



Final Report

Regional Municipality of Wood Buffalo

Transportation Master Plan Stage 3

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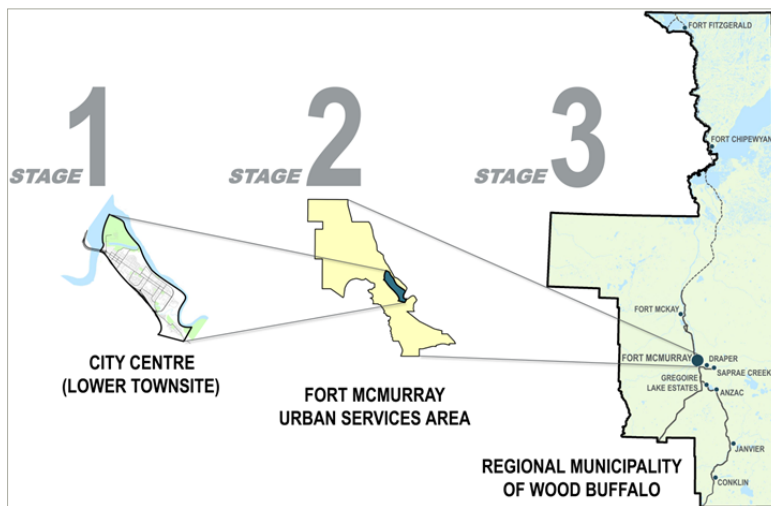
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Executive Summary

Stage 3 of the Transportation Master Plan (TMP) builds on the previous Stage 2 and Stage 1 plans, and provides a transportation strategy that is focused on multi-modal integration and regional connectivity. The TMP is a blueprint for achieving the region's transportation vision over the next 10 years.

Its purpose is to develop a regional transportation strategy, including policies and infrastructure recommendations to implement in the next 10 years. This regional approach balances the urban needs in and around Fort McMurray, along with the rural needs in communities spread across the region. Stage 3 of the TMP expands the study area and builds on the previous Stage 1 and 2 components, as shown in the exhibit below.



Stage 1 of the TMP, completed in 2009, focused on the Fort McMurray City Centre (Lower Townsite).

Stage 2 of the TMP, completed in 2012, focused on the Urban Service Area of Fort McMurray.

Stage 3 of the TMP considers the transportation system within the entire Regional Municipality of Wood Buffalo, and takes a more current and holistic approach to identifying future needs.

Methodology

A Transportation Master Plan is a long-range planning tool that serves three key purposes:

- Defines an overall vision for the transportation system
- Identifies strategies to achieve the vision
- Creates a framework for transportation decision making and investment

The TMP recommends and prioritizes transportation infrastructure and policy improvements within the next 10 years. The TMP also supports the objectives of the Municipal Development Plan (MDP).

The preparation of the TMP followed a layered approach which generally included a review of the policy framework, best practices, existing conditions and future trends, a gap / opportunity analysis, and recommendations. The final recommendations are compiled into the Implementation Plan.

Stakeholder and Community Engagement

Stakeholder and community engagement is important to the success of a project, as those who are affected by a decision should have the opportunity to understand and influence the outcome of the project.

Multiple engagement events allowed stakeholders to understand and influence the recommendations in a meaningful way.

The key objectives of the consultation were to:

- Inform stakeholders of the project, the study process, and study goals and outcomes;
- Provide opportunities for stakeholders to identify and communicate their comments, concerns, questions, and issues; and
- Obtain feedback on the study progress and recommendations, and incorporate knowledge and ideas into the study recommendations where possible.

Stakeholders

The list of stakeholders included the following organizations:

Regional Municipality of Wood Buffalo Departments

- Engineering
- Planning
- Road Maintenance
- Operations
- Aboriginal and Rural Relations
- Wood Buffalo Transit

Provincial Stakeholders

- Alberta Transportation
- Alberta Infrastructure

Oil Sands Stakeholders

- Oil Sands Community Alliance (OSCA)
- Oil Sand Sustainable Development Secretariat (OSSDS)
- Oil Sands Transit Group

Rural Community Stakeholders

- Anzac FCSS
- Anzac Willow Lake Community Association
- Chard Métis Society
- Christina River Dene Nation Council
- Conklin Resource Development Advisory Committee (CRDAC)
- Fort McKay Métis Group
- Janvier Dene Wood Buffalo Community Association
- McMurray Métis (MNA Local 1935)
- Vista Ridge / Sapræ Creek Residents Society

Stakeholder events

- Context and Issues Stakeholder Workshop
- Fort McKay BBQ & Tradeshow
- Anzac Community Leadership Meeting
- Conklin Resource Development Advisory Committee
- Fort Chipewyan Hamlet Manager conference call

See Appendices A & B for stakeholder engagement and consultation details.

Study Aims

Throughout the TMP study, the following transportation issues were reviewed, with the aims identified below.

Regional Transportation Network

- Support all users of the network.
- Balance the needs of regional movements and local travel.

Rural Communities

- Address the unique needs of each community and provide more mobility options within and between rural communities, as well as to Fort McMurray.

Regional Transit

- Encourage transit use and shift travel to higher occupancy vehicles.
- Extend the life and capacity of Highway 63 from the perspective of people movement rather than vehicle movement.
- Improve the livability of communities in and around Fort McMurray.

City Centre Circulation

- Improve access to and from the City Centre.
- Improve connectivity of the road network and circulation within the City Centre.
- Redefine the function and character of Franklin Avenue, while also accommodating other travel modes and livability.

Urban Parking

- Address the balance of on-street parking and other potential uses, while managing the demand and supply for urban parking.

Active Transportation

- Facilitate active transportation as an everyday mobility option by expanding the recreational network to a utilitarian network.

Implementation Plan

The Implementation Plan as shown in the following table lists the projects that are recommended for completion over the next 10 years. It includes a proposed timeline for implementation, as well as “high-level” cost estimates.

Each recommendation is described as one or more of three categories:

- **Do** – recommendations that require action, such as revising municipal policies or bylaws
- **Study** – recommended new studies and study updates
- **Build** – construction or purchase of physical infrastructure and / or equipment.

The recommendations are organized over three time periods:

- 2017 - 2021
- 2022 - 2026
- 2027 – Beyond

Row #	Type	Recommendation	2017-2021	2022-2026	2027-Beyond
1	Study	In the planning for any future highway expansion from four to six lanes, work with Alberta Transportation to plan for HOV and Transit.			
2	Study	Investigate opportunities to develop a park and ride facility, possibly shared with other uses, in the Gregoire/Mackenzie Industrial Park area to intercept auto commuters coming from communities south of Fort McMurray and going northbound to oil sands sites, for use by all transit services if desired.			
3	Study / Do	Implement mainline transit services on key transit corridors (Confederation Way, Thickwood Boulevard, Highway 63, Franklin Avenue, Gregoire Drive, MacKenzie Boulevard, and Saprae Creek Trail (Highway 69)).			
4	Study	Review the current bus service to the Airport, considering whether it could operate as more of an Express or Limited-Stop service.			
5	Do	Revise the Vehicle for Hire Bylaw, mandating accessible vehicle requirements.			
6	Do	Contract with accessible taxis to supplement specialized SMART Bus transit services.			
7	Study	Review current rural community bus service and identify where demand warrants increased service.			
8	Study	Conduct a Feasibility Study to implement Higher Order Transit (BRT and LRT) in key travel corridors.			
9	Do	Implement revisions to the intersection of Franklin Avenue and MacDonald Drive to prioritize movements between Franklin Avenue and Highway 63 / Athabasca River Bridge.			
10	Do	Convert Morrison Street and/or Hardin Street at Highway 63 to right-in/right-out only.			
11	Study	Conduct a functional design study of a northbound Highway 63 overpass at Hardin Street based on the identified concept. The study should focus on the cost, safety considerations of a left exit/entrance and length of time the improvement can provide benefits, noting that the concept could potentially be incorporated into six-laning of Highway 63.			
12	Study	Conduct a functional design study of the extension of Fraser Avenue from MacIver Street to Riedel Street, including potential realignment to Gordon White Avenue.			

Row #	Type	Recommendation	2017-2021	2022-2026	2027-Beyond
13	Study / Do	In conjunction with future rehabilitation, undertake functional design of Franklin Avenue as an urban corridor, to improve the urban context of the street.			
14	Do	Provide an online and printed City Centre parking inventory map.			
15	Do	Convert the bus staging area on the south side of MacDonald Drive, between Morrison and Main Streets, to parallel on-street parking with a 2 hour restriction (relocate bus staging further away from the high activity area).			
16	Do	Implement a 2 hour parking restriction along Franklin Avenue, with a 1 hour time restriction between Morrison and Hardin Streets.			
17	Study	Investigate a pay for parking strategy within the City Centre.			
18	Study	Develop the parking policy requirements for large scale developments within the City Centre.			
19	Do	Implement updated off-highway vehicle bylaws for each community.			
20	Do	Expand on the Emergency Management Plan to include specific evacuation routes and transportation procedures for each rural community.			
21	Do	Encourage Alberta Transportation to undertake assessments of safety, passing/climbing lane requirements and reliability on provincial highways in the RMWB			
22	Study	Conduct a passenger and freight access study for Fort Chipewyan.			
23	Build	Continue implementation of the “Land Swap” projects			
24	Study / Build	Complete the Saline Parkway in conjunction with new development in the area to provide access to development and a secondary route between the airport and City Centre			
25	Study / Build	Complete Parsons Creek Access Road and West Access Road to Timberlea to provide new development access and a secondary access route for Parsons Creek and Timberlea/Thickwood.			
26	Study	Work with Alberta Transportation to fully define the feasibility and benefits of the East Clearwater bypass route.			
27	Study	Undertake a functional planning study for the west urban connection to establish feasibility, cost, staging and property requirements for a western connection of the existing and future neighbourhoods on the west side of Highway 63.			

Row #	Type	Recommendation	2017-2021	2022-2026	2027-Beyond
28	Study / Build	Develop an initial connection between Abasand and Beacon Hill that can evolve to long-term connections to the communities once the west urban connection is developed.			
29	Study / Build	Establish emergency access routes for Draper and Saprae Creek that could ultimately be developed into permanent road network and/or active transportation connections.			
30	Study / Do / Build	Expanding on the Active Transportation Plan Update, 2014, develop an Active Transportation Strategy in Fort McMurray: <ul style="list-style-type: none"> • Expand the existing recreational multi use path network to a utilitarian network for everyday mobility. • Develop a core cycling network for utilitarian trips, building on the network identified in Figure 24. • Update the trails classification system. • Identify a year-round cycling network. • Provide a budget for snow clearing of the major links on the active transportation network. • Update the Engineering Servicing Standards and Development Procedures to include typical cycling facilities and on-street design standards. • Implement a regular pedestrian and cyclist count program. • Develop an active transportation program budget. 			
31	Study	Prepare an Active Transportation Plan for each rural community			
32	Build	Construct high priority active transportation projects: <ul style="list-style-type: none"> • <u>Fort McKay</u>: Sidewalk or multi-use path on Fort McKay Road. • <u>Conklin</u>: Connect existing multi-use path on Northland Drive from the water treatment plant to Conklin Corner. • <u>Conklin</u>: New multi-use path from Northland Drive to Christina Lake. 			
33	Study	Identify policy targets for connectivity indices and block lengths, and incorporate into land use planning policy documents.			
34	Study	Conduct a comprehensive review of all existing sidewalk and trail infrastructure, identifying barriers and interruptions in connectivity, and carry out remedial works to address these issues.			
35	Study	Conduct a focused review of missing pedestrian connections to bus stops.			

Row #	Type	Recommendation	2017-2021	2022-2026	2027-Beyond
36	Study	Develop an active transportation policy (pedestrian and cycling) for access to transit.			
37	Do	Incorporate a designated cycling facility within the functional design for Franklin Avenue.			

Contents

1	Introduction	1
1.1	Study Purpose	2
1.2	Strategic Direction	3
1.3	Study Process	3
1.4	Background Documents	4
2	Consultation and Engagement	5
2.1	Stakeholders	5
2.2	Engagement Process	6
3	Rural and Regional Connections	7
3.1	Rural Communities	7
3.2	Regional Connectivity and Access	11
3.3	Regional Network Options	13
3.4	Recommendations	20
4	Transit	23
4.1	Transit Planning Framework	23
4.2	Travel Movements and Current Services	24
4.3	Travel Trends	28
4.4	Travel Demand	28
4.5	Gap / Opportunities	29
4.6	Opportunities	31
4.7	Recommendations	35
5	City Centre Circulation	36
5.1	Planning Framework	36
5.2	Existing Conditions	36
5.3	Proposed City Centre Street Network	43
5.4	Recommendations	47
6	Urban Parking	49
6.1	Planning Framework	49
6.2	Existing Conditions	49
6.3	Opportunities	52
6.4	Recommendations	53

7	Active Transportation	55
7.1	Planning Framework	55
7.2	Existing Conditions	55
7.3	Opportunities	58
7.4	Recommendations	62
8	Implementation Plan	63
	Appendix A: Context and Issues Stakeholder Workshop	69
	Appendix B: Consultation Summary	76
	Appendix C: Opportunities / Gaps - Rural Communities	78
	Appendix D: Intersection Analysis Output	84

Tables

Table 3-1: Rural Community Characteristics and Existing Transportation Conditions	9
Table 3-2: Review of Potential West Urban Connection Options	19
Table 4-1: Peer System Comparison with Similar Sized Transit Agencies across Canada	27
Table 4-2: Existing Weekday AM Peak Hour Travel Demand on Highway 63 North of Confederation Way	29
Table 4-3: Typical Travel Speed and Capacity Range for Transit Technologies	34
Table 5-1: Existing Traffic Operations at Key Hwy 63 Intersections	37
Table 5-2: Existing Intersection Operations at Hwy 63 at Morrison and Hardin Streets (PM Peak Hour) – 2016 Peak Hour Traffic Volumes	39
Table 5-3: Existing Traffic Operations at Key Franklin Ave Intersections	41
Table 5-4: Franklin Avenue Long-Term Cross Section Elements	46
Table 7-1: Walking Accessibility Scores	56

Figures

Figure 1: Study Area	1
Figure 2: Stages of the Transportation Master Plan.....	2
Figure 3: Relationship between Transportation Planning Documents	3
Figure 4: Study Process	4
Figure 5: Engagement Process.....	6
Figure 6: Rural Population Growth and Distribution by 2030 (MDP)	8
Figure 7: Rural Communities and First Nations Reserves in the Regional Municipality of Wood Buffalo	8
Figure 8: 10-Year Average Annual Daily Traffic – Provincial Highways (Source: Alberta Transportation)	11
Figure 9: Bypass Routes	15
Figure 10: East Clearwater Bypass Route	16
Figure 11: West Urban Connection Options.....	18
Figure 12: Recommended Long-Term Regional Network.....	22
Figure 13: Regional Growth Concept, MDP	24
Figure 14: Existing Transit Services.....	26
Figure 15: Key Transit Corridors in Fort McMurray	33
Figure 16: Existing City Centre Road Network.....	38
Figure 17: Existing Franklin Avenue Corridor.....	42
Figure 18: Hwy 63 Northbound Lanes Grade-Separation Concept.....	44
Figure 19: Proposed Cross Section for Franklin Avenue	46
Figure 20: Proposed City Centre Road Network	48
Figure 21: Existing On-Street Parking Facilities in the CBD ..	50
Figure 22: Existing On-Street Parking Utilization in the CBD ..	51
Figure 23: Existing Sidewalks and Trail Network in Fort McMurray	57
Figure 24: High Level Network of Core Cycling Corridors.....	61

1 Introduction

The Regional Municipality of Wood Buffalo (RMWB) is one of Canada's largest municipalities. Located in the northeast corner of Alberta, the region is known internationally for the Athabasca Oil Sands deposits. This mining and resource activity is attracting people from all over Canada and beyond, putting pressure on public infrastructure.

Stage 3 of the Transportation Master Plan (TMP) builds on the previous Stage 2 and Stage 1 plans, and provides a transportation strategy that is focused on multi-modal integration and regional connectivity. It is a blueprint for achieving RMWB's transportation vision over the next 10 years.

The region is approximately 515 km from north to south and 240 km from east to west. With an area of 66,361 km² it is the second largest municipality in Canada, and includes the urban centre of Fort McMurray, nine rural communities, and five First Nations communities.

The region's population has grown rapidly over the last decade. From the 2015 Census data, the Municipality has a population of approximately 125,000, of which about 83,000 live in Fort McMurray. A large portion of the population includes temporary workers and non-permanent residents who live on-site at work camps distributed across the region.

The TMP study area is the entire Regional Municipality of Wood Buffalo, as shown in **Figure 1**.

Figure 1: Study Area

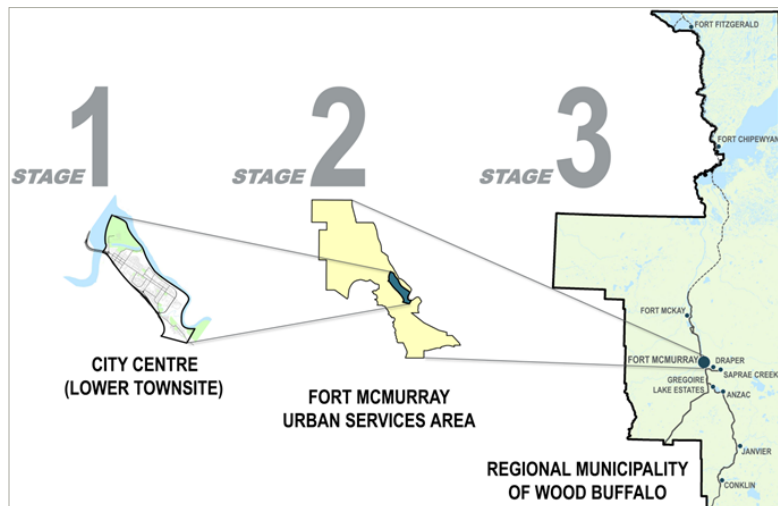


1.1 Study Purpose

The purpose of this Stage 3 Transportation Master Plan is to develop a regional transportation strategy, including policies and infrastructure recommendations to implement over the next 10 years. This regional approach balances the urban needs in and around Fort McMurray, along with the rural needs in communities spread across the region.

Stage 3 of the TMP expands the study area and builds on the previous Stage 1 and 2 recommendations, as shown in **Figure 2**.

Figure 2: Stages of the Transportation Master Plan



Stage 1 of the TMP, completed in 2009, laid out the framework for a regional transportation plan and focused on improvements within the Fort McMurray City Centre (Lower Townsite).

Stage 2 of the TMP, completed in 2012, identified and prioritized transportation needs in the Urban Service Area of Fort McMurray.

Stage 3 of the TMP considers transportation within the entire Regional Municipality of Wood Buffalo.

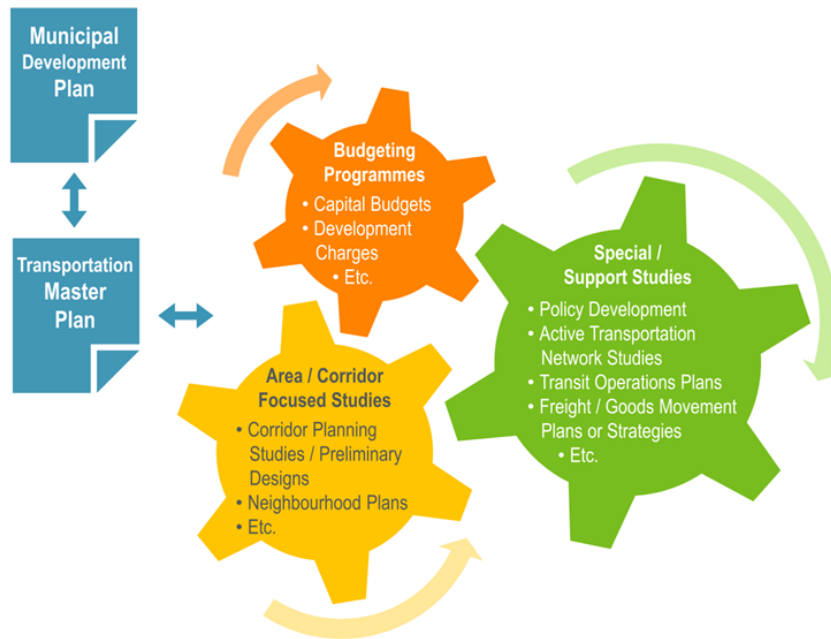
As land use and transportation conditions have evolved since Stage 1 and 2 of the TMP were completed, Stage 3 updates some of the previous recommendations.

A Transportation Master Plan is a long-range planning tool that serves three key purposes:

- Defines the overall vision for the regional transportation system
- Identifies strategies to achieve the vision
- Creates a framework for transportation decision making and investment

By assessing the current transportation conditions and the gaps and opportunities for improvement, a TMP recommends and prioritizes transportation infrastructure and policy improvements with a 10-year Implementation Plan. This document also supports the objectives of the Municipal Development Plan (MDP).

Figure 3: Relationship between Transportation Planning Documents



1.2 Strategic Direction

The TMP provides the strategic direction for **regional mobility that supports economic development and community vitality**.

The strategy focuses on connectivity between communities, support for economic growth and the needs of both urban and rural areas. The focus of each transportation mode differs, as follows:

- The **regional road network** is the backbone of the mobility system. As the Municipality develops the road network to make travel more efficient, all road users must be

supported, including active transportation, transit, goods movement, personal vehicles, and parking. The road network must balance the needs of regional movements and local travel.

- The **regional transit network** is critical to transporting employees efficiently, serving the social and economic needs of the community and reducing congestion and traffic delays on the road network.
- Active transportation is both recreational and a means for commuting and urban travel. Developing a **utilitarian active transportation network** provides more mobility options and builds a community.

Building on the recommendations and work completed in previous stages of the TMP, Stage 3 concentrates on high-level strategies and opportunities to improve regional mobility.

1.3 Study Process

The key outcome of this study is a 10-year Implementation Plan, outlining actions to enhance transportation services throughout the region. It identifies policy recommendations, infrastructure projects, and additional studies for implementation within the next 10 years.

In forming the Implementation Plan, a layered approach was taken, as shown in **Figure 4**. The assessment for each task generally included a review of the policy framework, best practices, existing conditions and future trends, a gap / opportunity analysis, and recommendations. The final recommendations for each task were compiled into the Implementation Plan.

Figure 4: Study Process



1.4 Background Documents

This TMP has been developed within the context of provincial and municipal planning policies, initiatives, and planned projects. A summary of the planning documents and key studies are provided in a separate document. Some of the more influential planning documents are as follows:

- RMWB Municipal Development Plan, 2011
- RMWB Transportation Master Plan – Stage 1, 2009
- RMWB Transportation Master Plan – Stage 2, 2012
- RMWB Active Transportation Plan Update, 2014
- Lower Athabasca Regional Plan 2012-2022, 2012
- Comprehensive Regional Infrastructure Sustainability Plan, 2011
- RMWB Engineering Servicing Standards and Development Procedures, 2013
- Fringe Area Development Assessment, Urban Service Area, 2007
- Commercial and Industrial Land Use Study, 2010

- Lower Townsite Area Redevelopment Plan, 2009
- Regional Structure Action Strategy for Wood Buffalo (RSAS), 2014
- Transportation Assessment Report – South Side of Fort McMurray Urban Service Area, 2014
- Urban Development Sub-Region Population Projection, 2013
- RMWB Urban Road Rehabilitation Study, 2014
- RMWB Rural Road Rehabilitation Study, 2013
- Wood Buffalo Transit Master Plans, 2007 and 2016
- RMWB Urban Parking Strategy, 2014
- RMWB Rural Service Delivery Review, 2010
- Athabasca Oil Sands Area Air Transportation Services Study, 2012
- AOSA Aviation Activity, 2014
- Active Transportation Plan Update, 2014
- Transit Master Plan, 2016

2 Consultation and Engagement

Stakeholder and community engagement is important to the success of a project, as those who are affected by a decision should have the opportunity to understand and influence the outcome of the project.

The various engagement events for the TMP allowed stakeholders to influence the recommendations of the project by informing and providing opportunities to participate in a meaningful way. This consultation process recognized and communicated the needs of all participants and stakeholders, including decision makers.

The key objectives of the consultation were to:

- Inform stakeholders of the project, the study process, and study goals and outcomes;
- Provide opportunities for stakeholders to identify and communicate their comments, concerns, questions, and issues; and
- Obtain feedback on the study progress and recommendations, and incorporate knowledge and ideas into the study recommendations where possible.

2.1 Stakeholders

A list of stakeholders includes the following organizations:

Regional Municipality of Wood Buffalo Departments

- Engineering
- Planning
- Road Maintenance
- Operations

- Aboriginal and Rural Relations
- Wood Buffalo Transit

Provincial Stakeholders

- Alberta Transportation
- Alberta Infrastructure

Oil Sands Stakeholders

- Oil Sands Community Alliance (OSCA)
- Oil Sand Sustainable Development Secretariat (OSSDS)
- Oil Sands Transit Group

Rural Community Stakeholders

- Anzac FCSS
- Anzac Willow Lake Community Association
- Chard Métis Society
- Christina River Dene Nation Council
- Conklin Resource Development Advisory Committee (CRDAC)
- Fort McKay Métis Group
- Janvier Dene Wood Buffalo Community Association
- McMurray Métis (MNA Local 1935)
- Vista Ridge / Sapræ Creek Residents Society

2.2 Engagement Process

The engagement process is shown in **Figure 5**.








An initial Context and Issues Workshop was held to engage key stakeholders at the onset of the study.

Three events were held in rural communities to understand the regional mobility needs in the RMWB's rural service areas.

Throughout the study, ongoing communications occurred with individual stakeholders and groups as necessary. Stakeholder feedback was obtained throughout the study and was incorporated into the study recommendations where possible.

A summary of the engagement events is shown in **Appendix B**.

Figure 5: Engagement Process

Context and Issues Workshop  <i>Dec. 10, 2014</i>	Initial workshop with key stakeholders to: <ul style="list-style-type: none"> • Introduce the study background, study purpose, study process • Provide context on various transportation topics • Discuss stakeholders' issues on various transportation topics in a rotating café format
Ongoing Dialogue 	Ongoing communication with individual stakeholders through face-to-face meetings, telephone calls, and emails to: <ul style="list-style-type: none"> • Introduce the study background, study purpose, study process • Understand their transportation issues and gather ideas • Coordinate the study with ongoing projects and future plans
Fort McKay BBQ / Tradeshow  <i>Jun. 12, 2015</i>	Engagement with the Fort McKay community at a RMWB barbecue / tradeshow to: <ul style="list-style-type: none"> • Introduce the study and the focus on regional mobility • Obtain input on transportation issues in and around Fort McKay • Obtain ideas of how to improve transportation in and around Fort McKay
Community Leadership Meeting  <i>Jun. 13, 2015</i>	Round table discussion with leaders and representatives of various rural and Aboriginal community groups to: <ul style="list-style-type: none"> • Introduce the study and the focus on regional mobility • Obtain input on transportation issues in rural communities • Obtain ideas of how to improve regional mobility for rural communities
CRDAC Meeting  <i>Aug. 19, 2015</i>	Meeting with the Conklin Resource Development Advisory Committee to: <ul style="list-style-type: none"> • Introduce the study and the focus on regional mobility • Obtain input on transportation issues in Conklin • Obtain ideas of how to improve transportation in and around Conklin
Fort Chipewyan Meeting  <i>Oct. 27, 2015</i>	Meeting with the Hamlet Manager of Fort Chipewyan to: <ul style="list-style-type: none"> • Introduce the study and the focus on regional mobility • Obtain input on transportation issues in Fort Chipewyan • Obtain ideas of how to improve transportation in and around Fort Chipewyan
Study Outcomes Workshop  <i>Date TBD</i>	Final workshop with key stakeholders to: <ul style="list-style-type: none"> • Recap the study background, study purpose, study process • Discuss the study strategy and the focus on regional mobility • Present recommendations and implementation plan • Obtain input to refine recommendations and implementation plan

3 Rural and Regional Connections

3.1 Rural Communities

The Municipality provides transportation infrastructure and services to the rural communities. The TMP addresses regional mobility at a strategic level, with a focus on connectivity between rural communities and Fort McMurray. Mobility affects the livability of a community, and the accessibility to services such as healthcare, social programs, education, employment, shopping, and entertainment.

As transportation needs differ for each community due to location, physical constraints, unique character and land uses each rural community is addressed separately. In addition to the rural communities, there are many oil sands sites and work camps dispersed across the region. While these sites place demand on the regional road network, transportation is primarily managed and operated privately by each company and are outside the scope of this TMP.

The strategy for rural communities is to:

- ➔ Address the unique needs of each community and provide more mobility options within and between rural communities, and to Fort McMurray

3.1.1 Planning Framework

A key component of the MDP is Rural Community Growth Management, with a key strategy to *“accommodate population growth into rural communities that reflects the unique aspirations of each community.”*

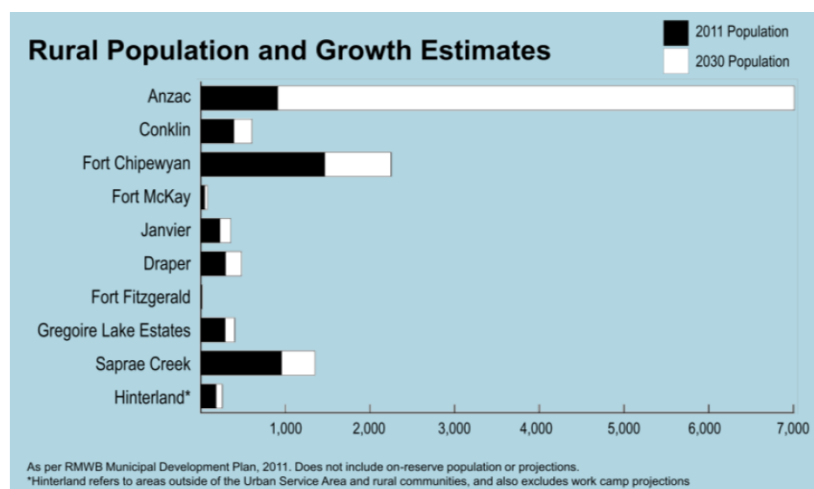
As the majority of rural population growth is planned to occur in Anzac, the community has been identified as a Priority Growth Area, with plans to transform the community into a small urban centre and the region’s secondary service centre. The four communities of Conklin, Janvier, Fort McKay, and Fort Chipewyan have been identified as Areas of Stability, accommodating modest population growth through a variety of land uses. The four remaining communities of Draper, Saprae Creek, Gregoire Lake Estates, and Fort Fitzgerald are not intended to develop into communities with a wide range of land uses or services and will be protected from development to preserve the residential character.

In addition, several of the region’s First Nations Reserves are adjacent to rural communities. The Municipality is also committed to *“coordinate the provision of services and infrastructure with adjacent First Nations communities to ensure that land use, infrastructure, and servicing needs are met in an efficient and reasonable manner and are complementary to the plans of adjacent communities.”*

Transportation and mobility options are identified as an important aspect in supporting the desired population growth in rural communities, both within each community, and providing access to services in Fort McMurray and Anzac.

The Municipal Development Plan (MDP) rural population growth estimates for 2030 are illustrated in **Figure 6**.

Figure 6: Rural Population Growth and Distribution by 2030 (MDP)



3.1.2 Existing Conditions

While the region's urban centre of Fort McMurray, is located in a central area of the region, nine rural communities are dispersed across a vast area, along with the five First Nations communities of Mikisew Cree First Nation, Athabasca Chipewyan First Nation, Fort McKay First Nation, Fort McMurray First Nation, and Chipewyan Prairie Dene First Nation, as shown in **Figure 7**.

A summary of the unique characteristics in each rural community and the existing transportation access is provided in **Table 3-1**.

Figure 7: Rural Communities and First Nations Reserves in the Regional Municipality of Wood Buffalo

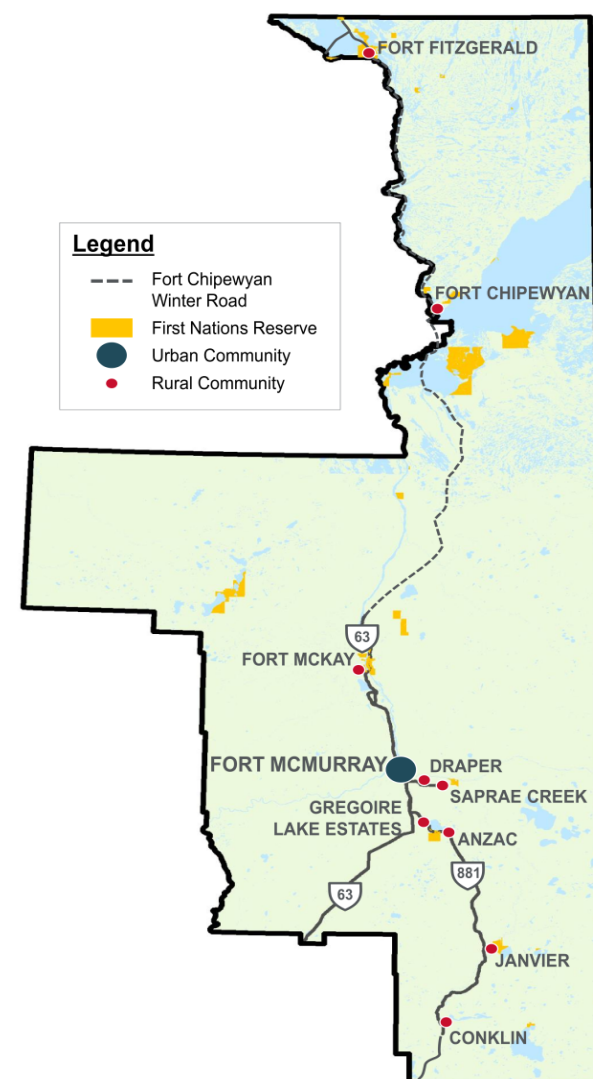


Table 3-1: Rural Community Characteristics and Existing Transportation Conditions

Community	Characteristics	Existing Transportation Access
Anzac	<ul style="list-style-type: none"> Located approx. 45 km south of Fort McMurray, on the eastern shore of Willow Lake Population of approx. 763 	<ul style="list-style-type: none"> Year-round access to provincial highway network on Hwy 881 Wood Buffalo Transit and SMART Bus provide limited service Taxi service available 24/7 within community and to other communities Air travel through Fort McMurray International Airport
Conklin	<ul style="list-style-type: none"> Located approx. 160 km south of Fort McMurray, at the confluence of Christina Lake and the Jackfish Rivers Population of approx. 376 	<ul style="list-style-type: none"> Year-round access to provincial highway network on Hwy 881 Wood Buffalo Transit provides limited service Taxi service available 24/7 within community and to other communities Air travel primarily through Fort McMurray International Airport
Janvier	<ul style="list-style-type: none"> Located approx. 120 km south of Fort McMurray, adjacent to the Chipewyan Prairie Dene First Nation Population of approx. 155 	<ul style="list-style-type: none"> Year-round access to provincial highway network on Hwy 881 Wood Buffalo Transit and SMART Bus provide limited service Taxi service available 24/7 within community and to other communities Air travel primarily through Fort McMurray International Airport, along with a small airstrip located within the community
Fort McKay	<ul style="list-style-type: none"> Located approx. 60 km north of Fort McMurray, at the confluence of the Athabasca and McKay Rivers, and lies adjacent to the Fort McKay Indian Reserve Population of approx. 51 Close proximity to oil sands sites, providing employment and housing support for nearby mining operations 	<ul style="list-style-type: none"> Year-round access to provincial highway network on Hwy 63 Taxi service available 24/7 within community and to other communities Private bus and shuttle services between Fort McKay and oil sands sites provided by some oil sands companies Air travel primarily through Fort McMurray International Airport, or an airstrip in Mildred Lake
Fort Chipewyan	<ul style="list-style-type: none"> Located approx. 300 km north of Fort McMurray, on the western shores of Lake Athabasca Population of approx. 1,261 Oldest continual settlement in Alberta, and the region's most historic community Oil sands employment accounts for 10% of jobs 	<ul style="list-style-type: none"> No all-weather road access – winter road access to Fort McMurray and Fort Fitzgerald from mid-December to mid-March along the Fort Chipewyan Winter Road The only year-round transportation link is the Fort Chipewyan Airport Taxi service available 24/7 within community

Community	Characteristics	Existing Transportation Access
Draper	<ul style="list-style-type: none"> Located adjacent to the southeast portion of Fort McMurray, approx. 10 km from the City Centre, within the Urban Development Sub-Region boundary Residential community with population of approx. 215 	<ul style="list-style-type: none"> Year-round access to provincial highway network (Highway 63) via Draper Road and Saline Creek Road. No Wood Buffalo Transit service Taxi service available 24/7 within community and to other communities Air travel through Fort McMurray International Airport
Saprae Creek	<ul style="list-style-type: none"> Located approx. 25 km southeast of Fort McMurray, on the crest of the Clearwater River Valley, within the Urban Development Sub-Region boundary, and in close proximity to the Fort McMurray International Airport Residential community with population of approx. 977 	<ul style="list-style-type: none"> Year-round access to provincial highway network on Saprae Creek Trail (Highway 69) Wood Buffalo Transit provides limited service to Fort McMurray Taxi service available 24/7 within community and to other communities Air travel through Fort McMurray International Airport
Gregoire Lake Estates	<ul style="list-style-type: none"> Located approx. 35 km south of Fort McMurray, on the western shore of Willow Lake Residential community with population of approx. 232 	<ul style="list-style-type: none"> Year-round access to provincial highway network on Hwy 881 Wood Buffalo Transit provides limited service Taxi service available 24/7 within community and to other communities Air travel through Fort McMurray International Airport
Fort Fitzgerald	<ul style="list-style-type: none"> Most northern community in the region, located on the border of Alberta and the Northwest Territories, adjacent to Smith's Landing First Nation Nearest urban centre is Fort Smith, Northwest Territories, approx. 25 km to the north Small residential community with population of approx. 9 	<ul style="list-style-type: none"> All-weather road access on Hwy 5 to Fort Smith, Northwest Territories Winter road access to Fort Chipewyan and Fort McMurray from mid-December to mid-March along the Fort Chipewyan Winter Road Air access

3.1.3 Rural Communities Opportunities / Gaps

Based on the issues identified through consultation with each community, several transportation opportunities and gaps have been identified, and provided **Appendix B-3**.

3.2 Regional Connectivity and Access

The various communities within RMWB are reliant on the provincial highway system for travel between communities and employment locations. In most cases, travel demand between communities does not warrant more than a two-lane highway, with the exception of some areas in the around the Fort McMurray urban sub-region where traffic volumes are high.

However, the Municipality should continue to encourage Alberta Transportation to evaluate the highway corridors, including assessment of safety, passing/climbing lane requirements and reliability.

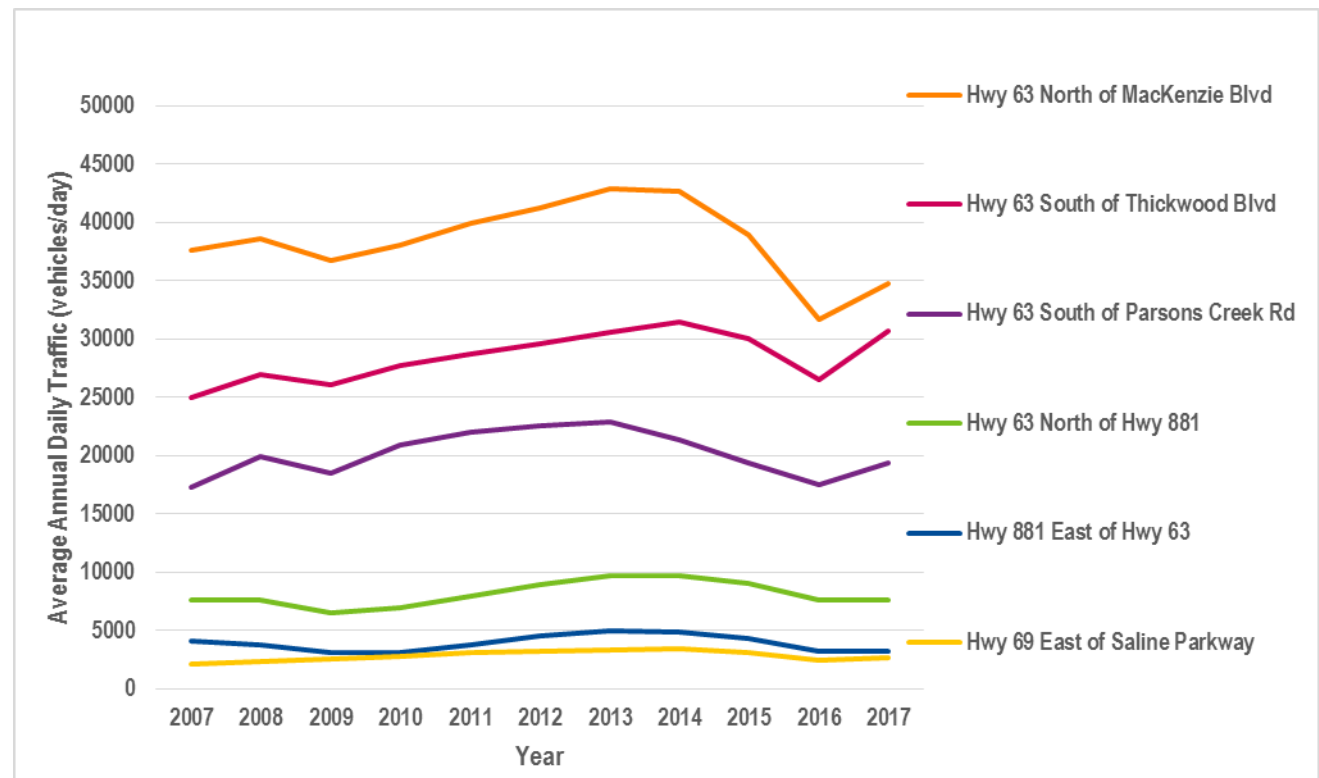
3.2.1 Travel Demand

Figure 8 summarizes the historical daily traffic on the provincial highways around Fort McMurray. These highways provide access to most of the rural communities in RMWB.

Growth was steady until 2013 and 2014, when volumes dropped off significantly.

Volumes started to increase in 2017. Average traffic growth rates in the previous 10 years varied from an average decrease of 2.4% on Highway 881 to an average increase of 2.2% pm Sapræ Creek Trail (Highway 69) east of Saline Creek. With average daily volumes below 10,000 vehicles/day, the areas outside the urban area of Fort McMurray are well below the threshold for additional capacity. The considerable difference between volumes inside and outside Fort McMurray shows the strong influence of the urban area on travel on provincial highways in the region.

Figure 8: 10-Year Average Annual Daily Traffic – Provincial Highways (Source: Alberta Transportation)



3.2.2 Regional Transportation Needs

Outside of Fort McMurray, there is no travel demand that would indicate a need for significant capacity expansion, either through additional lanes on existing highways or new network connections.

Many of communities and/or neighbourhoods within the communities have a single route in or out. Following the 2016 fires, there is heightened concern regarding alternative and emergency access. In most cases, emergency access can be achieved through development of dirt/gravel routes that serve the emergency function only and do not form part of the regional transportation system in the context of routine daily movement of people and goods.

The following summarizes access/egress issues in each community. Potential emergency egress routes have been identified in some communities.

Anzac – Anzac is connected to Highway 881 on Stony Mountain Road, Gilmore Drive and Singer Drive. With connections to the north and south on Highway 881, there are multiple connections options available. There is a single access/egress for the northern portion of the community. Options for emergency access could include routes along the railway or power lines south to the Long Lake Project road. These would be emergency-access only routes. No additional emergency egress is necessary.

Conklin - Conklin connects to Highway 881 to the north via Northland Road. The Encana Bypass road provides a secondary access into Conklin. There are two potential egress routes within the community. One is an extension of

the south end of Northland Road to east, connecting to Highway 881. An alternative would be a new connection from Pine Lake Road, along an existing dirt road to Highway 881.

Fort Chipewyan – With no year-round roadway connection to Fort Chipewyan, the airport is the primary means of access to the community general travel and emergency situations, as well as water access to Lake Athabasca. Within the community, the street network is well-connected.

Janvier – Janvier has a single access to Highway 881 via Nokohoo Road / Twp. Road 795A / Range Road 54A. Christina River to the west and Bohn Lake to the east create barriers to alternate routes. There is a road that continues Cowper Lake, approximately 11 km to the east, but does not go further. An emergency egress could be created by developing a route parallel to Nokohoo Road, from Northland Drive north of the airstrip and connecting back to Nokohoo Road approximately 800m from the Highway 881 intersection, with an additional connection into the community at MacDonald Drive. An alternate connection may also be possible by connecting the route as described above southward to an existing dirt road and connecting to Highway 881 approximately 7km south of Nokohoo Road.

Fort McKay – Access to Fort McKay is via Fort McKay Road (Range Road 110A), which connects to Highway 63 approximately 7km south of the community. There are also connections to CNRL Horizon the CNRL Horizon Highway to the south and the continuation of Fort McKay road north of the community. A potential emergency egress route would include an extension of Target Road to the west, across the MacKay River and connecting to CNRL Horizon Highway. This will

provide a second crossing of the MacKay River and a route through the community from CNRL Horizon if the southern portion of the CNRL Horizon Highway is blocked.

Draper – Draper Road connects the community to the Fort McMurray City Centre approximately 10 km to the west. There is no alternative access. The future Saline Parkway will be close to Draper Road, but the elevation difference may be challenging. An alternative would be a connection from Draper Road to Snow Eagle Drive through the Saprae Creek valley. Both of these routes have challenges, and further investigation is required to identify a preferred route.

Fort Fitzgerald - Fort Fitzgerald is connected to Fort Smith via an all-season road, with several local resource roads parallel that could serve as emergency routes if necessary. Identification of a specific emergency egress route is not necessary.

Gregoire Lake Estates – Gregoire Lake Estates has direct access to Highway 881 via two connections with Gregoire Avenue, providing community and emergency access.

Saprae Creek – Saprae Creek Trail (Highway 69) provides access to the community via Spruce Valley Drive. However, Saprae Creek Trail only extends 1.3km to the east beyond Spruce Valley Drive and the Spruce Valley Drive is the only route in and out of Saprae Creek. An emergency route may be possible from the west end of Community Lane to an extension of Snow Eagle Drive on the northern edge of the airport. There are terrain challenges and a crossing of Saprae Creek required. If an East Clearwater bypass route is developed, an alternative emergency egress could be an

eastern extension of Community Lane to the East Clearwater corridor.

Fort McMurray – The specific needs associated with Fort McMurray City Centre and related to transit are addressed in Sections 4 and 5 respectively.

3.3 Regional Network Options

Several concepts to alleviate congestion on Highway 63 have been suggested in the past, many involving bypasses or partial ring road highway alternatives around Fort McMurray. The challenge with any network alternative that bypasses the majority of the developed area is limited traffic that would be attracted away from the existing corridor, and in particular the current Highway 63 Athabasca River crossing.

The majority of traffic on Highway 63 has either an origin or destination within the urban Fort McMurray area. Any new network alternative that does not provide easy access into the urban area will not be convenient or provide time savings, and thus will not attract significant traffic.

3.3.1 Future Base Network

There are road network projects for which funding is in place, that have started, or which are required to provide connectivity in the network that are assumed to be in place by the 2041 future horizon. These include:

- **Saline Creek Parkway** – The first phase of this roadway is complete at the east end from Saprae Creek Trail to Snow Eagle Drive. At the west end, it will follow Saline Drive into Fort McMurray. Completion of the remaining middle section will depend on funding

and development. This roadway provides access to future development, provides network connectivity and serves as an alternate route to Highway 63. The need is not based on traffic demand or on attracted traffic, and therefore is recommended in spite of the modest traffic volumes that will be attracted to it by the 2041 horizon year.

- **Parsons Creek North Access Road** – Construction of this roadway is partially complete. Its function is to provide access to development in the area.
- **West Access Road** – The West Access Road connects the southwest end of the Parsons Access Road to the west end of Abraham Drive. This road provides a connection between the two communities. Like the Saline Parkway, traffic volumes attracted will be modest by the 2041 horizon year, but this connection serves an important long-term connectivity function.

3.3.2 Land Swap Projects

There are several planned projects that have historically been referred to as the “Land Swap Projects”. These projects came about following an agreement with the Alberta Government in 2014, in which properties on Provincial land were released to the Municipality with an agreement that the following would be carried out by the Municipality:

1. Highway 63: add bus lane at Thickwood Interchange.
2. Highway 63: add a bus lane on shoulders on Highway 63 between Sapræ Creek Trail (Highway 69) and Hospital Street (this project is further discussed in the Regional Transit Strategy section).

3. Highway 63: upgrade from 4 to 6 lanes on Highway 63 between the Hospital Interchange to north of the Athabasca Bridge (the 6-laning work was scheduled to begin in the 2017 construction season).
4. Sapræ Creek Trail (Highway 69): twin Sapræ Creek Trail (Highway 69) west of Saline Creek to Range Road 85 (West Airport Boundary Road).
5. Sapræ Creek Trail (Highway 69): improve intersection at Sapræ Creek Trail (Highway 69) and West Airport Boundary Road.
6. Parsons Creek Highway 686: install bus lane on shoulders.

3.3.3 Bypass Routes

Alberta Transportation and RMWB have explored a variety of alternate routes around urban Fort McMurray to allow industrial traffic to bypass the community and to provide relief to the current Highway 63 bridge across the Athabasca River, which is expected to reach capacity by the 2041 horizon year.

Modelling suggests that none of the bypass options will attract significant volume, nor provide relief to Highway 63. However, there are other strategic reasons for considering the bypass, including provision of an alternative corridor for emergency purposes, network connectivity and creating access to new developable land. All three bypasses considered will provide an additional crossing of the Athabasca River, creating redundancy in the regional network and further providing alternate emergency routes.

Bypass routes have historically been investigated to provide alternate access to industrial development north of Fort McMurray and specifically to avoid congestion within the urban

area. The 2016 wildfires placed greater focus on the need for alternate emergency egress for the areas to the north. The general locations are shown on **Figure 9**.

3.3.3.1 WEST BYPASS

A Western Bypass concept was previously considered by Alberta Transportation to completely bypass the urban area of Fort McMurray. No specific alignment was identified, but it linked to Highway 63 south of Sapræ Creek Trail (Highway 69) with limited connections to the western part of Fort McMurray. This bypass concept provides an alternate route around urban Fort McMurray for industrial traffic, avoiding congestion within the urban area. However, it does not provide an alternative egress route for Fort McKay or the industrial sites north of Fort McMurray for any event that occurs north of the west bypass northern connection to Highway 63.

3.3.3.2 NORTH BYPASS

A north bypass concept a western connection at Parsons Creek Access Road, with a crossing of the Athabasca River and eventually intersecting with the east end of Sapræ Creek Trail and continuing south. Modelling results show that this route would attract less than 100 vehicles/hour in each direction in the 2041 PM peak hour. This route does not provide local connectivity and has a limited function as an alternate access route for Fort McMurray neighbourhoods.

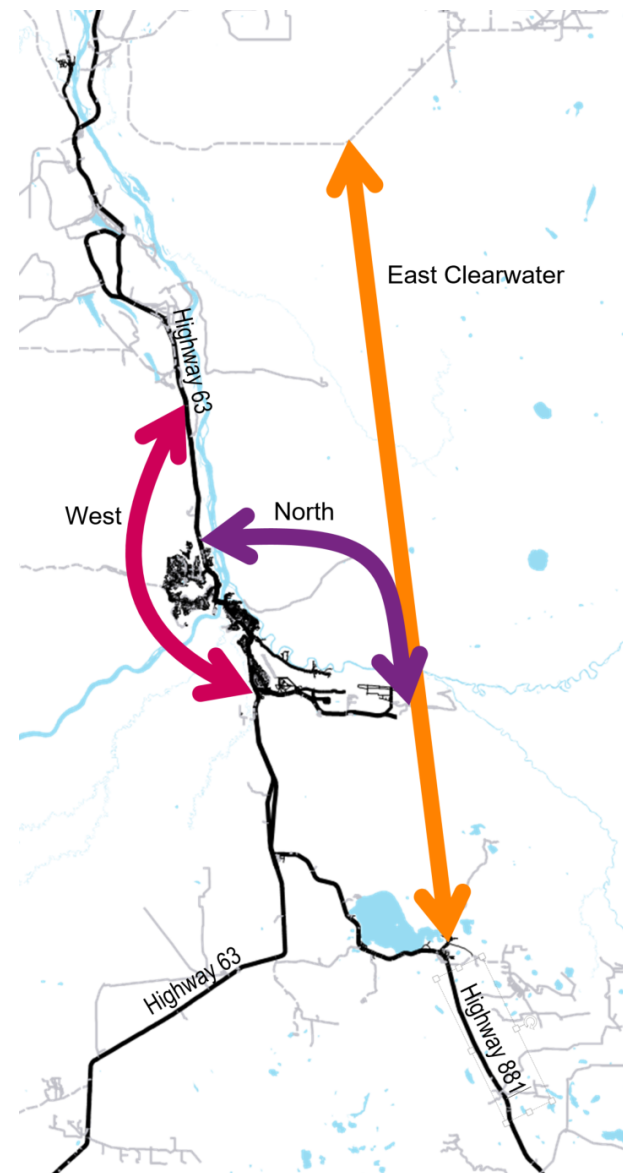


Figure 9: Bypass Routes

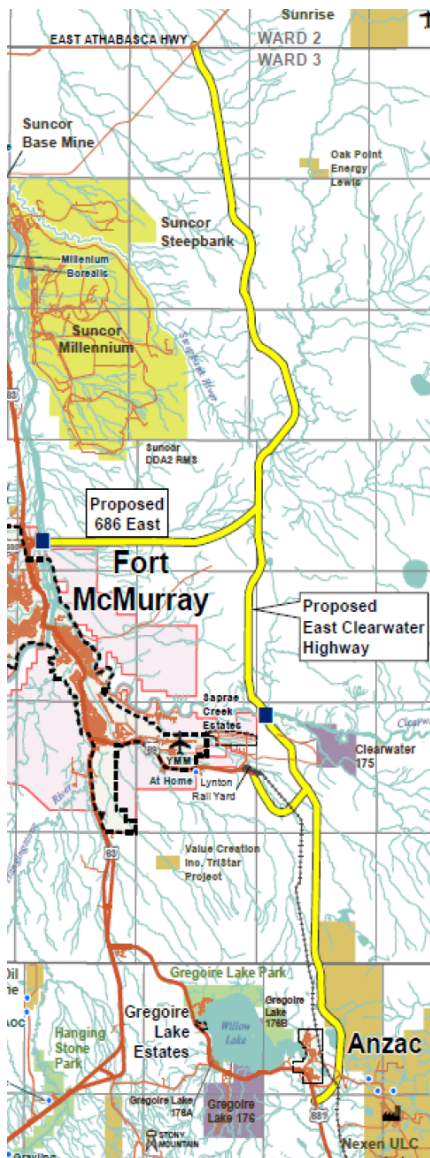


Figure 10: East Clearwater Bypass Route

3.3.3.3 EAST CLEARWATER BYPASS

The East Clearwater bypass route connects the East Athabasca Highway in the north to Highway 881 and approximately parallels Highway 63 on the east side of the Athabasca River, approximately 15-20 km to the east. It includes connections into Fort McMurray via an extension of Parsons Creek Road (Highway 686O to the east across the Athabasca River and via an extension of Sapræ Creek Trail to the east. The bypass would pass to the east of Anzac and connect to Highway 881.

This route has been identified as the preferred bypass route by the RMWB and Alberta Transportation. Further investigation into the feasibility and benefits of the route are ongoing. The current preferred routing is shown on **Figure 10**.

3.3.4 Fort McMurray Urban Neighbourhood Connectivity

While the East Clearwater bypass route provides emergency egress for the industrial areas to the north, modeling has demonstrated that it does not provide congestion relief on Highway 63 within Fort McMurray nor does it provide connectivity between neighbourhoods for general day-to-day travel within the Fort McMurray area.

A western bypass routing closer to Fort McMurray than the traditionally considered west bypass was investigated as a bypass route, but dropped from consideration as an industrial bypass and emergency egress. However, linking existing and planned neighbourhoods in the western portion of Fort McMurray may provide community connectivity and congestion relief benefits in the long-term, and could potentially open new land for development. An alternative to the western bypass that provides urban connectivity has been retained for consideration.

By 2041, peak hour volumes on Highway 63 crossing the Athabasca River are expected to reach approximately 6,500 vehicles/hour (two-way). The existing six lanes crossing the Athabasca River are theoretically sufficient for this volume, but traffic is not evenly distributed by direction or destination, meaning some lanes will be approaching or exceeding capacity. In addition, the through capacity (i.e., on the bridge) will be much higher than the capacity of signalized intersections or weaving sections at interchanges. Therefore, capacity relief is required on Highway 63 by the 2041 horizon.

Several alternatives were reviewed as illustrated in **Figure 11**. **Table 3-2** provides a review of the potential western urban connection options.

Travel demand modeling for an alignment that connects to Saprae Creek Trail at Highway 63 shows that between 200 and 250 vehicles/hour would be attracted to the route in the 2041 PM peak hour. This represents less than 20% of the capacity of a two-lane highway. In addition, it attracts virtually no traffic from Highway 63 due to the effects of induced traffic. While some of the traffic on the western bypass would be diverted from Highway 63, some would also be trips that occur only because a free-flowing route is available (i.e., a person would not make a trip in congested conditions, but will with less congestion). There will also be some additional peak hour trips made on Highway 63 due to the capacity that has been freed up by vehicles that have diverted to the new connection.

It is possible that versions of the Option 1 and Option 2 alternatives could be combined as long term staging options. Option 1a, b or c could form an initial stage, with a later extension to one or more of the Option 2 alternatives.

More detailed functional planning will be required to confirm the alignment and the specific alternatives under Options 1 and 2, but it is recommended that Option 1 be initially developed, with provisions to extend the bypass route to Option 2, including protection of the future corridor in the Municipal Development Plan.

Timing of a west urban connection will require further investigation of more detailed costing and alignment development that can be achieved with a functional planning study. It is likely that this will be a very long-term initiative as the pace of development and available funding will be the primary factors.

Figure 11: West Urban Connection Options

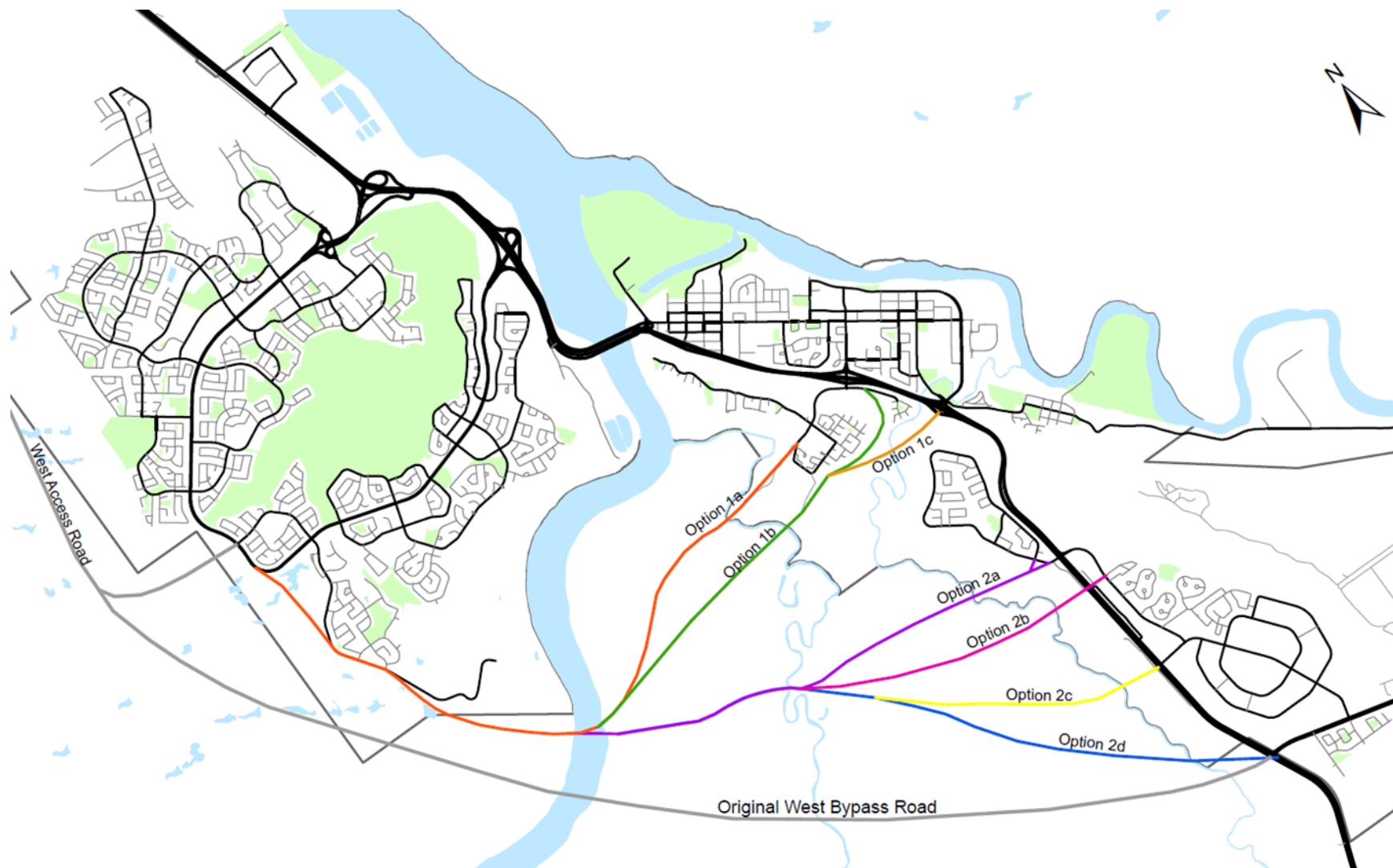


Table 3-2: Review of Potential West Urban Connection Options

	Length of new roadway	New bridges required	Comments
Option 1a	9.0km	Athabasca and Horse Rivers	Connects to Abasand interchange/Hwy 63 via north side of Abasand neighbourhood
Option 1b	10.0km	Athabasca and Horse Rivers	Connects to Abasand interchange/Hwy 63 via south side of Abasand neighbourhood
Option 1c	10.0km	Athabasca, Horse and Hangingstone Rivers	Connects to Prairie Loop Boulevard interchange/Hwy 63 via south side of Abasand neighbourhood
Option 2a	10.3km	Athabasca, Horse and Hangingstone Rivers	Connects to Beacon Hill Drive/Gregoire Drive/Hwy 63 intersection – between Beacon Hill and Gregoire neighbourhoods
Option 2b	10.5km	Athabasca, Horse and Hangingstone Rivers	Connects to Sakitawaw Trail/Hwy 63 intersection
Option 2c	11.3km	Athabasca, Horse and Hangingstone Rivers	Connects to MacKenzie Boulevard/Hwy 63 intersection
Option 2d	12.8km	Athabasca, Horse and Hangingstone Rivers	Connects to Hwy 63/ Saprae Creek Trail (Hwy 69) intersection

3.3.5 Secondary Access to Fort McMurray Neighbourhoods

Emergency access considerations for the neighbourhoods within Fort McMurray but outside the City Centre include the future regional network connections in addition to local and temporary roads as describe below. The City Centre is discussed in **Section 5**.

Parsons Creek – Primary access is via Parsons Creek Access Road to Highway 63. Currently, a secondary access is available connecting to Timberlea on Heritage Drive. The West Access Road will provide another access, and in the long-term, the preferred west bypass route will provide an additional connection across the Athabasca River.

Timberlea/Thickwood– Current access to Timberlea and Thickwood is via Confederation Way and/or Thickwood Boulevard to Highway 63. Like Parsons Creek, long-term alternative access across the Athabasca River will be provided by the west bypass.

Abasand – The only existing access to Abasand is via Abasand Drive to Highway 63 at Hospital Street. A temporary access road for use in emergency circumstances only could include a route along the west bypass alignment 1a to east of the Horse River, then south between the Horse River and Hangingstone River, and east along the west urban connection alignment 2a to Beacon Hill. When the Riverbend Point neighbourhood is developed, it should connect to Abasand via the west urban connection alignment 1a, and a permanent road crossing (forming part of the west urban connection) constructed and connected to the west urban connection alignment 2b. In the long-term, a west urban

connection route with a link to Abasand could serve as the alternative access.

Beacon Hill – Beacon Hill has only one access on Beacon Hill Drive to Highway 63 at Gregoire Drive. The alternate access should be developed the same as for Abasand, with the emergency access for Beacon Hill via Abasand. Like Abasand, the long-term alternate access will be via the west urban connection.

Gregoire – Gregoire is well connected to the regional network with two accesses to Highway 63 via Mackenzie Avenue and Gregoire Drive, and to Sapræ Creek Trail via Mackenzie Boulevard. No additional emergency or alternate access is recommended.

3.4 Recommendations

3.4.1 Rural Communities

Recommendations to improve transportation access between rural communities have been developed through extensive community consultation. The recommendations for the rural communities are as follows:

Rural Community Recommendations

Develop an Active Transportation Plan in each rural community

Construct high priority active transportation projects:

- Fort McKay: Sidewalk or multi-use path on Fort McKay Road
- Conklin: Connect existing multi-use path on Northland Drive from the water treatment plant to Conklin Corner
- Conklin: New multi-use path from Northland Drive to Christina Lake

Rural Community Recommendations

Implement updated off-highway vehicle bylaws for each community.

Expand on the Emergency Management Plan to include specific evacuation routes and transportation procedures for each rural community, including an assessment of emergency access routes for the northern portion of Anzac, Conklin and Janvier. Draper and Sapræ Creek emergency access should be considered in the context of Fort McMurray.

Encourage Alberta Transportation to undertake assessments of safety, passing/climbing lane requirements and reliability on provincial highways in the RMWB

Conduct a passenger and freight access study for Fort Chipewyan.

Regional Network

Timberlea to provide new development access and a secondary access route for Parsons Creek and Timberlea/Thickwood.

Undertake a functional planning study for the west urban connection to establish cost and property requirements for the west urban connection, treating Options 1 and 2 as sequential phases.

Develop an initial temporary emergency access route between Abasand and Beacon Hill that can evolve to long-term connections to the communities once the west urban connection is developed.

Establish emergency access routes for Draper and Sapræ Creek that could ultimately be developed into permanent road network and/or active transportation connections.

3.4.2 Fort McMurray Regional Network Connections

The proposed network for Fort McMurray outside the city centre, including regional network connections, is shown in **Figure 12**, with the exception of emergency egress, no new network elements are proposed in the rural communities. The regional network is focused on regional connections to/from the Fort McMurray urban area.

The following are recommended for the long-term regional network, to be implemented as warranted by future growth:

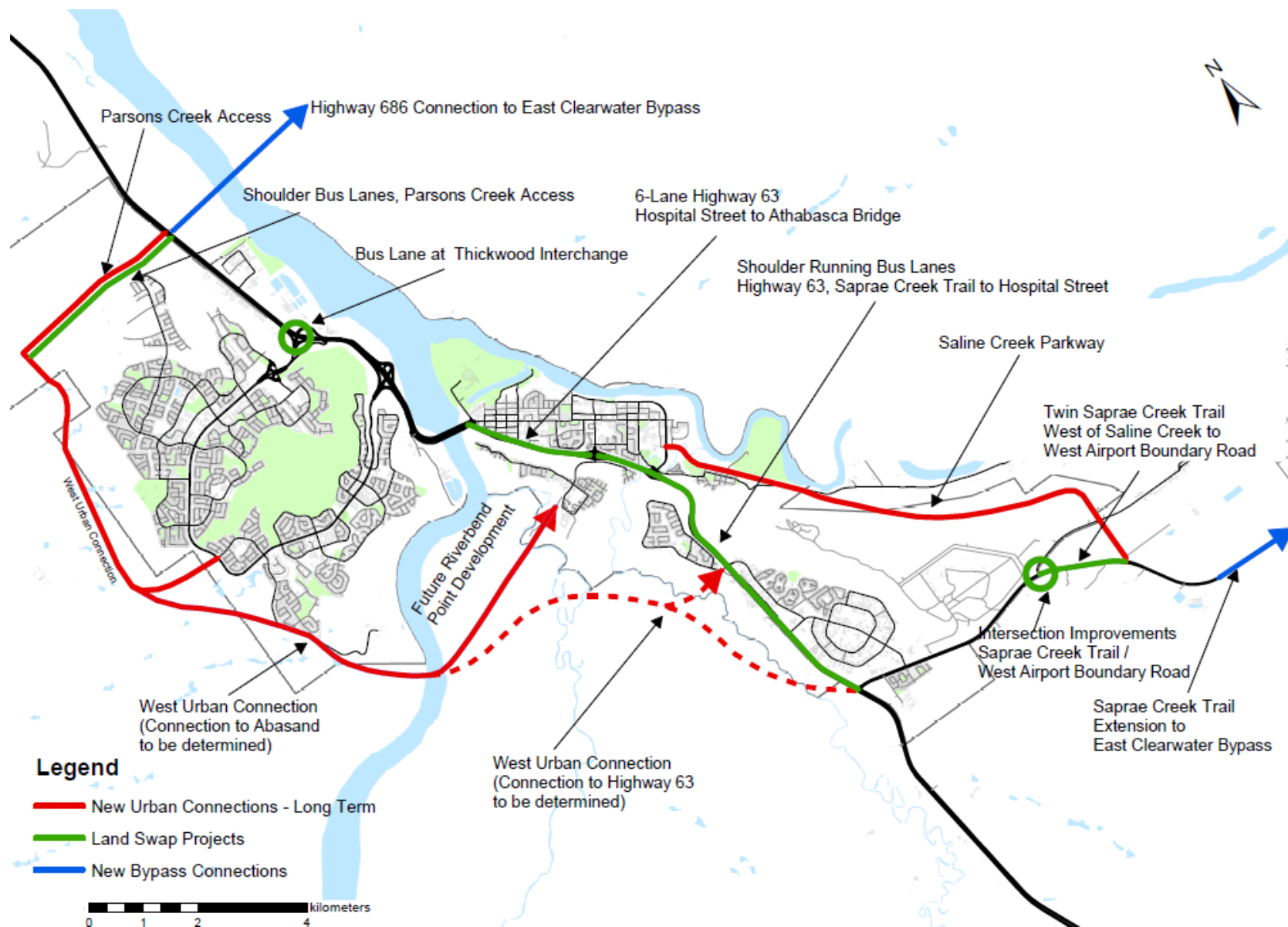
Regional Network

Continue implementation of the “Land Swap” projects

Complete the Saline Parkway in conjunction with new development in the area to provide access to development and a secondary route between the airport and City Centre

Complete Parsons Creek Access Road and West Access Road to

Figure 12: Recommended Long-Term Regional Network



4 Transit

Transit is an important component of the regional transportation network. It provides a broad spectrum of social, economic and environmental benefits to the community. Transit enhances the quality of life by increasing personal mobility and community inclusion for those people who do not have access to an automobile; it supports economic growth and access to employment; lowers the personal cost of transportation; moves more people more efficiently than single occupancy vehicles; and lessens the environmental impact of travel by saving fuel and reducing the carbon footprint of transportation.

This Regional Transit Strategy focuses on policies and infrastructure initiatives that:

- ➔ Encourages transit use and shifts travel to higher occupancy vehicles;
- ➔ Extends the life and capacity of Highway 63 from the perspective of people movement rather than vehicle movement; and
- ➔ Improves the livability of communities in and around Fort McMurray.

4.1 Transit Planning Framework

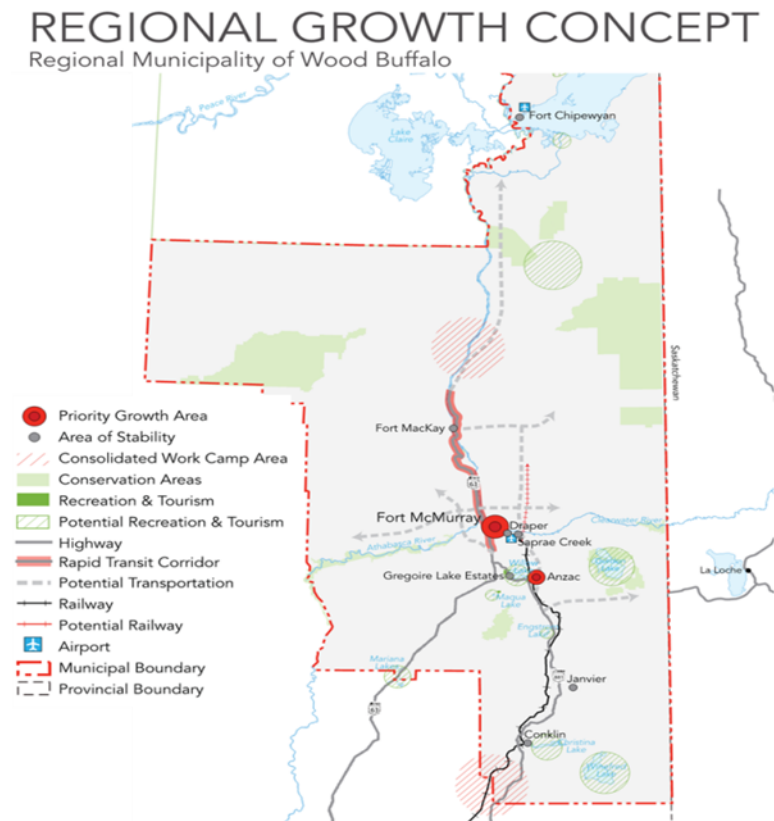
The MDP notes that the Regional Growth Management strategy “*depends upon an improved transportation network connecting the workforce to places of industrial development*”. The long-term direction is that “*rapid transit systems need to be developed to quickly and reliably transport residents from where they live to where they*

work.” In addition, transit has been identified as an important aspect in building environmentally sustainable communities in the region.

The MDP identifies Highway 63 as a Rapid Transit Corridor from south of Saprae Creek Trail (Highway 69) to north of Fort McKay, as shown in **Figure 13**. The Municipality’s commitment to regional rapid transit is outlined in *R.2.1 Develop Rapid Transit*, of *Direction R.2 Integrated Multi-modal Mobility Systems*, as follows:

Rapid transit is an integral part of the solution to encourage permanent residency in the region by reducing commuting time from communities to oil sands operations throughout the region. The Municipality will commit to the pursuit of rapid transit solutions focusing, as a first priority, on a connection between Fort McMurray’s City Centre and places of employment and the consolidated work camp area to the north. This commitment may be approached incrementally, transitioning over time from dedicated bus lanes to Bus Rapid Transit (BRT), and potentially to Light Rail Transit (LRT). New transportation corridors will be designed and developed with consideration for rapid transit.

Figure 13: Regional Growth Concept, MDP



The Municipality's focus on transit is outlined in U.2.1. *Focus on Transit*, of Direction U.2. *Supportive Urban Mobility Systems*, as follows:

Within the urban area, the Municipality will emphasize the provision of regular transit to connect Emerging and New Neighbourhoods to the City Centre as a destination, and as a connector, through rapid transit to employment in the north. In addition, the Municipality will investigate rapid

transit connections between the airport and the City Centre. The Municipality will develop transit systems that are reliable, safe and convenient, as well as accessible throughout the year.

4.2 Travel Movements and Current Services

An assessment of the major travel movements provides an understanding of the need for transit service. The five major travel movements within the region, and the current transit services that are provided, are shown in **Figure 14** and discussed as follows:

Travel within the urban areas of Fort McMurray, within each community, and between communities and the City Centre

- Wood Buffalo Transit provides local public transit within the urban area of Fort McMurray with conventional transit routes and school services. Specialized service is provided through the SMART Bus.
- There are approximately 400 active taxi licenses within the region. There are no requirements for accessible vehicles in the Municipality's Vehicle for Hire Bylaw. Some taxi companies can provide an accessible vehicle upon request.

Travel between Fort McMurray and rural communities / hamlets, such as Anzac, Janvier, Conklin, and Fort McKay

- Wood Buffalo Transit operates a conventional rural bus service between Fort McMurray and the rural communities.
- Taxis provide service within rural communities, and between the urban and rural service areas.

Travel between Downtown and Fort McMurray International Airport

- Wood Buffalo Transit operates a bus route between Downtown and the Fort McMurray International Airport.
- Taxi services provide 24/7 on-demand transportation service to and from the airport.

Travel between communities in Fort McMurray and various oil sands mines (primary travel movement is to sites located north of Fort McMurray, with some travel demand to the south)

- The majority of oil sands companies operate private bus and shuttle services for their workers (both scheduled routes and on-demand shuttle services).
- Oil sands company transit services generally include daily services from Fort McMurray to the site, on-site shuttles, site-to-site shuttles, transportation services for fly-in/fly-out (FIFO) workers, airport shuttles, and recreational transportation.
- Services typically operate at designated stop locations, such as the Wood Buffalo Transit bus stops, or as a curbside flag stop, and are aligned with shift schedules.
- Suncor also operates scheduled fixed route bus service from Fort McMurray communities to the Suncor Business Centre.
- Taxi services provide 24/7 on-demand transportation service to oil sands sites.

Travel inter-regionally, between Fort McMurray and other urban centres, such as Edmonton and Calgary

- Private bus companies, such as Greyhound, Red Arrow and eBus, provide regional bus transportation from Fort McMurray to Edmonton, Red Deer and Calgary.

Wood Buffalo Transit Peer System Comparison

To understand how Wood Buffalo Transit compares with similar sized transit agencies (population range of 50,000 to 150,000) in Alberta and across Canada, key performance statistics were assessed using data from the Canadian Urban Transit Association's (CUTA) **2014 Canadian Transit Fact Book**¹. Although every transit system is different, a peer system comparison of industry accepted performance indicators serves as a benchmark of reasonable expectations for transit service. The key performance indicators include the following:

- Annual revenue hours per capita
- Annual passengers per capita
- Passengers per revenue hour
- Average fare
- Operating cost per hour
- Revenue to cost ratio (R/C ratio)

In general, Wood Buffalo Transit is performing well with regard to passengers per capita (28.0) and passengers per revenue hour (38.3) relative to its peers; however, it does have a very high operating cost per hour (\$391.54), a very low average fare (\$1.00) and a very low cost recovery ratio (8%). As well, the annual operating contribution per capita is very high (\$287), over twice the Canadian average.

¹ Most recent available statistics in 2012

Figure 14: Existing Transit Services

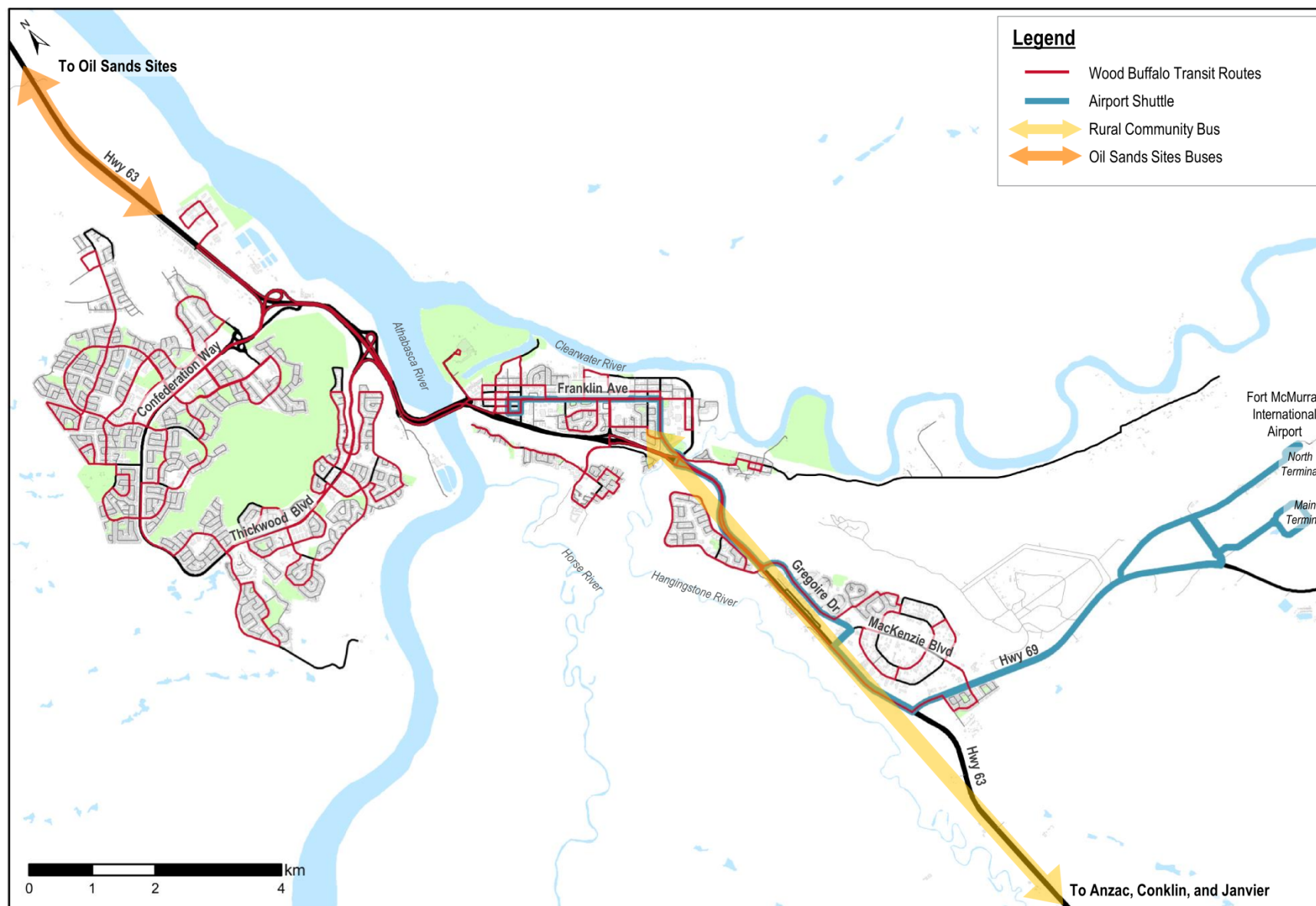


Table 4-1: Peer System Comparison with Similar Sized Transit Agencies across Canada ²

	Population	Annual Revenue Hours	Annual Ridership	Revenue Hours per Capita	Passengers per Capita	Passengers per Revenue Hour	Average Fare	Operating Cost per Hour	Revenue to Cost Ratio
Grande Prairie, AB	55,000	42,127	762,487	0.8	13.9	18.1	\$0.96	\$112.62	17%
Fredericton, NB	50,000	52,212	1,560,000	1.0	31.2	29.9	\$1.10	\$65.07	52%
St. Albert, AB	63,255	88,298	1,196,495	1.4	18.9	13.6	\$3.18	\$112.41	37%
Strathcona, AB	65,465	109,052	1,539,612	1.7	23.5	14.1	\$2.92	\$120.11	31%
Wood Buffalo, AB	74,631	54,560	2,089,905	0.7	28.0	38.3	\$1.00*	\$391.54*	8%*
Milton, ON	85,191	32,996	409,601	0.4	4.8	12.4	\$2.29	\$108.70	28%
Peterborough, ON	80,000	122,132	3,323,170	1.5	41.5	27.2	\$1.42	\$84.44	44%
Lethbridge, AB	93,004	103,038	1,215,147	1.1	13.1	11.8	\$2.36	\$107.93	28%
Red Deer, AB	98,505	143,880	4,015,291	1.5	40.8	27.9	\$1.28	\$106.77	34%
Brantford, ON	97,499	76,149	1,603,305	0.8	16.4	21.1	\$1.92	\$120.23	34%
Moncton, NB	118,338	105,552	1,506,288	0.9	12.7	14.3	\$1.56	\$95.94	35%
Kingston, ON	114,535	196,999	4,185,170	1.7	36.5	21.2	\$1.43	\$86.34	34%
Saint John, NB	122,389	102,617	2,287,625	0.8	18.7	22.3	\$1.89	\$102.01	44%
MEDIAN	85,191	102,617	1,560,000	1	19	21	\$2	\$108	36%

* 2013

² 2014 Canadian Transit Fact Book, CUTA

4.3 Travel Trends

At a regional level, the major travel movements are between Fort McMurray and oil sands sites in the north. Travel movements also occur between communities south of Fort McMurray to the oil sands sites in the north. In addition, there is a smaller travel demand between Fort McMurray to the oil sands sites in the south.

In general, the directional peak movements are northbound in the AM peak and southbound in the PM peak. However, the oil sands sites generate a significant amount of all-day traffic, with employee shift times and goods movement that differ between companies.

The location of current and future oil sands sites play a major role in the travel movements and demand for transit in the region. The maximum acceptable commute time varies between communities, typically based on the geography, land use, and the amount of choice people have for transportation and residential options. The threshold commute time for those residing in Fort McMurray and working in oil sands sites to the north is currently about 60-75 minutes.

As new oil sands sites are located further north, and as commute times from Fort McMurray increase, people will begin to choose different places to live, and different ways to travel to work. The two major competing transportation and residential choices are:

- **Commute from Fort McMurray** – Workers reside in the residential communities in Fort McMurray, and drive a personal vehicle or take employee transit to work each day.
- **Fly-in / Fly-out (FIFO)** – Workers reside in on-site work camps / accommodation and fly-in / fly-out through private on-site airports, or through the Fort McMurray International Airport.

As congestion on Highway 63 increases and oil sands sites locate further away from Fort McMurray, it is important to ensure a reasonable access time to Fort McMurray and the Fort McMurray International Airport.

At the local Fort McMurray level, the primary travel movements are between residential areas (the majority are located north of the City Centre), commercial areas in the City Centre and industrial areas south of the City Centre.

4.4 Travel Demand

The peak regional travel demand can be understood through a macro-level assessment of the peak hour, peak direction travel movements on Highway 63, north of Fort McMurray (north of Confederation Way). Traffic data collected by Alberta Transportation was used to determine the peak travel volumes and the bus mode split.

North of Fort McMurray, the major peak-hour, peak-direction travel movement is AM northbound. The existing weekday AM peak hour travel demand of vehicle-trips and person-trips is shown in **Table 4-2**. Vehicle-trips were calculated using an AM peak hour average weekday traffic volume of 1,992 vehicles (March 2015), and an average mode split of buses of

approximately 8.5% in the peak direction, during the peak hour. Person-trips were calculated assuming that the number of bus passengers is 35 persons/bus (approximately 63% seated capacity), and the passengers of all other vehicle types of 1.2 persons/vehicle.

Transit is the dominant mode of travel for the regional travel movement between Fort McMurray and oil sands sites to the north. As such, to improve transportation operations on Highway 63 north of Fort McMurray, a key focus of this Regional Transit Strategy is to increase vehicle occupancy, reduce single occupancy vehicles, increase transit ridership, and improve transit travel times.

Table 4-2: Existing Weekday AM Peak Hour Travel Demand on Highway 63 North of Confederation Way

AM Peak Hour Travel Demand		
Travel Mode	Vehicle-Trips	Person-Trips
Bus	170	5,950
All Other Vehicles	1,820	2,185
Total	1,990	8,135

4.5 Gap / Opportunities

A gap / opportunity analysis was conducted to identify opportunities for improvement for each of the major travel movements within the region, as follows:

Travel Movement	Gap	Opportunities
<ul style="list-style-type: none"> Travel within the urban areas of Fort McMurray, within each community, and between communities and the City Centre 	<ul style="list-style-type: none"> Transit is currently not competitive with personal vehicle travel, due to low frequencies, and long travel times 	<ul style="list-style-type: none"> Improve routing and frequencies of transit routes to be more convenient and direct, and develop key transit corridors Develop transit pass programs (ex. Universal Passes) with major employers Review taxi bylaw to implement accessible taxi requirements Contract accessible taxis as part of fleet mix for SMART Bus specialized transit services
<ul style="list-style-type: none"> Travel between Fort McMurray and rural communities, such as Anzac, Janvier, Conklin, and Fort McKay 	<ul style="list-style-type: none"> Transit service is limited between Fort McMurray and the rural communities, which makes it difficult for residents to access healthcare and shopping 	<ul style="list-style-type: none"> Increase service to each community and expand services based on demand from each community
<ul style="list-style-type: none"> Travel between the City Centre and Fort McMurray International Airport 	<ul style="list-style-type: none"> Wood Buffalo Transit provides an Airport route 	<ul style="list-style-type: none"> Review current airport bus service to consider whether it could be more of an Express or Limited Stop service Coordinate airport shuttle services between Wood Buffalo Transit and oil sands companies such that one service could be provided at higher frequencies Transit priority measures, such as signal priority, queue jump, or HOV lanes to provide preferential travel for airport buses
<ul style="list-style-type: none"> Travel between communities in Fort McMurray and various oil sands mines (primary travel movement is to sites located north of Fort McMurray) 	<ul style="list-style-type: none"> Buses face the same congestion on Highway 63 as other vehicles Each oil sands company / site provides its own transportation with different routes in Fort McMurray 	<ul style="list-style-type: none"> Transit priority measures, such as signal priority, queue jump, or HOV lanes to provide preferential travel for buses, and improve transit travel times Encourage greater coordination between oil sands companies Potential Park & Ride facilities and shared transfer points between companies such that one service is provided from Fort McMurray to a transfer hub (ex. Suncor Interchange), and each company provides service north of the transfer hub Policies that encourage or require major employers to reduce single occupancy commute trips and increase transit usage Potential higher order transit technologies
<ul style="list-style-type: none"> Travel inter-regionally, between Fort McMurray and other urban centres, such as Edmonton and Calgary 	<ul style="list-style-type: none"> No gap has been identified 	<ul style="list-style-type: none"> Limited opportunities for improvement

4.6 Opportunities

Key transit opportunities and initiatives have been identified, based on the planning framework, an assessment of current travel movements, future travel trends and demand, and the gap / opportunity analysis. The key themes of the recommended policies and initiatives are to encourage transit use and shift travel to higher occupancy vehicles; to extend the life and capacity of Highway 63, from the perspective of person-trips, rather than vehicle-trips; and improve the livability of communities in and around Fort McMurray.

4.6.1 Encourage Reduction in Single Occupancy Vehicle Travel

The major oil sands companies are already leaders in employee trip reduction through provision of free transit services. They have recognized the value of reduced parking and access requirements, and the positive benefits to employees, including reduced exposure to traffic accidents by reducing the total vehicle-kilometres travelled.

There are always opportunities to do more. All employers should be encouraged to investigate Commute Trip Reduction (CTR) to reduce reliance on Single Occupant Vehicles (SOV). The most common form of CTR is carpooling, using software to connect employees who may want to share ride, or providing preferential parking to carpoolers.

4.6.2 High Occupancy Vehicle Programs

High Occupancy Vehicle (HOV) programs are established to maximize the movement of people rather than vehicles, by providing incentives to use transit, vanpools, and carpools instead of Single Occupancy Vehicles (SOV). HOV lanes work

best where roadway congestion occurs during peak periods and where supporting policies encourage HOV usage - for example Commuter Trip Reduction (CTR) programs. HOV lanes are a cost-effective and environmentally friendly option to encourage a reduction in SOV travel. Existing general purpose lanes may be re-designated as HOV lanes, for vehicles with two to three, or more occupants at a low capital cost.

HOV programs are an efficient use of road capacity, as an HOV lane can accommodate more person-trips than a general-purpose lane. In addition, it is a more equitable allocation of road space, as it allocates more road space for passengers sharing a vehicle, who impose less traffic delay to other road users and are hence rewarded by experiencing more reliable travel times and less delay.

Two opportunities for HOV lanes are identified in the region. Firstly, it is recommended that upon upgrading of Highway 63 from a 4-lane to a 6-lane facility, that one general purpose lane in each direction be re-designated as an HOV lane, between Sapræe Creek Trail (Highway 69) and the Athabasca River. These HOV lanes could initially operate during peak periods and be transitioned to all-day HOV lanes in the future. Secondly, it is recommended that HOV lanes be extended northwards to the Suncor Interchange. Coupled with appropriate CTR programs, this would provide significant incentive for major employers to reduce SOV trips and encourage HOV travel. It should be noted that conversion of one lane each direction also provides benefits for transit as transit vehicles would also use the HOV lanes.

To support the HOV program, appropriate enforcement is required.

4.6.3 Park & Ride

The purpose of Park & Ride facilities is to intercept commuters in low-occupancy vehicles prior to their destination and allow them to leave their vehicles and transfer to a transit service (or to carpool) to continue their journey. Typically, Park & Ride users have access to an automobile but do not necessarily need, nor want, to use their automobile for the entire trip to their destination. Park & Ride serves as another access mode to transit services, in addition to active transportation (walking or cycling) to bus stops. Park & Ride facilities can be an efficient way for people from areas with lower transit coverage and/or frequency to access the transit system, and thus has the potential to increase the transit ridership base by reaching a larger geographic area. Additionally, Park & Ride may capture “choice riders” who choose to only use higher order rapid transit, but will avoid using conventional bus transit operating in mixed traffic.

Within the region, Park & Ride could serve as another transit access mode for oil sands commuters residing in and south of Fort McMurray. However, there are several limitations to Park & Ride facilities, particularly with the cold climate in Fort McMurray:

- Transit routes circulating along local roads intercept passengers closer to their origins. Rather than buses picking up numerous riders in residential communities, Park & Ride facilities increase traffic volumes of personal vehicles on local roads.
- When a person starts a trip in a personal vehicle, they gain momentum to continue travelling in their car. In cold weather, it is more difficult to disrupt that momentum and encourage drivers to park their vehicle and transfer to a bus. Transit ridership may actually decrease, especially if transit routes were modified to access Park & Ride facilities only, rather than circulating along local roads.
- With increased transit ridership through the success of Wood Buffalo Transit’s heated bus shelter program, expanding the program may yield higher return on investment than constructing a Park & Ride facility.
- Depending on the uptake of Park & Ride transit access and supply of parking spots, transit ridership may decrease. If potential transit riders drive to a Park & Ride facility and are unable to find a parking spot, they would continue their trip in their personal vehicle.
- Park & Ride facilities simply redistribute parked vehicles from household driveways to public lots. As such, Park & Ride facilities may be an inefficient use of land, as large parking lots could be used for a more productive purpose than storing vehicles.

Due to the service area characteristics of Fort McMurray, it would not be suitable to provide a Park & Ride facility north of the Timberlea and Thickwood Heights communities to intercept passengers travelling north to the oil sands sites. Bus routes circulating within the communities and picking up passengers at Wood Buffalo Transit stops are more effective at attracting transit ridership than Park & Ride facilities, as the bus routes intercept passengers closer to their origins.

A key market for Park & Ride transit access would be to intercept riders coming from communities south of Fort McMurray, thereby reducing traffic volumes through and north of Fort McMurray. It is recommended that opportunities to initially implement park and ride in the Gregoire or MacKenzie Industrial Park areas be investigated. Shared use of an existing parking lot or development of a modest new lot would be the most practical first step.

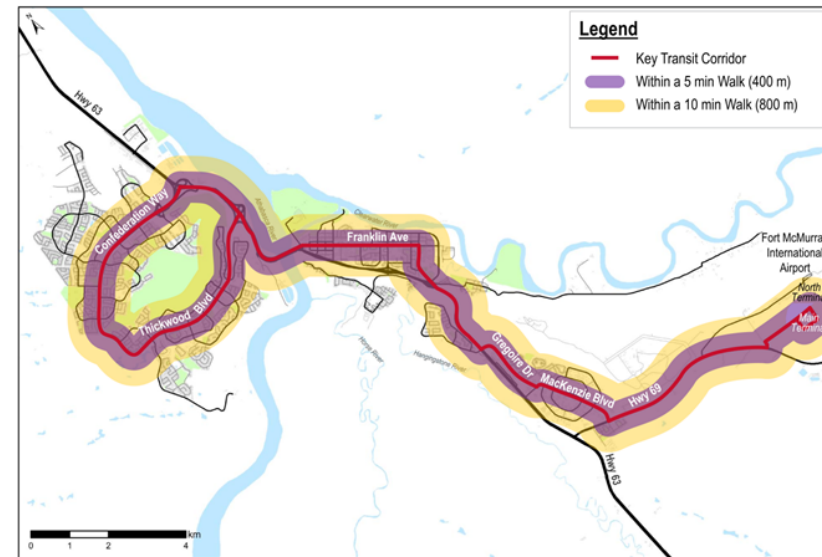
4.6.4 Key Transit Corridors

Fort McMurray has a network of travel corridors which connect all major trip origins and destinations within the urban area and have the potential to become high ridership transit corridors.

- Along Confederation Way, Thickwood Boulevard, and Highway 63, connecting Timberlea and Thickwood Heights communities with the City Centre;
- Along Franklin Avenue, through the City Centre;
- Along Gregoire Drive, MacKenzie Boulevard, and Highway 63, connecting Gregoire and MacKenzie Industrial Parks with the City Centre; and
- Along Saprae Creek Trail (Highway 69), connecting the Fort McMurray International Airport with the City Centre.

As shown in **Figure 15**, a large percentage (approx. 80%) of developed land in the urban area of Fort McMurray is within a 5 min walk (400 m), of these corridors. Investment in frequent, direct service along these corridors would provide a significant improvement to transit service within Fort McMurray. Additional investment in transit priority measures such as signal priority and queue jumps, would provide additional incentives to use transit.

Figure 15: Key Transit Corridors in Fort McMurray



4.6.5 Taxi Services

In rural and lower density urban centres, taxi service is a basic form of public transit that provides on-demand service, 24/7. Increasing the utilization of taxi services has significant benefits to the community, as taxi services are operated privately, but are regulated and licensed by the Municipality.

The current Vehicle for Hire Bylaw addresses physical vehicle requirements and driver responsibilities associated with accessible taxis, but does not provide any direction on the number of accessible taxis, if any, that are required. It is recommended that RMWB review the bylaw and consider mandating accessible vehicle requirements (ex. mandated as a certain percentage, such as 20%, of the fleet being accessible). An implementation plan to transition existing taxis

to an accessible fleet should be identified over a 3-5 year period.

It is also recommended that Wood Buffalo Transit explore potential contracts to supplement specialized SMART Bus transit services with accessible taxis, to reduce operating costs and expand service.

4.6.6 Rural Community Connectivity

To support community vitality and economic development within the smaller rural communities, it is important to provide transit that connects rural communities within the region. These transit services should, at a minimum, provide access to healthcare, social services, shopping, and recreation for rural community residents.

It is recommended that the transit service between Fort McMurray and the rural communities be reviewed periodically to ensure an appropriate level of service is provided.

4.6.7 Higher Order Transit

With growth in oil sands development and increasing travel demand north of Fort McMurray, the RMWB MDP has identified Highway 63 as a Rapid Transit Corridor from south of Sapræ Creek Trail (Highway 69) to north of Fort McKay.

The transition to higher order transit depends on the need to increase transit capacity and travel speed. The appropriate transit technology is chosen based on the desired capacity and speed, along with the appropriate model of coordination between transit services.

A progression of potential rapid transit enhancements have been identified, suitable to the demand and service area

characteristics of the region. Buses could initially operate in HOV lanes with priority measures within the next 10 years. Beyond the 10-year period and as travel demand increases, Bus Rapid Transit (BRT) service could be operated in dedicated busways on or parallel to Highway 63, with consideration and right-of-way protection for conversion of BRT facilities to Light Rail Transit (LRT) in the future.

Existing travel demand north of Fort McMurray is approximately 8,135 peak hour person-trips, of which 5,950 are currently transit trips. As such, buses are the most appropriate transit technology, either with HOV priority or dedicated busways. As demand increases above 10,000 peak hour person-trips, and additional transit capacity is desired, LRT would become an appropriate transit technology.

Table 4-3: Typical Travel Speed and Capacity Range for Transit Technologies³

Transit Technology	Person Capacity (passengers per hour per direction)	Travel Speed Range (km/h)
Bus with HOV Priority	4,000-8,000	50-90
BRT in Dedicated Busway	4,000-10,000	50-90
LRT in Separated Guideway	8,000-25,000	50-80

Transportation Research Board, 2003

However, consideration of higher order transit extends beyond the rapid transit infrastructure and facilities. Shifting from buses with HOV priority to BRT or LRT operations would also change the transit operations model of existing transit services. Bus operations in HOV lanes could maintain the existing model of bus operations, whereby Wood Buffalo Transit provides local transit services in Fort McMurray, and each oil sands company operates separate services that also circulate within Fort McMurray and connect with oil sands sites to the north.

As BRT and LRT operations are adopted, the operations model would need to shift to a more coordinated model, requiring cooperation between various oil sands companies and Wood Buffalo Transit to accommodate shift schedules, feeder services within each community, and cost sharing / fare arrangements.

A possible operating model for BRT and LRT operations would be for Wood Buffalo Transit to operate feeder services that circulate within Fort McMurray, along with BRT and LRT services on Highway 63 between Fort McMurray and a northern transit terminal (ex. near the Suncor Interchange), and for each oil sands company to operate separate services between the northern transit terminal and their sites.

4.7 Recommendations

The strategy for regional transit is based on the Municipality's planning framework, current travel movements, future travel trends, a gap / opportunity analysis, and an assessment of potential policies and initiatives. The key themes of the recommendations are to encourage transit use and shift travel to higher occupancy vehicles, to extend the life and capacity of Highway 63 from the perspective of people movement rather than vehicle movement, and to improve the livability of communities in and around Fort McMurray. The regional transit recommendations are summarized as follows:

Transit Recommendations

In any future highway from four to six lanes, work with Alberta Transportation to establish the additional capacity for HOV and Transit.

Develop a Park & Ride facility in the Gregoire/Mackenzie Industrial Park area to intercept auto commuters coming from communities south of Fort McMurray and going northbound to oil sands sites, for use by all transit services if desired.

Implement mainline transit services on key transit corridors (Confederation Way, Thickwood Boulevard, Highway 63, Franklin Avenue, Gregoire Drive, MacKenzie Boulevard, and Saprae Creek Trail - Highway 69).

Review the current bus service to the Airport, considering whether it could operate as more of an Express or Limited-Stop service.

Revise the Vehicle for Hire Bylaw, mandating accessible vehicle requirements.

Contract with accessible taxis to supplement specialized SMART Bus transit services.

Review rural community bus service and increase service where warranted by demand.

Conduct a Feasibility Study to implement Higher Order Transit (BRT and LRT) in key travel corridors.

5 City Centre Circulation

Fort McMurray is the urban centre of the Region, with key commercial uses located in the City Centre. As such, transportation in and around the City Centre plays an important role in the transportation network.

This Stage 3 TMP expands on the recommendations of Stage 2, addressing the evolving transportation conditions, building on previous recommendations, and further refining the City Centre transportation network. The strategy for City Centre Circulation is focused on policies and infrastructure initiatives to:

- Improve access to and from the City Centre
- Improve connectivity of the road network
- Improve circulation within the City Centre
- Redefine the function and character of Franklin Avenue
- Accommodate all travel modes

5.1 Planning Framework

Transportation within and access to the City Centre is a critical component of achieving the vision and future growth throughout the urban area of Fort McMurray. The MDP notes that as part of the Urban Growth Management strategy *“the most critical component of the urban growth strategy is to reinvigorate the City Centre as the heart of Fort McMurray and the reflection of Wood Buffalo’s identity.”*

Significant population growth is expected with a projection of approximately 48,000 residents in the City Centre by 2030.

To accommodate the projected growth and to achieve the urban identity of the City Centre, there is a *“need for enhanced transportation options within the urban area.”*

The Municipality’s focus on enhancing transportation in the City Centre is outlined in *U.2.1. Focus on Transit*, and *U.2.2. Promote integration of urban transportation systems of Direction U.2. Supportive Urban Mobility Systems*. As part of this strategy, *“the Municipality will promote complete streets that provide equal opportunity for all modes of mobility.”*

In addition, a number of transportation network improvements were identified in Stage 2 of the Transportation Master Plan, some of which have been constructed or are planned for future implementation.

Key roadway improvements include widening Highway 63 to a six lane facility from the Athabasca River Bridge to Saprae Creek Trail (Highway 69) and grade separated interchanges at key locations.

5.2 Existing Conditions

There are numerous transportation limitations in and around the City Centre that affect the efficiency of the transportation network. To understand the current transportation conditions, three major travel movements were assessed, including access to the City Centre, circulation within the City Centre, and travel along Franklin Avenue.

Existing traffic operations were assessed at key intersections within the City Centre, with a focus on Highway 63 and Franklin Avenue. A qualitative assessment of the network was

coupled with traffic analysis at key intersections⁴, which included a review of existing traffic volumes and signal timing for key signalized intersections⁵.

Access to the City Centre

Access constraints will limit development potential in the City Centre. There are currently five access points from Highway 63:

- At-grade intersections at Morrison Street and Hardin Street
- Grade-separated interchanges at Hospital Street and Prairie Loop Boulevard
- Ramps at the Athabasca River Bridge / Franklin Avenue

These accesses are shown in **Figure 16**.

A summary of existing traffic operations at Highway 63 intersections is shown in **Table 5-1**

There are competing movements on Hwy 63, between the southbound-left (SBL) movement from Hwy 63 into the City Centre and the northbound-through (NBT) movement on Hwy 63, in particular at the at-grade signalized intersections at Morrison and Hardin Streets.

⁴ Traffic analysis was conducted using Synchro/SimTraffic software, evaluating operations at signalized, unsignalized, and roundabout controlled intersections with volume to capacity (v/c) ratios and level of service (delay). Synchro employs methodology from the Highway Capacity Manual, 2010, published by the Transportation Research Board National Research Council.

⁵ Data provided by the RMWB and AT included traffic counts from 2014 and 2015, with the exception of two counts at unsignalized intersections collected in 2012 and 2013. PM Peak Hour volumes were used in the analysis. For the intersections of Hardin and Morrison Streets, traffic counts from 2016 were provided by the RMWB.

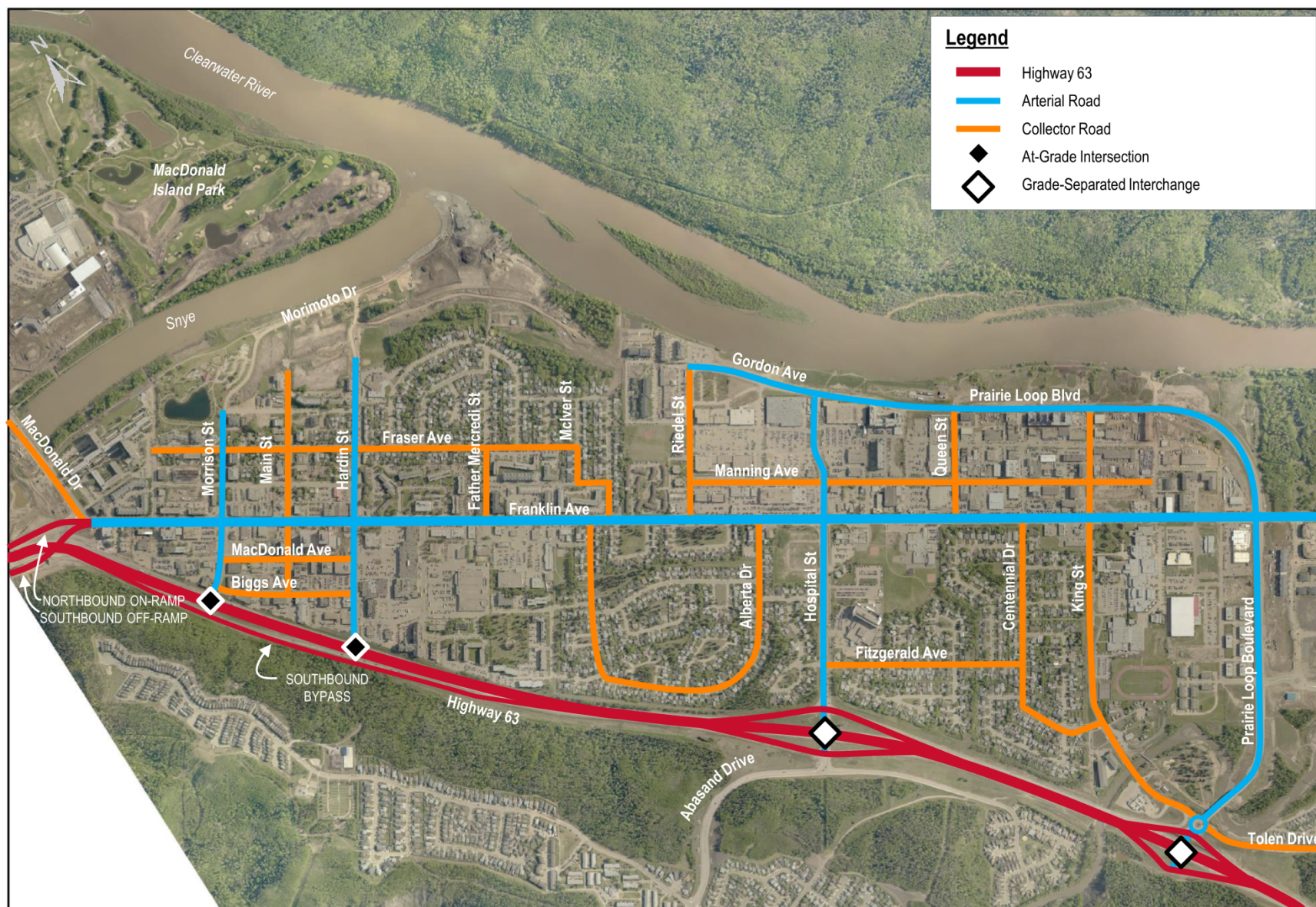
Table 5-1: Existing Traffic Operations at Key Hwy 63 Intersections⁶

Highway 63 Intersection	Control	Overall		Critical Movements		
		LOS	V/C	Move	LOS	V/C
Franklin Avenue Ramps	Signalized	A	0.57	EBL ⁷	E	0.72
Morrison Street	Signalized	E	1.17	NBT SBT	F C	1.25 0.99
Hardin Street	Signalized	C	1.00	SBT	C	0.99
Hospital Street (NB Ramps)	Signalized	B	0.59	-	-	-
Hospital Street (SB Ramps)	Signalized	B	0.55	-	-	-
Prairie Loop Blvd (NB Ramps)	Roundabout	D	0.63	-	-	-
Prairie Loop Blvd (SB Ramps)	Unsignalized	-	-	SBTR	E	0.68

⁶ Traffic volumes based on Alberta Transportation data for PM 100th Highest Hour Estimates in 2014. Note that while further assessment of Hardin and Morrison Streets used updated 2016 RMWB counts, this table retains 2014 data for consistency and comparison across the interchanges.

⁷ EBL refers to the southbound ramp movement from Highway 63, approaching the Franklin Ave / MacDonald Dr Intersection, and heading towards MacDonald Island

Figure 16: Existing City Centre Road Network



Based on the traffic operations analysis, as shown in **Table 5-1**, Highway 63 is most congested at Morrison Street and at Hardin Street consistent with observed conditions of southbound vehicles entering the City Centre at the first available intersection. Further traffic assessment was conducted as shown in **Table 5-2** with updated traffic volumes. The intersections operate within capacity, but due to the signal time given to northbound and southbound through traffic on Hwy 63, westbound and southbound left-turn movements experience significant delay.

Table 5-2: Existing Intersection Operations at Hwy 63 at Morrison and Hardin Streets (PM Peak Hour) – 2016 Peak Hour Traffic Volumes

INTERSECTION MOVEMENT	PM Volumes ⁸	Signal Timing Split ⁹ (s)	v/c	LOS	Delay (s)	95 th Queue Length (m)	Travel Time (s)
Morrison Street	-	230	0.73	B	-	-	-
Westbound Left-turn	84	12	0.71	F	116.3	32	-
Westbound Right-turn	257	-	0.28	A	0.5	0	-
Northbound Through	1901	183	0.76	A	7.7	65	36.2
Northbound Right-turn	81	-	0.06	A	1.9	1	-
Southbound Left-turn	101	18	0.44	F	102.5	39	-
Southbound Through	437	207	0.30	A	2.1	31	23.4
Hardin Street	-	230	0.70	C	-	-	-
Westbound Left-turn	164	30	0.75	F	113.3	57	-
Westbound Right-turn	296	-	0.24	A	0.4	0	-
Northbound Through	1669	168	0.69	B	16.4	260	44.1
Northbound Right-turn	176	-	0.13	A	8.2	8	-
Southbound Left-turn	205	32	0.74	F	99.4	61	-
Southbound Through	317	200	0.23	A	3.1	58	31.6
Total Northbound Travel Time (from south of Hardin St to north of Morrison St)							80 (LOS C)
Total Southbound Travel Time (from north of Morrison St to south of Hardin St)							55 (LOS B)

⁸ Traffic volumes based on turning movement counts undertaken on February 9th, 2016

⁹ Signal timing plans provided by the RMWB, dated August 26, 2014 were used. Signal timing from 4:00 to 6:00 pm was used, aligned with the PM peak hour of 4:30 pm.

Circulation within the City Centre

As **Figure 16** shows, there are gaps in the network of arterial and collector streets within the City Centre.

From a network perspective, there are a number of north-south streets that support access and movements both within the City Centre, and access to Highway 63. However, Franklin Avenue is the only east-west street that spans the entire length of the City Centre. Other streets, including Prairie Loop Boulevard, are discontinuous.

This network provides little redundancy to manage congestion on an everyday basis, as well as in the event of a collision or emergency. In addition, the lack of continuity causes drivers to make more turning movements, which reduces the capacity of key intersections.

Reviewing east-west arterial streets in further detail, Prairie Loop Boulevard connects to Highway 63 at the east end of the City Centre; however it currently does not reach the west end of the City Centre, where significant economic activity occurs. Construction is programmed to extend Prairie Loop Boulevard as far as Morrison Street by 2018.

On the west end, Morimoto Drive runs alongside the Snyc River, connecting Morrison Street to Hardin Street. However, there is no connection to Gordon Avenue or to MacDonald Drive.

Additionally, both Fraser Avenue and Manning Avenue provide east-west links north of Franklin Avenue, but are disconnected between MacIver Street and Riedel Street.

Franklin Avenue Corridor

As the only east-west roadway spanning the entire City Centre, Franklin Avenue is a critical corridor within Fort McMurray from both a traffic and economic perspective. Current development along the corridor includes higher density land uses of hotels and commercial uses on the west end, and lower density land uses on the east end.

The current built cross section is inconsistent along the corridor. The right-of-way (ROW) is consistently 30 m, while the existing pavement width varies between 10 and 25 m. Generally, there are two through lanes per direction with left-turn bays or a centre shared two-way left turn lane, and a planted median east of Father Mercredi Street. However, in the section between Morrison Street and Hardin Street, Franklin Avenue is reduced to one lane in each direction, with left-turn bays and angled parking on both sides of the street.

Parallel parking is provided on both sides of Franklin Avenue, west of Morrison Street. Sidewalks on both sides of the street are continuous throughout the corridor, except in the east end near King Street. In this area, there is only one lane in each direction approaching Prairie Loop Boulevard. A summary of the Franklin Avenue corridor is shown in **Figure 17**.

Based on the traffic analysis of key signalized and unsignalized intersections along Franklin Avenue, as shown in **Table 5-3**, all traffic movements are operating at an acceptable level of service, although some movements are experiencing delays. These delays are typically on north-south side streets intersecting Franklin Avenue, including MacDonald Drive, Hardin Street, Father Mercredi Street, Riedel Street, and Hospital Street. The available signal timing

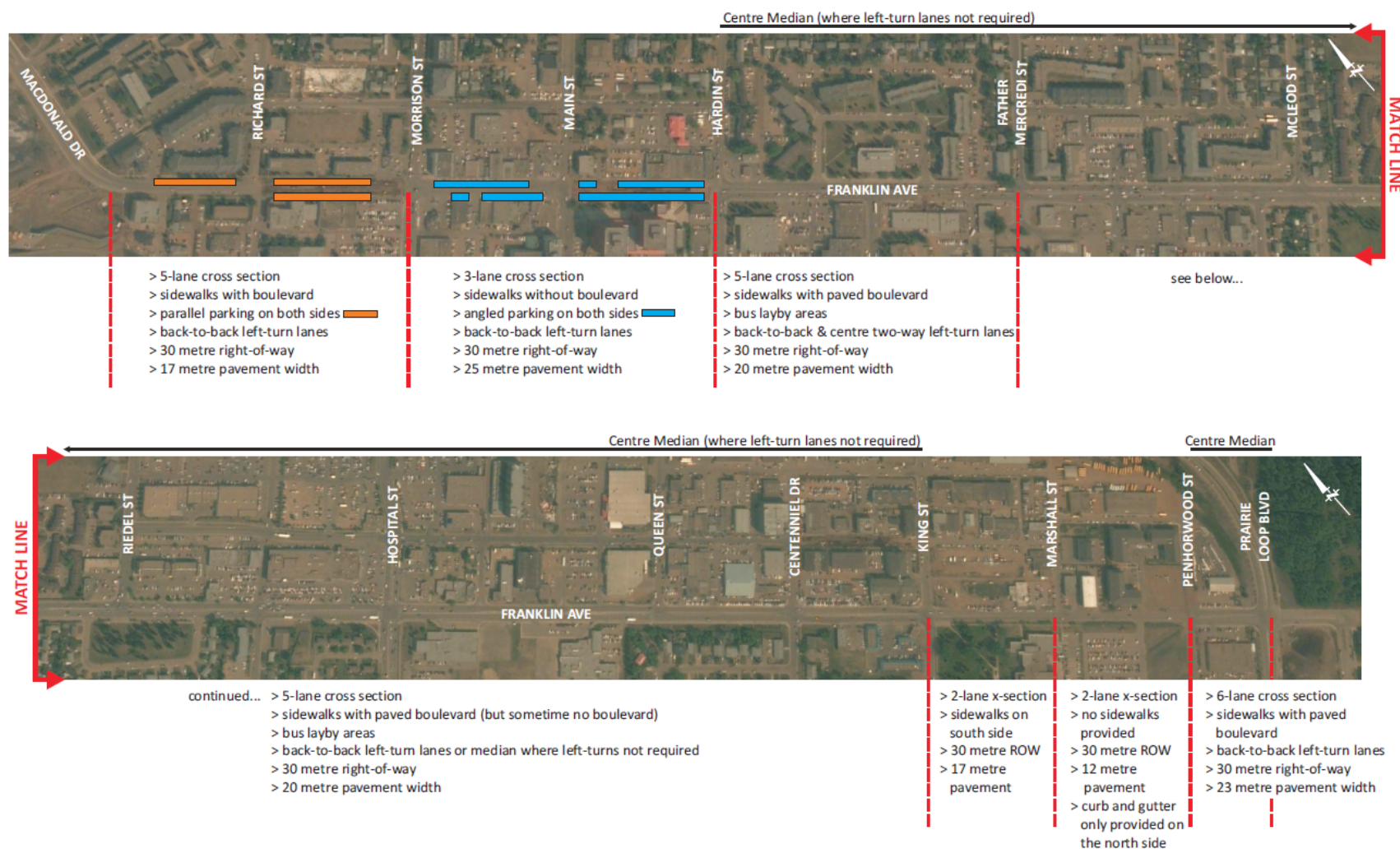
information indicates that signals are coordinated along Franklin Avenue.

Table 5-3: Existing Traffic Operations at Key Franklin Ave Intersections

Franklin Ave Intersection	Control	Overall		Critical Movements		
		LOS	V/C	Move	LOS	V/C
MacDonald Drive	Signalized	A	0.57	NBL ¹⁰	E	0.72
Richard Street	Unsignalized	-	-	-	-	-
Morrison Street	Signalized	C	0.64	-	-	-
Main Street	Signalized	B	0.45	-	-	-
Hardin Street	Signalized	B	0.49	SBT	E	0.87
Haineault Street	Signalized	B	0.43	-	-	-
Father Mercredi Street	Signalized	A	0.49	SBT	E	0.69
Access to Tamarack Village / Northern Lights Shopping Centre	Signalized	B	0.53	NBT	E	0.74
McLeod Street	Unsignalized	-	-	-	-	-
Riedel Street	Signalized	C	0.69	SBR	E	0.91
Alberta Drive	Signalized	A	0.33	-	-	-
Hospital Street	Signalized	D	0.57	EBR NBL	F E	0.18 0.92
Pedestrian Crossing	Signalized	A	0.59	-	-	-
King Street	Signalized	B	0.47	-	-	-
Marshall Street	Unsignalized	-	-	-	-	-
Penhorwood Street	Unsignalized	-	-	-	-	-
Prairie Loop Boulevard	Signalized	B	0.17	-	-	-

¹⁰ NBL refers to the southbound ramp movement from Highway 63, approaching the Franklin Avenue / MacDonald Drive Intersection, and heading towards MacDonald Island

Figure 17: Existing Franklin Avenue Corridor



5.3 Proposed City Centre Street Network

Through review of the existing conditions, opportunities were identified to improve access to the City Centre, circulation along the internal network, and the functionality of Franklin Avenue.

Highway 63 Access – Franklin Avenue Connection

The current design and operation of the connection from Highway 63 at the Athabasca River Bridge to Franklin Avenue and MacDonald Drive could be improved.

Traffic analysis shows that there is additional capacity for southbound movements from Highway 63. Although the interchange is currently underutilized, it could become a major access point for the City Centre, accommodating some of the travel demand from the at-grade intersections at Morrison Street and Hardin Street.

The current intersection configuration may be confusing to drivers. Additionally, the design does not encourage fluid movement from Franklin Avenue onto Highway 63, nor from Highway 63 onto Franklin Avenue.

Intersection modifications should be made to prioritize traffic flow between Highway 63 and Franklin Avenue as the primary movement. This can be done by:

- providing dashed guideline pavement markings within the intersection,
- larger signage, and
- traffic signal timing that favours Franklin Avenue and Highway 63.

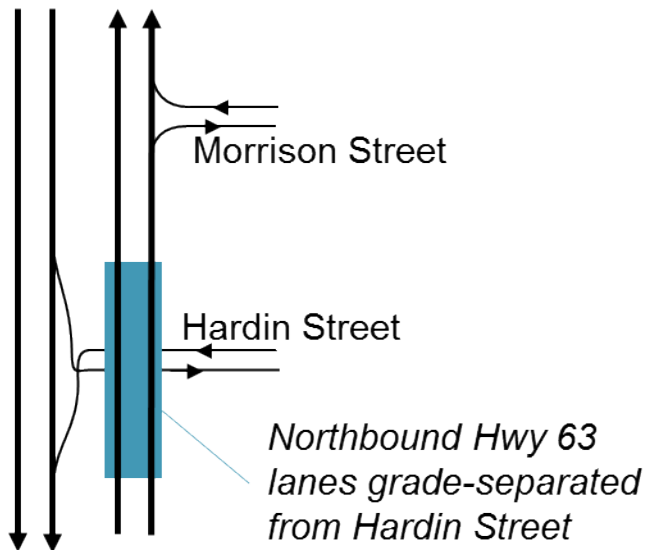
Pavement markings and signage should represent MacDonald Drive as the minor approach. These measures would encourage greater use of this access point to the City Centre.

Highway 63 Operations – Morrison St and Hardin St

Traffic operations for the Highway 63 intersections at Morrison Street and Hardin Street can be improved in the short-term before Highway 63 is widened to a 6-lane facility. Two potential options exist:

- **Prohibit southbound left turns from Highway 63 onto Morrison Street and Hardin Street.** By restricting these movements, traffic would be redistributed to the Franklin Avenue ramp access and Hospital Street interchanges, which are both grade separated and have sufficient capacity to accommodate existing demand. This measure would improve traffic flow along Highway 63 through the City Centre.
- **Northbound overpass on Highway 63 at Hardin Street.** For this option, the northbound lanes on Highway 63 would be grade-separated from the Hardin Street, and Morrison Street would be converted to northbound right-in/right-out only, to avoid conflicting turning movements. Between the two intersections, all movements would be provided, with left turns at Hardin Street and right turns at Morrison Street. This option is more capital intensive but would significantly improve traffic flow on Highway 63, although left-side exits/entrances to a highway are unconventional. This concept is illustrated in **Figure 18**.

Figure 18: Hwy 63 Northbound Lanes Grade-Separation Concept



City Centre Network Connectivity

Improving the existing City Centre internal road network is an important factor in both access to, and circulation within the City Centre. The following describes projects that can improve connections within the City Centre, providing route choices and better distributing traffic to allow for more efficient traffic flow¹¹.

- **Clearwater Drive (Extension of Prairie Loop Boulevard).** The extension of Prairie Loop Boulevard to Morrison Street is currently under construction and will provide a second continuous east-west link across the City Centre, improving connectivity from the Prairie Loop

Boulevard / Highway 63 interchange through to the Franklin Avenue / MacDonald Drive access to Highway 63. The Gordon Avenue / Prairie Loop Boulevard corridor has been renamed Clearwater Drive).

- **Clearwater Drive, Morrison Drive to MacDonald Drive.** With the section of Clearwater Drive currently under construction, there will be a continuous link from Highway 63 to Morrison Drive as a parallel route to Franklin Avenue. However, with the western terminus at Morrison Drive, traffic destined for MacDonald Island Park, one of the Municipalities highest traffic generators, will need to use Franklin Avenue. A continuation of Clearwater Drive westward along the Snye River Dyke to MacDonald Drive will provide an attractive alternative access to MacDonald Island Park, diverting traffic from Franklin Avenue, and more importantly out of the Franklin Avenue / MacDonald Drive intersection. Further engineering study is required to assess the implications of construction on, or adjacent to the dyke as there may be stability issues and impacted utilities. In spite of modest time savings associated with link, it provides important connectivity and network redundancy, which is currently lacking in the City Centre.
- **Extension of Fraser Avenue.** A 340m extension of Fraser Avenue would connect McIver Street to the east with Riedel Street. It would provide additional east-west capacity north of Franklin Avenue, and better connection with Manning Avenue. This would also reduce demand on Franklin Avenue, as east-west travel movements would also be distributed along Prairie Loop Boulevard (now part of the renamed Clearwater Drive corridor), Fraser Avenue, and Manning Avenue.

¹¹ Improvements to the Franklin Avenue corridor are described in the subsequent section.

However, this extension of Fraser Avenue would affect a field and recreation centre, and approximately 6 low-density residential properties along MacIver Street and McLeod Street. Future study and design is required to determine if property impacts can be reduced. This further study should consider an alignment that turns northward to Gordon White Avenue after crossing MacLeod from the west. If future study indicates that the connection can be made with reduced impacts, the short-term strategy should be to identify property requirements and begin property acquisition.

MacLeod Street is planned to be extended north from Fitzsimmons Avenue to Clearwater Drive. This connection will provide some of the benefits of a Fraser Avenue extension, and allow the Municipality to be opportunistic in its approach to property acquisition, as there is no urgency to complete the link.

Franklin Avenue Corridor

Franklin Avenue will continue to function as the major east-west travel corridor and “main street” through the City Centre. It is also a destination that supports development and vibrancy of the City Centre. The function of Franklin Avenue must balance multiple purposes:

- Support continuous east-west travel movements through the City Centre
- Provide access onto north-south side streets and driveways
- Support future travel demands of higher density development
- Provide parking to support businesses and other land uses

- Support multiple transportation modes, including transit, pedestrians and cyclists
- Display a continuous character that supports the community identity of the City Centre.

Franklin Avenue has recently been rehabilitated. Through future rehabilitation projects, the municipality should seek opportunities to further enhance the streetscape and provide additional active transportation opportunities.

Figure 19 shows a possible cross-section that retains the current right-of-way but provides enhanced active transportation facilities. The cross-section dimensions are summarized in **Table 5-4**.

To the extent possible, Franklin Avenue should maintain a continuous identity along the entire corridor. As the continuous general purpose lanes will facilitate traffic flow and improve transit flow, it is recommended that buses continue to operate in mixed traffic.

The 3.5m through lane width is less than specified in the current RMWB Engineering Servicing Standards and Development Procedures, but is consistent with existing conditions and accepted practice for urban streets. This cross-section better accommodates active modes and is more consistent with the long-term needs of a “main street”.

Table 5-4: Franklin Avenue Long-Term Cross Section Elements

Element	Cross Section A Widths
Two continuous general purpose lanes in each direction	3.5 m lanes
Centre planted median with left-turn bays where appropriate	4.0 m
Parallel parking on both sides	2.5 m
Raised cycling facility on both sides	1.5 m
Sidewalk on both sides	2.0 m
Bus-only lanes	Not Recommended

Figure 19: Proposed Cross Section for Franklin Avenue



5.4 Recommendations

Improvements to the City Centre transportation network have been developed through a review of the Municipality's planning framework, current travel movements and traffic analysis, and identification of various practical and feasible opportunities.

The future street network, including potential links requiring additional study are shown in **Figure 20**.

The recommendations to improve City Centre circulation are as follows:

City Centre Network Recommendations

Implement revisions to the intersection of Franklin Avenue and MacDonald Drive to prioritize movements between Franklin Avenue and Highway 63 / Athabasca River Bridge.

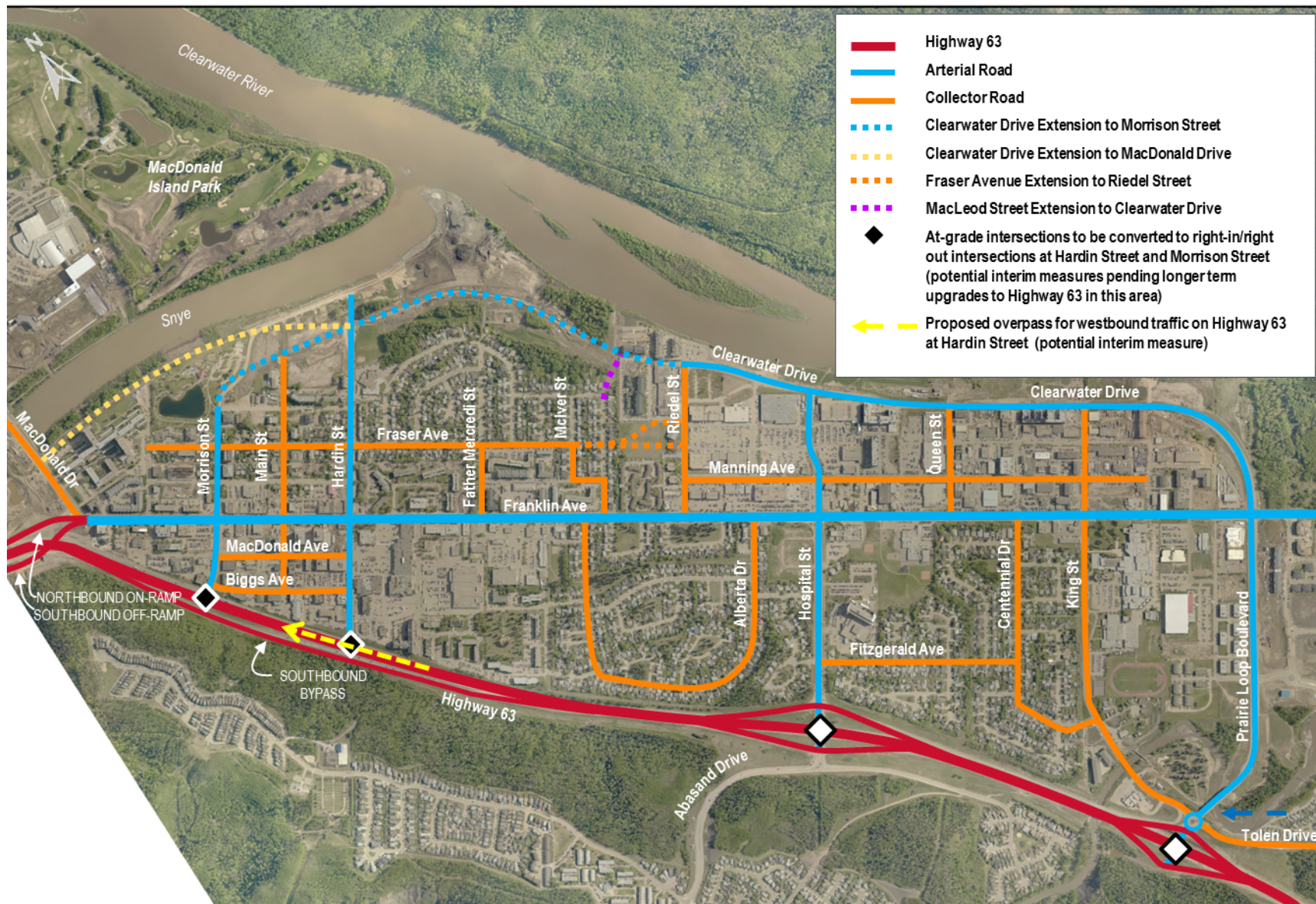
Convert Morrison Street and/or Hardin Street at Highway 63 to right-in/right-out only.

Conduct a functional design study of a northbound Highway 63 overpass at Hardin Street based on the identified concept. The study should focus on the cost, safety considerations of a left exit/entrance and length of time the improvement can provide benefits, noting that the concept could potentially be incorporated into six-laning of Highway 63.

Conduct a functional design study of the extension of Fraser Avenue from MacIver Street to Riedel Street, including potential realignment to Gordon White Avenue.

In conjunction with future rehabilitation, undertake a functional design of Franklin Avenue as an urban corridor, to improve the urban context of the street.

Figure 20: Proposed City Centre Road Network



6 Urban Parking

Urban parking supports commercial uses in the City Centre, but provision of parking requires a trade-off from other transportation needs and land uses.



6.1 Planning Framework

An Urban Parking Strategy (UPS) was completed in 2014 and provided a strategy for managing the parking supply in the City Centre. Key on-street parking management strategies identified included applying time limits or time of day restrictions to on-street parking spaces, providing travel demand management measures to reduce parking demand, considering pay-for-parking, and providing enhanced information, such as real-time supply of parking spots.

6.2 Existing Conditions

An on-street parking inventory and utilization survey was completed for the Central Business District (CBD) as part of

the UPS. The survey identified a significant on-street parking supply in the CBD area, with approximately 1113 spaces¹², in addition to a number of private surface lots.

Duration restrictions of 1 to 2 hours are currently imposed on Franklin Avenue, Manning Avenue, MacDonald Drive, Main Street, and Haineault Street. Angled parking is currently used along Franklin Avenue and Biggs Avenue. Within the CBD, residential permit parking is used along a short section of Manning Avenue. A lack of on-street parking supply is evident within the area bounded by Hardin Street, Franklin Avenue, Nixon Street, and Highway 63. This area is predominantly filled with big-box format stores and surface parking lots. The north-south Haineault Street is the only public street with on-street parking that accesses this area.

The ideal utilization rate of on-street parking along a given street block is typically 85%. This ensures that the parking resource is not being underutilized, while still providing some additional capacity (about 1 out of 8 spots). Retaining some excess capacity along a block frontage will reduce the amount of cruising for parking – an activity that has been found to contribute to local congestion.

The existing on-street parking facilities are illustrated in **Figure 21**.

¹² This approximation includes all the on-street parking on both sides of the streets

Figure 21: Existing On-Street Parking Facilities in the CBD¹³



The weekday peak period on-street utilization was observed to be 48% within the City Centre CBD¹⁴, with utilization varying considerably among the different streets, as shown in **Figure 22**. Several block frontages were observed at about 71% to 90% utilization, indicating reasonably ideal utilization.

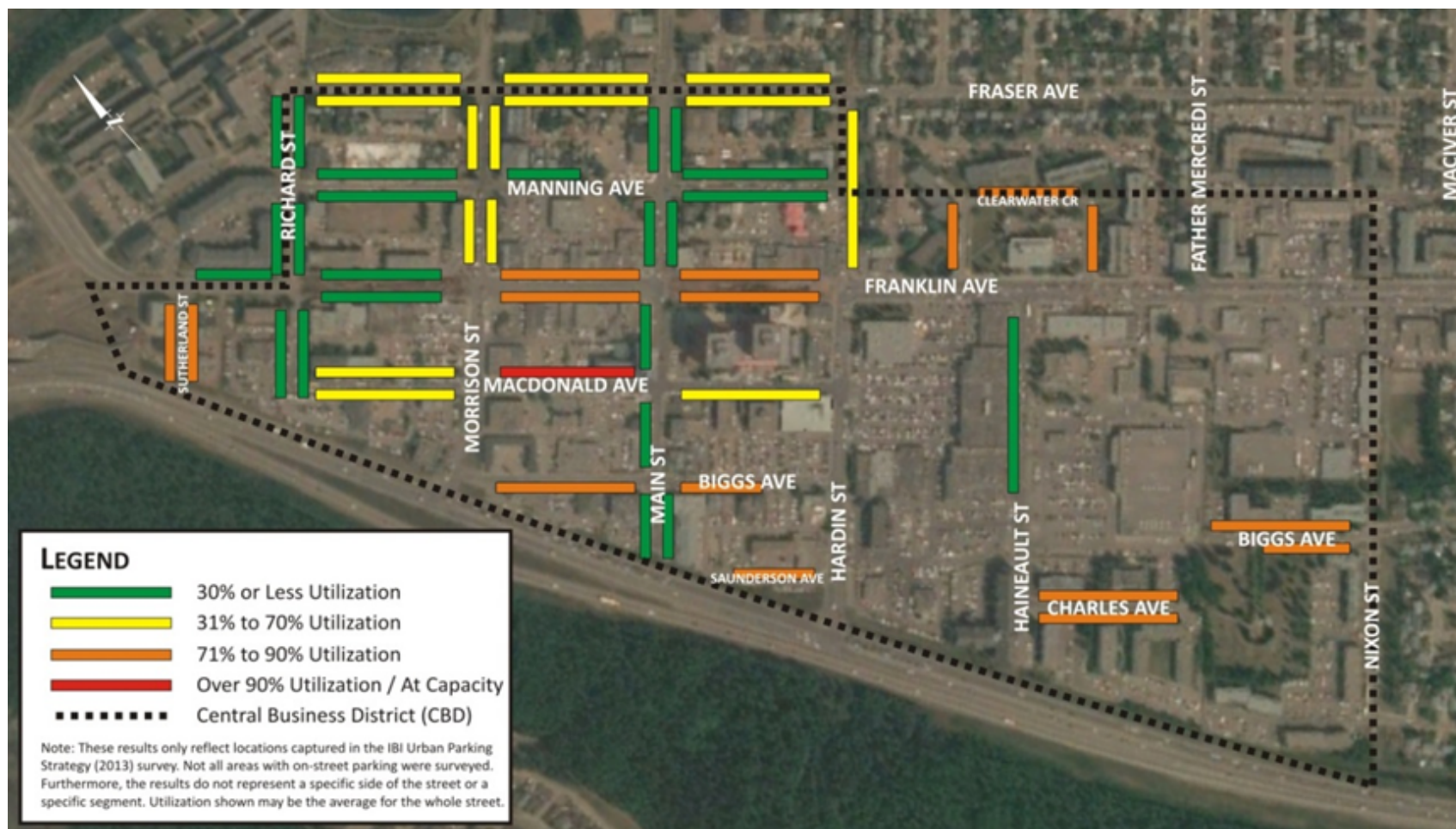
The only street observed at 100% utilization was MacDonald Drive, between Morrison Street and Main Street.

The parking supply is also underutilized along Franklin Avenue, with an overall utilization of 54% between Sutherland Street and Hardin Street. East of Morrison Street the utilization is 79%, and is only about 7% to the west of Morrison Street. Many of the streets at the boundary of the CBD area were observed with a utilization rate of less than 40%. It is evident that there is significant excess capacity of on-street parking supply in the entire CBD.

¹³ Adapted from RMWB Urban Parking Strategy, 2014

¹⁴ Information was adapted from the on-street parking utilization assessment of the CBD area undertaken in the 2014 UPS

Figure 22: Existing On-Street Parking Utilization in the CBD¹⁵



¹⁵ Adapted from RMWB Urban Parking Strategy, 2014

6.3 Opportunities

A number of opportunities have been identified to improve parking in the urban area.

6.3.1 Perception and Behaviour

As urban areas grow, parking can become increasingly challenging to manage. Although the utilization survey observed no parking supply deficiencies in the City Centre, residents familiar with ample parking supply may perceive a lack of adequate parking supply when activity in an urban area increases. This may be a result of high demand at specific locations with high activity, or that residents are unaware of where there is available parking and are accustomed to a space immediately adjacent to their destination. These perception issues also need to be addressed and mitigated¹⁶.

The parking demand is currently concentrated in small areas within the CBD. As the community grows, parking cannot be supplied and available immediately adjacent to the desired destination at all times. Longer walking distances between parking spots and the final destination will be required as development and land use intensity increases. To mitigate the perception that parking is unavailable and that greater walking distances impose a burden, it is important for the Municipality to improve the public realm and street character and ensure the sidewalk network has a high level of connectivity.

¹⁶ However, it is important to note that low availability due to high utilization of on-term parking is a symptom of successful and vibrant streets. This is a desirable community outcome, even if it is burdensome for individuals. The cost of parking and providing parking must account for both the individual and the Municipality, and consider the trade-offs of land development.

To manage perception, the Municipality could also provide more detailed information for residents, including a comprehensive map of on-street and off-street parking facilities, rules and restrictions of on-street parking, and tips for finding parking in the City Centre.

6.3.2 Demand and Supply Management

Based on the current gaps in the existing parking supply, several opportunities exist:

- Parallel on-street parking should be considered on the south side of MacDonald Drive, between Morrison Street and Main Street. This section is currently reserved for staging of buses, but could be designated for parallel parking if buses are relocated to a terminal or surface lot elsewhere.
- To manage the parking supply and to reduce long-term parking on MacDonald Drive between Richard Street and Hardin Street, a time restriction of 2 hours should be implemented.
- Consider implementing a pay for parking strategy.

6.3.3 Franklin Avenue On-Street Parking

The revitalized cross section on Franklin Avenue proposes parallel parking on both sides of the street, along the length of the corridor. Converting the existing angled parking spaces has multiple benefits. Front-in angle parking currently requires vehicles to reverse into flowing traffic, which can pose safety issues and traffic delays. In addition, angled parking vehicles also have overhanging front ends that can obstruct the sidewalk and the pedestrian environment.

Under existing conditions, there are approximately 214 parking spaces on Franklin Avenue in the CBD, including a mixture of angled parking (from Morrison Street to Hardin Street) and parallel parking (from Sutherland Street to Morrison Street)¹⁷. Conversion of the angled parking spaces to parallel parking will result in a net reduction in the number of parking spaces on Franklin Avenue. Assuming a typical parallel parking space of 7.0 m in length, the number of parking spaces which can be provided on Franklin Avenue in the CBD (from Sutherland Street to Hardin Street) is estimated to be approximately 130 spaces¹⁸. Throughout the Franklin corridor from Sutherland Street to Hardin Street, the current peak observed parking demand of 116 vehicles can be accommodated. However, the majority of parking demand is currently between Morrison Street and Hardin Street, with approximately 69 parking spaces in the future configuration of Franklin Avenue. This reduction will require that people park further from their destination than they currently do.

In addition, implementing shorter time restrictions can also increase the turnover rate of parking facilities, thereby increasing the capacity. On-street parking should be used for short durations of less than 2 hours and it is recommended that a time restriction of 2 hours be applied across the Franklin Avenue corridor. The busier area between Morrison and Hardin Streets could warrant a 1 hour time restriction to encourage greater turnover. Long-term parking should utilize surface lots away from Franklin Avenue.

¹⁷ As per RMWB Urban Parking Strategy, 2014

¹⁸ The total number of parking spaces needs to be confirmed through further design refinement of the Franklin Avenue corridor. In addition, utilization can be better managed by demarcating parallel parking spaces, which reduces the underutilized or “wasted” space.

6.3.4 Accommodating Future Development

Potential future development of an arena / entertainment centre in the area bounded by Franklin Avenue, Morrison Street, MacDonald Drive, and Main Street will require careful consideration and detailed analysis of traffic access and parking. The proposed City Centre circulation recommendations provide a robust road network that improves access to the site from all directions, and revitalization of Franklin Avenue will support access to the facility.

As plans for the facility progress, it is recommended that a parking study and a traffic impact assessment be conducted, with consideration of all modes of transportation (including pedestrians, cycling, and transit). Further study will help plan for necessary transportation infrastructure that supports the arena / entertainment facility, while maintaining the livability of the City Centre.

As well, an opportunity exists for the Municipality to develop policy direction and a strategy to guide parking requirements for large scale developments in the City Centre. The Municipality should not implement or construct parking structures, nor use on-street parking to support large developments. Instead, the Municipality should work closely with developers to identify parking solutions for major sites.

6.4 Recommendations

Although there is high parking demand in areas of high activity in the Fort McMurray City Centre, there is currently adequate overall parking supply. Various recommendations for urban parking have been identified to optimize existing supply and manage parking demand, as follows:

Urban Parking Recommendations

Provide an online and printed City Centre parking inventory map.

Convert the bus staging area on the south side of MacDonald Drive, between Morrison and Main Streets, to parallel on-street parking with a 2 hour restriction (relocate bus staging further away from the high activity area).

Implement a 2 hour parking restriction along Franklin Avenue, with a 1 hour time restriction between Morrison and Hardin Streets.

Investigate a pay for parking strategy within the City Centre.

Develop the parking policy requirements for large scale developments within the City Centre.

7 Active Transportation

Active transportation consists of any form of travel that is human powered. This generally includes walking and cycling, but also needs to consider people with limited mobility, such as parents with strollers, mobility devices, etc. While some people consider active transportation only for leisure and exercise, it is also a necessary mode of transportation for everyday needs for many people.

The strategy for Active Transportation is to:

- ➔ Facilitate active transportation as an everyday mobility option by expanding the recreational network to a utilitarian network.

Utilitarian trips differ from recreational trips in that they serve a direct purpose such as travelling to work, school, shopping, etc. Utilitarian trips have a destination where an activity can be undertaken. A utilitarian network should support these types of trips and allow for everyday mobility.

Detailed best practices research and other supporting analysis are provided in an Addendum to this report.

7.1 Planning Framework

The current policy framework in the region supports active transportation. The *2011 MDP* supports the growth of the active transportation network and facilities, directly indicated in *Direction U.2. Supportive Urban Mobility*, and *U.2.2 Promote Integration of Urban Transportation Systems*, as follows:

As the population grows, it is desirable to have more and more people select alternative modes of transportation. The Municipality will promote alternative modes of transportation by emphasizing convenience, comfort, and efficiency. An integrated approach to transportation planning will ensure smooth interchanges between systems... The Municipality will promote complete streets that provide equal opportunity for all modes of mobility.

In addition, the *2012-2016 Implementing Sustainability Strategic Plan* identifies a key action item in *Priority 2: Develop Sustainable Mobility Choices*, to **“develop active transportation and transportation alternatives.”**

As well, Stage 2 of the Transportation Master Plan contained a variety of policies and projects to develop active transportation, but were limited to improving the trail network for recreational trips, rather than for utilitarian trips.

An Active Transportation Plan Update was completed in 2014, recommending 20 major active transportation network upgrade projects. These projects significantly improve gaps in the network, but still lack the directness and connectivity required to facilitate active transportation as an everyday mobility option, to allow walking and cycling to work, school, shopping and other needs, rather than only for recreation.

7.2 Existing Conditions

Currently, active transportation modes are used by approximately 6% of residents in the region for trips to work, most of which are walking trips¹⁹. Fort McMurray has a fairly comprehensive network

utilitarian trips; recreational trips; or separate trip stages (ex. a two-part trip, with one

of sidewalks and an extensive recreational trail network, as shown in **Figure 23**. Although the existing facilities serve some utilitarian trips, there is no defined cycling network and no on-street cycling facilities in the City Centre or any other community.

7.2.1 Walking Accessibility

Walking accessibility can be measured by a walk score²⁰ that indicates how easy it is for residents to reach amenities in their neighbourhood, depending on walking distance. The walk score²¹ is typically higher where the street network patterns provide high connectivity, shorter block lengths with minimal circuitous routes, and mixed land uses. A high walk score is correlated with higher rates of walking among residents. This tool was used to review three distinct areas in Fort McMurray. As shown in **Table 7-1**, the City Centre is considered very walkable, the central area of Timberlea is considered somewhat walkable, and the outer area of Thickwood Heights is considered car-dependent.

segment by car and another segment walking).

²⁰ Analysis was completed using Walk Score®, a tool that provides a walkability ranking of numerous communities in the world. It is used on over 20,000 real estate sites, clearly indicating that walkability is valued by home buyers and acknowledged as a characteristic of higher real estate values.

²¹ Walk score is ranked from 0 to 100, with 100 being the most walkable. The walk score ranking is as follows:

90-100: A Walker's Paradise (daily errands do not require a car)

70-89: Very Walkable (most errands can be accomplished on foot)

50-69: Somewhat Walkable (some errands can be accomplished on foot)

25-49: Car-Dependent (most errands require a car)

0-24: Car-Dependent (almost all errands require a car)

Table 7-1: Walking Accessibility Scores

Walk Scores in Fort McMurray



City Centre

(walk score of 71)

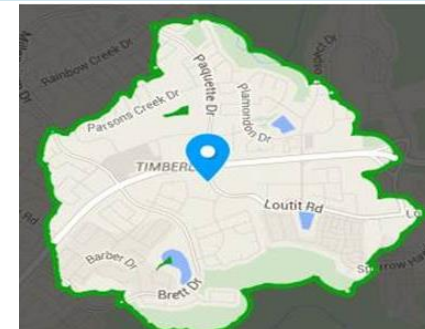
- Lots of amenities and diverse land uses
- Gridded street network providing high connectivity
- Highway 63, topography, and rivers are barriers for travel



Timberlea Central Area

(walk score of 50)

- Some amenities and mix of land uses
- Street pattern is less gridded and contains cul-de-sacs and crescents
- Confederation Way creates a barrier due to large right-of-way and high traffic speeds



Thickwood Outer Area

(walk score of 5)

- Minimal amenities and homogenous land uses (residential only)
- Very circuitous and disconnected street network causing long walking routes
- Topological barriers and challenges created by the creeks and land topography

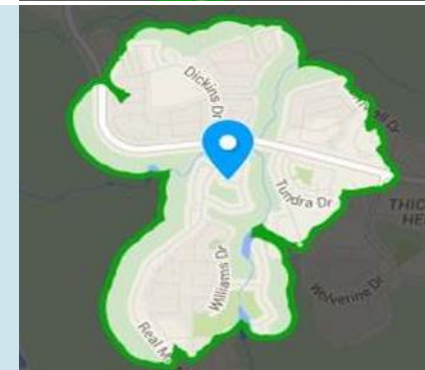
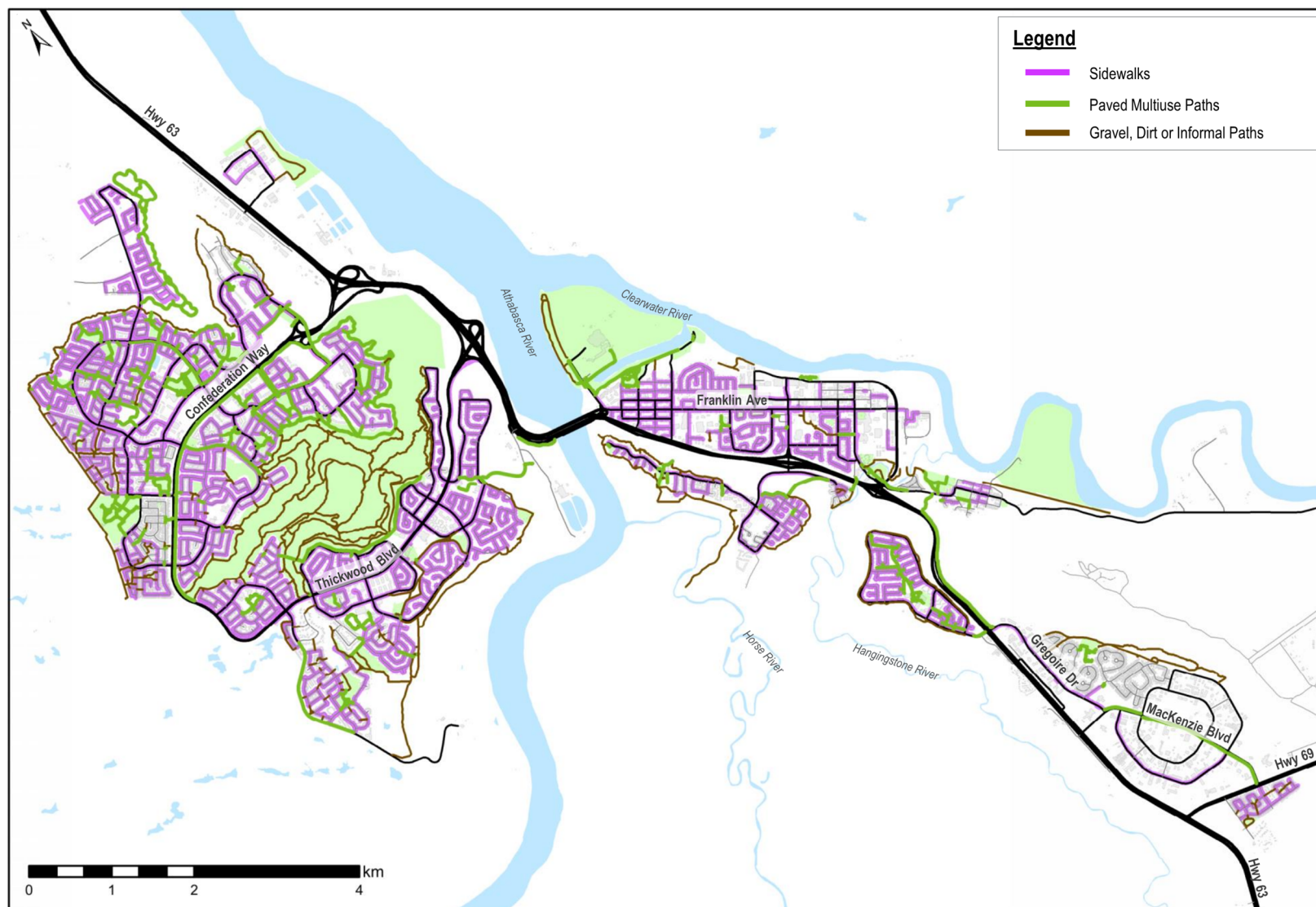


Figure 23: Existing Sidewalks and Trail Network in Fort McMurray



7.3 Opportunities

A number of opportunities have been identified to improve and shift the active transportation network from primarily recreational to a utilitarian network.

7.3.1 Utilitarian Network

In order for walking and cycling to be viable transportation modes, there needs to be a clearly defined utilitarian network that provides direct travel to key destinations, year-round.

Key active transportation corridors serving as the backbone of the utilitarian cycling network, has been identified at a conceptual level in **Figure 24**. These key corridors encourage cycling for all trip types, not just recreational trips, as they provide a direct connection between a number of origins and destinations, along streets with higher amounts of activity. These core links are intended to be complementary to the improvements identified in the 2014 Active Transportation Plan Update, and are described as follows:

- With Franklin Avenue being the main activity corridor in the City Centre and with high vehicular volumes, this link should be a designated and protected facility. A separated cycle lane at the sidewalk level, or similar high quality cycling facilities are recommended in each direction. The lane should connect through to the Waterways area and to the Prairie Loop Boulevard pathway. This facility should be further refined in the design stage, coordinated with the revitalization of the Franklin Avenue corridor and including intersection treatments for connectivity.
- The Prairie Loop Boulevard pathway should be provided for trips that bypass Franklin Avenue. This link should

connect at its east and west ends to access the Athabasca River Bridge, MacDonald Island, and continue along Prairie Loop Boulevard, east of the City Centre.

- Network connectivity should also be provided on key north-south streets, such as Hardin Street, and Hospital Street, and King Street. However, the applicability of these streets should be refined in further study and alternate streets can be used.
- The existing link over the Athabasca River Bridge and the Silin Forest Trail is the only connection from the City Centre to the Thickwood area. The facility should provide a safe crossing of Highway 63 and be well connected to the links on Franklin Avenue, MacDonald Drive, and Prairie Loop Boulevard.
- A key corridor on Confederation Way / Thickwood Boulevard connects the residential communities in the Timberlea and Thickwood Heights neighbourhoods, and multi-use trails are provided along much of this corridor. It is recommended that improved links into the adjacent neighbourhoods as well as to/from the City Centre and other parts of Fort McMurray are provided.
- A new direct connection through Birchwood Trails should be implemented. Although the existing topography and natural features pose considerable constraints and would require a significant investment, this connection would provide the largest benefit to connect communities north of Confederation Way with communities south of Thickwood Boulevard, provide access to the Silin Forest Trail leading to the City Centre, and create a significant travel time advantage for active mode trips.
- The existing multi-use path connection south of the City Centre should be improved to better connect to Gregoire

Park, MacKenzie Industrial Park and new residential development near Sapræ Creek Trail (Highway 69). This link should connect to the Franklin Avenue and Prairie Loop Boulevard pathways.

- As development occurs within Saline Creek Plateau and along the Saline Creek Parkway, an active transportation link should be implemented to connect the community with the City Centre.

7.3.2 Active Transportation Strategy

To encourage active transportation as a viable mode of transportation for everyday purpose, an Active Transportation Strategy should be developed, including the following elements:

- Identify an overall strategy for active transportation, to expand the recreational network to a utilitarian one for everyday mobility.
- Expand upon and refine the core cycling network shown in **Figure 24**. Network coverage should be extended as cycling rates increase and as new communities are developed. This will require the Municipality's Engineering, Parks, and Planning departments to work closely together to define routes and locations of utilitarian bicycle and pedestrian facilities.
- Update the trail classification system to define utilitarian cycling. The core cycling network should consist of Class 1 trails.
- Identify a year-round network, which would be maintained throughout the year. Develop standard operations/maintenance and snow clearing procedures for key routes along the utilitarian network. Snow clearing

should occur sooner than the current target of 48 hours after a snowfall event.

- Update the *Engineering Servicing Standards and Development Procedures* to include a variety of potential cycling facilities that are suitable for each classification, acknowledging flexibility for accommodate design innovations and case specific treatments. Include design standards for on-street cycling facilities.
- Implement a program to count cyclists and pedestrians at key intersections to understand demand and desire lines. This monitoring should acknowledge that the type and extent of facilities influences volumes, and low volumes do not necessarily indicate that facilities are not required.
- Determine an active transportation program budget.

7.3.3 Improve Network Connectivity

Although the structure of the pedestrian network generally follows the street pattern, there are often barriers that reduce the connectivity of the pedestrian network. Opportunities to improve connectivity for pedestrians are as follows:

- Adopt targets for connectivity indices (node/link ratio) and block length to guide street design. These targets would be mandated in new development and redevelopment areas, and serve as a guideline for improvements in existing built-up areas. Connectivity indices are becoming commonplace in development guidelines. Typically, a minimum street network index of 1.4, active transportation network index of 1.6 are used as guidance in the development of new communities²².

²²Calgary Regional Partnership Greenfield Toolbox – Connectivity Index (http://greenfield.calgaryregion.ca/tools/greenfield_process_connectivityIndex.pdf)

- Conduct a field inventory, condition assessment, and review of all existing sidewalk and trail infrastructure to identify barriers and interruptions in micro-connectivity. The outcome of the review should be micro-level recommendations, such as locations for curb ramps and marked crossings, minimizing abrupt horizontal shifts and removing vertical deviations, and removing sidewalk obstructions.

7.3.4 Integration with Other Modes

Every transit passenger starts and ends their trip as a pedestrian. Seamless integration of active transportation with transit is critical to support and encourage transit ridership. Opportunities to improve integration with transit are as follows:

- Conduct a review of the pedestrian infrastructure adjacent to all transit stops to evaluate the connectivity to surrounding neighbourhoods and developments, micro-connectivity, maintenance and snow clearing procedures, wayfinding and visibility of bus zones.
- Develop a policy for cycling integration with transit, including aspects such as policies for secure bike parking, external bike racks, and/or allowing space for bicycles on a bus.

Active Transportation in Cold Weather Environments

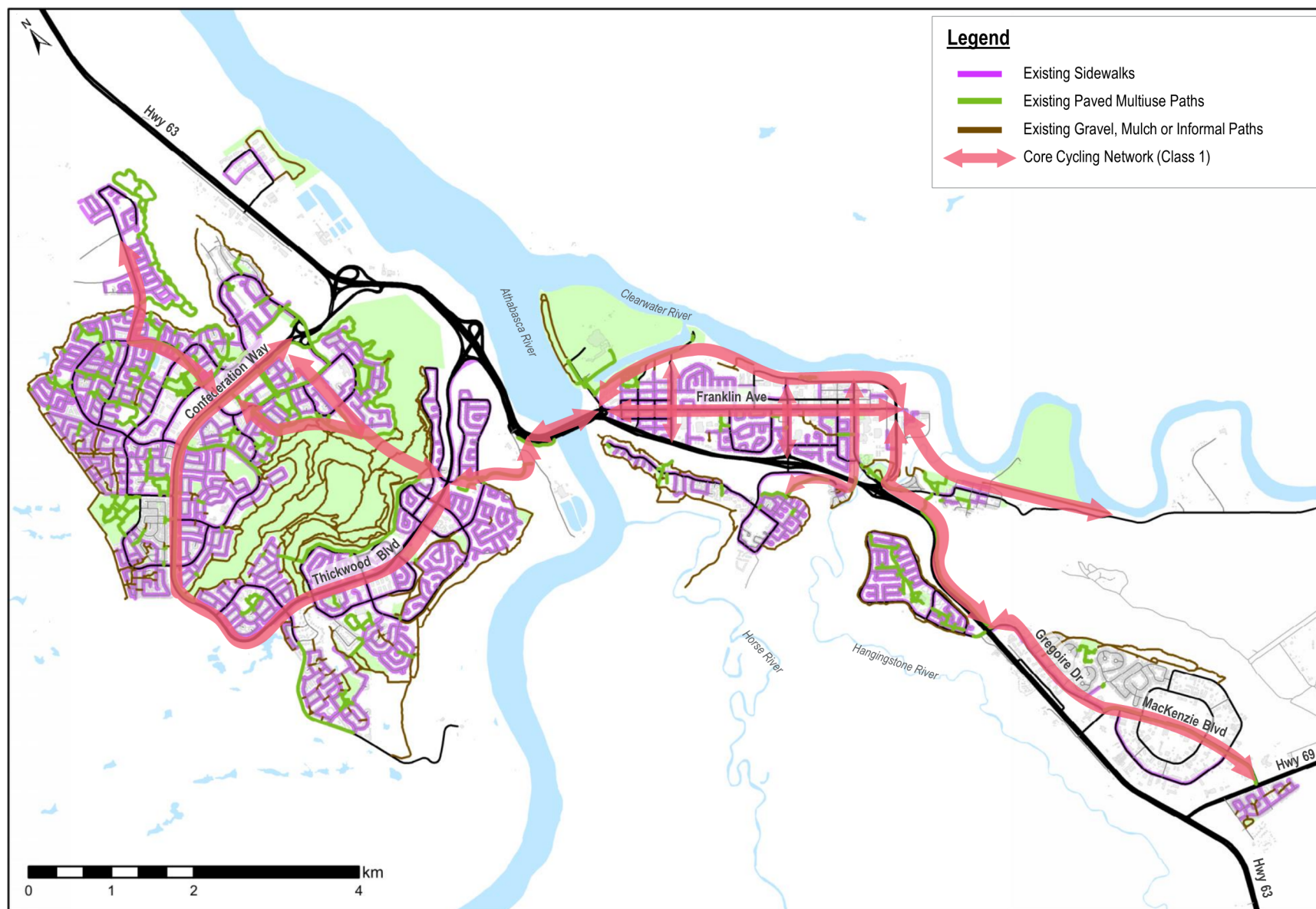
“Active transportation is a great idea, but it’s too cold and snowy to work here”. This is the number one criticism of active transportation planning in most Canadian communities. Snow and cold don’t have to be an impediment. Communities like Montreal, Canmore and Whitehorse have embraced year-round active transportation.

Whitehorse has become recognized as a leader in active transportation in cold climates. Whitehorse has worked hard to gain that reputation. Plans related to the development of active transportation include the 2014 Transportation Demand Management Plan and the 2015-2050 Strategic Sustainability Plan. Specific active transportation actions from the TDM Plan include:

1. Developing a Trails + Active Transportation Plan
2. Improving Priority Routes between Neighbourhoods + Downtown
3. Reviewing Maintenance Practices
4. Expanding Bike Trip-End Facilities
5. Investing in Active Transportation Facilities
6. Engaging Community Groups
7. Establishing a Citizen Trail Maintenance Program

From the 2015-2050 Strategic Sustainability Plan, efficient, low-impact transportation targets include: increasing the active transportation and transit mode share to 35% by 2020, 48% by 2030 and 55% by 2050 while maintaining congestion levels at current standard (Level of Service D) for major intersections for all movements, and E or F for peak period low-volume movements. Actions from the Strategic Sustainability plan include the implementation of the 2014 TDM Plan.

Figure 24: High Level Network of Core Cycling Corridors



7.4 Recommendations

While the existing active transportation network in Fort McMurray responds well to the needs of recreational trips, it does not provide adequate direct routes for utilitarian trips. Pedestrians and cyclists and other active transportation will use infrastructure more frequently for daily needs if it allows them to move from origin to destination safely and quickly on a direct route. The recommendations for active transportation are as follows:

Active Transportation Recommendations

Continue implementation of the Active Transportation Plan Update, 2014, and expand on the plan for Fort McMurray:

- Expand the existing recreational multi use path network to a utilitarian network for everyday mobility
- Develop a core cycling network for utilitarian trips, building on the network identified in **Figure 24**.
- Update the trails classification system
- Identify a year-round cycling network
- Provide a budget for snow clearing of the major links on the active transportation network
- Update the Engineering Servicing Standards and Development Procedures to include typical cycling facilities and on-street design standards
- Implement a regular pedestrian and cyclist count program
- Develop an active transportation program budget

Identify and adopt targets for connectivity indices and block length, and incorporate into land use planning policies.

Conduct a comprehensive review of all existing sidewalk and trail infrastructure, identifying barriers and interruptions in connectivity, and carry out remedial works to address these issues.

Conduct a review of missing connections to bus stops.

Develop an active transportation policy (pedestrian and cycling) for access to transit.

Plan and design the designated cycling facility on Franklin Avenue in the City Centre, as part of a functional corridor study.

Develop network connectivity guidelines for new developments that include:

- minimum street connectivity index of 1.4 and active mode connectivity index of 1.6
- maximum street block perimeter of 500 lineal metres
- maximum spacing of 400 metres between major collector or arterial streets
- intersection spacing between local streets of 70-150 metres
- discourage cul-de-sacs, and where provided, have a maximum length of 100 metres with an active mode connection at the end.

8 Implementation Plan

The Implementation Plan as shown in the following Table outlines the projects that can be considered by the Municipality for progression. It includes proposed timescales for implementation, as well as “high-level” cost estimates for each recommendation throughout its duration.

Each recommendation is an action that will enhance the transportation network in the Regional Municipality of Wood Buffalo, and these are divided into three categories:

- **Do** – measures that require action by the RMWB, such as revising municipal policies or bylaws that require time and effort, but minimal physical infrastructure.
- **Build** – construction or purchase of physical infrastructure and / or equipment.
- **Study** – new studies and study updates required, as well as recommendations on how studies are structured.

There are three time horizons shown in the Implementation Plan, as follows:

- 2017 - 2021
- 2022 - 2026
- 2027 - Beyond

The proposed timescales identified for each recommendation are mainly based on the relative ease of implementation, and the level(s) of further planning, feasibility and/or design that would be required to progress the recommendations.

It should be noted however that the availability of funding, as well as Council decisions regarding prioritization of projects, will be the main determinants of which recommendations are brought forward.

Row #	Type	Recommendation	2017-2021	2022-2026	2027-Beyond
1	Study	In the planning for any future highway expansion from four to six lanes, work with Alberta Transportation to plan for HOV and Transit.			
2	Study	Investigate opportunities to develop a park and ride facility, possibly shared with other uses, in the Gregoire/Mackenzie Industrial Park area to intercept auto commuters coming from communities south of Fort McMurray and going northbound to oil sands sites, for use by all transit services if desired.			
3	Study / Do	Implement mainline transit services on key transit corridors (Confederation Way, Thickwood Boulevard, Highway 63, Franklin Avenue, Gregoire Drive, MacKenzie Boulevard, and Sapræ Creek Trail (Highway 69)).			
4	Study	Review the current bus service to the Airport, considering whether it could operate as more of an Express or Limited-Stop service.			
5	Do	Revise the Vehicle for Hire Bylaw, mandating accessible vehicle requirements.			
6	Do	Contract with accessible taxis to supplement specialized SMART Bus transit services.			
7	Study	Review current rural community bus service and identify where demand warrants increased service.			
8	Study	Conduct a Feasibility Study to implement Higher Order Transit (BRT and LRT) in key travel corridors.			
9	Do	Implement revisions to the intersection of Franklin Avenue and MacDonald Drive to prioritize movements between Franklin Avenue and Highway 63 / Athabasca River Bridge.			
10	Do	Convert Morrison Street and/or Hardin Street at Highway 63 to right-in/right-out only.			
11	Study	Conduct a functional design study of a northbound Highway 63 overpass at Hardin Street based on the identified concept. The study should focus on the cost, safety considerations of a left exit/entrance and length of time the improvement can provide benefits, noting that the concept could potentially be incorporated into six-laning of Highway 63.			
12	Study	Conduct a functional design study of the extension of Fraser Avenue from MacIver Street to Riedel Street, including potential realignment to Gordon White Avenue.			
13	Study / Do	In conjunction with future rehabilitation, undertake functional design of Franklin Avenue as an urban corridor, to improve the urban context of the street.			

Row #	Type	Recommendation	2017-2021	2022-2026	2027-Beyond
14	Do	Provide an online and printed City Centre parking inventory map.			
15	Do	Convert the bus staging area on the south side of MacDonald Drive, between Morrison and Main Streets, to parallel on-street parking with a 2 hour restriction (relocate bus staging further away from the high activity area).			
16	Do	Implement a 2 hour parking restriction along Franklin Avenue, with a 1 hour time restriction between Morrison and Hardin Streets.			
17	Study	Investigate a pay for parking strategy within the City Centre.			
18	Study	Develop the parking policy requirements for large scale developments within the City Centre.			
19	Do	Implement updated off-highway vehicle bylaws for each community.			
20	Do	Expand on the Emergency Management Plan to include specific evacuation routes and transportation procedures for each rural community.			
21	Do	Encourage Alberta Transportation to undertake assessments of safety, passing/climbing lane requirements and reliability on provincial highways in the RMWB			
22	Study	Conduct a passenger and freight access study for Fort Chipewyan.			
23	Build	Continue implementation of the “Land Swap” projects			
24	Study / Build	Complete the Saline Parkway in conjunction with new development in the area to provide access to development and a secondary route between the airport and City Centre			
25	Study / Build	Complete Parsons Creek Access Road and West Access Road to Timberlea to provide new development access and a secondary access route for Parsons Creek and Timberlea/Thickwood.			
26	Study	Work with Alberta Transportation to fully define the feasibility and benefits of the East Clearwater bypass route.			
27	Study	Undertake a functional planning study for the west urban connection to establish feasibility, cost, staging and property requirements for a western connection of the existing and future neighbourhoods on the west side of Highway 63.			
28	Study / Build	Develop an initial connection between Abasand and Beacon Hill that can evolve to long-term connections to the communities once the west urban connection is developed.			

Row #	Type	Recommendation	2017-2021	2022-2026	2027-Beyond
29	Study / Build	Establish emergency access routes for Draper and Saprae Creek that could ultimately be developed into permanent road network and/or active transportation connections.			
30	Study / Do / Build	Expanding on the Active Transportation Plan Update, 2014, develop an Active Transportation Strategy in Fort McMurray: <ul style="list-style-type: none"> Expand the existing recreational multi use path network to a utilitarian network for everyday mobility. Develop a core cycling network for utilitarian trips, building on the network identified in Figure 24. Update the trails classification system. Identify a year-round cycling network. Provide a budget for snow clearing of the major links on the active transportation network. Update the Engineering Servicing Standards and Development Procedures to include typical cycling facilities and on-street design standards. Implement a regular pedestrian and cyclist count program. Develop an active transportation program budget. 			
31	Study	Prepare an Active Transportation Plan for each rural community			
32	Build	Construct high priority active transportation projects: <ul style="list-style-type: none"> <u>Fort McKay</u>: Sidewalk or multi-use path on Fort McKay Road. <u>Conklin</u>: Connect existing multi-use path on Northland Drive from the water treatment plant to Conklin Corner. <u>Conklin</u>: New multi-use path from Northland Drive to Christina Lake. 			
33	Study	Identify policy targets for connectivity indices and block lengths, and incorporate into land use planning policy documents.			
34	Study	Conduct a comprehensive review of all existing sidewalk and trail infrastructure, identifying barriers and interruptions in connectivity, and carry out remedial works to address these issues.			
35	Study	Conduct a focused review of missing pedestrian connections to bus stops.			
36	Study	Develop an active transportation policy (pedestrian and cycling) for access to transit.			

Row #	Type	Recommendation	2017-2021	2022-2026	2027-Beyond
37	Do	Incorporate a designated cycling facility within the functional design for Franklin Avenue.			

Appendices

Regional Municipality of Wood Buffalo

Transportation Master Plan Stage 3

Appendix A: Context and Issues Stakeholder Workshop

Appendix B: Consultation Summary

Appendix C: Opportunities / Gaps - Rural Communities

Appendix D: Intersection Analysis Output

Appendix A: Context and Issues Stakeholder Workshop

The Context & Issues Stakeholder Workshop for the Transportation Master Plan Stage 3 Update was held on Wednesday December 10, 2014 from 1:00 – 4:00 pm at the RMWB offices in Fort McMurray. The attendees included:

- Mazhar Hajhossein, RMWB Engineering
- Bipul Bhowmik, RMWB Engineering
- Thomas McKell, RMWB Engineering
- Wayne MacIntosh, RMWB Engineering
- Mohammed Amin, RMWB Engineering
- Amie Dawe, RMWB Engineering
- Molkes Rahman, RMWB Engineering
- Hap Stelling, RMWB Planning
- Chris Booth, RMWB Planning
- Latosia Campbell, RMWB Planning
- Muhammad Arif, RMWB Road Maintenance
- Jason White, RMWB Aboriginal Relations
- Tony O'Doherty, Wood Buffalo Transit
- Nitesh Gupta, Alberta Transportation
- Dianne Farkouh, OSCA
- Allan Kwan, Alberta Transportation Consultant
- Julie Rivet, RMWB
- Ian MacLeod, HDR
- John Hubbell, HDR
- Carol Kong, HDR

Representatives from other RMWB departments (City Centre, and Operations), Oil Sands Sustainable Development Secretariat, Oil Sands Transit Group were invited but did not attend.

The key objectives of the meeting were to introduce the study team, provide background information on the study purpose and process, provide context on various transportation topics, and discuss stakeholders' transportation issues. All presentation materials from the forum are attached to the consultation summary.

Stakeholders participated in a Context & Issues Café session, where transportation issues were discussed during three sessions of three groups. Stakeholders were asked to participate in the sessions that interested them and were important to them, and were able to move around to different groups. A debrief occurred at the end of the Café Session and attendees summarized the discussions. The discussion for each transportation topic is summarized in the following sections.

Land Use

Context

- Oil sands in north, residential land uses in north area of Fort McMurray
- Future industrial development in south area of Fort McMurray
- Hwy 63 – capacity and issues as the only north-south link
- City Centre Development
- Other

Issues

- Growth planned in City Centre ARP has been moving to oil sands work camps, rural communities outside of Fort McMurray, and outside the Lower Townsite / City Centre.
- City Centre Development has been limited to mid-rise and smaller scale developments – key factors have been limited transportation access and congestion, parking, rising land prices and difficulty encouraging developers.
- Developments underway could improve transportation access to City Centre, including Hardin interchange, extension of Prairie Loop Boulevard to Morrison, east-west street extensions.
- Potential Clearwater access could provide additional access to Fort McMurray as an eastern ring road and alternate Hwy 63 corridor – could develop as an east corridor and encourage land use to develop in the east. Note that one of the Saline Creek Parkway designs considered crossing the Clearwater.
- Current land use and infrastructure development not in sync – It was noted that moratoriums on development were declared in Calgary and Edmonton until sufficient transportation infrastructure was developed. Noted that this was primarily for rural / suburban areas to limit sprawl, and would not encourage desired growth in City Centre or industrial areas.
- In South area, there is infrastructure (Saprae Creek Trail (Highway 69)) to support some industrial land development currently, but transportation improvements and net waste water treatment facility needed to achieve longer-term vision and growth.
- Noted that with an east Clearwater corridor, Eastlands and Forest Heights areas could serve as industrial lands instead of Southlands (improved access to northern oil sands without increasing congestion through Fort McMurray).
- Noted that Westgrowth area could potentially serve as light industrial area rather than residential.

Urban, Regional & Employee Transit

Context

- Impacts of Hwy 63 congestion
- Hwy 63 Bus Rapid Transit/HOV lanes
- New transit terminals and transfer stations
- Park & Ride / Kiss & Ride
- Airport service
- Other

Issues

- Concern noted with the quality of current transit services within Fort McMurray. Concerns with route planning, scheduling (bunching of buses on Franklin Avenue), operations and maintenance were noted.
- Concern noted with transit service to the Airport and lack of use.
- Perception of customer safety issues; however, actual experience is quite good.
- The implementation of 200+ heated passenger shelters was noted as very positive for oil sands employee transit users and Fort McMurray transit customers.
- Concern with no shelters on Franklin Avenue (which were to be implemented as part of City Centre Plan).
- Concern noted with the high cost of vandalism (\$200K per year) and electrical heating and lighting (\$200K per year) for the passenger shelters in Fort McMurray.
- Highway 63 HOV lanes north of Fort McMurray seen as a positive idea.
- Recognition that there is a finite limit of about 60 to 75 minutes to the bus commute times to oil sands sites. As sites are developed further from Fort McMurray more emphasis will be placed on Fly In/Fly Out and use of remote work camps which may affect the population growth of Fort McMurray.
- Discussion of use of LRT; however, bus transit was considered most effective.
- Discussion of the development of a new multi-use corridor north of Fort McMurray (top of ridge west of 63 corridor).
- Concern with mixed traffic safety issues on Hwy 881.

Urban Parking

Context

- Parking demand of future developments in City Centre is a concern.
- High parking demand in CBD on weekdays.
- Lack of short-stay parking for retail and public areas.
- Traffic conflicts from angle parking on Franklin.
- Suburban parking on-street conflicts with snow removal and municipal operations.
- Other

Issues

- In City Centre, all day employee parking is a larger concern than retail short-stay parking.
- Parking areas in higher demand are the west part of downtown in vicinity of Franklin Ave / Hardin Street, and lower demand in the east part of downtown in vicinity of Franklin Ave / Hospital and King Streets.
- On-street parking in residential areas is perceived as a larger concern, due to conflict with snow clearing – parked vehicles are given a 2 day notice prior to snow clearing, but many vehicles remain on the street. Note: No municipal operations staff were present at the workshop.
- Residential issues arise from increased number of vehicles per dwelling unit.
- Land use bylaw being updated to increase on-site parking which may discourage transit use.
- Lot typology may be addressed in future bylaw changes from roll faced curbs to straight faced curbs in residential areas, limiting

the driveway size for aesthetics and for on-street parking purposes.

- Noted that parking enforcement could be increased in residential areas to assist snow clearing. Other policies could be implemented, such as snow route times, overnight parking restrictions, etc.
- Concerns of angle parking on Franklin, which causes congestion in vicinity of City Hall. If switched to parallel parking, may need additional capacity elsewhere.
- Need for parkade was discussed, and no municipal parking structures are planned. New private developments in City Centre (e.g. Golden Buffalo) may include public parking levels in addition to private parking structure.
- Question was raised regarding the total parking capacity of Fort McMurray – is it commensurate to population? What is typical?

Active Transportation

Context

- Recreation paths vs. destination paths
- Community wide connectivity of multi-use paths
- Barriers – Hwy 63
- Other

Issues

- Topography and weather is a challenge in Fort McMurray – trails are not consistently cleared in winter.
- Strong mountain biking community, but few commute/purpose cycling trips.
- Limited access to City Centre – previously 3 trails, but only the one Silin Forest trail now (other trails removed during road widening and other road construction).
- Concerns were raised with bike lanes beside parked cars. Noted concern with lack of cycling facilities within City Centre.
- Potential for new trails along utilities easements.
- Residential communities are well served, but are not well connected. Engineering standards stipulate multi-use trails on both sides of arterials, and on one side of collectors, subdivisions have perimeter trails, and trails connect to all schools.
- Noted concerns of perceived safety – need trails to be illuminated, visible, cleared of snow, etc.
- Highway 63 is a major barrier – Abasand Heights has underpass to cross, and other communities need similar crossings.
- Athabasca River is another major barrier, and increases travel distance.
- More coordination with AT for highway overpasses to include cycling facilities.

Rural Communities

Context

- Access to Fort McMurray
- Regional transit
- Other

Issues

- Concern with lack of sidewalks in rural communities.
- Wish to improve the livability and functionality of rural communities by implementing multi-use paths, extending sewer and water servicing and upgrading local roads to RMWB standards. Comment that this may encourage more new development in the rural communities which may not be all positive.
- Noted that the requirements for First Nations consultation may be extended to Metis and the increased consultation would need to be planned into new processes.
- Concern noted with both community and oil sands development traffic on Hwy 881.
- Currently once a week bus service is provided to Anzac, Janvier and Conklin, and weekly service may be extended to Fort McKay. As well, Saturday service is provide between Conklin, Janvier and Anzac to provide access to the Recreation Centre in Anzac.
- There has been no work on defining the regional travel demand for bus service.
- Concern with security on the regional bus service was noted. Peace officers currently ride the buses for security.
- Noted the winter road to Fort Chipewyan and Fort Fitzgerald operates between December 15 and March 15.

Goods Movement, Oil Sands Access, and Airport Access

Context

- Congestion on Hwy 63
- BRT/HOV corridors
- Employee transit network
- Sapræ Creek Trail (Highway 69) future improvements and access to Fort McMurray Airport
- Impact of new land uses and developments in South
- Transit access to airport
- Other new transportation corridors / links
- Other

Issues

- Concern noted with Dangerous Goods movement and High, Wide and Heavy corridors.
- Noted that someone is reviewing High, Wide and Heavy corridor from Calgary to Fort McMurray.
- Noted need for staging area north of Fort McMurray (AT noted that new site is being built just north of town).
- Noted need for chaining up area below Super Test Hill.
- Possible east bypass corridor could be used for dangerous goods traffic.
- Concern with evacuation routes out of communities in the event of emergencies.
- Noted there has been oil sands industry growth south of Fort McMurray.
- A lot of discussion regarding Highway 63 and the impact of congestion on neighborhood connectivity within Fort McMurray.
- Discussed a multiple pronged approach to managing Hwy 63:
 - Expand Hwy 63 to 8 lanes within Fort McMurray.
 - Develop policy and implement HOV lanes north of Fort McMurray.
 - Encourage oil sands industry to make better use of regional transit solutions.
 - Balance future residential and industrial land use growth within Fort McMurray to minimize impact to traffic.

Road Network – Highways and City Centre

Context

- Highway 63 corridor:
 - Only N-S corridor, shared between all modes
 - Capacity and 6-laning
 - Intersection/interchange upgrades
- Saprae Creek Trail (Highway 69) corridor
 - Proposed developments and accesses
- Saline Creek Parkway
- Franklin Avenue corridor
- Connectivity of east-west streets in City Centre
- Hwy 63 intersections/interchanges – Hardin Street
- Other

Issues

City Centre Road Network

- Congestion in downtown area, particularly along Franklin Avenue.
- Bottleneck on Franklin Ave at City Hall where road narrows to 2 lanes.
- In general, a lack of lane continuity along Franklin Ave causes problems for drivers and generates congestion.
- It was suggested that a one-way system could be implemented: Hwy 63-Hardin (in only) – Franklin-Prairie Loop – Morrison (out only). Franklin and Prairie Loop would be a one-way pair.

- Daily congestion at Franklin Avenue/Riedel Street intersection from 3.00 to 6.00 pm.
- Much of this congestion due to traffic on Hwy 63 trying to bypass congestion at Hardin St by exiting at Prairie Loop Blvd, traveling to Riedel St and then trying to turn right onto Franklin.
- Extending Prairie Loop Blvd to Morrison St would help but may just move problem to that location.
- If Prairie Loop could be extended to MacDonald Drive this would be much better as then there would be direct access to bridge over Athabasca but this is probably not achievable due to lack of available land.
- In the long-term interchanges are planned on Hwy 63 in the downtown but these are likely many years away. An interim solution is required to alleviate the current congestion problems.
- An overpass on Hwy 63 NB at Hardin St for through traffic was proposed as a potential short-term measure to alleviate congestion.
- It was noted that due to recent bridge projects there is now free-flow of traffic over the Athabasca River and the issue is now how to get traffic through the downtown to the bridges.
- Local improvements such as extending Fraser Avenue to Riedel would improve local connections for little cost.

Highway Network

- It was noted that previous planning studies for Hwy 63 through the downtown had assumed a 120 km/h design speed with associated C-D roads and considerable ROW requirements.
- Currently, a study is underway assuming posted speeds of 70 or 80 km/h within the UDSR.
- RMWB plans to provide 6 lanes on Hwy 63 in the next couple of years whilst maintaining existing intersections.
- Ultimately there will likely be diamond interchanges to replace intersections.
- Ultimately there will also be a need for more than 6 lanes and either additional lanes will need to be provided or alternatives such as HOV or transit lanes could be provided.
- The need for a western access road to connect Sapræe Creek Trail (Highway 69) to residential neighbourhoods in the NW was identified although there would be a high construction cost due to the river crossing.
- Issue with oversize loads on Hwy 63; an alternative route is required.
- Saline Creek Parkway options are being reviewed by RMWB as it has been identified as a vital link despite the high construction cost due to geotechnical issues.
- AT noted that they are considering a Hwy 881 Anzac Bypass to go to Hwy 63.

Appendix B: Consultation Summary

Context and Issues Stakeholder Workshop

The Context & Issues Stakeholder Workshop was held on Wednesday December 10, 2014 at the RMWB Offices in Fort McMurray. The attendees included representatives from Alberta Transportation, Oil Sands Community Alliance (OSCA), and multiple RMWB departments, including Engineering, Planning, Road Maintenance, Aboriginal Relations, and Wood Buffalo Transit. Representatives from other RMWB departments (City Centre, and Operations), Oil Sands Sustainable Development Secretariat, Oil Sands Transit Group were invited but did not attend.

The key topics discussed were:

- Land Use
- Urban, Regional and Employee Transit
- Urban Parking
- Active Transportation
- Rural Communities
- Goods Movement, Oil Sands Access, and Airport Access
- Road Network – Highways and City Centre

Fort McKay BBQ Tradeshaw

A RMWB barbecue and tradeshaw was held for the community of Fort McKay on Monday, June 12, 2015 at the Fort McKay Métis Group Ltd. facility. The Transportation Master Plan was showcased as one of the booths at the event, alongside other RMWB projects and initiatives. It is estimated that approximately 100 community members of all ages attended the event.

The key topics discussed were:

- Access to services and amenities
- Transit
- Sidewalks and active transportation
- Highway safety

Community Leadership Meeting

A Community Leadership Meeting was held on Tuesday, June 13, 2015 at the Anzac Recreational Centre in Anzac. The attendee list for this meeting included representatives from numerous rural community and Aboriginal groups.

The key discussion themes were:

- Transit
- Highways and truck movements
- Active transportation
- Land use
- School transportation

Conklin Resource Development Advisory Committee Meeting

A meeting with the Conklin Resource Development Advisory Committee was held at the Christina Lake Lodge in Conklin on Wednesday, August 19, 2015.

The key discussion themes were:

- Highway 881
- Transit
- Active transportation
- Emergency and event transportation

Fort Chipewyan Meeting

A conference call with the Hamlet Manager of Fort Chipewyan was held on Tuesday, October 27, 2015.

The key discussion themes were:

- Transportation impacts from climate change
- Winter road and all weather road access
- Waterways, ferries, and barge system
- Transit

Appendix C: Opportunities / Gaps - Rural Communities

Category	Issues	Recommendations	Communities
Active Transportation	<ul style="list-style-type: none"> Sidewalk network is disconnected or non-existent in numerous areas Multiple pedestrian fatalities have occurred in locations where separate walking paths do not exist and pedestrians are expected to walk on the road Trail network is disconnected and does not serve a recreational nor functional purpose Off-highway vehicles (quads, snowmobiles, etc.) are commonly used as a mode of transportation within the community and not only for recreation – accommodation of off-highway vehicles on trails and roads is not clear or consistent in various communities. Specific gaps in the active transportation network were identified in Fort McKay (along paved section of Fort McKay Road) and in Conklin (along Northland Drive and connection to Christina Lake) 	<ul style="list-style-type: none"> Develop an Active Transportation Plan in each rural community, as follows: <ul style="list-style-type: none"> Conduct an inventory and condition assessment of all existing facilities Consult community members to identify active transportation needs Identify gaps in the existing network and new links to provide direct travel between key destinations Provide designated walking facilities on major roadways to separate pedestrians from vehicles Identify methods and locations to accommodate off-highway vehicles and reduce conflicts with pedestrians / cyclists and motorized vehicles (ex. increase multi-use path width, wider shoulders, etc.) Develop an implementation plan for active transportation recommendations Identify a program budget for each community, recognizing the investment rate likely will not be comparable on a per-person basis. Revise or implement bylaws for off-highway vehicles ensuring consistency between communities Construct high priority active transportation projects, identified through consultation: <ul style="list-style-type: none"> Fort McKay: New sidewalk or multi-use path on Fort McKay Road Conklin: Connect existing multi-use path on Northland Drive from the water treatment plant to Conklin Corner Conklin: New multi-use path from Northland Drive to Christina Lake 	<ul style="list-style-type: none"> All

Category	Issues	Recommendations	Communities
Emergency / Evacuation Transportation	<ul style="list-style-type: none"> The Municipality's Emergency Management Plan does not clearly address varying needs in each community Transportation support during emergencies and evacuations is unclear 	<ul style="list-style-type: none"> Expand on the Municipality's Emergency Management Plan to include site-specific procedures for each community and include transportation procedures for each community (provision of buses, when vehicles will be dispatched, etc. such as provision of buses, timing of dispatch, etc.) 	<ul style="list-style-type: none"> All
Event Transportation	<ul style="list-style-type: none"> Transportation for events is adequately provided There is a lack of transportation to attend council meetings (note that meetings can be watched via a live stream) and other evening events in Fort McMurray 	<ul style="list-style-type: none"> Implement an on-demand transit service for council meetings and other RMWB events (assess need and consider a pilot program for taxi voucher / subsidy, etc.) 	<ul style="list-style-type: none"> All

Category	Issues	Recommendations	Communities
Conventional Rural Transit Service	<ul style="list-style-type: none"> Transit service from Anzac, Janvier and Conklin to Fort McMurray is limited and is considered inadequate for healthcare and shopping needs of the community As Anzac becomes a secondary service centre for Conklin and Janvier, there may be a greater need for transit service to Anzac Current transit service does not circulate within the community Wood Buffalo Transit currently does not provide service between Gregoire Lake Estates to Fort McMurray, although the current rural bus routes pass by the community Wood Buffalo Transit currently does not provide service between Fort McMurray and Fort McKay Lack of information for transit services and how to use them 	<ul style="list-style-type: none"> Increase Fort McMurray transit service to Anzac, Conklin, and Janvier – note that Anzac can be served on passby trips from Conklin and Janvier Provide multiple transit stops and circulate in community Construct more comfortable and identifiable transit amenities, such as heated shelters, benches, information pylon, lighting, etc. Include Gregoire Lake Estates along transit routes to Anzac, Conklin, and Janvier as an on-demand service Implement a transit service between Fort McKay and Fort McMurray Provide more and better information of transit services to increase awareness (clear and easy to understand schedules, stop locations, cost, rules, etc.) 	<ul style="list-style-type: none"> Anzac Conklin Janvier Fort McKay Gregoire Lake Estates

Category	Issues	Recommendations	Communities
Specialized Rural Transit Service	<ul style="list-style-type: none"> Limited information is available on the eligibility and use of SMART Bus SMART Bus provides limited service to Anzac and Janvier Some communities, such as Conklin, provide their own health bus / specialized transportation since the service is not provided by the Municipality 	<ul style="list-style-type: none"> Provide more detailed information of using the SMART Bus in rural communities, including eligibility, booking, cost, etc. Expand SMART Bus to operate in Conklin and Fort McKay Expand SMART Bus to operate in all communities on two days a week – this could be combined with conventional services if an accessible vehicle is used Review and discuss opportunities to integrate SMART Bus service with Conklin's health bus, such as funding, etc. 	<ul style="list-style-type: none"> Anzac Conklin Janvier Fort McKay
Rural Transit Safety	<ul style="list-style-type: none"> Safety and appropriate behavior is a concern for operator and rider safety Vehicle size is a concern for riders on Hwy 881, due to the presence of trucks and heavy vehicles 	<ul style="list-style-type: none"> Consult with rural communities and identify opportunities to improve safety, such as employing local residents as transit operators, providing enforcement, communications/programs to reward good behavior, etc. Use a full size 40 ft bus for conventional rural services 	<ul style="list-style-type: none"> Anzac Conklin Janvier Fort McKay
Urban Area Transit	<ul style="list-style-type: none"> No transit service is provided between Draper and the City Centre Limited transit service is provided on weekends / holidays between Sapræ Creek and the City Centre 	<ul style="list-style-type: none"> Review the need for a regular transit service for Draper Review the need for regular daily transit service for Sapræ Creek and the need to increase weekend service Ensure the design and construction of the Saline Creek Parkway considers its use as a key transit corridor 	<ul style="list-style-type: none"> Draper Sapræ Creek

Category	Issues	Recommendations	Communities
Operating Contracts	<ul style="list-style-type: none"> There are currently no opportunities for Aboriginals to have operating contracts for transit services Operating contracts could provide multiple benefits, encouraging ridership, improving safety / security, and providing local business opportunities 	<ul style="list-style-type: none"> Consult with each community and identify potential opportunities for transit operating contracts for rural community residents and Aboriginals Identify other operations / maintenance contract opportunities for rural community residents and Aboriginals, such as for snow removal, construction, etc. 	<ul style="list-style-type: none"> Anzac Conklin Janvier Fort McKay
Highway 881	<ul style="list-style-type: none"> Safety is a significant concern on Highway 881 from Highway 63 to Conklin There are limited/no shoulders along many sections of Highway 881 and a lack of safe places to stop Speeding is a major concern, and does not appear to be regularly monitored / enforced Centre line pavement markings do not seem to permit safe passing 	<ul style="list-style-type: none"> Conduct a review of passing locations on Hwy 881 and ensure all existing locations are in accordance with TAC standards (appropriate passing sight distance for both horizontal and vertical curvature, design speed, length of passing distance, driveways, etc.) Assess and implement measures to improve actual and perceived safety on Hwy 881, such as widening the gravel / paved shoulder, providing passing lanes, providing rest areas, increasing width of centre line markings, etc. Implement a speed enforcement program, such as variable message speed signs, and increasing random enforcement 	<ul style="list-style-type: none"> Anzac Conklin Janvier Gregoire Lake Estates
Fort Chipewyan Winter Road	<ul style="list-style-type: none"> Climate change and warming is reducing the available time for the winter road. The opening is being delayed to late-December and closing earlier than mid-March Community storage capacity for key commodities is a concern, as demand is increasing 	<ul style="list-style-type: none"> Conduct a feasibility study to extend the all weather road further north, reducing the distance required for yearly winter road construction Review potential funding options from private companies to contribute to the all weather road construction Conduct a long-term study to assess the needs for Fort Chipewyan, as it relates to the transportation impacts of climate change and need for expanding storage or other facilities 	<ul style="list-style-type: none"> Fort Chipewyan

Category	Issues	Recommendations	Communities
Fort Chipewyan Waterway Service	<ul style="list-style-type: none"> Barge system was previously supported by the federal government until the winter road was implemented Barge and other waterway transportation could be a viable alternative to road access 	<ul style="list-style-type: none"> Conduct a needs assessment and feasibility study for waterway transportation services for Fort Chipewyan and northern Alberta, assessing potential for goods and people movement (this should be included within a general study into access for Fort Chipewyan by all relevant modes of transport) 	<ul style="list-style-type: none"> Fort Chipewyan



















Appendix D: Intersection Analysis Output

D1: INTERSECTION ANALYSIS PM PEAK HOUR - UNSIGNALIZED

HCM Unsignalized Intersection Capacity Analysis

1: MacDonald Ave/Richard St & Franklin Ave

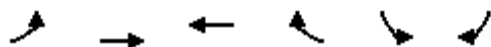
Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	51	410	33	32	742	38	25	2	34	26	5	118
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	446	36	35	807	41	27	2	37	28	5	128
Pedestrians		1			16			12			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		166			208							
pX, platoon unblocked												
vC, conflicting volume	853			494			1191	1509	269	1289	1506	430
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	853			494			1191	1509	269	1289	1506	430
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			97			72	98	95	72	95	78
cM capacity (veh/h)	779			1055			96	106	712	101	106	570
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	55	297	184	35	538	310	66	162				
Volume Left	55	0	0	35	0	0	27	28				
Volume Right	0	0	36	0	0	41	37	128				
cSH	779	1700	1700	1055	1700	1700	187	291				
Volume to Capacity	0.07	0.17	0.11	0.03	0.32	0.18	0.36	0.56				
Queue Length 95th (m)	1.7	0.0	0.0	0.8	0.0	0.0	11.4	23.9				
Control Delay (s)	10.0	0.0	0.0	8.5	0.0	0.0	34.6	31.8				
Lane LOS	A			A			D	D				
Approach Delay (s)	1.0			0.3			34.6	31.8				
Approach LOS							D	D				
Intersection Summary												
Average Delay			5.0									
Intersection Capacity Utilization			45.4%			ICU Level of Service		A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

25: Franklin Ave & McLeod St

Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

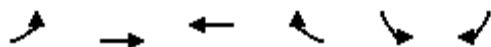


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	745	1085	189	22	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	17	784	1142	199	23	21
Pedestrians			16		16	
Lane Width (m)			3.7		3.7	
Walking Speed (m/s)			1.2		1.2	
Percent Blockage			1		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		241	245			
pX, platoon unblocked	0.84				0.86	0.84
vC, conflicting volume	1357				1699	687
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1041				1225	242
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				84	97
cM capacity (veh/h)	559				142	633
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	17	392	392	761	580	44
Volume Left	17	0	0	0	0	23
Volume Right	0	0	0	0	199	21
cSH	559	1700	1700	1700	1700	225
Volume to Capacity	0.03	0.23	0.23	0.45	0.34	0.20
Queue Length 95th (m)	0.7	0.0	0.0	0.0	0.0	5.4
Control Delay (s)	11.6	0.0	0.0	0.0	0.0	24.9
Lane LOS	B					C
Approach Delay (s)	0.2			0.0		24.9
Approach LOS						C
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			46.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

41: Franklin Ave & Marshall St

Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour





















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩		↩	
Volume (veh/h)	8	144	255	22	46	33
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	157	277	24	50	36
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (m)		200	311			
pX, platoon unblocked						
vC, conflicting volume	301				463	289
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	301				463	289
tC, single (s)	4.2				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.3
p0 queue free %	99				91	95
cM capacity (veh/h)	1205				541	748
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	165	301	86			
Volume Left	9	0	50			
Volume Right	0	24	36			
cSH	1205	1700	611			
Volume to Capacity	0.01	0.18	0.14			
Queue Length 95th (m)	0.2	0.0	3.7			
Control Delay (s)	0.5	0.0	11.8			
Lane LOS	A		B			
Approach Delay (s)	0.5	0.0	11.8			
Approach LOS			B			
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			26.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

43: Penhorwood St & Franklin Ave









Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	123	19	25	157	55	39	1	42	22	4	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	8	143	22	29	183	64	45	1	49	26	5	22
Pedestrians		1						7				
Lane Width (m)		3.7						3.7				
Walking Speed (m/s)		1.2						1.2				
Percent Blockage		0						1				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		394			116							
pX, platoon unblocked												
vC, conflicting volume	247			172			443	482	161	460	429	184
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	247			172			443	482	161	460	429	184
tC, single (s)	4.2			4.1			7.1	6.5	6.2	7.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.3			2.2			3.5	4.0	3.3	3.5	4.2	3.3
p0 queue free %	99			98			91	100	94	95	99	97
cM capacity (veh/h)	1252			1409			494	471	884	473	469	863
Direction, Lane #	EB 1	WB 1	WB 2	WB 3	NB 1	SB 1						
Volume Total	173	29	183	64	95	52						
Volume Left	8	29	0	0	45	26						
Volume Right	22	0	0	64	49	22						
cSH	1252	1409	1700	1700	638	584						
Volume to Capacity	0.01	0.02	0.11	0.04	0.15	0.09						
Queue Length 95th (m)	0.1	0.5	0.0	0.0	4.0	2.2						
Control Delay (s)	0.4	7.6	0.0	0.0	11.6	11.8						
Lane LOS	A	A			B	B						
Approach Delay (s)	0.4	0.8			11.6	11.8						
Approach LOS					B	B						
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			27.4%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

62: Hwy 63 SB ON Ramp/Hwy 63 SB OFF Ramp









Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	346	0	0	0	167	0
Sign Control	Free		Stop			Stop
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	376	0	0	0	182	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0		752	0	752	752
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		752	0	752	752
tC, single (s)	4.1		6.5	6.2	7.1	6.5
tC, 2 stage (s)						
tF (s)	2.2		4.0	3.3	3.5	4.0
p0 queue free %	77		100	100	32	100
cM capacity (veh/h)	1623		261	1085	268	261
Direction, Lane #	WB 1	SB 1				
Volume Total	376	182				
Volume Left	376	182				
Volume Right	0	0				
cSH	1623	268				
Volume to Capacity	0.23	0.68				
Queue Length 95th (m)	6.8	33.9				
Control Delay (s)	7.9	42.6				
Lane LOS	A	E				
Approach Delay (s)	7.9	42.6				
Approach LOS		E				
Intersection Summary						
Average Delay		19.2				
Intersection Capacity Utilization		35.1%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

Fort McMurray Lower Townsite

64: Hwy 63 NB OFF Ramp & Tolen Dr & Prairie Loop Boulevard & Hwy 63 NB ON Ramp












								
Movement	EBT	EBR	WBT	WBR	NBT	NBR	NWT	NWR
Right Turn Channelized								
Volume (veh/h)	167	50	346	238	50	445	50	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	182	54	376	259	54	484	54	54
Approach Volume (veh/h)	236		635		538		109	
Crossing Volume (veh/h)	0		163		236		720	
High Capacity (veh/h)	1385		1219		1151		782	
High v/c (veh/h)	0.17		0.52		0.47		0.14	
Low Capacity (veh/h)	1161		1011		949		621	
Low v/c (veh/h)	0.20		0.63		0.57		0.17	
Intersection Summary								
Maximum v/c High			0.52					
Maximum v/c Low			0.63					
Intersection Capacity Utilization			78.5%		ICU Level of Service			D

D2: INTERSECTION ANALYSIS PM PEAK HOUR - SIGNALIZED

HCM Signalized Intersection Capacity Analysis

Fort McMurray Lower Townsite

3: Hwy 63 SB-NB OFF & Franklin Ave/MacDonald Dr & Hwy 63 SB OFF Existing Conditions PM Peak Hour























					
Movement	EBR	NBL	NBT	SBT	NEL
Lane Configurations			 	 	
Volume (vph)	314	191	912	157	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		5.5	5.5	5.5
Lane Util. Factor	1.00		0.95	0.95	1.00
Frt	0.86		1.00	1.00	1.00
Flt Protected	1.00		0.99	1.00	0.95
Satd. Flow (prot)	1613		3589	3650	1690
Flt Permitted	1.00		0.84	1.00	0.95
Satd. Flow (perm)	1613		3048	3650	1690
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	341	208	991	171	158
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	341	0	1199	171	158
Heavy Vehicles (%)	3%	0%	1%	0%	8%
Turn Type	custom	custom	NA	NA	NA
Protected Phases			2 9	6	11
Permitted Phases	9 2	2			
Actuated Green, G (s)	89.1		89.1	66.8	14.9
Effective Green, g (s)	89.1		89.1	66.8	14.9
Actuated g/C Ratio	0.77		0.77	0.58	0.13
Clearance Time (s)				5.5	5.5
Vehicle Extension (s)				3.0	3.0
Lane Grp Cap (vph)	1249		2361	2120	218
v/s Ratio Prot				0.05	c0.09
v/s Ratio Perm	0.21		c0.39		
v/c Ratio	0.27		0.51	0.08	0.72
Uniform Delay, d1	3.7		4.8	10.6	48.1
Progression Factor	1.00		0.86	1.00	1.00
Incremental Delay, d2	0.1		0.2	0.1	11.3
Delay (s)	3.8		4.3	10.7	59.4
Level of Service	A		A	B	E
Approach Delay (s)			4.3	10.7	59.4
Approach LOS			A	B	E
Intersection Summary					
HCM 2000 Control Delay		9.5		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio		0.57			
Actuated Cycle Length (s)		115.0		Sum of lost time (s)	16.5
Intersection Capacity Utilization		61.2%		ICU Level of Service	B
Analysis Period (min)		15			
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis

4: Morrison St & Franklin Ave

Fort McMurray Lower Townsite













Existing Conditions PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	41	307	134	113	601	27	139	32	79	21	73	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	4.0	5.5	5.5		5.5	5.5		5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.95	
Frpb, ped/bikes	1.00	1.00	0.94	1.00	1.00	0.95		1.00	0.96		0.98	
Flpb, ped/bikes	0.99	1.00	1.00	0.99	1.00	1.00		0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		1.00	
Satd. Flow (prot)	1687	1865	1411	1772	1902	1490		1717	1549		3178	
Flt Permitted	0.38	1.00	1.00	0.47	1.00	1.00		0.55	1.00		0.92	
Satd. Flow (perm)	675	1865	1411	870	1902	1490		977	1549		2930	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	334	146	123	653	29	151	35	86	23	79	177
RTOR Reduction (vph)	0	0	69	0	0	10	0	0	63	0	130	0
Lane Group Flow (vph)	45	334	77	123	653	19	0	186	23	0	149	0
Confl. Peds. (#/hr)	12		30	30		12	14		11	11		14
Heavy Vehicles (%)	7%	3%	9%	2%	1%	4%	6%	9%	1%	10%	0%	1%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	61.0	61.0	61.0	73.7	73.7	73.7		30.3	30.3		30.3	
Effective Green, g (s)	61.0	61.0	61.0	73.7	73.7	73.7		30.3	30.3		30.3	
Actuated g/C Ratio	0.53	0.53	0.53	0.64	0.64	0.64		0.26	0.26		0.26	
Clearance Time (s)	5.5	5.5	5.5	4.0	5.5	5.5		5.5	5.5		5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	358	989	748	625	1218	954		257	408		771	
v/s Ratio Prot		0.18		0.01	c0.34							
v/s Ratio Perm	0.07		0.05	0.11		0.01		c0.19	0.01		0.05	
v/c Ratio	0.13	0.34	0.10	0.20	0.54	0.02		0.72	0.06		0.19	
Uniform Delay, d1	13.6	15.4	13.4	8.5	11.3	7.5		38.5	31.7		32.9	
Progression Factor	0.87	0.85	0.63	1.11	1.17	5.04		1.00	1.00		1.00	
Incremental Delay, d2	0.7	0.9	0.3	0.1	1.6	0.0		9.7	0.1		0.1	
Delay (s)	12.6	14.0	8.8	9.7	14.8	37.9		48.2	31.7		33.0	
Level of Service	B	B	A	A	B	D		D	C		C	
Approach Delay (s)		12.4			14.9			43.0			33.0	
Approach LOS		B			B			D			C	
Intersection Summary												
HCM 2000 Control Delay			20.9				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			115.0				Sum of lost time (s)			19.0		
Intersection Capacity Utilization			86.2%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Highway 63 & Morrison St






















Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	96	784	2010	65	419	1230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	6.0	6.0	5.5	6.0
Lane Util. Factor	1.00	1.00	0.95	1.00	0.97	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	1617	3476	1585	3437	1746
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1789	1617	3476	1585	3437	1746
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	852	2185	71	455	1337
RTOR Reduction (vph)	0	0	0	35	0	0
Lane Group Flow (vph)	104	852	2185	36	455	1337
Heavy Vehicles (%)	2%	1%	5%	3%	3%	10%
Turn Type	NA	Free	NA	Perm	Prot	NA
Protected Phases	4		6		5	2
Permitted Phases		Free		6		
Actuated Green, G (s)	9.2	90.0	45.4	45.4	18.4	69.3
Effective Green, g (s)	9.2	90.0	45.4	45.4	18.4	69.3
Actuated g/C Ratio	0.10	1.00	0.50	0.50	0.20	0.77
Clearance Time (s)	5.5		6.0	6.0	5.5	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	182	1617	1753	799	702	1344
v/s Ratio Prot	0.06		c0.63		0.13	c0.77
v/s Ratio Perm		c0.53		0.02		
v/c Ratio	0.57	0.53	1.25	0.04	0.65	0.99
Uniform Delay, d1	38.5	0.0	22.3	11.3	32.8	10.2
Progression Factor	1.00	1.00	0.49	0.04	1.00	1.00
Incremental Delay, d2	4.3	1.2	114.9	0.1	2.1	23.3
Delay (s)	42.8	1.2	125.7	0.6	34.9	33.5
Level of Service	D	A	F	A	C	C
Approach Delay (s)	5.8		121.8			33.9
Approach LOS	A		F			C
Intersection Summary						
HCM 2000 Control Delay			68.1		HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.17			
Actuated Cycle Length (s)			90.0		Sum of lost time (s)	17.0
Intersection Capacity Utilization			91.4%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

11: Main St & Franklin Ave























Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	387	20	37	669	21	42	15	46	31	15	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5			5.5	5.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.68	1.00	1.00	0.92		0.96			1.00	0.89
Flpb, ped/bikes	0.98	1.00	1.00	0.82	1.00	1.00		0.96			0.96	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.94			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.97	1.00
Satd. Flow (prot)	1688	1865	1103	1503	1902	1500		1614			1709	1449
Flt Permitted	0.37	1.00	1.00	0.53	1.00	1.00		0.85			0.69	1.00
Satd. Flow (perm)	657	1865	1103	831	1902	1500		1394			1222	1449
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	16	391	20	37	676	21	42	15	46	31	15	32
RTOR Reduction (vph)	0	0	4	0	0	4	0	30	0	0	0	29
Lane Group Flow (vph)	16	391	16	37	676	17	0	73	0	0	46	3
Confl. Peds. (#/hr)	24		119	119		24	46		40	40		46
Heavy Vehicles (%)	6%	3%	0%	0%	1%	0%	0%	0%	2%	6%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	91.7	91.7	91.7	91.7	91.7	91.7		12.3			12.3	12.3
Effective Green, g (s)	91.7	91.7	91.7	91.7	91.7	91.7		12.3			12.3	12.3
Actuated g/C Ratio	0.80	0.80	0.80	0.80	0.80	0.80		0.11			0.11	0.11
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5		5.5			5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	523	1487	879	662	1516	1196		149			130	154
v/s Ratio Prot		0.21			c0.36							
v/s Ratio Perm	0.02		0.01	0.04		0.01		c0.05			0.04	0.00
v/c Ratio	0.03	0.26	0.02	0.06	0.45	0.01		0.49			0.35	0.02
Uniform Delay, d1	2.4	3.0	2.4	2.5	3.7	2.4		48.4			47.7	46.0
Progression Factor	1.01	1.67	1.62	0.61	0.64	0.42		1.00			1.00	1.00
Incremental Delay, d2	0.1	0.4	0.0	0.1	0.9	0.0		2.5			1.7	0.1
Delay (s)	2.5	5.4	3.9	1.7	3.2	1.0		50.9			49.3	46.0
Level of Service	A	A	A	A	A	A		D			D	D
Approach Delay (s)		5.2			3.1			50.9			48.0	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			10.0				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			115.0				Sum of lost time (s)			11.0		
Intersection Capacity Utilization			88.4%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: Hardin St & Franklin Ave
















Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	368	67	245	576	229	78	77	195	74	101	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	4.0	5.5	5.5		5.5			5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		0.95			0.95	
Frpb, ped/bikes	1.00	1.00	0.89	1.00	1.00	0.97		0.98			0.99	
Flpb, ped/bikes	0.99	1.00	1.00	0.98	1.00	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.92			0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99			0.98	
Satd. Flow (prot)	1814	1883	1299	1754	1902	1459		3130			3346	
Flt Permitted	0.43	1.00	1.00	0.46	1.00	1.00		0.79			0.59	
Satd. Flow (perm)	826	1883	1299	859	1902	1459		2487			2019	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	18	391	71	261	613	244	83	82	207	79	107	34
RTOR Reduction (vph)	0	0	22	0	0	56	0	179	0	0	16	0
Lane Group Flow (vph)	18	391	49	261	613	188	0	193	0	0	204	0
Confl. Peds. (#/hr)	9		63	63		9	11		20	20		11
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	2%	12%	2%	1%	9%	0%	4%	4%	3%	5%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	74.5	74.5	74.5	88.5	88.5	88.5		15.5			15.5	
Effective Green, g (s)	74.5	74.5	74.5	88.5	88.5	88.5		15.5			15.5	
Actuated g/C Ratio	0.65	0.65	0.65	0.77	0.77	0.77		0.13			0.13	
Clearance Time (s)	5.5	5.5	5.5	4.0	5.5	5.5		5.5			5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	535	1219	841	738	1463	1122		335			272	
v/s Ratio Prot		0.21		0.03	c0.32							
v/s Ratio Perm	0.02		0.04	0.24		0.13		0.08			c0.10	
v/c Ratio	0.03	0.32	0.06	0.35	0.42	0.17		0.58			0.87dl	
Uniform Delay, d1	7.3	9.0	7.4	4.1	4.5	3.5		46.7			47.9	
Progression Factor	0.30	0.32	0.13	0.48	0.43	0.01		1.00			1.00	
Incremental Delay, d2	0.1	0.7	0.1	0.3	0.8	0.3		2.4			10.7	
Delay (s)	2.3	3.6	1.1	2.3	2.8	0.3		49.1			58.6	
Level of Service	A	A	A	A	A	A		D			E	
Approach Delay (s)		3.2			2.1			49.1			58.6	
Approach LOS		A			A			D			E	
Intersection Summary												
HCM 2000 Control Delay			16.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			115.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			87.3%				ICU Level of Service			E		
Analysis Period (min)			15									
dl Defacto Left Lane. Recode with 1 though lane as a left lane.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Highway 63 & Hardin St

Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	 		 		 	
Volume (vph)	158	462	1367	267	367	1190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	4.0	6.0	6.0	5.5	6.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3541	1601	3444	1617	3437	1715
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3541	1601	3444	1617	3437	1715
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	172	502	1486	290	399	1293
RTOR Reduction (vph)	0	0	0	138	0	0
Lane Group Flow (vph)	172	502	1486	152	399	1293
Heavy Vehicles (%)	0%	2%	6%	1%	3%	12%
Turn Type	NA	Free	NA	Perm	Prot	NA
Protected Phases	4		6		5	2
Permitted Phases		Free		6		
Actuated Green, G (s)	9.9	90.0	47.2	47.2	15.9	68.6
Effective Green, g (s)	9.9	90.0	47.2	47.2	15.9	68.6
Actuated g/C Ratio	0.11	1.00	0.52	0.52	0.18	0.76
Clearance Time (s)	5.5		6.0	6.0	5.5	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	389	1601	1806	848	607	1307
v/s Ratio Prot	0.05		0.43		0.12	c0.75
v/s Ratio Perm		c0.31		0.09		
v/c Ratio	0.44	0.31	0.82	0.18	0.66	0.99
Uniform Delay, d1	37.5	0.0	17.9	11.2	34.5	10.3
Progression Factor	1.00	1.00	1.00	1.00	0.88	1.31
Incremental Delay, d2	0.8	0.5	4.4	0.5	1.6	16.9
Delay (s)	38.3	0.5	22.3	11.7	31.8	30.5
Level of Service	D	A	C	B	C	C
Approach Delay (s)	10.1		20.6			30.8
Approach LOS	B		C			C
Intersection Summary						
HCM 2000 Control Delay			23.0		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			1.00			
Actuated Cycle Length (s)			90.0		Sum of lost time (s)	17.0
Intersection Capacity Utilization			78.9%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

17: Haineault St & Franklin Ave



















Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↑
Volume (vph)	611	103	194	894	186	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.90	1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3579	1414	1773	3579	1789	1530
Flt Permitted	1.00	1.00	0.36	1.00	0.95	1.00
Satd. Flow (perm)	3579	1414	679	3579	1789	1530
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	643	108	204	941	196	173
RTOR Reduction (vph)	0	40	0	0	0	146
Lane Group Flow (vph)	643	68	204	941	196	27
Confl. Peds. (#/hr)		31	31		57	27
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%
Turn Type	NA	Perm	pm+pt	NA	NA	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	72.9	72.9	86.1	86.1	17.9	17.9
Effective Green, g (s)	72.9	72.9	86.1	86.1	17.9	17.9
Actuated g/C Ratio	0.63	0.63	0.75	0.75	0.16	0.16
Clearance Time (s)	5.5	5.5	4.0	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2268	896	595	2679	278	238
v/s Ratio Prot	0.18		0.03	c0.26	c0.11	
v/s Ratio Perm		0.05	0.23			0.02
v/c Ratio	0.28	0.08	0.34	0.35	0.71	0.11
Uniform Delay, d1	9.4	8.1	4.5	4.9	46.0	41.7
Progression Factor	0.95	1.69	0.70	0.62	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.3	0.3	7.9	0.2
Delay (s)	9.2	13.8	3.5	3.4	53.9	41.9
Level of Service	A	B	A	A	D	D
Approach Delay (s)	9.9			3.4	48.3	
Approach LOS	A			A	D	
Intersection Summary						
HCM 2000 Control Delay			12.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.43			
Actuated Cycle Length (s)			115.0		Sum of lost time (s)	15.0
Intersection Capacity Utilization			59.6%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

19: Plaza/Father Mercredi St & Franklin Ave

Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	782	69	3	1076	59	46	13	2	97	9	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5			5.5			5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00			0.99	
Flpb, ped/bikes	0.98	1.00		0.98	1.00			0.98			0.99	
Frt	1.00	0.99		1.00	0.99			1.00			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.97	
Satd. Flow (prot)	1793	3510		1794	3518			1784			1664	
Flt Permitted	0.21	1.00		0.30	1.00			0.71			0.79	
Satd. Flow (perm)	395	3510		568	3518			1307			1360	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	823	73	3	1133	62	48	14	2	102	9	44
RTOR Reduction (vph)	0	4	0	0	2	0	0	1	0	0	14	0
Lane Group Flow (vph)	32	892	0	3	1193	0	0	63	0	0	141	0
Confl. Peds. (#/hr)	42		23	23		42	27		12	12		27
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	2%	2%	0%	2%	6%	2%	0%	0%	6%	22%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	86.6	86.6		86.6	86.6			17.4			17.4	
Effective Green, g (s)	86.6	86.6		86.6	86.6			17.4			17.4	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.15			0.15	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.5			5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	297	2643		427	2649			197			205	
v/s Ratio Prot		0.25			c0.34							
v/s Ratio Perm	0.08			0.01				0.05			c0.10	
v/c Ratio	0.11	0.34		0.01	0.45			0.32			0.69	
Uniform Delay, d1	3.8	4.7		3.5	5.3			43.5			46.2	
Progression Factor	0.56	0.48		0.41	0.43			1.00			1.00	
Incremental Delay, d2	0.7	0.3		0.0	0.5			0.9			9.3	
Delay (s)	2.9	2.6		1.5	2.8			44.5			55.5	
Level of Service	A	A		A	A			D			E	
Approach Delay (s)		2.6			2.8			44.5			55.5	
Approach LOS		A			A			D			E	
Intersection Summary												
HCM 2000 Control Delay			7.3			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			115.0			Sum of lost time (s)			11.0			
Intersection Capacity Utilization			58.8%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

22: Plaza/Scotia Bank & Franklin Ave

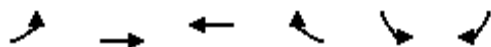
Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Volume (vph)	25	784	49	104	1063	74	70	11	100	57	15	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	4.0	5.5			5.5			5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.92	1.00	0.99			0.98			0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00			1.00			1.00	
Frt	1.00	1.00	0.85	1.00	0.99			0.93			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1802	3614	1499	1783	3528			1685			1740	
Flt Permitted	0.23	1.00	1.00	0.29	1.00			0.77			0.67	
Satd. Flow (perm)	435	3614	1499	536	3528			1331			1193	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	27	843	53	112	1143	80	75	12	108	61	16	62
RTOR Reduction (vph)	0	0	19	0	3	0	0	44	0	0	29	0
Lane Group Flow (vph)	27	843	34	112	1220	0	0	151	0	0	110	0
Confl. Peds. (#/hr)	24		22	22		24	10		14	14		10
Heavy Vehicles (%)	0%	1%	0%	2%	2%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	74.8	74.8	74.8	86.3	86.3			17.7			17.7	
Effective Green, g (s)	74.8	74.8	74.8	86.3	86.3			17.7			17.7	
Actuated g/C Ratio	0.65	0.65	0.65	0.75	0.75			0.15			0.15	
Clearance Time (s)	5.5	5.5	5.5	4.0	5.5			5.5			5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	282	2350	975	483	2647			204			183	
v/s Ratio Prot		0.23		0.02	c0.35							
v/s Ratio Perm	0.06		0.02	0.16				c0.11			0.09	
v/c Ratio	0.10	0.36	0.04	0.23	0.46			0.74			0.60	
Uniform Delay, d1	7.5	9.2	7.2	4.5	5.5			46.5			45.4	
Progression Factor	0.55	0.55	0.03	0.60	0.55			1.00			1.00	
Incremental Delay, d2	0.6	0.4	0.1	0.2	0.5			13.4			5.5	
Delay (s)	4.8	5.4	0.2	2.9	3.5			59.9			50.9	
Level of Service	A	A	A	A	A			E			D	
Approach Delay (s)		5.1			3.5			59.9			50.9	
Approach LOS		A			A			E			D	
Intersection Summary												
HCM 2000 Control Delay			10.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			115.0			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			71.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

27: Franklin Ave & Riedel St

Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour






















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	204	718	960	30	64	528
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	5.5	5.5	5.5
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.92	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1807	3579	3614	1499	1825	1580
Flt Permitted	0.19	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	365	3579	3614	1499	1825	1580
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	212	748	1000	31	67	550
RTOR Reduction (vph)	0	0	0	8	0	181
Lane Group Flow (vph)	212	748	1000	23	67	369
Confl. Peds. (#/hr)	22			22	9	9
Heavy Vehicles (%)	1%	2%	1%	0%	0%	1%
Turn Type	pm+pt	NA	NA	Perm	NA	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	74.4	74.4	60.1	60.1	29.6	29.6
Effective Green, g (s)	74.4	74.4	60.1	60.1	29.6	29.6
Actuated g/C Ratio	0.65	0.65	0.52	0.52	0.26	0.26
Clearance Time (s)	4.0	5.5	5.5	5.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	365	2315	1888	783	469	406
v/s Ratio Prot	c0.05	0.21	0.28		0.04	
v/s Ratio Perm	c0.32			0.02		c0.23
v/c Ratio	0.58	0.32	0.53	0.03	0.14	0.91
Uniform Delay, d1	11.3	9.1	18.1	13.3	32.9	41.4
Progression Factor	0.97	0.78	0.73	0.56	1.00	1.00
Incremental Delay, d2	2.3	0.4	1.0	0.1	0.1	23.5
Delay (s)	13.3	7.4	14.2	7.5	33.1	64.9
Level of Service	B	A	B	A	C	E
Approach Delay (s)		8.7	14.0		61.4	
Approach LOS		A	B		E	
Intersection Summary						
HCM 2000 Control Delay			23.3		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.69			
Actuated Cycle Length (s)			115.0		Sum of lost time (s)	15.0
Intersection Capacity Utilization			69.3%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

29: Alberta Dr/Plaza & Franklin Ave

Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	137	576	28	68	687	104	31	18	39	36	9	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5	5.5		5.5			5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.94		0.97			0.97	
Flpb, ped/bikes	1.00	1.00		0.99	1.00	1.00		0.99			0.99	
Frt	1.00	0.99		1.00	1.00	0.85		0.94			0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1818	3579		1562	3614	1531		1490			1673	
Flt Permitted	0.34	1.00		0.40	1.00	1.00		0.76			0.82	
Satd. Flow (perm)	643	3579		654	3614	1531		1155			1399	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	151	633	31	75	755	114	34	20	43	40	10	70
RTOR Reduction (vph)	0	2	0	0	0	35	0	29	0	0	52	0
Lane Group Flow (vph)	151	662	0	75	755	79	0	68	0	0	68	0
Confl. Peds. (#/hr)	21		25	25		21	19		31	31		19
Heavy Vehicles (%)	0%	1%	0%	16%	1%	0%	3%	0%	31%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	89.7	82.1		85.5	80.0	80.0		12.4			12.4	
Effective Green, g (s)	89.7	82.1		85.5	80.0	80.0		12.4			12.4	
Actuated g/C Ratio	0.78	0.71		0.74	0.70	0.70		0.11			0.11	
Clearance Time (s)	4.0	5.5		4.0	5.5	5.5		5.5			5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	579	2555		529	2514	1065		124			150	
v/s Ratio Prot	c0.02	0.18		0.01	c0.21							
v/s Ratio Perm	0.19			0.10		0.05		c0.06			0.05	
v/c Ratio	0.26	0.26		0.14	0.30	0.07		0.54			0.46	
Uniform Delay, d1	3.3	5.8		4.0	6.7	5.6		48.6			48.1	
Progression Factor	0.94	0.56		0.38	0.30	0.08		1.00			1.00	
Incremental Delay, d2	0.2	0.2		0.1	0.3	0.1		4.8			2.2	
Delay (s)	3.3	3.5		1.6	2.3	0.5		53.4			50.3	
Level of Service	A	A		A	A	A		D			D	
Approach Delay (s)		3.4			2.0			53.4			50.3	
Approach LOS		A			A			D			D	























Intersection Summary

HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

31: Hospital St & Franklin Ave



















Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	137	268	258	138	390	52	353	341	144	33	319	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5		4.0	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.91	0.91		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.92	1.00	0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	0.98	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.99		0.95	1.00	
Satd. Flow (prot)	1615	3614	1469	1767	3520		1628	3235		1759	3298	
Flt Permitted	0.40	1.00	1.00	0.52	1.00		0.95	0.77		0.42	1.00	
Satd. Flow (perm)	683	3614	1469	963	3520		1628	2518		786	3298	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	141	276	266	142	402	54	364	352	148	34	329	139
RTOR Reduction (vph)	0	0	195	0	9	0	0	27	0	0	40	0
Lane Group Flow (vph)	141	276	71	142	447	0	288	549	0	34	428	0
Confl. Peds. (#/hr)	37		54	54		37	26		13	13		26
Heavy Vehicles (%)	12%	1%	2%	1%	1%	2%	2%	3%	1%	3%	2%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA		Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4		4	8						6		
Actuated Green, G (s)	37.8	30.8	30.8	41.2	32.5		22.2	60.5		34.3	34.3	
Effective Green, g (s)	37.8	30.8	30.8	41.2	32.5		22.2	60.5		34.3	34.3	
Actuated g/C Ratio	0.33	0.27	0.27	0.36	0.28		0.19	0.53		0.30	0.30	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5		4.0	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	281	967	393	405	994		314	1463		234	983	
v/s Ratio Prot	c0.03	0.08		c0.03	0.13		c0.18	0.07			c0.13	
v/s Ratio Perm	c0.13		0.05	0.10				0.12		0.04		
v/c Ratio	0.50	0.29	0.18	0.35	0.45		0.92	0.37		0.15	0.44	
Uniform Delay, d1	28.8	33.4	32.4	25.8	33.9		45.5	16.1		29.6	32.5	
Progression Factor	1.36	1.27	4.55	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.7	1.0	0.5	1.5		30.1	0.2		0.3	0.3	
Delay (s)	40.6	43.2	148.4	26.3	35.4		75.6	16.2		29.9	32.9	
Level of Service	D	D	F	C	D		E	B		C	C	
Approach Delay (s)		83.6			33.2			36.0			32.7	
Approach LOS		F			C			D			C	
Intersection Summary												
HCM 2000 Control Delay			47.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			115.0			Sum of lost time (s)				19.0		
Intersection Capacity Utilization			84.6%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

34: Hwy 63 NB OFF/Hwy 63 NB ON & Hospital St













Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	180	579	0	0	517	336	179	0	210	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95	1.00			
Frt	1.00	1.00			0.94		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (prot)	1789	3579			3367		1700	1700	1601			
Flt Permitted	0.25	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (perm)	472	3579			3367		1700	1700	1601			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	629	0	0	562	365	195	0	228	0	0	0
RTOR Reduction (vph)	0	0	0	0	182	0	0	0	157	0	0	0
Lane Group Flow (vph)	196	629	0	0	745	0	97	98	71	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)	29.7	29.7			29.7		19.0	19.0	19.0			
Effective Green, g (s)	29.7	29.7			29.7		19.0	19.0	19.0			
Actuated g/C Ratio	0.49	0.49			0.49		0.31	0.31	0.31			
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)	230	1751			1647		532	532	501			
v/s Ratio Prot		0.18			0.22							
v/s Ratio Perm	c0.41						0.06	0.06	0.04			
v/c Ratio	0.85	0.36			0.45		0.18	0.18	0.14			
Uniform Delay, d1	13.6	9.6			10.2		15.2	15.2	15.0			
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00			
Incremental Delay, d2	24.9	0.1			0.2		0.8	0.8	0.6			
Delay (s)	38.5	9.7			10.4		15.9	16.0	15.6			
Level of Service	D	A			B		B	B	B			
Approach Delay (s)		16.6			10.4			15.8			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			13.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			60.7				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			65.1%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: PXO & Franklin Ave






















Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations		↑↑			↑↑							
Volume (vph)	0	445	0	0	580	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5			5.5							
Lane Util. Factor		0.95			0.95							
Flt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3579			3579							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3579			3579							
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	484	0	0	630	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	484	0	0	630	0	0	0	0	0	0	0
Turn Type		NA			NA							
Protected Phases		4			8							
Permitted Phases												
Actuated Green, G (s)		15.7			15.7							
Effective Green, g (s)		15.7			15.7							
Actuated g/C Ratio		1.00			1.00							
Clearance Time (s)		5.5			5.5							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		3579			3579							
v/s Ratio Prot		0.14			0.18							
v/s Ratio Perm												
v/c Ratio		0.14			0.18							
Uniform Delay, d1		0.0			0.0							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.0			0.0							
Delay (s)		0.0			0.0							
Level of Service		A			A							
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			0.0		HCM 2000 Level of Service				A			
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			15.7		Sum of lost time (s)				11.0			
Intersection Capacity Utilization			20.6%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

38: King St & Franklin Ave
























Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	112	112	54	164	31	149	91	25	28	165	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5			5.5	5.5		5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	0.99			1.00	0.97		1.00	
Flpb, ped/bikes	0.99	1.00	1.00	0.98	1.00			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.99	
Satd. Flow (prot)	1814	1865	1528	1789	1835			1846	1585		1830	
Flt Permitted	0.62	1.00	1.00	0.68	1.00			0.60	1.00		0.94	
Satd. Flow (perm)	1192	1865	1528	1273	1835			1144	1585		1725	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	41	123	123	59	180	34	164	100	27	31	181	51
RTOR Reduction (vph)	0	0	68	0	4	0	0	0	19	0	10	0
Lane Group Flow (vph)	41	123	55	59	210	0	0	264	8	0	253	0
Confl. Peds. (#/hr)	7		19	19		7	10		7	7		10
Heavy Vehicles (%)	0%	3%	1%	0%	2%	0%	1%	0%	0%	4%	1%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	37.0	33.5	33.5	37.2	33.6			22.6	22.6		22.6	
Effective Green, g (s)	37.0	33.5	33.5	37.2	33.6			22.6	22.6		22.6	
Actuated g/C Ratio	0.50	0.45	0.45	0.50	0.45			0.30	0.30		0.30	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5			5.5	5.5		5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	619	836	685	658	825			346	479		521	
v/s Ratio Prot	0.00	0.07		c0.00	c0.11							
v/s Ratio Perm	0.03		0.04	0.04				c0.23	0.01		0.15	
v/c Ratio	0.07	0.15	0.08	0.09	0.25			0.76	0.02		0.49	
Uniform Delay, d1	9.7	12.2	11.8	9.7	12.8			23.6	18.3		21.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.4	0.2	0.1	0.7			9.6	0.0		0.7	
Delay (s)	9.8	12.5	12.0	9.8	13.5			33.2	18.3		22.0	
Level of Service	A	B	B	A	B			C	B		C	
Approach Delay (s)		11.9			12.7			31.8			22.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			19.7			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			74.7			Sum of lost time (s)			19.0			
Intersection Capacity Utilization			69.2%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

46: Prairie Loop Blvd & Franklin Ave

















Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	26	111	21	21	6	148	161	27	16	145	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5		5.5	5.5	5.5	5.5	5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1815	3650	1577	1529	3520		1807	3444	1505	1720	3485	
Flt Permitted	0.74	1.00	1.00	0.74	1.00		0.64	1.00	1.00	0.65	1.00	
Satd. Flow (perm)	1410	3650	1577	1189	3520		1220	3444	1505	1169	3485	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	23	27	116	22	22	6	154	168	28	17	151	24
RTOR Reduction (vph)	0	0	102	0	5	0	0	0	7	0	6	0
Lane Group Flow (vph)	23	27	14	22	23	0	154	168	21	17	169	0
Confl. Peds. (#/hr)	7		4	4		7			2	2		
Heavy Vehicles (%)	0%	0%	2%	19%	0%	0%	1%	6%	7%	6%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)	10.0	10.0	10.0	10.0	10.0		64.7	64.7	64.7	64.7	64.7	
Effective Green, g (s)	10.0	10.0	10.0	10.0	10.0		64.7	64.7	64.7	64.7	64.7	
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12		0.75	0.75	0.75	0.75	0.75	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5		5.5	5.5	5.5	5.5	5.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	164	425	184	138	410		921	2600	1136	882	2631	
v/s Ratio Prot		0.01			0.01			0.05			0.05	
v/s Ratio Perm	0.02		0.01	c0.02			c0.13		0.01	0.01		
v/c Ratio	0.14	0.06	0.07	0.16	0.06		0.17	0.06	0.02	0.02	0.06	
Uniform Delay, d1	34.0	33.7	33.7	34.1	33.7		2.9	2.7	2.6	2.6	2.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1	0.2	0.5	0.1		0.4	0.0	0.0	0.0	0.0	
Delay (s)	34.4	33.7	33.9	34.6	33.7		3.3	2.8	2.6	2.7	2.8	
Level of Service	C	C	C	C	C		A	A	A	A	A	
Approach Delay (s)		33.9			34.1			3.0			2.7	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			11.8			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.17									
Actuated Cycle Length (s)			85.7			Sum of lost time (s)			11.0			
Intersection Capacity Utilization			60.9%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

52: Hwy 63 SB ON/Hwy 63 SB OFF & Hospital St

Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	404	89	234	462	0	0	0	0	355	0	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0					6.0	6.0	
Lane Util. Factor		0.95			0.95					0.91	0.91	
Frt		0.97			1.00					1.00	0.91	
Flt Protected		1.00			0.98					0.95	0.98	
Satd. Flow (prot)		3481			3519					1628	3070	
Flt Permitted		1.00			0.65					0.95	0.98	
Satd. Flow (perm)		3481			2343					1628	3070	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	439	97	254	502	0	0	0	0	386	0	228
RTOR Reduction (vph)	0	28	0	0	0	0	0	0	0	0	136	0
Lane Group Flow (vph)	0	508	0	0	756	0	0	0	0	212	266	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		28.0			28.0					27.3	27.3	
Effective Green, g (s)		28.0			28.0					27.3	27.3	
Actuated g/C Ratio		0.42			0.42					0.41	0.41	
Clearance Time (s)		6.0			6.0					6.0	6.0	
Vehicle Extension (s)		3.0			3.0					3.0	3.0	
Lane Grp Cap (vph)		1448			974					660	1245	
v/s Ratio Prot		0.15										
v/s Ratio Perm					c0.32					c0.13	0.09	
v/c Ratio		0.35			0.78					0.32	0.21	
Uniform Delay, d1		13.4			16.9					13.7	13.0	
Progression Factor		1.00			1.00					1.00	1.00	
Incremental Delay, d2		0.1			3.9					1.3	0.4	
Delay (s)		13.6			20.9					15.0	13.4	
Level of Service		B			C					B	B	
Approach Delay (s)		13.6			20.9			0.0			13.9	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			16.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			67.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			61.1%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

D3: HIGHWAY 63 INTERSECTION LEVEL OF SERVICE

HCM Signalized Intersection Capacity Analysis

8: Morrison St & Highway 63













Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	84	257	1901	81	101	437
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.5	4.0	6.0	6.0	5.5	6.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3225	1488	3293	1488	3225	1750
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3225	1488	3293	1488	3225	1750
Peak-hour factor, PHF	0.70	0.61	0.95	0.84	0.90	0.92
Adj. Flow (vph)	120	421	2001	96	112	475
RTOR Reduction (vph)	0	0	0	20	0	0
Lane Group Flow (vph)	120	421	2001	76	112	475
Heavy Vehicles (%)	4%	4%	5%	4%	4%	4%
Turn Type	Free		Perm		Prot	
Protected Phases	4		6		5	2
Permitted Phases		Free		6		
Actuated Green, G (s)	12.0	230.0	183.0	183.0	18.0	206.5
Effective Green, g (s)	12.0	230.0	183.0	183.0	18.0	206.5
Actuated g/C Ratio	0.05	1.00	0.80	0.80	0.08	0.90
Clearance Time (s)	5.5		6.0	6.0	5.5	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	168	1488	2620	1184	252	1571
v/s Ratio Prot	c0.04		c0.61		c0.03	0.27
v/s Ratio Perm		0.28		0.05		
v/c Ratio	0.71	0.28	0.76	0.06	0.44	0.30
Uniform Delay, d1	107.3	0.0	12.2	5.1	101.2	1.6
Progression Factor	0.96	1.00	0.49	0.35	1.00	1.00
Incremental Delay, d2	13.2	0.5	1.7	0.1	1.3	0.5
Delay (s)	116.3	0.5	7.7	1.9	102.5	2.1
Level of Service	F	A	A	A	F	A
Approach Delay (s)	26.2		7.4			21.3
Approach LOS	C		A			C
Intersection Summary						
HCM Average Control Delay			13.1		HCM Level of Service	B
HCM Volume to Capacity ratio			0.73			
Actuated Cycle Length (s)			230.0		Sum of lost time (s)	17.0
Intersection Capacity Utilization			71.7%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

16: Hardin St & Highway 63







Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	164	296	1669	176	205	317
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	5.5	4.0	6.0	6.0	5.5	6.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3288	1517	3293	1502	3257	1733
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3288	1517	3293	1502	3257	1733
Peak-hour factor, PHF	0.76	0.80	0.98	0.92	0.97	0.94
Adj. Flow (vph)	216	370	1703	191	211	337
RTOR Reduction (vph)	0	0	0	48	0	0
Lane Group Flow (vph)	216	370	1703	143	211	337
Heavy Vehicles (%)	2%	2%	5%	3%	3%	5%
Turn Type	Free		Perm		Prot	
Protected Phases	4		6		5	2
Permitted Phases		Free		6		
Actuated Green, G (s)	20.2	230.0	172.6	172.6	20.2	198.3
Effective Green, g (s)	20.2	230.0	172.6	172.6	20.2	198.3
Actuated g/C Ratio	0.09	1.00	0.75	0.75	0.09	0.86
Clearance Time (s)	5.5		6.0	6.0	5.5	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	289	1517	2471	1127	286	1494
v/s Ratio Prot	c0.07		c0.52		c0.06	0.19
v/s Ratio Perm		0.24		0.10		
v/c Ratio	0.75	0.24	0.69	0.13	0.74	0.23
Uniform Delay, d1	102.4	0.0	14.8	7.9	102.3	2.7
Progression Factor	1.01	1.00	1.00	1.00	0.88	1.04
Incremental Delay, d2	9.8	0.4	1.6	0.2	9.0	0.3
Delay (s)	113.3	0.4	16.4	8.2	99.4	3.1
Level of Service	F	A	B	A	F	A
Approach Delay (s)	42.0		15.6			40.2
Approach LOS	D		B			D
Intersection Summary						
HCM Average Control Delay			25.2	HCM Level of Service		C
HCM Volume to Capacity ratio			0.70			
Actuated Cycle Length (s)			230.0	Sum of lost time (s)		17.0
Intersection Capacity Utilization			82.0%	ICU Level of Service		E
Analysis Period (min)			15			
c Critical Lane Group						

D4: HIGHWAY 63 QUEUES







Queues
8: Morrison St & Highway 63

Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	120	421	2001	96	112	475
v/c Ratio	0.72	0.28	0.76	0.08	0.44	0.30
Control Delay	125.8	0.5	7.9	0.4	107.2	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	125.8	0.5	7.9	0.4	107.2	2.2
Queue Length 50th (m)	28.6	0.0	68.0	0.2	26.0	24.8
Queue Length 95th (m)	32.2	0.0	65.0	1.4	38.5	30.9
Internal Link Dist (m)	116.5		151.7			289.4
Turn Bay Length (m)		30.0		150.0		
Base Capacity (vph)	175	1488	2621	1204	512	1571
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.28	0.76	0.08	0.22	0.30
Intersection Summary						

Queues
16: Hardin St & Highway 63

Fort McMurray Lower Townsite
Existing Conditions PM Peak Hour

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	216	370	1703	191	211	337
v/c Ratio	0.75	0.24	0.69	0.16	0.74	0.23
Control Delay	119.1	0.4	17.4	1.3	105.0	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.1	0.4	17.4	1.3	105.0	3.3
Queue Length 50th (m)	51.8	0.0	202.2	0.0	50.8	14.5
Queue Length 95th (m)	56.5	0.0	260.4	8.3	60.5	57.9
Internal Link Dist (m)	364.2		389.0			113.5
Turn Bay Length (m)		30.0		140.0	200.0	
Base Capacity (vph)	350	1517	2472	1175	375	1495
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.24	0.69	0.16	0.56	0.23
Intersection Summary						

D5: HIGHWAY 63 ARTERIAL LEVEL OF SERVICE

Arterial Level of Service: NB Highway 63

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (km)	Arterial Speed	Arterial LOS
Hardin St	II	70	26.7	17.4	44.1	0.41	33.7	D
Morrison St	II	70	28.3	7.9	36.2	0.46	45.7	B
Total	II		55.0	25.3	80.3	0.87	39.1	C

Arterial Level of Service: SB Highway 63

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (km)	Arterial Speed	Arterial LOS
Morrison St	II	70	21.2	2.2	23.4	0.31	48.2	B
Hardin St	II	70	28.3	3.3	31.6	0.46	52.3	B
Total	II		49.5	5.5	55.0	0.77	50.6	B



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