints will dictate alignments of these future roadways; however, continuous routes between development areas should be an important consideration for future planning activities.

Designation of 100 Street and Railway Avenue between Territorial Drive and 100 Street as arterial roadways is recommended. This recommendation is not intended to be in conflict with the City's downtown pedestrian network plan, but to provide the City with increased control over direct access to the corridor as new development occurs in the future. This corridor plays an important role in both the roadway network, serving as the key access points to the City from the north, east and south, and the active modes network, providing a continuous north south route and connecting to the downtown area. Specific improvements are not identified along the corridor; however, decisions on future access to Railway Ave and 100 Street should carefully consider its role in the roadway and future active modes network and impacts on all users of the corridor. Direct access to arterials is generally not permitted.

Territorial Drive has dual purposes in the roadway network, providing local access between residential, commercial and industrial areas for residents and serving as an urban connector for Highway 4 north to Highway 16, Highway 4 south, Highway 29, Highway 40, and Highway 658. To allow the corridor to continue to function as efficiently as possible, it is recommended that access be limited to only those roadways shown in the long term plan and that existing direct access to commercial areas be removed as improvements are made to the corridor and existing intersections. Direct access to Territorial Drive should not be permitted, instead provided via the collector cross-roads, as this compromises its ability to serve as an efficient urban connector. For the same reason, access to Highway 4 north of Territorial Drive should also be limited to existing locations, and the proposed arterial at the north end limits of North Battleford. Future planning studies should include a public engagement component and conversations directly with business owners to agree upon acceptable access management strategies.

Long-term recommendations for Highway 16 within the City limits include twinning and upgrading to a grade-separated, access-controlled corridor. Interchanges are proposed at Hereford Street, Railway Avenue, and Battleford Road. Consideration should be given to realigning Highway 40 to Hereford Street, to improve spacing between interchanges. With the re-alignment of Highway 40, Carlton Trail could be extended along the existing Highway 40 alignment, providing an alternate access to the east side of the City from the highway. A functional planning study of the Highway 16 corridor between Hereford Street and Highway 4 south should be undertaken in the short-term to develop preliminary designs for grade separations and identify right-of-way requirements. The functional planning study should also consider the geometric feasibility of retaining right-in/right-out access at the existing Highway 4 and Thatcher Avenue intersections, and the proposed Territorial Drive extension to the bypass. The functional planning study should be completed prior to

design and construction of the recommended interim improvements to the corridor, and should address design of the interim improvements in a manner that reduces throw away between the stages. Investigation of the feasibility of grade separation of the westbound turn movement from Highway 16 to the bypass, with the interim improvements, should also be conducted. Although this movement is anticipated to operate well from a capacity perspective, a yield condition and left turn to continue on the highway is corridor is not consistent with driver expectations. Traffic volumes on the Highway 16 bypass and Highway 4 between 100 Street and the bypass are similar in magnitude; extension of the southbound section of Highway 4 through the bypass merge will likely be required at the same time as twinning of the bypass. In order to maintain lane balance and acceptable operations, this will trigger the requirement to add an additional lane across the river. Although not recommended in the 25,000 population horizon, upgrades to the highway corridor to a grade separated facility will likely be desirable for growth beyond this horizon. Provision for a westbound to northbound right turn at the interchange between the Highway 16 bypass and Highway 4, to provide an alternative access to North Battleford was considered but is not recommended. When one movement is provided at the intersection of high classification roadways, to meet driver expectations, it is also desirable to provide the return movement (i.e. westbound right and southbound left). At this location, although it would likely impact access to the wastewater treatment plant and planned lift station, a westbound right could potentially be provided, however the return movement would require multiple structures and subsequently be a significant cost to provide. Furthermore, addition of these movements would likely accelerate the need for twinning of the bypass. A functional planning study could investigate the feasibility of westbound to northbound and southbound to eastbound connections further to correspond with twinning of the bypass.



City of North Battleford

TRANSPORTATION MASTER PLAN

LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY
- EXPRESSWAY
- ARTERIAL
- COLLECTOR
- LOCAL
- CONCEPTUAL FUTURE EXPRESSWAY
- CONCEPTUAL FUTURE ARTERIAL
- CONCEPTUAL FUTURE COLLECTOR
- CONCEPTUAL FUTURE LOCAL
- FUTURE INTERCHANGE
- INTERSECTION CLOSED

FIGURE 14

LONG TERM ROADWAY NETWORK

North Battleford

Government of Saskatchewan

CIMA

Project No. CA000196 Drawn by: RKG

Date: DECEMBER 21, 2017 Checked by: RR

NOT TO SCALE

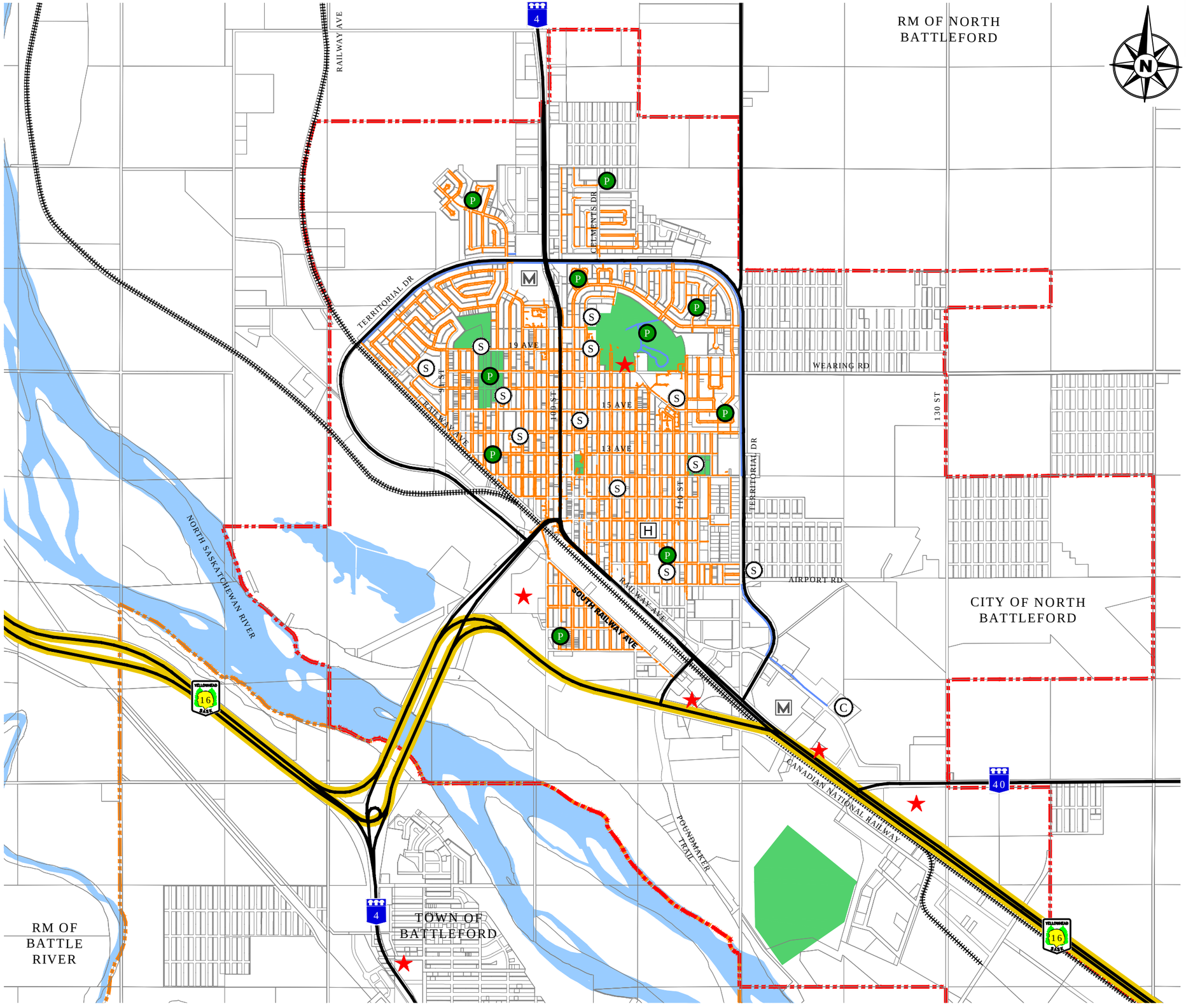
Active Modes Network

Active transportation, such as walking and cycling, provides many health and exercise benefits to users while also providing an environmental, social, and financial benefit to society, and strengthening a sense of community. The existing network of sidewalks and pathways, as well as common recreational destinations, are illustrated in **Figure 15.**

The existing active modes network includes a multi-use pathway along Territorial Drive and in Centennial Park as well as sidewalks on both sides of the majority of the collector and local roadways. There are also a number of unpaved trails that have developed around the community and in the river valley. The Finlayson Island summer hiking and winter skiing trails provide opportunity for year round recreational activity. The Trans Canada Trail enters the Battlefords area in the southeast corner of the Town of Battleford and continues along the River, across the Highway 16 bridge up to Railway Avenue West, and then along the railway line north. The Trans Canada Trail is recognized as connected for the segment through the Battlefords however some portions of the trail are paved, others are not, and there are gaps, such as on Highway 4 between Railway Avenue and River Valley Drive where there is not a pathway outside of the shoulder of the Highways. There are currently no sidewalks in the industrial developments along Highway 4 to the north or south of Highway 16 to the east.

Pedestrian and cyclist counts were conducted along with traffic data. **Table 4** shows the total pedestrian and cyclist movements counted over the 4-hour count period between the hours of 7:00 A.M. to 9:00 A.M., and 4:00 P.M. to 6:00 P.M. Pedestrian volumes are shown by the approach they are crossing and bikes are coming from the direction they categorized under, for example, bikes under the north category are southbound. The counts indicate that the highest concentration of pedestrian and cyclist movements occur in the downtown area. With the most pedestrian activity at the intersections of 100 Street and 15 Avenue, and 101 Street and 11 Avenue

Responses to the questions and comments received at the open house and through the online survey indicate that there is a desire from the residents for improved pathway and sidewalk connections throughout the City. Pedestrian and cyclist network safety and improved walkability ranked #4 and #5 in the responses to what was most important for long-term transportation planning in the City.



City of North Battleford
TRANSPORTATION
MASTER PLAN

LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY
- SIDEWALKS
- PATHWAY
- PARKS & FIELDS
- SCHOOL
- SHOPPING MALL
- CONVENTION CENTER
- CUPLEX
- PLAYGROUND
- HOSPITAL

FIGURE 15

EXISTING SIDEWALKS & PATHWAY NETWORK

North Battleford

Government of Saskatchewan

CIMA

Project No. CA000196 Drawn by: RKG

Date: DECEMBER 21, 2017 Checked by: RR

NOT TO SCALE

Table 4: 2015 Pedestrian and Cyclist Volumes (Total AM Peak and PM Peak 4-hour Volumes)

LOCATION	NORTH		SOUTH		EAST		WEST	
	PED	BIKE	PED	BIKE	PED	BIKE	PED	BIKE
Territorial Drive & Pioneer Avenue	20	15	11	7	4	7	7	5
Territorial Drive/South Railway Avenue & Highway 4	0	0	0	0	1	1	2	2
Highway 16 & Battleford Road	1	5	0	2	2	0	0	0
91 Street & 19 Avenue	17	4	9	0	9	5	16	8
100 Street & 19 Avenue	10	13	12	11	13	3	9	2
100 Street & 15 Avenue	35	3	31	5	38	7	31	9
100 Street & 13 Avenue	5	2	8	3	4	2	5	2
101 Street & 13 Avenue	11	9	14	3	28	5	29	2
102 Street & 13 Avenue	15	5	12	6	14	0	20	5
100 Street & 11 Avenue	2	0	3	1	13	4	16	4
101 Street & 11 Avenue	100	3	62	3	72	5	200	5
101 Street & Railway Avenue	1	0	0	1	6	1	8	0
Battleford Road & Railway Avenue	3	2	5	2	3	6	4	2
110 Street & Diefenbaker Drive	4	12	15	9	20	11	10	8
110 Street & 15 Avenue	16	17	12	9	5	3	5	5
110 Street & 13 Avenue	6	9	0	2	2	10	13	7
110 Street & 11 Avenue	5	4	4	5	3	2	6	0
Territorial Drive & Railway Avenue	0	1	10	2	0	2	0	0
Territorial Drive & Frontier Mall	6	4	3	4	1	4	1	0
Highway 16 & Highway 40/ Simmental Street	1	5	1	5	0	1	0	1
Territorial Drive & Railway Avenue	0	0	0	0	0	0	0	1

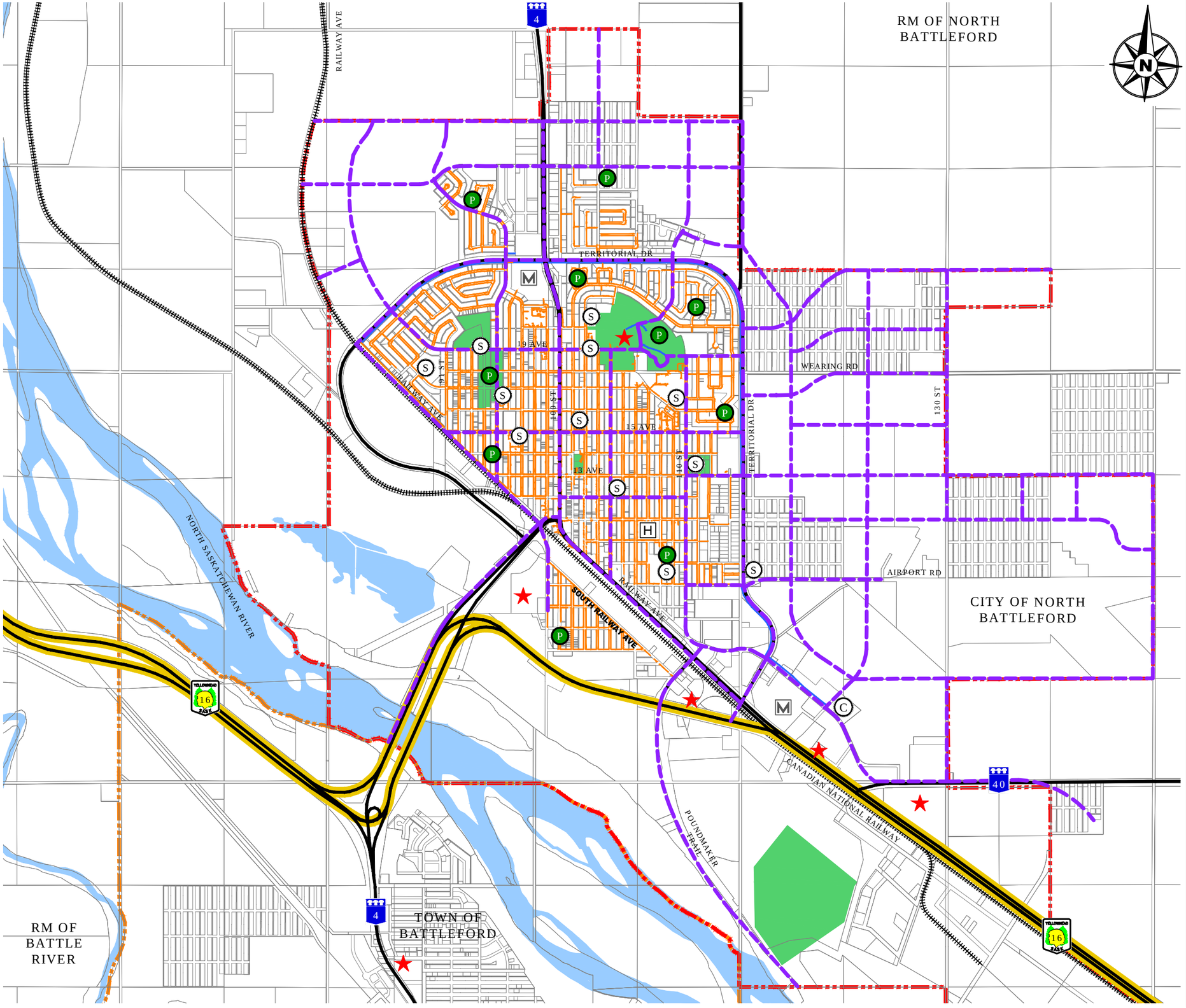
Network Recommendations

Figure 16 shows the recommended long-term active modes network for the existing developed areas within the City, and a conceptual plan for future development areas. The network for future development areas follows the cross-section guidelines, which recommends that arterials and collectors include multi-use pathways on one side of the roadway. The active modes network shown will serve existing and future development areas, and provide the basis for a well-connected pathway system. Additional connections on local roadways may be desired for connectivity and to provide access to key destinations such as the hospital, schools, and recreational facilities.

In the existing areas of North Battleford, three main east-west pathway corridors are recommended on 12 Avenue, 15 Avenue, and 19 Avenue. North-south corridors include 110 Street, 104 Street, 100 Street and 95 Street. The network formed by these key routes would be the core of the active transportation system for the City. Additional links include Railway Avenue between 100 Street and Battleford Road, Carlton Trail and 12 Avenue between 110 Street and 100 Street, with connections to recreational areas along the river via Poundmaker Trail and Highway 4, and extension of the current pathway towards the Don Ross Centre.

The timeline for implementation of the active modes network will depend on a number of factors including available funding, and improvement priorities. The development of routes on existing roadways could be staged, beginning with signed on-street routes and over time developing networks through a pathway system upgrade program, utility improvements, complete streets upgrades, and traffic calming projects. Another interim option would be to use stencils painted on sidewalks to indicate to pedestrians and cyclists that it is a part of the trail system and cyclists are permitted on the sidewalk. In development of an active modes network, a key component is creating comfortable user spaces; this includes lighting, and attractive amenities such as benches, bike racks, and garbage cans. Landscaping and wayfinding signage are also important features when promoting multi-mode travel.

CA000196



City of North Battleford
TRANSPORTATION
MASTER PLAN

LEGEND

- CITY OF NORTH BATTLEFORD BOUNDARY
- TOWN OF BATTLEFORD BOUNDARY
- EXISTING RAILWAY
- SIDEWALKS
- PATHWAY
- PRIMARY PATHWAY SYSTEM
- PARKS & FIELDS
- SCHOOL
- SHOPPING MALL
- CONVENTION CENTER
- CUPLEX
- PLAYGROUND
- HOSPITAL

FIGURE 16
LONG TERM PEDESTRIAN NETWORK

North Battleford

Government of Saskatchewan

CIMA

Project No. CA000196 Drawn by: RKG
Date: DECEMBER 21, 2017 Checked by: RR

NOT TO SCALE

Transportation Noise

Vehicular noise can be annoying and disruptive to living conditions. A transportation noise policy establishes vehicular noise levels that would be considered generally unacceptable and outlines how mitigation measures could be implemented.

The audible frequency range of a healthy, unimpaired human ear is approximately 20 - 20,000 Hz. For most environmental noise sources (caused by traffic, industrial, and recreational activities), the parameter typically used is the A-weighted equivalent sound pressure level, L_{eq}, measured in decibels (dBA). Simply stated, the A-weighting takes into consideration the human ear's sensitivity to certain frequencies; Sounds between 1,000 Hz and 6,300 Hz are emphasized, while frequencies outside of that range are de-emphasized.

Neither the City of North Battleford, nor the Province of Saskatchewan, currently have a sound attenuation program or policy in place. As such, a review of existing noise mitigation policies from other municipalities, provinces and national standards was conducted.

Based on the review, it is recommended that the City of North Battleford adopt a day-night noise level threshold of 65 dBA L_{dn} for residential developments backing on to roadways classified as arterials or higher, using a 20-year projected traffic volume. 65 dBA L_{dn} is consistent with the guidelines of the other Saskatchewan municipalities, and the 20-year traffic volume projection is near consistent with the 25,000 population horizon of the North Battleford Transportation Master Plan, currently anticipated to occur in the year 2038. Further, the use of the day-night noise level measurement (L_{dn}) over the 24-hour average noise level (L_{eq}) is considered more appropriate for application in North Battleford as the L_{dn} reflects residents' increased sensitivity to nighttime noise.

Based on the recommended threshold of 65 dBA L_{dn} and existing and projected traffic volumes, a review was conducted using the Federal Highway Administration (FWHA) Traffic Noise Model (TNM) method to determine if there are locations where mitigation may be warranted. Territorial Drive is currently the only roadway with an arterial or higher classification with adjacent backing residents. The analysis showed that existing and future noise levels are well below the 65 dBA L_{dn} threshold. Based on the analysis further more detailed study of traffic noise is not warranted at this time, and likely will not be necessary until beyond the 25,000 population horizon. Significant changes in the volume or composition of traffic (i.e. increased heavy vehicles) may trigger the need for additional analysis sooner.

As growth in the City continues, it is recommended that the City of North Battleford develop a detailed set of transportation noise guidelines or formal policy that would provide guidance on dealing with existing transportation noise issues (noise testing, construction materials, rail, etc.) and on the financial and maintenance responsibility of new development proposals to mitigate the possibility of noise problems to proposed development. The transportation noise guideline or policy should also include a process for addressing noise-related concerns from residents.

Railway Crossings

Canadian National Railways (CN Rail) secondary lines through the study area largely affect the urban highway connectors. The low-volume Aberdeen subdivision approaches the City from the southeast, parallel and adjacent to the south side of Highway 16. A number of spur lines branch off serving industrial areas to the south as the line enters the City, crossing various local roads at-grade. The North Battleford marshalling yard is south of Railway Avenue (old Highway 16) between Battleford Road and Highway 4. The Blackfoot sub and a branch line to Hamlin, exits the City in the northwest. The following crossings, are most significant to the Transportation Master Plan, from southeast to northwest:

+ CN line crosses at grade at Simmental Street immediately adjacent to the intersection with Highway 16
+ CN line crosses at grade at Hereford Street immediately adjacent to the intersection with Highway 16
+ CN line crosses Highway 16 bypass at-grade immediately adjacent to intersection with Railway Avenue
+ CN line crosses Battleford Road at-grade.
+ CN line grade separated crossing Highway 4.
+ CN line grade separated crossing west Territorial Drive.
+ CN branch line to Hamlin crosses west Territorial Drive at-grade immediately adjacent to the intersection with intersection with Railway Avenue East.

A high-level review of railway crossings in the City of North Battleford was conducted including review of relevant railway and governmental standards and assessment of crossing warrants/treatments, analysis of the crossings. The most significant challenge related to the rail line is its close proximity to Highway 16 and the associated impacts to interchanges that will be ultimately required to create a free-flow facility on Highway 16.

CA000196

The cross-product of trains per day and vehicles per day is the primary criteria used to determine railway crossing safety system requirements. Transport Canada's *Grade Crossing Standards, 2014* identify cross-product thresholds at which automatic warning device (AWD) protection, such as flashing lights, bells, and gates are requires at at-grade crossings. While Transport Canada regulates when at-grade railway crossings require additional protections, they do not specify when grade separation should be considered. Further, there are currently no Canada-wide standards, from the Transportation Association of Canada or other, which provide any guidelines or specific cross-product value at which grade separation should be considered at railway crossings.

The Province of British Columbia Ministry of Transportation and Infrastructure's (BC MoTI) *Supplement to TAC Geometric Design Guide, 2014* provides specific guidance as to when grade separation should be considered. Historically, this threshold has been the most commonly accepted by industry in Canada.

In December 2015, the Transportation Safety Board of Canada (TSB) recommended that Transport Canada provide specific guidance as to when grade separation should be considered for at-grade railway crossings. In February 2016, the recommendation was accepted by Transport Canada. Transport Canada indicated that they will work with provinces and railways to develop guidelines that would assist road authorities and railways to determine when grade separation should be considered. However, no timelines have yet been established. The decision to construct a grade separation will continue to be the responsibility of the road authority and the railway.

The daily train volume along the Aberdeen subdivision line in the City of North Battleford is four trains per day, per information provided to the CIMA+ project team from CN Western Region on October 6, 2016. Assuming that future daily train volumes will remain the same as existing conditions, the cross-product analysis shows each of the crossings currently and will continue to meet or exceed the minimum requirements for warning systems up to the 25,000 population horizon.

Table 5 shows the existing crossing treatments on the Aberdeen Line. Although further upgrades to the Aberdeen subdivision line crossings in North Battleford not are triggered, given the recent TSB recommendation and Transport Canada's support for the development of specific guidelines for grade-separated crossings, it is recommended that the City of North Battleford continue to monitor grade crossings. Detailed assessments of all road and railway conditions, and engineering judgement should prevail when considering higher forms of railway crossing warning systems and protection.

Table 5: Aberdeen Subdivision Line Railway Crossing Assessment Data

Line	Location	Existing Control Devices
Aberdeen Sub	Hereford St	AWD without gates
	Simmental St	AWD with gates
	Highway 16 Bypass	AWD without gates
	Battleford Road	AWD with gates
	Highway 4	grade-separation
	West Territorial Dr	grade-separation
Branch line to Hamlin	West Territorial Dr at Railway Ave E	AWD without gates

AWD = automatic warning device (lights, bells, gates)

Plan Implementation

The Transportation Master Plan should be a dynamic document guiding changes to the transportation system through the application of the policies contained within this TMP. Changes to the transportation system will include expansion of the system due to growth, upgrades of the existing facilities, and maintenance of the infrastructure.

Key to the success of the Transportation Master Plan is a commitment to incorporating the strategies identified throughout into City planning and design activities. **Table 6** outlines the key actions needed to implement the directions of the Transportation Master Plan and the proposed time frame for action, level of effort for City administration and relative capital budget implications. The cost range is:

+ Low – less than $50,000
+ Medium – $50,000 to $250,000
+ High – greater than $250,000

Many of the actions listed are ongoing and should become part of regular practices for the City, others are specific tasks. Check marks identify early action items in the near-, mid- and long-term timeframes. Early action items include adopting the roadway cross-section guidelines and developing a set of design standards for the City, and adopting the roadway network and primary trail system recommendations.

Implementation of the plan would benefit from a monitoring system to track progress on important aspects of the plan. Realistic targets should to be set reflecting the City's vision, objectives, priorities and funding capabilities. Baseline data would be required for targets selected. The success of the plan is in delivering services to residents can also be gauged by 'proxy' indicators. For example, the number and type of collisions reported in the City could be used as an indicator of how safely the system is operating. Public opinion surveys can indicate resident satisfaction with the quality of facilities provided. Some examples of performance indicators that could be used to monitor progress are:

+ Safety (roadway, pedestrian, cyclist)
+ Customer Satisfaction
+ Network Delay
+ Pathway Supply
+ Transportation Investment
+ Mode Split (Transit, walking, cycling, single occupancy vehicles)

Table 6: Implementation Plan

	Key Actions	Timeframe			Effort	Cost Range
		Near	→	Long		
General Strategies						
+	Implement and adapt transportation best practices to the needs and priorities of the City	Ongoing			Low	None
+	Establish dialogs with neighbouring jurisdictions on matters of mutual interest	Ongoing			Low	None
+	Administer and enforce transportation by-laws	Ongoing			Medium	Low
+	Design street layouts to maximize connectivity and provide safe spaces for all users	Ongoing			Low	None
+	Develop a plan to provide clear and comprehensive guide signing to key commercial and recreational destinations		✓		Low	Medium
+	Implement and follow policies outlined in the TMP	Ongoing			Low	Low
+	Establish a monitoring system for the TMP, include baseline data and realistic goals		✓		Medium	Low
+	Undertake regular reviews/updates of the Transportation Master Plan		✓	✓	Medium	Medium
+	Ensure that new development plans consider impacts on all transportation systems and accord with design guidelines	Ongoing			Low	None
Roadway Network						
+	Adopt the long term roadway network illustrated in **Figure 14**	✓			Low	None
+	Implement the roadway cross-section guidelines illustrated in **Table 3**	✓			Low	None
+	Develop design standards for the City incorporating the cross-section guidelines	✓			Medium	Medium
+	Establish a transportation noise policy			✓	Low	Low
+	Undertake a functional planning study for Highway 16	✓			Medium	High
Pedestrian and Cycle Accommodation						
+	Adopt the long term active modes network illustrated in **Figure 16**	✓			Low	None
+	Implement the roadway cross-section guidelines illustrated in **Table 3**	✓			Low	None
+	Develop an action plan for staged improvements to the active modes network	✓			Medium	Low
Transit						
+	Review the delivery of transit services periodically through a collaborative approach with key stakeholder groups		✓	✓	Medium	Low
+	Review the delivery of Handi-Bus services periodically through a collaborative approach with key stakeholder groups	Ongoing			Medium	Low
+	Ensure that new development plans include consideration for potential future transit routes	Ongoing			Low	None

Conclusions and Recommendations

Mobility needs in the City of North Battleford are served mainly by a transportation system of roads and sidewalks. The vision for North Battleford is to create a City that is Healthy, Green, Safe, and Strong as it moves towards 2030. This includes goals to diversify land use; improve aesthetics at entryways; support, protection and maintenance of provincial interest; and facilitate development that provides a high quality of life for residents, including providing healthy transportation options. Feedback received from the public indicated that although vehicular travel was currently the preferred travel mode, increased transit, economy, active mode network safety and walkability are also priorities; this is consistent City's vision. Administration, vehicular mobility, active modes, and transit policies outlined in this transportation master plan support the overall vision and will guide implementation of the plan. It is recommended that the ***transportation policies outlined in this TMP are adopted, implemented and followed.***

The road network in the City comprises a hierarchy of urban and provincial routes, serving local, regional, interprovincial and national travel. Access management is a key component to maintaining the mobility functions of key corridors for all modes of travel. Key regional mobility corridors in and around North Battleford include Highway 16, Highway 4, and Territorial Drive. Provincial levels of interest on these corridors were reviewed and no changes from the existing levels were identified. It is recommended that ***the long-term roadway network (Figure 14) is adopted, that access to key corridors be limited to the arterial and collector roads and that opportunities to remove or consolidate existing local road and business accesses are investigated***. Further, it is recommended that the City and Province work together to ***complete a functional planning study to develop a plan for upgrading Highway 16 to a twinned grade-separated, fully access controlled corridor.*** Railway Avenue and 100 Street are also important corridors in the transportation network, serving as connections for all modes travel to key commercial and recreational facilities. Balancing the role of these corridors to serve vehicles and pedestrians will be necessary in future planning activities.

Key components to providing alternative transportation options are to enable safe access for all users and to promote active modes by providing high quality pedestrian facilities. The cross-section guidelines outlined in **Table 3** incorporate complete street concepts to provide an attractive environment for active modes users. In addition to

active modes accommodation new roadways, **Figure 16** identifies an active modes network to serve existing development areas. Implementation of the active modes network can be staged and will depend on available funding and improvement priorities. It is recommended that the ***cross-section guidelines and long-term active modes network are adopted and a plan developed for staged implementation in existing areas.***

A review of noise policies in various jurisdictions around Saskatchewan resulted in the recommendation that the City of North Battleford ***adopt a day-night noise level threshold of 65 dBA Ldn***. Based on this threshold and a preliminary review of existing and forecast noise levels, further sound attenuations is not warranted at this time, and likely will not be necessary until beyond the 25,000 population horizon. Significant changes in the volume or composition of traffic (i.e. increased heavy vehicles) may trigger the need for additional analysis sooner. It is recommended that the City of North Battleford ***develop a transportation noise policy***.

A high-level review of railway crossings in the City of North Battleford was conducted including review of relevant railway and governmental standards and assessment of crossing warrants/treatments, analysis of the crossings. At this time, no further upgrades to the Aberdeen subdivision line crossings in North Battleford are recommended through to the 25,000 population forecast horizon, however, it is recommended that the City of North Battleford ***continue to monitor grade crossings***.

The City of North Battleford Transportation Master Plan (TMP) is a long-range transportation planning document that provides a picture of how the community would like to see its mobility needs met. It encompasses a relevant range of mobility components, integrates the overall vision of the community, has strategic goals and policies to guide its implementation, and action plans that can be further translated into short-term plans and budget documents. **Table 6** provides a list of key actions for the Transportation Master Plan including general and mode specific strategies. It is recommended that a ***monitoring system is established for the TMP*** including baseline data and goals and that the ***TMP is regularly reviewed and updated.***

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