CITY OF Lethbridge

2023 Transportation Master Plan Detailed Technical Report

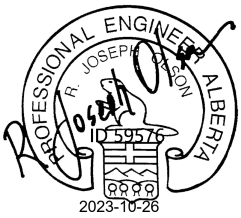
October 25, 2023

Final Submission

CITY OF LETHBRIDGE · 1890 · 1906 · GATEWAY TO OPPORTUNITY

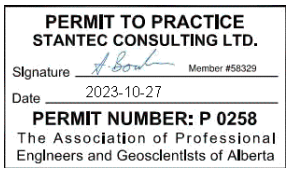
This document entitled Transportation Master Plan Detailed Technical Report Plan was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of The City of Lethbridge (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of the decisions made or actions taken based on this document.

Prepared by:



Joe Olson, P.Eng., PTOE
Project Manager

Stantec Permit to Practice:



Quality Review By:

Angela Forsyth, P. Eng.
Transportation Engineer

Independent Review By:

Digitally signed by Oliver, Stephen
Date: 2023.10.25 16:19:38 -04'00'

Stephen Oliver,
Senior Planner

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date
01	Draft 1	J. Olson	Dec 05/22	--		--	
02	Draft 2	J. Olson	Feb 13/23	M. Worona	Feb 13/23	J. Workman	Mar 07/23
03	Final Draft	J. Olson	Jul 17/23	A. Forsyth	Jul 18/23	N. Kelly	Jul 20/23
04	Final	J. Olson	Sept 20/23	A. Forsyth	Sept 20/23	S. Oliver	Sept 25/23

Table of Contents

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

LAND ACKNOWLEDGEMENTS

The City of Lethbridge acknowledges that we are living on the lands of the Blackfoot people of the Canadian Plains and pays respect to the Blackfoot people past, present and future while recognizing and respecting their cultural heritage, beliefs, and relationship to the land. The City of Lethbridge is also home to the Métis Nation of Alberta, Region III.

COMMUNITY ACKNOWLEDGEMENTS

Thank you to all participants that contributed to this plan and for their time and perspectives during the process. In particular, the project team appreciates the support and guidance from the Kainai, Piikani, and Siksika Nations, members of the Reconciliation Lethbridge Advisory Committee and Mi'kai'sto Red Crow Community College.

CONTRIBUTORS ACKNOWLEDGEMENTS

The City of Lethbridge Transportation Master Plan (TMP) is the product of the feedback and input of many City of Lethbridge Internal Departments, community stakeholders, Indigenous Community partners, and the public. The policy direction and focus of the TMP was shaped by the guidance provided by Lethbridge City Council over 2 workshops held in 2021 and 2022.

CITY OF LETHBRIDGE CORE PROJECT TEAM

Adam St. Amant, Transportation
Ahmed Ali, Transportation
Echo Nowak, Indigenous Relations
Janet Gutsell, Planning and Design
Kaitlin Barr, Engagement
Nick Kuhl, Communications
Tyson Boylan, Planning and Design

CITY COUNCIL

Belinda Crowson
Blaine Hyggen
Chris Spearman
Jeff Carlson
Jeff Coffman
Jenn Schmidt-Rempel
Joe Mauro
John Middleton-Hope
Mark Campbell
Nick Paladino
Rajko Dodic
Rob Miyashiro
Ryan Parker

CONSULTANT TEAM

Stantec

Joe Olson, Project Manger
Angela Forsyth, Deputy Project Manager
Bart Zacher, Transportation Engineer
Josh Workman, Corporate Support
Matthew Worona, Transportation Planner
Stephen Oliver, Transportation Planner
Noah Kelly, Transportation Engineer
Nathan Friesen, Document Control

argyle: *Engagement Services*

Maia Schor
Rhianne Fiolka

NELSON NYGAARD *Active Transportation & Transit Services*

Paul Lutey
Lee Miller

level PLAYING FIELD an accessibility agency *Accessibility Services*

Darby Lee Young
Jesika Lindley

CITY OF LETHBRIDGE SUPPORT

Abby Slovack	Darwin Juell	Lloyd Brierley
Andrew Sommerville	Dave Ellis	Lori Harasem
Amy Wehlage	David Sarsfield	Lori McLain
Andrew Malcolm	Doug Hawkins	Mandy Parker
Blair Richter	Doug Kaupp	Matthew Harker
Bradley McLeod	Gareth Jones	Maureen Gaehring
Brian Loewen	Heath Wright	Omer Gobeil
Bryce Dudley	James Nicholls	Pam Beebe
Burns Hill	Jason Price	Perry Stein
Byron Buzunis	Jeff Gillette	Richard Brummund
Cameron Prince	Jeff Koshuta	Robin Harper
Charlene Bruised Head-Mountain Horse	Joel McDonald	Ryan Westerson
Chris Demory	Joel Sanchez	Spencer Croil
Chris Witkowski	Juliane Ruck	Tara Grindle
Coreen Putman	Karen Carney	Taunya Pickles
Craig Dalton	Karen Iwaasa	Timothy Sanderson
Craig Richter	Kerry Boogaart	Trevor Nelson
Crystal Sheit	Kevin Ponech	Tymmarah Mackie
Daniel Lomness	Lawrence Canning	Vicky Bennett

GLOSSARY OF TERMS

ASP: Area Structure Plan, a statutory planning document that outlines the land use and infrastructure plans for a specific area.

BPR: Boundary Representation, a method of showing the spatial boundaries of objects or areas in a geographic information system (GIS).

DRZ: Demand Response Zones, geographic areas where microtransit services are provided on an on-demand basis.

EB: Eastbound, a direction of travel towards the east.

HBO: Home-Based-Office trip, a type of trip where a person travels from their home to their office.

HBSc: Home-Based-School trip, a type of trip where a person travels from their home to their school.

HBW: Home-Based-Work trip, a type of trip where a person travels from their home to their place of work.

LBS: Location Based Services, a type of service that uses the location of a device or person to provide relevant information or services

LOS: Level of Service, a measure of the quality of service provided by a transportation facility, often based on factors such as travel time, speed, and congestion.

MaaS: Mobility as a Service, a transportation concept that integrates different modes of transportation into a single mobility service, often through a digital platform. MaaS aims to provide travelers with a seamless and convenient transportation experience, by allowing them to plan, book, and pay for their trips using a single app or service. MaaS can include various modes of transportation such as public transit, ride-hailing, bike-sharing, car-sharing, and more.

MAMP: Mobility/Accessibility Master Plan, a planning document that outlines the goals and strategies for improving mobility and accessibility for all modes of transportation in a particular area.

Microtransit is a form of on-demand transportation that uses smaller vehicles, such as vans or minibuses, to provide point-to-point service within a defined service area. Unlike traditional fixed-route transit systems, microtransit services are typically demand-responsive, meaning that they operate only when there is a request from a passenger. Microtransit services are often provided through a digital platform or app, allowing users to request a ride, track the vehicle in real-time, and pay for the service through their mobile device. Microtransit can be used to complement existing transit systems or provide service to areas with low demand or limited access to public transportation.

NB: Northbound, a direction of travel towards the north.

NCHRP: National Cooperative Highway Research Program, a research program that provides funding for transportation research in the United States.

NHB: Non-Home-Based trip, a type of trip that does not start or end at home, such as a recreational or shopping trip.

OD: Origin-Destination, a pair of points representing the starting location and the destination of a trip, often used in transportation planning and traffic analysis.

OP: Outline Plan, a planning document that provides a more specific planning framework for an area included within an ASP and conforms to the general principles and concepts established in the ASP.

PEFM: Population and Employment Forecast Model, a model used to predict the future population and employment growth of a particular area.

RMSE: Root Mean Square Error, a statistical measure used to evaluate the accuracy of a prediction or estimate.

RRFB: Rectangular Rapid Flashing Beacon, a type of pedestrian crossing signal that uses flashing lights activated by a pedestrian to alert drivers of the presence of pedestrians.

SB: Southbound, a direction of travel towards the south.

TAZ: Transportation Analysis Zone, a geographic unit used in transportation planning and modeling to divide a study area into smaller sub-areas for analysis.

TDM: Travel Demand Management, a set of strategies aimed at reducing the demand for single-occupancy vehicle trips, such as promoting public transportation, carpooling, or telecommuting.

TMC: Traffic Management Centre, a facility where traffic monitoring, control, and management are conducted. TMCs are typically responsible for monitoring traffic conditions, responding to incidents, and supplying real-time traffic information to the public.

TMP: Transportation Master Plan, a long-term plan that outlines the goals, strategies, and actions for improving the transportation system in a particular area.

TWSI: Tactile Walking Surface Indicator, a raised pattern on the ground used to indicate the presence of a pedestrian crossing.

V/C: Volume-to-Capacity Ratio, a measure of the level of congestion on a transportation facility, calculated as the ratio of the traffic volume to the facility's capacity.

VDF: Volume-Delay Function, a mathematical model used to estimate the delay experienced by vehicles on a roadway based on the traffic volume.

VHT: Vehicle Hours Travelled, a measure of the time spent by vehicles on the road in a particular area.

VKT: Vehicle Kilometers Travelled, a measure of the distance traveled by vehicles in a particular area.

WB: Westbound, a direction of travel towards the west.

WFH: Work from Home, a type of employment arrangement where employees work from their home instead of commuting to an office.

EXECUTIVE SUMMARY

E.1 Introduction

The Lethbridge Transportation Master Plan

The 2023 Transportation Master Plan (TMP) is a document that looks at how transportation systems work across the City of Lethbridge (the City). The goal of the TMP is to improve the current transportation network and ensure it meets the needs of people now and in the future. This means creating safe systems for getting around and getting people where they need to go, whether by walking, biking, driving, or other means. The Plan considers new technologies and ideas for improving transportation and listens to the opinions of the public to support their mobility needs. The Plan sets priorities for what needs to be done, suggests policies and actions to make them happen, and gives an idea of how much it may cost to inform the City's future capital and operating budgets.

The TMP is guided by a vision statement approved by City Council with nine strategic goals supporting the vision. Twelve lenses are used to provide different perspectives to create policies for several areas.

Vision Statement

The Civic Works Standing Policy Committee created a Vision Statement for the Lethbridge TMP, which City Council approved on April 20, 2021:

> *Connect Lethbridge with a well-balanced, integrated and maintained transportation network that serves all residents, businesses, and visitors safely, efficiently, and equitably while focusing on sustainable multi-modal solutions that are adaptable to the future needs of the City and is embraced by the community.*

TMP Goals

Further, the following nine strategic goals were developed to support the TMP's Vision Statement:

- Strengthen connectivity between a variety of places, services, and modes.
- Recognize and meet the diverse mobility/accessibility needs of all residents, businesses and visitors.
- Strive for zero transportation-related deaths and serious injuries.
- Affirm the City's commitment to public transit and active modes of transportation.
- Respond to the current and future needs of Lethbridge and the region.
- Design transportation systems that are adaptable and resilient to future climate realities.
- Design transportation infrastructure that contributes to a healthy environment and ecosystem function.
- Leverage technologies and innovations to increase transportation efficiency, improve value and enhance services.
- Ensure future transportation investments are financially sustainable.

TMP Goals

The TMP is built on the foundation of 12 themes or lenses. Lenses looks at the mobility network from different angle and include a wider set of values when deciding how to design and make future improvements. These lenses guide the development of future policies and strategies for transportation.

Accessibility	Environment / Ecosystems	Public Service
All Ages and Abilities Active Transportation	Integration with Land Use	Resiliency
Climate Change and Climate Change Adaptation	Integration of Emerging Technologies, Services and Disruptions	Transportation Safety – Building Safe Systems
Diversity and Intersectional Lens Regarding Marginalized Populations	Indigenous Communities	Transit

Guiding Documents

The City has developed many land use, natural area, and transportation plans and studies over the past 10 years. These documents provide valuable background information that has helped for the 2023 TMP. The key guiding documents are plans that continue to be implemented and work in parallel with the TMP to create a more sustainable, equitable, and complete transportation network.

E.2 Engagement

To ensure that the new TMP caters to the needs of Lethbridge residents, the City conducted a variety of engagement activities. More than 2,000 participants took part over a span of two years. Feedback was collected through workshops, meetings, online sessions, surveys, and intercept events. A wide range of stakeholders were involved, including representatives from City departments, Indigenous communities, accessibility groups, motor vehicle stakeholders, active transportation groups, and the public. In addition, input was gathered from City Council and its committees.

Priority Areas from Engagement

Overall, the following priority issues were identified through the engagement process:

- **Accessibility** – A desire for a transportation network serves everyone, including people of all ages, incomes, and abilities.
- **Communication -** A desire for accessible technology for transportation systems, and accessible communication materials for diverse needs.
- **Safety** – A desire for safer streets for all people leveraging existing efforts and strategies identified in the Transportation Safety Plan. Improve safety issues related to racism and discrimination, especially against Indigenous women and youth, and impose more cultural sensitivity training for public servants.

- **Active transportation modes -** A desire for more bike infrastructure, with an emphasis on separated bike lanes, and pedestrian oriented infrastructure with a focus on accessibility and safety measures.
- **Transit -** A desire for a broader bus schedule (more times and increased frequency and increased stops), and increased accessibility to transit (through routes, timing and stops) for people with mobility issues, elderly people, and children.
- **Reconciliation -** A desire to see active reconciliation and decolonizing efforts in the TMP, such as acknowledging the Traditional Blackfoot Territory in the naming of transportation related infrastructure.
- **Pedestrian infrastructure -** Concern with missing sidewalk links in industrial areas of the city, leading to unsafe crossings.
- **Winter city -** A desire to see improved efforts to make Lethbridge more accessible during the winter, including more de-icing of sidewalks and roads.
- **Connectivity and integration with land use** – A desire for connections between activity centers of the city that currently have missing links, for all modes.
- **Equity:** A desire for innovative, connected, safe and reliable transportation options, especially for students. As well as a concern about financial barriers to all modes of transportation.
- **Environment**: The desire to prioritize green energy and lean on local businesses and innovations.
- **Technology:** The desire for more technology options regarding transit and safety features throughout the city.

Engagement Feedback Integration

Throughout each phase of engagement, a summary What We Heard Report (WWHR) was created. The reports outline discussion points as well as categorized and consolidated input received from stakeholders, Indigenous community partners, and the public. Where applicable, technical analysis and TMP content were expanded to ensure that key issues and themes were incorporated into the document. The WWHR also informed the policies and actions put forward while ensuring that the established goals, objectives, and lenses were incorporated and/or in alignment.

E.3 Modelling

To plan for future transportation needs, the City developed a detailed travel demand model. This model estimates how much travel will occur in the future based on projected future land use and planned infrastructure improvements.

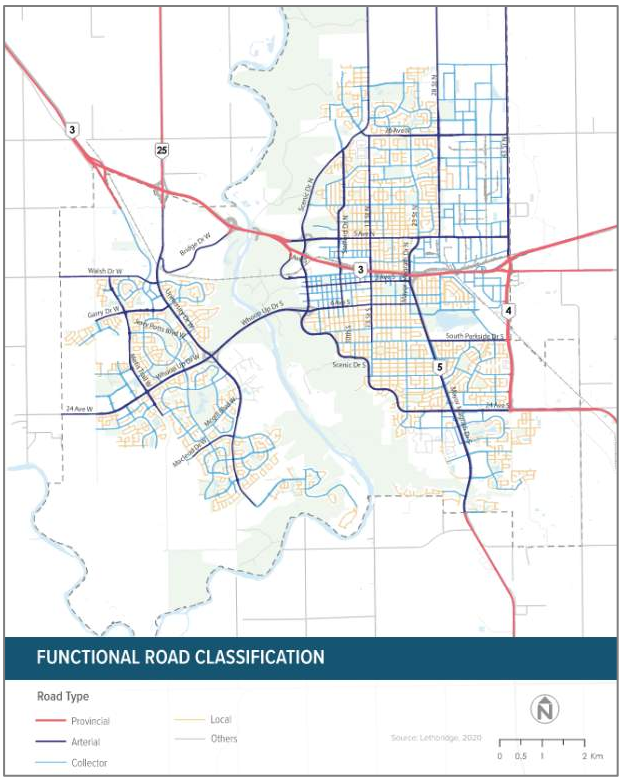
The model examined the future horizon years of 2029, 2039 and 2069. Additional scenarios were undertaken to look at the effects of different land use and infrastructure timing. The scenarios included:

- Scenario 1: 10% more non-auto trips
- Scenario 2: 2-lane reduction of Mayor Magrath Drive
- Scenario 3: No growth in the West Lethbridge Employment Centre
- Scenario 4: No CANAMEX bypass
- Scenario 5: 205 more homes and residents in the central neighborhoods in 2069

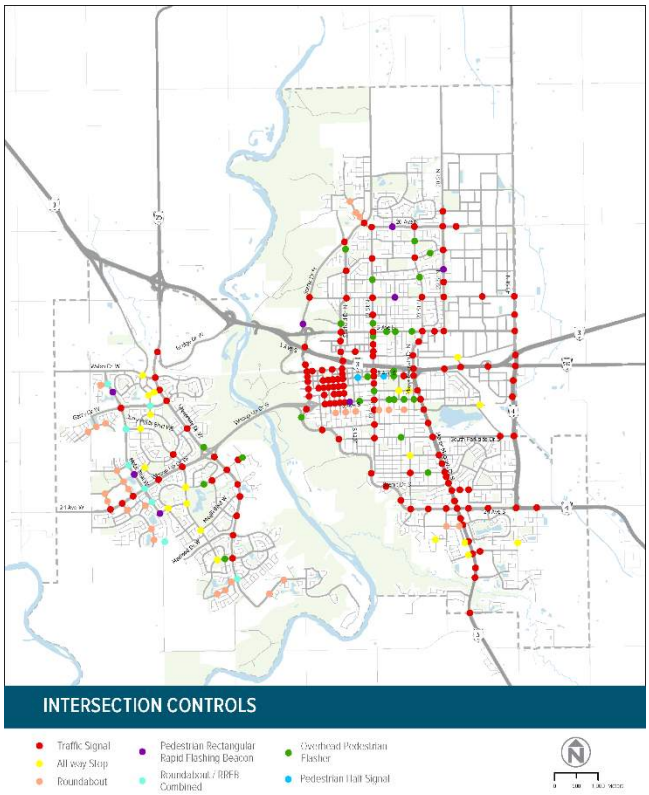
E.4 CURRENT TRANSPORTATION NETWORK

Road Network

The City of Lethbridge has approximately 600 kilometers of roads, which are categorized into four types: Arterial, Collector, Local and Other (Provincial and County highways/roads). These roads vary in their design and function. About 50% of the streets in Lethbridge are local while Arterials and collectors make up the other 50%. The City's existing functional roadway classification map is shown to the right.



Neighborhoods in Lethbridge that were developed before the 1970s tend to follow a traditional grid pattern. They have narrower roads, more intersections, and consistent access to rear lanes. Surburban neighborhoods developed between the 1970s and early 2000s often have curvilinear street patterns with wider roads and fewer intersections. A higher intersection density in an area generally means that it is more walkable.



Intersections

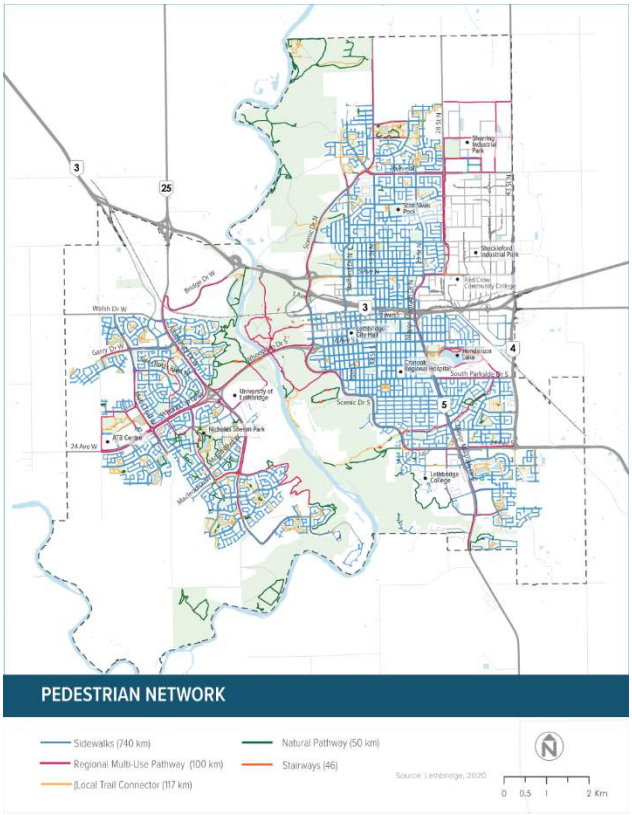
There are over 230 intersections controlled with traffic signals, pedestrian crossing beacons, roundabouts, or all-way stops in Lethbridge. There are currently 149 traffic signal-controlled intersections, and most include pedestrian push buttons and pedestrian signal heads. Approximately 45 of the intersections are pedestrian-controlled crossings, which are important to help people make connections between destinations and the larger mobility network. A map of the existing controlled intersections by type is shown on the left.

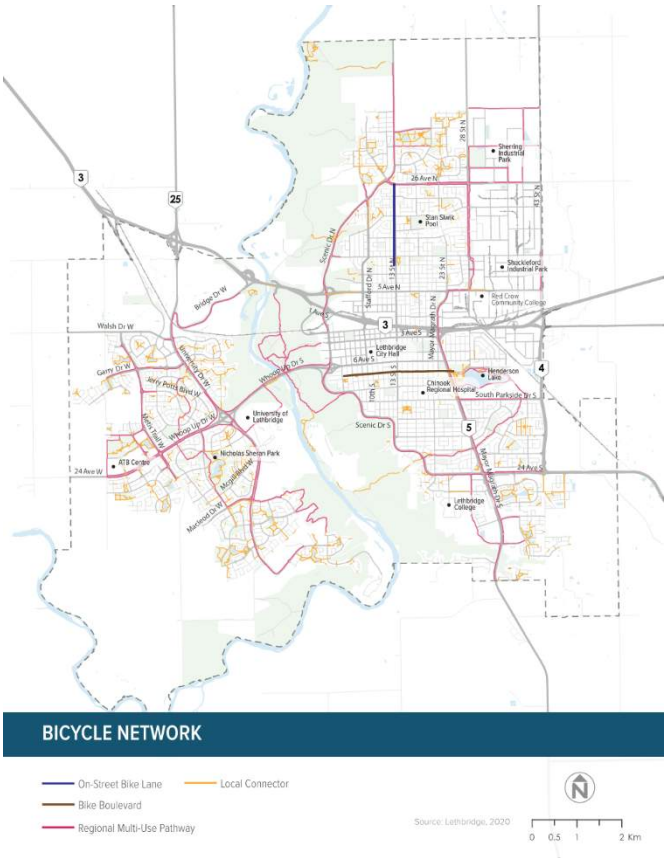
Pedestrian Network

Lethbridge currently has over 500 marked pedestrian crosswalks. These crosswalks play a crucial role in creating safe journeys for pedestrians between destinations.

Lethbridge is equipped with an extensive network of sidewalks and pathways, covering over 800 kilometers. Almost all roadways in the city have sidewalks on both sides. In residential areas, local roads and some collector roads have sidewalks without any separation from parked or moving vehicles.

There are four types of pedestrian infrastructure, as shown in the figure to the right – sidewalks, multi-use pathways (and local connectors), natural pathways, and stairways.





Bicycle Network

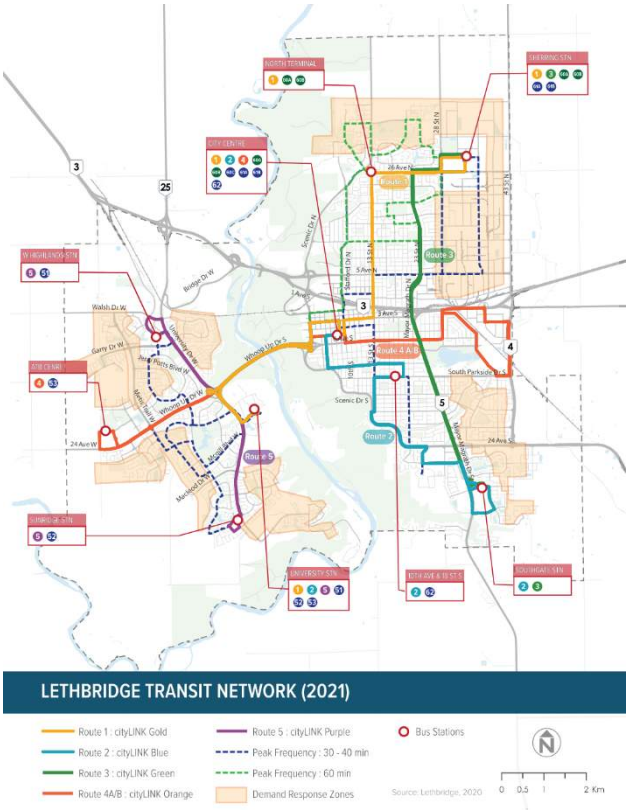
Lethbridge currently does not have an extensive on-street bicycle network but does have an extensive multi-use pathway network as shown by the figure on the left.

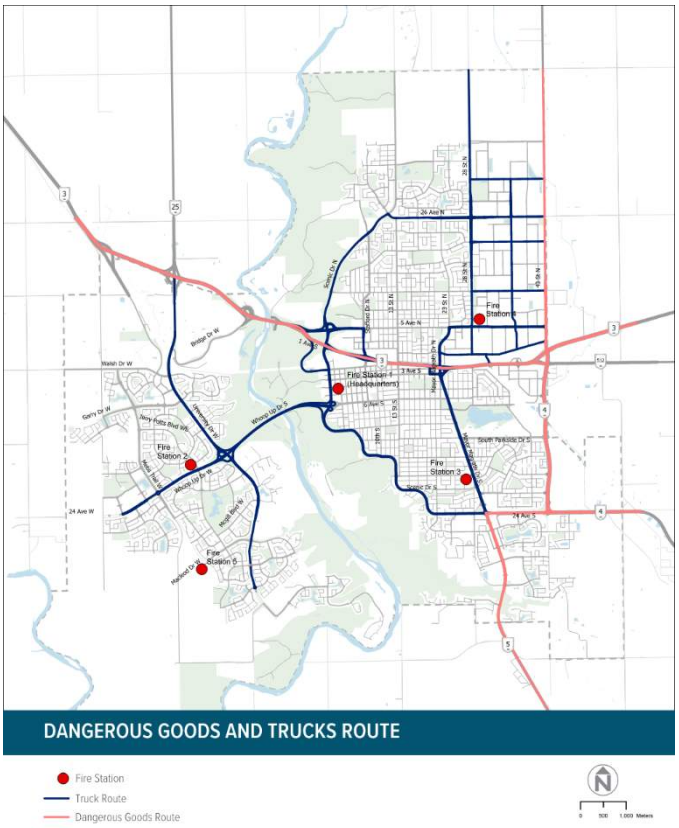
There are four types of on-street bicycle infrastructure proposed for the future network. These include:

- Shared Lane: cyclists share the road with vehicles and may include signage or pavement markings.
- Bike Boulevard: low volume, low speed roads in neighborhoods suitable for both users to share the space. Special treatment at major intersections may be required.
- Bike Lane: separate travel lanes designated exclusively for cyclists.
- Protected Bike Lane: physically separated bicycle lanes using parked cars or other vertical measures.

Transit Network

Lethbridge Transit provides public transportation through 11 fixed routes and various on-demand services. These on-demand services serve individuals who are unable to use the fixed route bus service and include options like Access-A-Ride. The transit system is designed with a focus on frequent service routes, transit hubs, and services in areas with lower population density. This organization ensures that residents have convenient access to public transportation, even in areas where demand might be lower. The 2021 Transit Network (show to the right) includes: cityLINK, cityHUBS, and Demand Response Zones.





Dangerous Goods and Truck Routes

Bylaw 5254 restricts the transport of dangerous goods to specific truck routes. Dangerous goods are those that require a sign on the transporting vehicle because the contents are dangerous to the public. Truck routes are also used for heavy vehicles which weigh more than five tonnes or are more than 11 metres in length. Trucks can also travel on Dangerous Goods Routes. The map on the left shows the current dangerous goods and truck routes.

Transportation Safety

In October 2020, the City of Lethbridge adopted its *Transportation Safety Plan* (TSP). The primary goal of the TSP is to identify the necessary actions and resources to provide a safer transportation system in Lethbridge to eliminate deaths and serious injuries by 2040. The Plan sets the following vision:

"A community on the move towards ZERO transportation-related deaths and serious injuries"

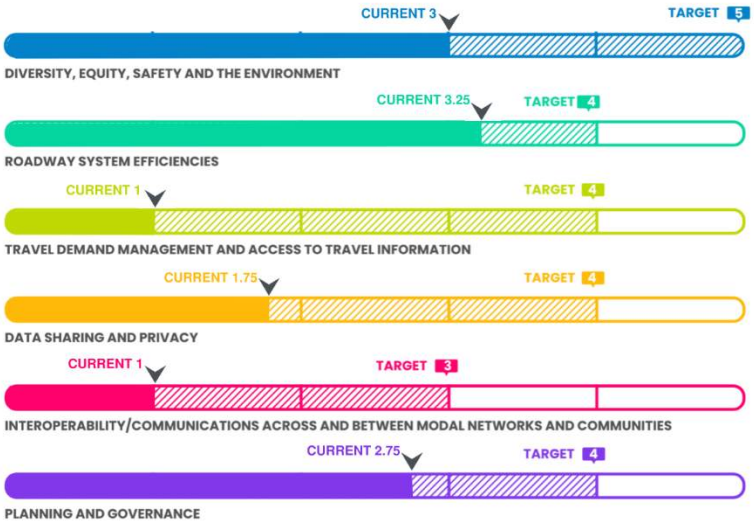
The *Transportation Safety Plan* identified five focus areas for the city based on data trends, community engagement, best practices, and alignment with the TSP vision and guiding principles:

- Distraction
- Speed and Aggressive Driving
- Intersections
- Vulnerable Road Users
- Safer Vehicles

The TSP informs the Transportation Master Plan, adding emphasis on the development of a safe systems approach for all modes of transportation and highlighting the needs of vulnerable road users.

Smart Mobility

New technologies and approaches to transportation is broadly categorized as Smart Mobility. By using technology, people have more information and may be less dependent on one transportation mode. To evaluate how ready the City is for Smart Mobility, the following six categories were considered:

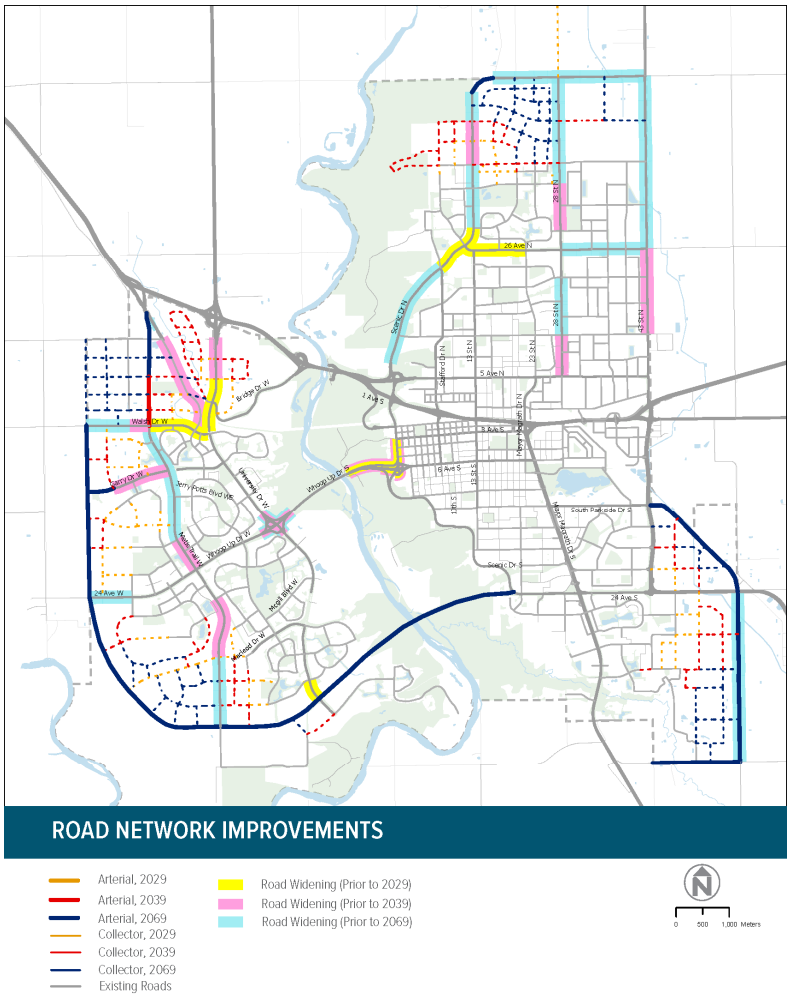


- Diversity, Equity, Safety, and the Environment
- System Efficiencies
- Travel Demand Management and Access to Travel Information
- Data Sharing and Privacy
- Interoperability / Communications Across and Between Modal Networks and Communities
- Planning and Governance

The Smart Mobility Readiness Assessment Tool provides an approach to evaluating and quantifying these domains and identifying an action plan. Through the initial evaluation, Lethbridge's current readiness assessment current scores and target goals are displayed in the above graph for each of the 6 Smarter Mobility topic areas that were evaluated.

E.5 FUTURE TRANSPORTATION NETWORK

Following the analyses, future network conditions were created. The future network considerations for road networks, dangerous goods transportation, pedestrians, bikeways, crossings, transit, accessibility, and Smart Mobility are discussed in this section.



Road Network

Traffic modelling was developed for the future horizons (2029, 2039 and 2069). The results of the model indicated the roadway modifications needed at each future horizon.

Specific roadway opportunities include:

- Building a third bridge along the Chinook Trail alignment
- Expanding the trucks and dangerous goods network in North Lethbridge
- Constructing the roadway network as identified in the map on the right.

Third Bridge Analysis

The analysis of the third bridge looked at traffic conditions in 2069 based on the number of total lanes crossing the Old Man River as well as the position of the proposed bridges. The results showed that if there was no third bridge, additional congestion would cause Whoop-Up Drive and parts of the network east and west of this river crossing to experience unacceptable levels of congestion. The model shows that the bridge will be required shortly after 2039. The model also shows that the Chinook Trail alignment is a better choice as it will attract more traffic than a more southern alignment.

Scenario Analysis

The results of the five scenarios for the 2039 traffic horizon (unless otherwise noted) are summarized as follows:

Scenario 1: 10% Reduction in Automobile Trips – between 3-10% less traffic in all areas of Lethridge and major bridges. An 8% reduction in daily vehicle kilometers travelled.

Scenario 2: Narrowing of Mayor Magrath Drive from 6 to 4 lanes – minor traffic impacts in most areas of Lethbridge. 20-25% reduction of traffic on Mayor Magrath Drive. 10-15% increase in traffic on parallel streets.

Scenario 3: No Employment in West Lethbridge Employment Centre – minor traffic impacts in most areas of Lethbridge. Up to 8% increase of traffic on Whoop-Up Drive and 2% increase in daily vehicle kilometres travelled.

Scenario 4: No CANAMEX Bypass (2069 Horizon) – minor impacts in most areas of Lethbridge. 20% increase in traffic on Highway 3 bridge.

Scenario 5: 20% of Residential Growth Through Central Infill (2069 Horizon) – 5% higher traffic in Central Lethbridge. Up to 15% lower traffic in all areas of Lethbridge. Approximately 5% lower traffic on all bridge crossings.

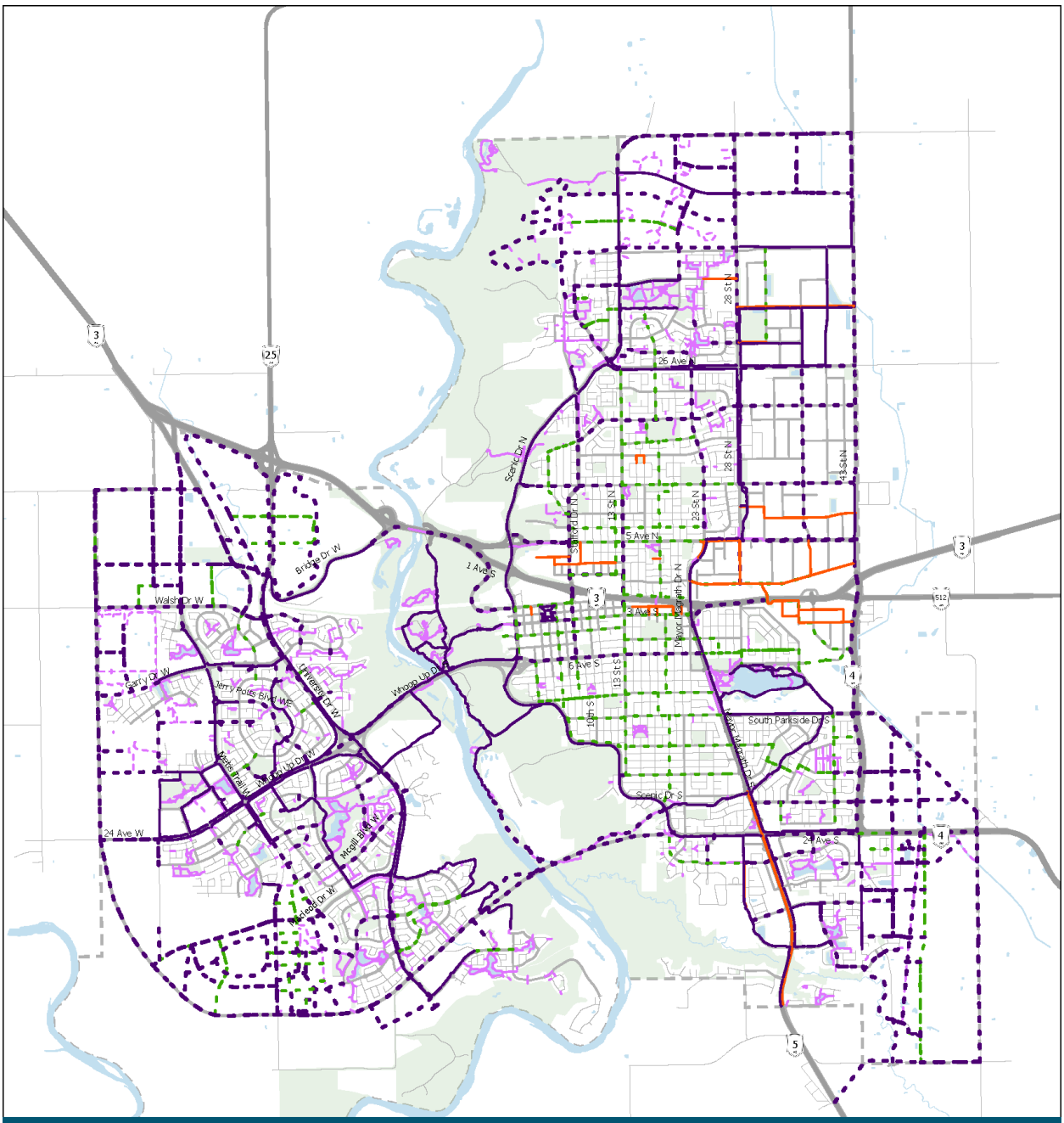
Pedestrian & Bikeway Network

To understand how people in Lethbridge will travel in the future using different modes of transportation, the focus was placed on finding areas where improvements are needed, and where current or planned networks might not be enough to meet transportation needs.

Three areas stood out for improvement based on the analysis of current conditions, direction from City Council, and community feedback. They are access to public transit, challenges faced by pedestrians and cyclists when crossing roads, and potential conflicts between different modes of transportation.

The network alignment and types of cycling infrastructure and/or multi-use pathways in new neighborhoods is to be determined at the outline plan stage. The recommended active modes connections are shown on the next page.

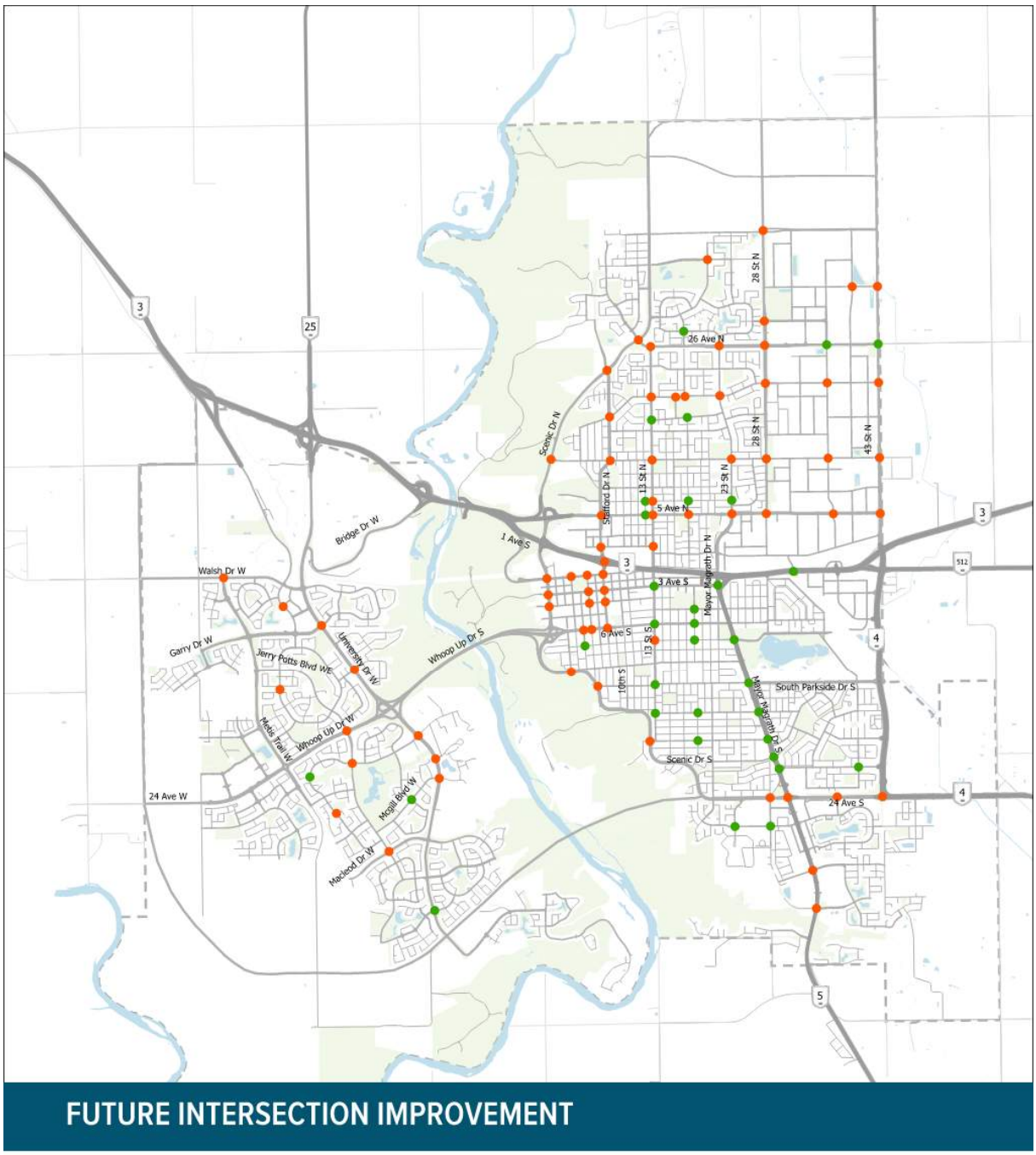
In addition to these infrastructure improvements, two categories of intersection improvements were also identified: cycling crossing improvements (generally along planned bicycle routes), and pedestrian crossing improvements. Improvements targeted at pedestrians and cyclists generally make the intersection safer for all users (including drivers) as operating speeds are lower, cyclists are given their own designated space, and existing pedestrian crossings are improved such that pedestrian visibility is greater, and exposure time is reduced. Recommended future intersection improvement locations are shown on page E12.



ACTIVE MODE CONNECTIONS

- Existing Roads
- Existing Sidewalks
- Existing Local Connectors
- Existing Multi-Use Pathway / On-Street Cycling Infrastructure
- Future Sidewalk in Existing Areas
- Future Multi-Use Pathway
- Future On-Street Cycling Infrastructure
- Future Local Connectors

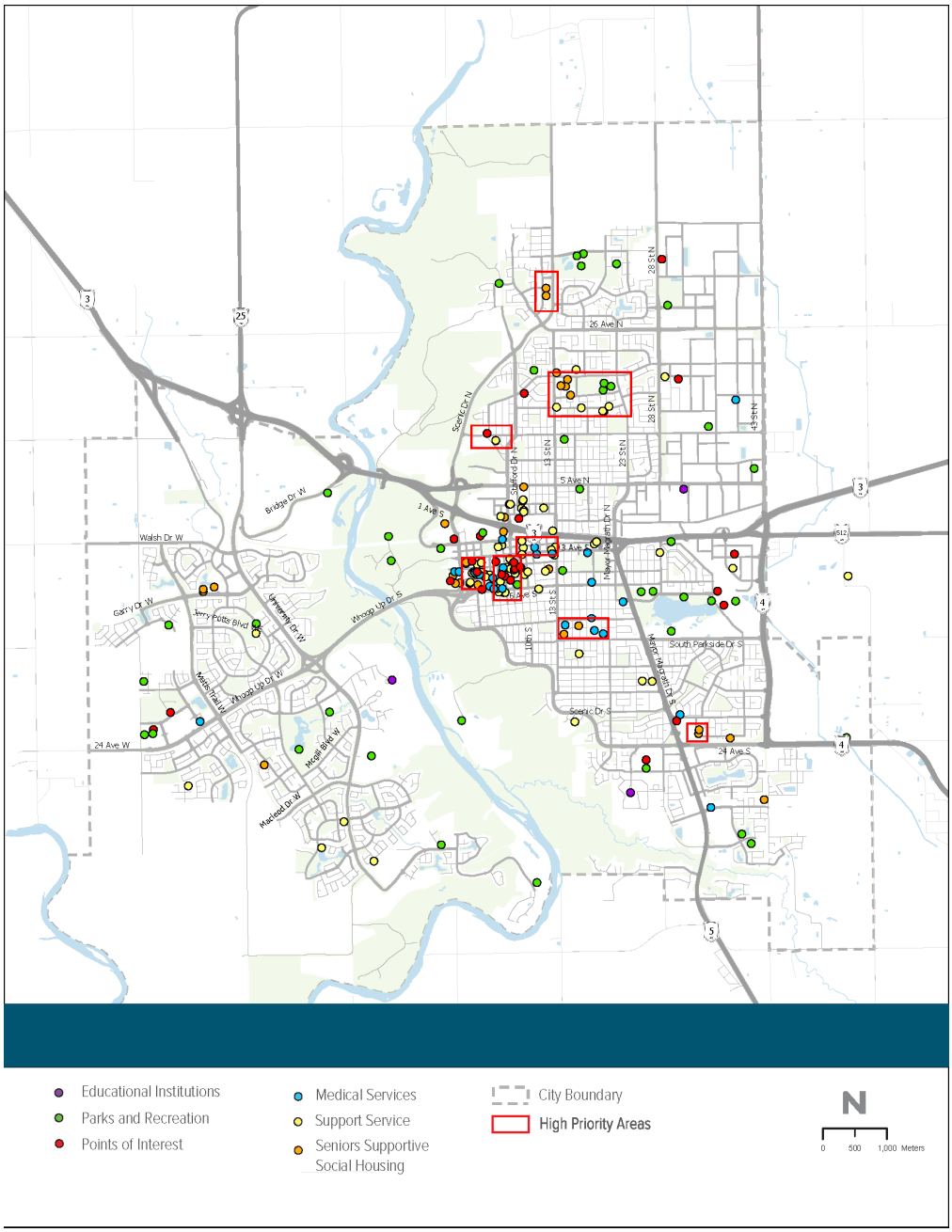
0 500 1,000 Meters


FUTURE INTERSECTION IMPROVEMENT
Recommended Pedestrian Crossing Improvements
Recommended Cycling Crossing Improvements
Existing Roads
0 500 1,000 Meters
26 Ave N
28 St N
43 St N
Scenic Dr N
Stafford Dr N
11 St N
23 St N
5 Ave N
Bridge Dr W
1 Ave S
Walsh Dr W
3 Ave S
Mayor Magrath Dr N
Garry Dr W
Jerry Potts Blvd W
University Dr W
Whoop Up Dr S
6 Ave S
13 St S
10th S
South Parkside Dr S
Mayor Magrath Dr S
Scenic Dr S
Whoop Up Dr W
Metis Trail W
24 Ave W
Mogill Blvd W
Macleod Dr W
24 Ave S

Transit and Accessibility

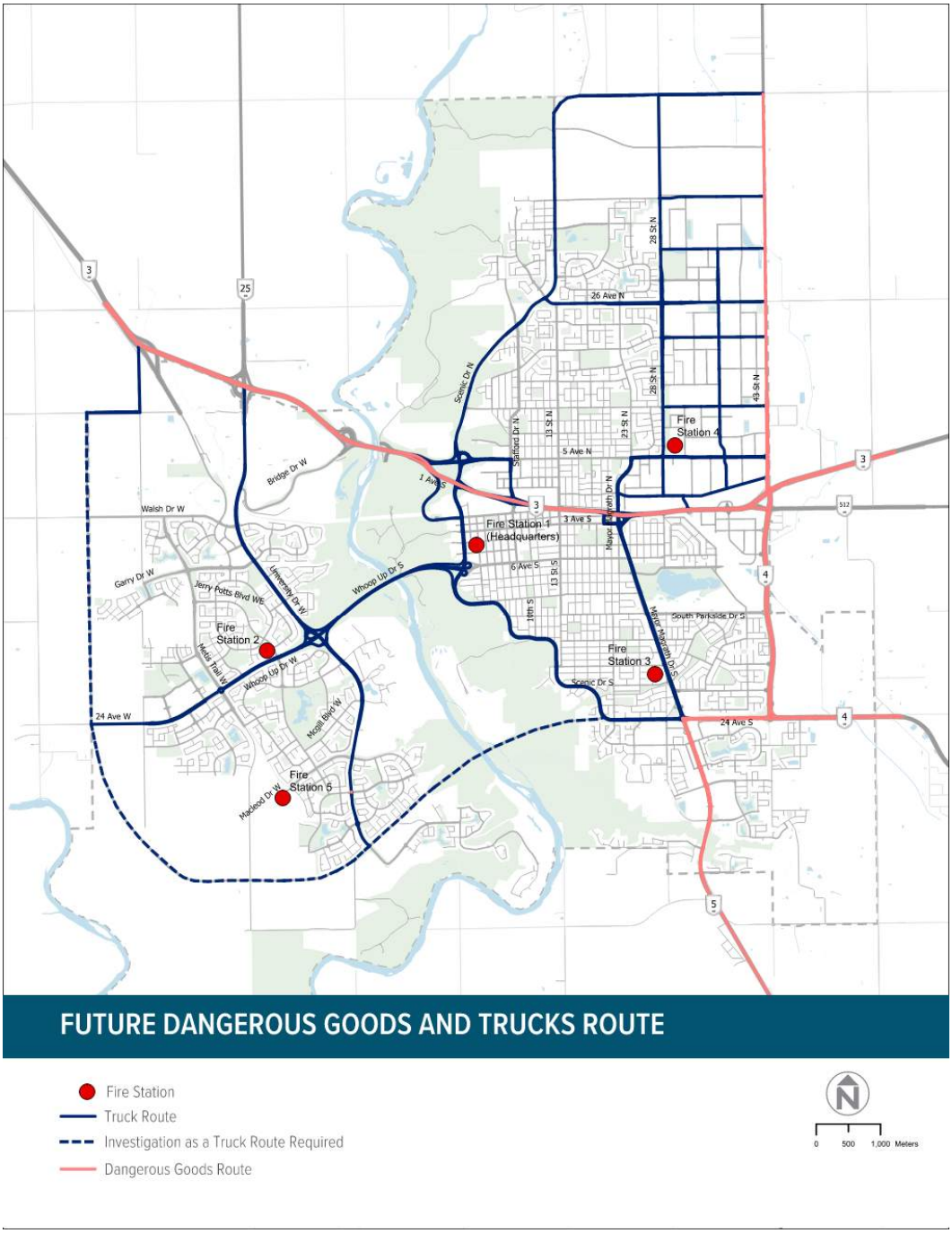
An accessible transportation network allows everyone to move around freely and participate fully in the community. Universal design, which considers the needs of various individuals such as those with disabilities, seniors, parents with strollers, and children, is important in creating an inclusive environment for everyone.

It is crucial to prioritize the placement of accessible transit stops in areas that have been identified as high priority to ensure the people can easily access resources, entertainment, housing, medical services, and support services. This map provides an overview of the destinations requiring accessibility and high priority areas for future improvements.



Dangerous Goods and Truck Routes

As the industrial areas of North Lethbridge (Sherring Industrial Park and north Sherring Future Development Area) continue to expand, it will be necessary to expand the current heavy truck network. The recommended expansion is show in this figure.



E.6 SUPPORTING INITIATIVES & STRATEGIES

For a successful implementation of the TMP over the next several years, several initiatives and strategies that should continue, or are strongly encouraged to consider include:

Current Initiatives & Strategies:

- Regional Improvements
- Complete Streets Policy and Design Guidelines
- Transit Master Plan
- Permanent Count Stations

New Initiatives & Strategies:

- Vision Zero Strategy
- Traffic Calming Policy and Guidelines
- Roundabout Implementation and Guidelines
- Smart Mobility and Emerging Technologies
- Intelligent Transportation System (ITS)
- Traffic Management Center
- Travel Demand Management
- Parking Strategy
- Whoop Up Drive Monitoring Strategy

E.7 IMPLEMENTATION PLAN

Capital costs estimates provide suggested timing and costing for recommended transportation projects, based on modelling. This helps the City plan for future spending. Short, medium, and long-term upgrades are often included. Short-term upgrades are imminent. Medium-term upgrades are either in pre-planning, centrally located, or benefit established communities. Lastly, long-term upgrades are reserved for newer parts of the city. Detailed cost estimates are provided in the following section.

Road Infrastructure Capital Costs

The road infrastructure costs summarized in the following table. It includes road widening, new arterial roads, and new bridges. It does not include developer-constructed roads.

Corridor	< 10 years	10-20 years	20+ years	Total
26 Avenue N	$10.0 M	$0 M	$4.7 M	$14.7 M
28 Street N	$4.5M	$13.5 M	$16.1 M	$34.1 M
43 Street N	$0 M	$6.2 M	$12.7 M	$18.9 M
62 Avenue N	$0 M	$0 M	$23.1 M	$23.1 M
Garry Drive W	$0 M	$2.7 M	$3.3 M	$6.0 M
Métis Trail	$6.6 M	$2.6 M	$28.7 M	$37.9 M
Scenic Drive N	$7.3 M	$12.3 M	$19.5 M	$39.1 M
Scenic Drive S	$12.3 M	$0 M	$0 M	$12.3 M
University Drive	$9.5 M	$12.6 M	$0 M	$22.1 M
Walsh Drive	$17.3 M	$4.0 M	$4.1 M	$25.4 M
Westside Drive W	$0 M	$0 M	$0.4 M	$0.4 M
Whoop Up Drive	$10 M	$45 M	$42.9 M	$97.9 M
Chinook Trail				
- Scenic Drive S to University Drive W (including bridge: 4km)	$0 M	$0 M	$130.0 M	$130.0 M
- University Drive W to Métis Trail W (2km)	$0 M	$0 M	$19.8 M	$19.8 M
- Métis Trail W to Whoop Up Drive W (3.5km)	$0 M	$0 M	$38.5 M	$38.5 M
- Whoop Up Drive W to Walsh Drive W (3.2km)	$0 M	$0 M	$31.9 M	$31.9 M
TOTAL	**$77.5 M**	**$98.9 M**	**$375.7 M**	**$552.1 M**

Active Transportation Cost Estimates

Infrastructure costing estimates for active transportation include infrastructure such as bike boulevards, painted bicycle lanes, protected bicycle lanes, sidewalks, pathways, and crossing improvements. The combined cost estimates for active transportation infrastructure are provided below. A more detailed breakdown of bikeway improvements by project is also provided.

Infrastructure Type	Quantity	Total over 10+ years
Bikeways	18 km	$59.5 M
Sidewalks	31 km	$8.0 M
Multi-Use Pathways	79 km	$18.7 M
Intersections (Pedestrian Improvements)	82	$22.1 M
Floating Transit Stops	69	$7.7 M
TOTAL		**$116.0 M**

Bikeway Projects

Corridors	Limits	Facility Type	Timeframe	Project Cost
13 Street N*	8 Avenue N to 26 Avenue N	PBL	Short	$10.1 M
13 Street S* 16 Avenue S	2 Avenue S to 16 Avenue S 13 Street S to Scenic Drive S	PBL	Short	$6.0 M
13 Street N* 2A Avenue N*	2A Avenue N to 2 Avenue S Stafford Drive N to 13 Street N	PBL	Short	$3.7 M
1 Avenue S* 7 Street S*	Scenic Drive S to Stafford Drive S 1 Avenue S to 10 Avenue S	PBL	Short	$3.7 M
Scenic Drive S	1 Avenue S to 6 Avenue S	PBL	Short	$0.5 M
4 Avenue S* 5 Avenue S	Scenic Drive S to 13 Street S 13 Street S to Mayor Magrath Drive S	PBL	Short	$4.9 M
12C Street N	8 Avenue N to 2A Avenue N	BB	Short	$1.3 M
1 Avenue N 6 Avenue N 18 Street N	13 Street N to Mayor Magrath Drive N Stafford Drive to 23 Street N 1 Avenue N to 9 Avenue N	BB	Med	$1.8 M
10 Avenue S 16 Avenue S 17 Street S 18 Street S	Scenic Drive S to Mayor Magrath Drive S 13 Street S to Mayor Magrath Drive S 9 Avenue S to 10 Avenue S 10 Avenue S to Scenic Drive S	PBL BL BB BB	Med	$2.6 M
12 Avenue S Scenic Drive S	Scenic Drive S to Henderson Lake Boulevard S 10 Avenue S to 12 Avenue S	BL	Med	$1.0 M
Grand River Boulevard W Princeton Crescent W Riverglen Link W	University Drive W to Riverstone Boulevard W Métis Trail W to Columbia Boulevard W University Drive W to Riverdale Terrace W	BL	Med	$0.5 M
2 Avenue N	Mayor Magrath Drive N to 30 Street N	PBL	Med	$2.3 M
3 Avenue S 9 Avenue S 18 Street S	Stafford Drive S to Mayor Magrath Drive S 13 Street S to Mayor Magrath Drive S 3 Avenue S to 9 Avenue S	PBL BL BB	Med	$2.6 M
Stafford Drive S	6 Avenue S to 9 Avenue S	BB	Med	$2.0 M
Coalbanks Link W 30 Street	Firelight Way W to Coalbanks Boulevard W Whoop Up Drive W to Coalbanks Blvd W	PBL PBL	Med	$0.4 M
32 Street S Forestry Avenue S / Lakemount Boulevard S Henderson Lake Boulevard S / Lakeridge Boulevard S	20 Avenue S to 24 Avenue S 43 Street S to Lakeridge Boulevard S 12 Street S to Forestry Avenue S	BL	Med	$0.5 M
4 Street S 9 Avenue S	7 Avenue S to Scenic Drive S 4 Street S to 13 Street S	BL BL	Med	$0.5 M
40 Avenue N Grace Dainty Road N Haru Moriyama Road N Lettice Perry Road N Mildred Dobbs/Edith Emma Coe	Mildred Dobbs Boulevard N to 13 Street N Lettice Perry Road N to 13 Street N Mildred Dobbs Boulevard N to Lettice Perry Road N Mildred Dobbs Boulevard N to 40 Avenue N Lettice Perry Road N to 40 Avenue N	PBL PBL BL BL BL	Med	$1.2 M
5 Avenue N* 9 Avenue N	Strafford Drive N to 23 Street N 13 Street N to 28 Street N	PBL PBL	Med	$6.0 M

Corridors	Limits	Facility Type	Timeframe	Project Cost
Parkside Drive S / 7Avenue S WT Hill Boulevard S	34 Street S to WT Hill Boulevard S 4 Avenue S to 43 Street S	BL BL	Med	$1.5 M
6 Street N / Stafford Avenue N	9 Avenue N to Stafford Bay N	BL	Med	$0.4 M
Blackfoot Blvd Country Meadows Boulevard W Grassland Boulevard W Highlands Boulevard W	Métis Trail W to Red Crow Boulevard W 30 Street W to Métis Trail W County Meadows Boulevard W to Garry Drive W Walsh Drive W to Red Crow Boulevard W	BB BB BB BB	Med	$1.0 M
Edgewood Boulevard W Mic Mac Boulevard W	University Drive W to Sherwood Boulevard W Red Crow Boulevard W to University Drive W	PBL PBL	Long	$1.2 M
5 Avenue S 6 Avenue S 28 Street S 34 Street S	Mayor Magrath Drive S to 25 Street S Mayor Magrath Drive S to 34 Street S 6 Avenue S to Parkside Drive S Leaside Avenue S to Parkside Drive S	PBL PBL PBL PBL	Long	$0.4 M
Great Lakes Road S Nipigon Road S	South Parkside Drive S to Cul-de-Sac Great Lakes Road N to 43 Street S	BB BB	Long	$0.7 M
36 Street N 2 Avenue N	2 Ave N to 26 Ave N 30 St N to 36 St N	BL BL	Long	$1.0 M
15 Avenue N 18 Street N	13 Street N to 23 Street N 9 Avenue N to 26 Avenue N	BL BB	Long	$1.2 M
Tudor Boulevard S / 28 Avenue S	Scenic Drive S to 28 Street S	BB	Long	$0.5 M
TOTAL				**$59.5 M**

Operating Cost Considerations

As the City proceeds with the implementation of transportation projects, operational funding will need to be considered. Costing, on the operational side, will vary depending on the recommendation. These new operational needs have been summarized with anticipated areas of focus:

1. **Transportation & Land Use Planning Integration** - Consideration for administration staff time in reviewing new developments and supporting City policy development.

2. **Multi-modal Integration** - The development of new sidewalks, new pathways, new on-street bicycle infrastructure (painted and protected bike lanes), and new roads will need to consider both lifecycle maintenance and seasonal maintenance.

3. **Transit Integration** - Public transit carries considerable operational costs, with increased operating hours and distances traveled increasing the cost of drivers and maintenance on the vehicles.

4. **Transportation Demand Management** - Most Transportation Demand Management solutions come tied with a separate business case model, such as car share or ride share. The use of information sharing supporting Transportation Demand Management is achieved through either online or separate applications, each with their own operational and maintenance implications.

5. **Transportation Supply Management** - Management of transportation supply is dependent on the collection of accurate data whether continuous real-time or sampled data, which have added costs.

6. **Monitoring and Reporting** - Successful implementation of the TMP will require dedicated staff and other resources to initiate and deliver actions, monitor TMP progress, and report back to Administration and Council.

Policies & Actions

The TMP policies and their supporting actions will guide transportation projects and programs throughout the city for years to come. They are helpful tools to ensure the TMP vision and strategic goals are met. These policies and actions are summarized in the following tables under five themes:

- Transportation & Land Use Planning Integration
- Multi-Modal Integration
- Manage Transportation Demand
- Transportation Supply
- Parking

The policies and supporting actions are accompanied by a relative priority, projected implementation timeline, and relative cost. The priority is categorized as High, Medium, or Low, indicating the importance of each supporting action in fulfilling the vision statement of the TMP. The implementation timeline is estimated based on the time require to execute a task if it has been allocated resourced and initiated. It is divided into three time periods: less than 5 years, less than 10 years, and more than 10 years. There is also a separate category for 'ongoing' actions, where a policy decision or direction can begin delivering results if the City has the current capacity and capability to do so. The cost is indicated on a scale of $, $$, or $$$, which can include both operational and capital expenses. A $ represents a small-scale project (e.g., a supporting action costing less then $100,000), $$ corresponds to a medium-scale project (e.g., a supporting action between $100,000 and $500,000), and $$$ denotes a larger-scale project surpassing the medium-scale threshold of $500,000.

Transportation & Land Use Planning Integration

#	Policy	Supporting Actions	Priority	Timeline	Cost
1-1 	Develop new lands with the intention of accommodating all modes (and encouraging active modes and transit).	A. Ensure high quality pedestrian and cycling connections exist to major activity centers and transit stops.	High	Ongoing	$$
		B. Promote transit routes to serve activity centers and residential developments.	High	Ongoing	$$
		C. Support continuous high quality active transportation infrastructure network throughout new developments.	High	Ongoing	$$
		D. Develop the road network to maintain high quality transit service with walkable stop locations.	High	< 10 years	$$$
		E. Work with the development industry to encourage the provision of secure and high-	High	< 5 years	$

#	Policy	Supporting Actions	Priority	Timeline	Cost
		quality parking for regular bicycles, e-bicycles and cargo/over-sized bicycles.			
		F. Update City of Lethbridge Traffic Impact Study guidelines to improve considerations of all modes of transportation.	High	< 5 years	$
		G. Work with Lethbridge County and Alberta Transportation to plan for the future arterial road connection from the southeast boundaries of the city to Highway 5.	High	< 5 years	$
		H. Continue the logical expansion and maintenance of the City's industrial rail network.	High	Ongoing	$$$
		I. Through the Municipal Development Plan and other related planning documents, endeavor to balance the development of activity nodes throughout the City as best as possible to assist in the distribution of traffic on the road network.	High	Ongoing	$
1-2 	Support development in targeted nodes and corridors serviced by transit and intensify uses and activities in these areas.	A. Promote a mixture of land uses at current and future transit hubs and stops which can support one another for a range of user groups and mobility solutions. This needs to be achieved in parallel to ensure transit is available at occupancy.	Med	Ongoing	$
		B. Support airport passengers and employees with reliable and frequent travel options which are tied to forecasted journeys.	Med	<5 years	$$
1-3 	Support opportunities for mixed-use developments in areas with existing infrastructure.	A. Support a network that connects and promotes basic services (e.g., convenience retail, health food options, schools, social services and parks) at a local level.	Med	Ongoing	$$
		B. Ensure that contextually sensitive infill and redevelopment in existing built-up areas informs multi-modal transportation infrastructure investments.	Med	Ongoing	$$
		C. Pursue opportunities to make auto dependent existing neighbourhoods more accessible near bus stops, along arterial roads and at intersections.	Med	< 5 years	$$
		D. Explore funding options to pave commercial roadways and rear lanes.	Low	< 5 years	$
1-4 	Improve communication to be inclusive, accessible, and equitable.	A. Provide the opportunity for Indigenous Relations Advisors/Specialists to be engaged during the planning, design, and implementation phases of future transportation and planning projects.	High	< 5 years	$
		B. Transportation staff to complete development reviews with equity, diversity and inclusion lenses specifically considered.	High	Ongoing	$
		C. Ensure that all public transportation communication materials and planning events are accessible and available by providing different formats for users with diverse abilities.	High	< 5 years	$

Multi-Modal Integration

#	Policy	Supporting Actions	Priority	Timeline	Cost
2-1	Design streets to create pedestrian, cycling, and transit supportive environments.	A. Facilitate flexibility in design standards by completing the Complete Streets Guidelines/Policy and providing a greater range of roadway cross sections to include a range of appropriate active transportation and transit infrastructure.	High	< 5 years	$$
		B. Update design standard to include the principles of Universal Design.	High	< 5 years	$
		C. Ensure the missing links in the pathway system are completed to accommodate pedestrians and cyclists.	Med	< 10 years	$$$
		D. Commit to a new active-modes river crossing to create a river valley multi-use pathway loop and directly connect southwest and southeast Lethbridge communities.	Med	> 10 years	$$$
		E. Support expanded shared mobility opportunities including electric scooter and electric bike share.	Med	< 5 years	$$
		F. Consider opportunities to integrate cultural heritage (i.e. indigenous public art) into transportation infrastructure (e.g., concrete treatment for underpasses, art piece for roundabouts).	Med	< 10 years	$$
		G. Consider opportunities to integrate shade, wind buffering and nature-based solutions to create supportive environments for all users.	Med	< 10 years	$$$
2-2	Build awareness and promote the benefits of walking and cycling.	A. Develop an education program to provide information (to decision makers, and the public) on the environmental, economic/financial (both City and individual), and health benefits of walking and cycling by way of advertising and promotional activities.	High	< 5 years	$
		B. Secure capital, grant, or alternative funding streams to earmark for cycling network implementation.	Med	< 5 years	$
2-3	Ensure the transportation network serves everyone, including people of all ages, incomes, and abilities.	A. Commit to the winter maintenance of pathways, cycle lanes and sidewalks to promote alternative modes throughout the year.	Med	< 5 years	$$$
		B. Accelerate the retrofit programs for the construction of accessible infrastructure to ensure accessible wheelchair ramp angle and design, and addition of tactile walking strips.	High	< 5 years	$$
		C. Ensure intersection and crossing improvement implementation, prioritizing locations of high traffic stress, near transit, schools, and other activity centres.	High	< 5 years	$$

#	Policy	Supporting Actions	Priority	Timeline	Cost
		D. Create new standards and/or adopt existing standards from other municipalities to improve legibility of street name signs and pedestrian information/wayfinding signs.	Med	< 10 years	$$
		E. Update Indigenous Street names to culturally acceptable spellings.	Med	< 5 years	$
		F. Update temporary traffic control standards to include accessibility requirements.	Med	< 10 years	$$$
		G. Support regional transportation initiatives.	Low	Ongoing	$
		H. Develop a wayfinding strategy that incorporates the principles of universal design.	Med	< 5 years	$
2-4	Ensure that new developments adhere to design standards and incorporate multi-modal infrastructure.	A. Work with the development industry (Building Industry & Land Development Association – BILD) and/or other similar organizations to develop planning guides for planning cycling networks for new communities.	High	Ongoing	$
		B. Ensure all new developments provide safe and convenient pedestrian environments through provision of infrastructure such as sidewalks, crosswalks, lighting etc.	High	< 5 years	$
2-5	Ensure Lethbridge streets are safe for all people.	A. Commit funding towards and implement the actions of the 5 focus areas identified in the 2020 Transportation Safety Plan: Distraction, Speed & Aggressive Driving, Intersections, Vulnerable Road Users, and Safe Vehicles.	High	> 10 years	$$$
		B. Develop an education and encouragement program for residents and businesses to support a shift in mode choice, safe routes, and 'sharing the road'.	High	< 5 years	$$
		C. Provide communications programs for safety relating to natural risks to driver and user safety (e.g. threats from wildlife collisions, seasonal weather, etc.)	Low	< 5 years	$$

Manage Transportation Demand

#	Policy	Supporting Actions	Priority	Timeline	Cost
3-1	Design streets to create pedestrian, cycling, and transit-supportive environments.	A. Create and fill the position of Transportation Demand Management Coordinator within the City staffing structure, to be responsible for leading and managing the City's implementation of Transportation Demand Management strategies.	Med	< 5 years	$$

#	Policy	Supporting Actions	Priority	Timeline	Cost
		B. Develop a comprehensive Transportation Demand Management implementation plan that will confirm key objectives, set priorities for short-term actions, and identify required resources.	Med	< 5 years	$
		C. Promote sustainable transportation choices through communication and outreach methods including partnering with other agencies, web sites, integrated transit, cycling, and pathways maps, cycling and transit skills training, media relations, and special events that raise the profile of sustainable transportation choices.	Med	< 5 years	$
3-2	Consider traffic calming as an effective means of reducing the negative impacts of traffic on the quality of life for Lethbridge residents in existing and future neighbourhoods and built-up areas.	A. Require the development of neighbourhood traffic management plans as part of future outline plans and area redevelopment plans.	Med	Ongoing	$
		B. Develop a Traffic Calming Policy to guide the prioritization and implementation of traffic calming measures.	Med	< 5 years	$$
		C. Develop (or adopt existing) traffic calming design standards.	Med	< 5 years	$$

Transportation Supply

#	Policy	Supporting Actions	Priority	Timeline	Cost
4-1	Maximize the multimodal capacity of current infrastructure (e.g., transit priority, access management).	A. Develop and require incorporation of key criteria and factors that impact or define level of service for each major mode – walking, cycling, goods, transit and vehicles – in all planning and design projects.	Med	< 10 years	$$$
4-2	Keep Lethbridge moving by developing and maintaining a well-connected street network to address traffic flows.	A. Install permanent traffic counters and promote the use of Location Based Data for monitoring traffic growth and for improved open data sharing.	High	< 5 years	$$
		B. Begin the planning process for implementing a Traffic Management Centre to manage traffic signals, transit operations, detours, and incidents in real-time.	Med	< 10 years	$$$
		C. Continue expanding the Transit Signal Priority program and investigate the use of dynamic signals in areas of high congestion.	Med	< 10 years	$$$

#	Policy	Supporting Actions	Priority	Timeline	Cost
		D. Promote Mobility as a Service digital platforms to integrate transportation systems and options for visitors and residents.	Med	Ongoing	$
		E. Undertake a review of the current signage and ease of wayfinding for Trucks and Dangerous Goods, and implement improvements where required.	Med	< 5 years	$
4-3 	Consider the life cycle benefits and costs when planning, maintaining, and operating the transportation system.	A. Ensure that direct investments in roadway projects will enhance mobility, safety, and the Level of Service on the City's arterial road network.	Med	Ongoing	$
		B. Ensure roadway segments scheduled for maintenance or restriping are compared against planned on-street bicycle routes to lower the capital cost and accelerate the implementation of the bicycle network.	High	Ongoing	$
		C. Limit the impact to natural lands when designing and implementing new infrastructure to protect and, in some instances, recognize adjacent historical Indigenous sites.	High	Ongoing	$
		D. Ensure designs for transportation corridors, notably arterials, provide sufficient spacing and easements suitable for compatible utilities such as high-pressure gas lines and electrical transmission.	High	Ongoing	$$

Parking

#	Policy	Supporting Actions	Priority	Timeline	Cost
5-1 	Attempt to balance the need to supply sufficient parking to support residents and businesses while avoiding excess parking supply that can discourage alternative modes.	A. Ensure that parking standards in the Land-Use Bylaw accurately represent needs by specific land use and do not result in excess parking supply,	High	Ongoing	$
		B. Support reducing the amount of required parking along major transit routes by creating parking maximums or reducing parking minimums.	Med	Ongoing	$
		C. Explore eliminating or reducing parking minimums in the Land Use Bylaw.	High	Ongoing	$
		D. Reduce the reliance on public curbside parking and allow repurposing of this space for street furniture, patios, bicycle and micro-mobility parking.	Med	< 10 years	$

#	Policy	Supporting Actions	Priority	Timeline	Cost
		E. Create cycling and micro-mobility parking minimums.	Med	Ongoing	$
5-2 	Improve on-street parking operations	A. Require periodic parking needs surveys in the downtown to determine utilization and potential for pricing.	Med	< 5 years	$$

E.8 MONITORING

Monitoring the progress or success of the Transportation Master Plan requires key performance indicators, metrics (and a means to collect those metrics), baseline data and targets. For Lethbridge, transportation mode split, accessibility to transit, and average network speed are recommended key indicators. The table below summarizes these three key indicators, their metrics, baseline values, and target values for both 2029 and 2039.

Key Indicators for Mobility (TMP)

#	Key Indicator	Metric	Baseline Year	Baseline	2029	2039
1	Transportation Mode Split*	Walking Mode Split (all-purpose trips, 24 hrs, city-wide)	2019	4.7%	7%	10%
		Cycling Mode Split (all-purpose trips, 24 hrs, city-wide)	2019	1.3%	3%	5%
		Transit Mode Split (all-purpose trips, 24 hrs, city-wide)	2019	1.4%	3%	5%
		Auto Mode Split (all-purpose trips, 24 hrs, city-wide)	2019	89.0%	87%	80%
2	Bikeway Network (On-Street)	% Phase 1 (Cycle Master Plan) complete	2019	10%	30%	100%
3	Pathways	% Pathway network complete	2021	73%	85%	100%
4	Sidewalks	% Sidewalk network complete	2021	86%	90%	100%
5	Accessible Ramps	% of Intersections with pedestrian ramps	2023	77%	85%	100%
6	Tactile Walking Surface Indicators	% of downtown, major collector and arterial intersections with tactile walking surface indicators at ramps	2023	4%	50%	100%

#	Key Indicator	Metric	Baseline Year	Baseline	2029	2039
7	Audible Traffic Signals	% of signalized intersections with audible pedestrian signals	2023	77%	88%	100%
8	E-Scooter/e-Bike Services	# of Annual Trips	2022	167,000	50% increase	100% increase
9	EV Stations	# EV Charging Stations (publicly owned)	2022	6	400% increase	800% increase
10	Average Street Network Speed	Average speed for all daily trips (based on the VISSUM model)	2019	39km/hr	>35 km/hr	>35 km/hr
11	Safety	Pedestrian & Cycling Severe Injuries & Fatalities	2019	20 per year (5-year average)	50% reduction	100% reduction (to zero)

*3.6% trips were recorded as “other” for baseline data

It is recommended that progress on the action items and key indicators should be reported back to Council every 2 to 3 years and that the TMP be updated in 10 years.

1 INTRODUCTION

The 2023 Transportation Master Plan (TMP) is a document that looks at how transportation systems work across the City of Lethbridge. It is a long-term plan for how the City's transportation networks will interface with one another to enhance the mobility choices of residents, visitors and workers, support goods movement into, out and within the city, and connect land uses to one another. The plan is an opportunity to evaluate how the City's transportation systems are functioning, incorporate new technologies and evolving best practices, and re-align the objectives and funding priorities of the transportation system with new policies, plans and practices that have been approved by City Council. Most importantly, the TMP is an opportunity for the public to have their voices heard in shaping how future transportation services can match their mobility needs. As such, stakeholder, Indigenous Community partner, and community engagement has been an integral part of the TMP's creation and was conducted at each phase of the development of this document. These phases included:

- Phase 1: Establishing the TMP's vision and goals,
- Phase 2: Assessing how the transportation system is currently functioning and identifying potential gaps and opportunities,
- Phase 3: Validating the recommendations and prioritizing the mobility enhancements that were most important to the people of Lethbridge.

This TMP identifies the infrastructure improvements required in the short, medium, and long-term for all modes of travel, the associated costs, and the policies and actions required to support the successful implementation of the TMP improvements.

A key focus of this TMP is shifting emphasis towards the role multi-modal networks play in the overall transportation system. Active travel modes such as transit, walking, cycling, and various forms of micro-mobility (e.g., e-scooters) can go a long way towards reducing the negative impacts on health and wellness, affordability, equity, and the climate associated with a car-focused municipality. As the concerns around climate change, health and wellness, affordability, and equity become front and center to the public, there has been a growing interest in active transportation modes, including walking and cycling. The interest in active modes was confirmed through stakeholder engagement work conducted as part of the TMP and the visioning process with Council.

Every trip – whether by vehicle, bicycle, transit, or another mode – begins and ends as a pedestrian. Therefore, building an interconnected mobility network starts with ensuring strong pedestrian connections are in place. It also means providing the public with:

- the ability to both travel from their origin to their destination as directly and uninterrupted as possible,
- the flexibility to shift their travel mode along their journey, and
- the elimination of any physical or economic constraints that may limit mobility.

The TMP needs to consider every travel mode's design, operations, and maintenance. The TMP provides a blueprint for how to build Lethbridge's' future interconnected mobility network by:

- prioritizing the completion of missing links in the cycling network,

- upgrading the pedestrian network to provide accessible surfaces for all people walking and rolling and prioritize the completion of missing links in the sidewalk and pathway networks, and
- accommodating emerging mobility services such as e-scooters, e-bikes, and electric vehicle charging stations.

1.1 Purpose of the Plan

Ultimately, the TMP is designed to address existing deficiencies within the transportation system, meet the current needs of residents, visitors, and businesses, integrate future land uses, and adapt the City's mobility network to the future population and employment growth estimates. This includes building a safe multi-modal system, integrating the different modes of travel together and to the land uses they serve, and incorporating the needs of commercial and industrial activity across the city. The TMP defines the City's next set of mobility priorities, the policies, and actions to support implementation, and high-level capital and operational cost estimates to inform the required changes into the City's capital and operational budgets. Adequate fiscal management means identifying the potential triggers for when mobility enhancements should occur that minimize throwaway costs, integrate flexibility to changing conditions into the design, and avoid overbuilding too soon to avoid unnecessary maintenance costs.

1.2 Understanding the Plan

1.2.1 PLAN COMPONENTS

The TMP is built on the foundation of 12 themes or lenses, a vision statement, and goals for the future of Lethbridge's transportation network. These are discussed in Section 2. Section 3 outlines the overall communication and engagement strategy used to develop and shape the TMP. Public, Indigenous Community partner and stakeholder feedback informs the plan at several stages of development. For this reason, this feedback is summarized in later sections. Sections 4 and 5 focus on the extensive modelling effort for the TMP to ensure that a resilient street network is in place to accommodate the city's growth. Scenario testing in Section 5 provides insights into what a more sustainable mobility network might look like. Section 6 of the TMP is a comprehensive review of existing conditions and an early examination of gaps and opportunities. Section 7 is focused on the future transportation network and solutions. Section 8, Supporting Initiatives and Strategies, develops actions and policies. Section 9 is where everything comes together, including network improvement projects, costing, actions, and policy statements. Section 10 recommends the metrics and monitoring needed to measure the success of plan implementation over time.

Section Details & Links

The Transportation Master Plan includes the 10 Sections described in **Table 1-1**Error! Reference source not found..

Table 1-1: TMP Section Details & Links

Section #	Title	Description
1	Introduction	Purpose, understanding, policy language, audience, and geographic context.
2	Plan Foundations	Lens (themes), vision, goals, related plans & studies.
3	Communications and Engagement Overview	Engagement participants, communications and engagement plan (mechanisms, tactics), integration.
4	Travel Demand Model	Base Year (2019) development (inputs, 4-step process, calibration/validation, outputs), and future baseline projections (population/employment, road improvements, future outputs).
5	Model Scenarios & Analysis	Location based data, scenario testing, third bridge analysis, meso-analysis.
6	Existing Transportation Network Conditions	What we heard summary, existing road network, existing bicycle/pedestrian network, transit network, street sections, accessibility assessment, technological readiness, existing conditions assessment summary.
7	Future Transportation Network Assessment	What we heard summary, future community integration, roadway classifications, multi-modal needs assessment, future accessibility needs, future goods movement, COVID impacts, hybrid work, third bridge assessment.
8	Supporting Initiatives and Strategies	Planned regional improvements and recommended supplementary studies/policies, traffic calming policy, roundabout policy, complete streets policy, speed reduction, emerging technologies, transportation demand management.
9	Implementation Plan	What we heard summary, roadway improvements, bikeway improvements, transit/accessibility improvements, technological improvements, prioritization, short/medium/long-term projects, costing, pilot projects, integration of sustainability and health.
10	Monitoring Implementation Progress	Key performance indicators, targets, reporting.
Appendix A	Model Development Reports	The development of the VISSUM model, calibration, outputs, future horizons, scenario testing, and guidelines on how to use/update the model.
Appendix B	What We Heard Reports	Summary of engagement events, tactics, analysis, and key themes, issues/opportunities heard.

Section #	Title	Description
Appendix C	Accessibility Destination Analysis	Identification and prioritization of accessibility destinations in the city.
Appendix D	Multi-Modal Analysis Reports	Existing and Future Multi-Modal Analysis Reports produced by Nelson Nygaard.
Appendix E	Smart(ER) Mobility Report	Stand-alone report on the readiness, targets, and recommendations for the City in emerging technologies.
Appendix F	Project Lists & Cost Estimates	Detailed project lists and costing excel sheets used to provided input to the summary tables in Section 9.
Appendix G	Cost & Societal Benefits of Cycling Infrastructure	A memo that summarizes local cost and researched societal benefits of investing in cycling infrastructure.

1.2.2 POLICY LANGUAGE

The TMP aligns with the Municipal Development Plan policy language. The City of Lethbridge uses specific terminology within policies to ensure they are clear, consistent, and can be achieved through actions.

Policies for which there is a very high level of commitment use the word "ENSURE" to indicate that the City of Lethbridge, through its decision-making, intends to make sure the desired result is achieved using a requirement. "ENSURE" policies indicate actions highly aligned with topics within the City's jurisdiction and/or actions identified as priorities through Council direction.

Policies that begin with the word "PROMOTE" indicate policies that are strongly aligned with the TMP's vision and outcomes but for which the actions to be taken may fall outside the City's direct jurisdiction or control. With these policies, the City intends to make the desired results more likely through a specified action.

Policies that begin with the word "SUPPORT" are those for which the City administration intends to provide passive support through conditional consideration. These are often policies that address topics identified as high priorities for and by the community but for which decision-making or implementation may fall outside the City's jurisdiction or overall control.

For each level of policy intention, there is a corresponding list of action words used.

Table 1-2 illustrates the alignment between intention and action.

Table 1-2 : TMP Policy Language

Policy Intent Term	Policy Action Term	Example
ENSURE Make sure the desired result is achieved using a requirement.	Require, Review, Establish, Safeguard, Incorporate, Prepare, Develop, Commit, Grow, Assess, Deliver, Respond, Update, Maintain, Provide, Make, Disallow, Protect, Create	**Commit** investment in the Strategies and Actions of the 5 focus areas identified in the 2020 Transportation Safety Plan.
PROMOTE Make the desired result more likely through a specified action.	Encourage, Facilitate, Sponsor, Include, Strengthen, Continue, Discourage, Restrict, Clarify, Obtain, Confirm, Advocate, Identify, Motivate	**Continue** expanding shared mobility opportunities including electric scooter and electric bike share.
SUPPORT Provide passive support through conditional consideration.	Consider, Explore, Back, Participate, Investigate, Assist, Endorse	**Explore** the development of an education and encouragement program for residents and businesses to support a shift in mode choice, safe routes, and 'sharing the road'.

1.2.3 FORMATS & AUDIENCE

The TMP document has been designed in two formats – a primarily technical version that includes the necessary details and precision to guide City staff and TMP implementors (that is this document) and a public-friendly version that is intended to share the information in a way that is easy to understand. Both versions are available to the public.

1.2.4 REGIONAL CONTEXT

Highways 3 and 4 are designated core routes of Canada's National Highway System (NHS) that travel through Lethbridge, as shown in **Figure 1-1**. These highways are also considered important highways in Alberta and are generally divided highways (expressways) or freeways in the Lethbridge area.

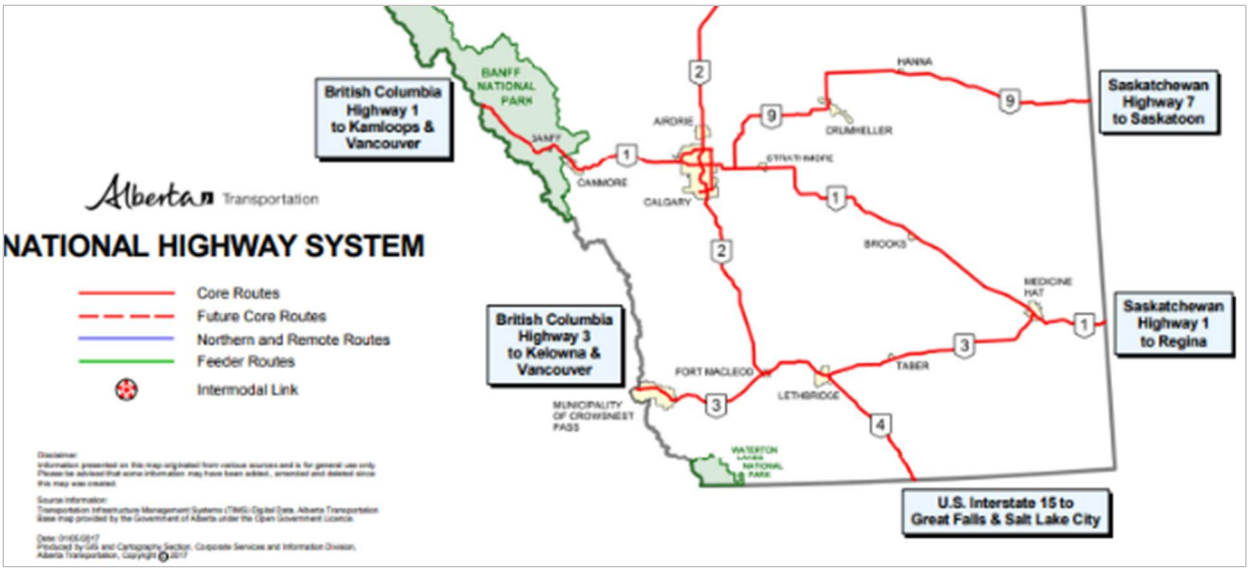


Figure 1-1: Alberta National Highway System

Source: https://open.alberta.ca/publications/national-highway-system-ma

As shown in

Figure 1-2, Highway 5 is a 129-kilometer highway that connects Lethbridge to Waterton Lakes National Park in southwestern Alberta. It is a 2-lane undivided highway. Highway 25 is a provincial highway that connects Lethbridge to Picture Butte. Highway 843 is a gravel provincial highway that ends near the river, north of the city.

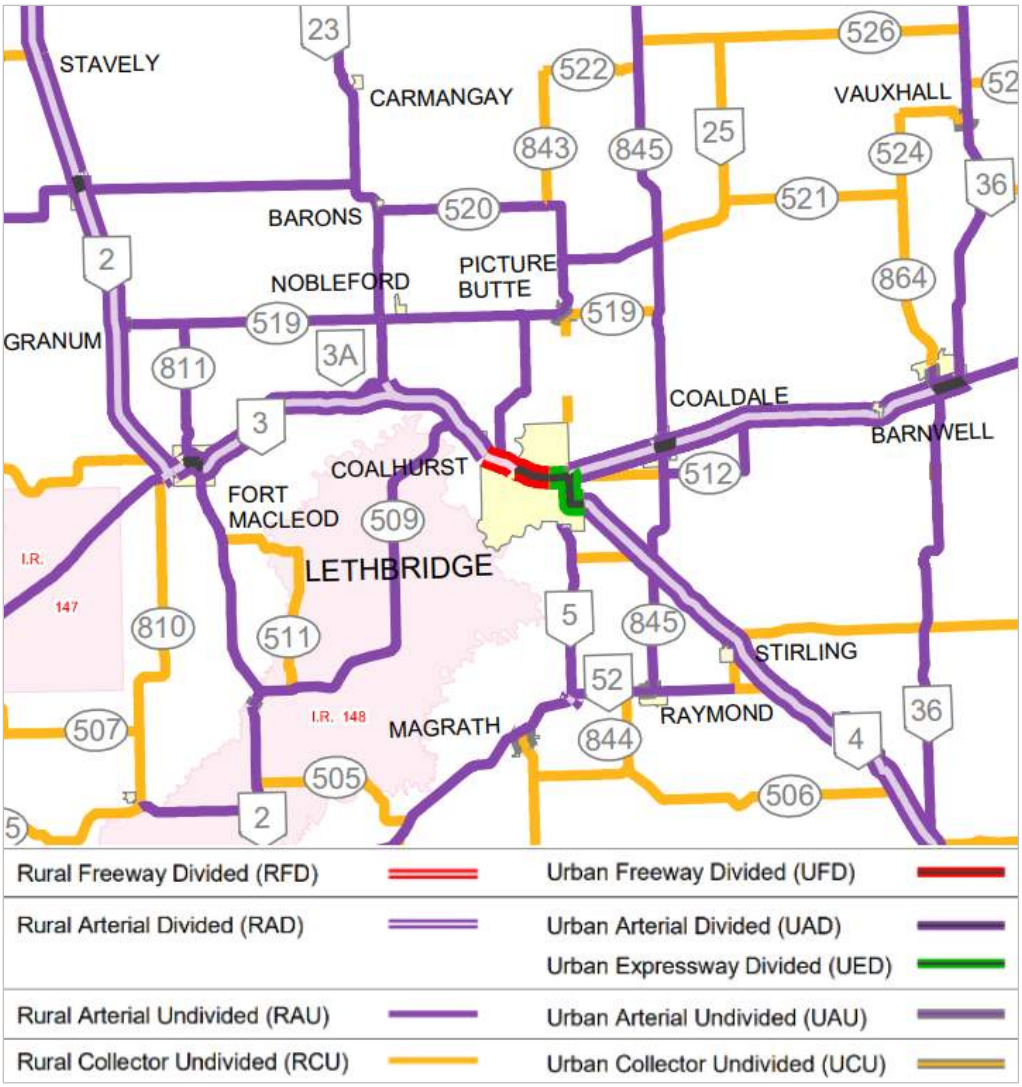


Figure 1-2: Roadside Management Classification Map Lethbridge Transportation District

Source: http://www.transportation.alberta.ca/Content/docType329/Production/11x17_Provincial_Network_Map.pdf

1.2.5 LETHBRIDGE COUNTY

The City of Lethbridge is in the southwest quadrant of Lethbridge County (Figure 1-3).

Highway 3 is the main east-west corridor running through Lethbridge, with the communities of Coalhurst to the west and Coaldale to the east.

Figure 1-3: Lethbridge County Map

Source: Modified from https://redecoupage-redistribution-2022.ca/com/ab/actl/images/48026.jpg

1.2.6 LETHBRIDGE NEIGHBOURHOODS

The TMP covers all the developed, natural, and future developing areas within the current municipal boundaries. These areas are shown in **Figure 1-4**.

Figure 1-4: Lethbridge Existing & Future Neighbourhoods
Source: https://www.lethbridge.ca/living-here/Maps/Documents/Basemaps/Neighbourhoods.pdf

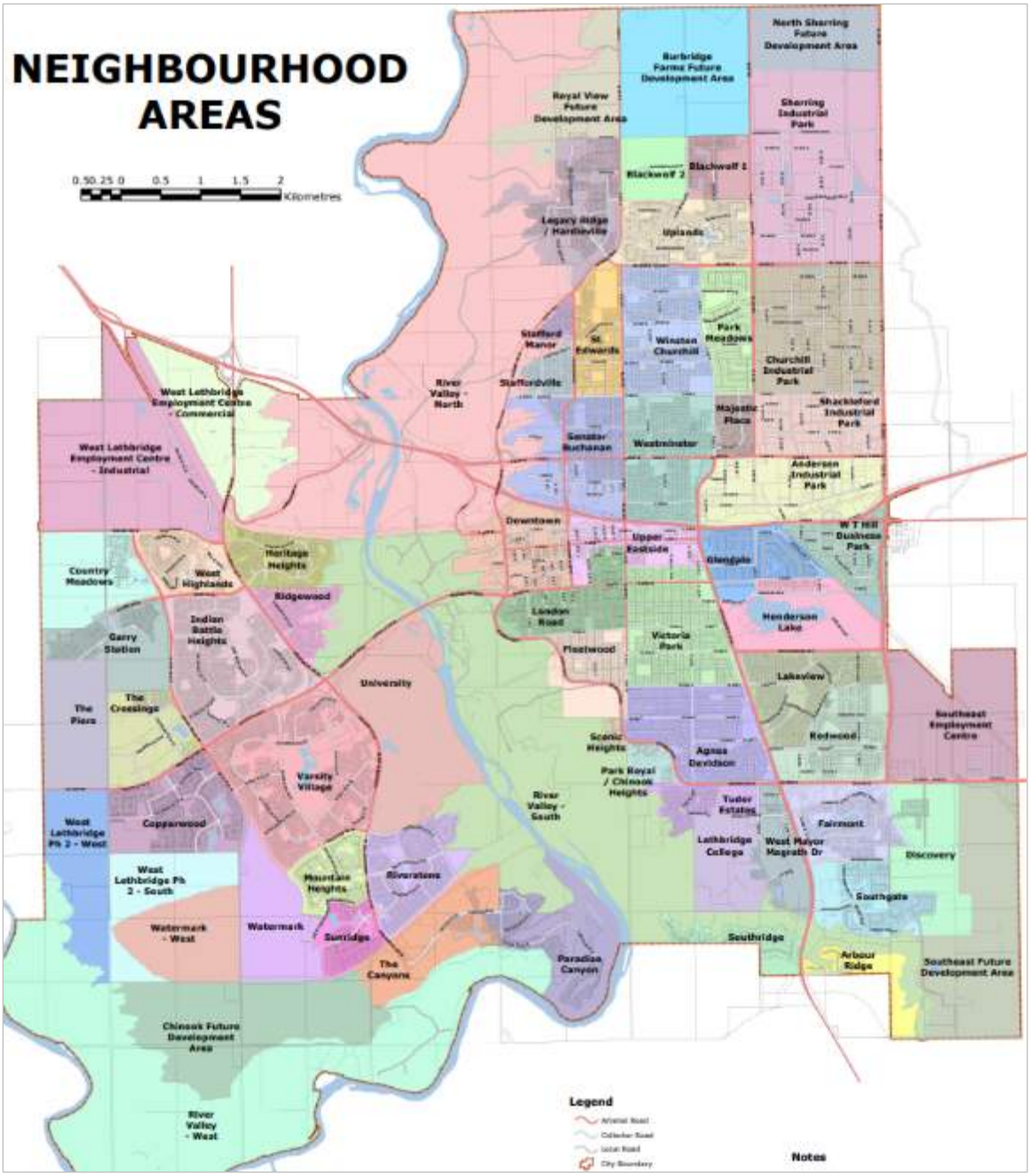


Figure 1-4: Lethbridge Existing & Future Neighbourhoods
Source: https://www.lethbridge.ca/living-here/Maps/Documents/Basemaps/Neighbourhoods.pdf

2 PLAN FOUNDATIONS

2.1 Project Lenses

The TMP is based on 12 themes or lenses. Lenses look at the mobility network from different angles and include a wider set of values when deciding how to design and make future improvements. These lenses guide the development of future policies and strategies for transportation. The lenses are described in **Table 2-1.**

Table 2-1: TMP Project Lenses

	**Accessibility:** Providing access for everyone, everywhere, all the time, including accommodations for persons with different abilities, is key to achieving an inclusive mobility strategy. This can include potential technologies and design elements to mitigate specific concerns and flexibility to adapt to other future needs. The TMP will identify opportunities to incorporate the City's *Mobility / Accessibility Master Plan*'s guiding principles and strategies.
	**All Ages and Abilities Active Transportation:** The City recognizes that an inclusive mobility network must be adaptable to people of different ages and abilities as they will use the transportation system differently today than in the future. Universal design principles, flexibility, and inclusionary technologies will be considered part of the TMP so that transportation networks can adapt to people's needs.
	**Climate Change and Climate Change Adaptation:** As the City increasingly recognizes the dynamic relationship with the environment, the City also acknowledges the impact that unsustainable transportation modes can have. As part of the TMP, the City will incorporate climate change solutions into the planning and design of the transportation network, prioritizing multi-modal solutions and a long-term adaptability, to transform the network design to support sustainable travel modes.
	**Diversity and Intersectional Lens Regarding Marginalized Populations:** The City is made up of diverse populations and groups that interact with the transportation systems differently. This includes potential barriers that may discourage people from certain modes, such as payment systems or access.
	**Environment / Ecosystems**: Innovations in infrastructure design approaches over the last few years have allowed for opportunities to mitigate traditional impacts on the environment and surrounding ecosystems, and transportation is no exception. Recommendations will be made to identify opportunities to incorporate design elements that will support environmental stewardship and ecosystem protection and enhancement.
	**Indigenous Communities:** The City acknowledges the need to consider the regional mobility needs of First Nations communities, both to and from the City and within. This also includes a robust engagement strategy to understand how the current systems are functioning, what aspects are working well, and where there are potential gaps. The City also acknowledges that the community needs may differ with Indigenous youth and require separate discussions on their needs.

	**Integration of Emerging Technologies, Services and Disruptions:** The transportation industry is in a transformative time, with new innovations underway that impact how, when and where people move. E-commerce had been rising for years and only accelerated through the pandemic, impacting retail and food services. Unified payment systems, integration of mobile devices, flexible work arrangements, micro-mobility, and electrified, autonomous, connected vehicles are just a handful of other changes that will require us to re-consider how future transportation systems need to function to keep up with the mobility evolution underway.
	**Integration with Land Use:** At its core, a transportation system serves people and land uses. As future land use changes are contemplated, the network must evolve to meet the future demand generated. This includes identifying the cascading transportation impacts that reverberate across the network with major land use changes and requires building adaptability into the network, to change as required. This also includes considering how modal shifts may occur as land use changes alter people's travel preferences.
	**Public Service:** The transportation system is designed to connect people with places. By this very nature, quality mobility choices become a public service that requires consideration for equality, equity, affordability and safety in design and function. As a public service, transportation systems should strive to meet the needs of the public and improve their quality of life. Public service often includes transit, which may be the primary mode of travel for residents that do not own a personal vehicle.
	**Resiliency:** Building resiliency into the transportation system requires considering the mobility options available today, current demand needs, and then integrating an adaptation strategy to accommodate the changing needs of tomorrow. This includes flexible design considerations to reflect other project lenses and build equity and balance in the overall transportation system.
	**Transit:** Transit is a primary mode of travel for many residents, visitors and workers who do not own a personal vehicle and for those who cannot use an alternative travel mode. High transit ridership can also reduce roadway congestion by reducing the number of vehicles on a roadway, reducing greenhouse gas emissions, and can potentially delay or even eliminate costly roadway network upgrades. A robust transit service that includes appropriate stop locations, direct service routes and convenient frequency is required to achieve these objectives. Integrating transit service options and elements of the City's *Transit Master Plan* into the TMP is a crucial aspect of the project vision and goals.
	**Transportation Safety – Building Safe Systems:** Vision Zero aims to see zero fatalities and injuries related to transportation. As the TMP envisions the future mobility network, incorporating the City's *Transportation Safety Plan* recommendations will be paramount.

2.2 Vision Statement and Goals

During Phase 1 of engagement, the Civic Works Standing Policy Committee created a Vision Statement for the Lethbridge TMP, which City Council approved on April 20, 2021.

> *Connect Lethbridge with a well-balanced, integrated and maintained transportation network that serves all residents, businesses, and visitors safely, efficiently, and equitably while focusing on sustainable multi-modal solutions that are adaptable to the future needs of the City and is embraced by the community.*

City Administration then created the following nine strategic goals (**Table 2-2**) to support the TMP's Vision Statement. The Lenses that are associated with these goals is also provided.

Table 2-2: TMP Goals w/Lens Alignment

Goal	Lens Alignment			
1. Strengthen connectivity between a variety of places, services, and modes.				
2. Recognize and meet the diverse mobility/accessibility needs of all residents, businesses, and visitors.				
3. Strive for zero transportation-related deaths and serious injuries.				
4. Affirm the City's commitment to public transit and active modes of transportation.				
5. Respond to the current and future needs of Lethbridge and the region.				
6. Design transportation systems that are adaptable and resilient to future climate realities.				
7. Design transportation infrastructure that contributes to a healthy environment and ecosystem function.				
8. Leverage technologies and innovations to increase transportation efficiency, improve value and enhance services.				
9. Ensure future transportation investments are financially sustainable.				

2.3 Key Guiding Documents

2.3.1 MUNICIPAL DEVELOPMENT PLAN

City Council approved an updated Municipal Development Plan in 2021. There are helpful mappings and policies within this Plan that inform this TMP. **Figure 2-1** shows the City's key existing activity nodes that are well-served by the road network and transit.

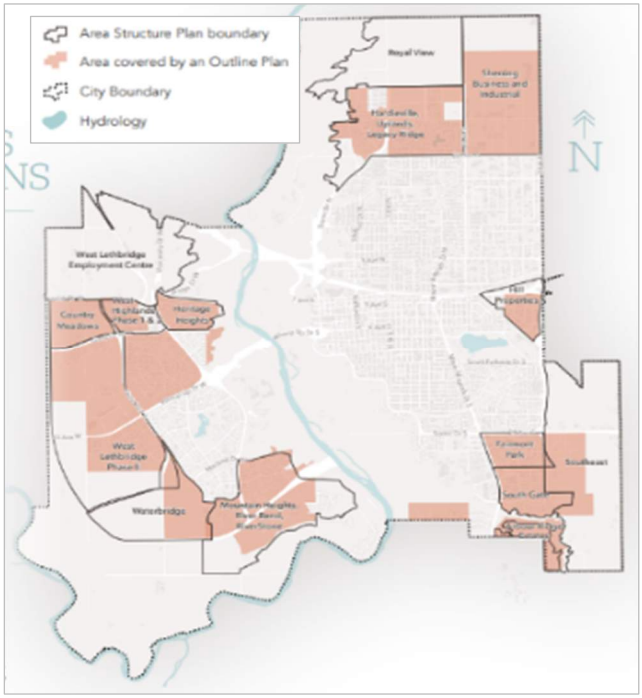


Figure 2-1: Approved Area Structure Plans & Outline Plans
Source: Municipal Development Plan, Map 6

There is also a dedicated section/policy topic in the Municipal Development Plan focused on Transportation. Within this section are 16 transportation policies and 33 direction statements covering transportation modes, the transportation network, and mobility/accessibility/safety. Direction from the Municipal Development Plan is incorporated into the Transportation Master Plan.

2.3.2 TRANSPORTATION SAFETY PLAN

Motor vehicle collisions can cause lifetime injuries and take their toll on individuals and their families. They are also estimated to cost society approximately $130 million per year.

The Transportation Safety Plan (2020) identifies the necessary actions and resources to provide a safer transportation system in Lethbridge with specific actions between 2020 and 2025. A vision-zero approach for fatal and severe injury collisions is proposed with a target of a 50% reduction in fatal and severe injury collisions by 2030. In addition, a target of zero fatal collisions involving vulnerable road users was set for 2040 with specific strategies for younger users, pedestrians, bicycles, motorcycles, e-bikes and e-scooters, elderly users, people with disabilities, and adaptive roadways.

The guiding principles are sustainability, adaptability, positive culture, and equity. The proposed strategies to improve road safety focus on distraction, speed and aggressive driving, intersection-related crashes, vulnerable road users, and safe vehicles. Key elements of the Transportation Safety Plan are described more **in Section 6.8.1.**

2.3.3 MOBILITY/ACCESSIBILITY MASTER PLAN

The 2020 Mobility/Accessibility Master Plan (MAMP) is a long-term visionary plan to create a universally accessible city that is designed for all people regardless of ability, where everyone can meaningfully contribute to, and engage with, their community. The Plan was developed through a comprehensive planning process including best practices research with other communities, significant engagement with the public, stakeholders, and City Business Units.

Areas of Focus include:

A. Seek sustainable funding for facility retrofits.
B. Ensure City assets are accessible for all abilities.
C. Assess current conditions (accessibility audits).
D. Enhance external communication & engagement.
E. Develop consistent mobility/accessibility guidelines and standards.
F. Test design ideas unique to Lethbridge.
G. Prioritize planned mobility & accessibility improvements.
H. Collaborate to minimize winter city challenges.
I. Maintain accessibility during construction detours.
J. Ensure a seamless interface between public & private spaces.
K. Explore an accessible door to accessible door transportation service.
L. Manage Access-A-Ride demand.
M. Monitor and enforce mobility & accessibility regulations.

The Plan includes tools and techniques to use through the development process, financial considerations and a monitoring plan.

2.3.4 CYCLING MASTER PLAN

The Cycling Master Plan from 2017 seeks to increase cycling through safe, properly designed and located infrastructure. The 2017 Cycling Master Plan set a vision that *"Lethbridge commits to making cycling a*

realistic transportation option for all ages and abilities, contributing to our sustainable future." It also identifies the following six goals:

- More people cycling: including commuting, with a quantitative goal of doubling all trip percentages by 2021.
- Cycling is safe: a reduction in crashes and safer designs.
- Cycling is desirable: infrastructure welcoming to all ages and abilities.
- Cycling is connected: connected to activity centres and transit and walking modes.
- Cycling is understood: education programs and creating a culture of cycling.
- Cycling is implemented: staged implementation, well maintained in all seasons.

Through a cycling demand and potential zones analysis, the plan outlined a future cycling network to provide higher comfort for people of all ages and abilities, as is shown in **Figure 2-2.**

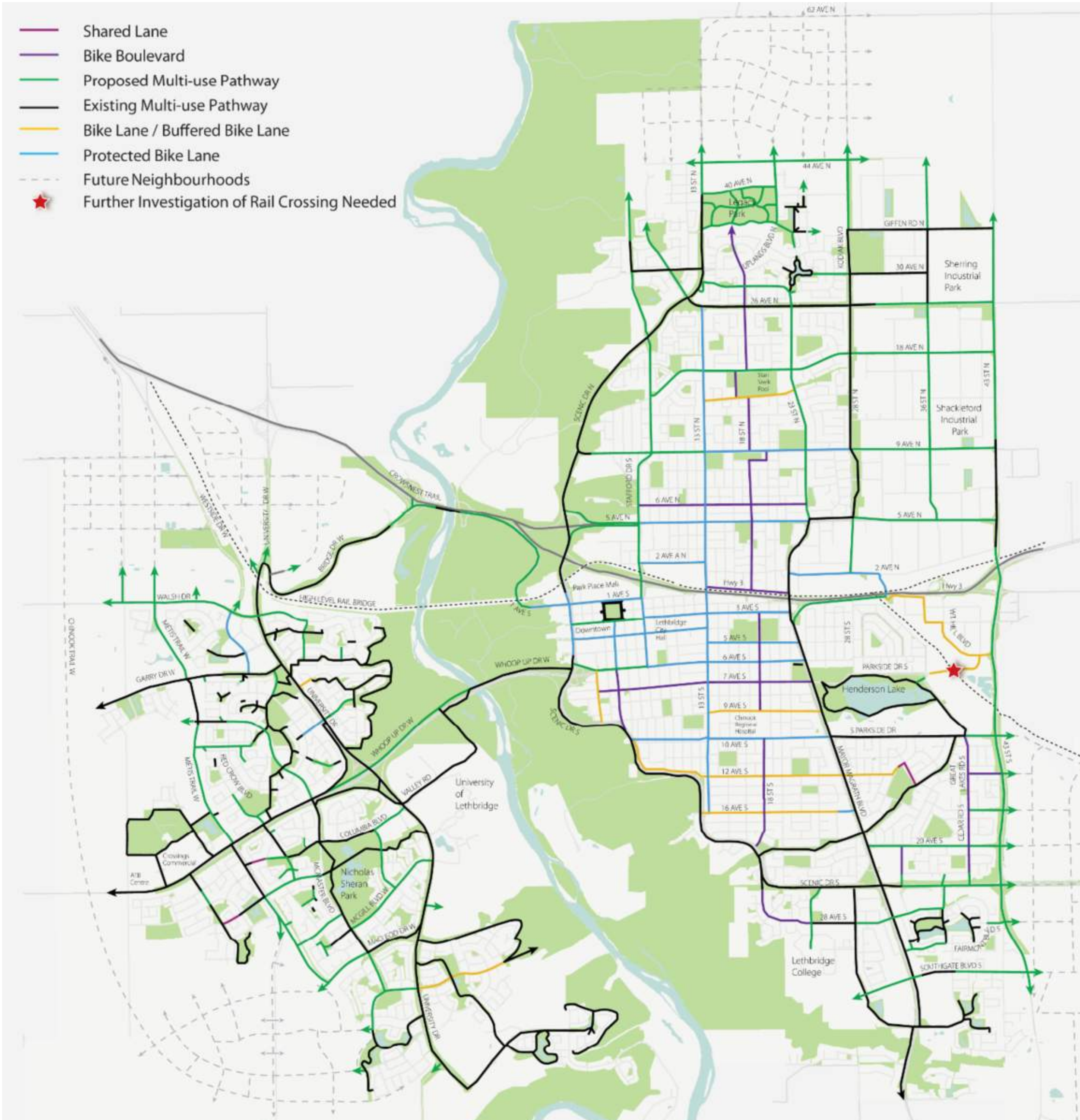


Figure 2-2: Lethbridge Future Bike Network
Source: (City of Lethbridge Cycling Master Plan, 2017)

2.3.5 TRANSIT MASTER PLAN

The City of Lethbridge completed the Transit Master Plan in 2017. This transformational plan was developed in response to the Integrated Community Sustainability Plan, which envisioned a future with cleaner air, cleaner water, and fewer greenhouse gas emissions. The vision from the Transit Master Plan is *"Helping move Lethbridge into the future."*

The goals of the Transit Master Plan include:

- Transit helps transform Lethbridge.
- Transit values customer's time.
- Transit helps achieve a community that is prosperous, competitive and provides choice.
- Transit takes people where they want to go – connecting people to jobs, education and services.

The Transit Master Plan was developed in support of the following planning efforts:

- Intermunicipal Development Plan (2016).
- Public Realm & Transportation Study (2012).
- Transportation Master Plan (2012).

The Lethbridge Transit Master Plan recommends transit actions at different time frames focusing on frequent, local, community, and on-demand transit levels. The long-term network vision presented also includes key terminal locations to connect different services. A walk distance buffer of 800 meters around the frequent transit lines provides access and multimodal connectivity among different transit services. The high-frequency routes, marked as 1 and 4 in **Figure 2-3**, connect Lethbridge across the Oldman River.

The Transit Master Plan was designed to allow for a phased implementation, starting with structural changes to the complex and circuitous route network and then improving transit frequency as funding allowed. In 2020, Lethbridge City Council authorized the cityLINK/Demand Response pilot project that significantly restructured the system into a series of fast, direct, and frequent cityLINK routes, community circulator routes, and flexible and adaptable on-demand services in low-density areas.

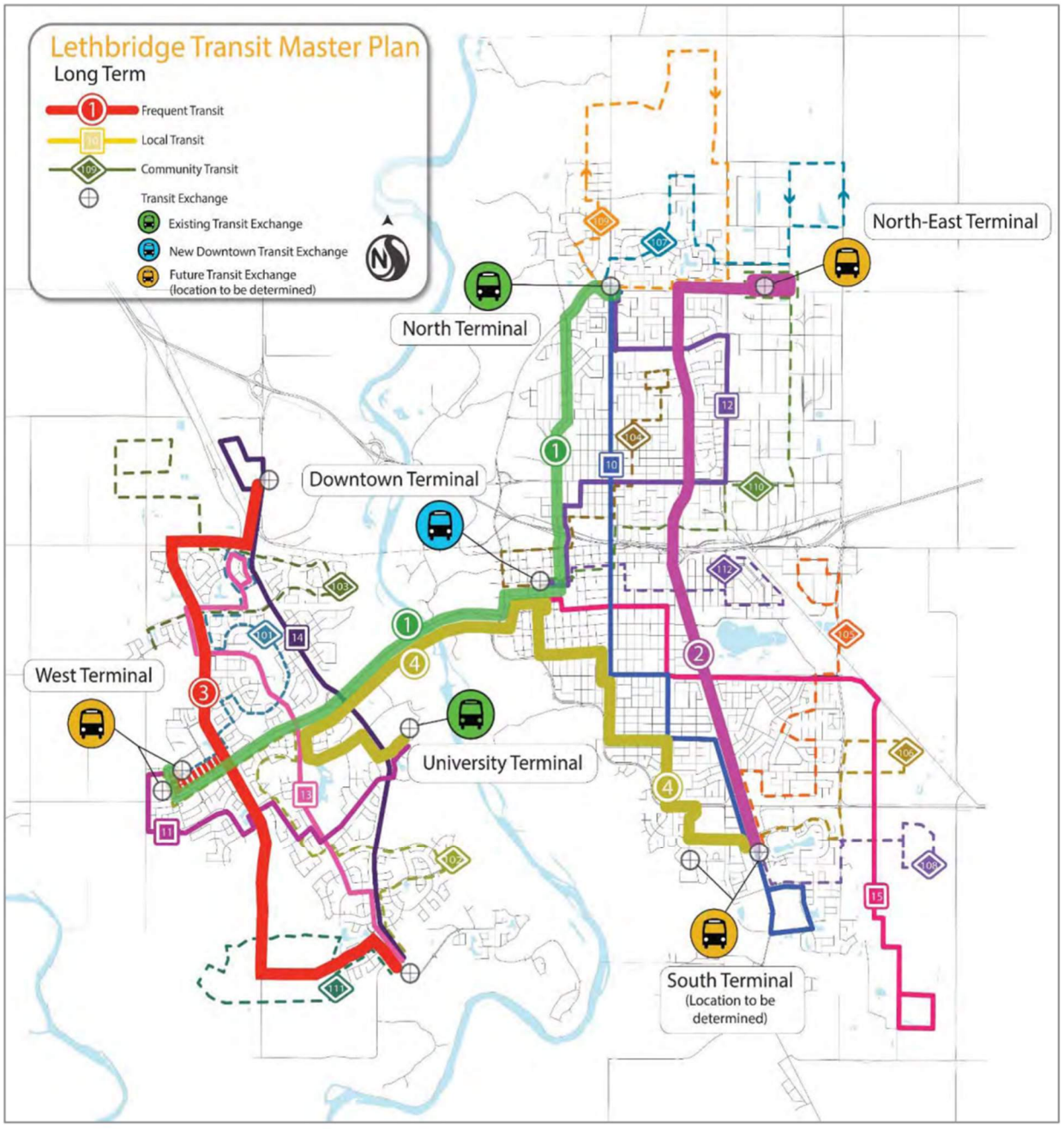


Figure 2-3: Long Term Lethbridge Transportation Master Plan Vision

Source: Figure 34, Lethbridge Transit Master Plan (2017)

2.4 Other Guiding Documents

2.4.1 URBAN FOREST MANAGEMENT PLAN

The Lethbridge Urban Forest Management Plan (2021) outlines a strategic vision, goals and objectives for Lethbridge's urban forest, establishes guiding principles for urban forest management, and proposes detailed actions for urban forest policy and program development and implementation.

The 2041 vision statement for Lethbridge's Urban Forest Management Plan:

"Lethbridge's urban forest is healthy, resilient, and growing. Trees along streets, in parks and on private lands enhance the quality of life for all of the city's residents and are an important part of the city's identity. All community members support each other in caring for, preserving, and enhancing the urban forest and the many valuable services it provides for the enjoyment and benefit of all."

There are five strategic goals that will realize the vision set by the City of Lethbridge if pursued and fulfilled:

1. **Understand:** Develop a better understanding of all aspects of the urban forest and its management and use this knowledge to make better urban forest management decisions.
2. **Maintain:** Improve the health, longevity, safety, and functional capacity of the urban forest, and ensure that the future urban forest can reach its genetic potential to provide the full range of services safely and cost-effectively.
3. **Grow:** Expand the extent of the urban forest, strengthen its resilience against stressors, and enhance its capacity to provide functional services to the community.
4. **Protect:** Protect existing trees and their growing environments against injury and destruction wherever possible, particularly during land development and land use change, through a coordinated tree protection program.
5. **Engage:** Encourage all community members to engage in urban forest stewardship on both public and private lands and build strong urban forest partnerships.

2.4.2 CYCLING CORRIDOR FUNCTIONAL PLANNING STUDY

The Cycling Corridor Functional Planning Study (2019) considered the existing transit and cycling networks and proposed the following corridors to be built in a 5-year timeframe:

- **4 Avenue S:** one-way protected bicycle lanes with three travel lanes for motorized vehicles and on-street parallel parking.
- **7 Street S:** one-way protected bicycle lanes with two travel lanes for motorized vehicles and on-street front-in-angle parking.

On a longer timeframe, these corridors provide a more comprehensive network:

- **2A Avenue N:** 4.0-metre multi-use pathway located on the south side of the road while preserving the motorized vehicle cross-section.
- **Stafford Drive N and S**: 3.0-metre multi-use pathway on the west side of the road.
- **4 Avenue S:** directional one-way 1.5-metre bicycle pathways protected from the travel lanes by a boulevard buffer and on-street parallel parking.
- **7 Street S:** directional one-way bicycle pathways protected from the travel lanes by a boulevard buffer and on-street parking.
- **1 Avenue S**: 3.0-metre two-way bicycle pathway on the north side of the road.
- **Highway 3**: multi-use pathway within a boulevard connecting Mayor Magrath Drive S to 32 Street S on the south side of Highway 3.

For each corridor, alternatives for typical cross sections, motorized vehicle on-street parking layouts, lane geometry, and recommended posted speed limits are provided. Traffic operations, crash history (particularly pedestrians and cyclists), parking supply, transit connections, and land use were included as part of the analysis for these corridors.

2.4.3 RIVER VALLEY PARKS MASTER PLAN

The River Valley Parks Master Plan (2017) provides a long-term strategy for resource protection, sustainable management, and nature-based recreational development. It provides a guiding framework for future parks that strikes a balance between the conservation of natural resources and the desire of residents to enjoy recreation and leisure activities.

Specific Transportation Related Objectives were outlined as follows:

Mobility

- Provide accessible infrastructure and amenities to those with mobility limitations at major and minor nodes.
- Ensure appropriate parking provisions at park nodes and boat launches.
- Provide accessible entry points for people to access the Oldman River for a broader range of watercraft.
- Use parking management strategies to provide access to special events (temporary overflow parking, bus shuttle, etc.).

Safety

- Ensure reasonable and safe public access into and within the River Valley that does not impact sensitive natural features.
- Ensure adequate emergency access into and across the River Valley.
- Repair and maintain pathways to ensure safety.

Pathways

- Create a continuous north-south pathway system that connects park nodes.
- Create a continuous pathway from the top of the bank connecting to the bottom of the valley at appropriate locations.
- Increase the number of pedestrian river crossings.
- Ensure pathway connectivity between park nodes.
- Provide a diversity of pathway types to support a variety of uses throughout.
- Connect dead-end pathways.
- Create pathway loops of various types, lengths and difficulties.
- Formalize key pathway links to contribute to a well-connected pathway system.

Amenities

- Increase opportunities and access infrastructure for river-based activities and accommodate a broader range of vessels (canoe, kayak, paddleboard, etc.).
- Provide signage and wayfinding to support pathway activities (i.e., measure distance) and orientation.

2.4.4 INTERMUNICIPAL DEVELOPMENT PLAN

The Intermunicipal Development Plan (2016) is a joint planning collaboration between the City of Lethbridge and Lethbridge County and is a Statutory Plan following the Municipal Government Act, adopted by bylaw of each of the Councils (City of Lethbridge Bylaw # 6015 and Lethbridge County Bylaw # 1478). The plan provides Transportation policies that support the long-range growth and development of the City of Lethbridge and Lethbridge County. When transportation networks cross between municipal and provincial jurisdictions it is necessary to ensure efficiency and functionality through communication, coordination, and long-range planning.

The Intermunicipal Development Plan outlines several transportation-related policies:

Policy 5.1.1 In order to provide for efficient development and reasonable access between the two municipalities, the City and the County should coordinate the planning of major transportation links for all modes of transportation.

Policy 5.1.2 Both municipalities should jointly consult with Alberta Transportation to coordinate planning and development of major roadways within the Plan Area relative to provincial highways/jurisdictions.

Policy 5.1.3 The City and County should consider further intermunicipal cooperation and integration of master plans, land use plans and engineering studies on transportation related matters.

Policy 5.1.4 Multi-modal transportation connections between municipalities should be coordinated where appropriate.

Policy 5.1.5 Both municipalities should communicate regularly on transportation matters with Administrative Staff. The Inter-Municipal Committee will be informed of any collaboration or issues at Inter-Municipal Committee meetings.

Policy 5.1.6 Where warranted, the host municipality should consider the impacts that a proposed development may have on the transportation infrastructure of the adjacent municipality through the development of a Transportation Impact Assessment, to the standard of the host municipality.

Policy 5.1.7 Both the County and the City acknowledge that a Traffic Impact Assessment will be required prior to any development as part of an Area Structure Plan or conceptual scheme, to confirm access management standards, roadway cross sections and other functional considerations, which should be provided at the expense of the developer.

Policy 5.1.8 Where development exceeds the current road capacity and the Traffic Impact Assessment indicates upgrades are required to accommodate the proposed development, the developer will be required to cover the costs of the design and construction of these roadway upgrades.

Policy 5.1.9 Each municipality must be notified of any development or subdivision proposal not previously covered by Area Structure Plan or Outline Plan in the other municipality that will result in access being required from an adjoining road under its control or management. The affected municipality must give its approval or decision in writing prior to the application being considered as complete by the other municipality.

Policy 5.1.10 Transportation connections should be compatible across municipal boundaries.

Policy 5.1.11 Both municipalities should discuss and coordinate access from boundary roads.

Policy 5.1.12 Where the road jurisdiction changes on a boundary road or a road standard is most efficiently maintained by the adjacent municipalities, a maintenance agreement should be pursued.

Policy 5.1.13 Both municipalities will notify the other municipality, in writing, of any road bans, bridge bans and closures, a minimum of two (2) days prior to the ban taking effect whenever possible.

Policy 5.1.14 The County or the City may require an agreement regarding the construction, repair, or long-term maintenance of any municipal roads, which may be impacted by subdivision or development or the construction of such development, when the development requires access to come from the adjacent municipality's road.

Policy 5.1.15 Municipal roads that may be affected by the annexation or a municipal boundary change must be identified in the growth or annexation study provided in accordance with the policies in Section 3.2 of the IMDP.

Policy 5.1.16 Both the County and the City will utilize their own engineering design standards for roads unless otherwise agreed upon.

Policy 5.1.17 Within Area 4, access to the Lethbridge Regional Landfill will be protected and maintained.

The City of Lethbridge and Lethbridge County Intermunicipal Development Plan (plan area shown with a black border) in **Figure 2-4** identifies where highways and roads connect and are governed by the Intermunicipal Development Plan corridor design standards policies. Relevant policies have been incorporated later in this document. While focusing on the transportation network within the blue boundary, the TMP needs to consider policies and road functions outside of this boundary so that master planning objectives are aligned. In line with the Intermunicipal Development Plan, Lethbridge County was consulted in the drafting on this TMP.

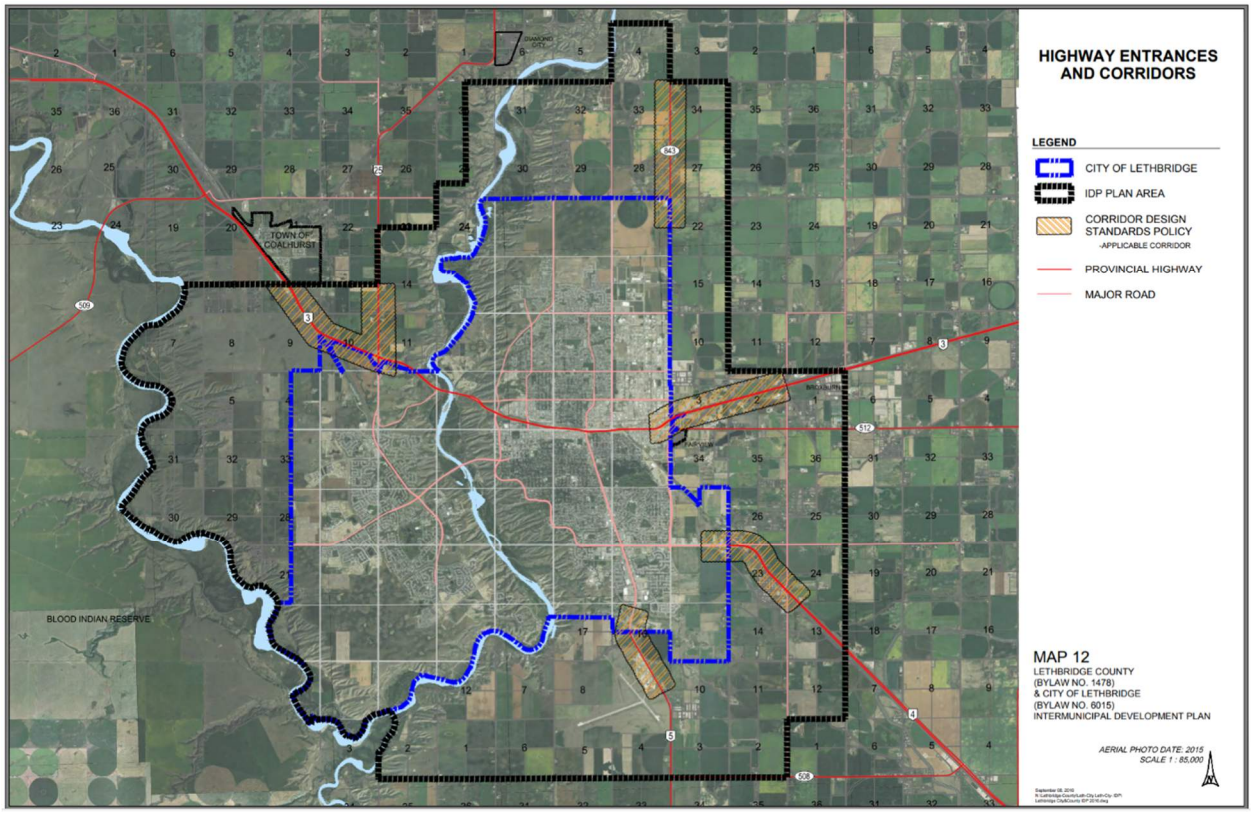


Figure 2-4: Intermunicipal Development Plan Highway Entrances & Corridors
Source: City of Lethbridge and Lethbridge County Intermunicipal Development Plan, Map 12

2.4.5 SOUTH SASKATCHEWAN REGIONAL PLAN 2014-2024

The South Saskatchewan Regional Plan 2014-2024 (2017) focuses on strategic direction for medium-term growth within the plan area, which is bordered by British Columbia to the west, Montana to the south and Saskatchewan to the east. The northern border is the northern limits of the M.D. of Bighorn, the M.D. of Rockyview, Wheatland County, County of Newell, and Cypress County. The City of Lethbridge is in the general centre of the plan area.

Transportation Initiatives are presented within the plan and consist largely of highway twinning and bypass studies. Highway twinning along Highway 3 is proposed from Crowsnest Pass to Fort Macleod and from Taber to Medicine Hat. Bypass studies completed or proposed for highways leading to Lethbridge include Nanton, Claresholm and Fort Macleod.

2.4.6 FUNCTIONAL PLANNING STUDIES

Functional Planning Studies define specific intersection and roadway alignments and identify how roadways will connect in the future. These include intersection treatments and designs, auxiliary lanes such as turn lanes, and future traffic control measures. Several functional planning studies have been incorporated into the future transportation demand model to assess how the introduction of these roadway network improvements will shape land use changes and future traffic within the city. The following list identifies the Functional Planning Studies included in the TMP:

- Whoop-Up Drive Interchanges Functional Planning Study (2019).
- 28 Street North Upgrade Functional Planning Study (2010).
- 6 Avenue S Functional Planning and Design Report (2016).
- Highway 5 Detailed Design Report (2013).
- Scenic Drive North Preliminary Design Report (26 Avenue N to Pavan Park Access) (2018).
- Lethbridge Circulation Road Study (2010).
- Scenic Drive North Preliminary Design Report (Pavan Park Access to 43 Street N) (2019).
- North Lethbridge Arterial Improvements (26 Avenue N Twinning).
- 5 Avenue N / 13 Street Functional Planning and Design (2021).
- Walsh Drive W (University Drive W to Métis Trail W).

Highways 3 & 4 Lethbridge Area NHS & NSTC Functional Planning Study

Beyond city limits, a significant study is the Highways 3 & 4 Lethbridge Area NHS & NSTC Functional Planning Study. The Province is proposing a major realignment of Highways 3 and 4. This will create the CANAMEX Corridor (shown as yellow in **Figure 2-5** which is proposed to tie Canada to the United States and Mexico, encouraging the free trade of goods and services.

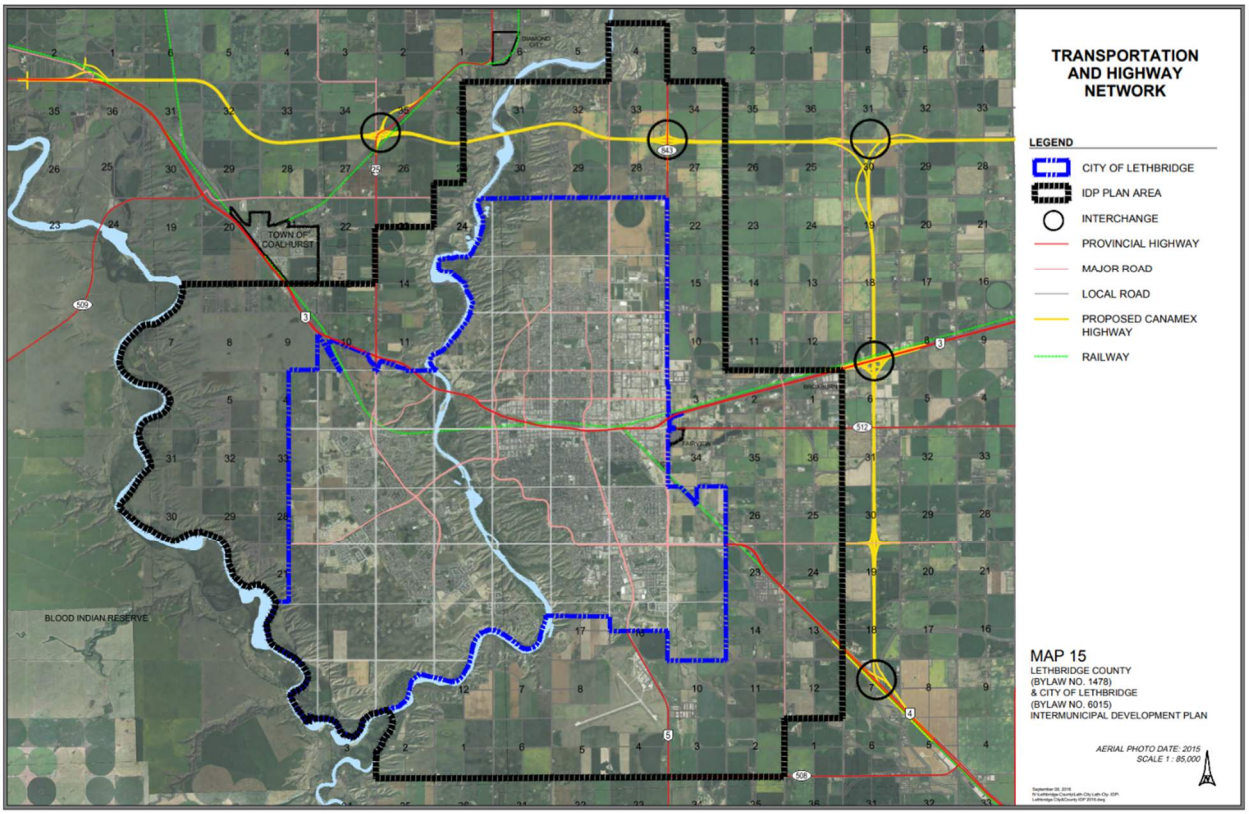


Figure 2-5: Transportation and Highway Network, Including CANAMEX
Source: Map 15, 2016 Intermunicipal Development Plan

2.4.7 2012 TRANSPORTATION MASTER PLAN

The previous TMP's vision was established as follows:

"We, the TMP Partners, commit to creating an integrated multi modal plan that encourages a sustainable transportation system that is safe, affordable, effective, and environmentally responsible."

The City's previous TMP focused on transportation infrastructure needs associated with the 100,000 and 130,000 population horizons, roughly estimated to be the 8-year and 30-year horizons. At the time, the TMP's study goals were:

- Adequate access and mobility for people and goods.
- A safe, secure, and integrated transportation system.
- Effective public involvement in the TMP development process.

The 2012 Transportation Master Plan identified the network improvements to support the 100,000-population horizon in two (2) categories: the Basic and the Optional road networks. The Basic road network improvements are summarized in **Table 2-3** and the Optional road network improvements are summarized in

Table 2-4.

Table 2-3: 2012 TMP Basic Road Improvements (2020 Horizon)

Corridor	Limits	Improvement	Status (2022)
26 Avenue N	23 Street N to 28 Street N	Widen from 2 lanes to 4 lanes (700 metres)	Complete
28 Street N and 5 Avenue N	Mayor Magrath Drive N to 26 Avenue N	Upgrade to divided arterial (2.8 km)	Partially complete
Scenic Drive N	5 Avenue N to Stafford Drive N	Construct initial 2 lane arterial (1.8 km)	Complete
43 Street N	Highway 3 to 9 Avenue N	Widen from 2 lanes to 4 lanes (1.4 km)	Complete
Mayor Magrath Drive S	City Limits to the Airport Access	Widen from 2 lanes to 4 lanes (900 metres)	Incomplete
43 Street S	Highway 4 to Southgate Boulevard S)	Construct initial 2 lane arterial (900 metres)	Link deleted
University Drive W	Sun Ridge Boulevard W to Canyon Parkway W	Construct initial 2 lane arterial (900 metres)	Complete
Métis Trail W	Simon Fraser Boulevard W to Blackfoot Boulevard W	Construct initial 2 lane arterial (1.9km)	Partially complete
Métis Trail W	Jerry Potts Boulevard W to Garry Drive W	Construct initial 2 lane arterial (600 metres	Complete
Métis Trail W	Aberdeen Links W to Walsh Drive W	Construct initial 2 lane arterial (600 metres)	Complete
Garry Drive W	600 m west of Métis Trail	Construct initial 2 lane arterial (1.2 km)	Complete
Whoop Up Drive W	Coalbanks Gate W to 200 m west	Construct initial 2 lane arterial (200 metres)	Complete
Mayor Magrath Drive S at Scenic Drive S	Intersection Improvements	3rd southbound lane	Complete

Table 2-4: 2012 TMP Optional Road Network Improvements (2020 Horizon)

Corridor	Limits	Improvement	Status (2022)
26 Avenue N	Scenic Drive N to 23 Street N	Widen from 2 lanes to 4 lanes (1.2 km)	Incomplete
26 Avenue N	31 Street N to 41 Street N	Widen from 2 lanes to 4 lanes (900 metres)	Incomplete
Scenic Drive N	Stafford Drive N to 26 Avenue N	Widen from 2 lanes to 4 lanes (800 metres)	Incomplete
Scenic Drive N	Uplands Boulevard N to 44 Avenue N	Construct 2 new lanes (1.4 km)	Incomplete
43 Street N	26 Avenue N to 44 Avenue N	Construct 2 new lanes (1.8 km)	Incomplete
43 Street S	Southgate Boulevard S to Highway 5	Construct initial 2 lane arterial (3.5 km)	Link deleted
Whoop Up Drive W	McMaster Boulevard W to Aquitania Boulevard W	Widen from 2 lanes to 4 lanes (2.1 km)	Complete
University Drive W	Community Stadium to Sunridge Boulevard W	Widen from 2 lanes to 4 lanes (1.6 km)	Complete
Métis Trail W	Blackfoot Boulevard to Jerry Potts Boulevard	Construct 2 new lanes (1.2 km)	Complete
Métis Trail W	Garry Drive W to Aberdeen Links W	Construct initial 2 lane arterial (600 metres)	Complete

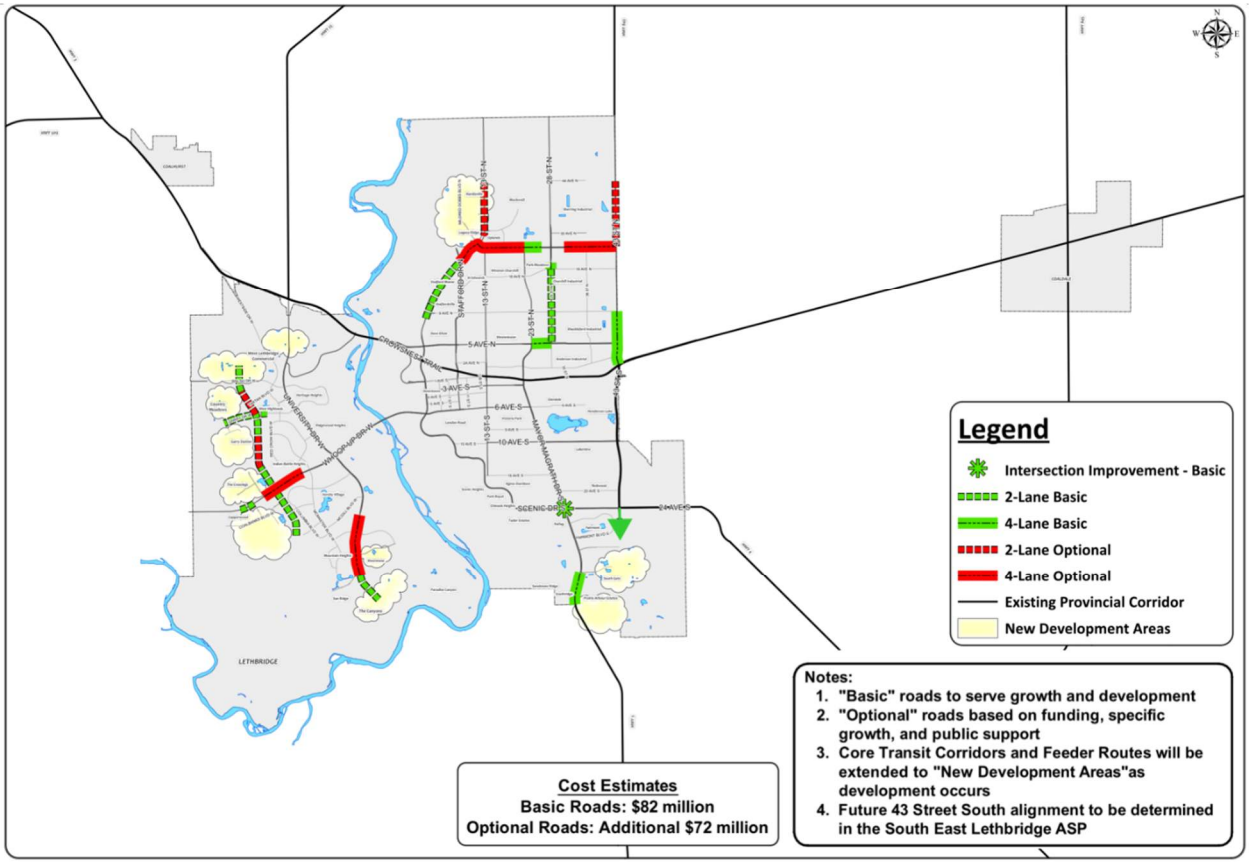


Figure 2-6: 2012 TMP Proposed Road Network (100k Population)

Source: 2013 TMP Final Report (Figure 5-1, 2020 Arterial Road Scenarios)

The 2012 TMP similarly identified improvements for the 130,000-population horizon (2040), divided into a Basic and Optional road network. The 130,000 population Basic road network consists of the 100,000 population (2020) Basic road network and the infrastructure in **Table 2-5.** The "Required in 2039" column entries are based on the VISSUM modelling work undertaken for the 2023 TMP and explained in more detail in Section 4.0.

Table 2-5: 2012 TMP Basic Road Network Improvements (2040)

Corridor	Limits	Improvement	Req'd in 2039?
Métis Trail W	North of Walsh Drive W to Highway 3	Construct initial 2 lane arterial (2.6 km)	No
Garry Drive W	To west development limits	Construct 2 lane arterial (100 metres)	Yes – to Homestead Boulevard W
MacLeod Drive W	McMaster Boulevard W to Métis Trail W	Construct 2 lane arterial (700 metres)	Yes
Mayor Magrath Drive S	City Limits to Airport Access	4 lane arterial (1.5 km)	Yes

Corridor	Limits	Improvement	Req'd in 2039?
43 Street N	9 Avenue N to 26 Avenue N	Upgrade 2 lane arterial (1.7 km)	Yes
44 Avenue N	43 Street N to Scenic Drive N	2 lane arterial (3.3 km)	Yes - from Scenic Drive N to 28 Street N

The 130,000-population optional road network consists of the 100,000-population optional road network and the following in **Figure 2-7**.

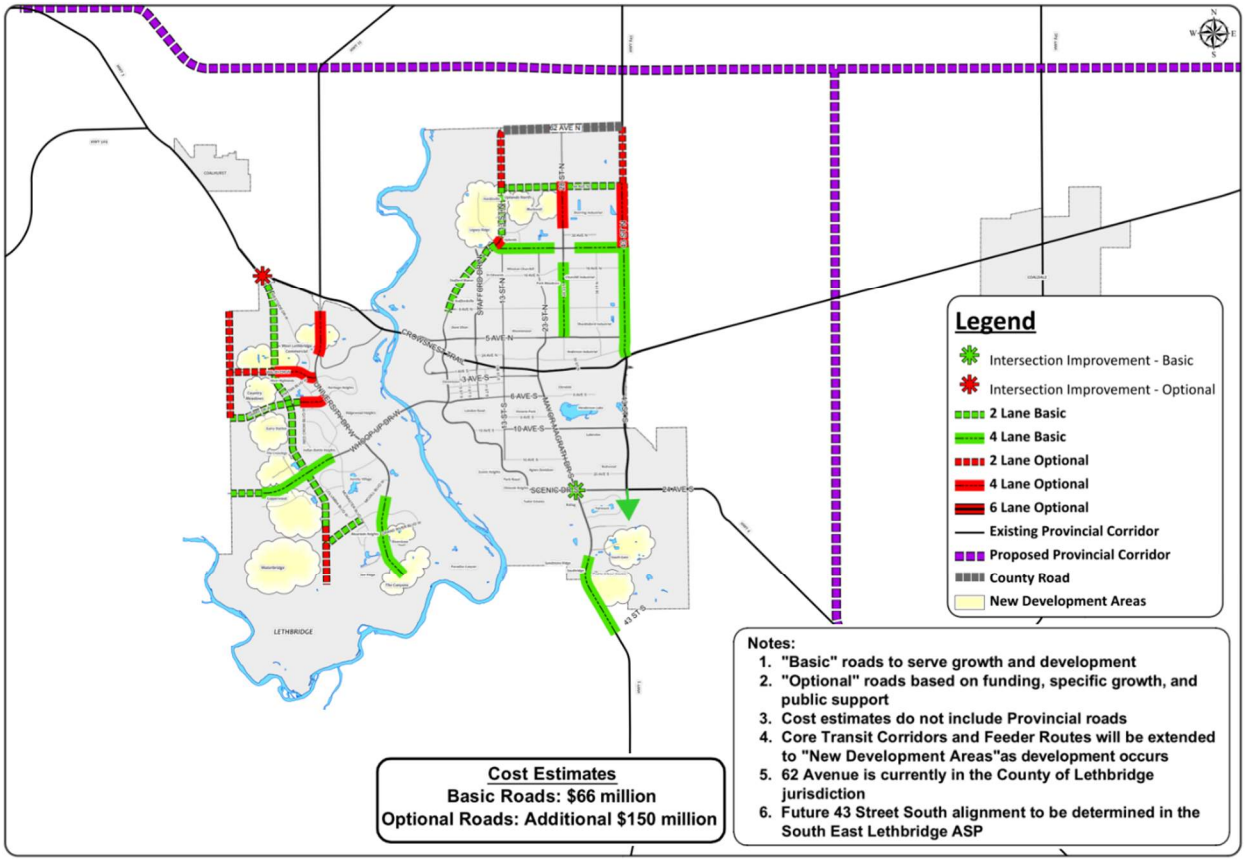


Figure 2-7: 2012 TMP Proposed Road Network (130k Population)
Source: 2013 TMP Final Report (Figure 5-2, 2040 Arterial Road Scenarios)

Table 2-6: 2012 TMP Optional Road Network Improvements (2040)

Corridor	Limits	Improvement	Req'd in 2039?
Métis Trail W	Chinook Trail W to Simon Fraser Boulevard W	2 lane arterial (2.7 km)	No
Garry Drive W	University Drive to west of Squamish Boulevard W	Widen from 2 lane to 4 lane (450 metres)	Complete
Walsh Drive W	To development limits	2 lane arterial (1.3 km)	No
Walsh Drive W	University Drive W to Métis Trail W	Widen from 2 lane to 4 lane (1.2 km)	Yes
University Drive W	North of the railway tracks to Highway 3	Widen from 2 lane to 4 lane (1.2 km)	Yes
44 Avenue N	43 Street N to Scenic Drive N	2 lane arterial (3.3 km)	Yes – Scenic Drive N to 28 Street N
43 Street N	44 Avenue N to 62 Avenue N	2 lane arterial (1.7 km)	No
Scenic Drive N	44 Avenue N to 62 Avenue N	2 lane arterial (2.0 km)	No
28 Street N	30 Avenue N to 44 Avenue N	2 lane arterial (1.5 km)	No
62 Avenue N*	43 Street N to Scenic Drive North	2 lane arterial (3.3 km)	No

*62 Avenue N currently resides beyond City limits and is under the control of the Lethbridge County.

No-Build scenarios were also evaluated for the 100,000 and 130,000 population horizons and identified several critical areas of future congestion. For the 100,000-population horizon, these consisted of:

- Portions of University Drive W
- Entrances to the Indian Battle Heights Neighbourhood

For the 130,000-population horizon, these potential constraints consisted of:

- Significant portions of University Drive W
- Portions of Whoop Up Drive W west of University Drive W
- 30 Street W
- 28 Street N

Comparing these constrained areas with the 2023 TMP's No-Build scenarios will be undertaken to identify if similar operations can be expected or if the network improvements that have been undertaken since the 2012 TMP have mitigated these concerns.

Similarly, the 2012 TMP identified the top five (5) locations with safety concerns:

- Mayor Magrath Drive S at Scenic Drive S / 24 Avenue S
- 13 Street N at 5 Avenue N
- Highway 3 at 43 Street
- University Drive W at Garry Drive W
- Mayor Magrath Drive S at 22 Avenue S

Improvements were identified for these locations that could potentially address these concerns. A summary of improvements and changes to collision rates is summarized in **Table 2-7.**

Table 2-7: 2012 TMP Intersection Improvements

Intersection	Improvements Since 2012	Result
Mayor Magrath Drive at Scenic Drive S / 24 Avenue S	Conversion of eastbound right from free flow added lane to channelized yield. Third southbound through lane added.	No notable change in collision data. The average collision rate per year is still similar to pre-improvements.
13 Street N at 5 Avenue N	No significant improvements.	n/a
Highway 3 at 43 Street	No significant improvements.	n/a
University Drive W at Garry Drive W	Red light camera installed in conjunction with traffic signal modifications.	No reduction in collision rate.
Mayor Magrath Drive S at 22 Avenue S	Implemented protected-only left turns.	Significant reduction in collisions; collision rate reduced by approximately 70%.

Transit routing and servicing changes were also discussed as part of the 2012 TMP, however, this is covered in greater detail in **Section 6.2.4** of this report.

2.4.8 PUBLIC REALM & TRANSPORTATION STUDY

The Public Realm and Transportation Study (2012) builds on the vision for downtown development presented in the Heart of Our City Master Plan. The area studied was bound east to west from Scenic Drive S to Stafford Drive S and north to south from 1 Avenue S to 6 Avenue S, representing the downtown core of Lethbridge. This study aimed to produce preliminary streetscape designs that create an exciting and lively public urban space downtown that is vibrant yet harmonious with historical origins.

Three priority corridors were selected for the study as a function of the highest short-term gains from enhancement. These corridors were:

- 2 Avenue S – Scenic Drive S to 5 Street S.
- 5 Street S – 1 Avenue S to 6 Avenue S.
- 3 Avenue S – 4 Street S to 8 Street S.

The conclusion of the transportation component of this study recommends a change in mindset, reallocating space back to the public realm and reducing vehicle lanes in the downtown core instead of creating more space for motor vehicles.

2.4.9 BIKEWAYS AND PATHWAYS MASTER PLAN

The Bikeways and Pathways Master Plan from 2007 served as a guide for the future development of the bikeways and pathways network and to ensure that the existing network at that time functioned effectively. It presented a 10-year strategic plan with priorities at different time horizons. Short-term priorities identified hazardous crossings and barriers that limit access and adopted a new pathway classification system. The framework for mid-term and long-term recommendations is the basis for future studies like the Cycling Master Plan from 2017.

2.4.10 PARKS MASTER PLAN

The Parks Master Plan (2007) proposed different types of park developments, including open space in new communities, open space developments and upgrading in existing communities, preservation areas, and open space acquisition strategies. One objective was to protect natural spaces that provide habitats for wildlife species and native and rare plants. Some of the recommendations were intended to be incorporated from ASP visions and a park classification with local requirements unique to Lethbridge providing flexibility and guidance.

2.4.11 AREA STRUCTURE PLANS & OUTLINE PLANS

Several ASPs and OPs have been approved since the last TMP. ASPs define a broad land use strategy for a large area, considering the economic viability of land use decisions and future densities as the full development of an ASP area takes decades to complete. ASPs also broadly define where future Arterials and Collector roadways will connect internally through the lands and to the regional network.

Outline Plans are for smaller areas that are nested within ASPs and are drafted when development in a specific portion of an ASP is more imminent. They are more refined than ASPs and are where the specific alignments of higher classified roadways are identified, and the local roadway network is determined.

With ASPs and OPs, a transportation impact assessment (TIA) is often undertaken to determine what transportation network changes may be required to support the proposed development. These TIAs will often include recommendations for new roadways constructed within the development lands and network improvements to the surrounding regional network. ASPs and OPs have been incorporated into this TMP, which help to identify roadway improvements to include in the future modelling road network. A map of the Area Structure Plan Boundaries is provided in **Figure 2-8.**

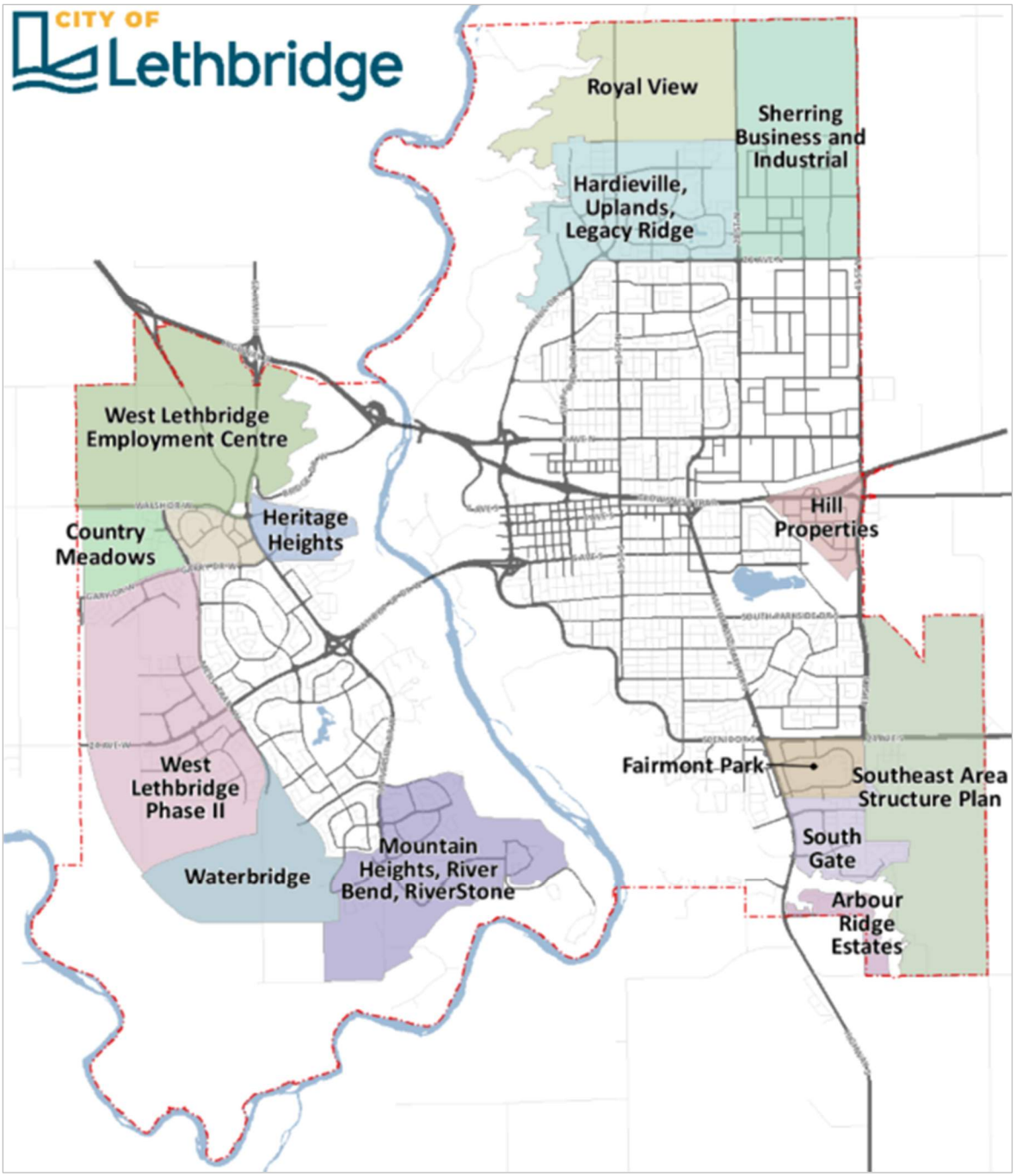


Figure 2-8: Area Structure Plan Boundaries

Source: City of Lethbridge (Feb 2022)

2.4.12 COMPLETE STREETS STRATEGY (DRAFT)

The Complete Streets Strategy Document is the second step of a four-step process (Vision Statement, Strategy, Guidelines, Standards review). The strategy is described in more detail below.

Complete Streets is an approach to balanced street design that seeks to accommodate everyone, regardless of their age, physical mobility, or socioeconomic status. This approach does not impose a uniform set of standards into cities. Rather, each city must tailor their approach to what works locally, considering contextual factors such as existing right-of-way, climate costs, travel mode share, and objectives. The draft of the Complete Streets Strategy (2018) provides a vision statement, guiding principles, and policy recommendations to set the stage for development of a more detailed Complete Streets Guideline, and revision of the City's construction standards to ensure that all new streets or retrofit projects provide streets for all users. The project aligns with the policies in the 2017-2021 Council Strategic Plan, the Integrated Community Sustainability Plan / Municipal Development Plan (ICSP/MDP) and is in response to recommendations from the 2012 Transportation Master Plan and 2017 Cycling Master Plan. Though the Complete Streets Strategy did not advance to a Guideline, the policy recommendations are useful for the development of the policies and actions for this TMP.

Vision Statement

The project vision statement was developed by members of the Complete Streets Technical Working Group, including representatives from City departments, and members of the homebuilding and development industries.

"The City of Lethbridge, in consultation with local stakeholder organizations, will develop new balanced, multi-modal transportation standards using the principles of complete streets for the purpose of enhancing the health, safety, modal choice, access, convenience and comfort of users of all ages and abilities. Complete streets standards will be designed in the context of the neighbourhood, surrounding land uses, anticipated and existing users, efficient land use, and costs of construction and maintenance."

Guiding Principles

The Guiding Principles, as drafted by the Technical Working Group, expand on the Vision Statement and provide a more detailed foundation that sets out what the revised Constructions Standards must achieve.

Complete Streets in Lethbridge shall:

I. **Provide multi-modal travel options in all seasons.**
The intention is that the infrastructure be safe and accessible to all Users in all seasons. Consider seasonal effects on the design, function, and maintenance of multi-modal infrastructure.

II. **Ensure that streets are designed to balance the vital relationship between Users, land use, infrastructure, and transportation.**
Rights-of-ways contain many different Users. The standards, codes, regulations, and requirements for each of these must be considered when designing the street.

III. **Create a comprehensive, integrated, safe and continuous network of streets that together provide high-quality travel experiences for all Members of the Public.**
Transportation networks need to connect and provide access to Users within neighbourhoods and across the city. Consideration will be given to existing master plans to ensure that street layouts are kept in context with current policies and plans.

IV. **Be adaptable to the needs of the present and the future through effective space allocation for the many functions of the street.**
When designing streets, balance is required to ensure that the split between private and public land allocation remains sustainable, both for land developers, service providers and future change. Allocation of land for streets must consider adjacent land uses and values and provide flexibility for distribution of rights-of-way. Street design will consider emerging trends and technologies.

V. **Contribute to the environmental sustainability and resiliency of the city.**
Consider aspects such as landscaping materials and maintenance, impermeable surfaces, stormwater management, materials (embedded carbon), energy efficiency and product life cycle in street design.

VI. **Assess both direct and indirect costs.**
Street construction, operation, maintenance, and lifecycle renewal costs must be considered in all projects. Strive to control and balance costs, so that increased costs in one area are offset by reduced costs in another.

VII. **Create 'People Places' that are vibrant and attractive in all seasons, which contributes to an improved quality of life.**
Consider adjacent land uses, roadway context, safety, Members of the Public when designing street function and aesthetics. Value should be placed on elements such as human comfort, landscaping, gathering places, surfacing, street trees, and traffic calming, which add to the liveability of the neighbourhood.

VIII. **Foster relationships with the First Nations, Province of Alberta, and municipalities.**
Seek to create and improve relationships with First Nations, provincial departments, and other municipalities to share experiences and best practices. Pursue opportunities for intermunicipal multi-modal transportation connections.

IX. **Recognize the need for flexibility within the context of the neighbourhood to accommodate different types of streets and Users.**
Every street functions differently and will require different infrastructure based on the street hierarchy and community context. Opportunities for a variety of street types shall be provided.

X. **Be monitored, reviewed, and evaluated on a regular basis.**
The success of Complete Streets projects shall be evaluated. Factors such as costs, land allocation, modal shift, and demographics will be included. It will be important to challenge ideas throughout the street design process to look for unintended consequences.

3 COMMUNICATIONS AND ENGAGEMENT OVERVIEW

Incorporating stakeholder, Indigenous Community partner and public input into the TMP requires striking a fine balance between the technical analysis of how the transportation system is intended to function and the human experience of how mobility is achieved. In the TMP, the goal is to use stakeholder, public

and Indigenous Community partner experience to enhance the transportation system's performance for decades to come.

3.1 Engagement participants

From the project's onset, participant groups were identified to engage with. The public, stakeholders, and Indigenous Community partners were engaged using various tactics, offering insight and influence on the overall project's decision-making process.

3.2 Communications and Engagement Plan

The Communications and Engagement Plan was developed to ensure participants understood the technical issues and were provided with various opportunities to engage, provide feedback, and ultimately have confidence in the recommended improvements. This was achieved by focusing on the following pillars:

- **Values** – Communicating the commitment to hearing ideas, understanding concerns, and engaging transparently. Ensuring that the concerns, challenges, and opportunities gathered were used to inform the policy themes, concepts, and improvement options, educating participants on the technical details and how the process works.
- **Responsiveness** – Acknowledging and leveraging previous engagement findings and incorporating those findings into the strategies and processes used. Ensuring alignment with related City projects to demonstrate the City's commitment to listening and learning from the diverse voices that were heard.
- **Transparency** – Providing clear and consistent answers to all questions and concerns. Ensuring that the project team was proactive in responding to questions and addressing misinformation about the project. This was done through regular, transparent communications and engagement efforts, including:
    - Development of clear, accessible communications products that explained the process, improved understanding, and prepared participants to offer their feedback.
    - Established an issues management framework to ensure questions out of scope for the initiative were recorded and responded to appropriately.

The four-phase engagement plan was supported by strategic communications at each step. The four phases of engagement were:

- **Phase 1: Determining the Vision for the Transportation Master Plan**
  During Phase 1 of engagement, City Council developed a vision for the TMP. Following the visioning workshop, administration generated several goals for the TMP.
- **Phase 2: Understanding the top-of-mind issues and mobility barriers**
  During Phase 2 of engagement, stakeholders, Indigenous Community partners and the public was

engaged to determine the key barriers that area residents and businesses face regarding transportation systems in Lethbridge.

- **Phase 3: Validating the options and priority setting**
  During Phase 3 of engagement, targeted stakeholders and Indigenous Community partners were reached to develop concepts and ideas as well as reaching out to the broader public to test those concepts and identify priorities. Participants were asked to provide input on the concepts' challenges and opportunities and identify priorities for the project team's consideration. Later in Phase 3, policies and projects were presented to stakeholders, Indigenous Community partners and the public for validation.

- **Phase 4: Closing the Loop and presentation of the Final Plan**
  During the final phase of engagement, all input from throughout the engagement program was gathered, the Final Transportation Master Plan was presented, and a report back process to those who contributed feedback was done.

The public, stakeholders, and indigenous partners were involved at different levels of that IAP2's (International Association for Public Participation) Spectrum of Public Participation, offering insight and influence on the project's decision-making process. Each phase of engagement is shown in **Figure 3-1**.

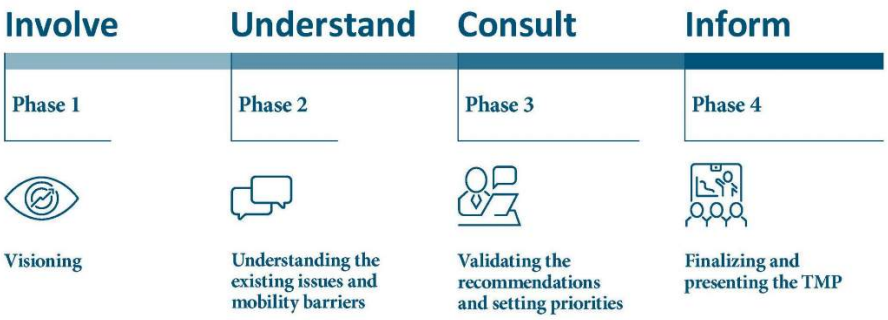


Figure 3-1: TMP Phases and Level of Engagement

3.2.1 ENGAGEMENT MECHANISMS AND OUTREACH TACTICS

Prior to engagement, a Communication and Engagement Plan was created. This included key messages and core narrative, stakeholder lists, risk assessment and mitigation techniques, communications tactics, and measurement as well as roles and responsibilities, and engagement questions. This communication and engagement plan was developed in collaboration with the City and in alignment with current City guidelines and policies related to communications and engagement.

To ensure the engagement program was accessible, the following engagement mechanisms were developed. These mechanisms and tactics built upon each other to invite and collect input from diverse groups. **Table 3-1** summarizes the engagement strategy for Phase 1 and 2 of the project. **Table 3-2** summarizes the engagement strategy for Phase 3a and 3b.

Table 3-1: Summary of Engagement Mechanisms, Tactics, and Tools (Phase 1 & 2)

Engagement mechanism	Outreach tactics	Data collection tool	Engagement touchpoints
Civic Works Standing Policy Committee Visioning Workshop	• Direct outreach via email	• Virtual workshop • Google Jamboards (virtual brainstorming tool)	Civic Works Standing Policy Committee
City Administration Workshop for Strategic Goal Creation	• Direct outreach via email	• Virtual workshop • Google Jamboards (virtual brainstorming tool)	10 participants
Survey	• Get Involved Lethbridge website • Organic and paid social media posts • Project Information Package sent to community organizations. • Direct Indigenous Community Partners outreach via the Indigenous Relations Advisor at the City of Lethbridge • Promotion of the survey was also done verbally through all other engagement activities during Phase 2, such as at the end of the Online Information Session and during the interviews	• Get Involved Lethbridge survey	512 respondents
Interviews with External Stakeholders	• Direct outreach from City stakeholder list	• Virtual interviews with interviewer notes	13 participants
Online Information Session	• Organic social media posts • Project Information Package sent to community organizations	• Virtual workshop with workshop notes • Mentimeter (virtual polling and interactive engagement tool)	19 participants
Indigenous Community Partners Communications and Workshops	• Direct Indigenous Community partners outreach via City of Lethbridge Indigenous Relations Office	• Virtual workshop with workshop notes	6 participants
Accessibility Stakeholder Workshop	• Direct outreach from City stakeholder list	• Virtual workshop with workshop notes	8 participants

Table 3-2: Summary of Engagement Mechanisms, Tactics, and Tools (Phase 3a & 3b)

Engagement mechanism	Outreach tactics	Data collection tool	Engagement touchpoints
Phase 3a			
City Council Transportation Master Plan Phase 3 Initialization Workshop	• Council meeting session	• Virtual workshop with Slido (virtual polling and brainstorming tool)	City Council
Survey	• Get Involved Lethbridge website • Organic and paid social media posts. • Postcards and/or posters with QR codes were distributed to various gas stations and coffee shops in Lethbridge to be displayed for customers and/or staff. • Eight message boards around the city • An ad on the interior of 40 Lethbridge Transit buses • Promotion of the survey was also done verbally through all other engagement activities during Phase 3, such as at the workshops	• Get Involved Lethbridge survey	591 respondents
External Stakeholder Workshops	• Direct outreach to City stakeholder list	• Virtual workshop with Slido and notes	29 participants
Accessibility Stakeholder Workshop	• Direct outreach to City stakeholder list	• Virtual workshop with Slido and notes	10 participants
Intercept Events	• The City of Lethbridge held various intercept events throughout September-October 2022. A booth was set up to intercept people and engage them on the TMP, when they were already out in the community. A total of 225 people were meaningfully engaged at the following events or places: o Indigenous Entrepreneurship Trade Show and Pow Wow o October Farmers' Market o Downtown Transit Terminal o Lethbridge College o University of Lethbridge	• Given the opportunity to provide comments, fill out the survey on tablets, or given a postcard with information and a QR code to the Get Involved Lethbridge website and survey	225 interactions
Phase 3b			

Engagement mechanism	Outreach tactics	Data collection tool	Engagement touchpoints
Internal Stakeholder Workshop	• Direct outreach to City stakeholder list	• Virtual workshop with Slido and notes	22 participants
Community Conversations Event	• Over 200 conversations were had at the ENMAX Centre	• Conversations and written notes • Printed surveys • Tablets with survey • Display boards and postcards with QR code to Get Involved Lethbridge website and survey	Over 200 conversations
Survey	• Get Involved Lethbridge website • Postcards and posters with QR codes were distributed and put up during the Community Conversation event. • Promotion of the survey was also done verbally through Internal Stakeholder Workshop, Community Conversation event, Reconciliation Lethbridge Advisory Committee meeting and Youth Advisory Committee Meeting	• Get Involved Lethbridge survey	421 respondents
Reconciliation Lethbridge Advisory Committee Meeting	• Direct outreach to City stakeholders and Indigenous Community partners list	• Virtual workshop with Slido and notes	12 participants
Youth Advisory Committee Meeting	• Direct outreach to City stakeholder list	• Virtual workshop with Slido and notes	7 participants

Phase 4 of engagement focuses on closing the loop with those who were engaged at other phases and presenting the final TMP.

3.3 Engagement Feedback Integration

Coordination with project stakeholders and Indigenous Community partners was undertaken at multiple phases of the TMP, beginning with the project initiation to guide the development of the project vision and goals and identifying key constraints within the existing transportation system. This continued through reviewing the existing network, assessing the future network, and developing preliminary and final recommendations. In developing the TMP, input from stakeholders, Indigenous Community partners and the public was coupled with technical data and used to guide the recommendations. Stakeholders, Indigenous Community partners and the public were considered at the initial development of the Communications and Engagement Plan, which was then used to determine how stakeholder, Indigenous Community partners and public input would influence the overall TMP.

Throughout each phase's engagement activities, a summary What We Heard Report (WWHR) was created to outline discussion points and categorize and consolidate input received from stakeholders, Indigenous Community partners and the public. Where applicable, technical analysis and TMP content were expanded to ensure that key issues and themes were incorporated into the document. The WWHR also informed the policies and actions put forward while ensuring that the established goals, objectives, and lenses were incorporated and/or in alignment.

To achieve this, a series of routine questions were reflected upon through each phase:

- What values are being reflected by project stakeholders, the public and Indigenous Community partners?
- How do these values align with the project lenses, vision, and goals?
- How do these values align with other City policies and directives?
- How is success measured in the incorporation of stakeholder and Indigenous Community partner input?
- Where applicable, how is consensus achieved between conflicting stakeholder viewpoints and the technical analysis results?

4 TRAVEL DEMAND MODEL

The development of the TMP includes the assessment of travel needs based on anticipated future demand. To develop projected needs, the City of Lethbridge utilized a forecasting tool known as the travel demand model. Lethbridge had a prior travel demand model for the 2012 TMP based on anticipated AM and PM peak-hour traffic. As part of this TMP development, a more comprehensive travel model was developed, beginning with daily conditions, and then refined to forecast both the AM and PM two-hour peak periods. The model is intended to be a tool for developing and evaluating future transportation goals and plans.

4.1 Model Study Area

The transportation model includes the City of Lethbridge area and all areas in Lethbridge County to estimate how through traffic also utilizes the network. This also corresponds to the same area that Statistics Canada defines as the Lethbridge Census Metropolitan Area (CMA). The study area is shown in **Figure 4-1**.

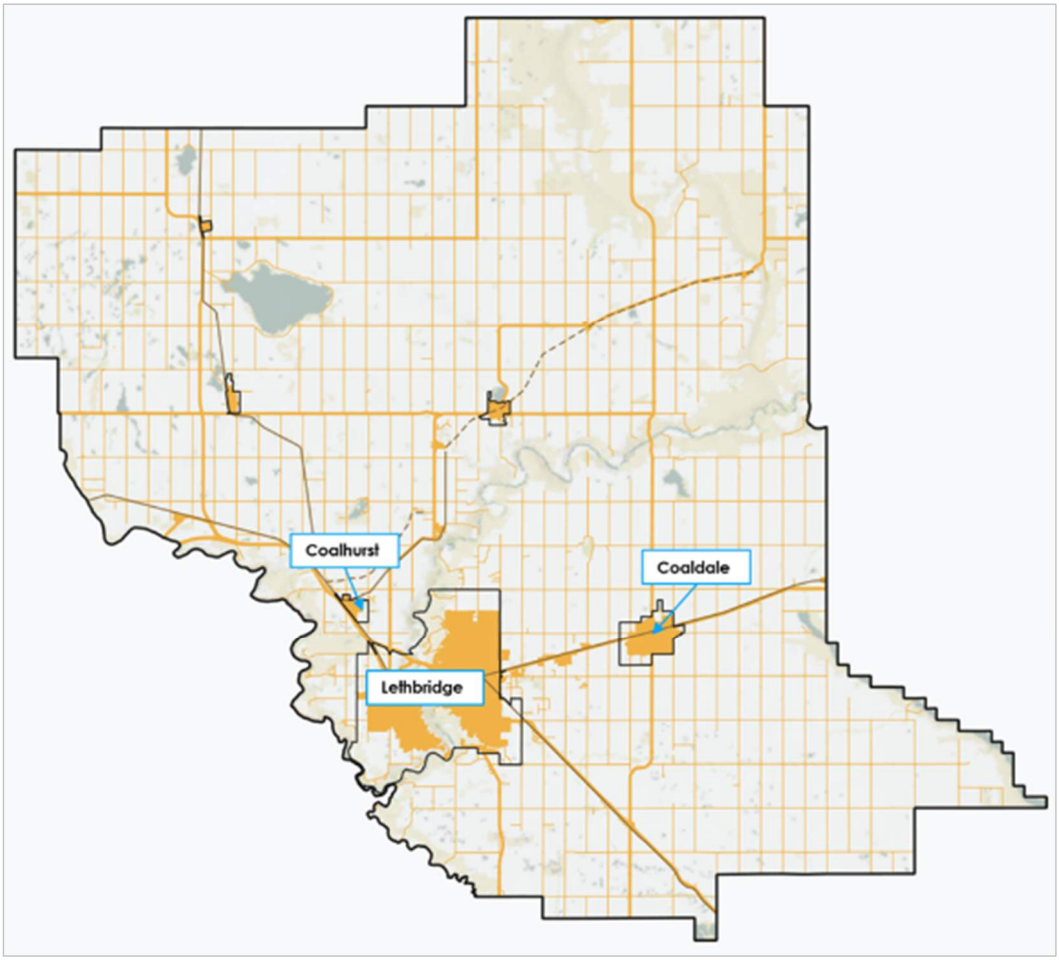


Figure 4-1: Lethbridge Model Study Area

Source: https://en.wikipedia.org/wiki/Lethbridge#/media/File:0204_Lethbridge_County,_Alberta,_Detailed.svg

4.2 Base Year Model Inputs

The two major input components of a travel forecasting model are the transportation (road) network, and the transportation analysis zones (TAZs) based on land uses. The transportation network is a special data structure that stores important transportation system and infrastructure characteristics (e.g., Number of travel lanes, road classification, posted speed). The City of Lethbridge (and surrounding land) is subdivided into small TAZs, with each TAZ storing socioeconomic characteristics such as population/households, employment categories and school enrollment.

4.2.1 ROAD NETWORK

The travel demand network's purpose is to represent the street and highway system operating in the planning area. The network depicts those streets that are functionally classified as collectors and higher in the City of Lethbridge. Streets are represented as lines, called links, in the travel demand network. Centroid connectors are represented on the network not as links but as generalized connections to the links. The internal model road network was developed by importing the GIS file provided by the City of Lethbridge, containing functional road class, number of lanes and the posted speed for each link. Adjustments to attribute values were made to various links that appeared to have unique speed or capacity differences not fully represented in its functional road class within the VISUM platform once the GIS layer was imported. For example, Whoop-up Drive, whose functional class is arterial but the section between Scenic Drive S and University Drive W act as freeway and therefore the speed and capacity of this section is adjusted to replicate real traffic condition. The existing (2019) road network is shown in **Figure 4-2.**

.

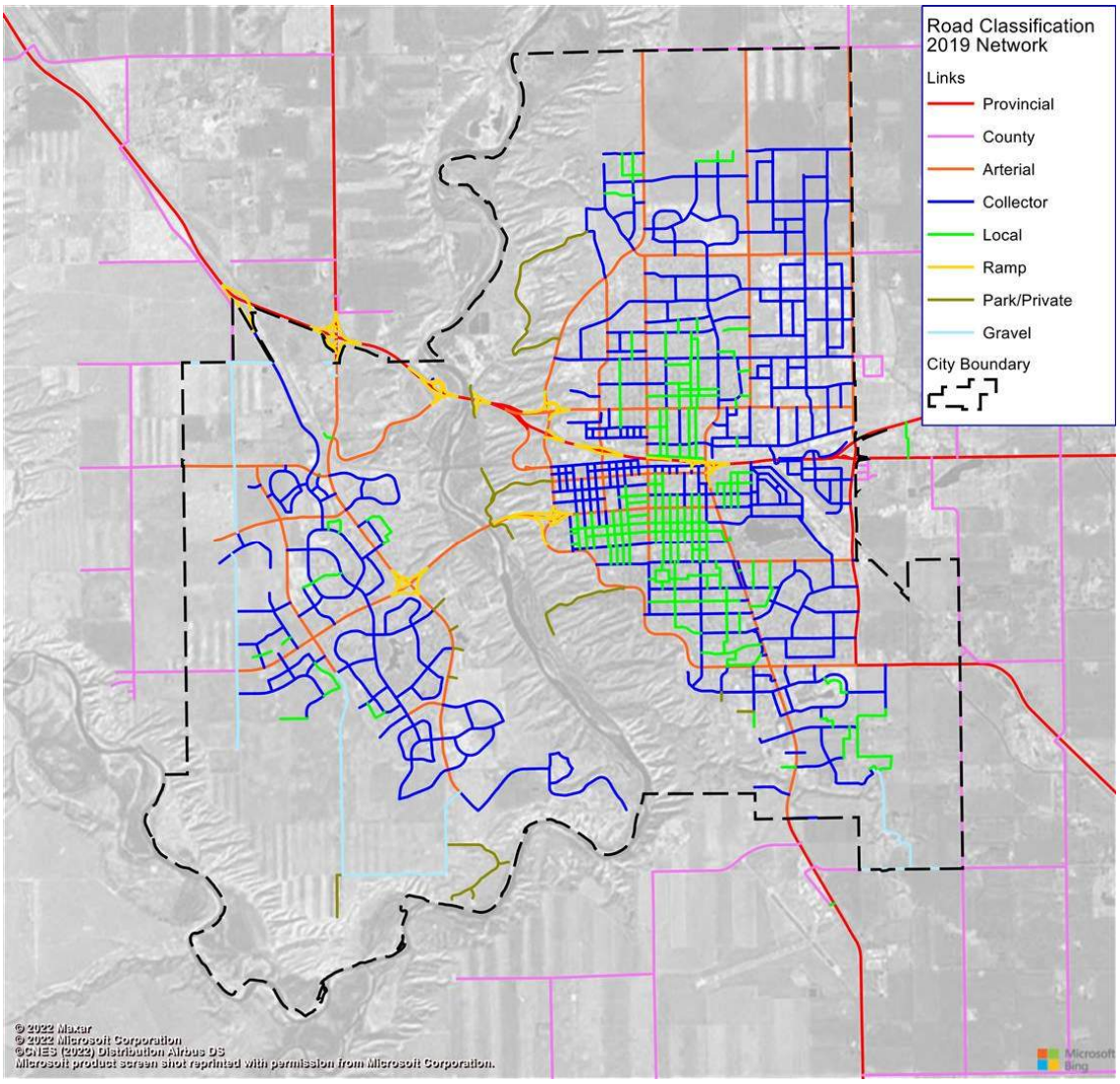


Figure 4-2: 2019 VISUM Road Classification Network

4.2.2 TRANSPORTATION ANALYSIS ZONES (TAZS) AND LAND USES

Generally represented with socio-economic data, land use is the most essential demand input in a travel demand model. TAZs are subdivisions of geographical areas used in transportation planning to summarize demographic characteristics and travel data and represent the origins and destinations of travel activity within the region.

In general, the use of smaller TAZs can have a beneficial effect on trip assignment. The TAZs for aggregate models are designed to be compact in shape, homogeneous in terms of characteristics, and equal in size to increase spatial precision in a trip assignment. For example, a residential neighborhood typically has its own TAZ or set of TAZs, as does a community's central business district or industrial area. The City of Lethbridge TAZs are shown in

Figure 4-3 and the external (County) TAZs are shown in **Figure 4-4**.

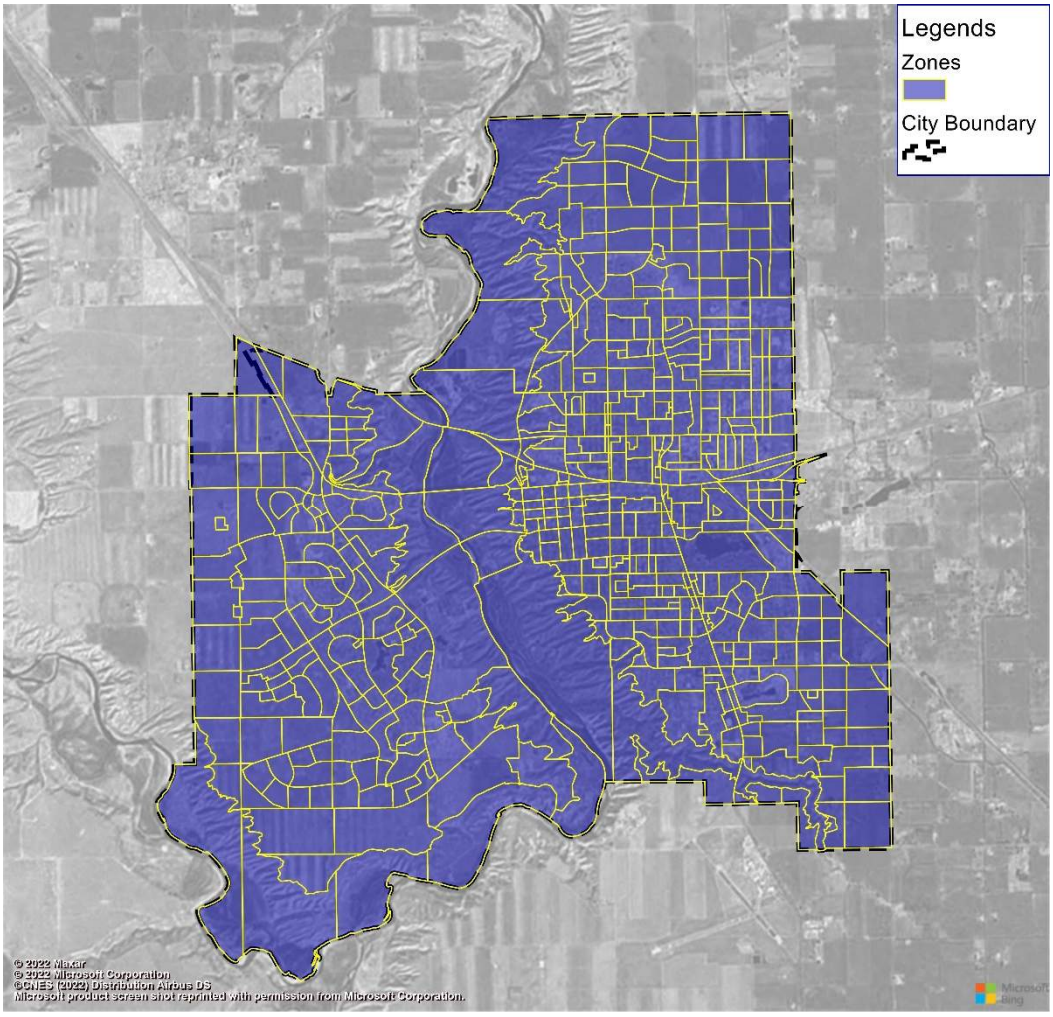


Figure 4-3: City of Lethbridge TAZs

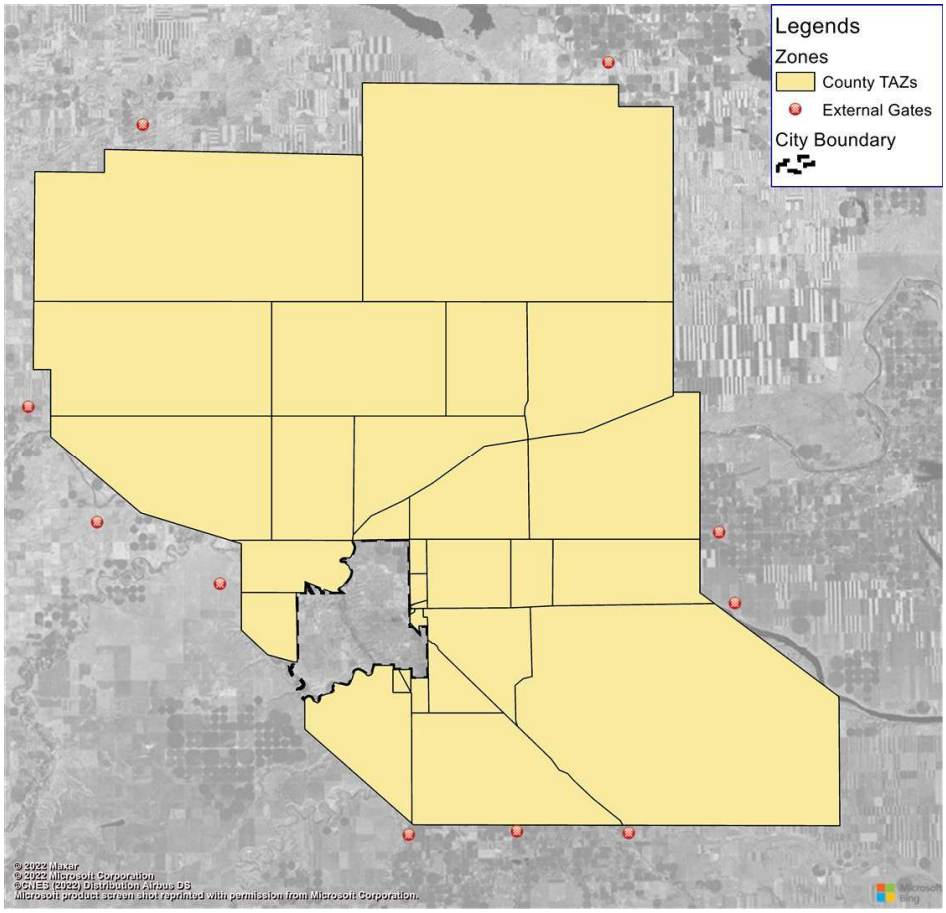


Figure 4-4: External (County) TAZs

Important socio-economic input data to the Lethbridge Travel Demand Model was provided through various sources. These include:

- 2019 Municipal Census conducted by the City.
- 2016 Federal Census conducted by Statistics Canada.
- School enrollment and higher education enrollment data.

Much of the core demographic data has been developed by Lethbridge planning staff in coordination with a forecasting consultant, completed under a different effort called the Population and Employment Forecasting Model (PEFM). It should be noted that transportation is just one of many areas (such as parks, schools, community facilities and utilities) that need forecasting data to project the needs of the City of Lethbridge.

A detailed explanation of model input data and data representation is included in section 2.0 of the Lethbridge – Model Development Report in **Appendix A**.

4.2.3 STREETLIGHT DATA INTEGRATION

One crucial data source used for this project is StreetLight. StreetLight is a location-based services (LBS) data provider that uses aggregated and anonymized data obtained from mobile devices to provide origin-destination (O-D) pairs and travel patterns across the transportation network between predefined territories.

As the data can be divided into 15-minute intervals and provide multiple years of data sets, StreetLight provides a significantly more robust data set than the traditional household travel surveys used in previous TMPs. For the City of Lethbridge, StreetLight data was obtained for the entirety of 2017, 2018, 2019, 2020 and 2021 in 15-minute intervals between the months of September and November. The data allowed the evaluation of how travel patterns can vary by time of day, peak periods, weekdays and weekends. It also allowed the capture of how travel patterns across the city and surrounding region flowed before the COVID-19 pandemic (2017, 2018 and 2019), through the most restrictive lockdown periods of the pandemic (2020), and as hybrid working environments emerged in 2021 as people began adjusting to their new flexible work arrangements and schedules. By understanding how existing travel patterns were made across the city and surrounding region before, during and near the end of the COVID-19 pandemic, a robust mobility strategy can be developed to support the TMP's Vision and goals. It can also identify potential opportunities to diversify modal choice across the city through more direct transit services based on peak time of day travel and identify gaps within the active modes network for recreational, commuter, and utilitarian (errands) travel.

After reviewing the various years of StreetLight data, the study team identified with the City that the 2019 September to November StreetLight data should be utilized for the model development as it represented the highest traffic volumes pre-COVID (2020). The integration of StreetLight data for the model development, calibration and validation is explained in more detail in **Appendix A.**

StreetLight Geography

To effectively use the StreetLight data source, geography in and around Lethbridge had to be created from which to extract data. The city was divided into "districts" and the "districts" were then further divided into smaller areas referred to as "zones" in StreetLight but are described as "territories" here to avoid confusion with the Travel Demand Model's TAZs. The creation of the geography had to be large enough to produce a valid sample but small enough to provide meaningful travel data. As a result of this process, a total of 7 districts and 187 territories were created in the city including the developing areas, and another 17 were created for the remainder of Lethbridge County. These districts and territories are depicted in **Figure 4-5.**

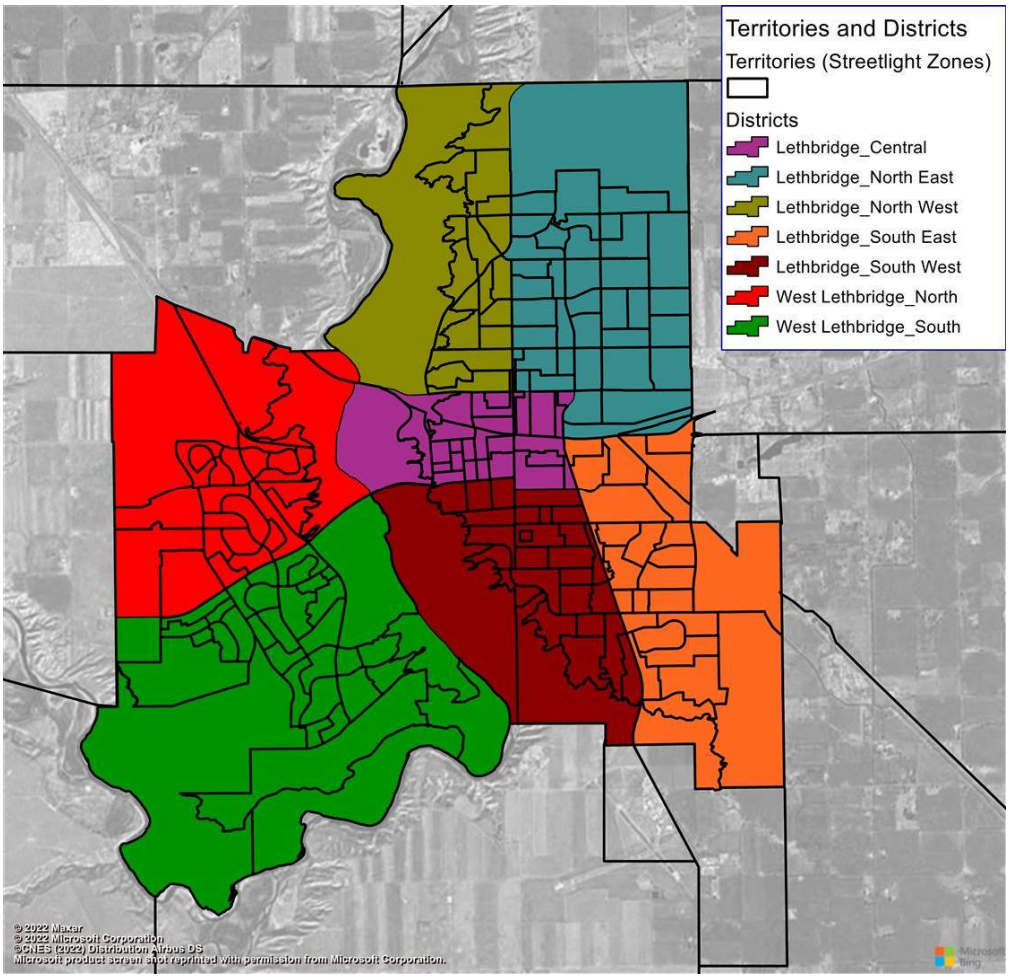


Figure 4-5: Lethbridge Territories and District Boundaries

In addition to the internal territories, StreetLight enables the retrieval of data from the various road gateways into and out of the study area. A total of 10 gateways were identified, previously depicted in **Figure 4-4,** and are listed as:

- Highway 3 (East)
- Highway 3 (West)
- Highway 4
- Highway 5
- Highway 23
- Highway 25
- Highway 509
- Highway 519
- Highway 845
- Range Road 182A

StreetLight Origin-Destination Plots

The 2019 origin-destination matrices from StreetLight were provided as a data source to assist in the calibration the travel demand model. **Figures 4-6** through **Figure 4-9** provide origin-destination examples extracted from StreetLight for high activity areas within the city: Downtown, University of Lethbridge, South Lethbridge Commercial, and Lethbridge College.

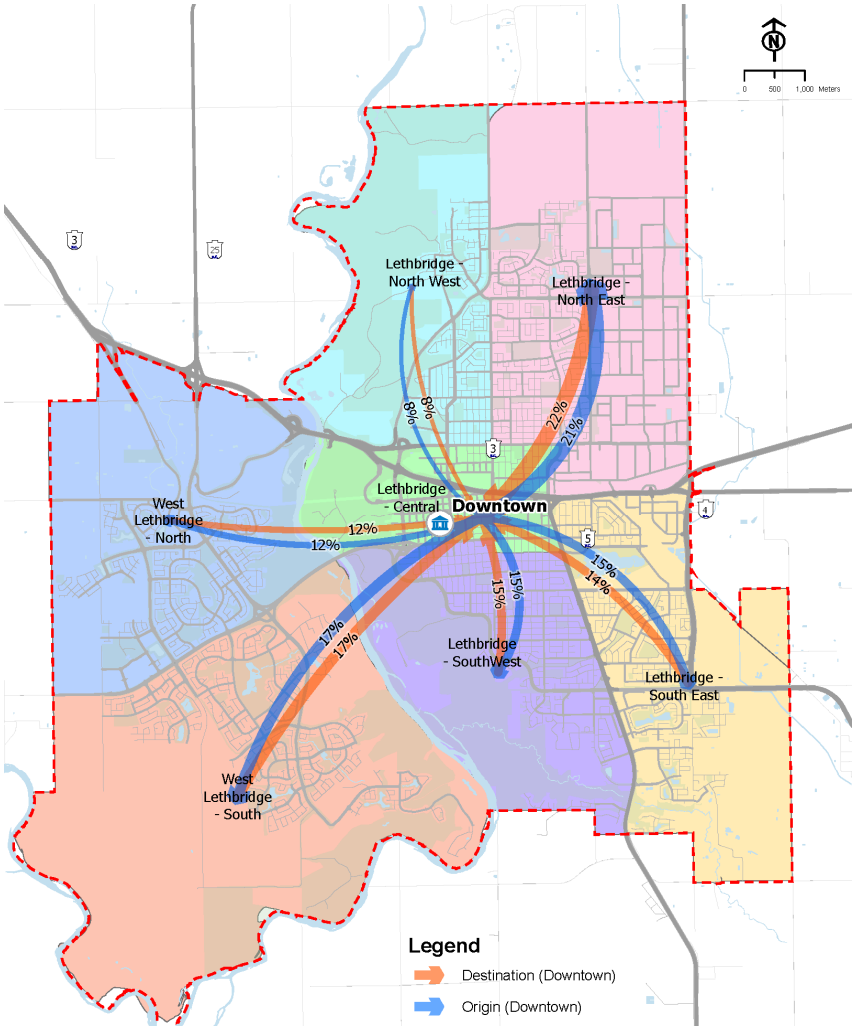


Figure 4-6: Origin-Destination Daily Distribution Plot (Downtown)

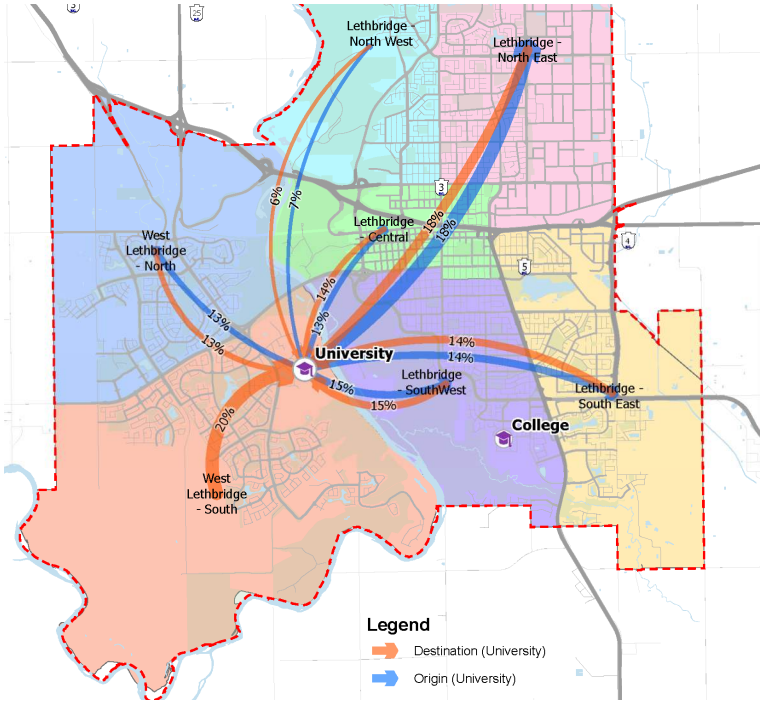


Figure 4-7: Origin-Destination Daily Distribution Plot (University of Lethbridge)

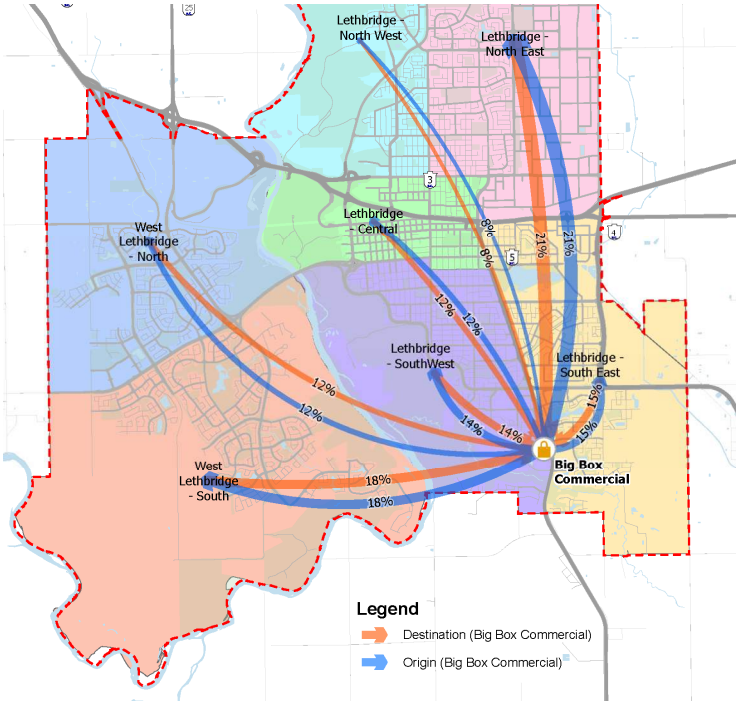


Figure 4-8: Origin-Destination Daily Distribution Plot (South Lethbridge Commercial)

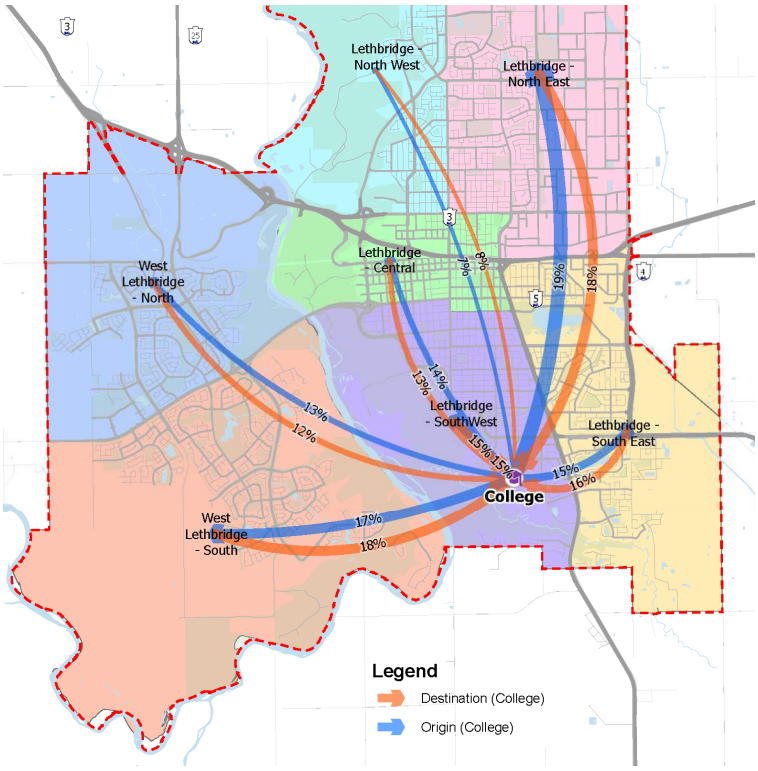


Figure 4-9: Origin-Destination Daily Distribution Plot (Lethbridge College)

4.3 4-Step Modelling

A traditional 4-step modelling procedure was used to estimate travel between 245 traffic zones within the study area. The model informed the city area road network for 2029, 2039, and 2069 horizon years. The model base year is 2019. The model was developed using VISUM 2022 (SP 1-8), the latest version available at the time of this project. The model focused on Daily (24-hrs), AM (07:00 – 09:00 am) and PM (03:00 – 05:00 pm) peak periods. The peak periods were defined by examining the various reports of travel activity during the day.

A travel demand model consists of several data development and application steps. However, these generally fit within four general categories and are commonly referred to as a four-step travel demand model. These four steps are defined as trip generation, trip distribution, mode share adjustment, and trip assignment.

Developing a travel demand model consists of first developing a "base year" model that approximates demand conditions through complex mathematical relationships. The demand conditions in the base year come from various sources, including behavioural information from the Census sources, traffic counts, and StreetLight data.

The descriptions of the four steps below are broad. A detailed description of the model development is available in **Appendix A**.

Step 1: Trip Generation

Trip generation is the first step in the four-step modelling process which examines the daily frequency of different trip purposes from households. The result of this step is an estimate of the number of trips beginning and ending within each model TAZ.

To fully estimate the daily travel activity, types of trips are subdivided by trip purpose. There are separate equations developed to represent the different categories of trips. - Home Based Work Trips (HBW), Home Based School Trips (HBSc), Home-Based College/University Trips, Home Based Other Trips (HBO) and Non-Home-Based Trips (NHB).

At this step, these trips are person trips in the Lethbridge Travel Demand Model. There are unique equations for both the home end (called productions) and non-home-end (called attractions) trips. For trips that have neither end at home, the equations are similarly designed at the production and attraction. Population and employment to determine the estimated number of trips and the equations differ depending on if it is a home end or a non-home end. Because the resulting estimated number of trips vary (because different equations are used), the resulting production and attraction totals for each trip purpose are normalized to match each other, which is needed to proceed to the next step.

Step 2: Trip Distribution

The data from trip generation provides the number of trip ends for each TAZ for every trip purpose. These trip-end approximations must be distributed to all other TAZs using a gravity model formula in this step. A gravity model formula estimates the propensity to travel to all other TAZs based on the distance or size of every other TAZ. These vary by trip purpose, as a typical work trip distance is often further than a trip for getting groceries or reaching a nearby elementary school.

The Lethbridge Travel Demand Model estimates the productions and attractions developed in the trip generation step and converts them into origin-destination matrices for each trip purpose using a standard gravity model. The values for impedance function coefficients were initially developed in large research projects on travel behaviour (such as NCHRP Report 716[1]) and adjusted based on other regions with corresponding and relevant characteristics. These initial values have been further refined as part of the calibration process to ensure they most appropriately reflect the local Lethbridge environment.

Step 3: Mode Share Adjustment

Mode share data from a household survey conducted by Synovate for the City of Lethbridge in 2010 are presented here. More recent home to work survey data was not available at the time of developing this report.

[1] TRB's National Cooperative Highway Research Program (NCHRP) Report 716: Travel Demand Forecasting: Parameters and Techniques

Figure 4-10 provides a summary of the travel mode share based on all trips over a day. The most common mode for all time periods is the automobile, and more specifically, auto driver. Auto driver trips account for 70% of all daily trips. Auto passenger trips account for another 20% all trips. Walking accounts for an estimated 4.7% of the mode share. Transit mode share (1.4%), bicycle mode share (1.3%) and other trips that could not be classified into a specific mode (3.6%) make up the remainder.

Figure 4-11 provides a summary of the travel mode share for the morning (AM) and afternoon (PM) peak hour. The break down by mode is similar to daily with one notable exception that passenger trips are lower and transit trips slightly higher in the morning peak hour.

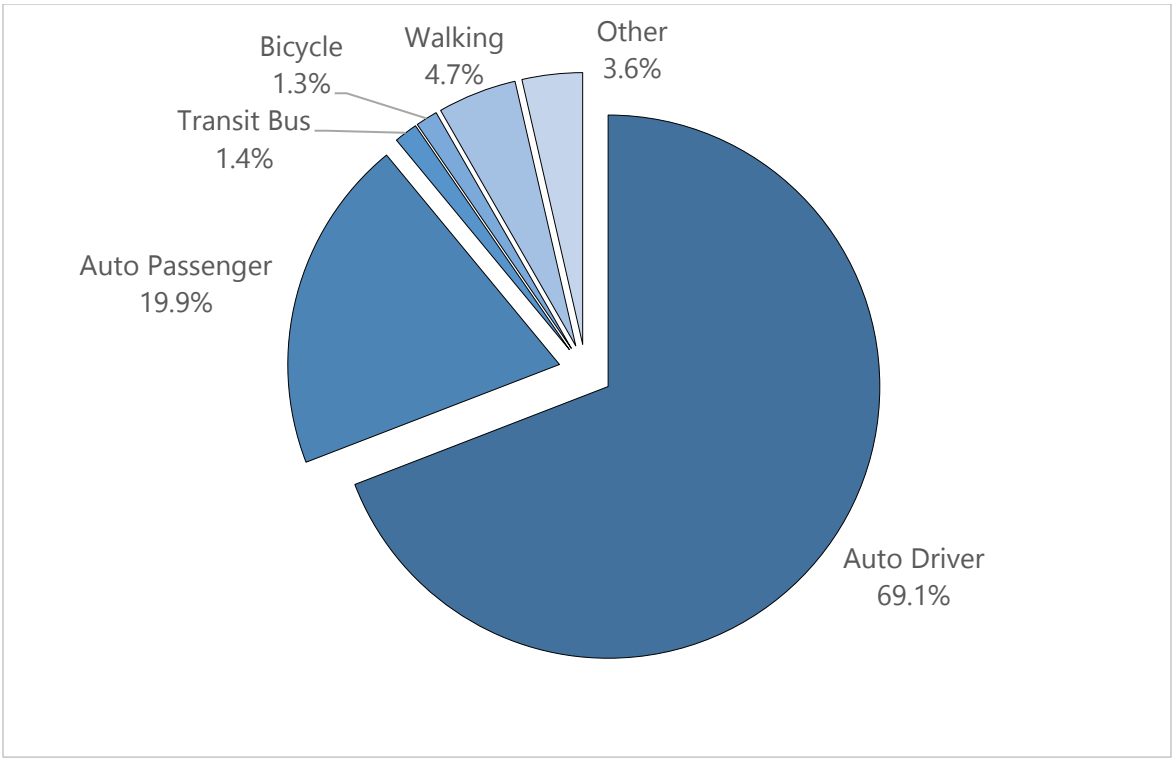


Figure 4-10: Daily Travel Mode Share
Source: 2010 Household Survey

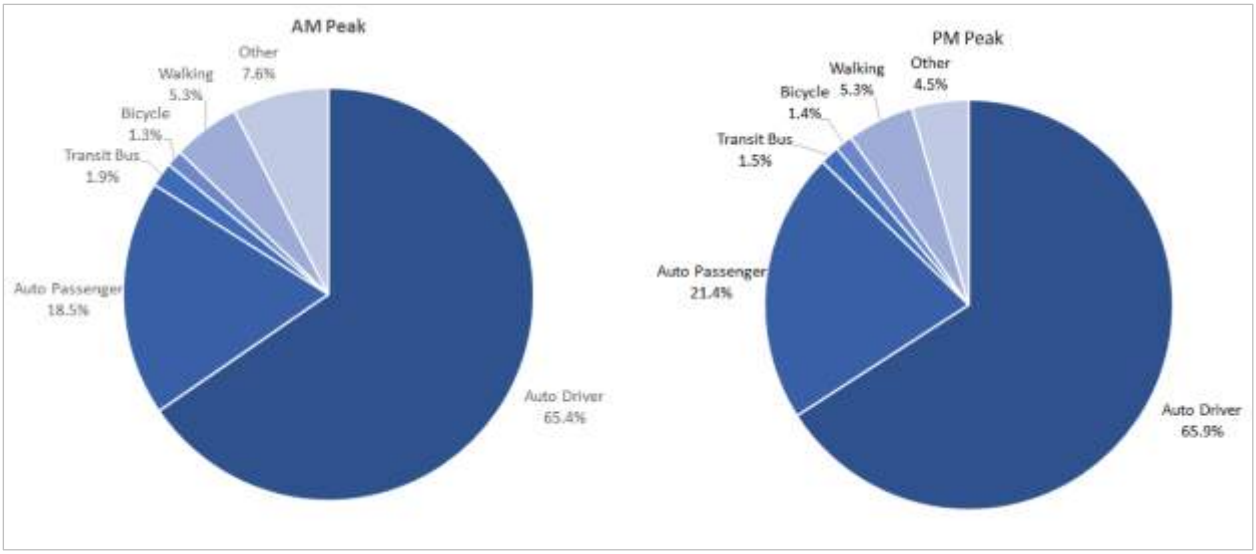


Figure 4-11: Peak Hour Mode Share
Source: 2010 Household Survey

Overall, private vehicles are the most dominant mode in the study area, accounting for approximately 90 percent of all person trips (as driver or passenger). Other trips are made by walking, bicycling, or taking transit. The same mode share was assumed for the development of the base year model. Each trip purpose contains a different set of considerations that are applied in this step. It is typical for more passengers to be in private vehicles for shopping trips than work trips, for example. Information about heavy truck activity was available through surveys conducted by Alberta Transportation on roadways near Lethbridge. These trips were identified at the end of the process to be applied to non-home-based trips destined for warehouse, industrial, and, to a lesser extent, retail areas. It is important to note that only heavy trucks are separated from the general traffic, as lighter trucks behave in traffic similarly to other private vehicles. The truck volumes were calibrated to estimate activity for the Lethbridge Travel Demand Model.

Step 4: Trip Assignment

After the mode share step, the estimated number of private vehicle driver trips is available as a table of trip estimates between each TAZ pair. In this step, every estimated auto driver trip is assigned to a path of streets based on the fastest way to drive between the two points. The model identifies the fastest three paths, and proportionally assigns the traffic according to how different the travel time is between these paths. Once all the trips are assigned, the model repeats the procedure until the network achieves a state of equilibrium. The state of equilibrium is reached when any incremental reassignment of trips to different routes does not improve the network travel performance (travel time).

The Equilibrium traffic assignment method provided within PTV VISUM has been used to assign traffic on the model links. The model uses the Bureau of Public Roads (BPR) equation mentioned in NCHRP Report

716[2] as the volume-delay functions (VDF) to assign traffic onto the network. The VDF is based on three variables: free-flow travel time, volume, and capacity (expressed as a time delay as a street segment gets more congested) assigned for each through street segment in and around Lethbridge.

Each step of the model process required verifying so that it represented conditions in Lethbridge in 2019 before proceeding to the next step. At the completion of the model, as traffic volume estimates are available, the overall model is validated to recorded or derived traffic counts to establish that it is a strong representation of travel demand in that year. The Lethbridge Travel Demand Model development report provides an explanation of each step. This document provides the summary data comparison – model estimated traffic volumes to traffic count data – as shown in **Table 4.1.** As this table shows, the Lethbridge Travel Demand Model exceeds professionally developed criteria for a model to be considered calibrated and validated.

To ensure the accuracy of the travel demand model, the assignments of the model were validated by comparing the estimated model results to the actual traffic count data. The analysis uses root mean square error (RMSE). Link count validation was undertaken at 255 locations across Lethbridge. A typical travel model comparison produces RMSEs that should decrease with increasing traffic volumes (or counts). In all cases, a lower %RMSE compared to a performance standard indicates that the difference between the model volume and the count aligns with standards and best practices.

Table 4-1: Average Weekday Traffic Validation Performance - RMSE%

Average Weekday Traffic Volume Range	Number of Counts Observed	Ohio Minimum Standard*	Best Practical Experience (Parkersburg, WV) *	Lethbridge Travel Demand Model
0-500	68	200%	166%	163%
500-1500	41	100%	80%	52%
1500-2500	34	62%	48%	44%
2500-3500	39	54%	47%	36%
3500-4500	18	48%	32%	32%
4500-5500	13	45%	27%	27%
5500-7000	12	42%	25%	14%
7000-8500	9	39%	23%	13%
8500-10000	12	36%	18%	13%
10000-12500	8	34%	19%	16%
12500-15000	5	31%	16%	16%
15000-17500	4	30%	14%	14%
20000-25000	2	26%	10%	10%

*Note: These are two methods applied in NCHRP 716 to be used in travel demand model development of small cities.

[2] TRB's National Cooperative Highway Research Program (NCHRP) Report 716: Travel Demand Forecasting: Parameters and Techniques

4.4 Model Outputs

The result of the travel model is forecasts for traffic volumes on every major street within the city as well as the surrounding area by short segments of only 1 to 4 blocks. To better describe the overall system performance, summary statistics can also be derived. Summary statistics typically involve measures including vehicle kilometres of travel (VKT), vehicle hours of travel (VHT) and average speed in kilometres per hour.

Summary network performance data is provided in

Table 4-2. The summary is listed for subareas in the Lethbridge travel demand model for the 2019 daily model. The maps of municipal districts and census municipal areas (CMA) are shown in **Figure 4-12** and **Figure 4-13** respectively.

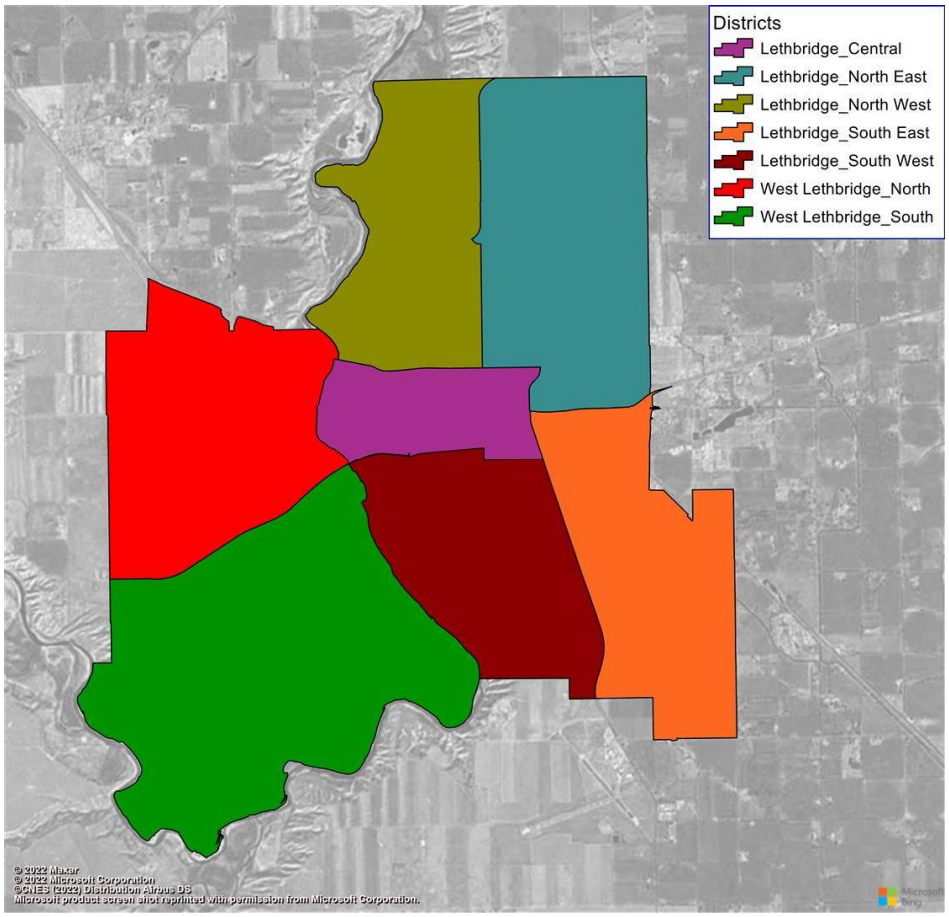


Figure 4-12: Study Districts (City of Lethbridge)

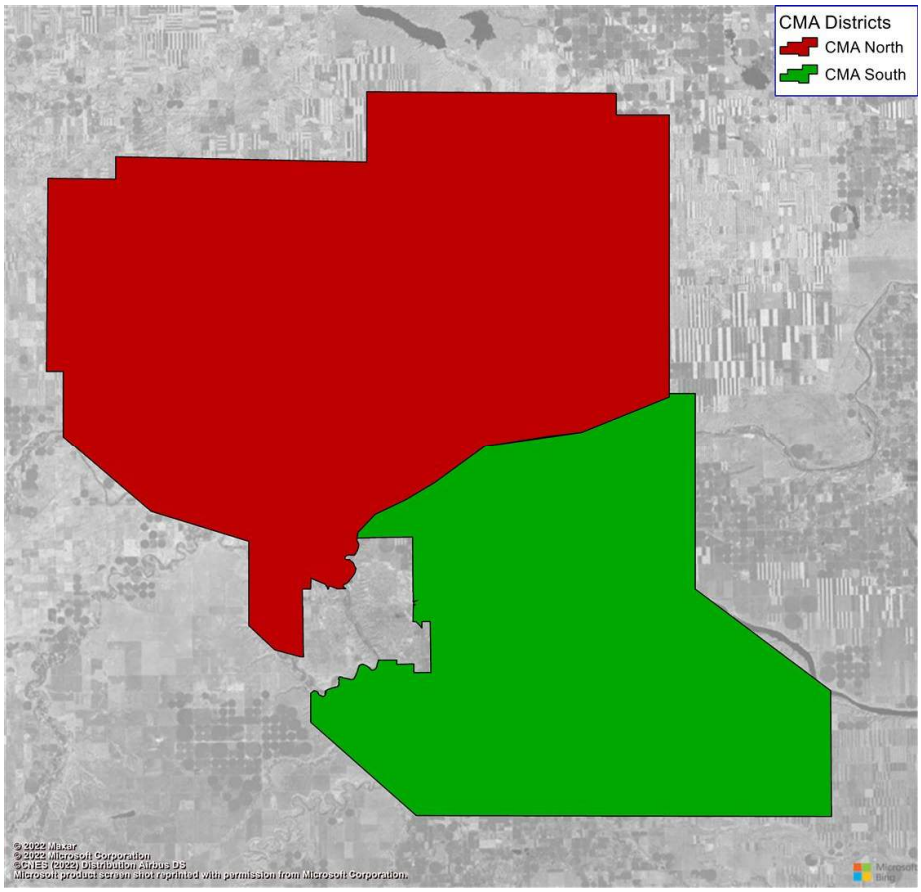


Figure 4-13: Study Districts (Census Metropolitan Area)

Table 4-2: Network Statistics Summary for 2019 Daily Model

Dist #	District Name	Vehicle Kilometers Travelled (VKT)	Vehicle Hours Travelled (VHT)	Average Speed (km/hr)
1	Lethbridge	1,638,374	41,870	39
2	Lethbridge_Central	351,064	8,759	40
3	Lethbridge_North East	182,153	4,736	38
4	Lethbridge_North West	99,013	2,791	35
5	Lethbridge_South East	219,867	4,746	46
6	Lethbridge_South West	341,264	9,047	38
7	West Lethbridge_North	186,974	4,477	42
8	West Lethbridge_South	258,038	7,314	35
9	CMA North	690,895	7,776	89
10	CMA South	681,207	7,904	86

Overall, the Lethbridge city road network operates at a daily average speed of 39 kilometers per hour.

The estimated traffic flows are illustratively summarized in **Figure 4-14**. These show the relative traffic volumes by the width of the street on the map, and actual daily volume data points are also displayed. It is important to mention that the overall network is much more extensive, and these major streets are only shown here to illustrate the information available for the model. The figure contains modelled flows on the provincial, county, major arterials, and arterial roads in the city of Lethbridge for the daily (24hr) model.

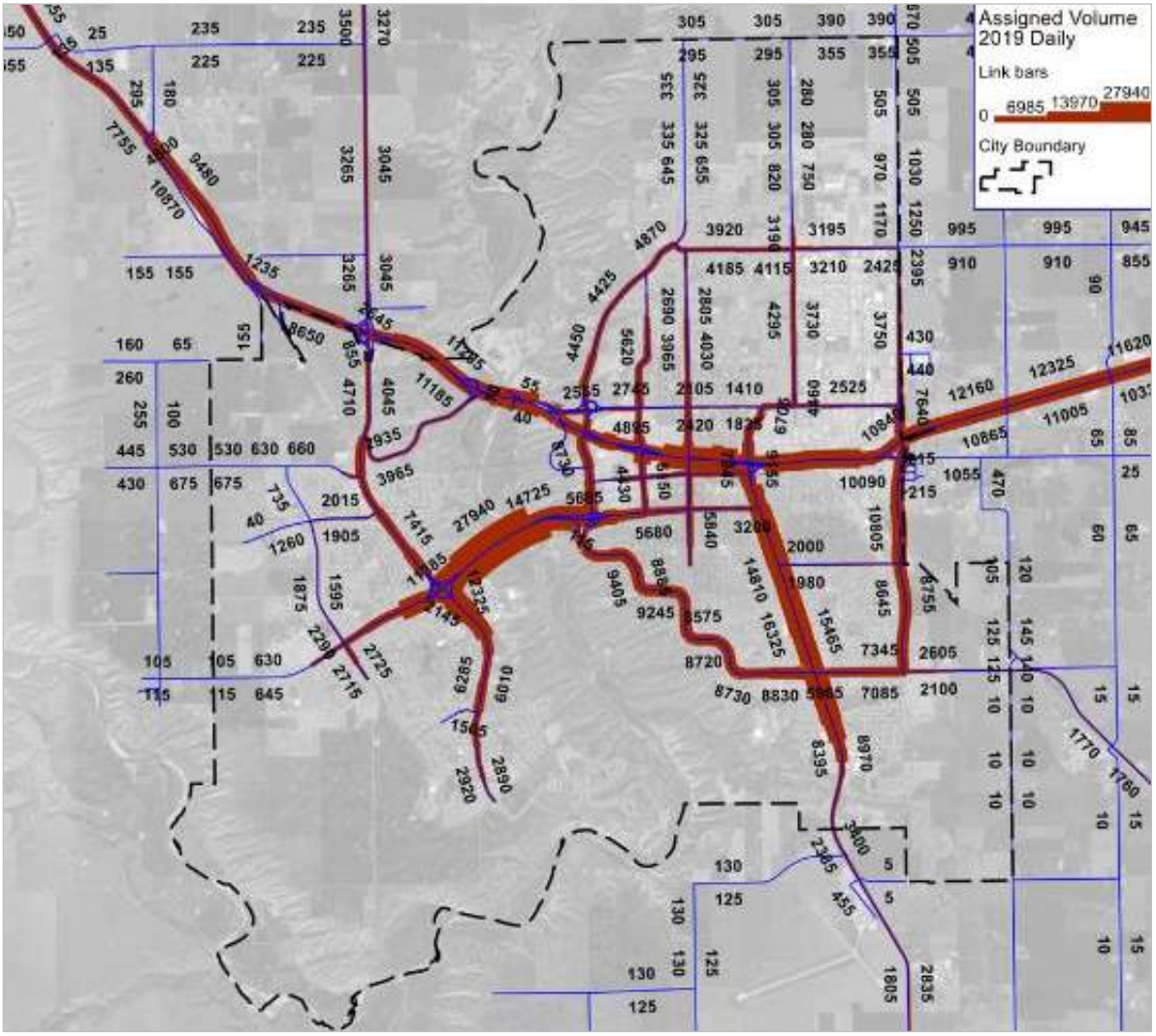


Figure 4-14: Assigned Volume 2019 Daily Volume

Traditionally volume-to-capacity ratio plots are an important output from the travel demand models and are generally used for strategic network improvement plans. Some of the observations and experience of various travel demand models suggest that it is not always possible to derive capacity completely/accurately through an analytical process. In most cases, capacity defined in models are theoretical values. Therefore, instead of volume-to-capacity ratio plots, travel speed/congested speed plots are presented in the Lethbridge travel demand model outputs. The congested speeds are displayed as a percentage of the speed limit or posted speed. The Highway Capacity Manual (HCM) suggests using travel speed as a percentage of free-flow speeds, which is frequently the speed limit/posted speed, to

define LOS for urban roadways. **Figure 4-15** shows the plot of the modelled congested speeds defined as a percentage of the speed limit/posted speed on the street network within the City of Lethbridge for the daily (24hrs) model. The LOS translation of congested speed presented as a percentage of the posted speed limit is explained in **Table 4-3**.

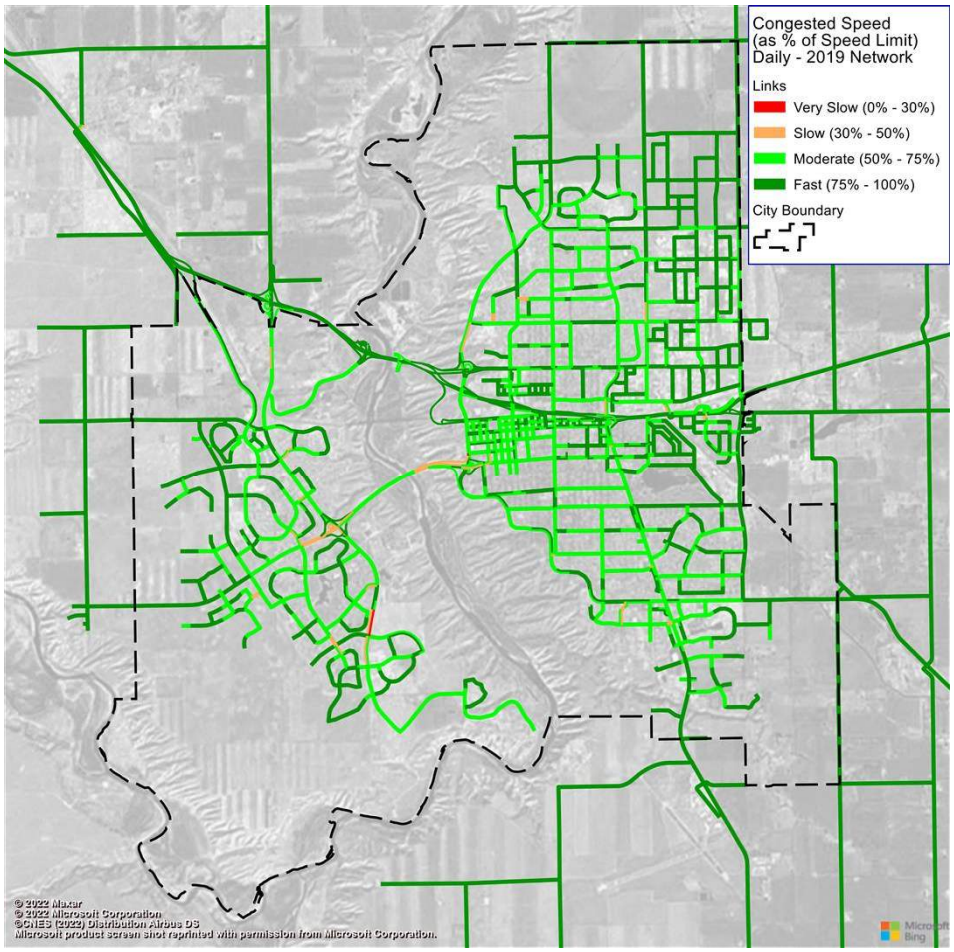


Figure 4-15: Congested Speed (as % of Speed Limit) 2019 Daily Model

Figure 4-15 shows that for baseline 2019 conditions, some segments of Whoop-Up Drive (near University Drive and Scenic Drive) and University Drive Were estimated to experience some moderate congestion at certain times of day.

Table 4-3: Travel Speed & Level of Service Translation

Speed Descriptor	% of Free-Flow Speed	Level of Service Description
Very Slow	0% – 30%	Indicates that the travel speed is between 0% to 30%of the posted speed limit. It is characterized by flow at extremely low speed, unstable operation and significant delay. Congestion is likely occurring at the intersections, as indicated by high delay and extensive queues.
Slow	30% - 50%	Indicates a less stable condition in which a small increase in flow may cause substantial increase in delay and decrease in travel speed. This travel condition is due to high volume with long queues, adverse signal progression or inappropriate signal timings at intersections. The travel speed is between 30% to 50% of the posted speed limit.
Moderate	50% - 75%	Describes stable and reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted and control delay at the intersections is not significant. The travel speed is between 50% -75% of the posted speed limit.
Fast	75% - 100%	Describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at the intersections is minimal. The travel speed exceeds 75% of the posted speed limit.

4.5 Future Baseline Projections

The future modelling was undertaken for 2029, 2039 and 2069, representing 10-, 20- and 50-year horizons. The Future Base scenarios assume all future network changes and land use growth plans identified by the City.

4.5.1 CITY POPULATION AND EMPLOYMENT FORECAST

The City of Lethbridge developed and provided the population and employment projections for the horizon years in its population and employment forecast (PEFM). The population and employment forecast for traffic zones within the city limits were primarily based on Area Structure Plans (ASPs) and Outline Plans (OPs) as identified and approved by the City. The resulting estimates were assumed to be suitable for adoption in the future horizon analysis. **Table 4-4** shows summaries of the population and employment forecast for the base year and future horizon years by the district of the city.

Table 4-4: Population and Employment Forecast Summary

District #, Description		Population and Employment							
		2019		2029		2039		2069	
		Pop	Employ	Pop	Employ	Pop	Employ	Pop	Employ
1	West Lethbridge_North	17,259	2,325	25,260	5,225	31,250	9,515	34,669	12,780
2	West Lethbridge_South	23,405	3,495	31,619	4,275	34,019	5,181	63,990	7,031
3	Lethbridge_North West	9,332	1,072	11,604	1,295	12,501	1,359	14,720	1,583
4	Lethbridge_North East	16,133	10,859	19,255	11,932	20,820	12,595	32,542	15,967
5	Lethbridge_Central	6,259	14,055	6,828	14,168	6,868	14,180	6,131	14,247
6	Lethbridge_South West	14,299	7,197	14,667	7,887	14,734	7,938	13,325	8,272
7	Lethbridge_South East	14,305	5,472	18,749	6,423	21,754	6,700	34,176	7,311
8	CMA - North	12,112	3,430	13,709	3,675	15,480	3,843	24,392	5,082
9	CMA - South	12,564	5,085	14,347	5,696	16,196	6,378	16,109	8,664
	TOTAL	**125,668**	**52,990**	**156,037**	**60,576**	**173,622**	**67,688**	**240,054**	**80,937**

Each district will grow at a different rate, with the highest growth projected in West Lethbridge and significant growth also projected in the far southeast and far north districts. **Table 4-5** shows the percentage growth in population and employment in horizon years compared to 2019, the model base year. It should be noted that very high employment growth was assumed in the north area of West Lethbridge in 2039 and 2069 due to the anticipated development of the area known as the West Lethbridge Employment Centre. The estimated population and employment data are used as inputs to horizon year analysis.

Table 4-5: The Percentage Growth in Population and Employment

Dist #	District	Growth % from 2019					
		2029		2039		2069	
		Population	Employment	Population	Employment	Population	Employment
1	West Lethbridge_North	46%	125%	81%	309%	101%	450%
2	West Lethbridge_South	35%	22%	45%	48%	173%	101%
3	Lethbridge_North West	24%	21%	34%	27%	58%	48%
4	Lethbridge_North East	19%	10%	29%	16%	102%	47%
5	Lethbridge_Central	9%	1%	10%	1%	-2%	1%
6	Lethbridge_South West	3%	10%	3%	10%	-7%	15%
7	Lethbridge_South East	31%	17%	52%	22%	139%	34%
8	CMA North	13%	7%	28%	12%	101%	48%
9	CMA South	14%	12%	29%	25%	28%	70%
	Total	**24%**	**14%**	**38%**	**28%**	**91%**	**53%**

4.5.2 FUTURE MODEL OUTPUTS

Because the rate of population and employment growth exceeds the rate of new lane kilometers added to the system, the streets are projected to see increased traffic over time, with some areas experiencing greater increases than others. In particular, the timing of roadway improvements in West Lethbridge should consider the growth occurring in that area as traffic operations will decline. **Table 4-6** to **Table 4-8** summarizes network statistics for the Lethbridge travel demand model sub-areas for the 2029, 2039 and 2069 daily model. The Lethbridge city road network operates at a daily average speed of 36 kph, 35 kph and 32 kph in 2029, 2039, and 2069 within the city limits, respectively.

Table 4-6: Network Statistics Summary for 2029 Daily Model

Dist #	District Name	Vehicle Kilometers Travelled (VKT)	Vehicle Hours Travelled (VHT)	Average Speed (km/hr)
1	Lethbridge	2,123,400	58,944	36
2	Lethbridge_Central	416,254	10,592	39
3	Lethbridge_North East	253,820	6,988	36
4	Lethbridge_North West	134,641	4,251	32
5	Lethbridge_South East	314,919	7,256	43
6	Lethbridge_South West	369,185	10,350	36
7	West Lethbridge_North	289,437	8,255	35
8	West Lethbridge_South	345,145	11,252	31
9	CMA North	799,951	9,146	87
10	CMA South	805,974	9,518	85

Table 4-7: Network Statistics Summary for 2039 Daily Model

Dist #	District Name	Vehicle Kilometers Travelled (VKT)	Vehicle Hours Travelled (VHT)	Average Speed (km/hr)
1	Lethbridge	2,400,798	68,451	35
2	Lethbridge_Central	446,548	11,343	39
3	Lethbridge_North East	298,610	8,239	36
4	Lethbridge_North West	147,673	4,868	30
5	Lethbridge_South East	364,998	8,514	43
6	Lethbridge_South West	378,476	10,773	35
7	West Lethbridge_North	380,959	11,550	33
8	West Lethbridge_South	383,533	13,164	29
9	CMA North	904,792	10,562	86
10	CMA South	908,366	10,878	84

Table 4-8: Network Statistics Summary for 2069 Daily Model

Dist #	District Name	Vehicle Kilometers Travelled (VKT)	Vehicle Hours Travelled (VHT)	Average Speed (km/hr)
1	Lethbridge	3,231,525	100,900	32
2	Lethbridge_Central	474,837	12,899	37
3	Lethbridge_North East	438,998	12,595	35
4	Lethbridge_North West	213,302	7,064	30
5	Lethbridge_South East	508,155	12,691	40
6	Lethbridge_South West	422,414	13,052	32
7	West Lethbridge_North	529,173	17,525	30
8	West Lethbridge_South	644,646	25,075	26
9	CMA North	1,145,263	15,489	74
10	CMA South	1,294,050	15,856	82

Forecasted Increases in traffic on specific major streets can also be shown. **Figure 4-16** to **Figure 4-18** show the modelled flows on the provincial, county, and arterial roads in the City of Lethbridge for an average weekday, 24-hour period forecasted during the horizon years 2039, 2039, and 2069.

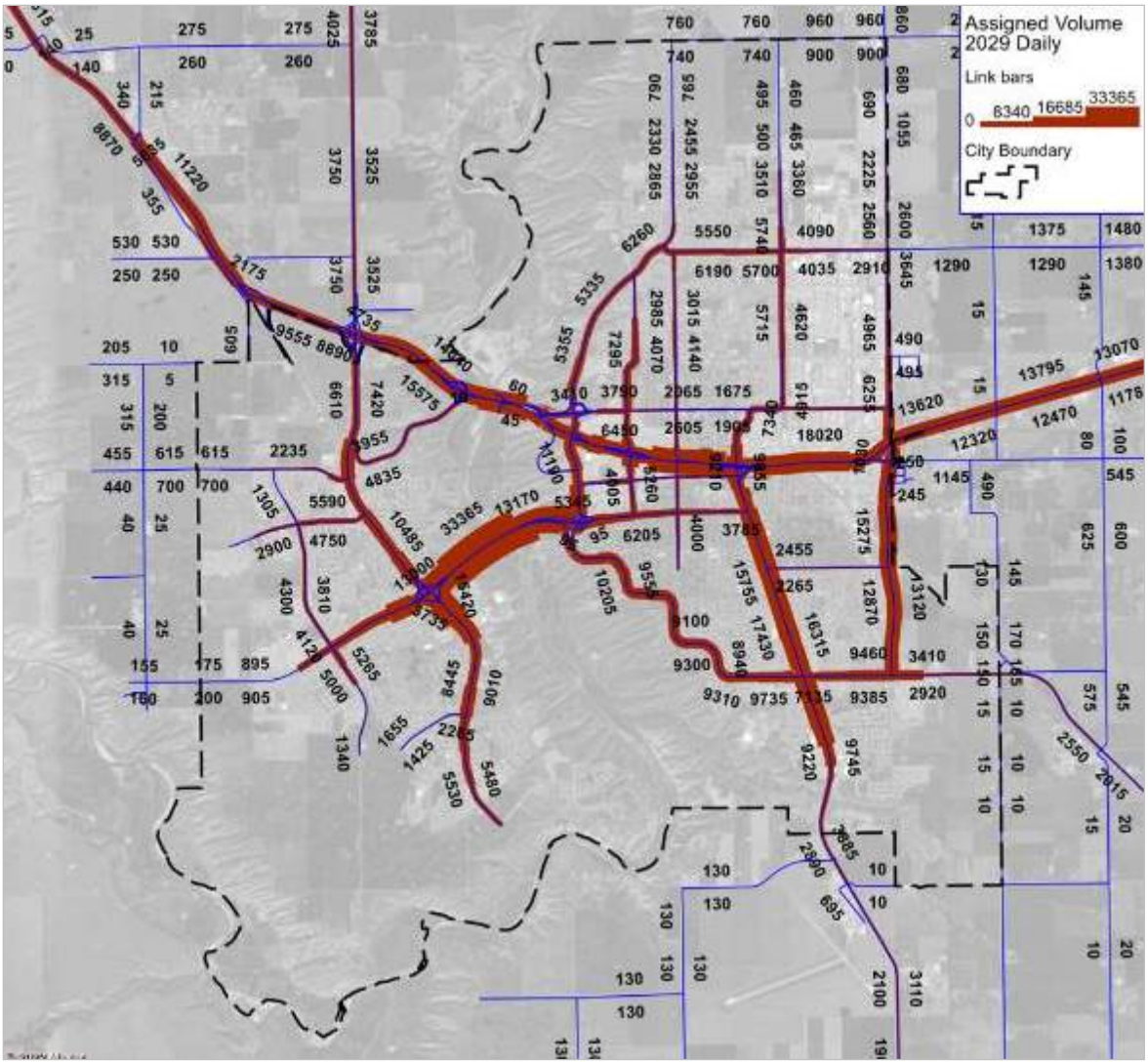


Figure 4-16: Daily Traffic Volume, 2029 Daily Model

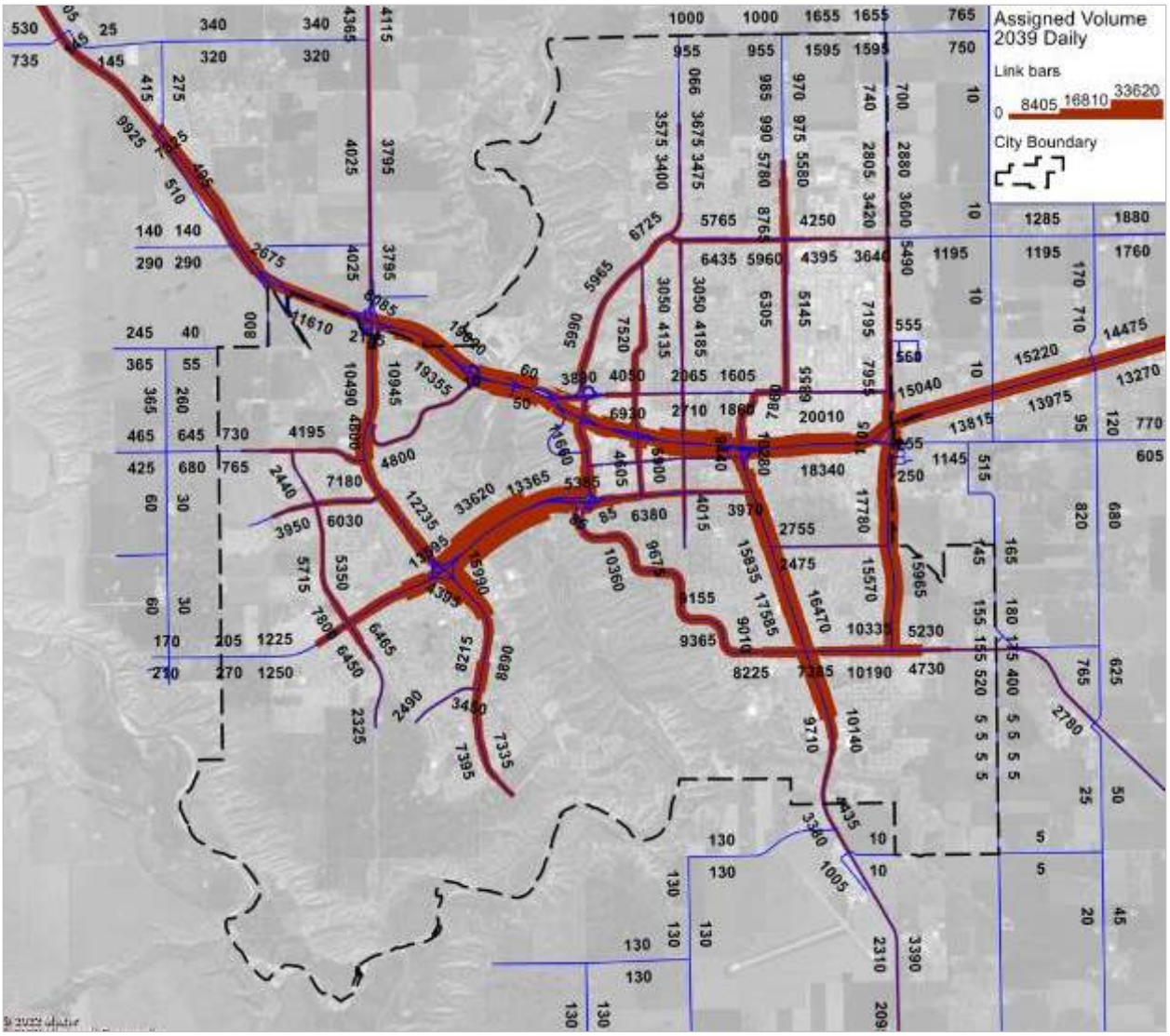


Figure 4-17: Daily Traffic Volume, 2039 Daily Model

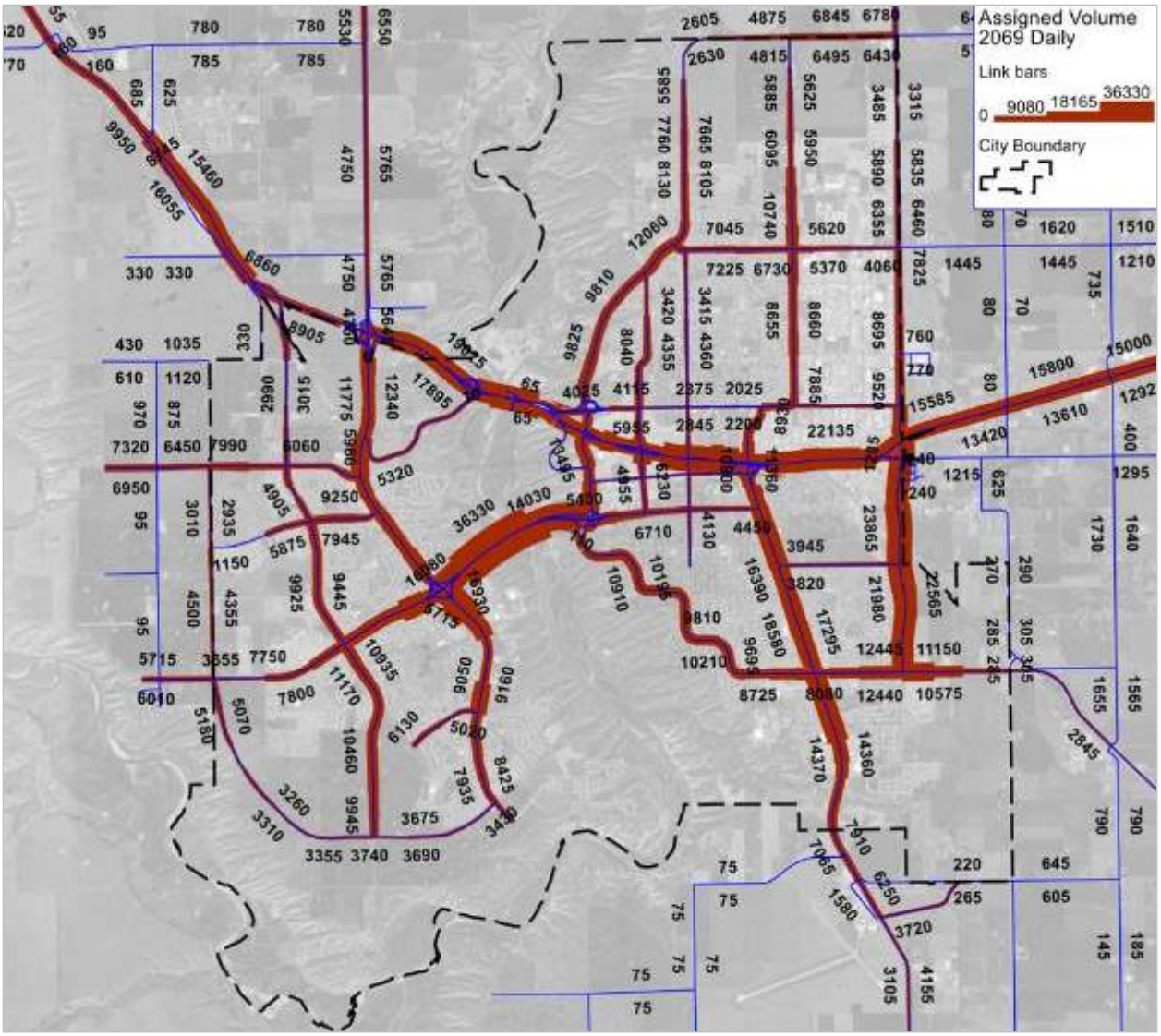


Figure 4-18: Daily Traffic Volume, 2069 Daily Model

The increase in travel volumes for the most comprehensive network can also be presented graphically. As traffic increases, speeds slow in some areas. Because Lethbridge has a robust grid system in its network, congestion issues across a wide area are not expected to occur, with slower traffic occurring mainly on isolated street segments in the network.

Figure 4-19 to **Figure 4-21** shows plots of the modelled congested speeds defined as a percentage of the speed limit/posted speed on the street network within the City of Lethbridge for average weekday, 24-hour period conditions.

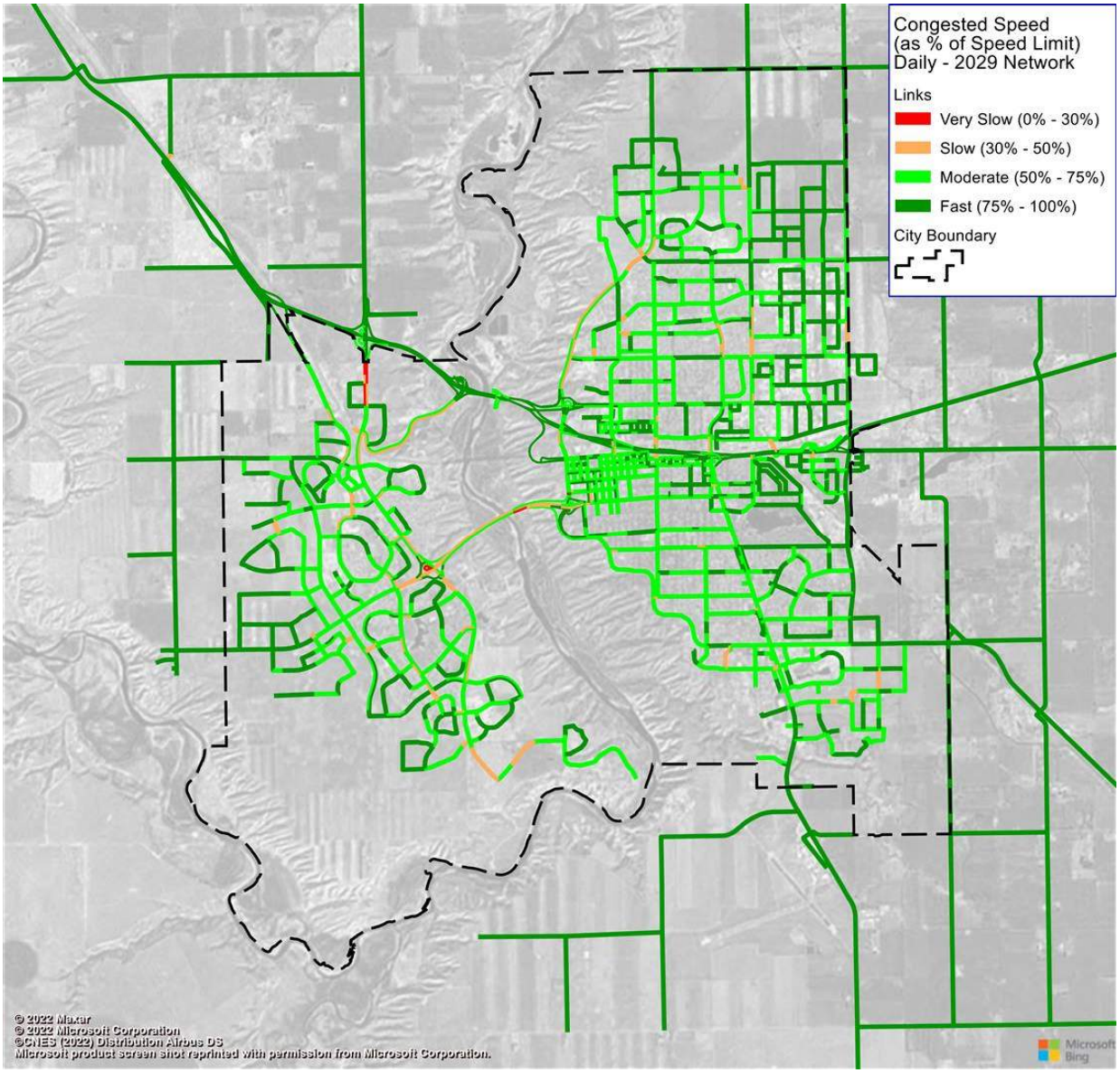


Figure 4-19: Congested Speed (as of % of Speed Limit) 2029 Daily Model

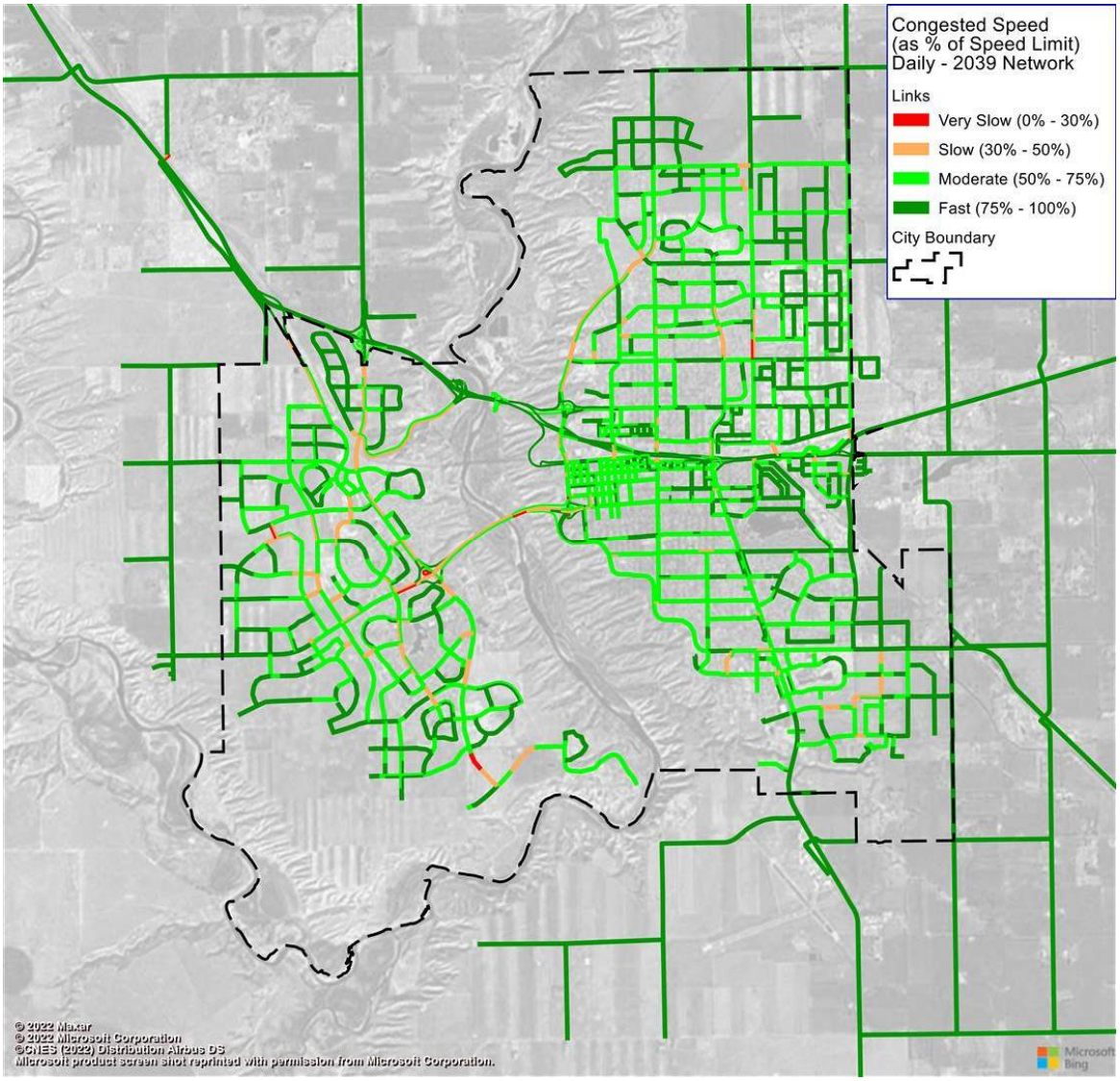


Figure 4-20: Congested Speed (as % of Speed Limit) 2039 Daily Volume

As **Figure 4-20** shows, wide-spread congestion issues are starting to develop on Whoop-Up Drive, West Lethbridge and isolated areas in North Lethbridge.

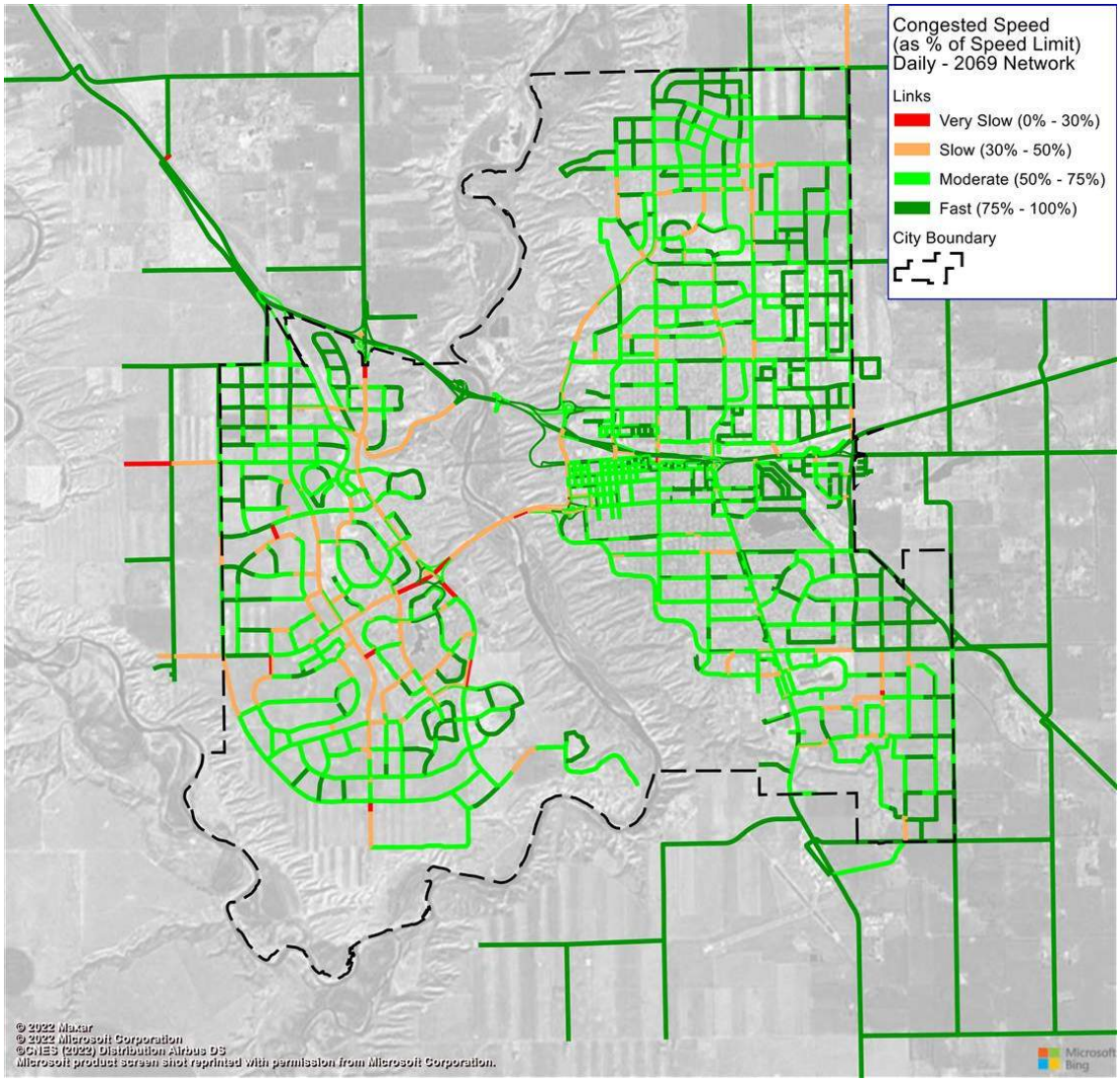


Figure 4-21: Congested Speed (as % of Speed Limit) 2069 Daily Model

As **Figure 4-21** shows, system-wide congestion issues, particularly on Whoop-Up Drive and in West Lethbridge. As this figure represents generalized daily congestion, peak hour congestion in the peak directions would be noticeably worse. This contrasts with most areas east of Old Man River, which are forecast to have only isolated daily congestion issues.

The detailed report of the Lethbridge travel demand model development is available in **Appendix A.**

5 MODEL SCENARIOS & ANALYSIS

5.1 Alternative Scenario Testing & Results

A key benefit of the Transportation Demand Model is its flexibility in responding to changing inputs. In this way, assumptions about the transportation network and land use can be revised and the impacts of those changes tested. Future Land Use assumptions drive travel patterns and are therefore directly connected to the transportation demand. Five alternative scenarios were tested using the new model. These scenarios and the modelling results are described in the following sections.

5.1.1 SCENARIO 1: 10% REDUCTION IN AUTOMOBILE TRIPS

The 'business as usual' scenario is continued investment in road infrastructure, but not an increase in transit and active modes infrastructure or lasting changes in driving behavior. In this scenario, it can be assumed that vehicle trips will continue to account for 90% of all trips. With TMP policies, actions, and a shift in funding priorities towards transit and active modes infrastructure as well as working, school and shopping from home, a shift of another 10% of trips away from driving is possible. This scenario examines the effects of that change.

5.1.2 SCENARIO 2: NARROWING OF MAYOR MAGRATH DRIVE FROM 6 TO 4 LANES

Mayor Magrath Drive is a major 6-lane north-south arterial between Highway 3 and Southgate Boulevard currently carrying up to 30,000 vehicles per day and up to 6,000 vehicles during the peak two-hour afternoon period. There is a history of higher collision numbers along this corridor, and through engagement, residents have raised the issue of the challenge of crossing Mayor Magrath's 6 to 8 lane width at intersections. The purpose of this scenario is to examine the network impacts of reducing the 6 through lanes to 4 to provide a space for active modes of travel.

5.1.3 SCENARIO 3: NO EMPLOYMENT IN WEST LETHBRIDGE EMPLOYMENT CENTRE

The West Lethbridge Employment Centre Area Structure Plan was adopted in February 2013 and amended in August 2018 and March 2022. The plan area is shown in **Figure 5-1** and is intended to be an area of high employment including office, retail and industrial land uses. As this area is in West Lethbridge, it should attract some Lethbridge residents from this sector of the city, diverting employment and shopping related trips from other city sectors and hence reduce demands on the river crossings. The purpose of this scenario is to examine the impacts of these employment-focused land uses if they do not develop.

Scenario 3A is at the 2039 horizon. Scenario 3B and 3C are both at the 2069 horizon and test the network both with and without a 3rd bridge crossing of the Oldman River.

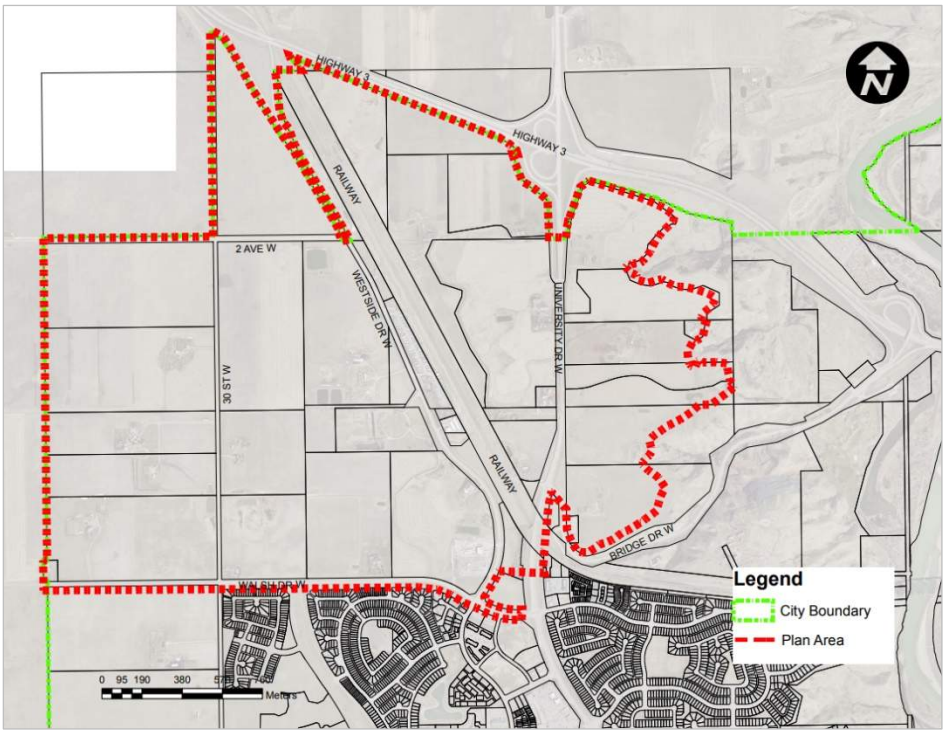


Figure 5-1: West Lethbridge Employment Centre Area

Source: Map 6, West Lethbridge Employment Centre Area Structure Plan

5.1.4 SCENARIO 4: NO CANAMEX BYPASS (2069 HORIZON)

The province is proposing a major realignment of Highways 3 and 4. This will create the CANAMEX Corridor (shown as yellow in

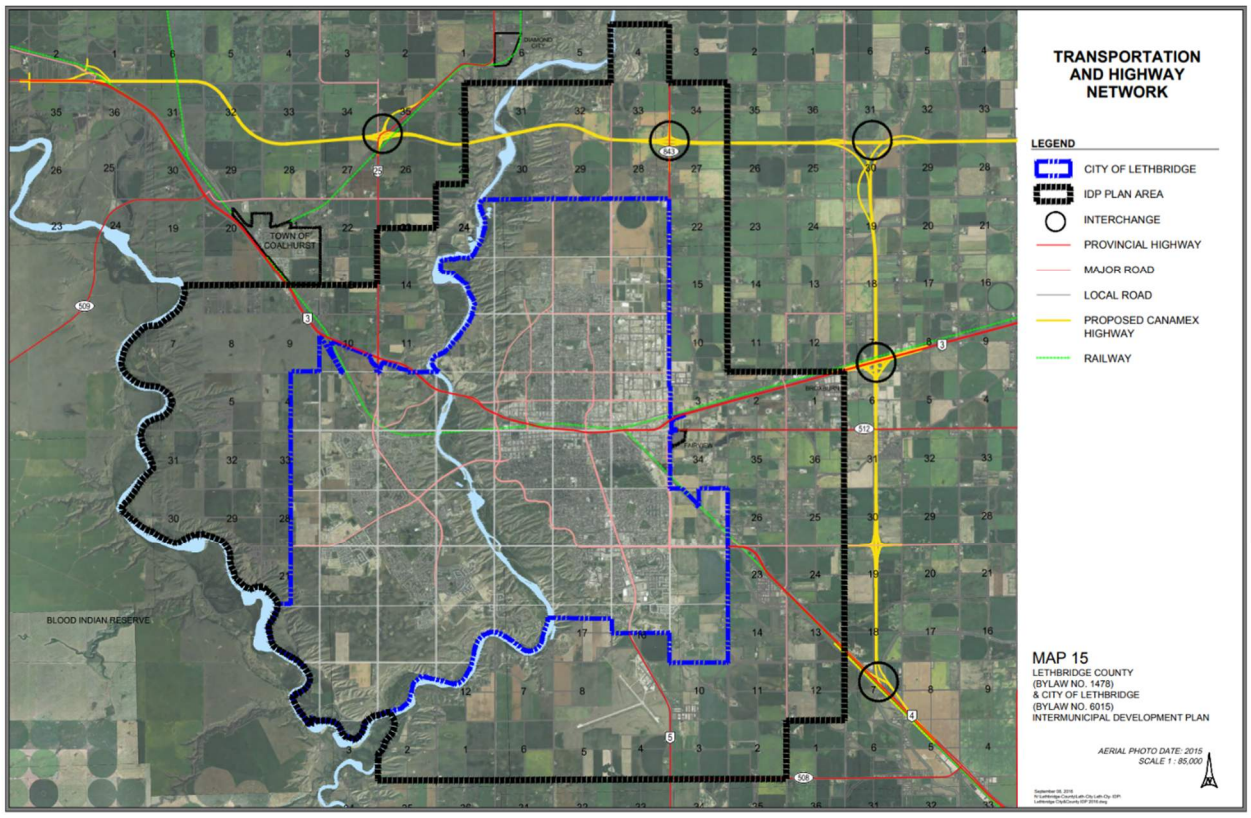


Figure 5-2: Regional Transportation Network with CANAMEX Corridor and is proposed to tie Canada to the United States and Mexico, encouraging the free trade of goods and services. The purpose of this scenario is to determine the impacts on the City's transportation network (especially the river crossings) without the CANAMEX corridor in place in 2069.

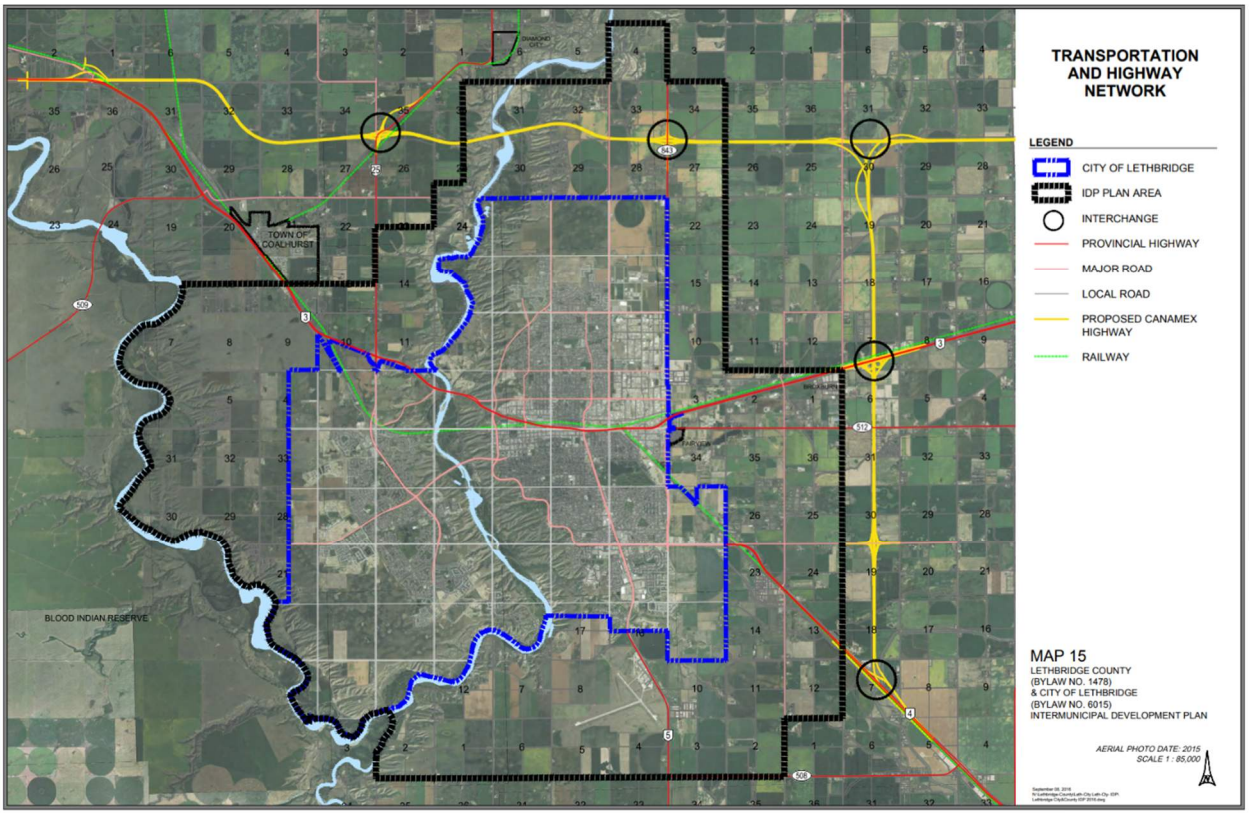


Figure 5-2: Regional Transportation Network with CANAMEX Corridor
Source: Map 15, 2016 Intermunicipal Development Plan

5.1.5 SCENARIO 5: 20% OF RESIDENTIAL GROWTH THROUGH CENTRAL INFILL (2069 HORIZON)

Low density suburban sprawl is a less sustainable, less economic, and more infrastructure intensive way for a city to grow. Currently nearly all city population growth occurs within greenfield suburban neighbourhoods. Replacing future low-density growth in the suburbs with medium density growth in established communities is a more sustainable, and smarter way to grow. The purpose of this scenario is to quantify the impacts (i.e., difference in traffic) if 20% of the growth forecasted for the suburbs is realized within existing, centrally located communities instead.

5.1.6 SUMMARY OF RESULTS

Scenarios 1, 2 and 3A were run using the 2039 future horizon model as the impacts of these scenarios will be realized within 20 years. Scenarios 3B, 3C, 4 and 5 were run using the 2069 horizon as these changes will not be realized until further out. It is important to note that at the 2069 horizon, high congestion levels cause the model to assume shorter trip lengths to compensate, which does not lead to accurate estimates of traffic volumes, particularly on the river crossings. To counter this, a less-network constrained approach with Chinook Trail as a 6-lane bridge was assumed. **Table 5-1** summarizes the results of the scenarios. A discussion of these results follows.

Table 5-1: Summary of Scenario Test Results

Effects (Compared to base 2039 or 2069 horizon year forecast)	**Scenario 1:** 10% Reduction in Automobile Trips	**Scenario 2:** Narrowing Mayor Magrath Dr (6 → 4 lanes)	**Scenario 3A:** No Employment in the West Lethbridge Employment Centre	**Scenario 3B:** No Employment in WLEC, no CANAMEX bypass, no 3rd Bridge	**Scenario 3C:** No Employment in WLEC, no CANAMEX bypass, with 3rd Bridge	**Scenario 4:** No CANAMEX Bypass	**Scenario 5:** 20% Residential Growth Through Central Infill
Horizon	**2039**	**2039**	**2039**	**2069**	**2069**	**2069**	**2069**
Effect on Bridges	Hwy 3: 10% Lower Whoop Up: 3% Lower	Not significant	Hwy 3: 5-8% Lower Whoop Up: 6-8% Higher	Hwy 3: 20-21% higher, Whoop-Up: 14-15% higher	Hwy 3: 6-15% higher, Whoop-Up: 7-8% higher, Chinook T: 8% lower	Hwy 3: 15-25% Higher Whoop Up: 0-2% Lower; Chinook Tr: 1-2% Lower	Hwy 3: 3-5% Lower Whoop Up: 2-4% Lower Chinook Tr: 6-9% Lower
Effect on Central Lethbridge Traffic	3-5% Lower	0-2% Lower	Less than 1%	10-11% higher	2-3% Higher	0-5% Higher	2-8% Higher
Effect on West Lethbridge Traffic	4-10% Lower	No Effect	Significantly less north-south traffic	3-9% higher S of Whoop-Up. 11-17% lower N of Whoop	1-11% Higher S of Whoop Up; 17-28% Lower N of Whoop-Up	0-5% Higher south of Whoop Up; 5-25% Higher north of Whoop Up	0-15% Lower
Effect on South Lethbridge Traffic	2-10% Lower	20% - 25% lower traffic on Mayor Magrath Dr; side and parallel streets with 5% - 20% higher traffic	Little Effect	4-12% higher	7-25% Higher	0-1% Change	5-15% Lower
Effect on North Lethbridge Traffic	3-8% Lower	Not significant	Increase in Local Traffic	10-26% higher	10-26% Higher	0-5% Higher S of 26 Avenue N; Lower N of 26 Avenue N	0-15% Lower
Effect on Vehicle Kilometers Traveled (daily)	Reduction of 8.4%	Reduction of 0.2%	Increase of 2.0%	Increase of 5%	Increase of 4%	Reduction of 1.9%	Reduction of 2.9%
Effect on Vehicle Hours Traveled (daily)	Reduction of 12.1%	Increase of 0.4%	Increase of 3.2%	Increase of 7%	Increase of 7%	Reduction of 1.9%	Reduction of 4.2%

Scenario 1 shows a reduction of more than 8% for vehicle kilometers travelled and more than 12% for vehicle hours travelled. There is less local traffic (2-8%) in all areas of Lethbridge and a reduction of traffic on the river crossings (3-10%).

Scenario 2 results show little impact on the network by reducing Mayor Magrath by two lanes. This suggests that a narrowing of the corridor is a viable project to examine further.

Scenario 3A results show that there is an impact on the river crossings. Traffic can be expected to be 5 to 8% higher with an increase in North Lethbridge traffic and overall network vehicle kilometers travelled.

Scenario 3B results show an impact on river crossings and local network in North Lethbridge. Traffic volume is expected to be 10 to 26% higher with an increase in North Lethbridge traffic, as the forecast allocated lower employment in West Lethbridge and higher in North Lethbridge. The significant increase in Highway 3 traffic (15-25%) and Whoop Up Drive traffic (14-15%) was observed. Slight increase (4%) in overall network vehicle kilometres travelled was observed.

Like Scenario 3B, **Scenario 3C** results also show an impact on river crossings and local network in Lethbridge. Because the scenario forecast allocated less employment in West Lethbridge and more in North Lethbridge, traffic volume is expected to be higher in North Lethbridge. The availability of third bridge access from West Lethbridge to the part of Lethbridge east of the river become a reason for the even distribution of the increase in traffic; North Lethbridge would expect 10-26% higher traffic and South Lethbridge would expect 7-25% higher traffic. The increase in bridge crossing traffic observed was distributed across the three crossings; Highway 3 (6-15% higher traffic), Whoop Up Drive (7-8% higher traffic) and Chinook Trail (7-8% higher traffic). An increase (5%) in overall network vehicle kilometres travelled was observed.

Scenario 4 results show a significant increase in Highway 3 traffic (15-25%), little change in the local traffic in Lethbridge, and a slight reduction (2%) in overall network vehicle kilometers travelled.

Scenario 5 results show a reduction of traffic on all river crossings (ranging from 2 to 9%), a decrease in traffic in all areas of Lethbridge except for the central area where more trips are generated from the infill, and an overall reduction (3%) in overall network vehicle kilometres travelled.

5.2 Third Bridge Analysis

The third bridge assessment (discussed in Section 7.9) required modelling analysis to compare the three river crossing options: Chinook Trail alignment, Popson Park alignment, and no alignment at the 2069 horizon. For comparison purposes, these were all compared against the 2019 base year model. The results of the modelling are shown in

Table 5-2 and

Table 5-3. These volumes are two-way daily volumes under each of the different scenarios and rounded to the nearest 100 vehicles.

Table 5-2: Modelling Results for 3rd Bridge Alignment Options

River Bridge Crossings	Two-Way Volume (Daily)			
	2019 Base Year	2069 Ultimate No 3rd Bridge	2069 Ultimate 3rd Bridge at Chinook Trail	2069 Ultimate 3rd Bridge at Popson Park
Whoop Up Drive	55,800	71,600	64,900	68,600
Highway 3 Existing	29,300	46,800	47,500	47,200
Highway 3 CANAMEX Bypass	n/a	11,400	11,600	11,400
Chinook Trail	n/a	n/a	37,500	n/a
Popson Park	n/a	n/a	n/a	24,700
TOTAL	**85,100**	**129,800**	**161,500**	**151,900**

Table 5-3: VKT and VHT Comparisons for Third Bridge Alignment Options

	District	2019 Daily			2069 Daily - No Bridge			2069 Daily - 3rd Bridge Chinook Trail			2069 Daily - 3rd Bridge Popson Park		
		VKT	VHT	Avg Speed	VKT	VHT	Avg Speed	VKT	VHT	Avg Speed	VKT	VHT	Avg Speed
1	Lethbridge	1,638,374	41,870	39	3,231,525	100,900	32	3,371,969	102,008	33	3,255,140	98,767	33
2	Lethbridge_Central	351,064	8,759	40	474,837	12,899	37	467,688	12,591	37	465,552	12,534	37
3	Lethbridge_North East	182,153	4,736	38	438,998	12,595	35	434,828	12,458	35	435,764	12,485	35
4	Lethbridge_North West	99,013	2,791	35	213,302	7,064	30	215,064	7,182	30	214,680	7,151	30
5	Lethbridge_South East	219,867	4,746	46	508,155	12,691	40	524,878	13,272	40	518,074	13,066	40
6	Lethbridge_South West	341,264	9,047	38	422,414	13,052	32	509,506	15,375	33	415,548	12,784	33
7	West Lethbridge_North	186,974	4,477	42	529,173	17,525	30	514,567	16,559	31	514,951	16,632	31
8	West Lethbridge_South	258,038	7,314	35	644,646	25,075	26	705,439	24,570	29	690,570	24,115	29
9	CMA North	690,895	7,776	89	1,145,263	15,489	74	1,142,115	15,388	74	1,141,209	15,354	74
10	CMA South	681,207	7,904	86	1,294,050	15,856	82	1,299,142	15,971	81	1,452,296	18,876	77

The third bridge analysis estimates how traffic might look in 2069 based on the number of total lanes crossing the Old Man River as well as the position of the proposed bridges. The model results show that if there was no third bridge, additional congestion would cause Whoop-Up Drive and parts of the network east and west of this river crossing to experience unacceptable levels of congestion. The model estimates that the improvement in connectivity would mostly serve new trips that cross the river (over 80 percent of new bridge traffic) as opposed to merely carrying rerouted trips that were on a different bridge. A third bridge would create a community where the residents and businesses of both sides of the river would be able to make trips much more quickly, and thus make those trips more desirable and more frequent.

The benefits of a third bridge will occur once constructed, as the Whoop Up corridor is already experiencing some congestion. Traffic congestion will continue to increase as West Lethbridge adds population each year. The 2039 land use projections likely will create notable congestion at the river crossings, and the third bridge will likely be perceived to be necessary at about this time.

Of the two possible bridge locations, the Chinook Trail alignment would be less costly and attract more traffic compared to a bridge further south. A bridge in the southwest end of the city would conflict with Popson Park and would require a longer travel distance to reach business and activity destinations.

5.3 Meso-Analysis

Travel Demand Model software now enables analyzing specific corridors in greater detail. This analysis is done at a "mesoscopic" or local level instead of a "macroscopic level" that would consider the entire city.

5.3.1 MODELING CONCEPT

The typical trips made within a travel demand model are complete trips that both begin and end during the study period. A mesoscopic analysis examines those trips at a more refined period, such as five-minute intervals. These time intervals allow for traffic conditions such as bottlenecks to be considered. A good example is how some drivers will choose a different path or to turn in a different direction if the traffic signal on the street in front of them appears so congested that it may take two or three signal cycles to reach the point where they want to turn. The analysis tool thus considers delays based on signal timing, spillback from bottlenecks and other operational strategies such as ramp metering and real-time traffic diversion.

5.3.2 WHOOP-UP DRIVE CORRIDOR

The macro network analysis has demonstrated operations in and near the Whoop-Up Drive bridge as the one corridor segment that may be subjected to regular traffic congestion. As a result, the corridor was chosen for a more detailed mesoscopic analysis. It is noted that several improvements to nearby ramps and intersections are already committed to be completed, and these have been included in testing future horizon years. All other improvements outside of the corridor remain as they were in the macro analysis. Therefore, the third bridge is not considered in this meso-analysis.

The traffic accumulating during the test period of the AM and PM peak two hours (2069 horizon) has been assigned as uniform throughout the period so that at the end of the period, the effect of congestion can be evaluated.

A diagram of where the mesoscopic analysis was performed is available as **Figure 5-3**

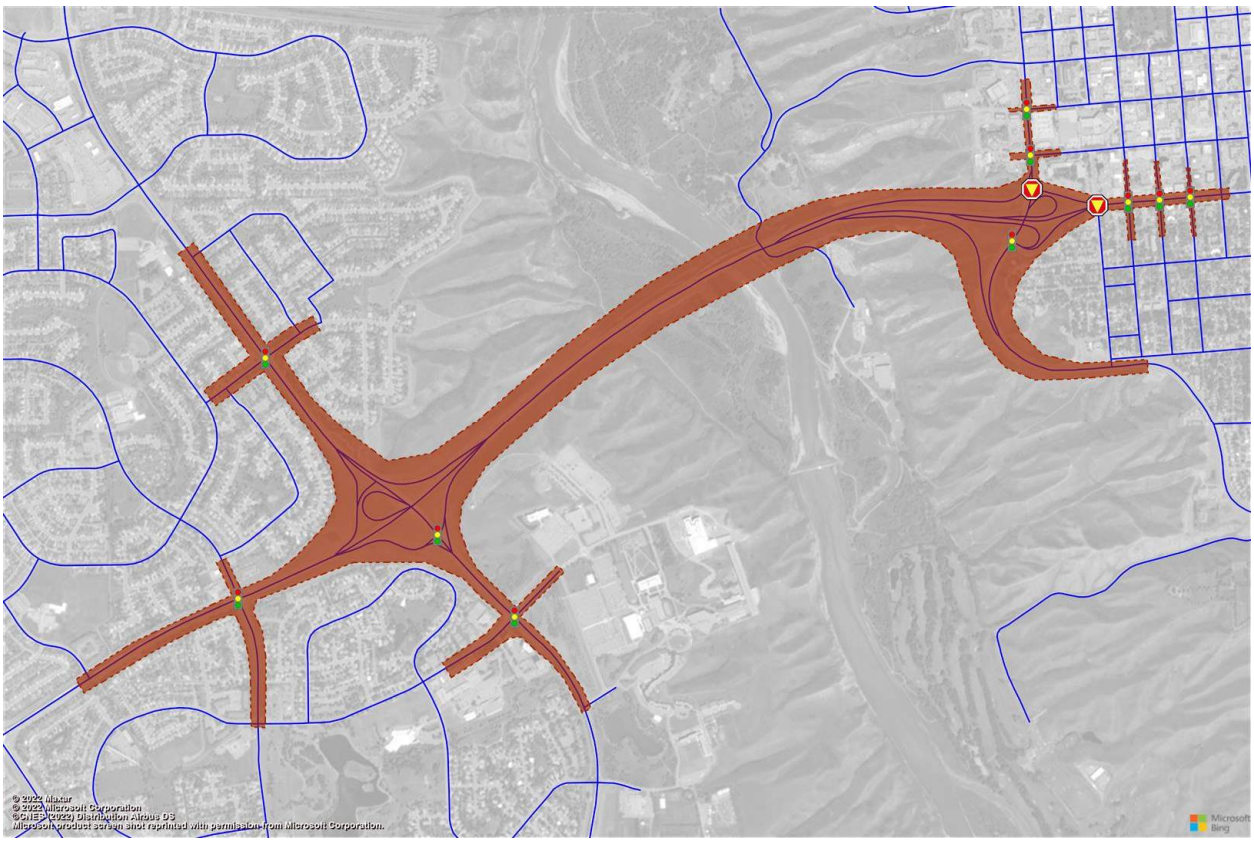


Figure 5-3: Whoop-Up Drive Meso-Analysis Study Area

Summary of Findings **Figure 5-4** and **Figure 5-5** show that the corridor will have operational management challenges eastbound on Whoop-Up Drive in the morning and westbound in the evening. The north-south intersecting roads in Central Lethbridge will also have operational issues at both peak times.

Figure 5-4: 2069 8:00-8:15am Congested Speed Plot

Figure 5-5: 2069 4:45-5:00pm Congestion Speed Plot

Although the mesoscopic model shows congestion, such tools demonstrate only average conditions during weekday peak period. In practice, volumes will vary from one day to the next. Thus, these tools can help to suggest strategies for easing traffic congestion. However, real-time monitoring and even dynamic operational adjustments, such as traffic signals that adapt to worsening congestion, may be needed to improve traffic operations during congested periods.

6 EXISTING TRANSPORTATION NETWORK CONDITIONS

6.1 What We Heard

Engagement on Existing Transportation Network Conditions determined the key barriers and opportunities that Lethbridge and other area residents and businesses face regarding transportation systems in Lethbridge. The following represents the top themes identified (detailed information on the engagement and questions asked can be found in **Appendix B**).

6.1.1 STAKEHOLDER INTERVIEWS

Interviews were held with 13 stakeholder groups from May through June 2021. These interviews were done virtually one-on-one, or in small groups of people from similar stakeholder organizations. Direct outreach for interviews was completed based on the City stakeholder list. The individuals interviewed represented stakeholders from the following interest groups: Accessible mobility, transit, active transportation, built environment, transportation safety, urban Indigenous groups and students.

These conversations highlighted the following challenges and opportunities that came from these interviews:

- **Connectivity:** Barriers to connectivity without a personal vehicle.
- **Safety:** Improve safety issues related to racism and discrimination, especially against Indigenous women and youth, and increase cultural sensitivity training for public servants.
- **Equity:** A desire for innovative, connected, safe and reliable transportation options, especially for students. As well as a concern about financial barriers to all modes of transportation.
- **Transit:** Efficiency challenges pertaining to bussing, the time it takes to get around the city, and the need for more flexible times and routes.
- **Winter City:** Winter city issues like ice on roads and sidewalks.

6.1.2 INDIGENOUS COMMUNITY PARTNERS

The Indigenous Relations Office at the City of Lethbridge consulted directly with the Kainai, Piikani and Siksika Nations and the Lethbridge and Area Métis Council about the ongoing TMP process. Two workshops for Indigenous Community partners, with representatives from the three Nations and groups representing urban Indigenous peoples, occurred on June 2, 2021, and July 22, 2021. These workshops offered Indigenous Community partners an opportunity to learn about the Lethbridge TMP process, the results from the Civic Works Standing Policy Committee Visioning workshop and City administration workshop, and then contribute their thoughts through a series of discussion questions.

Indigenous Community partners identified barriers and opportunities:

- **Safety:** Issues related to racism and discrimination especially against Indigenous women and youth, students, and Elders, needing more helpful, safe and reliable transportation options, and the need for cultural sensitivity training for customer-facing City staff.
- **Connectivity:** Barriers to connectivity for people without a personal vehicle, the desire for a robust network of multimodal options downtown.
- **Transit efficiency**: Challenges with bussing, the time it takes to get around the city, and the need for more flexible times and routes.
- **Financial barriers:** Financial barriers to all modes of transportation (from private vehicles to public transportation).
- **Winter City:** Issues like ice on roads, especially when travelling to the city from out of town.
- **Environment**: The desire to prioritize green energy and lean on local businesses and innovations.

6.1.3 ONLINE SURVEY AND INFORMATION SESSION

An online information session was held in June 2021 to offer the public an opportunity to learn about the Lethbridge TMP process, the results from the Civic Works Standing Policy Committee visioning workshop and City administration workshop. Participants were invited to contribute their thoughts through a series of interactive polling questions using Mentimeter.com and open discussion opportunities. This event had ASL interpreters and offered digital captioning.

The project team created a public-facing survey to better understand transportation-related barriers and what has been working well with transportation in Lethbridge. The survey aimed to give a foundational understanding of what needed to be addressed by the TMP and future engagement. The full survey can be found in Appendix C. This survey was accessible through the 'Get Involved Lethbridge' website and was open from May 10 – September 7, 2021.

Through the online survey and information session, many barriers and opportunities were identified:

- **Transit issues and desires**: Issues with transit efficiencies.
- **Multimodal transportation issues and desires:** The desire for more multimodal and active transportation options and supporting infrastructure.
- **Opinions for and against a third bridge**: There is a desire for a third bridge and concern for a third bridge.
- **Issues with driving-related infrastructure**: Issues with the number of roundabouts, the desire for better traffic management, the desire for a ring road, and a desire for a third bridge.
- **Technology:** The desire for more technology options regarding transit and safety features throughout the city.
- **Connectivity and Integration with land use –** A desire for connections between key areas of the city that currently have missing links, for all modes.

- **Winter City** – A desire to see improved efforts to make Lethbridge more accessible during the winter, including more de-icing of sidewalks and roads.

The top modes of transportation-use identified were:

1. Driving a personal motor vehicle.
2. Walking or using a personal mobility device.
3. Passenger in a personal motor vehicle / carpool.

However, the top issues identified for modes of transportation were issues related to transit and other active modes of transportation, suggesting the desire for these modes to be improved upon for increased use.

6.1.4 ACCESSIBILITY WORKSHOP

An online workshop was held in July 2021 to offer accessibility stakeholders an opportunity to learn about the Lethbridge TMP process, the results from the Visioning workshop and City administration workshop, and then contribute their thoughts through a series of discussion questions. This event was held virtually, had ASL interpreters, and offered digital captioning.

Accessibility stakeholder barriers and opportunities:

- **Transportation modes**: The need for more accessible public modes of transportation including multiple mode options (bussing, taxis, bicycles, etc.), and challenges related to bussing efficiencies and schedules.
- **Infrastructure:** Challenges relating to inaccessible locations in the city and the desire for universally designed infrastructure and improved weather response by the City.
- **Environmental:** The desire for more environmentally conscious and green energy options in Lethbridge.
- **Interpersonal** – A desire for more Equity, Diversity, and Inclusion training for customer facing City personnel.
- **Communication –** A desire for more communications related to transportation options and transit, such as accessible communication materials about transit schedules, payment options, and maps, as well as more accessible technology for transportation systems such as updated transportation apps.

6.1.5 SUMMARY

In summary, the top themes noted by all participants regarding existing transportation network conditions in Lethbridge were:

- The primary mode of transportation around Lethbridge is driving a personal vehicle.

- **Multimodal transportation:** The top issues related to modes of transportation are transit (efficiencies, changes to programming, accessibility, etc.) and driving-related infrastructure. Many people expressed the desire for more multimodal and active transportation options and supporting infrastructure because there are barriers to connectivity within Lethbridge if you do not have a personal vehicle, which is an equity issue.
- **Safety:** Safety within the city is a concern, with suggestions about how to fix this including new technology (transit apps, accessible communications about city infrastructure and programs, etc.), improved transit features (bus stop locations and features like emergency phones, bus driver sensitivity training, etc.), and additional lighting throughout the city.
- **Winter City:** There are issues related to Lethbridge being a winter city that many would like to see addressed, such as ice clearing on roads and sidewalks, and snow build up blocking curb cuts and access to bus stops.
- **Green energy:** There is a desire to prioritize green energy and environmentally conscious options.

6.2 Existing Transportation Systems

In this section, Lethbridge's existing transportation system is examined, infrastructure gaps and deficiencies identified, and opportunities and actions start to be identified.

Systems include relationships between networks, such as regional pathways and amenities, and travel behaviour, such as the decision to cycle to work. Individual elements of these systems help form complete streets or streets that provide safe mobility, access, and connections no matter how a person travels.

The City of Lethbridge's policies and practices can impact each element of the mobility network. Transportation systems in this section fall into the following topic areas:

- Roadway Network
- Walking and Rolling
- Cycling
- Transit

6.2.1 ROADWAY NETWORK & CLASSIFICATION

City of Lethbridge Jurisdiction Roads

The City of Lethbridge has approximately 600 kilometers of roads, which fall into one of four road classifications:

Arterial roadways allow movement between sections and subdivisions within the City of Lethbridge and are generally laid out on 1.6 km intervals along the boundaries of neighbourhoods. These roads also function as part of the Truck Route system.

Collector roadways collect and distribute traffic in commercial areas, between and within residential communities, as community entry roadways, and within industrial areas. These roadways serve secondary traffic generators such as industrial areas, commercial centres, recreational amenities, schools, and traffic from neighbourhood to neighbourhood within the community. Many collector roadways also serve as transit routes throughout the city. The five types of collector roadways are Community Entrance, Super, Major, Minor, and Industrial.

Local roadways provide access to adjacent residential lots and connect to Collector roadways. They include cul-de-sacs and P loops and serve as part of the Fire & Emergency Services access routes.

Other roadways include roadways within parks and provide connectivity to recreational areas.

Other Roads Outside City of Lethbridge Jurisdiction

Provincial roadways connect Lethbridge to the rest of Alberta, including Highways 3, 4, 5 and 25. Provincial roadways may have multiple travel lanes in each direction, and some are limited-access freeways. These highways are owned and operated by Alberta Transportation.

County roads connect rural areas to the City of Lethbridge. These roads are generally two-lane roadways, with an asphalt or gravelled surface. These roads are owned and operated by Lethbridge County.

Other roadways include private roadways in residential, commercial, and industrial developments that provide access to the City of Lethbridge's roadway network.

Roadway Development Patterns

Due to historical development patterns, Lethbridge's roadways range in type. Neighborhoods in Lethbridge that were developed before the 1970s tend to use a traditional grid pattern with narrower roadways, higher intersection density, and more consistent rear lane access. Suburban neighbourhoods developed between the 1970s and early 2000s tend to be based on a curvilinear street pattern with lower intersection density and slightly wider roadways. Higher intersection density typically means an area is more walkable because the block size is smaller, and there are more ways for people to connect to places they want to go. The following images show West Lethbridge and South Lethbridge to highlight the overall neighbourhood connectively. Based on the Lethbridge Municipal Development Plan Policy 128, new neighbourhoods in Lethbridge will be encouraged to use a grid or modified grid street network.

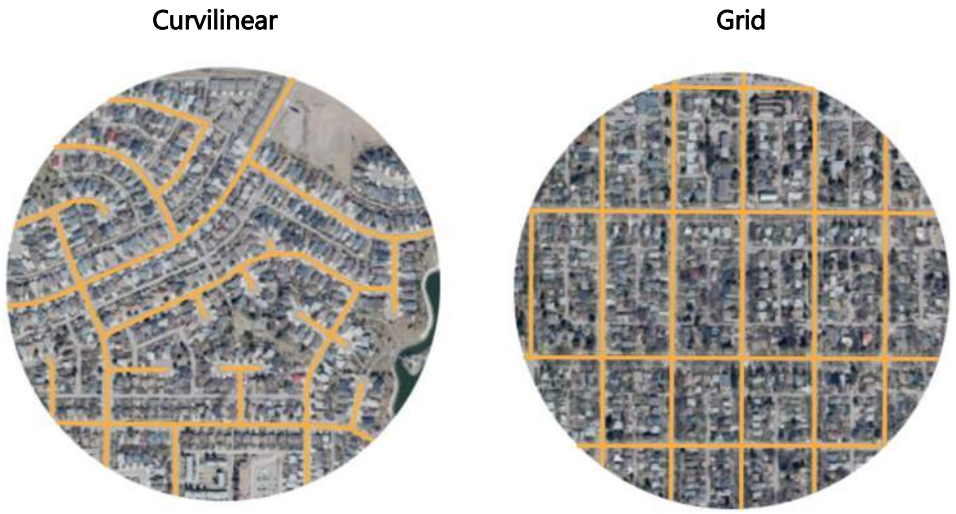


Figure 6-1: Lethbridge Roadway Development Patterns
Source: Google Earth/Stantec

Street Classifications

As shown in **Figure 6-2**, just over 50% of streets in Lethbridge are a local classification. Collectors and Arterials make up the other 50%. This distribution is typical for most urban municipalities where residential density requires more local and collector infrastructure to provide access to those homes.

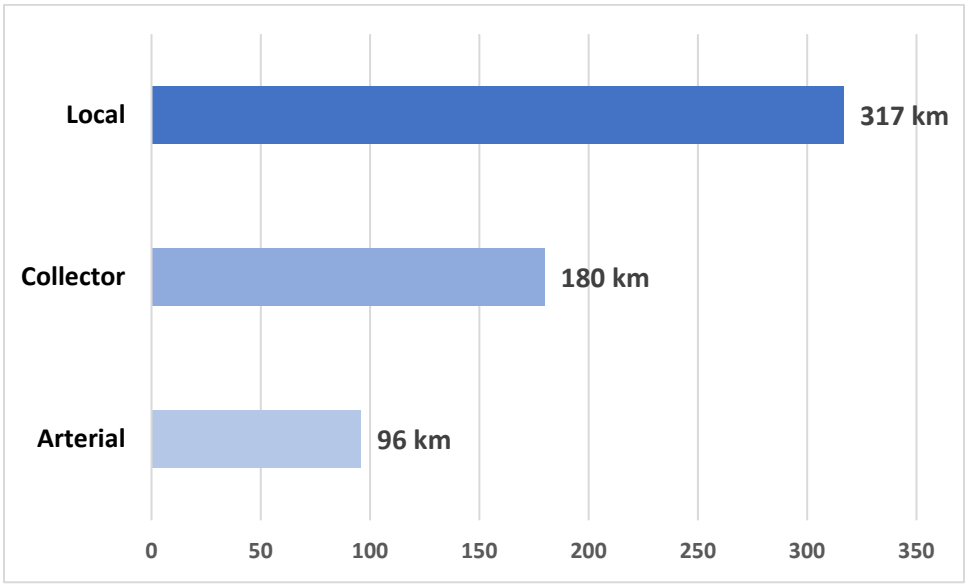


Figure 6-2: Street Network Breakdown by Classification (2022)

Design Criteria

Section 6 of the City of Lethbridge's 2021 Design Standards establishes the design requirements for roadways, lanes, sidewalks, and pathways located within road right of way. **Table 6-1** is a summary of the function and design features for each road classification.

Table 6-1: Design Criteria by Functional Road Classification

Design Element	Arterial	Collector					Local
		Super	Major	Minor	Industrial	Community Entrance	
Daily Traffic Volumes	15,000 +	2,000 to 15,000	2,000 to 8,000	Up to 4,000	NA	2,000 to 8,000	<2,000
Travel Lanes	2 to 6	2 to 4	2	2	2 to 4	2	1 or 2
ROW Requirement	45.0 m to 75.0 m	30.0 m +	25.0 m	21.0 or 23.0 m	20.0 m	28.0 m	16.5 m or 18.5 m
Minimum Intersection Spacing	400 m	200 m	120 m	60 m	120 m	120 m	30m
Posted Speed	50 – 80 kph			50 kph			
Parking	No		Yes			No	Yes
Sidewalk	Regional pathway on one or both sides	Regional pathway on one side; Separate sidewalk, curb, and gutter on one side	Separate sidewalk, curb, and gutter on both sides	Combined or separate sidewalk, curb, and gutter on both sides	Combined sidewalk, curb, and gutter on both sides	Separate sidewalk, curb, and gutter on both sides	Combined sidewalk, curb, and gutter on both sides
Traffic Signals	As warranted						No
Pedestrian Crossing	At grade ramps required						
Bikeway	Regional Pathway			See Cycling Master Plan			
Transit Route	Yes	Yes	Yes	Yes	Yes	Yes	No
Truck Route	Yes	No	No	No	Yes	No	No
Pavement Markings	Yes	Yes	Yes	No	At signalized intersection	Yes	No

These design criteria (and Lethbridge's Design Standards) are subject to change over time. For example, completion of a Complete Streets Guidelines may require updating of these standards. Generally, the intent of these guidelines is to work within existing right-of-way and modify the design criteria to better accommodate pedestrians, cyclists, and landscaping.

The City's existing functional roadway classification map (including provincial highways and county roads) is shown in **Figure 6-3.**

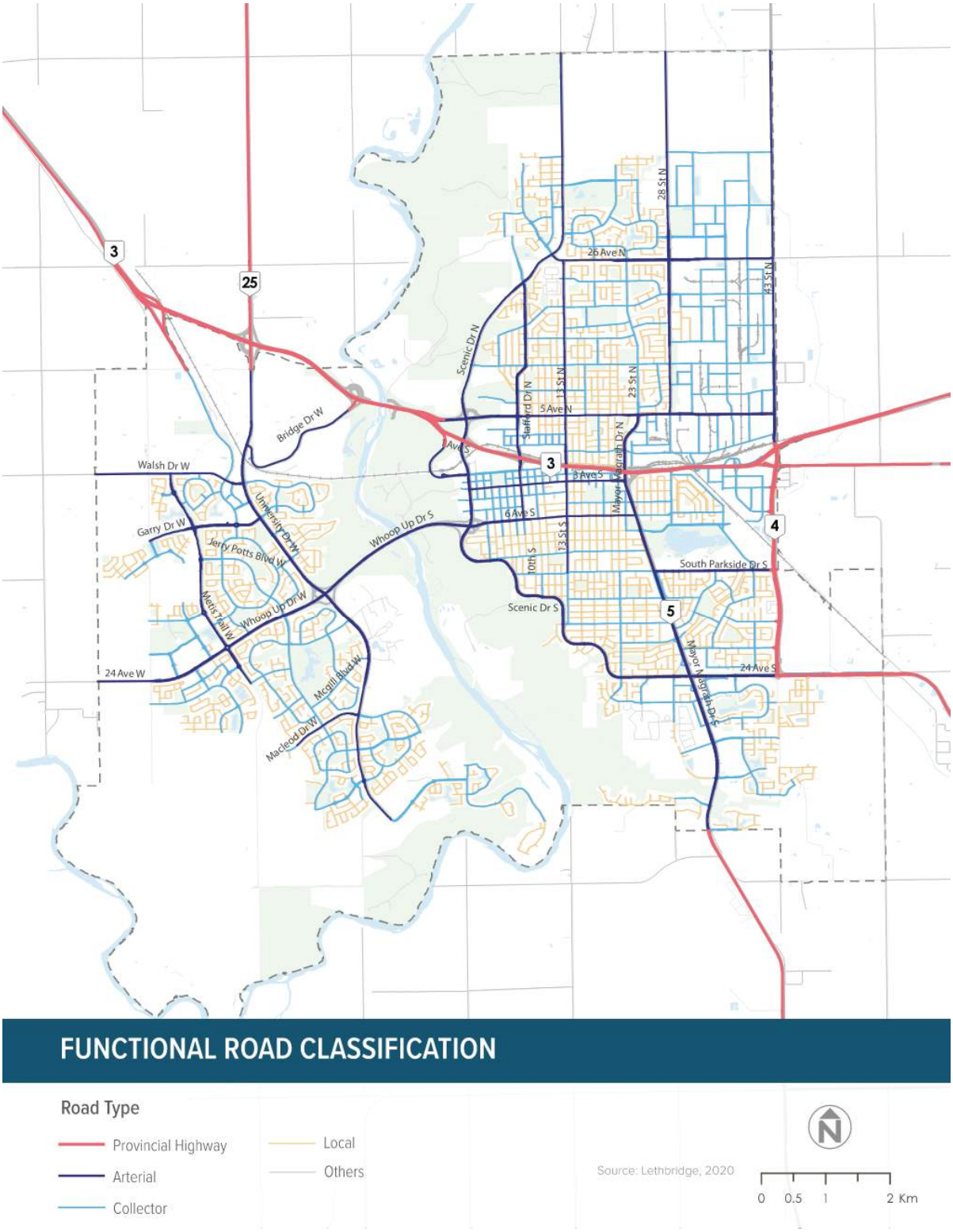


Figure 6-3: Existing Functional Road Classification
Source: Nelson Nygaard

Controlled Intersections

As shown in **Figure 6-4**, there are over 230 intersections controlled with traffic signals, pedestrian crossing beacons, roundabouts, or all-way stops in Lethbridge. There are currently 149 traffic signal-controlled intersections, and most include pedestrian push buttons and pedestrian signal heads.

Approximately 45 of the intersections are pedestrian-controlled crossings, which are important to help people make connections between destinations and the larger mobility network. Pedestrian controlled crossings include intersections with pedestrian half-signals (2), roundabouts with rectangular-rapid-flashing-beacons (RRFBs) (8), stand alone RRFB crossings (8) or crossings with overhead flashing beacons (27). There are also 30 roundabouts and 24 all-way stop controlled intersections providing traffic control in the city.

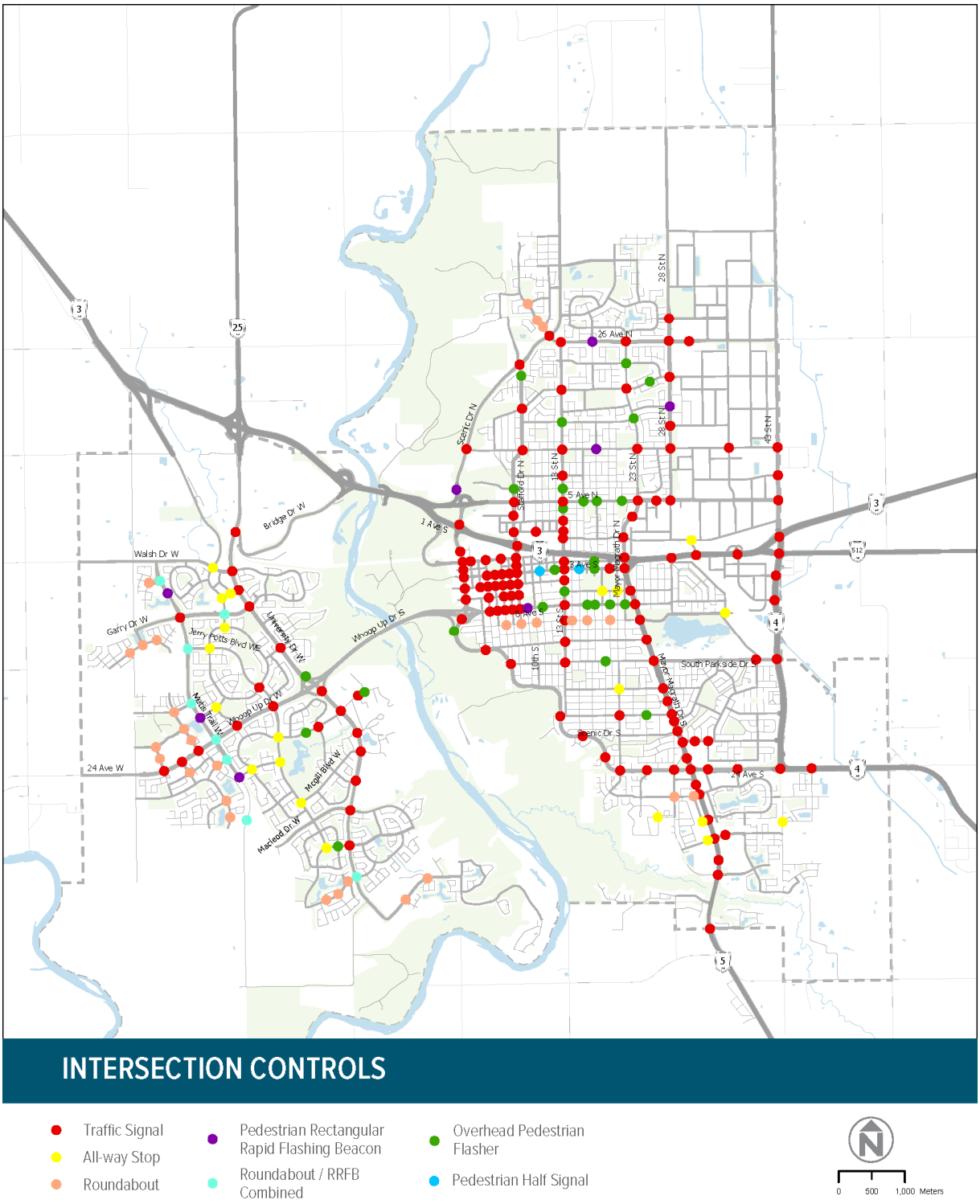


Figure 6-4: Controlled Intersection Locations in Lethbridge
Source: Nelson Nygaard

6.2.2 WALKING AND ROLLING

Each day, people walk, roll, or use mobility devices like wheelchairs to move around Lethbridge. Whether travelling to the bus stop, to their parked car, or across the neighbourhood, people should feel safe and comfortable. A good pedestrian environment has a combination of sidewalks (and multi-use paths), safe and accessible crossings (e.g., curb ramps and marked crosswalks), and destinations within walking or rolling distance.

Today, nearly all of Lethbridge's roadways in the downtown and residential neighbourhoods have sidewalks on both sides, with some destinations, like schools and parks, located close to where residents live. Most residential areas, however, have limited neighborhood commercial destinations that are within walking distance. Nearby commercial areas that are within walking distance, however, are typically auto oriented and people walking, and rolling must navigate busy driveways and parking lots to reach their destinations.

Lethbridge has a current inventory of over 800 kilometers of sidewalks and pathways. Even in Industrial areas, having a dedicated space to walk or roll should be a City priority, particularly along transit routes. Many of the sidewalks in residential neighbourhoods are directly at the curb (i.e., monolithic) and provide no separation from parked or moving vehicles. While this is a function of limited road right-of-way, separate sidewalks increase pedestrian safety and comfort, provides space for vegetation and street trees, and provides a more appealing pedestrian environment.

Lethbridge currently has over 500 marked pedestrian crosswalks. These crosswalks play a crucial role in creating safe journeys for pedestrians between destinations. While most crosswalks are painted with parallel lines, high-visibility crosswalks (also known as ladder or zebra crossings) can increase pedestrian visibility for drivers. These should be prioritized near schools, senior destinations, and high activity intersections.

Types of Pedestrian Infrastructure

Table 6-2 describes the types of pedestrian infrastructure in Lethbridge.

Table 6-2: Types of Pedestrian Infrastructure

Facility	Description	Typical Existing Widths
Sidewalk	Concrete infrastructure for pedestrians. May be separated from the curb.	Sidewalks range in width from 0.9 m along some local streets to 5m in Downtown.
Multi-Use Pathway / Local Connector	Off-street infrastructure that are shared between people walking, rolling, and cycling and are typically paved with asphalt.	Existing widths vary and are often less than 3.0 m.
Natural Pathway	Pedestrian trails that are typically not paved and use natural materials.	Width varies depending on facility and location.
Stairs	Stairs offer additional pedestrian connectivity in areas with steep terrain and are typically located along the banks of the Oldman River.	Width varies depending on facility and location.

Creating a Comfortable Pedestrian Environment

Walking is a great way to experience Lethbridge. Walking improves individual and community health and increases people's sense of wellbeing. In addition to sidewalks, walking trails, crosswalks, and nearby destinations, other elements enrich the pedestrian environment and encourage people to walk. This includes trees and landscaping, benches, lighting, plazas and parklets, public art, sidewalk patios, and shops to enhance Lethbridge's pedestrian realm.

Current Lethbridge Pedestrian Network

The City of Lethbridge pedestrian network consists of unpaved trails, regional multi-use pathways, local trail connectors and sidewalks. The City's current pedestrian network is shown in **Figure 6-5.**

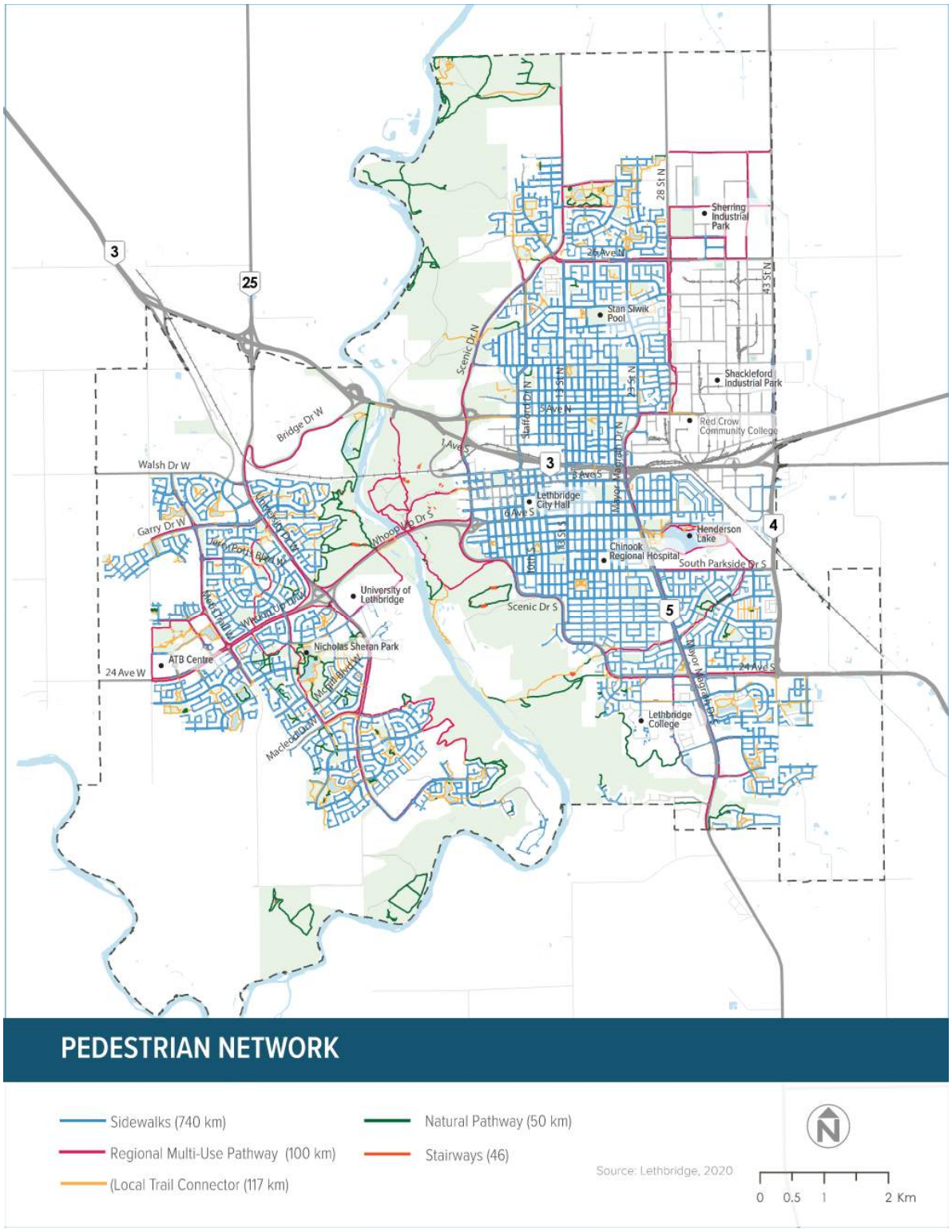


Figure 6-5: Lethbridge Pedestrian Network
Source: Nelson Nygaard

6.2.3 CYCLING

Lethbridge's cycling network primarily supports people who bike recreationally.[3] Minimal on-street bike infrastructure, limited network connectivity, topography, and a four-season climate with snowy winters are all challenges bicyclists face.

Lethbridge's on-street bike network is made up of one painted bike lane and one bike boulevard. The 13 Street N bike lane is suitable for confident and advanced cyclists, which represent a small portion of cyclists (5-7%). To attract cyclists of all ages and abilities, a network of protected or safe cycling infrastructure is required, like the City's 7 Avenue S bike boulevard and extensive multi-use path system.

Some additional facts about Lethbridge's existing cycling network:

- Lethbridge has one bike lane that is 1.6 kilometers long. The bike lane runs along 13 Street N between 26 Avenue N and 9 Avenue N.
- Lethbridge has one bike boulevard that runs 2.3 kilometers. The bike boulevard runs along 7 Avenue S from 4 Street S to 300m east of Mayor Magrath Drive S.
- Lethbridge has an extensive pathway system that often parallels arterial roads and provides connectivity for people cycling and walking or rolling. In total, Lethbridge has more than 130 kilometers of multi-use pathways.

Types of Cycling Infrastructure

Table 6-3 describes the existing and planned bicycle infrastructure types in Lethbridge.

Table 6-3: Types of Bicycle Infrastructure

Facility	Description	Typical Existing Widths
Shared Lane	Streets where people cycling share the road with motor vehicles and may include signage or pavement markings.	n/a
Bike Lane / Buffered Bike Lane	Separate travel lanes designated exclusively for bicycle use that are delineated by a painted line and, in some cases, a painted buffer area.	1.5 m
Bike Boulevard	Streets with low motor vehicle volumes and speeds that are suitable for motor vehicles and people cycling to share the road. Bike boulevards may include treatments such as signage, pavement markings, traffic calming, and traffic diversion to prioritize bicycles and make the facility comfortable for people of all ages and abilities.	Typically desire 4.0 - 5.5 m of space between curbs or parked vehicles.

[3] City of Lethbridge Cycling Master Plan, 2017

Facility	Description	Typical Existing Widths
Protected Bike Lane	Separate travel lanes designated exclusively for bicycle use that are physically separated from motor vehicles and pedestrians by vertical and/or horizontal elements. Can be one- or two-way.	No infrastructure currently in Lethbridge. Planned to be constructed along 4 Avenue S and 7 Street S in Downtown Lethbridge.
Multi-Use Pathway / Local Connector	Off-street infrastructure that are shared between people walking, rolling, and cycling and are typically paved with asphalt.	Existing widths vary and are often less than the recommended 3.0 m

Creating an All Ages and Abilities (AAA) Cycling Network

When it comes to cycling, people riding fall into one of four categories: (1) strong and fearless, (2) enthused and confident, (3) interested but concerned, and (4) no way, no how. A breakdown of these categories for people in Lethbridge is shown in **Figure 6-6.** Different types of cycling infrastructure provide varying levels of comfort and safety for each type of cyclist. Most people identify as "interested but concerned." This group is more likely to bike on protected or low-speed shared infrastructure, such as bike boulevards, protected bike lanes, and multi-use pathways. Creating an All Ages and Abilities (AAA) cycling network focuses on the two-thirds of the population that is interested but concerned, and enthusiastic and confident.

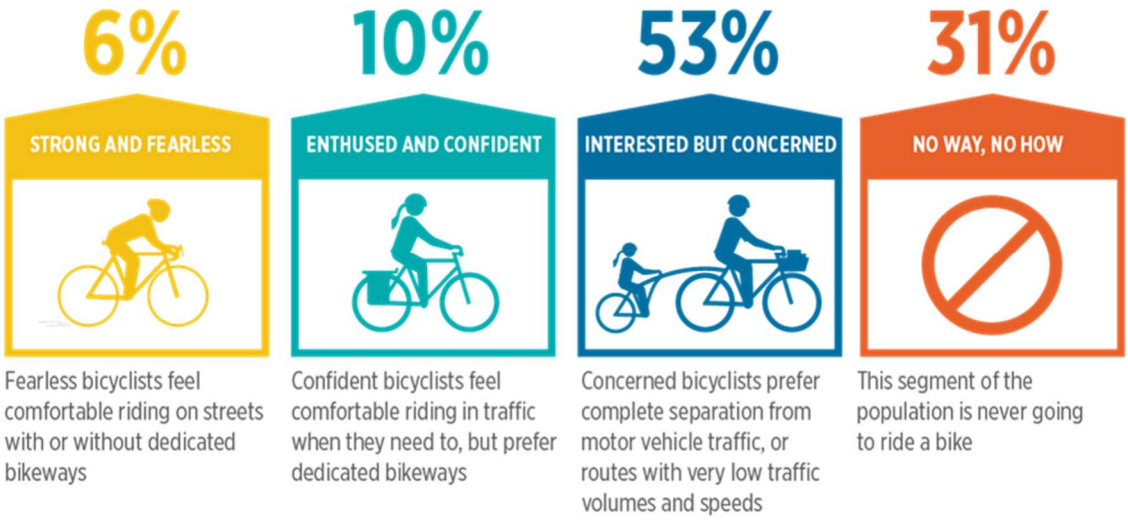


Figure 6-6: Rider Confidence Categories
Source: Nelson Nygaard and City of Lethbridge Cycling Master Plan

Types of Cycling Infrastructure & Level of Traffic Stress

Different types of cycling infrastructure attract different types of riders. While a standard bicycle lane on a busy road may work for people who are very comfortable cycling, it does not work for everyone. To create a network of safe cycling infrastructure, the speed and volume of traffic on a roadway must be considered with a focus on creating a comfortable environment for all people to cycle. On multi-lane streets, a painted bike lane alone is not welcoming. People need to be physically separated from cars to feel safe. On slower, low traffic volume streets, standard bicycle lanes are likely to be comfortable for many more people. Understanding the level of traffic stress on different streets, and the types of infrastructure that lower stress levels, helps plan for the future. For example, the improvements implemented to create the 7 Avenue S bike boulevard.

Assessing a "Level of Traffic Stress" for people cycling helps to understand how comfortable most people would be cycling on a specific roadway. It is based on factors including speed, roadway width, bicycle infrastructure type, and traffic volumes. Traffic stress ranges from low stress streets to high stress streets and are described below.

Low Stress

Low stress infrastructure is suitable for all ages and abilities. They typically include a high level of separation to increase bicyclist safety and comfort, or routes on low-volume, low-speed streets. In Lethbridge, local streets and some collector streets fall into this category.

Medium-Low Stress

Most adults that are interested but concerned cyclists can tolerate infrastructure with a 'medium-low' level of stress. The "interested but concerned" population will feel safe on these streets. Design plays an important role to make sure this infrastructure is safe and comfortable for a broad range of cyclists.

Medium-High Stress

Infrastructure with a medium-high level of stress is suitable for adults who are enthusiastic and have confidence cycling. These roadways are suitable for the "enthused and confident" riders who still prefer dedicated space. They require design attention to be more attractive to less experienced riders.

High Stress

Roadways with higher levels of stress are generally only comfortable for and used by the strong and fearless cyclists. They are characterized by high travel speeds and volumes, have multiple travel lanes, and have cycling infrastructure with little to no separation. In Lethbridge, arterial streets and many collector streets fall into these categories.

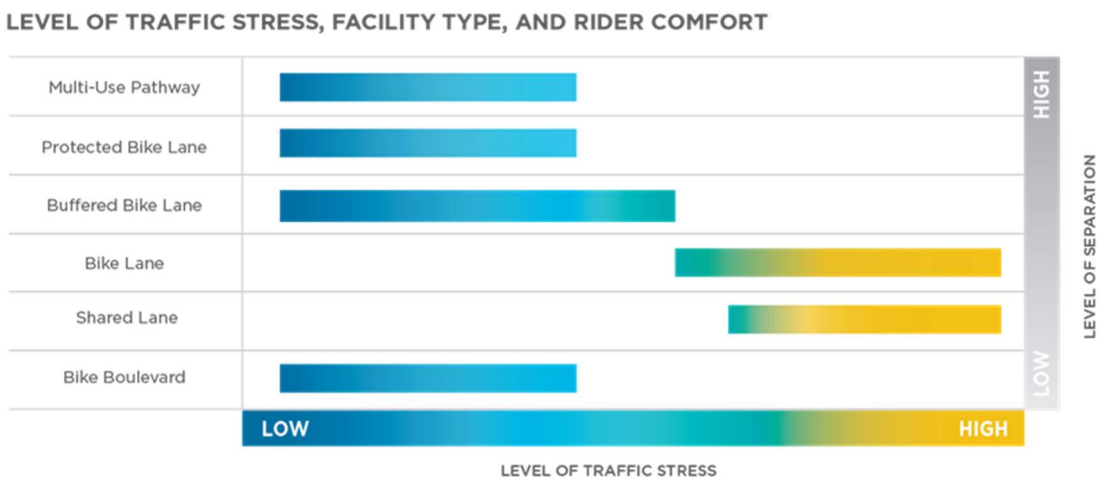


Figure 6-7: Level of Traffic Stress by Facility Type
Source: Nelson Nygaard

Current Lethbridge Cycling Network

The City of Lethbridge's cycling network consists of four infrastructure types: regional multi-use pathways (shared with pedestrians), local trail connectors (shared with pedestrians), on-street bike lanes, and bicycle boulevards (low-stress routes shared with traffic). The existing cycling network is shown in **Figure 6-8**.

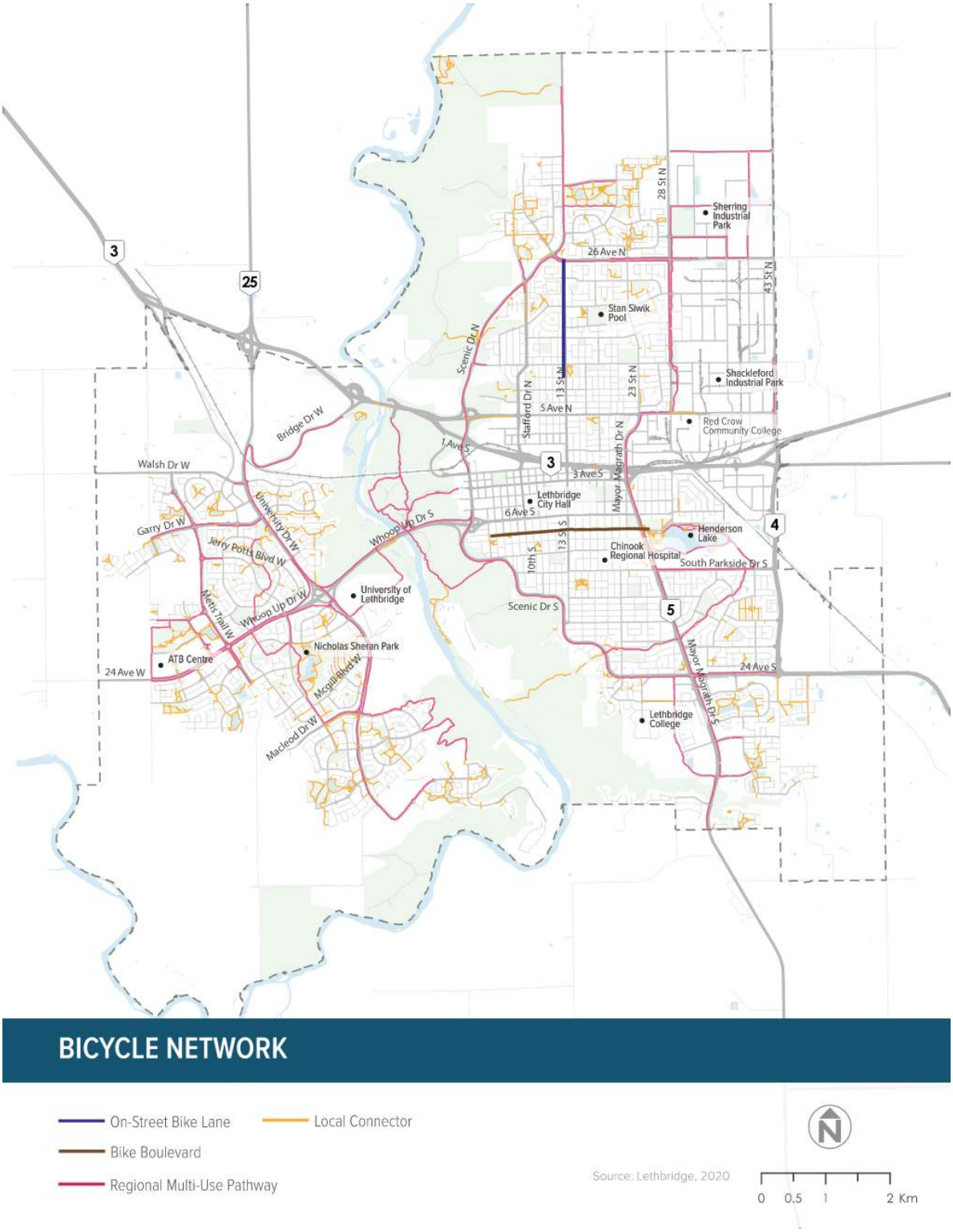


Figure 6-8: Lethbridge Existing Cycling Network
Source: Nelson Nygaard

6.2.4 TRANSIT NETWORK

Public transit is one of the most efficient, sustainable, and equitable means of moving people. Transit is also crucial in meeting other local, provincial, and national goals related to mobility for vulnerable populations, reducing the impacts of climate change, and growth management.

Old (2019) Transit Network

Figure 6-9 is a graphical representation of transit ridership in 2019. Note this was the transit system before it was revised in 2021. As would be expected, downtown and the University of Lethbridge were the two highest areas of transit usage.

- Some facts about the old transit network based on 2017-2019 data:
    - The percentage of people who commuted to work by transit in 2017 was 1.4%.
    - Annual transit ridership was 1.37 million passengers in 2018.
- Ridership growth had been stagnant from 2008 through 2018.
- The major transit destinations in 2018 were the City Centre, Park Place Mall, the University of Lethbridge, North Station, and Lethbridge College. 40% of transit users were students, and 24% are people commuting to work. Many students rely on the transit network to get to and from class. Lethbridge is home to the University of Lethbridge, Lethbridge College, Mi'kai'sto Red Crow College, and other college campuses.
- Most residents are within a 5-minute walk to transit. In 2019, most Lethbridge residents lived within 400m of a bus stop. In 2021, most residents are still within 400m of a bus stop, but demand response zones serve lower-density areas.

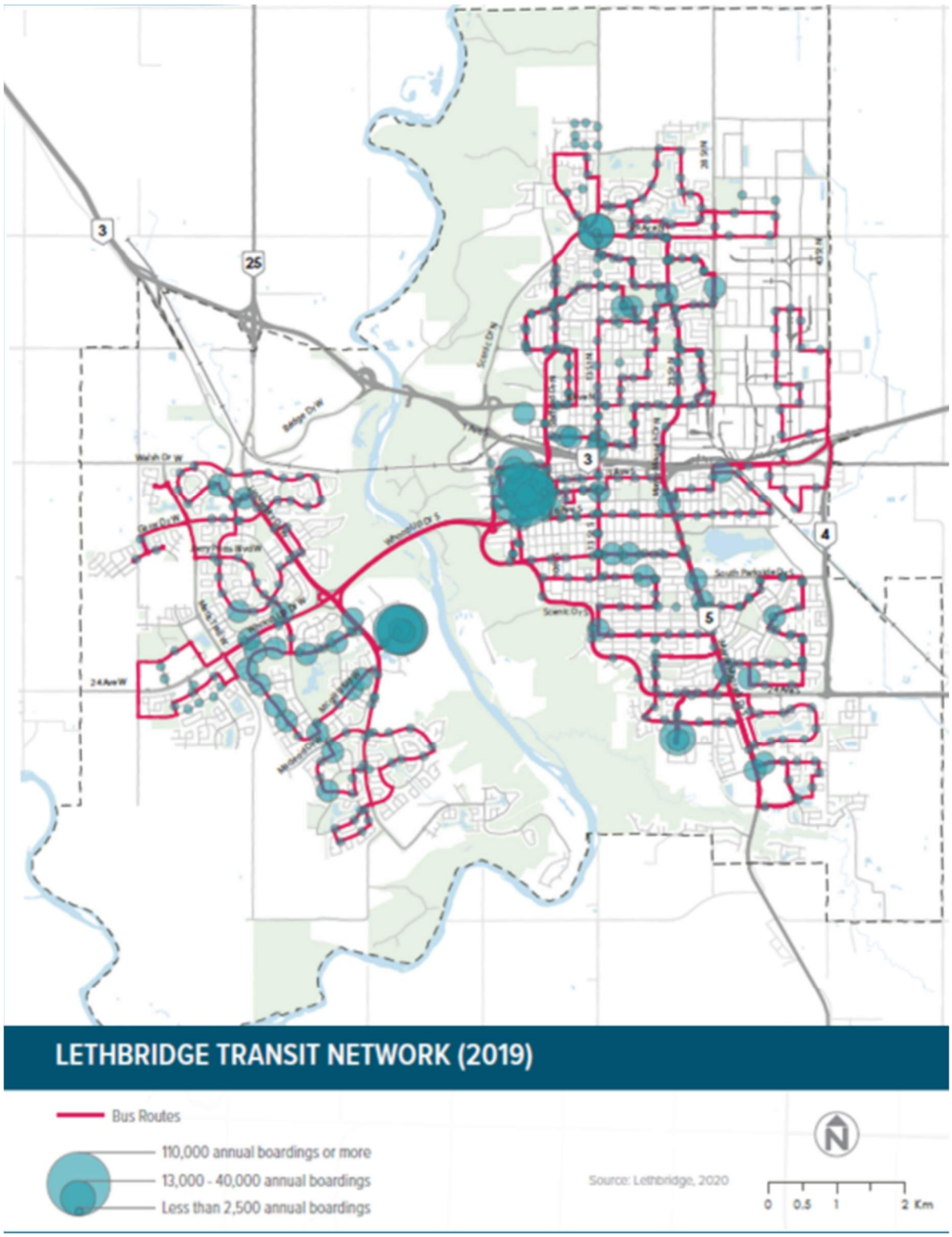


Figure 6-9: Lethbridge Transit Ridership (2019)
Source: City of Lethbridge

New (2021) Transit Network

Lethbridge's 2021 transit network is illustrated in **Figure 6-10.** In 2021, Lethbridge Transit operated 11 fixed routes and various on-demand services for riders unable to use the fixed bus route service and include options like Access-A-Ride. The transit system is designed with a focus on frequent service routes, transit hubs, and services in areas with lower population density as described below:

- **cityLINK: Frequent and Direct Connections:** To enhance ridership and meet other community development goals, the primary feature of the new fixed route network is a series of cityLINK routes that provide frequent and direct service to key corridors and destinations. Three cityLINK routes provide radial service in and out of the City Centre; one cityLINK route provides crosstown service on the east side of the city; another cityLINK route serves West Lethbridge and the University of Lethbridge.

- **cityHUBS: Stations and a New Transit Terminal:** The cityLINK routes connect a series of eleven stations throughout the city. The heart of the system is the new Regional Park 'n' Ride Transit Terminal that provides connections to regional services (Red Arrow and Spotted Eagle Contracting's Standoff – Lethbridge commuter service) as well as many local routes. The new facility also includes a parking garage. Three of the cityLINK routes also serve the University of Lethbridge station, an activity centre and ridership generator in the city. The other major cityHUBS in the city include Sherring Station, North Station, Southgate Station and West Highlands Station.

- **Matching Service with Demand:** Another key feature of the new transit network is providing more appropriate service types to areas with less demand. Six community routes provide coverage-oriented fixed route service that connects the stations and cityLINK routes. Lower-density areas in the city are served by Demand Response Zones, which provide on-demand service within the zones and connections to the cityLINK and community routes. There are six separate demand response zones in the city.

Figure 6-11: Fixed Route and Demand Response Service Frequency

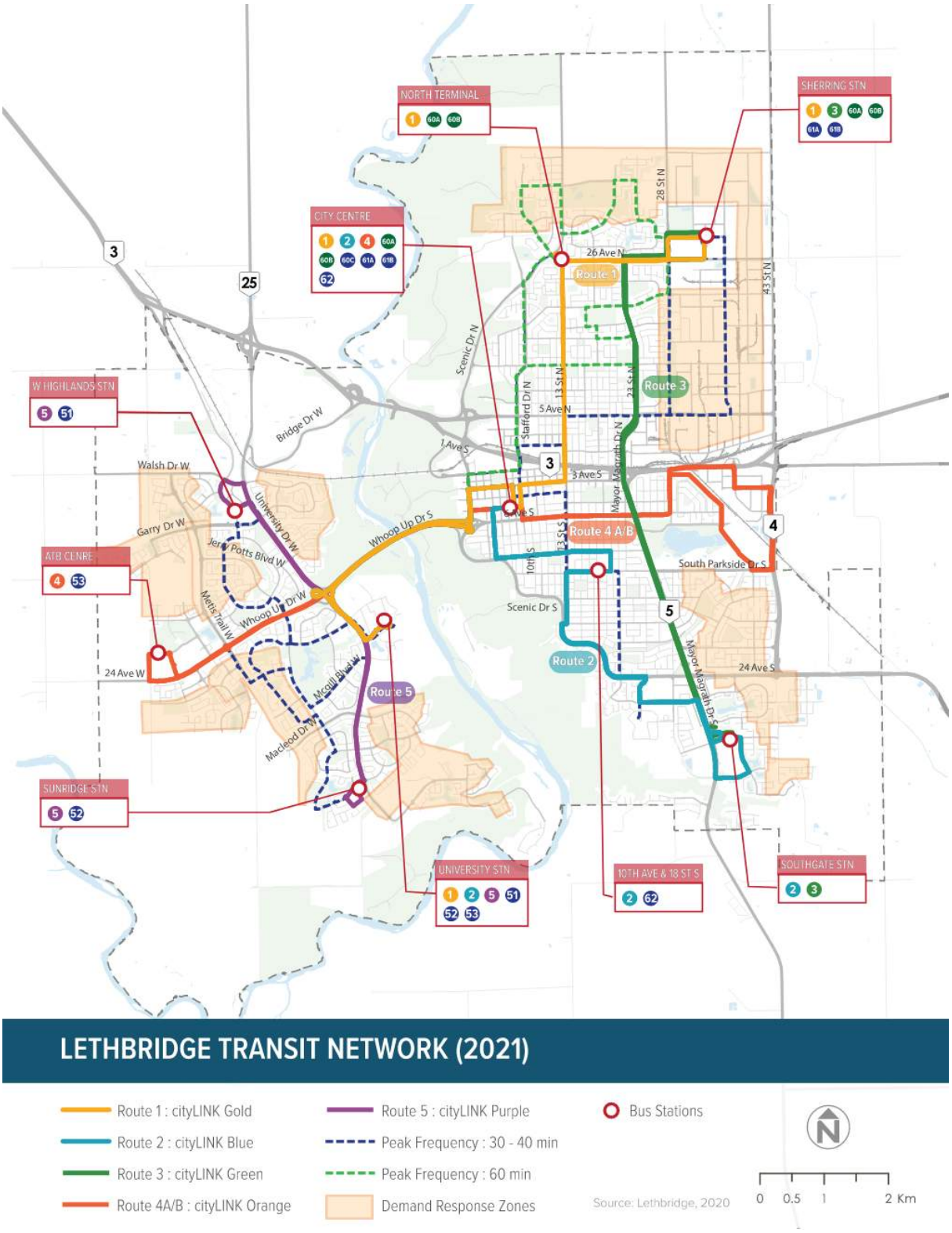


Figure 6-10: Lethbridge Transit Network (2021)
Source: City of Lethbridge (Modified by Stantec)

Figure 6-11 illustrates all fixed route and demand response services in the system and approximately how frequently they operate and for how long (weekdays only). Most fixed routes run buses every 30-40 minutes, with three routes running every 20 minutes and two routes every hour. Note that the transit network is continually being improved and revised. For the latest transit map, visit: https://myride.lethbridge.ca/RouteMap

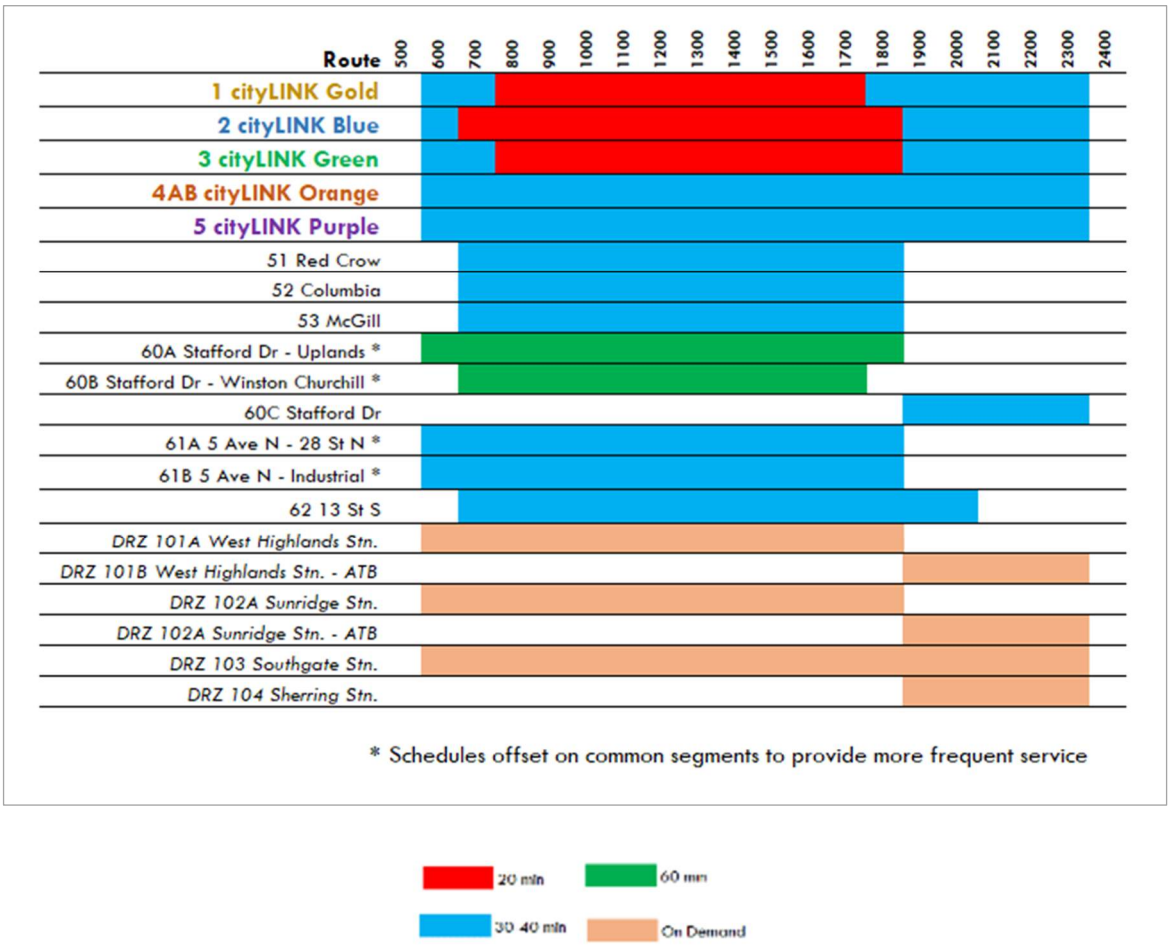


Figure 6-11: Fixed Route and Demand Response Service Frequency

In addition to Lethbridge Transit, the region is also connected to other cities in Alberta and beyond with Red Arrow and Spotted Eagle Contracting's Standoff – Lethbridge Commuter.

While most of Lethbridge's residents live within 400 metres (about a 5-minute walk) of a transit stop, subdivisions situated on the edges of West Lethbridge and South Lethbridge fall outside of this ideal range. Currently, almost all areas where residents are more than 400 metres from a transit stop are covered by Demand Response Zones. **Figure 6-12** shows the walksheds around Lethbridge's current transit network.

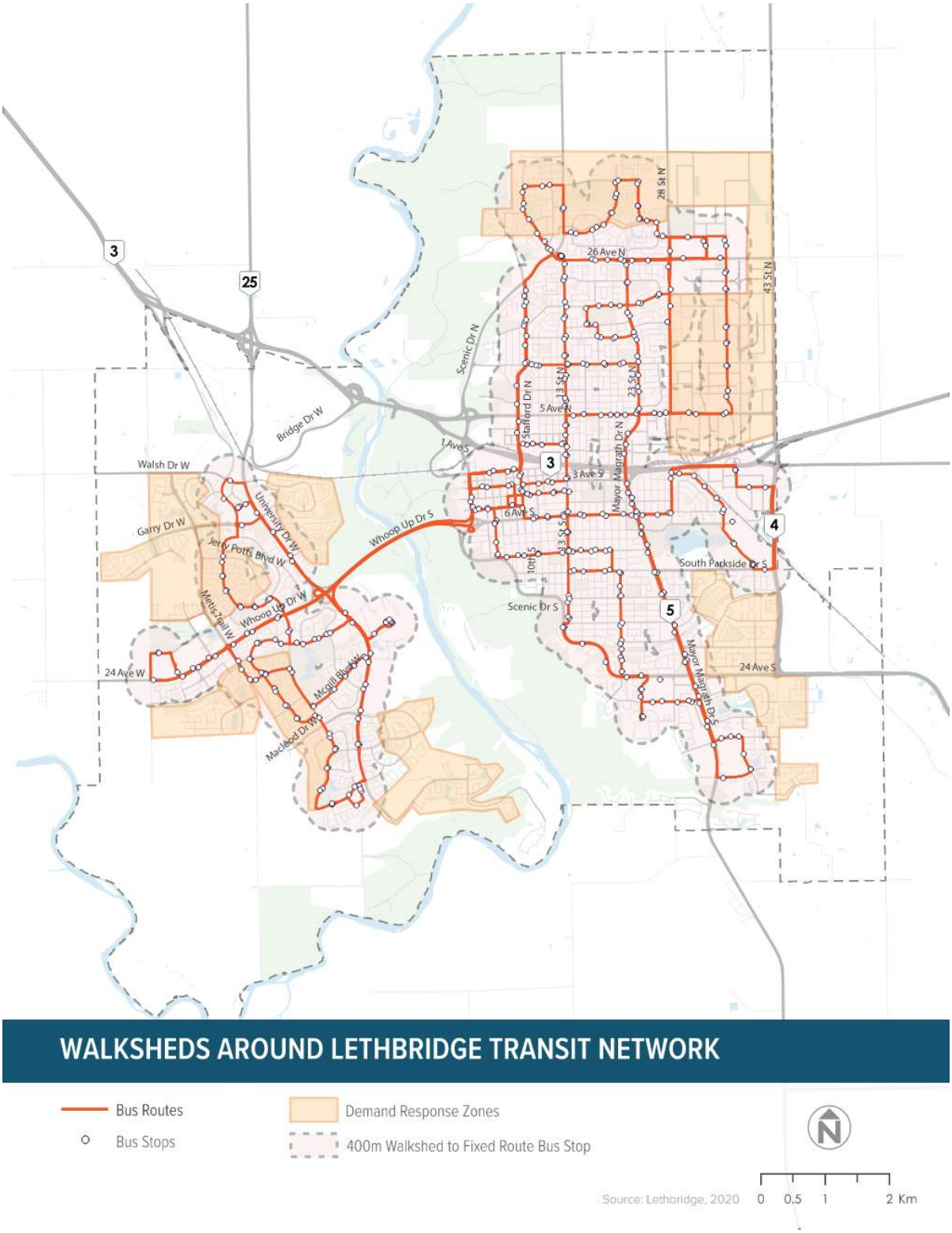


Figure 6-12: Walksheds Around Lethbridge Transit Network (2021)
Source: Nelson Nygaard (Modified by Stantec)

6.3 Typical Right-of-Way Cross Sections

The City of Lethbridge's current design standards and cross-sections are in the **City of Lethbridge 2021 Design Standards.**

Review of Current Design Standards

The City's current standards were compared against complete streets design best practices and the 2017 Transportation Association of Canada Geometric Design Guide. Some general opportunities were identified:

- Narrow sidewalks. The minimum sidewalk width should be 1.8m (separate). Monolithic sidewalks should be a minimum of 2.0m on collectors, and arterial roadways should have 2.5m wide sidewalks unless a multi-use pathway is present.
- A secondary 3.0m pathway should always be required on arterials and not 'as warranted' as currently identified.
- Travel lanes for collectors are oversized. 3.0-3.3m is sufficient.
- Off-street pathways should be considered for collector roads. As collector roads typically have parking, moderate vehicle speed and volume, and limited pavement width, a boulevard pathway is a safer and easier to implement infrastructure type.
- Trees should be incorporated into all cross-sections.
- Joint utility trenching strategies may allow utility easements less than 3.5m.
- Develop cross-section alternatives for all collector and local roads to provide cycling infrastructure.

The standard street cross sections would benefit from a design standard review and update to incorporate complete streets design best practices and update to align with the current version of the Transportation Association of Canada Geometric Design Guide.

6.4 Dangerous Goods & Truck Routes

Bylaw 5254 restricts the transport of dangerous goods to specific truck routes. Dangerous Goods are those that require a sign on the transporting vehicle because the contents are dangerous to the public. Truck routes are also used for heavy vehicles which weigh more than five tonnes or are than 11 metres in length. Trucks can also travel on Dangerous Goods Routes. This bylaw restricts the transport of dangerous goods to the thoroughfares in **Table 6-4.**

Table 6-4: Bylaw 5254 Dangerous Goods Thoroughfares

Thoroughfare	From	To
Mayor Magrath Drive S (Highway 5)	South City Limits	Junction with Highway 4
Highway 4	East City Limits	Junction with Highway 5
43 Street	Highway 4	North City Limits
Highway 3	Easy City Limits	West City Limits
Bridge Drive W	Highway 3	University Drive
Highway 25	North City Limits	University Drive
University Drive W	Highway 3A	Macleod Drive

The City also has a publicly available map that combines Dangerous Goods and Truck Routes onto a single map with additional base map features for easier reference. An easier to reference version of that map is shown in **Figure 6-13.**

Dangerous goods routes and heavy truck routes are to be signed as per the latest edition of the Manual of Uniform Traffic Control Devices Manual for Canada (MUTCDC).

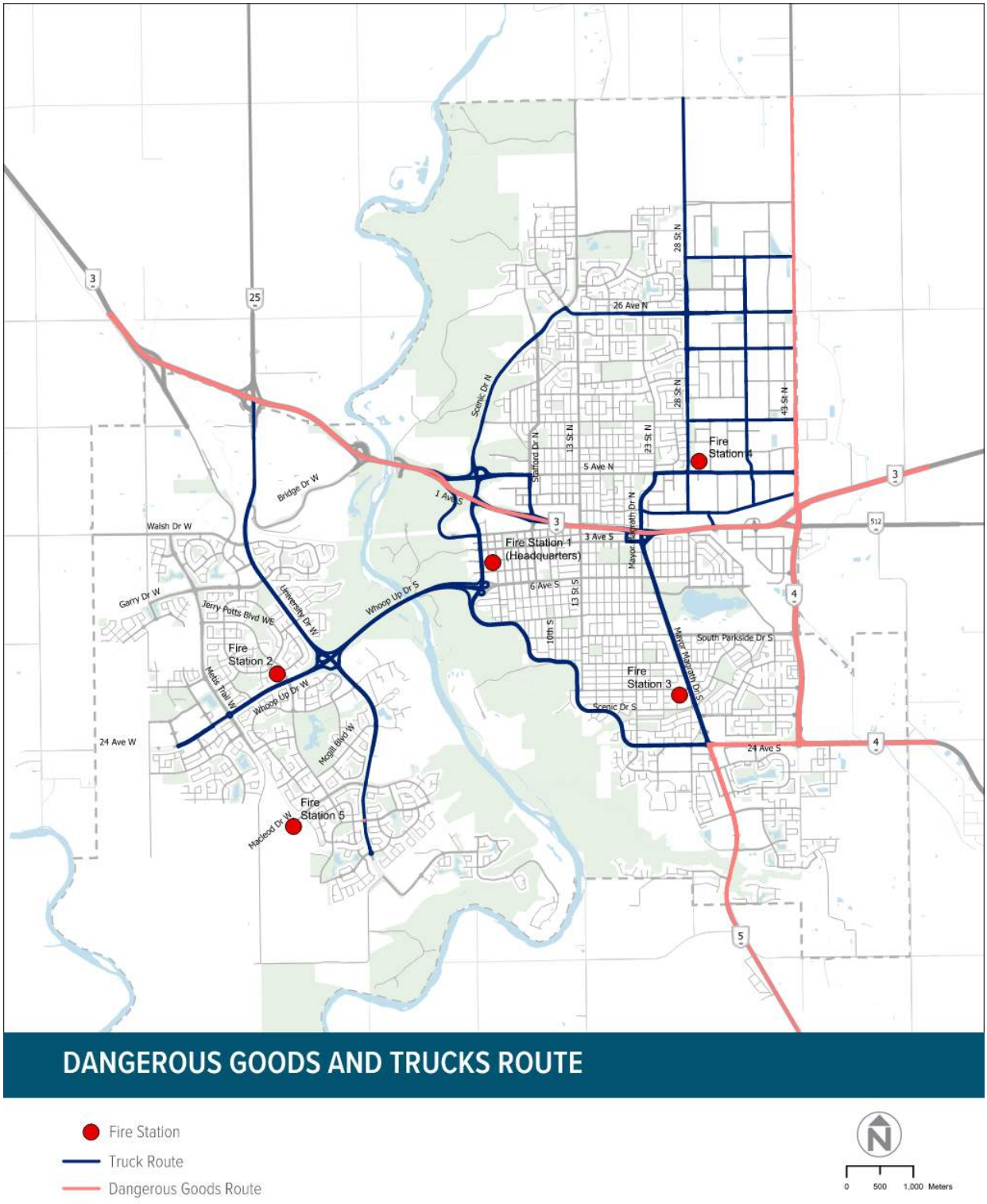


Figure 6-13: Dangerous Goods and Truck Route Map
Source: Stantec

6.5 Heavy Rail Network

There are currently two Canadian Pacific Railway (CPR) mainlines within City limits and 8km of City-owned industrial rail, as shown in **Figure 6-14.** CPR's single-track mainline includes the Montana Subdivision from the United States connecting into the east-west Taber Subdivision near Highway 3.

The Taber subdivision east-west mainline extends laterally through the city north of Highway 3 on the east side of the Oldman River valley and south of Highway 3 on the west of the Oldman River. On the west side of Lethbridge, this mainline exits the Lethbridge Viaduct just north of the Heritage Heights neighbourhood, taking a sharp northwest turn back towards Highway 3. The second single-track mainline branches off the lateral mainline near 30 Street, extends southeast, intersects Highway 4 near South Parkside Drive S, and continues until it rejoins the Highway 4 alignment near Range Road 21-1.

There are 8km of City-owned industrial spur lines in the industrial areas of North Lethbridge that provide goods access to over fifteen businesses. There is a centralized staging area in the Shackleford and Churchill Business Parks with multiple sidings, located between 36 Street N, 39 Street N, 9 Avenue N and 14 Avenue N. Plans identify an extension to the spur network north through the Sherring Business Park to service future businesses in the area. Maintaining these access points and connections to the rail system is vital to reduce the amount of heavy truck traffic. Future staging areas could be critical to the viability of this network as the spur lines extend further from the mainline

Currently, there are no intermodal hubs that exist in the local area, with the nearest facility located in Calgary. There is a large marshalling rail yard located west of Lethbridge at Kipp. CPR owned and operated transload facilities are in Calgary and Tilley, with the closest third-party operated facilities located in Wilson Siding (1,500 car spots), Coaldale (25 car spots), Foremost (200 car spots), Monarch (50 car spots), and Wilson (50 car spots). Locally, there is one CPR-serviced grain facility in Lethbridge (50 car spots), one in Sterling (112 car spots) and two at Wilson (112 car spots each).

There are opportunities for intermodal hubs close to the city to increase or encourage rail-to-truck traffic. Sites like the Stewart Siding area could offer an intermodal hub near all Lethbridge businesses and surrounding communities.

The existing heavy rail network is shown in **Figure 6-14.**

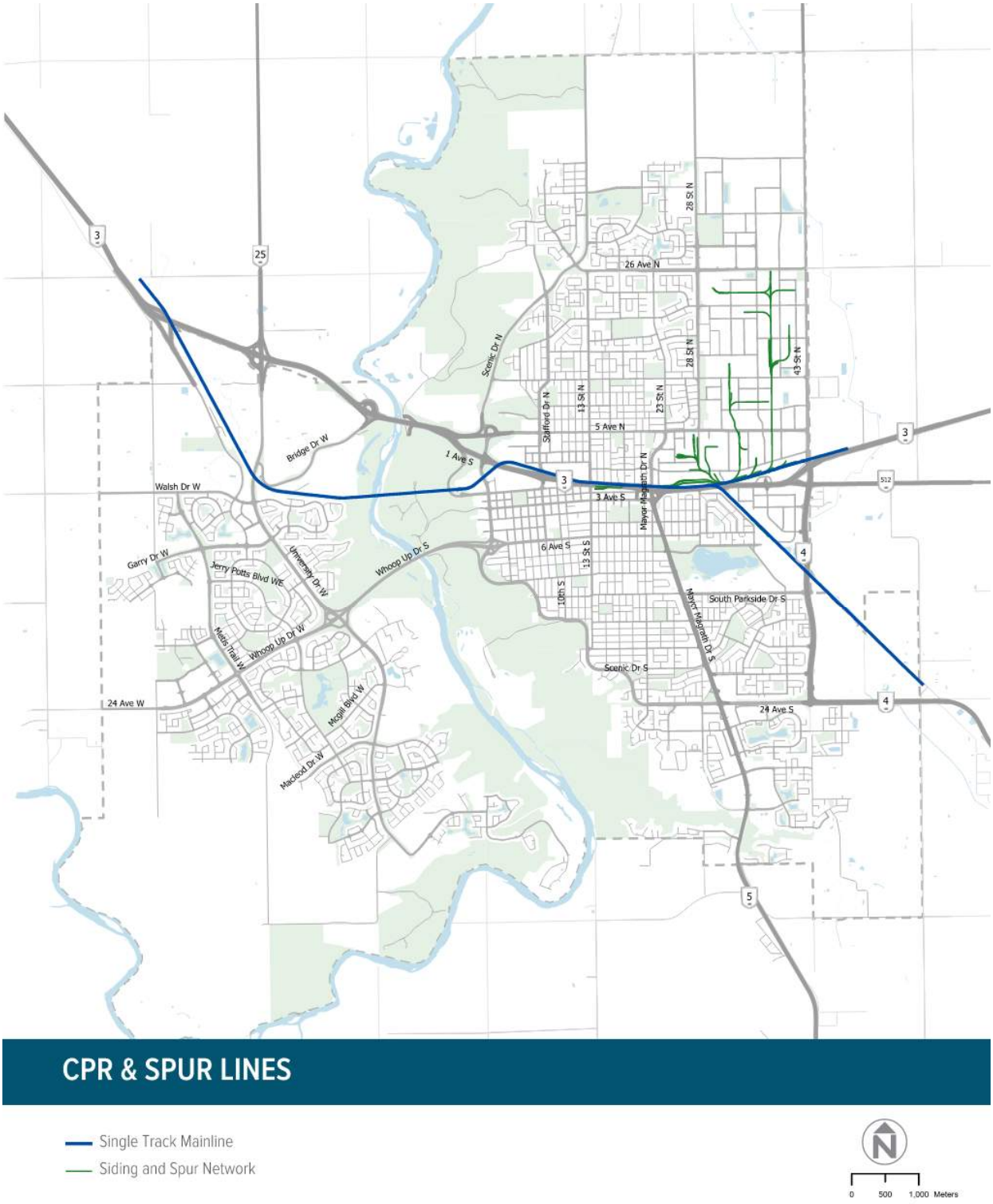


Figure 6-14: CPR & Spur Lines

Source: Modified from https://opendata.lethbridge.ca > Railways

6.6 Airport Connections

The city and surrounding area are serviced by the Lethbridge Airport (**Figure 6-15**) where ownership was transferred from Lethbridge County to the City of Lethbridge in 2018. The Lethbridge Airport currently services one commercial passenger airline with an average of three arriving and three departing flights per day. There are various smaller private aircraft that use the airport as well. The airport is not widely used for air cargo traffic. With airport traffic expected to increase, especially after the decline due to the COVID-19 pandemic, efficient routes to the airport will need to be protected and expanded. Efficient access points from the airport to the arterial network will be necessary. Traffic flow to and from the airport will occur as large peak flows intermittently over the day. While aircraft at the current time are relatively small, robust roadway connections will need to be reviewed and implemented as aircraft potentially increase in size, increasing the airport peak traffic flows onto the network.

As the city builds out to the south and as traffic volumes increase, Highway 5 will be twinned by Alberta Transportation with an initial south limit at Township Road 81A in accordance with the Highway 5:06 Detailed Design Report (2013). Access consolidation is planned at the time of twinning. Township Road 82A will be realigned to intersect with Prairie Arbour Boulevard S, while Township Road 81A will be extended north as a service road to access the highway via the Stubb Ross Road intersection. When this upgrade occurs, it will be imperative to assess potential future airport volumes, and land uses to protect right-of-way for appropriate access to the airport, ensuring traffic can be accommodated and excess stacking is not occurring.

Providing access to the airport with all modes of transportation should be considered. A portion of passengers use the airport to commute to meetings in Calgary, departing and returning on the same day. These passengers could potentially be cyclists or transit users. Providing efficient cycling infrastructure that connects the more developed city lands to the semi-remote airport lands will ensure these users are accommodated and reduces vehicular traffic on airport area roadways. Likewise, ensuring adequate transit access during peak arrival and departure times for employees will be just as important as during peak travel times for passengers. For horizons farther into the future, a road connecting 58 Street S and 60 Avenue S to the airport will play an important role in providing access to the airport. As aircrafts that serve the airport get bigger, so does traffic on surrounding roadways. The connection from 60 Avenue S to Highway 5 will play a vital role in reducing the peak hour airport traffic along Mayor Magrath Drive. So too will the Chinook Trail 3rd bridge crossing, reducing the demand on Whoop Up Drive and portions of Scenic Drive S.

Figure 6-15: Lethbridge Airport Lands
Source: Stantec

6.7 Regional Traffic Distribution

6.7.1 RIVER CROSSINGS

A major issue remains the limited opportunities that people have, to cross the Oldman River to reach destinations on the other side. This section focuses on how this specific movement occurs. To accomplish this, the travel demand model was used to gauge how many system trips cross the river during a typical weekday.

The results of the analysis are shown in **Table 6-5 .** This table shows what proportion of local trips do not cross the river and the proportion of trips that do. While many trips cross the river, most trips made within Lethbridge do not.

Table 6-5: Proportion of Local Trips Crossing Oldman River

Trip Pair Type	Attribute	2019 Estimate
Internal West Lethbridge	Activity	53900
	Percent of Total	13%
Internal East Lethbridge	Activity	206800
	Percent of Total	51%
River Crossing	Activity	61700
	Percent of Total	15%
County/Through	Activity	84800
	Percent of Total	21%
Total	**Activity**	**407200**
	Percent of Total	**100%**

6.7.2 REGIONAL TRAFFIC

Traffic not destined for the City of Lethbridge will generally stay on Highway 3 to traverse the city. If traffic is destined for the Lethbridge Airport, they will use Highway 5 / Mayor Magrath Drive which intersects Highway 3 east of downtown. For regional trips further south towards Milk River and the United States boarder crossing at Coutts/Sweetgrass, drivers will use Highway 4 which intersects Highway 3 on the eastern edge of Lethbridge.

6.8 Transportation Safety

6.8.1 TRANSPORTATION SAFETY PLAN

In October 2020, the City of Lethbridge adopted its *Transportation Safety Plan* (TSP). The primary goal of the TSP is to identify the necessary actions and resources to provide a safer transportation system in Lethbridge to eliminate deaths and serious injuries by 2040. The Plan sets the following vision:

"A community on the move towards ZERO transportation-related deaths and serious injuries"

Mission Statement

A Mission Statement, shared across City departments and key partners reads:

The City of Lethbridge and its partners recognize that transportation safety is a **top priority** and commit to **working together** towards eliminating deaths and serious injuries in our transportation system **by 2040**. To this end, we will fully embrace a **Safe Systems approach**, featuring **programs and policies** that are evidence-based, innovative and sustainable. We will aim to foster a positive culture of transportation safety in the community, to ensure that we all arrive home safely, regardless of **travel mode**.

Guiding Principles

A list of Guiding Principles adopted by the City and its partners, supported by the public are:

Sustainability: Prioritizing safety, regardless of political and economic cycles.

Adaptability: Managing the risks and harnessing the opportunities that come with technological advancements and other changes.

Fostering a Positive Culture: Starting to change social norms by rejecting risky behaviours and effectively engaging the public.

Equitability: Equity and fairness across all travel modes, abilities, and ages; a multidisciplinary evidence-based approach.

Focus Areas

The *Transportation Safety Plan* identified five focus areas for the City based on data trends, community engagement, best practices, and alignment with the TSP vision and guiding principles:

- **Distraction**
  Whether in the act of driving or using other modes of transportation, distraction has played a role in an increasing number of transportation-related deaths and serious injuries.
- **Speed and Aggressive Driving**
  Travelling at higher speeds will increase the probability of death or severe injury. Aggressive driving can also result in a wide range of severe collisions and breeds unfavourable public safety culture.
- **Intersections**
  Serious injuries frequently occur at intersections, often as the results of side-impact or head-on collisions and are the site of where all modes of transportation come into conflict.
- **Vulnerable Road Users**
  Road users such as children, the elderly, those who use mobility devices, and persons with disabilities are more vulnerable to injury and death.
- **Safer Vehicles**
  Public transit is the safest mode of transportation, and its underutilization represents a missed opportunity for increasing safety in the system. Connected and autonomous vehicles also have tremendous potential to minimize the risk of collisions.

The TSP analyzed collision data from 2012 to 2016. It noted that 38% of severe collisions involved vulnerable road users (people walking and people riding motorcycles, bicycles, and scooters).

The analysis also showed that at least 44% of all severe collisions occur at intersections, with 39% of those occurring at signalized intersections.

Surviving a crash is closely tied to motor vehicle speed. In Lethbridge, unsafe speed was noted by police in 23% of severe collisions. For collisions involving pedestrians, the likelihood of a fatality rises with speed

(see **Figure 6-16**). Making changes to streets, like lowering speed limits or installing traffic calming (including narrowing travel lanes), can help to reduce the chance of a crash and save lives. Narrower road width can affect driver comfort, increase driver attention, and lower operating speeds.

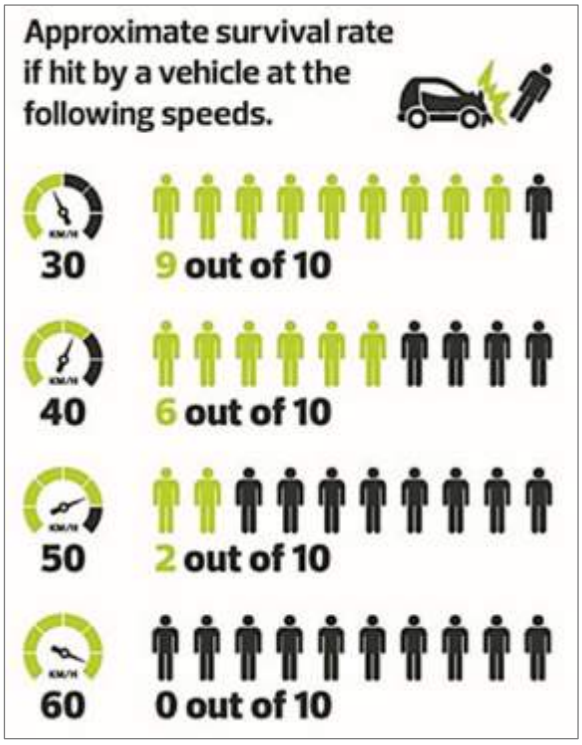


Figure 6-16: Pedestrian Survival Rate for Different Collision Speeds

Source : https://www.edmonton.ca/sites/default/files/public-files/assets/images/Approximate-survival-rate-vehicle-speeds-graph.jpg

Targets

An ultimate target of zero fatalities and injuries is not possible without aiming for interim targets and adjusting strategies along the way. An interim target of 50% reduction by 2030 sets up the City well for meeting a target of zero (100% reduction) by 2040.

Strategies & Supporting Actions

The TSP has developed strategies and supporting actions around Transportation Safety Management and the five focus areas, without which, the targets set cannot be achieved.

6.8.2 COLLISON DATA

Existing collision data (2003-2020) was made available by the City of Lethbridge. A crash density plot (using the last 5 years of available data) is shown in **Figure 6-17.** This figure indicates the characteristically high collision density where there are high volumes of traffic (e.g., Downtown, 13th Street, Mayor Magrath Drive). This information is valuable when prioritizing safety improvements throughout the city, particularly where pedestrian and cycling routes intersect or travel along these corridors. The City had this collision data further refined to isolate minor and major injury pedestrian/cycling-related collisions, as shown in **Figure 6-18**

As anticipated, there is the usual cluster of pedestrian-related collisions in the downtown area, along Mayor Magrath/23 Street N and along 13 Street, where traffic volumes and speeds are higher and intersection crossings wider. A disproportionate number of pedestrian injury collisions have occurred along 2 Avenue N and 23 Street N which warrants further examination.

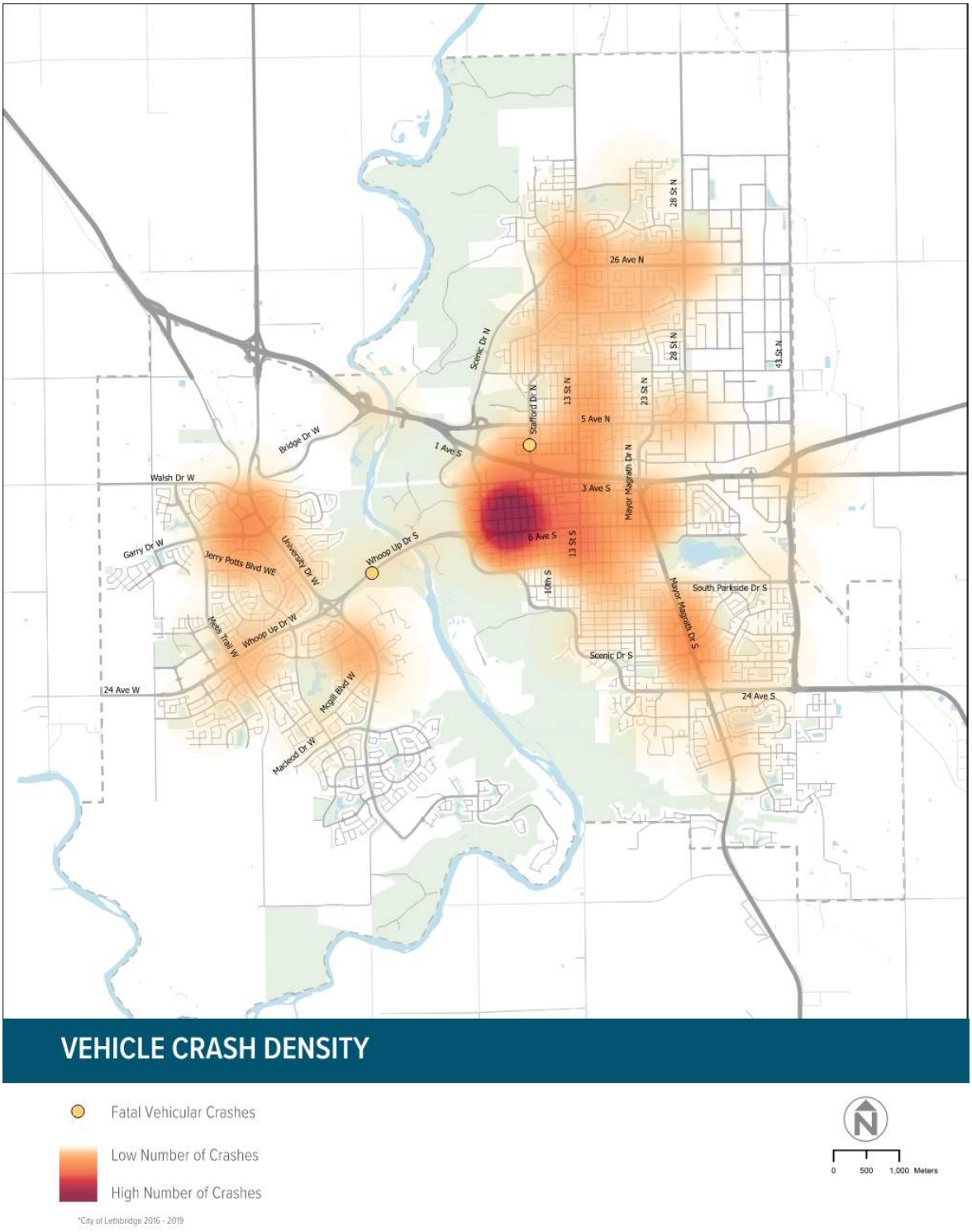


Figure 6-17: Vehicular Crash Density (2016-2020)
Source: Stantec (Graphics), City of Lethbridge (Data)

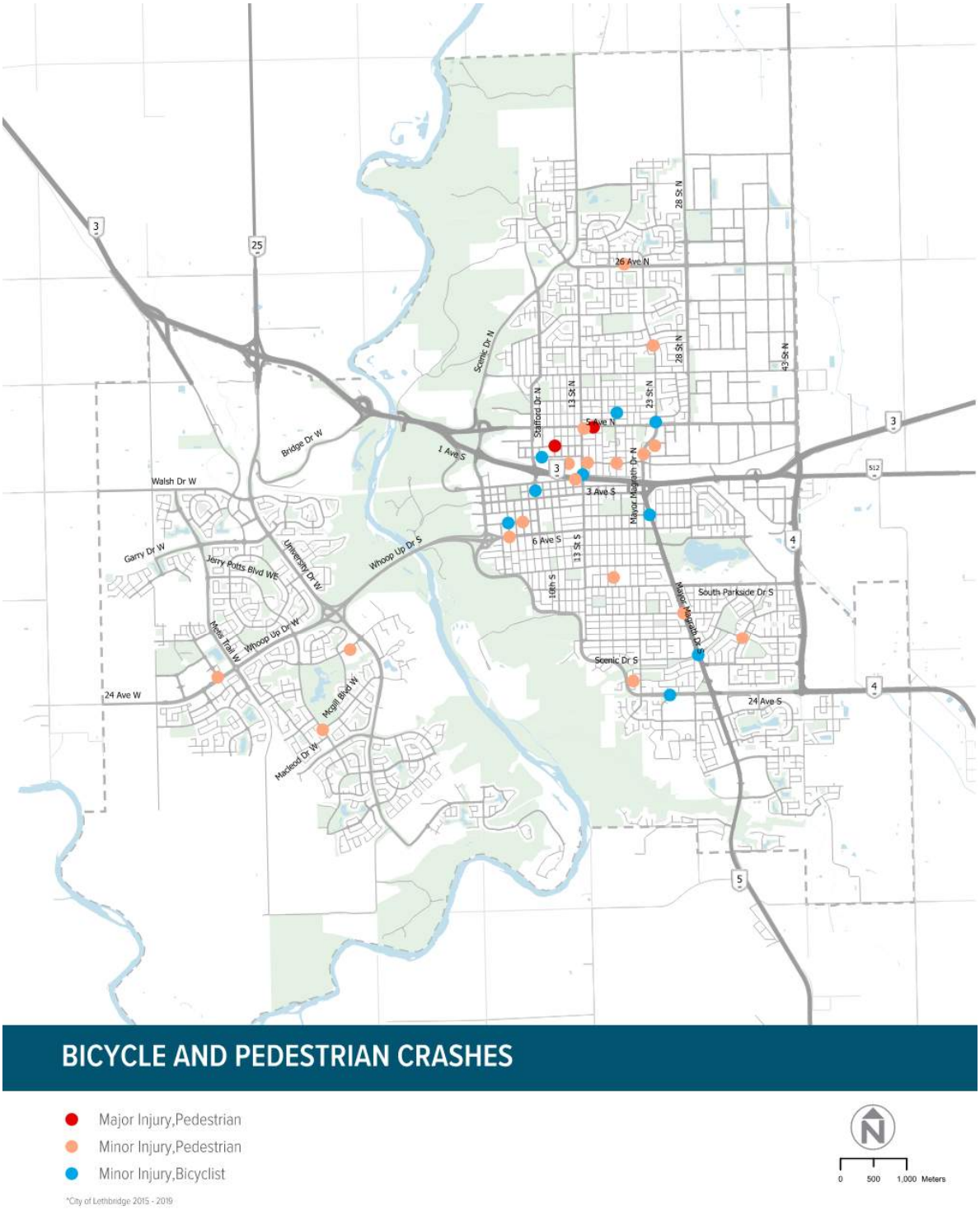


Figure 6-18: Bicycle and Pedestrian Crashes (2016-2020)
Source: Stantec (Graphics), City of Lethbridge (Data)

6.9 Accessibility Assessment

An accessibility review was conducted to better understand the current conditions and context of the Lethbridge transit system for those with disability (visual, auditory, physical, cognitive, etc.). The assessment began with a desktop exercise to determine locations to visit and what components to look at closer in person. Highly used locations across Lethbridge were analyzed for accessibility features through in-person site visits and Google Street View. In addition, the City's transit information and the City's Mobility/Accessibility Master Plan (MAMP) was reviewed to determine the ease of access to online accessible transit information.

Figure 6-19: Example of Barrier-Free Access Ramp
Source: Level Playing Field

The accessibility assessment includes:

- Major Commercial
- Major Intersections
- Major Roadways/Corridors
- Long-Term Care Facilities
- Medical Facilities
- Schools/University/College
- Parks (access to and pathways within)
- Recreation Facilities
- Pathways and Trail Network
- Transit Hubs
- Collection of neighbourhoods showing development variances from different timespans

Assessments (undertaken by experts with lived experienced) utilized visual inspection, walking, and using a scooter to navigate and determine the degree of location accessibility.

6.9.1 TRANSIT

Routes

At the time of the accessibility assessment, the transit system included five major routes, nine neighbourhood routes and six on-demand Demand Response Zones (DRZ). The non-DRZ routes provide service primarily to main and connector roads causing those that live in the middle of a neighbourhood to have to walk 2 to 3 blocks to the closest bus stop and potentially farther to get to their preferred bus stop (or major routes, which run for longer hours during the day).

Figure 6-20: Lethbridge Transit Wayfinding Map
Source: Level Playing Field

The DRZ routes provide long operating hours and will arrive at the location within 20 minutes of the request. While this is a helpful service for lower-use areas, it does come with challenges. The 20-minute window and the requirement to be at the stop when the bus arrives is a long wait time to be standing in an unprotected area expose to the elements.

Multiple people were observed walking down busy roads with no sidewalks to get to transit hubs. In addition, the DRZ vehicles require car seats for kids under 6, or 40 pounds. This does not make transit particularly accessible for a parent with an infant or toddler.

According to the City website, all busses are accessible low-floor models. The busses include securements for wheeled mobility devices, but the "Ride Guide" (September 1, 2021) implies that wheelchair users should use them and secure their wheelchair themselves. It is not until deeper searching that the website explains that bus drivers can help to secure passengers if requested.

Bus Stops

Bus stop types range from a sign beside the sidewalk (**Figure 6-21**) to a fully covered bus shelter with seating inclusive of standing space and area allotments for mobility aids (**Figure 6-23).**
Most stops include seating and paved access for getting onto the bus. Several residential stops do not include paved areas for those exiting via the rear door. This is not an essential feature in the provision of an accessible bus stop but is beneficial for those with limited mobility or visual impairments.

Figure 6-21: Typical Suburban Bus Stop with a Sign and Bench
Source: Level Playing Field

Figure 6-22: Accessible Transit Stop with Partial Shelter
Source: Level Playing Field

Figure 6-23: Sheltered Accessible Transit Stop
Source: Level Playing Field

Transit signage at transit stops do not provide accurate information. Route numbers displayed on bus stop signage does not correlate with the route. Contact information is non-existent leaving users without route information. The only way a user can access current and relevant transit information is online, which is not accessible for all transit users. The colour contrast and consistency of sign appearance was good (**Figure 6-24**).

Figure 6-24: High Contrast Transit Stop Sign
Source: Level Playing Field

Access-A-Ride

The transit system also offers the Access-A-Ride, an accessible, door-to-door transit system for people with disabilities. This program is well-used with the option to pre-book or arrange for a standing reservation during peak times.

A single ride costs the same for both regular busses and Access-A-Ride, but there are discounts for buying multiples for regular busses but no discount for Access-A-Ride.

6.9.2 PEDESTRIAN PATHS OF TRAVEL

Sidewalks

There was thorough coverage of sidewalks throughout Lethbridge (not including industrial areas). The sidewalks were a reasonable width and in good condition. Internal shopping complex sidewalks and crosswalks were suitable for the smaller complexes but were lacking for big box store shopping districts (i.e., Mayor Magrath Drive and 32 Avenue S).

There were two main types of sidewalks, one predominately in old neighborhoods and one predominately in new neighborhoods. The older neighbourhoods had boulevards separating the street from the sidewalks. Most boulevards had large mature trees. Newer neighbourhoods had the sidewalk directly adjacent to the road with rolled curbs (monolithic). Both neighbourhoods had similar-width sidewalks.

Pathways and Connectivity

Pathways were installed instead of sidewalks along busier roads (i.e., Whoop-Up Drive). They were set back from the road, smooth, and included regular rest stops with benches and garbage cans. The paths would direct users to the corner of intersections to allow for safe and easy crossings.

Older neighbourhoods were built with a grid system of roads, allowing for regular entrances and exits into the neighbourhood for all transportation modes. Newer neighbourhoods have limited entrances and exits, leading to long, circuitous routes to enter and exit the neighbourhood. This is more detrimental to active modes of transportation and those with mobility challenges.

Figure 6-25: Accessible Off-Street Pathway
Source: Level Playing Field

Curb Cuts and Intersections

Most of the intersections observed have curb cuts which provide a thorough and connected accessible network, by allowing users of all abilities to navigate the streetscape safely and effectively. Curb cuts at many intersections, however, did not have Tactile Walking Surface Indicators (TWSIs) whereas all new or renovated sidewalks have this treatment suggesting that the transition to these is well underway. The new TWSIs were installed correctly, perpendicular to the road rather than matching the curb edge.

Figure 6-26: Example of Narrow Curb Cut Without Tactile Treatment
Source: Level Playing Field

Some curb cuts downtown are not ideal as they are set at a 45-degree angle to the crosswalk which leads users with partial or full blindness into the middle of the intersection or requires users to practically travel into the flow of traffic before turning to cross the intended street. Blended curb ramps (**Figure 6-27**) are also problematic as they do not guide users to the crosswalk locations.

Good crosswalk design includes wide curb cuts with tactile treatment aligned with the crosswalk as the graphic illustration in **Figure 6-28** shows.

Figure 6-27: Example of a Blended Curb Ramp
Source: Level Playing Field

Figure 6-28: Good Accessible Crosswalk Design
Source: https://trec.pdx.edu/sites/default/files/Peter%20Eun%20FHWA%20STEP.pdf

Some parking lots have raised crosswalks. While there are benefits of giving priority to pedestrians over vehicles, it can be challenging for those with visual impairments as it does not make a clear differentiation that they are entering or exiting a roadway. Raised crosswalks can also create unnecessary barriers to users with mobility devices if they are not designed appropriately.

6.9.3 VEHICULAR ACCESS

Access to Recreation, Medical, Education, Etc.

In general, access to medical facilities and schools is sufficient. Such locations are equipped with drop-off zones, clearly marked crosswalks, and curb cuts. However, some curb cuts are not located near entry doors, creating longer routes through uncovered areas and the need to travel further to access the buildings entrance. The signage to guide drivers to the hospital was easy to follow.

Figure 6-29: Accessible Recreation Drop-Off Zone
Source: Level Playing Field

Parking

Accessible parking stalls are identified throughout Lethbridge, particularly in locations where parking is in high demand. This includes shopping districts, downtown, City Hall, and recreation centres.

The overall design of accessible stalls is inconsistent. Inconsistencies include the presence of incorrect vertical signage, the absence of vertical signage, side access stalls, variable stall width and use of blue pavement marking to delineate the stall. Accessible stalls are highly utilized across Lethbridge, but inconsistencies can make users confused about accessible parking as they see several different designs throughout the city.

Figure 6-30: Accessible Parking in Lethbridge

Source: Level Playing Field

6.9.4 SIGNAGE AND WAYFINDING

Street signs are consistently used throughout Lethbridge providing accessible and intuitive navigation. Corner signage is comparable to other Alberta municipalities. Overhead signage installed on traffic signal poles at intersecting roads are not large enough and lack the appropriate character size for viewing distance requirements that allow for advance notice for turning traffic, off-ramps, etc.

Lethbridge has several roundabouts. Every roundabout observed has high-contrast and easy-to-read signage at each exit labelling the road one would be exiting onto.

Figure 6-31: Examples of Pedestrian/Cycling and Vehicular Wayfinding Signage

Source: Level Playing Field

6.10 Smarter Mobility Readiness Assessment

The emergence of modern technologies and innovative approaches to transportation is broadly categorized as Smart Mobility. More broadly, it is recognized that Smart Mobility as a practice is one that builds more resilient and equitable communities through less dependence on one mode of transportation, and effective information use in planning and delivery. To evaluate the readiness for Smart Mobility and direct investment, the framework uses six domains which interrelate and overlap. Within each domain there are several metrics to get a 'full picture'. The domains used to evaluate the readiness are:

Diversity, Equity, Safety and the Environment which accounts for much of the physical infrastructure users experience in the transportation system. When a user experiences a Smart Mobility trip, they are often unaware of the role Smart Mobility played in it and the presence of options that are available is evaluated in this domain.

System Efficiencies speaks to the potential of Smart Mobility interventions to increase the transportation system's efficiency for all modes. Mainly this can be addressed through targeting lane interventions, such as High Occupancy Vehicle (HOV) or Bus Rapid Transit (BRT) lanes, dynamic lane signage, coordinated signal management or other lane management systems.

Travel Demand Management and Access to Travel Information which evaluates the City's tools to support the transportation demand, providing critical information to users that can support a diverse menu of transport options. This can be achieved through Mobility as a Service (MaaS) or a combination of infrastructure approaches that reduce user barriers to access, such as implementing Mobility Hubs.

Data Sharing and Privacy opportunities to use data to improve transportation system planning and delivery decisions. The general best practice is to ensure parties that benefit from the data can access it to inform their work.

Interoperability / Communications Across and Between Modal Networks and Communities evaluated the quality of these networks through the lens of interoperability. This ensures that newly deployed systems can be used with the current technology suite and other future systems.

Planning and Governance which evaluates the people and funding frameworks in place to support Smart Mobility and the multi-modal future.

Figure 6-32: The Six Topic Areas of Smarter Mobility
Source: Stantec, Smart(er) Mobility Sector

This occurs over a few key domains simultaneously, and the readiness of an agency, company, or government to advance Smart Mobility initiatives will not be equal among these. The approach of Smart Mobility Readiness Assessment Tool (**Figure 6-33**) provides an approach to evaluating and quantifying these domains and identifying an action plan. The initial evaluation of Lethbridge's current readiness assessment and self set targets are displayed in **Figure 6-34** for each of the 6 Smarter Mobility topic areas that were evaluated. Refer to **Appendix E** for the full Lethbridge Smart(ER) Mobility Readiness Assessment Report.

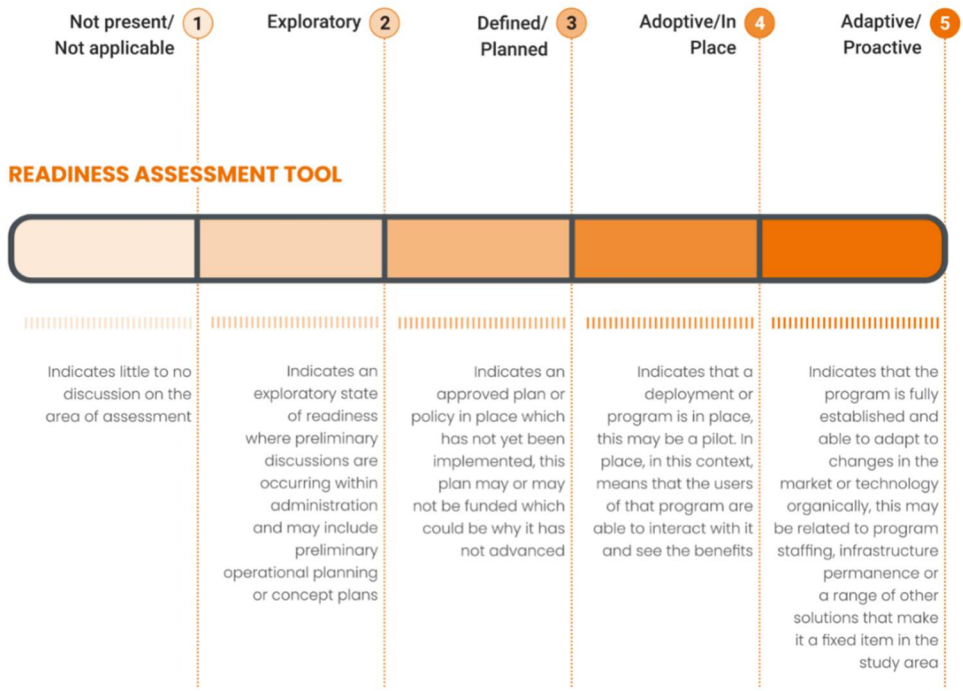


Figure 6-33: Readiness Assessment Tool Scale
Source: Stantec, Smart(er) Mobility Sector

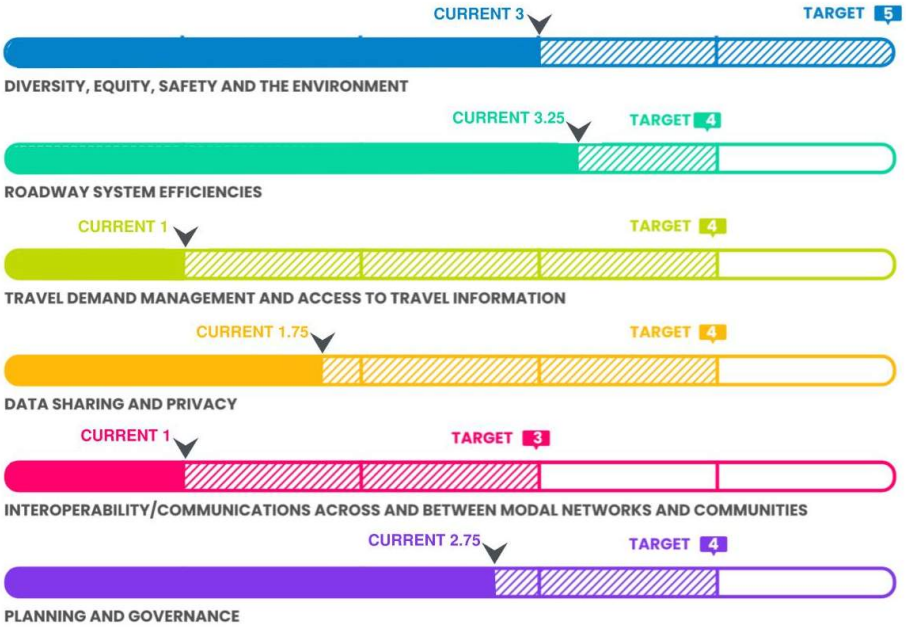


Figure 6-34 Smarter Mobility Current Readiness Assessment & Self Set Targets
Source: Stantec, Smart(er) Mobility Sector

6.11 Summary of Existing Conditions Assessment

With community input, the multi-modal assessment, and accessibility assessment in mind, below is a list of recommendations to consider relating to the information gathered from the existing conditions assessment.

6.11.1 PEDESTRIAN OPPORTUNITIES

With missing links or gaps in the network, investment in the sidewalk and pathway network is necessary to improve safety, comfort, and accessibility of pedestrian paths of travel and public transportation connectivity.

- Revisit street design standards to ensure sidewalk widths and protection are adequate for pedestrian safety and comfort.
    - Certain streets or land uses, like downtown, may benefit from wider sidewalks that provide space for increased pedestrian volumes, sidewalk cafes, and pedestrian-scale lighting, landscaping, and places to sit.
    - Sidewalk setbacks (from the curb) improve pedestrian comfort and safety and ensure parked vehicles do not encroach into space intended for pedestrians.
    - Increase sidewalk minimums for certain street types or land uses, requiring sidewalk setbacks from curbs for all street types, and/or increasing the minimum sidewalk width for streets with no setbacks.
- Focus future investments in high-priority areas, such as collision hotspots, safe routes to school, access to transit, and corridors with high levels of pedestrian delay.
- Coordinate data collection and management to support these efforts using automated pedestrian counters or equivalent at key locations.
- Explore low-cost options for pedestrians in areas that are missing sidewalks.
- Increase pedestrian comfort along existing streets by providing pedestrian-scale lighting, landscaping, and places to sit.
- The curb cuts downtown should be improved to prevent difficult navigation to avoid accidentally going into traffic. This work is already underway based on current renovations being completed during field observations, but the work will need to continue, especially along 4 Avenue S.
- The City should consider creating accessibility standards for construction mitigations that meet a minimum standard.

6.11.2 CYCLING OPPORTUNITIES

Bike routes in Lethbridge are somewhat disconnected. Major road barriers, busy streets with no bicycle infrastructure, river valley hills, wind, snowy winters, and hot summers create a biking environment that feels unsafe and uninviting for many people. Despite these barriers, Lethbridge offers mostly flat terrain outside of the river valley, many sunny days, and frequent winter melts to make cycling a desirable activity

year-round. Cycling also provides an opportunity to reconnect with the local environment and improve physical and mental health.

- Expand the cycling network, prioritizing protected bike lanes and bicycle boulevards that create a connected network.
- Encourage biking for short trips (5 km or less).
- Expand shared mobility opportunities, particularly electric scooter and electric bike share that can more easily handle hilly terrain to support longer trips.

6.11.3 TRANSIT OPPORTUNITIES

Buses can move more people more quickly and, in less space, than any other motorized form of transport.

- Explore opportunities for improving access to mid-block stops along major arterials where controlled intersections are absent.
- Consider expanding service so that all cityLINK routes operate at the same frequency.
- Continue monitoring demand response zones in newly developed parts of the community for possible fixed route extensions.
- To maintain schedule reliability, consider opportunities for short sections of streets or intersections prioritized for transit, particularly around the City Centre Park 'n' Ride Transit Terminal where many routes converge.
- Explore opportunities for transit service to help people get down into the river valley.
- Transit signage should include specific route information and contact information to check timing for the next bus arrival. Ideally, braille signage can also be installed at about 1200mm height.

6.11.4 COMPLETE STREETS OPPORTUNITIES

- Ensure new street connections include appropriate pedestrian and bicycle infrastructure to continue to build out those networks.
- Improve bicycle and pedestrian access to existing bridge crossings to capitalize on these assets.
- Explore opportunities to develop Safe Routes programs, which could include Safe Routes to School, Safe Routes for Seniors, and Safe Routes to Parks to identify needed improvements and raise awareness about safety for Lethbridge's most vulnerable people.
- Leverage existing efforts and implement strategies and actions identified in the City's Transportation Safety Plan.

- Consider reducing lane widths and providing additional crossing opportunities along wide, busy roadways like Highway 3, Mayor Magrath Drive, Scenic Drive S, and Whoop Up Drive W.
- Revisit street design standards to ensure future vehicle travel lanes are not oversized.
- Improve visibility, especially at intersections.
- Implement traffic calming in residential neighbourhoods to encourage slower travel.
- The City should consider development of accessible parking guidelines which improve the dimensioning, signage, and wayfinding, delineation, and visibility of accessible parking areas and stalls.

6.11.5 ROADWAY OPPORTUNITIES

- Upgrade 26 Avenue N from 23 Street N to Scenic Drive N, to an arterial road with 2 lanes in each direction.
- Explore an additional bridge across Oldman River, especially a crossing that prioritizes pedestrians, bicyclists, and transit to connect west and South Lethbridge.
- Explore the possibility of increasing the size of street signage when mounted on traffic signals at busier intersections. This can help all drivers safely navigate the roads and prepare their lane choice in advance if they need to turn.
- Improve winter maintenance of road rights-of-way (including travel lanes, bicycle lanes, sidewalks, pathways, wheelchair ramps, and transit stops).

7 FUTURE TRANSPORTATION NETWORK ASSESSMENT

7.1 What We Heard

Engagement on the Future Transportation Network focused on confirming what is most important. Participants were asked to provide input on the concepts' challenges and opportunities, as well as identify priorities for the project team's consideration. The following represents the top themes identified (detailed information on the engagement and questions asked can be found in **Appendix B.**

7.1.1 STAKEHOLDER WORKSHOPS

Two workshops were hosted in September 2022, involving a total of 29 stakeholder groups. Direct outreach for workshops was done based on a City stakeholder list. Those in attendance represented stakeholders from the following interest groups: secondary and post-secondary schools, arts and culture, parks, tourism, sports, businesses, trucking, environment, taxis, health services, active transportation, and students.

Participants were asked to prioritize transportation investments, and types of locations in Lethbridge where improvements related to accessibility features, pedestrian safety, and improved access to transit are required.

The top transportation investment areas in order of priority were:

1. Accessibility
2. Safety
3. Transit
4. People Walking
5. People Driving
6. People Cycling
7. Trucking

Attendees were provided with time at the end of the workshops to share any additional thoughts and reflections on the questions and conversations had up until that point. Top themes from these discussions include:

- An interest in safety, especially for pedestrians.
- A desire for more wayfinding signage towards city facilities and popular destinations.
- A desire for vehicle speed control.
- A desire for more lighting along roadways and pathways.
- A suggestion that the industrial part of the city is not getting the same amount of transportation related resources as other areas.

- A desire to focus on improving opportunities for active transportation and green transportation initiatives.
- A desire to separate transportation modes (i.e., separating bike lanes from vehicle lanes and sidewalks).
- A desire for more pedestrian and cycling connections.

7.1.2 ONLINE SURVEY

A public online survey was created to better understand transportation-related barriers, and what has been working well with transportation. The survey aimed to give a foundational understanding of what needed to be addressed by the TMP and future engagement. The full survey can be found in **Appendix B**. This survey was accessible through the 'Get Involved Lethbridge' website, was open from September 13 – October 28, 2022, and had 591 respondents.

Participants were asked to prioritize transportation investments, and locations in Lethbridge where improvements related to accessibility features, pedestrian safety, and improved access to transit are required.

The top transportation investment areas in order of priority were:

- **Accessibility** – Ensure the transportation network serves everyone, including people of all ages, incomes, and abilities.
- **Safety** – Ensure Lethbridge streets are safe for all people; and leverage existing efforts and strategies identified in the Transportation Safety plan.
- **People walking** – Be a pedestrian-friendly community with networks that integrate with transit, neighbourhood amenities, parks, open spaces and schools.
- **Transit** – Foster an efficient, affordable, safe and accessible transit system that is an attractive alternative to private vehicles and integrated with other transportation modes.
- **People Driving** – Develop and maintain a well-connected street network to address traffic flows and keep Lethbridge moving.
- **People cycling** – Provide safe and convenient bicycle routes suitable for commuting, recreating, and other daily trips.
- **Trucking** – Support the city's growing economy by ensuring the transportation system connects people to jobs and facilitates the efficient movement of goods.

Participants were provided with a text box in question 5 of the survey to share any additional comments for the TMP. Top themes from these comments include:

Table 7-1: Survey Key Themes

Key themes identified in the survey		
Theme (Percentage of all comments)	**Sub-themes (Percentage of all comments)**	**Details**
Transit specific desires (39%)	Bus timing, schedule, and routes (32%)	Comments suggested a desire for a broader bus schedule (more times and increased frequency), a return to old routes, and increased accessibility features for buses (such as cost, ramps)
	Bus stop infrastructure (5%)	Comments suggested a desire for better bus stop infrastructure such as lighting, seating, and shelters
Other active transportation modes (36%)	Bike infrastructure (16%)	Comments suggested a desire for more bike infrastructure such as bike lanes, bike parking, and comments on bike theft from racks at bus stops
	Walking and rolling infrastructure (11%)	Comments suggested a desire more pedestrian oriented infrastructure and zones
	De-prioritize cars (10%)	Comments suggested a desire to de-prioritize cars for accessibility, environmental, economic, or financial reasons
Location specific requests (13%)	Location specific requests	
Costing (6%)	Concern with how the city is spending money	
Third bridge (5%)	Desire for a third bridge	
Accessibility (5%)	Many comments suggested a need to focus more on accessibility overall	

7.1.3 ACCESSIBILITY WORKSHOP

An accessibility stakeholder workshop was held online in August 2022 with 10 participants from various disability and accessible mobility groups in and around Lethbridge. This event was held virtually.

Workshop accessibility features:

- Provided American Sign Language (ASL) interpreters.
- Provided AI-generated captioning in English.
- Sent out accessibility information upon invitation to event, reminders of event, and during event. This included information and instructions about the following:
    - ASL
    - Captioning
    - Technical support

- Technical support offered via phone and e-mail prior to the event as well as during the event.
- During the event, a team member supported the workshop as a technology and accessibility expert, as well as a team member answering all comments made through the chat box, posting accessibly information in the chat box, and taking notes for follow up queries.

The top transportation investment areas in order of priority were:

1. Accessibility
2. Transit
3. Safety
4. People Walking
5. People Cycling
6. People Driving
7. Trucking

Attendees were provided with time at the end of the workshops to share any additional thoughts and reflections on the questions and conversations had up until that point. Top themes from these discussions include:

- A desire to see improvement on all aspect of transit and Access-A-Ride: financial accessibility (price and method of getting transit passes/booking Access-A-Ride), physical accessibility of bus stops, physical accessibility of buses, improved bus schedules, improved bus routes (the change of bus routes have had an impact on people), and improved communications and information about transit.
- A desire to see more accessible transportation options, other than transit (i.e., subsidized taxis).
- Concerns with the accessibility of crossing streets, including lack of curb cuts and timing of crossing lights (especially in the industrial areas of the city).
- Concerns with poor sidewalk and street conditions, especially in the north side of the city, as well as missing sidewalk links.
- Concerns with delays in ice and snow clearance.
- Suggestion for more accessible information about what is and is not accessible in the city (i.e., an interactive map of where all sidewalks are).
- Desire to see more streetlights for visibility, accessibility and safety.

7.1.4 INTERCEPT EVENTS

The City held various intercept events throughout September and October 2022. A booth was set up to intercept people and engage them on the TMP at various high traffic locales offering an opportunity for a conversation on the spot or to give information to connect with the online survey. A total of 225 people were meaningfully engaged at the following events or places:

- Indigenous Entrepreneurship Trade Show and Pow Wow
- Farmers' Market
- Downtown Transit Terminal
- Lethbridge College
- University of Lethbridge

For the events, being 'meaningfully engaged' included:

- Completing the online survey on one of the tablets.
- Accepting a post card with the survey QR code to complete the survey later.
- Scanning the QR code to complete the survey.
- Providing verbal transportation related feedback (recorded in Appendix B under Additional Comments for each event).

Ability to participate in the survey was included at all events. Tablets were available for people to complete the survey on location, and a QR code on a poster board linking to the TMP getinvovledlethbridge.ca project page were available. Post cards with the QR code were distributed at all events except for the Indigenous Entrepreneurship Trade Show and Pow Wow.

Red Crow College was also contacted for a potential pop-up event. Red Crow College administration advised that many students were participating in classes remotely and recommended digital outreach. Red Crow College administration agreed to add the TMP to their student portal and to ask teachers to encourage their students to complete the survey.

The top themes from all intercept events were:

- A desire for more transit buses, more transit drivers, and routes to run later, especially at universities and colleges.
- A desire to embrace green technologies and innovations in all areas of transportation, as well as transportation related infrastructure management.
- A desire for more transportation related signage throughout the city.
- A desire to have more, and more accurate, transportation related information.
- A desire to install missing sidewalk links.
- A desire to see more upgraded transit-related infrastructure such as benches and lighting at bus stops.
- A desire for more cycling connections.
- A desire to focus on active transportation modes.
- A desire for more multiuse pathways.
- Concerns about traffic and pedestrian safety.
- Concerns with snow management.
- A desire to see more accessibility related infrastructure.

7.1.5 FUTURE TRANSPORTATION NETWORK CONDITIONS ENGAGEMENT SUMMARY

In summary, the top themes noted by all participants regarding Future Transportation Network Conditions were:

- Active transportation
    - A desire to prioritize active modes of transportation (walking, rolling, transit) for accessibility, environmental, economic, or financial reasons, and focus on improving opportunities for active transportation and green transportation initiatives.
    - Concerns about the recent changes in bus routes and schedules, noting that they have had a negative impact on many people. There is a desire for a broader bus schedule (more times and increased frequency), a return to old routes, and increased accessibility features for buses (such as cost, ramps, etc.).
    - A desire for more bike infrastructure such as bike lanes, bike parking, and comments on bike theft from racks at bus stops.
    - A desire for more pedestrian-oriented infrastructure and zones.
    - A desire to see more upgraded transit-related infrastructure such as benches, shelters, and lighting at bus stops.
- Accessibility and safety
    - A desire to prioritize accessibility and safety.
    - Concerns about traffic and pedestrian safety.
    - A desire for vehicle speed control.
    - Concerns with snow and ice management.
- Infrastructure
    - A desire for improved connections between destinations, including installing missing sidewalk links.
    - A desire for more lighting along roadways and pathways.
    - Concerns about North Lethbridge (specifically industrial area), where participants noted an overall lack of transportation resources and infrastructure.
    - A desire to have more, and more accurate, transportation related information, including more way-finding signage throughout the city.

7.2 Future Community Integration

7.2.1 ANTICIPATED CITY GROWTH AREAS

The future communities anticipated for build-out over the next 50 years were shown earlier in the document in **Figure 2-8**. Area structure plans (and in some instances, more detailed Outline Plans) provide the details around future land use, road networks, and access. These have all been incorporated into the regional transportation model for the future horizons. For full integration into the communities, it will be critical to expand the City's transit routes and active transportation infrastructure into these areas. Integration of this infrastructure into developing communities needs to be a high priority for the City when reviewing/approving ASPs, ARPs, and Outline Plans.

7.2.2 SURROUNDING GROWTH

The joint City of Lethbridge and Lethbridge County 2016 Intermunicipal Development Plan (City Bylaw No. 6015 & County Bylaw No. 1478) is the best resource for information regarding the anticipated growth and the future highway infrastructure surrounding the City of Lethbridge.

The plan provides a framework for the long-range planning for lands of mutual interest. This planning will help ensure that land use conflicts across municipal borders are minimized, that opportunities for collaboration and communication are provided, and that processes are in place for the resolution of issues that may arise within the Plan Area.

Figure 7-1 shows the City of Lethbridge and IDP boundaries and six policy areas. The IDP document provides agricultural, environmental, and land use policies specific to each policy area. The anticipated future population and employment forecasts in these policy areas were incorporated into the City's updated travel demand model future horizons.

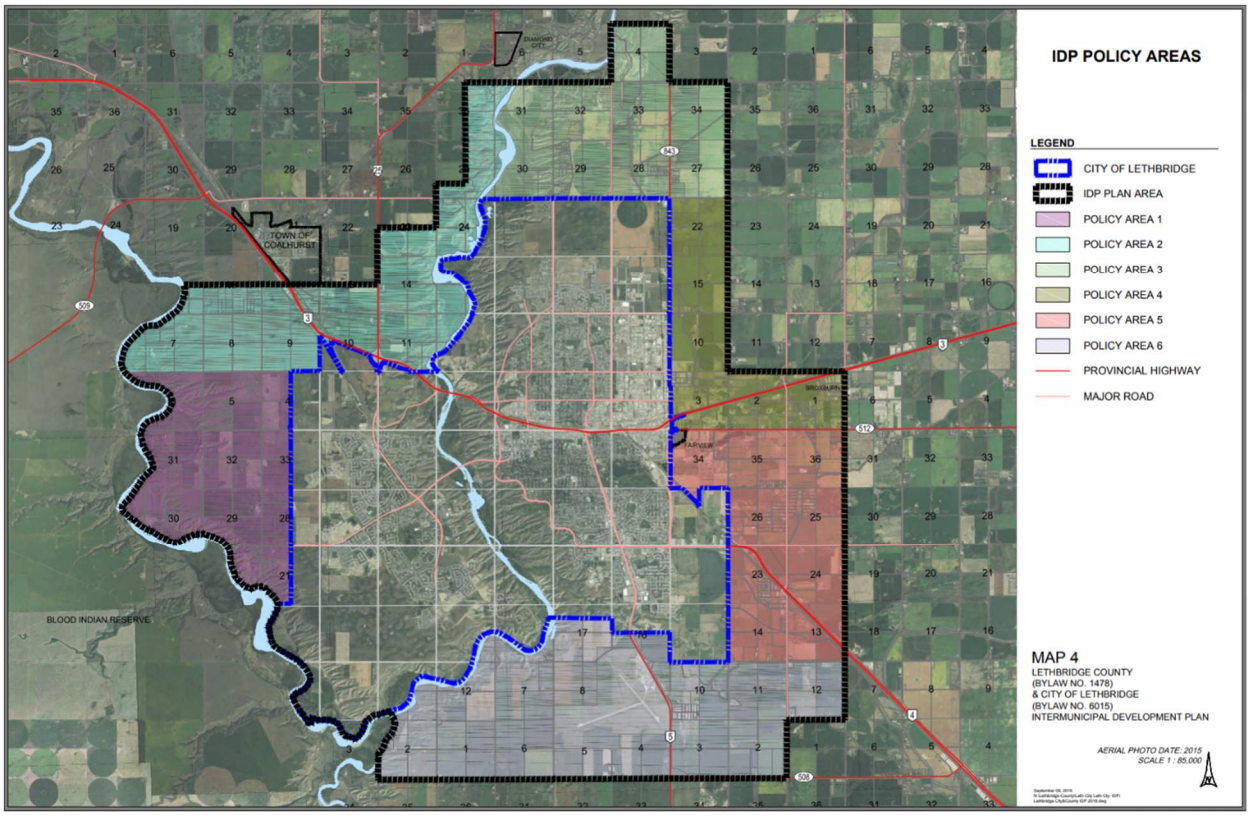


Figure 7-1: Intermunicipal Development Plan Policy Areas
Source: Map 4, 2016 Intermunicipal Development Plan

Figure 7-2 shows growth areas (primarily west and north) and development nodes to the northeast, east and southeast (industrial and airport lands). It also shows the future CANAMEX highway corridor which bypasses the City of Lethbridge to the north. The impacts of this regional connection were examined in Section 5.

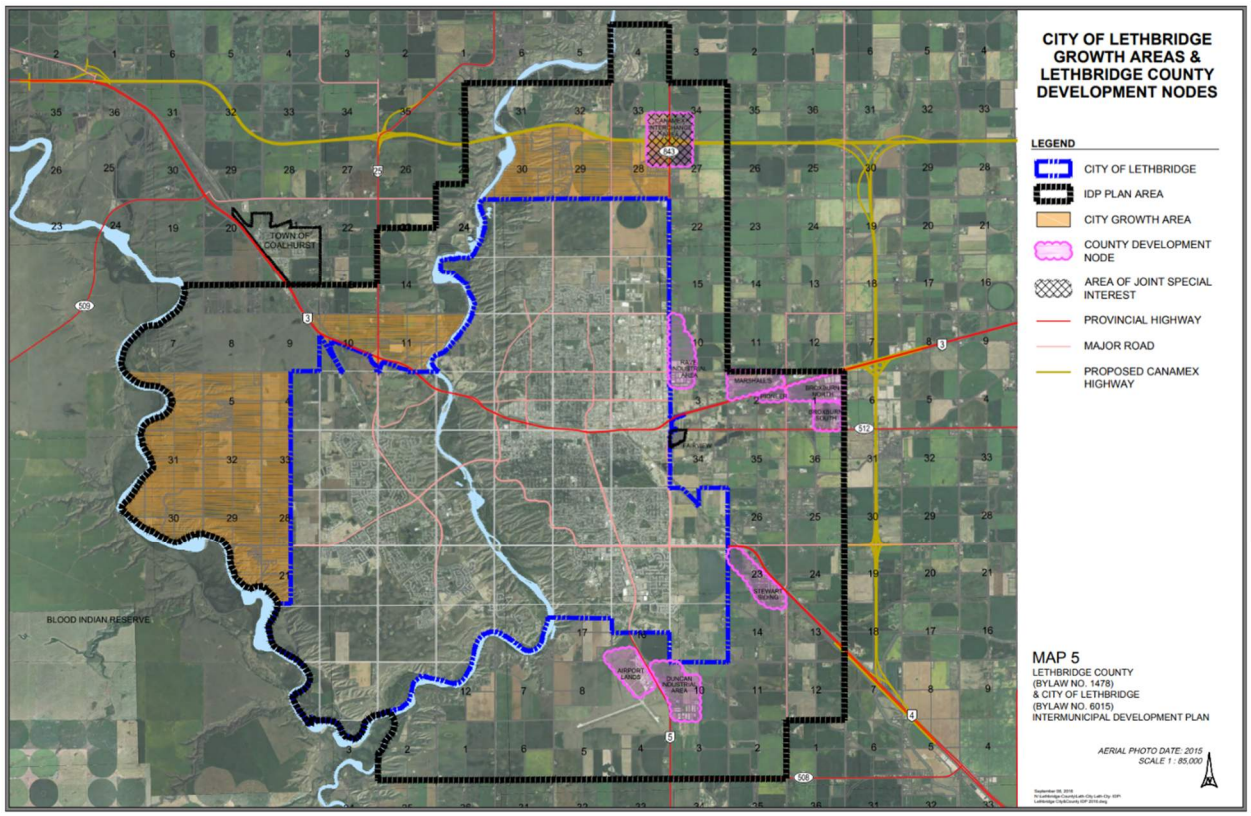


Figure 7-2: Intermunicipal Development Plan Growth Areas & Development Nodes
Source: Map 5, 2016 Intermunicipal Development Plan

7.3 Future Roadway Network Conditions

7.3.1 ROADWAY CLASSIFICATION

Modelling was developed for the future horizons (2029, 2039 and 2069). The process, including refinement of the road network and its attributes were presented in Section 5.2. The results of the model indicated the roadway modifications needed at each future horizon. **Figure 7-3** represents road infrastructure improvements and new community internal streets in the future years. A detailed list of road infrastructure improvements included in each horizon year is provided in Section 9.2.1 and **Appendix A.**

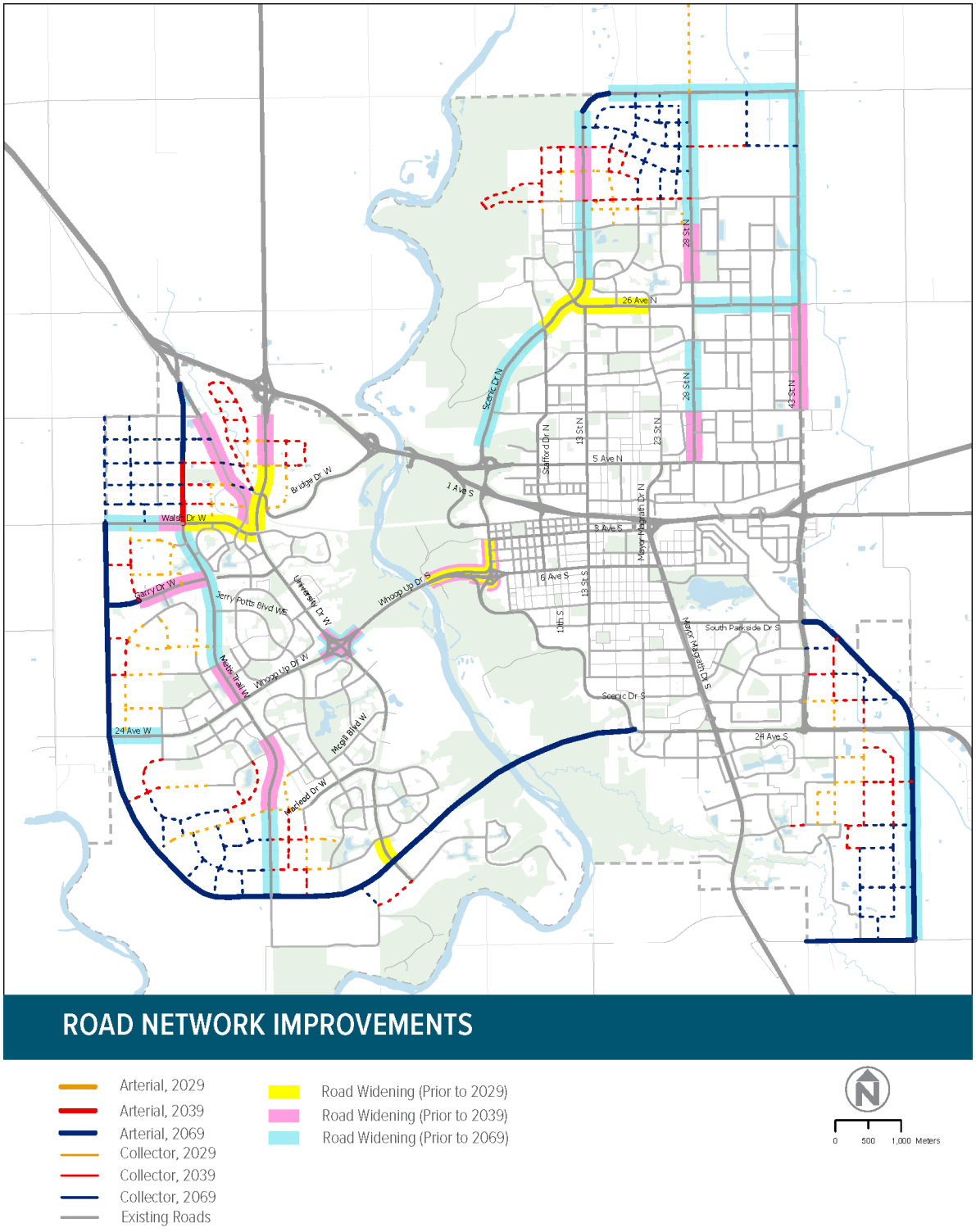


Figure 7-3: Road Infrastructure Improvements and New Community Streets – Build-Out (2069)
Source: Stantec

From this work, a refined ultimate (2069) road classification map was created (see **Figure 7-4**). A third arterial crossing of the Oldman River along the Chinook Trail alignment is required after 2039 but prior to 2069. Additional modelling analysis was undertaken to confirm the preferred alignment and the need for this crossing. Without it, Whoop-Up Drive, and parts of the network east and west of this river crossing will experience unacceptable levels of congestion.

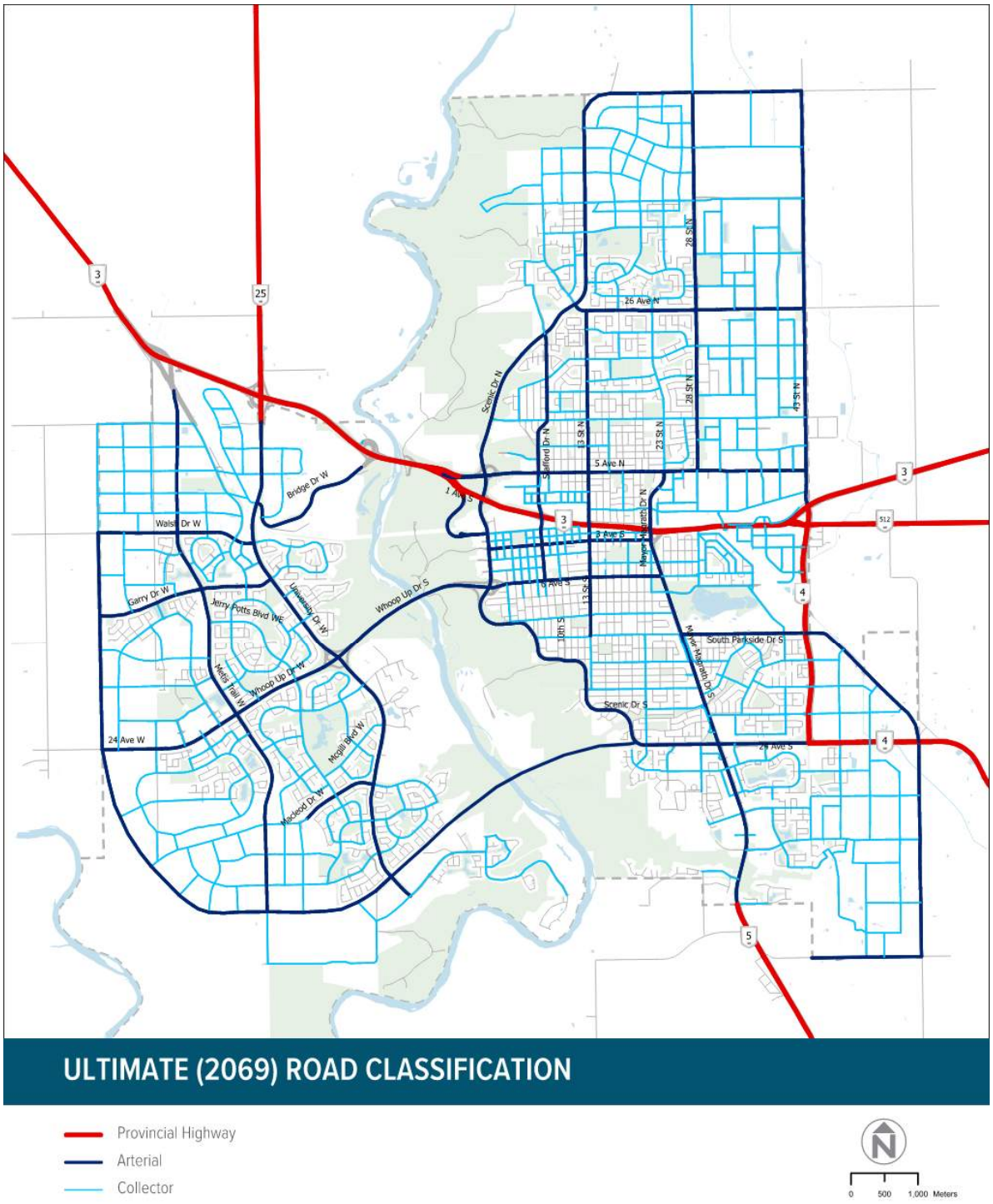


Figure 7-4: Ultimate (2069) Road Classification Map
Source: Stantec

7.4 Multimodal Needs Assessment

To explore the multimodal needs for people in Lethbridge into the future, focus was placed on identifying areas of need, and gaps where current and planned networks do not or may not adequately support transportation needs. Three areas that indicated need for improvement through the existing conditions analysis, direction from City Council, and feedback from the community, were examined. The three focus areas include access to transit, barriers to crossing roadways (for both pedestrians and cyclists), and areas of potential right of way tension between planned modal networks. Each of the focus areas are explored in the sections that follow.

7.4.1 PEDESTRIAN ACCESS TO TRANSIT

Supporting accessibility improvements and the efficiency of the Lethbridge Transit network has been identified as a key need through public and City Council feedback. To give an indication of where improvements may be needed to support safe and easy access to transit, the sidewalk network within a 400m walk of all transit stops in Lethbridge was examined to see how well the sidewalk network served each stop. For clarity, this should not be confused with a requirement to ensure transit service is only 400m away from each residence which was once a benchmark for how routes were designed in Lethbridge.

Methodology

A 400m walkshed surrounding each stop was constrained to the existing roadway network. 400m is typically the distance that people will walk to access a transit stop or station as part of their trip. Some people may be willing to walk further to access transit if stop amenities and walking routes are comfortable, and transit headways are very frequent. However, for most bus service provided by Lethbridge Transit, 400m is a reasonable assumption for planning walking access.[4]

Using ESRI Geographic Information System (GIS) tools, the team created 400m buffers surrounding only the street network at each stop to create a walkshed that people may use to access transit. While the buffers of some stops spaced less than 400m apart may overlap, this provides a full template to measure walking access to each stop.

Next, within the walkshed, the existing sidewalk lengths were measured in relation to the length of the roadway to find out the portion of the roadway network that was served by sidewalks. The steps outlined below are used to determine the sidewalk network coverage, or the percentage of the sidewalk network that is fully complete within a 400m walkshed. A fully built sidewalk network includes sidewalk on both sides of the street. The maps and tables summarize the sidewalk network coverage.

Analysis Results

As shown in **Figure 7-5** , the stops with highest sidewalk coverage are in the downtown area, north central, and West Lethbridge neighborhoods where the sidewalk network is built out to the greatest extent. The stops with the lowest sidewalk coverage includes the industrial areas of North Lethbridge

[4] (USDOT, FHWA-SA-07-017 – Pedestrian Safety Guide for Transit Agencies (2008) , Chapter 4, Pg 47)

where there is little sidewalk infrastructure for existing industrial street classifications and some newer communities where fixed schedule transit routes are not fully established, but demand response zones exist.

Table 7-2: Legend for Figure 7-5

Mapping Label	Sidewalk Coverage
Very Low Coverage	0-25%
Low Coverage	>25 - 50%
Medium Coverage	>50 - 75%
High Coverage	>75 - 100%

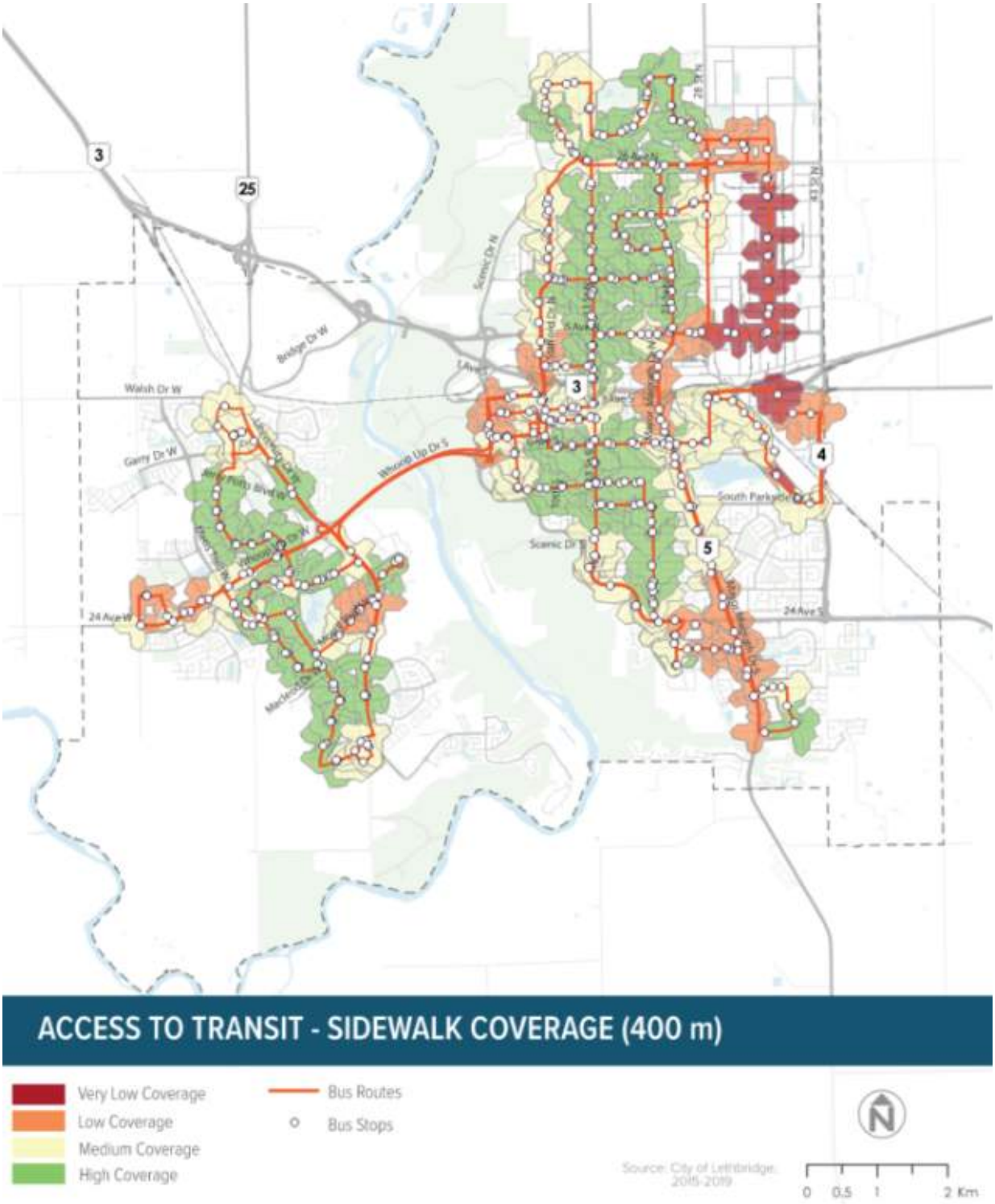


Figure 7-5: Access to Transit Sidewalk Coverage

Source: Nelson Nygaard

When considering options to support getting to and from transit stops, the cityLINK routes, which were implemented in August 2021, provide Lethbridge residents with higher quality and more frequent service. This improved service is a prime location to look for areas where the pedestrian network can be improved

to support the investment in high quality transit service. Most transit trips either start or end with a walking trip and the integration of the two networks is crucial to supporting a safe and well-functioning transportation network overall.

Looking deeper into the locations with low sidewalk coverage specifically along cityLINK routes, **Figure 7-6** shows clusters where sidewalk gaps could be filled to improve access to cityLINK stops. Areas of low sidewalk coverage include:

- Near the intersection of 26 Avenue N and 28 Street N.
- Employment and commercial district near WT Hill Boulevard S and 4 Avenue S.
- Near the Scenic Drive S and Mayor Magrath Drive S intersection.
- University Drive W between McGill Boulevard W and Aperture Drive W.

Results / Recommendations

Figure 7-6 depicts stops completely lacking sidewalks within a 400m walkshed. These 13 stops are in the Churchill Industrial Park in northeast Lethbridge and are all served by Route 61.

Table 7-3: Transit Walksheds with No Sidewalk Coverage

Stop ID	Intersection	Direction	Routes served
11198	5 Avenue N & 31 Street N	EB	61
11199	5 Avenue N & 33 Street N	WB	61
11200	5 Avenue N & 33 Street N	EB	61
11201	36 Street N & 6 Avenue N	NB	61
11213	36 Street N & 9 Avenue N	NB	61
11220	36 Street N & 12 Avenue N	NB	61
11221	36 Street N & 14 Avenue N	NB	61
11222	36 Street N & 18 Avenue N	NB	61
11232	36 Street N & 18 Avenue N	SB	61
11268	36 Street N & 14 Avenue N	SB	61
11269	36 Street N & 12 Avenue N	SB	61
11270	36 Street N & 9 Avenue N	SB	61
11271	36 Street N & 6 Avenue N	SB	61

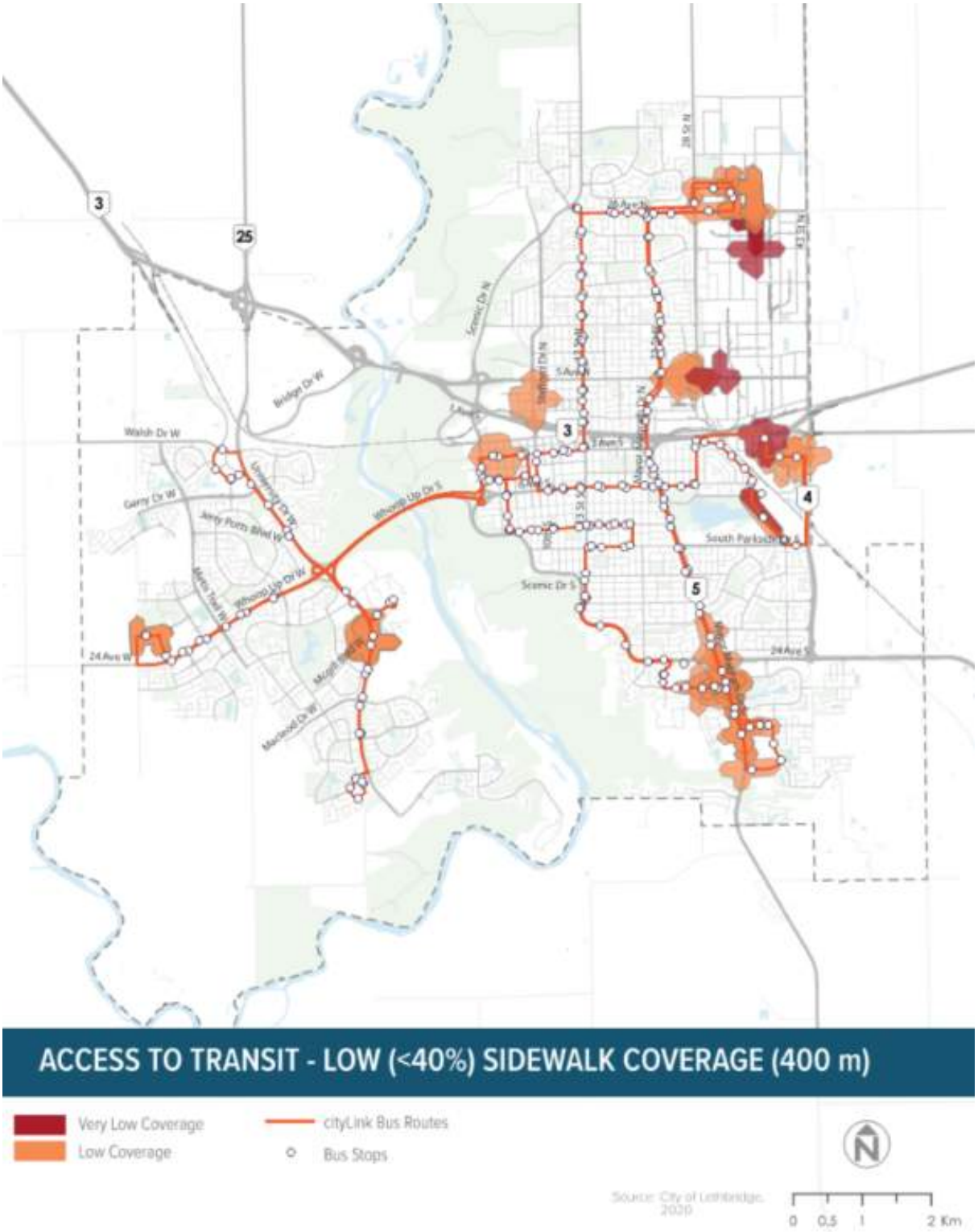


Figure 7-6: Access to Transit Low Sidewalk Coverage
Source: Nelson Nygaard

Table 7-4 below shows stops with less than 40% of sidewalk coverage. Many of these stops are in the Churchill Industrial Park and Sherring Industrial Park area. There are also several stops along Mayor

Magrath Drive S and McGill Boulevard W. Key destinations which would benefit from improved access include the stops around the Walmart and other big box stores in Sherring Industrial Park. These stops serve multiple routes including Routes 1, 3, 60, and 61.

Table 7-4: Transit Walksheds with less than 40% sidewalk coverage

Stop ID	cityLINK Stop		Stop ID	cityLINK Stop
5	yes		12131	yes
8	yes		12199	yes
11000	yes		12300	yes
11018	yes		12310	yes
11021	yes		12311	yes
11109	no		12323	yes
11176	no		12325	yes
11194	no		12326	yes
11195	no		12330	yes
11224	no		12331	yes
11226	no		12333	yes
11231	no		13088	no
11232	no		13307	yes
12120	yes		13320	no
12127	yes		13359	yes
12129	yes		14029	yes

7.4.2 PEDESTRIAN CROSSING ROADWAY BARRIERS

Just as people must walk along a street to access a destination, people must cross the street network, sometimes in unsafe or inclement conditions, to access their destination. If conditions are too inhospitable at street crossings, a person may avoid a walking trip completely, rather than detour to a safer crossing. A safe and direct path towards a destination is an important consideration, just as it may be with a person driving.

Intersections and corridors may cause a barrier to walking trips and should be a key consideration when building and improving a multimodal network. This section examines barriers to crossings the street network through the lens of accessing pedestrian and transit networks.

To better understand areas of need for improved crossings, an "ease of crossings" analysis was completed to identify areas of the street network that are currently difficult to cross. When viewing in context with the transit network and existing and planned cycling networks, the analysis can help unearth areas where redesign may be needed to support safe and comfortable walking and biking trips.

Methodology

The ease of crossing analysis is a GIS based analysis using files commonly kept by municipal or regional governments. Attributes typically used in the analysis include street classification, posted speeds, number of lanes (both directions), signalized intersections, signalized pedestrian crossings, Average Daily Traffic (ADT), and location of intersections (controlled and uncontrolled).

ADT was only available in limited street segments and therefore was omitted from the analysis so that the results would not be skewed. In addition, several roadway lanes were adjusted for arterial streets to provide number of lanes in both directions, to be consistent with collector streets and provide a more accurate analysis.

In the absence of ADT, and as an addition to help create more nuanced and on the ground accuracy for this analysis, truck route and snow route designations were used from the roadway layer. These two additional designations create an added level of complexity and stress for a person crossing the roadway. Truck routes increase total traffic volumes compared to similar roads that are not truck routes and create a more stressful environment at crossing locations due to vehicle size and typical truck route street characteristics, especially where street segments have a non-signalized crossing. Similarly, snow routes with the highest priority for snow plowing are an inconvenience for people walking, especially when crossing the street, and may prevent some people from walking all together. This occurs due to the windrows and accumulation of snow caused by snowplows, which may block access to sidewalk ramps. This is especially an issue for those using mobility devices or those who have accessibility challenges.

For this analysis, arterial and collector roadways were studied, as they present the major barriers to multimodal travel, while local streets are generally safe and comfortable without the need for signalized or other crossing design support.

Analysis Results

The outputs from this analysis are shown in **Figure 7-7** and **Figure 7-8.**

Arterial streets make up slightly less kilometers than collector streets and carry a slightly lower crossing score. **Figure 7-7** helps illustrate the locations where lower scoring street segments are located. These areas include:

- Industrial Parks in northeast Lethbridge.
- Commercial and Retail centers in South Lethbridge.
- Multiple street segments in West Lethbridge.

Figure 7-7 shows conditions in more detail around downtown Lethbridge. Further from the center of downtown, near Galt Gardens Park, the street network becomes more difficult to cross as wide lanes and unsignalized intersection are more prevalent.

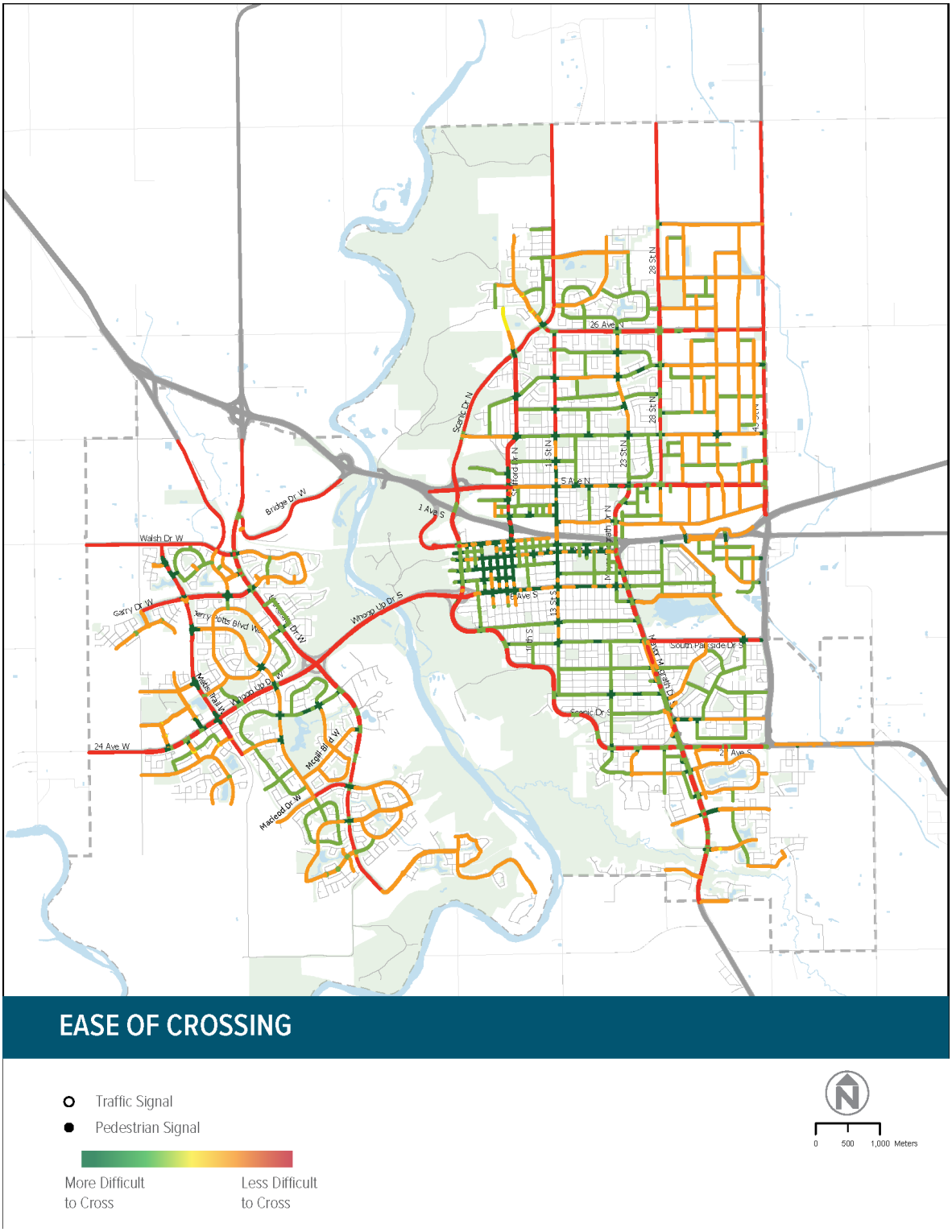


Figure 7-7: Ease of Pedestrian Crossing
Source: Nelson Nygaard

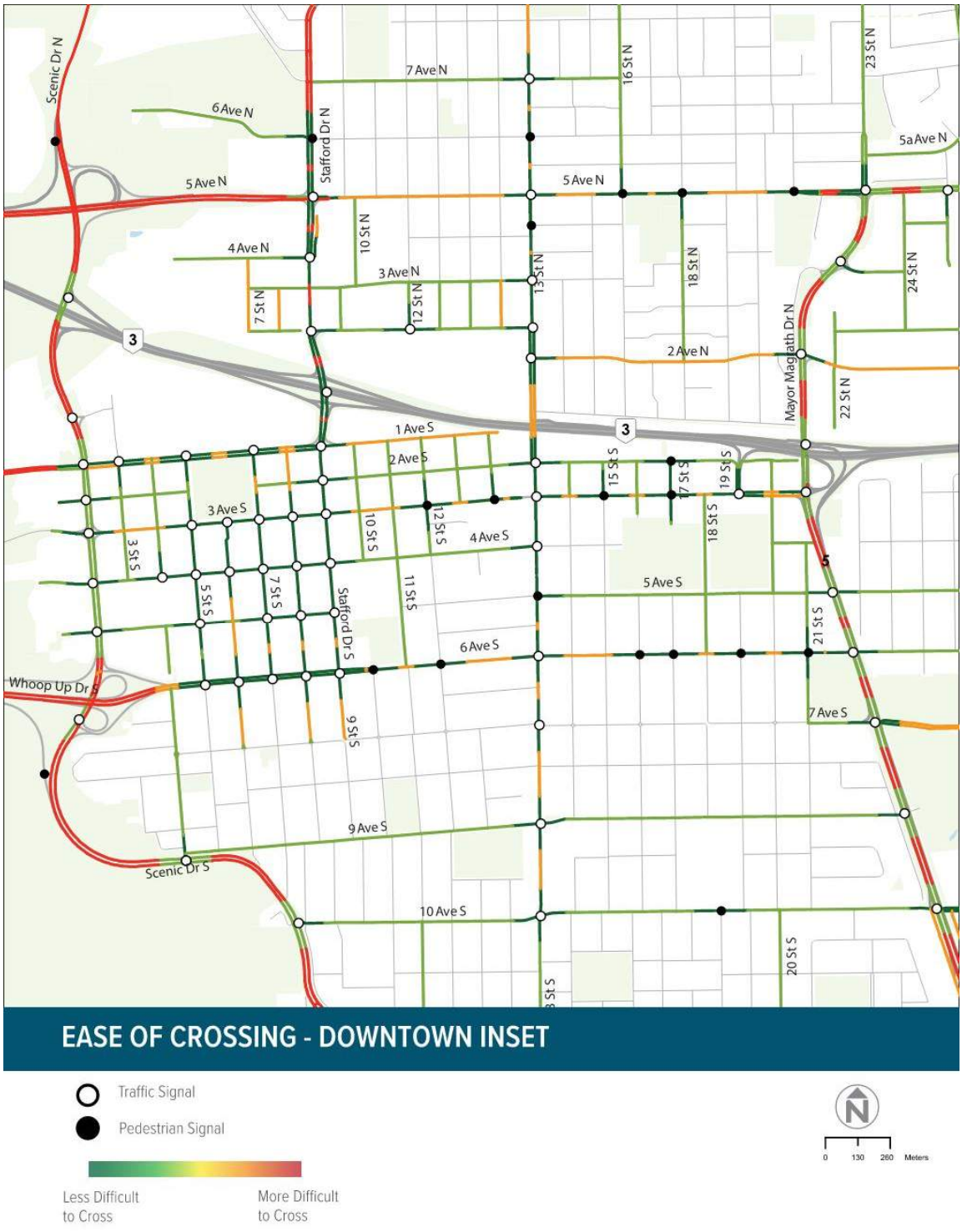


Figure 7-8: Ease of Pedestrian Crossing (Downtown)
Source: Nelson Nygaard

7.4.3 PEDESTRIAN CROSSING NEAR TRANSIT

When looking closer at transit access in Lethbridge and how to improve walking connections to stops, the ease of crossing analysis helps to highlight the crossing conditions in each stop walkshed. Each stop found in **Figure 7-9** summarizes the average crossing score of the segments found within its 400m walk to the stop. Refer to the Multi-modal Analysis Reports (Appendix D) for crossing score methodology and calculations.

Table 7-5: 20 Lowest Avg Crossing Scores in Walkshed

Stop ID	Avg Crossing Score	cityLINK Stop
11200	96	No
11199	98	No
11198	114	No
11271	117	No
12184	119	Yes
11231	120	No
11201	120	No
11222	121	No
11224	121	No
11232	121	No
13085	122	No
26391	144	No
13007	124	Yes
13324	125	No
11017	126	No
11000	127	Yes
11018	127	Yes
11226	129	No
12183	129	Yes
11221	129	No

Table 7-5 lists 20 bus stops which have the lowest average crossing score, or most difficult crossing experience, within its walkshed. Only a few of these stops serve the cityLINK service network, while the remainder serve local routes. **Figure 7-9** on the following page shows the locations of the 20 stops. Most of the stops cluster again in the northeast industrial area of Lethbridge. However, there are several stops in West Lethbridge, along with several stops on Scenic Drive S and near Lethbridge College.

The 20 stops listed in **Table 7-5** should be explored in more detail to identify locations for additional crossing opportunities or where existing crossings could be enhanced through design treatments to improve safety and comfort for people using transit.

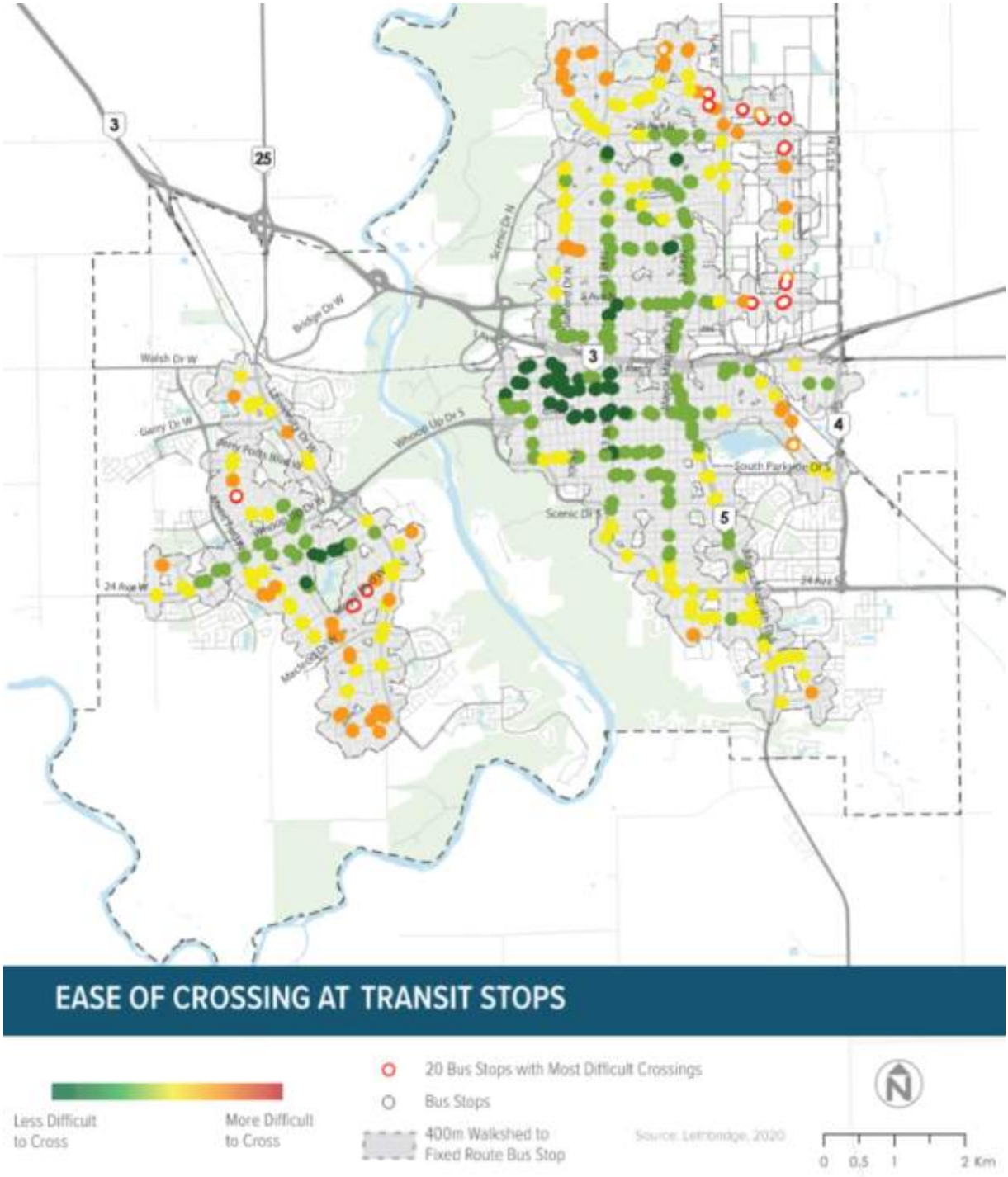


Figure 7-9: Ease of Pedestrian Crossing at Transit Stops
Source: Nelson Nygaard

7.4.4 CYCLING CROSSING ROADWAY BARRIERS

People who travel by bike also encounter uncomfortable and unsafe crossings. While intersection design may look different to accommodate people biking, the same criteria influence how people feel while crossing the street on a bike as crossing while walking.

Similar to the 'ease of crossing for pedestrians' previous analysis, intersections were identified where existing or planned on-street or multi-use path facilities intersect with each other or with an arterial or collector street. The crossing scores within 90 meters were averaged and symbolized for each crossing location. 90 meters is a typical distance a person can be expected to travel out of their path to use a more comfortable crossing facility[1]. Lower scores are more difficult to cross and higher scores are easier to cross. Refer to the Multi-modal Analysis Reports (Appendix D) for crossing score methodology and calculations.

Table 7-6: Cycling Facility Crossings at Arterial Streets

Intersection	Avg Crossing Score
Scenic Drive N & 5 Avenue N	100
43 Street N & 26 Avenue N	100
43 Street N & Giffen Road N	100
Kodiak Gate N & 30 Avenue N	102.5
Erminedale Boulevard N & 26 Avenue N	130
36 Street N & 5 Avenue N	130
Lakeview Drive S & South Parkside Drive S	135
Whoop Up Drive W & 30 Street W	135
Métis Trail W & Walsh Drive W	135
13 Street N & Grace Dainty Road N	140
Scenic Drive S (Off Ramp From 6 Avenue S)	147.5
4 Street S & 6 Avenue S	175
13 Street N & 15 Avenue N	175
Riverglen Link W & Sunridge Boulevard W	180
13 Street N & 1 Avenue N	185
12c Street N & 5 Avenue N	185
13 Street N & 8 Avenue N	185
10 Street S & 3 Avenue S	205
11 Street S & 3 Avenue S	205
18 Street S & 3 Avenue S	205
18 Street S & 6 Avenue S	205

[1] Pedestrian Crossings - Global Designing Cities Initiative
https://globaldesigningcities.org/publication/global-street-design-guide/designing-streets-people/designing-for-pedestrians/pedestrian-crossings/

As shown in **Figure 7-10**, non-signalized crossing locations are strong indicators of areas that may justify improvements to the cycling network as it gets built out. This is especially true at arterial crossings, which are identified in **Table 7-6**. Arterial crossings at non-signalized intersections prove challenging due to typical conditions like high traffic speed, long crossing distances, and higher traffic volumes.

As the planned on-street network is funded and built, the locations listed, along with the other lower scoring crossings should be considered for design treatments within project cost estimates to ensure a complete, safe, and comfortable network is created for all multimodal users.

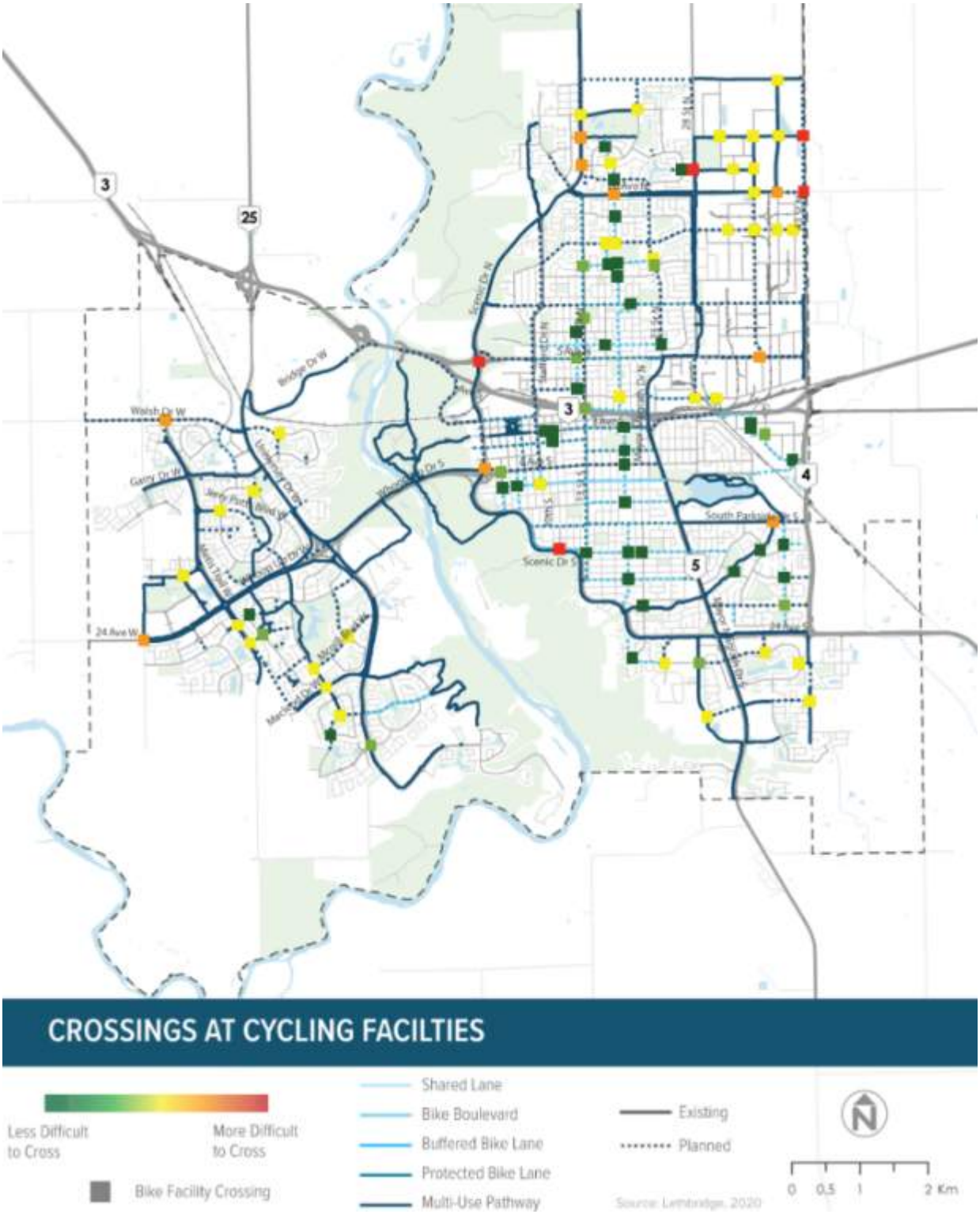


Figure 7-10: Ease of Cyclists Crossing Intersections
Source: Nelson Nygaard

7.4.5 CYCLING AND TRANSIT NETWORK CONFLICTS

To achieve the goals set out by the TMP, policy and project implementation will be critical for all active modes including walking, rolling, biking, using a wheelchair or mobility device, and transit. While there are benefits of modal networks working together, this report has not addressed scenarios where modes may be in conflict within the existing right of way. One of the most common tension points between modes occurs between transit vehicles and people cycling in the curb adjacent lane. While the biking and transit networks can have similar co-benefits as walking and transit, bikes and transit vehicles often share space, which can be a potential conflict and can degrade the functionality of both networks.

Identifying the locations where this occurs and considering the context and limitations of the current design of that roadway, is the first step to developing policy and design guidance to alleviate conflict and promote bike and transit networks that work in unison. To find potential conflict points, the project team looked at the existing transit network, and overlaid the planned on-street bike infrastructure to identify street segments where these networks overlap. The multi-use pathway network was not used in this analysis as the location of the facility is outside of the travel lanes. **Table 7-7** below lists the roadway segments and length where overlap in the networks occur. 13 Street N and 13 Street S are both extended areas where conflict occurs.

Table 7-7: Cycling and Transit Conflict Segments

Roadway Name	Length (km)
Scenic Drive S (at 16 Ave)	0.0[5]
15 Avenue N	0.2
18 Street N	0.2
7 Street S	0.2
16 Street N	0.3
3 Avenue S	0.7
9 Avenue S	0.7
Highlands Boulevard W	0.7
10 Avenue S	0.8
4 Avenue S	0.9
9 Avenue N	1.1
1 Avenue S	1.3
5 Avenue N	1.4
13 Street N	1.8
13 Street S	2.2
Total	**12.5**

In **Figure 7-11**, the orange roadway segments highlight the areas where improved design or policy guidance will be needed to address these conflict areas.

[5] Less than 0.1km in length

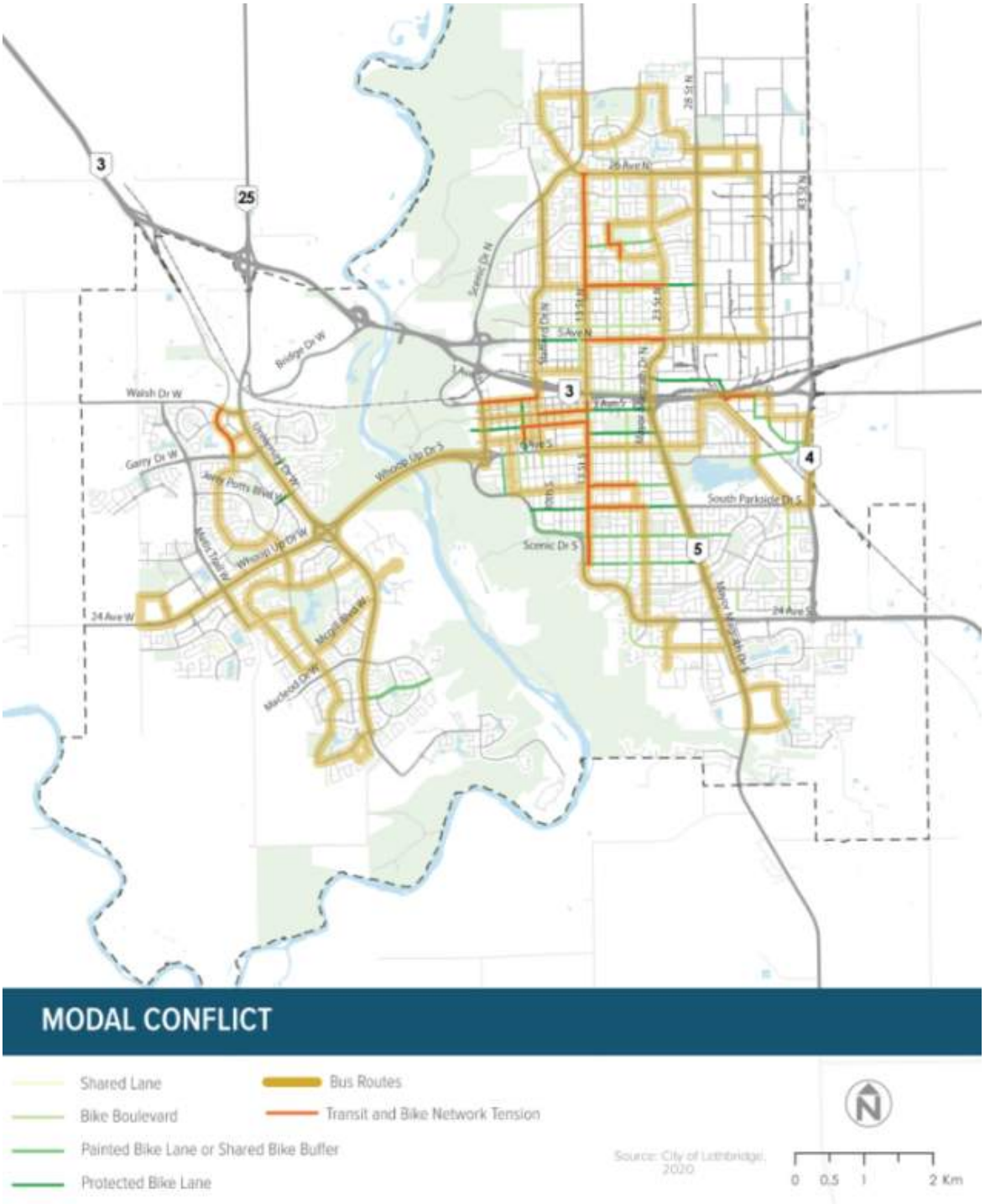


Figure 7-11: Bicycle Route/Transit Route Friction
Source: Nelson Nygaard

7.5 Future Accessibility Needs

7.5.1 UNIVERSAL DESIGN PRINCIPLES

Universal design, in the context of the transportation network, facilitates transit access, system equity, and ease of movements for all users, especially people using wheelchairs or mobility devices, the elderly, people with children and strollers, and people carrying groceries or packages. It employes tactile, visual, and audible design elements together to guide people of all abilities through the street environment.

The application of the 7 principles of Universal Design principles will allow for freedom of mobility for all residents and visitors to the City of Lethbridge. These principles are described as follows:

Principle 1: Equitable Use - The design is useful and marketable to people with diverse abilities.

Principle 2: Flexibility in Use - The design accommodates a wide range of individual preferences and abilities.

Principle 3: Simple and Intuitive Use - The design is easy to understand and use, regardless of the user's experience, knowledge, language skills or current concentration level.

Principle 4: Perceptible Information - The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

Principle 5: Tolerance for Error - The design minimizes hazards and the adverse consequences of accidental or unintended actions.

Principle 6: Low Physical Effort - The design can be used efficiently and comfortably and with a minimum of fatigue.

Principle 7: Size and Space for Approach and Use - Appropriate size and space are provided for approach, reach, manipulation, and use, regardless of the user's body size, posture, or mobility.

An accessible transportation network provides all users with the opportunity to freely navigate their environment and participate fully in the community. Universal design, which considers the needs of various individuals such as those with disabilities, seniors, parents with strollers, and children, is important in creating an inclusive environment for everyone.

7.5.2 KEY SITES TO CONSIDER ACCESSIBLE TRANSIT STOPS

The City of Lethbridge has many support services, senior residences, and other key sites clustered in the downtown core, Senator Buchanan and Winston Churchill communities. However, outside of the 3 key areas, sites are widely dispersed throughout the city. It is crucial to prioritize the placement of accessible transit stops in areas that have been identified as high priority to ensure the people can easily access

resources, entertainment, housing, medical services, and support services. **Figure 7-12** provides an overview of destinations requiring accessibility and high priority areas for future improvements.

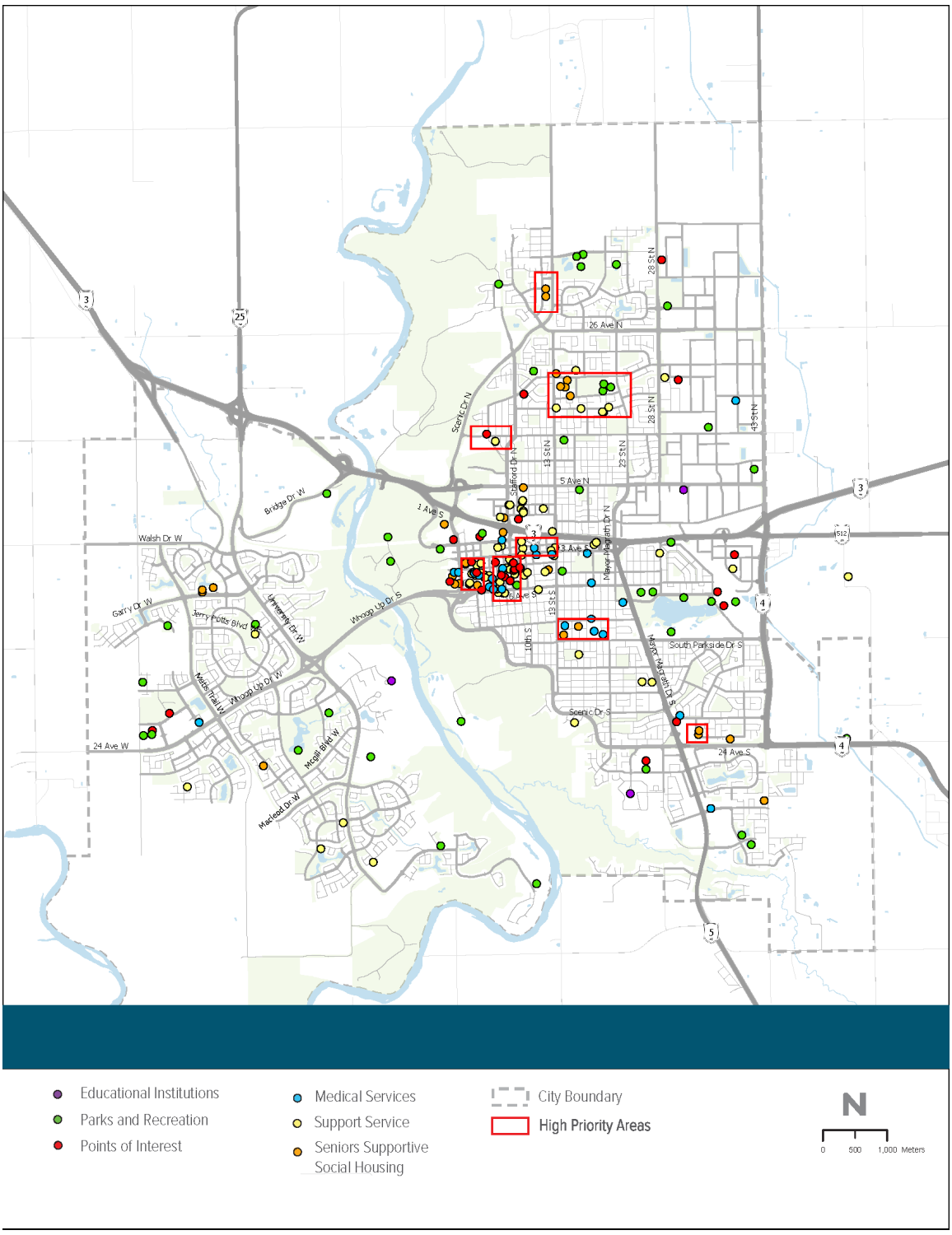


Figure 7-12: Transit Stops Near Destinations with High Accessibility Need
Source: Level Playing Field

7.5.3 ACCESSIBLE TRANSPORTATION POLICIES

Using data from the existing conditions accessibility assessment, engagement sessions, accessible need destination analysis, and universal design principles, the following policies aim to improve accessibility in the City of Lethbridge:

- The provision of affordable and accessible mobility choices, such as Access-A-Ride, available on an as-needed basis to ensure residents can access community resources at any time.
- Universal design principles to be applied in all aspects of the planning, design, operation and maintenance of transportation infrastructure and services.
- The transit network, including all vehicles and supporting infrastructure (such as sidewalks and bus stops), shall be designed, and built to Universal Design standards, over and above National Building Code of Canada (NBC) requirements.
- Accessible bus stops to be provided at high-priority locations in the short-term, and medium and low-priority locations in the long term.
- Directional ramps with functional connections to active mode networks should be provided at the corners of intersections, along with a Complete Streets strategy to ensure all exterior paths of travel connected to public transit are accessible.

7.5.4 PREVIOUS POLICY SUPPORT

Transportation specific policies from previously approved plans are summarized below.

Mobility/Accessibility Master Plan

- Ensure City Assets are Accessible for All Abilities (pg. 68):
  Ensure the needs of all are considered in designing the physical environment.
- Develop Consistent Mobility/Accessibility Guidelines & Standards (pg. 75):
  Develop Lethbridge-specific and consistent mobility and accessibility guidelines and standards to create predictability in the physical environment for users.
- Prioritize Planned Mobility & Accessibility Improvements (pg. 81):
  Create a comprehensive prioritization matrix with suitable criteria to help inform City investment and decision-making.
- Explore an Accessible Door to Accessible Door Transportation Service (pg. 91):
  Facilitate with partners the feasibility of establishing an accessible door-to-accessible door 24/7

service.

- Manage Access-A-Ride Demand (pg. 93):
  Ensure Access-A-Ride is a convenient, efficient, and viable transportation service for those with mobility challenges.

Transportation Safety Plan

- Focus Area #4: Adopt mobility/accessibility guidelines.

Municipal Development Plan

- Policy 122 - Promote improved accessibility by incorporating opportunities for multimodal transportation and accessibility into commercial development through Land Use Bylaw regulations.
- Policy 123 - Promote social, environmental, and economic sustainability by continuing to provide public transit that is safe, inclusive, cost-effective, and customer-focused.
- Policy 124 - Ensure that the transportation needs of all residents - regardless of their mode of transportation, age, physical mobility, or socioeconomic status - are met, by establishing Complete Streets Guidelines.
- Policy 130 - Ensure a robust multimodal transportation network, by requiring that proposed amendments to existing Area Structure Plans and Outline Plans only be supported if they maintain or increase the walkability, connectivity, and multi-modal transportation options in the plan area.
- Policy 131 - Support multi-modal transportation options by exploring opportunities for the creation of transit-oriented development throughout the city.
- Policy 132 - Ensure that public transit is integrated with community planning and design by requiring it be addressed in all new Area Structure Plans, Area Redevelopment Plans, and Outline Plans.
- Policy 135 - Promote barrier-free accessibility throughout the city by encouraging the application of Universal Design principles and backing the recommendations of the Mobility/Accessibility Master Plan.
- Policy 136 - Ensure improved access to commercial, institutional, and industrial developments, by:
  - Requiring the provision of direct, convenient pedestrian access from adjacent existing or planned sidewalks, pathways and bus stops to any primary building located on a commercial, institutional or industrial site, where possible.
  - Requiring that commercial and institutional developments provide direct, convenient, and efficient access between adjacent sites for pedestrians and vehicles.
- Policy 137 - Promote the safety of users of all modes of transportation by continuing to implement the recommendations of the Transportation Safety Plan, if and when this plan is approved.

7.6 Future Goods Movement Servicing

As the industrial areas of North Lethbridge (Sherring Industrial Park and north Sherring Future Development Area) continue to expand, it will be necessary to expand the current heavy truck network along the following corridors:

- 28 Street N to 62 Avenue N.
- 62 Avenue N between 28 Street N and 43 Street N.
- 44 Avenue N (Cavendish Road) between 28 Street N and 43 Street N.
- There is a potential for Chinook Trail from Highway 3 to Scenic Drive to be added to the future Goods and Trucks network, but more in-depth examination of environmental impacts will first need to be investigated.

The revisions to the future trucks and dangerous goods route are shown in **Figure 7-13.**

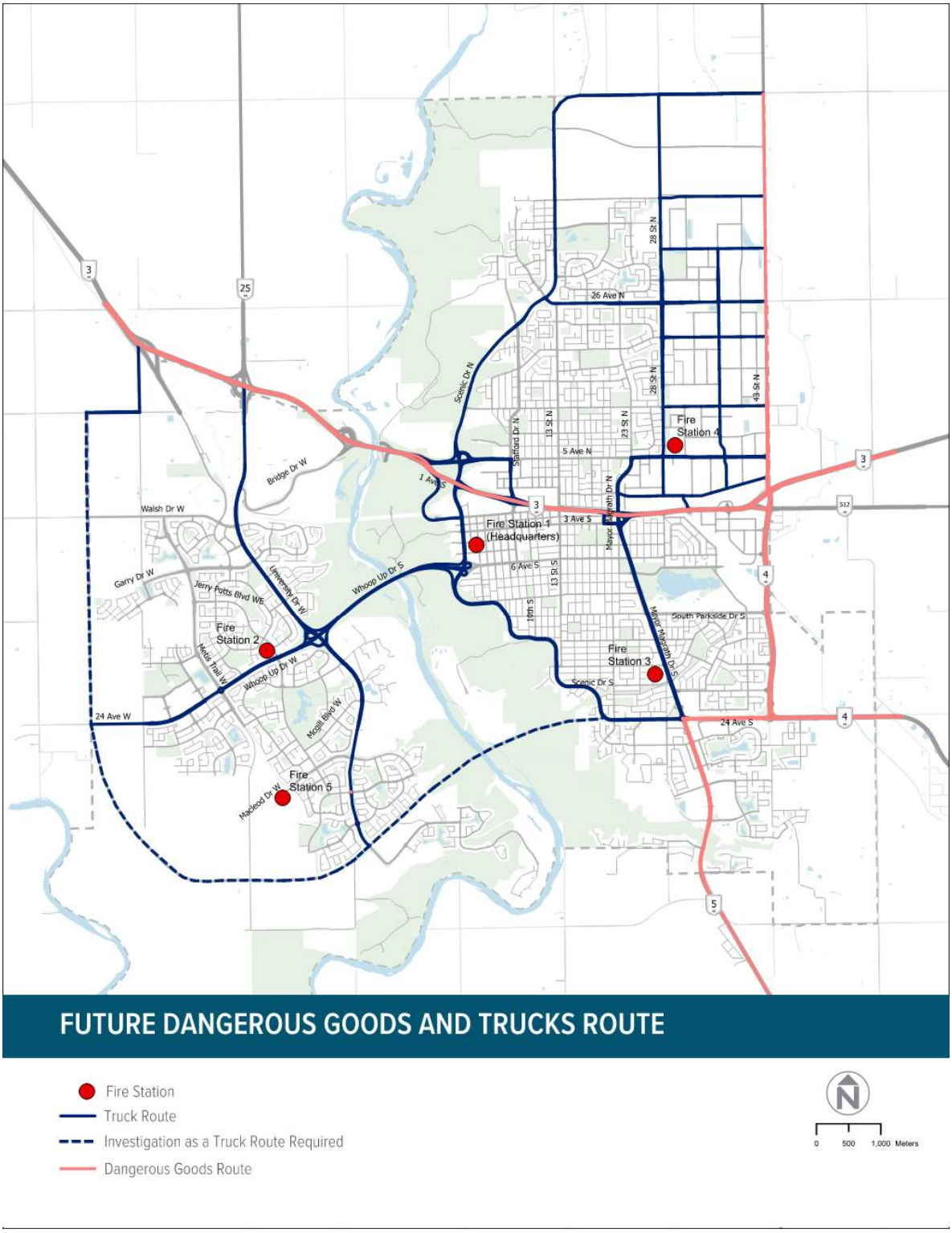


Figure 7-13: Proposed Future Trucks & Dangerous Goods Routes

Source: Stantec

7.7 Future Travel Characteristics and Patterns

As Lethbridge continues to experience a growth in population and employment, traffic growth is anticipated. The Lethbridge travel demand model quantitatively estimates how and where the traffic growth will occur. This is provided as **Table 7-8**.

Table 7-8: Forecasting Trip Activity in Lethbridge

Trip Pair Type	Attribute	Estimate/Forecast Year			
		2019	2029	2039	2069
Internal West Lethbridge	Activity	53,900	93,100	125,300	212,500
	Growth from 2019		73%	132%	294%
	Percent of Total	13%	18%	21%	26%
Internal East Lethbridge	Activity	206,800	250,300	267,500	351,100
	Growth from 2019		21%	29%	70%
	Percent of Total	51%	48%	45%	43%
Bridge Crossing	Activity	61,700	77,300	83,700	91,100
	Growth from 2019		25%	36%	48%
	Percent of Total	15%	15%	14%	11%
County/Through	Activity	84,800	99,800	112,400	160,200
	Growth from 2019		18%	33%	89%
	Percent of Total	21%	19%	19%	20%
Total	**Activity**	**407,200**	**520,500**	**588,900**	**814,900**
	Growth from 2019		**28%**	**45%**	**100%**
	Percent of Total	**100%**	**100%**	**100%**	**100%**

Proportionally, the part of the city west of the Oldman River is forecast to have a higher rate of population and employment growth than the parts of the city east of the river. Similarly, much of the future growth is expected on the edges of Lethbridge on undeveloped land, rather than within the core neighbourhoods as redevelopment.

It is important to note that travel demand model practice is to assume that today's travel behavior for a typical household should be projected to be similar in the future. While it is possible to change behavioral assumptions in a travel demand model, it is generally not considered as methodologically valid as there are not valid methods for expecting this to happen. Behavioral changes due to external forces such as more work-from-home, home schooling, work week adjustments, autonomous driverless vehicles or other societal, technological or behavioral changes are possible and even likely to some extent. These kinds of changes should be monitored and should be incorporated as appropriate in future travel demand model updates.

7.8 Return to Pre-COVID Conditions

From the beginning of the COVID-19 pandemic until summer 2022, the City of Calgary was proactive with their data collection, monitoring, and reporting of mobility trends for all modes. Their final report (July 03, 2022) offers useful insight around the recovery of mobility patterns towards 2019 pre-covid conditions that will be relevant to Lethbridge. Additionally, permanent counter data from Whoop-Up Drive W and 13 Street N provides a month-by-month comparison of the average daily traffic for every month in 2019 through 2022. This section begins with a review of that local data.

7.8.1 AVERAGE DAILY TRAFFIC (LETHBRIDGE)

Data from the permanent traffic counters located on Whoop-Up Drive W and 13 Street N was used to create the charts shown in **Figure 7-14** and **Figure 7-15** respectively. In both charts, average daily traffic volumes at those locations are shown for each month from 2019 through 2022. At both locations, a noticeable drop (30% to 40%) occurs in April 2020 when COVID-19 restrictions began. Despite this, traffic volumes nearly recovered during the summer months of that year and dropped again (~15%) moving into the 2020-2021 winter season. This may, in large part, be due to school closures. Overall, Average Annual Daily Traffic (AADT) for the entire year was 10-15% lower than 2019. By the summer months of 2022, however, both locations showed a full recovery in Average Daily Traffic. In 2022, AADTs had returned to 96% of 2019 traffic volumes on Whoop Up Drive and 93% of 2019 traffic volumes on 13 Street N.

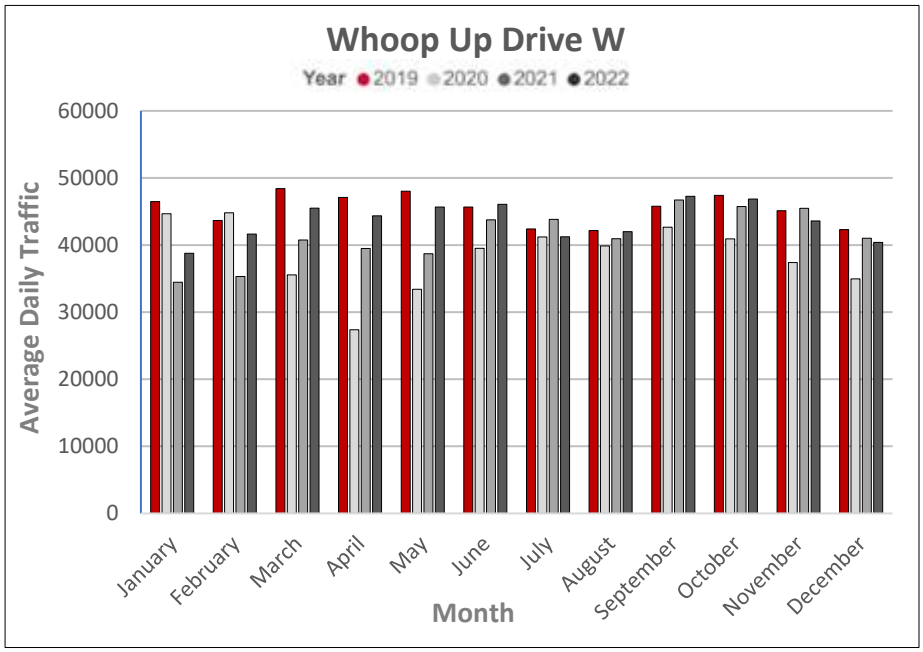


Figure 7-14: Whoop Up Average Daily Traffic (2019-2022)
Source: City of Lethbridge

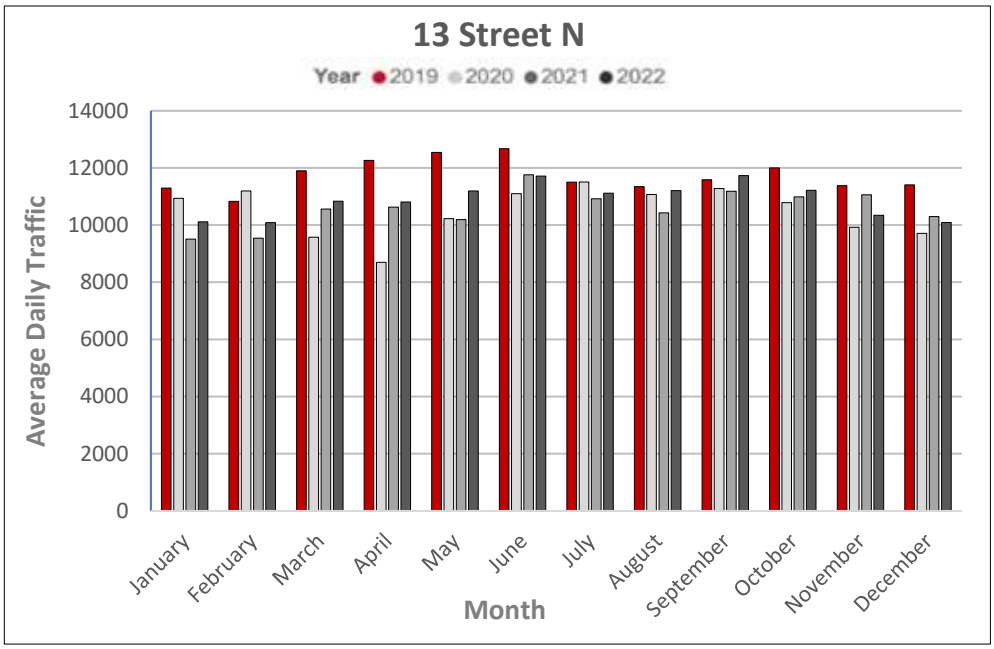


Figure 7-15: 13 Street N Average Daily Traffic (2019-2022)
Source: City of Lethbridge

7.8.2 DAILY WEEKDAY TRAFFIC (CALGARY)

The City of Calgary undertook a similar analysis for weekday daily traffic at a central location (Louise Bridge) and a suburban location in the northeast at McKnight Boulevard near 36 Street NE.

Figure 7-16 shows a more dramatic drop-in activity (70%) at the central location than the suburban location (~50%) in the early days of the COVID-19 restrictions (March 2020) and a slightly slower recovery in 2022. As Calgary's downtown is the epicentre of offices and some employees were continuing to work remotely in 2022, this is the likely explanation for this geographic difference in traffic recovery.

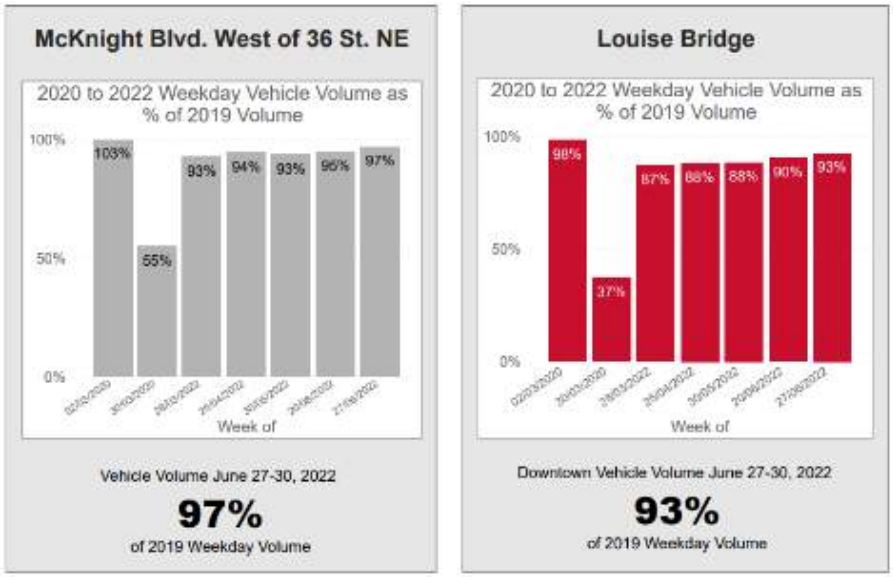


Figure 7-16: 2019 to 2022 Daily Volume Comparison

Source: City of Calgary Mobility Trends During COVID (Feb 2021 ITE Webinar)

7.8.3 HOURLY WEEKDAY TRAFFIC (CALGARY)

Hourly traffic volume at the same central location (Louise Bridge) was analyzed to show differences in traffic patterns by time of day. As **Figure 7-17** shows, there was a significant decline in traffic volumes at all hours during the restrictions of March 2020, particularly for the inbound (southbound) morning traffic and outbound (northbound) afternoon traffic. At both locations, travel patterns had almost fully recovered by May 2022 though the peaks have not quite reached pre-pandemic levels. These results are clearly related to commuter trips to/from the downtown core.

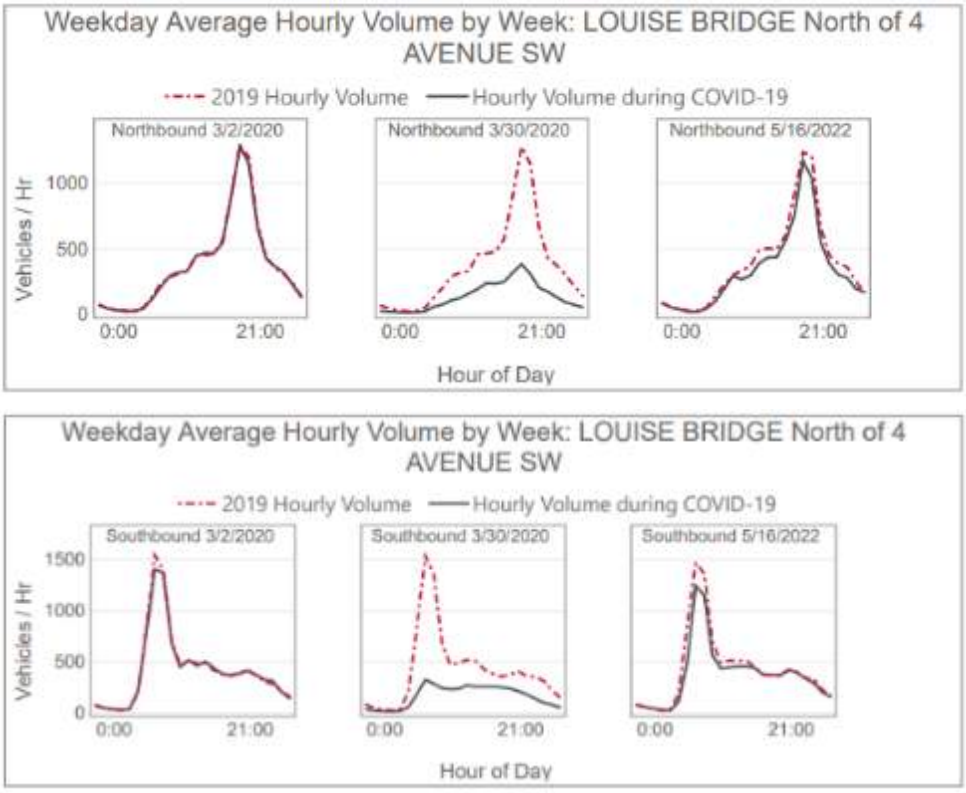


Figure 7-17: Average Weekday Hourly Volume by Direction at Louise Bridge
Source: City of Calgary Mobility Trends During COVID (Feb 2021 ITE Webinar)

7.8.4 TAXI & RIDESHARE (CALGARY)

The City of Calgary monitored city-wide monthly taxi and rideshare trips from 2019 to 2022 to examine the impacts that COVID-19 restrictions had on this travel service. This data, summarized in **Figure 7-18**, shows a dramatic decline beginning in March and dropping to the lowest levels (~20% of 2019 levels) by April. There was a slow recovery through 2020 to 50% of 2019 levels. 2021 had a slow start in the first half of the year with activity reaching 75% of 2019 levels in the second half. By May of 2022, taxi and rideshare trips had almost fully recovered.

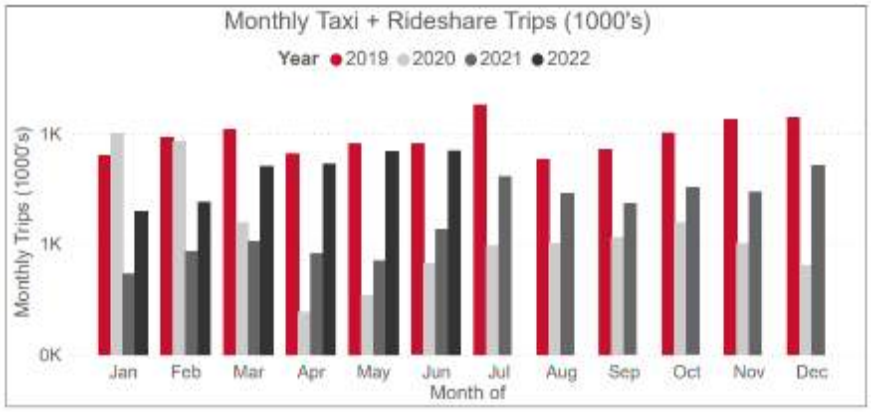


Figure 7-18: Monthly Taxi + Rideshare Trips
Source: City of Calgary Mobility Trends During COVID (Feb 2021 ITE Webinar)

7.8.5 MEDIUM TRUCKS, BUSES & HEAVY TRUCKS (CALGARY)

Figure 7-19 shows the daily truck and bus activity from early 2020 to mid-2022. Interestingly, this is one area of transportation activity that was impacted the least by COVID-19. Other than an obvious dip in March/April 2020 when aggressive isolation restrictions were first imposed, recovery was swift. Heavy truck activity returned to normal levels within 1 to 2 months. Medium trucks and buses returned to normal levels within 4 months.

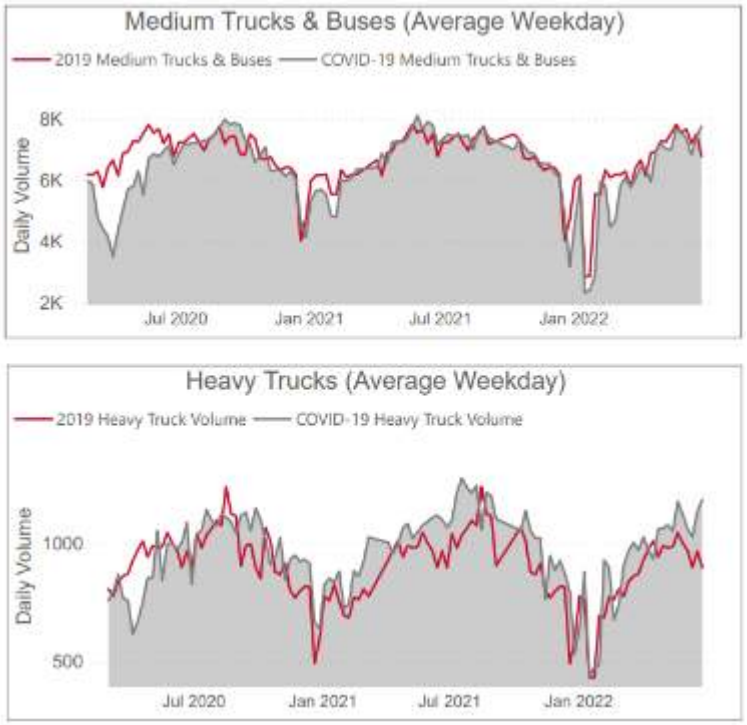


Figure 7-19: Medium Truck & Buses, Heavy Truck Weekday Activity
Source: City of Calgary Mobility Trends During COVID (Feb 2021 ITE Webinar)

7.8.6 CALGARY PATHWAYS

The City of Calgary has permanent e-counter locations throughout the city. Two locations were examined in **Figure 7-20** – Memorial Drive near the City Centre, and South Glenmore, a popular recreational area in southwest Calgary. The figure shows a slight decline in 2020 and further decline in activity in 2021 before a full recovery in 2022 near the City Center. In southwest Calgary, a dramatic increase in weekend activity in 2020 during the warmer months was followed by a gradual return to pre-covid volumes by 2022.

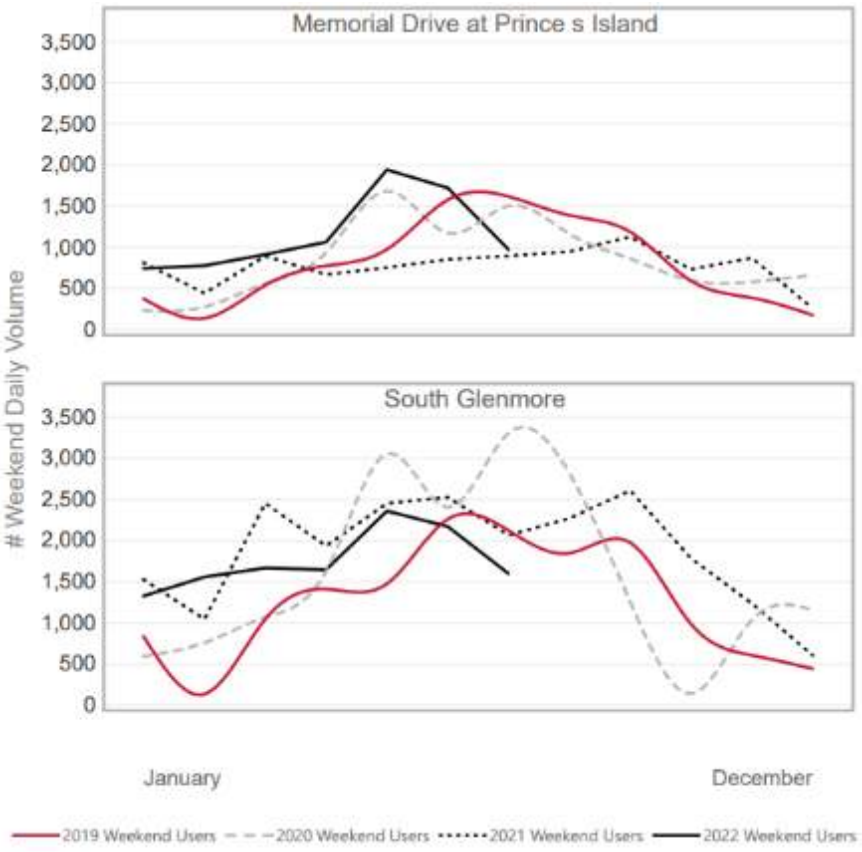


Figure 7-20: Pedestrians & Cyclist Activity by Month
Source: City of Calgary Mobility Trends During COVID (Feb 2021 ITE Webinar)

7.8.7 COMMUNITY ACTIVITY (NORTH AMERICAN TRENDS)

Big data producers like Google have published COVID-19 mobility summaries providing insights into community activities. **Figure 7-21** shows a summary of grocery, retail, workplace, residential and transit activities for 2020 through mid-2022 as compared against a baseline of that activity. Conclusions that can be drawn from this data include:

- Grocery and pharmacy activity surged over 20% in the early months of COVID-19 restrictions, then dropped to 20% below normal in the following months before returning to normal in mid-2020.
- Retail and recreation activity dropped dramatically (60% below normal) in the early months of the COVID-19 restrictions, and then recovered to only within 20% to 40% of normal activity through to mid-2021.
- Workplace activity dropped to 60% below normal in the early months of the COVID-19 restrictions and had recovered very slowly to 30% below normal by the end of 2020. This remained stable until early 2022 when workplace activity recovered to within 20% of normal.

- Residential activity increased to 25% above normal in the early months of COVID-19 restrictions and did not return to normal until mid-2022.
- Transit activity dropped dramatically (70% below normal) in the early months of COVID-19 restrictions and recovered slightly to 50% of normal over the course of 2020. There was a gradual recovery through 2021 and it was not until mid-2022 that transit activity had returned to within 20% of normal.

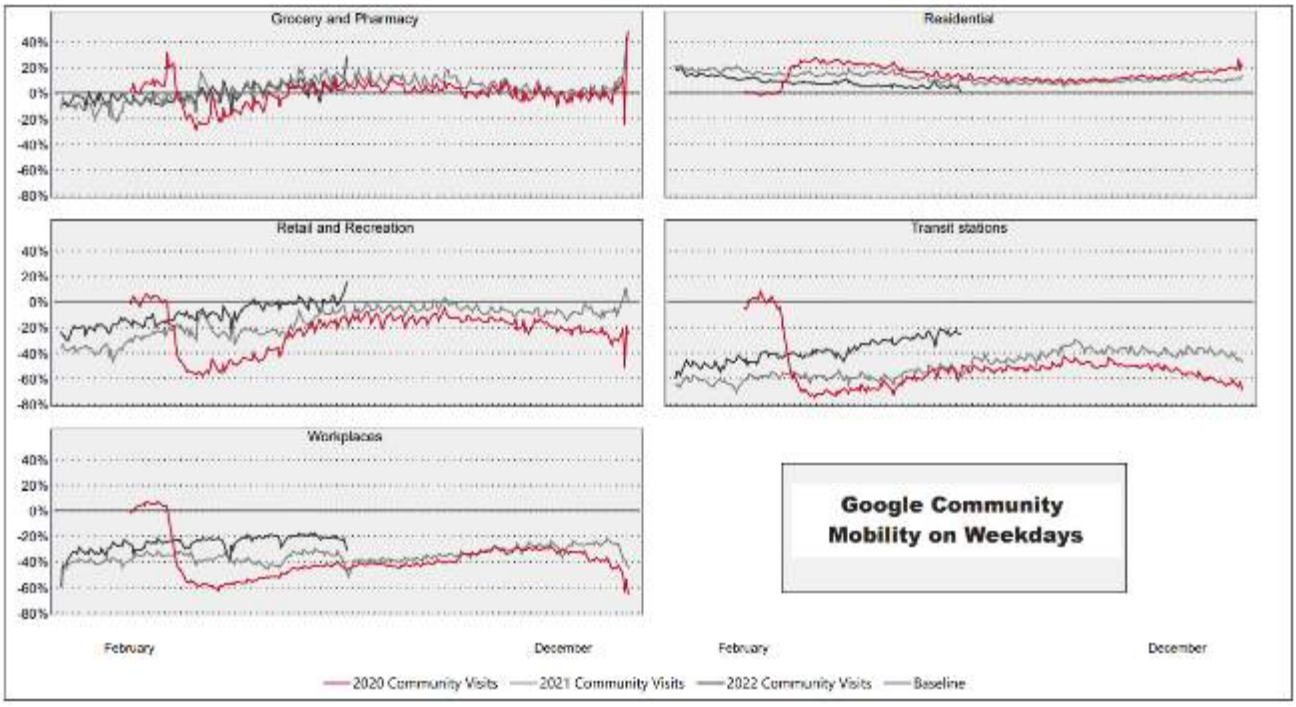


Figure 7-21: Community Visits by Purpose Type
Source: City of Calgary Mobility Trends During COVID (Feb 2021 ITE Webinar)

7.8.8 IMPACTS OF HYBRID WORKING CONDITIONS

Travel behavior often changes based on several factors, such as auto ownership, auto operating costs, technological changes resulting in different work rules and hours, job descriptions, online shopping and related factors that affect travel behavior. Most recently, the COVID-19 pandemic resulted in accelerated changes to some behaviors, and even created new ones. For example, work-from-home (WFH) has been emerging as a popular option for a variety of job descriptions at a full-time or partial level, and the option increased greatly during the pandemic. Remote work assignments are becoming more common, enabling Lethbridge residents to earn incomes that before required physical relocation to other cities. Even with the easing of the pandemic, some changes will remain but likely at a lesser level of importance. Though these changes will not be easy to quantify until they become stable over a few years, data suggests that traffic has now returned to 2019 levels and will continue to grow at historical growth rates. Monitoring of these behavior trends will also be important to ensure that the recommendations in this TMP remain relevant in the future.

7.9 Third Bridge Assessment

7.9.1 BACKGROUND

Stantec undertook an updated assessment of a third bridge crossing of the Old Man River, an important element on the City of Lethbridge's transportation network that has been discussed for decades. This assessment built on previous work undertaken by the City of Lethbridge, Alberta Transportation (AT), and AECOM. The purpose of this assessment was to summarize this previous work, update any previous information that has changed, provide forecasted daily traffic volumes for the crossing options with the new transportation demand model used for this TMP, and update construction costs.

Previous work conducted in 2009, in the form of a Circulation Road Study for the City of Lethbridge, sought to establish the long-term roadway needs of the City by evaluating three options for a potential new circulation road access across the Oldman River: the Chinook Trail alignment, the Popson Park alignment, and no additional crossing. The two alternative alignments are shown in **Figure 7-22**.

Nine criteria were considered in the evaluation of the bridge design: community assessment, recreation impact, environmental impact, historical resources impact, transportation impact, traffic noise impact, hydraulic impact, geotechnical impact, and fiscal impact. The updated assessment identified three potential new criteria for future evaluation including: traditional knowledge assessment, stormwater assessment, and impacts to existing planning.

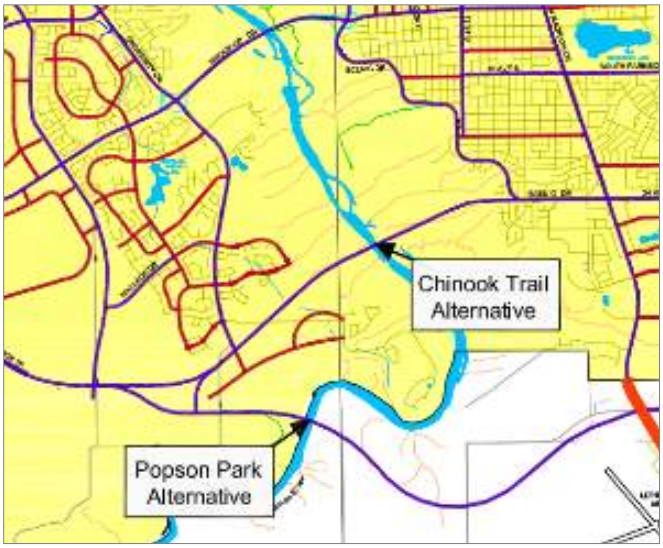


Figure 7-22: Third Bridge Crossing Alignment Alternatives
Source: Figure 9, 2010 City of Lethbridge Circulation Road Study, AECOM

7.9.2 UPDATED ASSESSMENT FINDINGS

Cost estimates were updated to 2022 costs based on changes in land value, material and construction costs. The Chinook Trail alignment was estimated to require $190 million and the Popson Park alignment $280 million. Since this assessment, cost estimates for the preferred Chinook Trail alignment have been

further examined. The latest estimates are $130 million for the segment between Scenic Drive and University Drive over the ravine (including $90 million for the bridge structure) and $98 million for the remainder of Chinook Trail between University Drive and Walsh Drive for a total of $228 million.

Upon reviewing the criteria and updating the parameters, there was no clear evidence that the City needed to amend the previous Council decision of preserving the Chinook Trail alignment as the future third river crossing. The Chinook Trail crossing attracts a larger traffic volume than the Popson Park crossing. This, coupled with the cost savings, would provide better value for dollars spent.

As development continues west of the Old Man River, traffic volumes across the river will continue to grow. According to initial analyses using the newly created Lethbridge Travel Demand Model, even if the third bridge is constructed as a four-lane facility (two lanes in each direction) the Whoop Up Drive bridge will still move at a slow speed in the ultimate horizon (2069), indicating that a 6-lane bridge will ultimately be required at the Chinook Trail alignment. While the pace of population and employment growth in West Lethbridge as well as the public level of acceptance for congestion will determine the best date to open the third bridge in its proposed location connecting Chinook Trail to Scenic Drive S, preliminary analysis suggests the best date for opening appears to be sometime between 2030 and 2040. As the model was refined, analysis suggested that the new river crossing is not needed until sometime between 2039 and 2069. Considering the results of the preliminary analysis, the Third Bridge will likely be needed closer to 2039 than 2069. By the ultimate buildout, the Third Bridge is estimated to have volumes similar to Whoop Up Drive today if travel behavior continues to be similar to today's conditions.

On October 11, 2022, City Council received the Third Bridge River Crossing review and filed it as information.

7.10 Summary of Future Transportation Network Assessment

7.10.1 PEDESTRIAN OPPORTUNITIES

Specific areas for pedestrian improvements identified through analysis include:

- Improve access to transit by placing a high priority on sidewalk installation in areas with low sidewalk coverage like the Churchill Industrial Park and Sherring Industrial Area. (Figure 7-6)
- Remove barriers for pedestrians at roadway crossings, particularly in the industrial areas in northeast Lethbridge, the Commercial and Retail centers in South Lethbridge, and multiple areas of West Lethbridge. Analysis shows that downtown does not have significant issues due in large part to the density of signalized intersections and short blocks. (Figure 7-7)
- Improve pedestrian crossings near transit particularly in the industrial area of North Lethbridge, and some areas in the south part of South Lethbridge. (Figure 7-9)

7.10.2 CYCLING OPPORTUNITIES

Specific areas for cycling improvements identified through analysis include:

- Install more protected cycling infrastructure in existing and new areas.
- Improve cycling infrastructure at intersections analyzed as more difficult to cross. This includes intersections in North Lethbridge industrial areas, some areas in South Lethbridge, most communities in West Lethbridge. (Figure 7-10)
- Install floating bus stops along combined bicycle/transit corridors like 13 Street. (Figure 7-11)
- Expanding the pathway network, particularly in the river valley including a new river crossing for active modes.

7.10.3 ACCESSIBILITY OPPORTUNITIES

Specific accessibility improvements identified include:

- Install directional wheelchair ramps with TWSI treatments that lead users directly across a street and not at a 45-degree angle.
- Ensure pedestrian paths of travel, connections to public transit, intersections, curbs cuts and crosswalks meet or exceed accessibility standards (CSA B651HB).
- Adding additional accessible transit shelters.
- Improve wayfinding signage/traveler information.
- Affordable Access-A-Ride with more availability.
- Improvements should focus on high priority destinations as shown in Figure 7-12 including the downtown area, the hospital area and the Winston Churchill community.

7.10.4 ROADWAY OPPORTUNITIES

Specific roadway opportunities include:

- Adopt Figure 7-4 as the new classification map (including the Chinook Trail Bridge).
- Build a Third bridge along the Chinook Trail alignment.
- Expand trucks and dangerous goods network in North Lethbridge.
- Construct the roadway network as identified in Figure 7-3.

8 SUPPORTING INITIATIVES AND STRATEGIES

8.1 Current Initiatives and Strategies

The following supporting initiatives and strategies are already underway by the city:

8.1.1 PROGRAMMED/PLANNED REGIONAL IMPROVEMENTS

Cor Van Raay LINK Pathway

Planning and fund raising is already underway for the first phase of a 15 km pathway linking the City of Lethbridge with the Town of Coaldale. The trail is adjacent to the St. Mary River Irrigation District canal, Canada's largest irrigation canal and pipelines (over 2,000 kilometers) providing water to over 150,000 hectares of land south of the Oldman and South Saskatchewan Rivers between Lethbridge and Medicine Hat, Alberta.

8.1.2 COMPLETE STREETS POLICY AND DESIGN GUIDELINES

The completion of a Complete Streets Policy and corresponding revisions to the current Design Standards, should be a high priority for the City. Retrofitting existing streets and conditioning development of new complete streets without an approved policy or design standards can be challenging. An approved policy will provide staff with the Council support to prioritize complete streets operational and design principles, and hold collaborating City departments and the development industry accountable to adherence with that policy. It is recommended that the policy/guidelines be a living document that is updated every three years and re-approved by Council.

8.1.3 MOBILITY/ACCESSIBILITY MASTER PLAN

There is significant overlap between the objectives of the Transportation Master Plan and the Mobility/Accessibility Master Plan, particularly in the areas of universal design, accessible transit, accessible detours, and winter considerations. The City should continue to prioritize the implementation of this long-term visionary plan to create a universally accessible city that is designed for all people regardless of ability, where everyone can meaningfully contribute to and actively engage with their community.

8.1.4 TRANSIT MASTER PLAN

The Transit Master Plan was developed in response to the Integrated Community Sustainability Plan, which envisioned a future with cleaner air, cleaner water, and fewer greenhouse gas emissions. The vision from the Transit Master Plan is "Helping move Lethbridge into the future." The Transit Master Plan was designed to be implemented in multiple phases. It begins with adjustments to routes and recommends gradually increasing transit frequency as funding permits.

8.1.5 PERMANENT COUNT STATIONS

Installing permanent count stations for cars and bikes in Lethbridge has many benefits. These stations collect important information about how much traffic there is and how it moves. This helps the city determine where to make transportation better and find ways to reduce congestion. The count stations can show where to improve things like bike lanes or places for people to cross the road, making it safer and easier for everyone to get around. By keeping track of this information regularly, the City can also see how traffic changes over time and make sure improvements are working well. Putting these count stations in strategic locations (e.g. Old Man River crossings, expressways, railways) and around the major entrances to the downtown will help determine how many people are coming in and out of those areas.

Lethbridge currently has four motor vehicle permanent count station locations:

- 13 Street N, just south of 9 Avenue N.
- Whoop Up Drive W just east of University Drive W.
- Scenic Drive N, just north of the 102 Scenic Drive N access.
- 43 Street N just south of 2 Avenue N.

There are several locations in Lethbridge where additional permanent count stations for cars and bikes would be beneficial for the transportation network. Here are some potential locations and their benefits:

Motor Vehicle Counters:

Mayor Magrath Drive: Mayor Magrath Drive is a major thoroughfare in Lethbridge that experiences high volumes of traffic, particularly during peak hours. By installing permanent count stations along this corridor, the city can gather data on traffic volumes and identify areas of congestion, allowing for targeted congestion mitigation strategies.

University Drive W: University Drive W is a major thoroughfare in West Lethbridge that will experience high traffic volumes in the future. Counters north of Columbia Boulevard W and at the rail crossing south of Bridge Drive W would track the traffic demand on this primary corridor.

Scenic Drive S: Scenic Drive S is a primary access road for areas south of Downtown. A counter near 16 Avenue S would help to inform how traffic demand changes in this part of the city.

It is noted that these counts inform overall traffic demand at all times of the day, all days of the week and all months of the year. Any count program should include a wide number of locations where traffic counts should be periodically recorded for reference.

Active Modes Counters:

13 Street S: 13 Street S is a popular cycling route in Lethbridge, connecting the downtown core to residential areas in the south. By installing permanent bike count stations along this route, the city can gather data on cycling volumes and identify areas where cycling infrastructure improvements may be needed.

Scenic Drive Pathway: Scenic Drive is a popular recreational area in Lethbridge that sees high volumes of bicycle traffic, particularly during the summer months. By installing permanent count stations along this route, the city can gather data on bicycle volumes, informing the development of targeted active transportation improvements.

Mayor Magrath Drive Pathway: Mayor Magrath Drive is a major thoroughfare in Lethbridge with a pathway on the east side connecting north and South Lethbridge. As one of the only protected bike facilities connecting the north and south parts of the city, it acts as a major route for the bike network.

8.2 New Initiatives and Strategies

8.2.1 VISION ZERO STRATEGY

With the adoption of the Transportation Safety Plan (TSP) in 2021, the City of Lethbridge has taken a significant step in prioritizing transportation safety, setting targets for reducing/eliminating serious injuries and fatalities, and developing a comprehensive set of strategies and supporting actions to achieve these targets. While the TSP has all the elements needed to achieve its ambitious targets, after a formal implementation plan has been completed, the City should consider rebranding the TSP to a "Vision Zero Initiative". Not only has this initiative gained international recognition, this "branding" is generally associated with stronger community involvement, and political commitment/leadership to provide direction, ensure resources, and drive progress towards the goal.

8.2.2 TRAFFIC CALMING POLICY AND GUIDELINES

The City of Lethbridge currently has an information brochure that provides information on what traffic calming is, the current warrant procedure in place, and how a resident can make a traffic calming request. The following is a summary of the key information:

- Traffic calming is an effective approach to address existing traffic issues on residential and other low volume roads. These measures are applied to mitigate the negative impacts of traffic, while still maintaining the ability of those roads to effectively move people and goods.
- Traffic calming issues can be nuisance-related (e.g., short-cutting traffic) or safety-related (e.g., speeding).
- Typically, traffic calming involves physical devices, signage, and other visual changes to influence motorists' behaviour and slow speed.
- Every request warrants a site visit so that engineers can understand the context of the area and determine, if warranted, the best traffic calming solution.

A formal traffic calming policy, including intake procedures, warrants, priority areas, and design guidelines would help the City of Lethbridge streamline the traffic calming implementation process and mitigate the high priority locations first.

8.2.3 ROUNDABOUT IMPLEMENTATION AND DESIGN GUIDELINES

The City of Lethbridge currently has a 2-page brochure describing what roundabouts are, why they are used, and general rules for different users.

Roundabouts have proven to be much safer than standard intersections with a reduction in fatal and injury collisions by up to 75% as compared to standard intersections. This is due to the lower travel speeds, and fewer conflict points.

Despite these benefits, roundabouts are not necessarily the best intersection treatment in all locations. Unequal traffic flow from the approaching legs, challenges with accessible crossings for the blind, and high pedestrian volumes can all be factors that impact the decision to implement a roundabout.

It is recommended that the City of Lethbridge develop design guidelines for roundabouts which include guidance around where and when to implement them, and detailed design standards to support their design and implementation.

8.2.4 SMART MOBILITY AND EMERGING TECHNOLOGIES

The emergence of new technologies and new approaches to transportation is broadly categorized as Smart Mobility. More broadly, it is recognized that Smart Mobility builds more resilient and equitable communities by reducing dependence on a single mode of transportation and using information and technology for effective planning, delivery, and execution of smart initiatives.

It is understood that this occurs over a few key domains simultaneously, and the readiness of an agency, company or government to advance Smart Mobility initiatives will not be equal among these. The Smart Mobility Readiness Assessment Tool provides an approach to evaluating and quantifying these domains and identifying an action plan. The process for this is outlined in **Figure 8-1.**

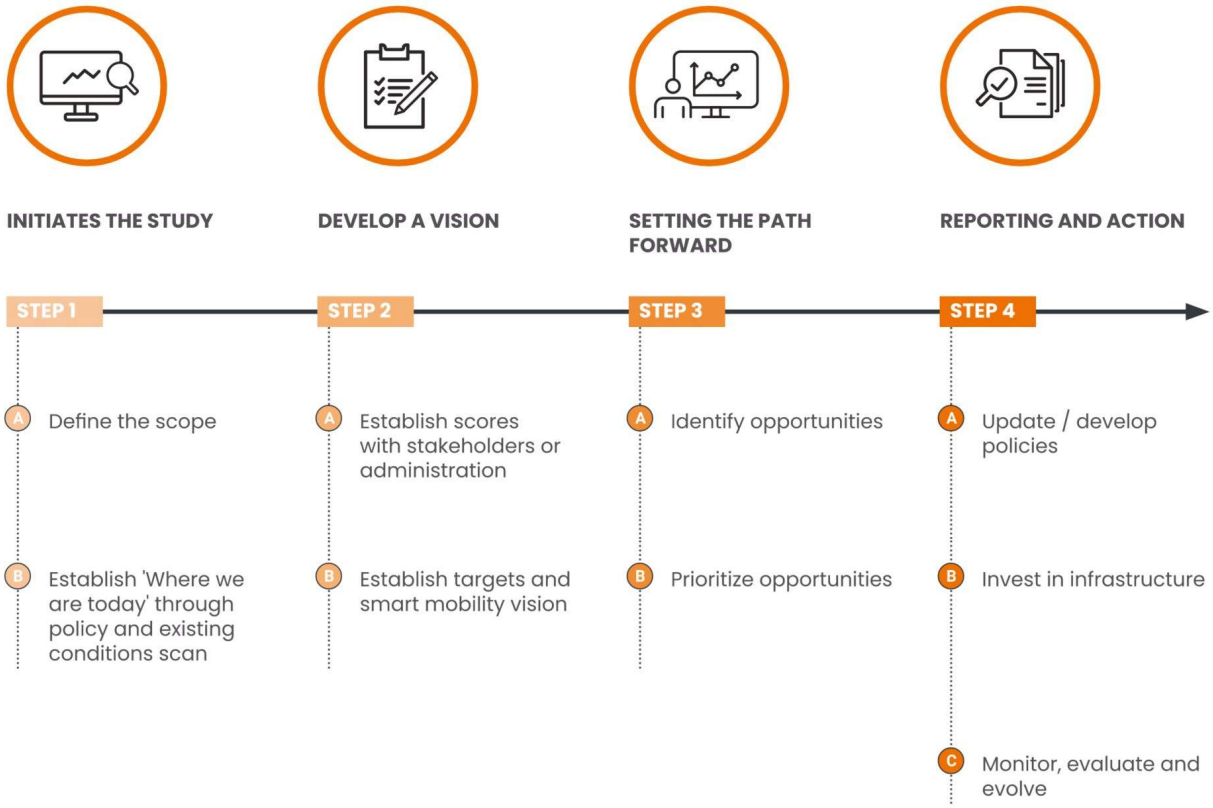


Figure 8-1: Evaluation Approach
Source: Stantec Smart(er) Mobility Sector

The summary and recommendations are provided as part of the accompanying Smart Mobility Readiness Assessment Tool Report (**Appendix E**). This tool evaluates the six domains of Smart Mobility, using a scale which evaluates the presence and sustainability for the components of that domain. While the Readiness Assessment focused on establishing existing scores and future targets, recommended actions that emerged from the Smarter Mobility Readiness Assessment Report include:

- Prioritize multi-modal opportunities in the TMP.
- Smart connected signals.
- Install permanent traffic counters for pedestrians, cyclists, and vehicles.
- Enhance open data and data sharing policies.
- Explore partnerships with local industries for development of a transportation demand management program and/or MaaS platform.
- Deploy a mobility hub at the Lethbridge Regional Park and Ride Transit Terminal.
- Support vehicle electrification.

The full report with additional context surrounding these opportunities and barriers can be found in **Appendix E**.

8.2.5 INTELLIGENT TRANSPORTATION SYSTEMS

The City of Lethbridge can benefit from implementing intelligent transportation system solutions to improve their transportation network in several ways. Intelligent transportation systems can help reduce traffic congestion and improve traffic flow, resulting in shorter travel times and reduced emissions. Real-time traffic data can be used to detect traffic congestion and suggest alternative routes, while smart traffic signals can adjust their timing based on traffic conditions, allowing for more efficient traffic flow.

Intelligent transportation systems can also enhance the safety of the transportation network. For example, connected vehicle technology can alert drivers of potential hazards on the road, such as collisions or road closures. This can reduce the risk of collisions and improve the overall safety of the transportation network.

These systems can improve the efficiency and reliability of public transportation. Real-time tracking and data analytics can be used to optimize routes and schedules, reducing wait times and improving the overall passenger experience. Additionally, smart transit systems can provide real-time information to passengers, allowing them to plan their trips more effectively.

These solutions can also be used to improve accessibility for people with disabilities. For instance, connected vehicle technology can be used to detect pedestrians with disabilities and adjust the timing of traffic signals to give them more time to cross. Additionally, real-time data can be used to suggest accessible routes for people with disabilities, improving their mobility and independence.

The City of Lethbridge has a lot to gain from implementing intelligent transportation system solutions. These solutions can reduce traffic congestion, enhance safety, improve public transit efficiency, reduce emissions, and improve accessibility for people with disabilities. By investing in these technologies, the city can improve the quality of life for its residents and enhance its reputation as a forward-thinking, sustainable city.

Three areas for Lethbridge to focus on for ITS solutions when it comes to traffic signals specifically are:

- The continuation of transit signal priority implementation at intersections along main transit routes.
- Improving bike detection at new intersections by using camera detection technology or sensors to help give cyclists a comfortable experience while enabling them to change the signal when traffic volumes are low.
- The importance and function of limited access highways, including ramp using ramp meters at highway interchanges to make them work more smoothly and help traffic flow better, especially for people going into or out of the city.

8.2.6 TRAVEL DEMAND MANAGEMENT

The City of Lethbridge can benefit from several Travel Demand Management strategies to make more efficient use of the current transportation network that is in place.

Traffic Management Centre (TMC)

Creating a traffic management center (TMC) for the City of Lethbridge can bring several potential benefits and drawbacks. Implementation of a TMC can take a real time approach to managing signals, congestion, and detours within the city. A TMC leverages interconnected infrastructure to meaningfully adjust based on the daily needs of the transportation system. Lethbridge is well positioned for creating a centre as much of the wireless traffic signal communications infrastructure is already in place.

Benefits:

Improved traffic flow: A TMC can collect real-time traffic data from various sources, such as traffic cameras and sensors, and analyze it to identify congestion and collisions. This information can be used to optimize traffic flow and reduce delays.

Enhanced safety: A TMC can also monitor traffic for potential safety hazards, such as speeding or reckless driving. In case of emergencies, the TMC can quickly respond to assist and dispatch emergency services.

Increased efficiency: By centralizing traffic management, a TMC can streamline communication between different departments, such as police and public works, and reduce response times.

Cost savings: By reducing traffic congestion and improving safety, a TMC can lead to cost savings for the city in the form of reduced fuel consumption, fewer collisions, and lower maintenance costs for roads.

Drawbacks:

Cost: Creating a TMC can be expensive, as it requires significant investment in hardware, software, and personnel. The costs associated with operating and maintaining the TMC can also be substantial.

Privacy concerns: Collecting and analyzing real-time traffic data can raise privacy concerns for individuals. A TMC must have robust data security and privacy policies in place to protect sensitive information.

Technical challenges: Integrating multiple data sources and systems can be complex, and technical issues can arise, leading to delays and disruptions in the traffic management process.

System reliability: A TMC must be highly reliable to avoid disruptions in the traffic management process. Equipment failures, power outages, and other technical issues can lead to delays and reduce the effectiveness of the TMC.

In summary, while a traffic management center for the City of Lethbridge can bring many potential benefits, it is essential to carefully consider the associated costs, privacy concerns, technical challenges, and system reliability issues to ensure that the TMC maximize the benefit of this investment for the city.

Parking Strategy

The purpose of a city-wide parking strategy is to efficiently manage both public and private parking resources, which are essential but costly assets. Parking lots and parking spaces contribute to the creation of heat-retaining surfaces due to their asphalt composition. When considering the impact of parking in the city, parking is often provided at front of buildings, impacting access for other modes. A parking strategy would encompass a few key considerations in the context of the city:

1) How is public parking managed and priced? Pricing should bet set to be both be competitive in the market while covering operational expenses for the product and not incentivise personal vehicle use through surplus parking.

2) How is private parking mandated through the current zoning bylaw? Should these rates be adjusted to reduce the environmental and transportation impacts of surplus parking in different development types and neighbourhoods?

3) Are there parking assets the City currently owns which can be repurposed to support other modes (i.e. on street parking converted to bike lanes) or sold for capital investment (i.e. surface parking lots to new development)?

4) What monitoring of both public and private parking should be undertaken to ensure that quality data on parking is accurate and readily available on a continuous basis? This will be necessary to support the ongoing delivery of various TMP objectives.

The City of Lethbridge should develop a parking strategy considering the following benefits while being cognizant of the drawbacks and pitfalls associated with developing and implementing such a strategy.

Here are some of the potential benefits and drawbacks of such a strategy:

Benefits:

Increased revenue: By implementing paid parking in more locations, the City can generate revenue that can be used to fund transportation and infrastructure projects or other public services.

Better parking availability: By introducing additional time restrictions or charges, the City can encourage drivers to park for shorter periods or in different locations, leading to increased parking turnover and availability in high-demand areas.

Improved traffic flow: Free parking can lead to full parking stalls in high pressure areas encouraging drivers to circle around in search of a parking spot, creating traffic congestion as they cruise at a much lower speed than other traffic as they search for parking. By introducing time restrictions or charges, the City can reduce traffic and improve traffic flow by eliminating the need to cruise for parking.

Drawbacks:

Public opposition: The introduction of paid parking or time restrictions can be met with public opposition, particularly from local businesses and residents who may see it as an inconvenience or as an additional financial burden.

Enforcement costs: Enforcing paid parking or time restrictions requires additional resources, such as parking officers or automated ticketing systems, which can be costly.

The parking strategy and its implementation can generate revenue, improve parking availability, and reduce environmental impact preparing the city for additional investment, redevelopment and revitalization in its core areas and its downtown. A parking strategy also needs to consider secure bike parking, secure micro-mobility parking, and transit access. It will be important for the City to carefully consider these factors and engage with stakeholders before implementing any changes to the parking system.

Transportation Demand Management Strategies for Major Institutions/Businesses

The City of Lethbridge can better achieve its transportation goals by delivering employer-focused Transportation Demand Management programming for large employers in the city. Here are some elements that could be delivered as a suite of programming with an employer-focussed transportation demand management program:

Encourage active transportation: The City can work with large employers to encourage active transportation, such as cycling or walking, by providing bike parking facilities, showers, and changing rooms. The City can also work with employers to establish walking groups, cycling clubs, or other incentives that encourage employees to use active transportation.

Implement transit incentives: The City can provide discounted transit passes to employees of large employers, making public transportation a more attractive option for commuting to work. The City can also work with employers to establish shuttle services that connect employees to transit hubs or other locations.

Promote teleworking and flexible scheduling: The City can work with employers to promote teleworking and flexible scheduling to reduce the number of employees commuting to the office. The city can also provide resources and support for employers to establish teleworking policies and practices.

Encourage carpooling: The City can encourage large employers to establish carpooling programs, providing resources such as ride-matching services, priority parking for carpoolers, and other incentives.

Provide education and awareness campaigns: The City can deliver education and awareness campaigns that promote sustainable transportation options and the benefits of using them. The City can also work with large employers to provide training and resources for employees to use sustainable transportation.

By delivering employer-focused Transportation Demand Management programming for large employers, the City can achieve its transportation goals by reducing traffic congestion, improving air quality, and reducing greenhouse gas emissions. Additionally, such a program can help to improve the quality of life for employees by reducing commuting stress and increasing physical activity levels. The program can also benefit employers by reducing parking demand and costs, improving employee satisfaction and retention, and enhancing the company's reputation as a sustainable and socially responsible organization.

Whoop Up Drive Monitoring Strategy

Whoop Up Drive is a key limiting transportation facility in Lethbridge. With only two existing connections to West Lethbridge and significant growth expected in this area, traffic congestion on Whoop Up is

expected to grow. A yearly monitoring plan for Whoop Up Drive in Lethbridge that measure congestion and proposes congestion mitigation strategies will be wise to undertake as any mitigation strategies push off the need for a third bridge at Chinook Trail, a significant capital expense that should be avoided and mitigated as much as possible through interventions in the coming years. To stretch the potential of this crucial community asset, it is recommended that the City of Lethbridge create a monitoring strategy for Whoop Up Drive. This strategy should include:

Continue collecting data on traffic volumes: Continue collecting traffic volume data on Whoop Up Drive during peak and off-peak hours using traffic counters, video cameras, or other tools. This data can be used to establish a baseline for traffic volume and identify periods of peak congestion.

Measuring travel times: Measure travel times on Whoop Up Drive during peak and off-peak hours to determine how long it takes for vehicles to travel through the area. This data can be used to identify areas of congestion and determine the extent of delays.

Conducting surveys: Conduct surveys of residents, commuters, and businesses to gather information about their transportation habits and preferences, including their use of Whoop Up Drive, reasons for travel, and willingness to use alternative transportation modes.

Analyzing data: Analyze the data collected to identify patterns of congestion and the underlying causes, such as rush hour traffic, collisions, construction, or weather events. This analysis can inform the development of appropriate mitigation strategies.

Developing mitigation strategies: Develop a range of mitigation strategies, such as traffic signal timing adjustments, roadway improvements, ramp metering, speed limit changes, or promotion of alternative modes of transportation. Prioritize the strategies based on their potential impact and feasibility.

Implementing and monitoring strategies: Implement the identified mitigation strategies and monitor their effectiveness over time. Adjust the strategies as needed to ensure their effectiveness and continued improvement of the transportation network.

Evaluating results: Evaluate the results of the monitoring plan, including the effectiveness of the mitigation strategies and any changes in traffic patterns or congestion levels. This evaluation can inform future planning and investment in the transportation network.

By implementing a comprehensive monitoring plan for Whoop Up Drive in Lethbridge, the City can identify areas of congestion and develop targeted mitigation strategies to alleviate congestion and delay. By reducing congestion, the City can delay or eliminate the need for significant capital investments, such as the construction of a third bridge at Chinook Trail, thereby saving taxpayer dollars and improving the quality of life for residents.

9 IMPLEMENTATION PLAN

9.1 What We Heard

The engagement on the Implementation Plan focuses on prioritizing actions to help guide the project priorities and final TMP recommendations. The following represents the top themes identified through community engagement (detailed information on the engagement and questions asked can be found in **Appendix B**).

9.1.1 COMMUNITY CONVERSATIONS

The project team attended the City's Community Conversation event at the ENMAX Center in January 2023, with over 600 people attending the event. The TMP project team prepared display boards with background information on the TMP and proposed upgrades and maps for the City. Project team members, along with the display boards, gave passersby a summary of the TMP work-to-date and engagement to date.

The project team had over 200 conversations with interested community members during the event. During conversations, participants' questions were answered by the project team, participants were offered opportunities to fill out the survey at the event through printed survey copies and tablets with access to the online survey. Postcards were also available with a QR code that took them to the project website and survey to learn more and provide their input. From the conversations had at the event, the following themes arose:

- **Regional transportation network connections:** A desire to see transportation connections with the county, especially a multi-use pathway to Coaldale.
- **Winter City:** A desire to see improved efforts to make Lethbridge more accessible during the winter, including more de-icing of sidewalks and roads.
- **Driving:** Concern with some roads being too narrow for buses and trucks.
- **Pedestrians:** A desire to have more pedestrian-oriented infrastructure, especially across the river valley, as well as improved pedestrian infrastructure such as safe road crossings, midblock crossings, longer pedestrian crossing lights, lighted walkways and repaved rough sidewalks.
- **Future planning:** A desire to ensure that all future infrastructure and development planning follow all City standards, such as future emergency response needs.
- **Accessibility:** A desire for future infrastructure development to meet accessibility standards.
- **Cycling:** A desire for separated bike lanes and to have more cycle crossings that are separate from pedestrian crossings.
- **Sustainability:** Concern over the ecological impact of a third bridge, and a desire to see more electric vehicle charging stations and bylaws to address e-scooters and e-bikes.

9.1.2 SURVEY

A public online survey was created to help guide the project priorities and final TMP recommendations. The survey aimed to give a foundational understanding of what needed to be considered by the TMP. The

full survey can be found in **Appendix B**. This survey was accessible through the 'Get Involved Lethbridge' website and was open from January 18 – February 1, 2023. A total of 421 participants filled out the survey.

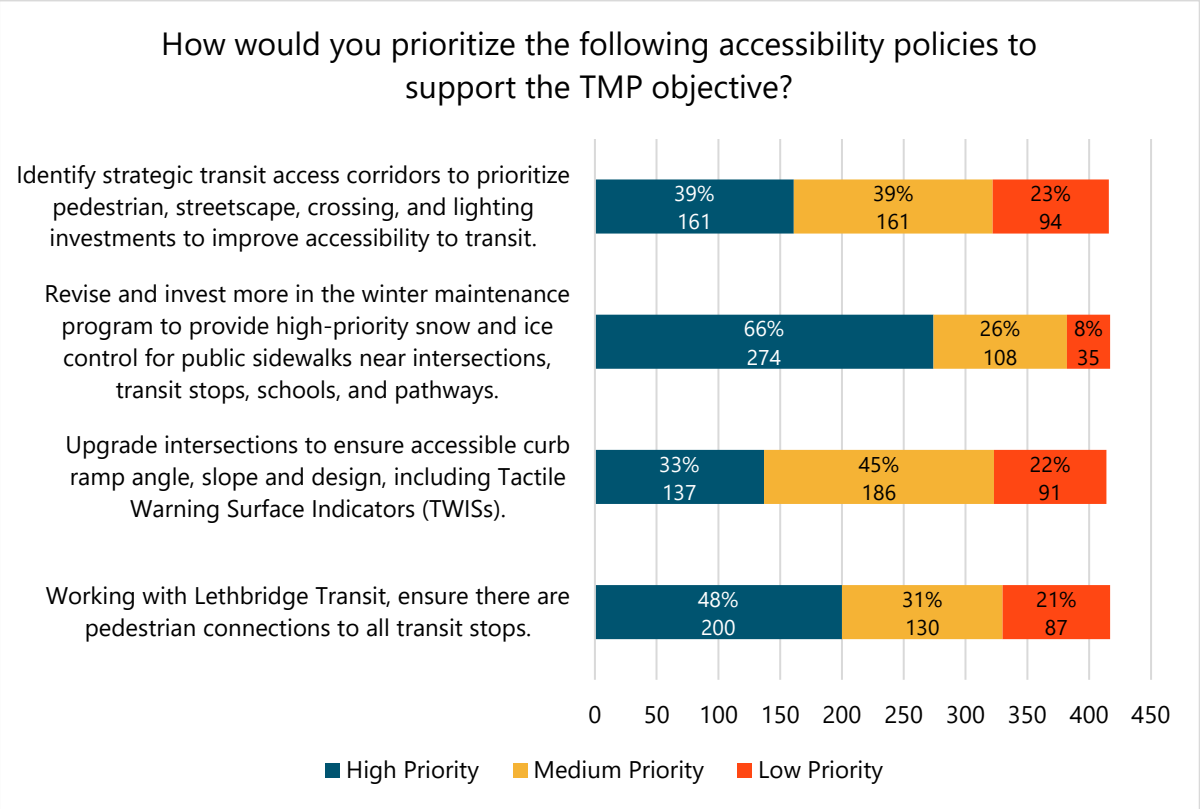
Participants were asked to prioritize actions, from short term to longer term, under five policy areas that the TMP was considering recommending.

The transportation policies, their respective actions, and how they were prioritized are shown in **Table 9-1** through **Table 9-5.**

Objective #1: Accessibility

Ensure the transportation network serves everyone, including people of all ages, incomes, and abilities.

Table 9-1: Objective #1 Accessibility (Survey Results)

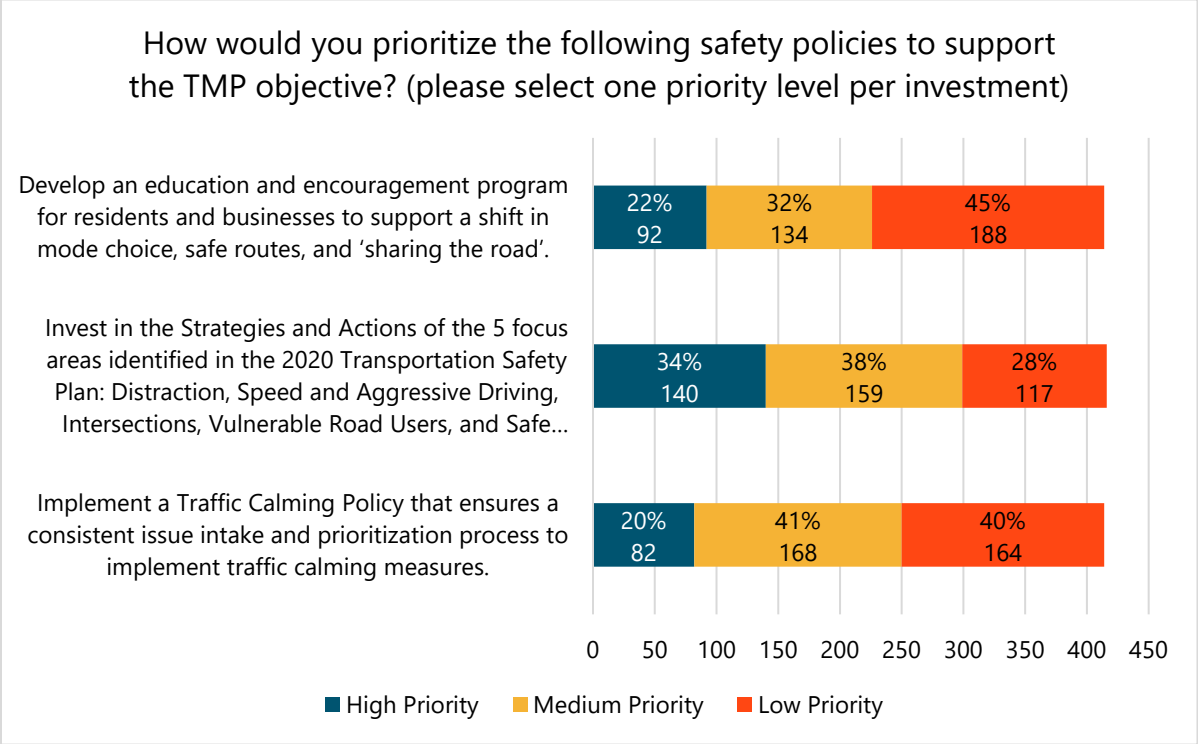


Source: Argyle

Objective #2 – Safety

Ensure Lethbridge streets are safe for all people; and leverage existing efforts and strategies identified in the City's Transportation Safety Plan.

Table 9-2: Objective #2 Safety (Survey Results)

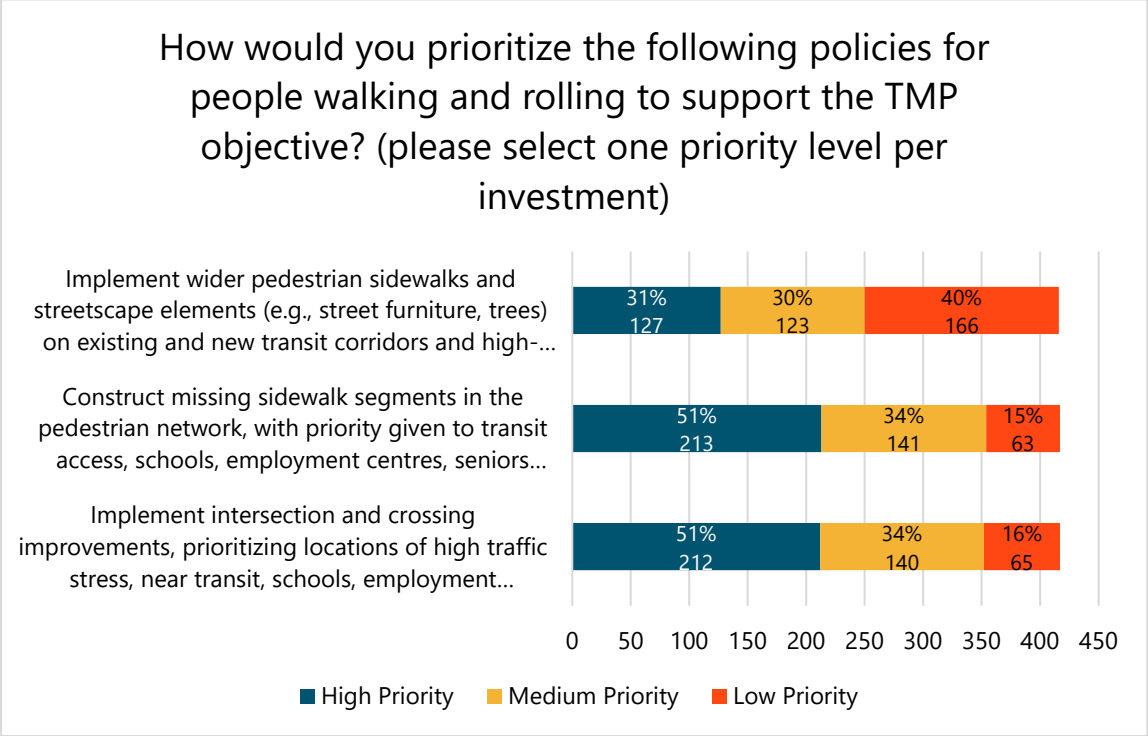


Source: Argyle

Objective #3 – People walking and rolling

Be a pedestrian-friendly community with networks that integrate with transit, neighbourhood amenities, parks, open space, senior centres, business centres and schools.

Table 9-3: Objective #3 - People Walking and Rolling (Survey Results)

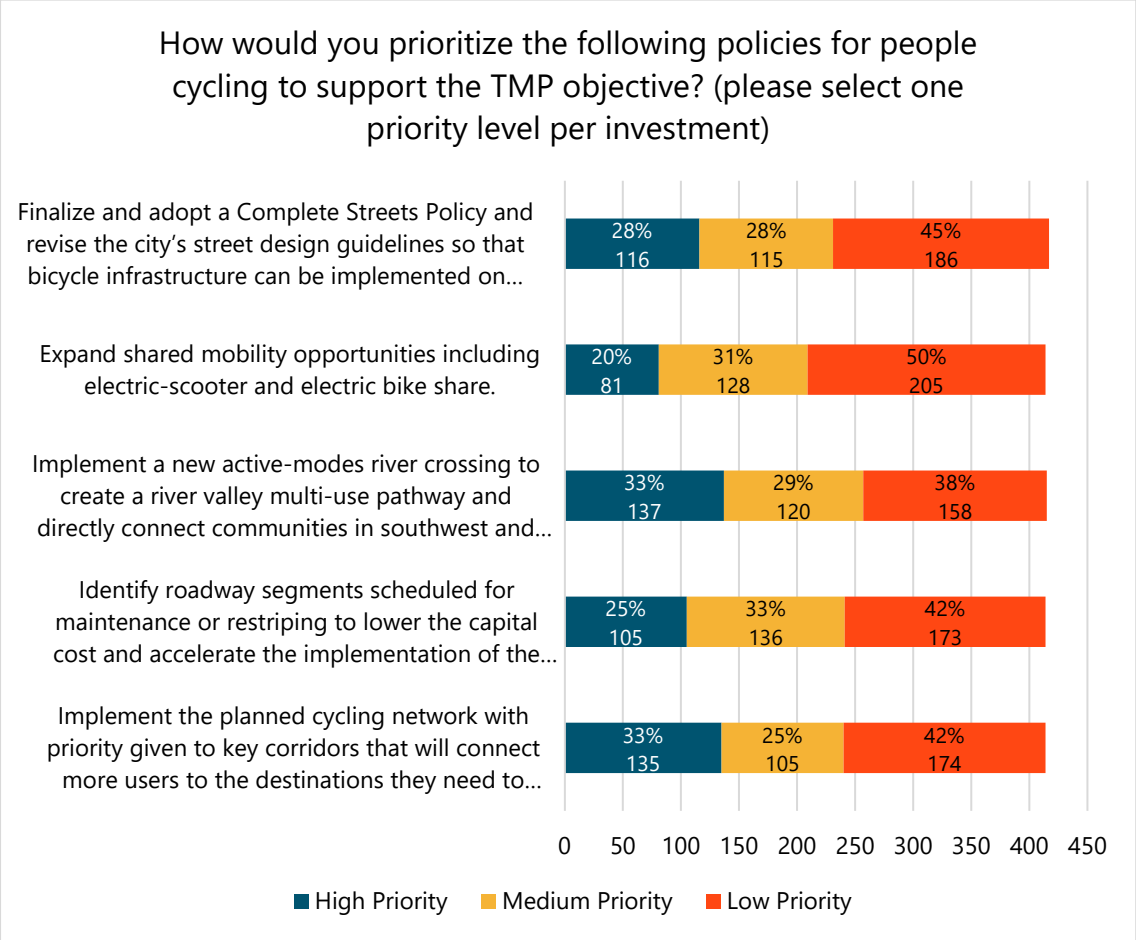


Source: Argyle

Objective #4 – People cycling

Be a bicycle-friendly community with networks that integrate with transit, neighbourhood amenities, parks, open space, senior centers, business centers and schools.

Table 9-4: Objective #4 - People Cycling (Survey Results)

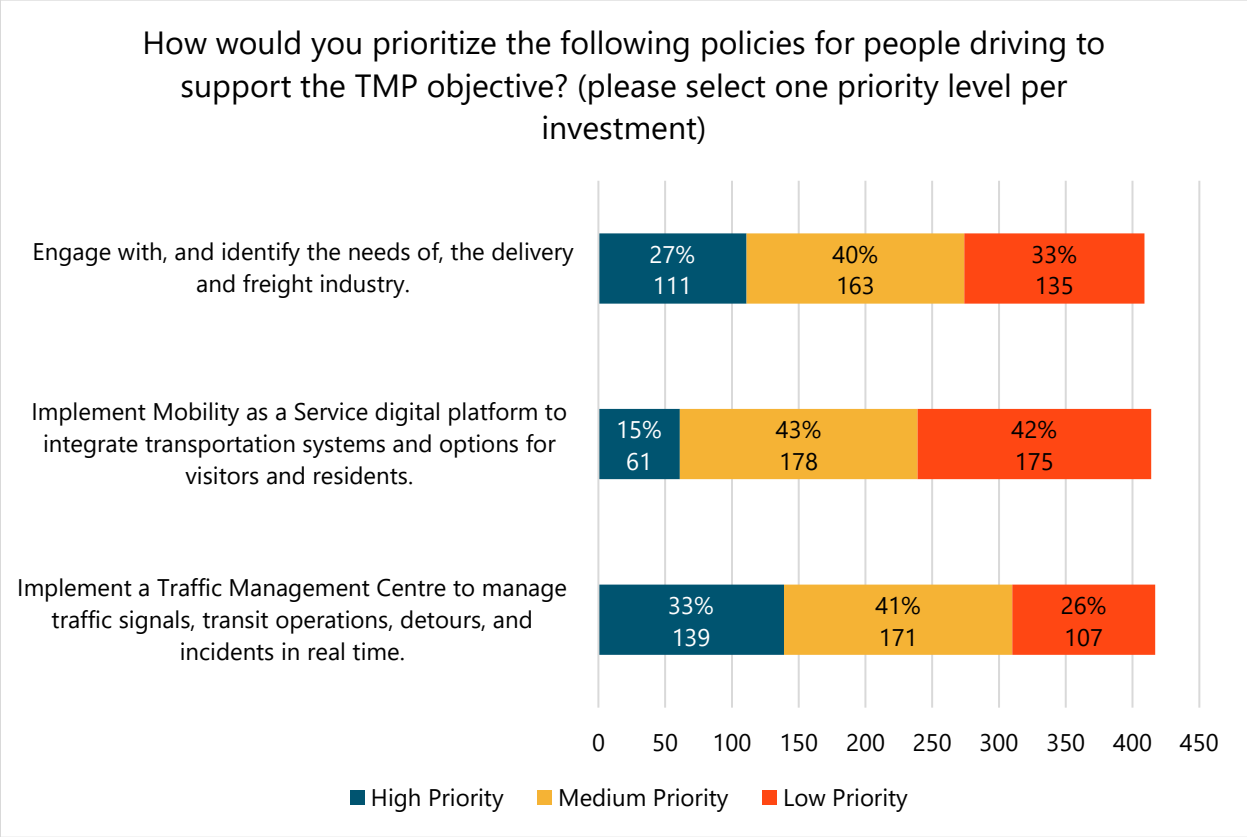


Source: Argyle

Objective #5 – People driving

Develop and maintain a well-connected street network to address traffic flows and keep Lethbridge moving.

Table 9-5: Objective #5 People Driving (Survey Results)



Source: Argyle

Participants were provided with a text box in question 6 of the survey to share any additional comments for the Transportation Master Plan. A total of 210 comments were given, and top themes from these comments are summarized in **Table 9-6.**

Table 9-6: Key Survey Themes

Theme (Percentage of all comments)	Sub-themes (Percentage of all comments)	Details
Other active transportation modes (42%)	A desire for more bike infrastructure (13%)	Comments suggested a desire for more bike infrastructure with an emphasis on wanting bike lanes to be fully separated from vehicular traffic
	Walking and rolling infrastructure (12%)	Comments suggested a desire for more pedestrian oriented infrastructure, with a focus on more accessible pedestrian-oriented infrastructure
	De-prioritize cars (9%)	Comments suggested a desire to de-prioritize cars for accessibility, environmental, economic, or financial reasons

Theme (Percentage of all comments)	Sub-themes (Percentage of all comments)	Details
Bus timing, schedule, stops, and routes	21%	Comments suggested a desire for a broader bus schedule (more times and increased frequency and increased stops), a return to old routes, and increased accessibility to bussing (through routes, timing and stops) for people with mobility issues, elderly people, and children
Location specific requests	20%	Location specific requests such as intersection improvements, suggestions about specific on/off ramps, street upgrades, congestion areas, missing sidewalk connections
Snow and ice removal	11%	Comments suggested a desire for more snow and ice removal on roads, sidewalks, and paths
Prioritize cars	10%	Comments suggested a desire to prioritize cars, with emphasis on the desire for improved traffic flow and road surfaces
Third bridge	8%	Comments suggested a desire for a third bridge
Costing	7%	Comments suggested a concern with how the City is spending money
Traffic lights	6%	Comments suggested a desire for improved traffic lights synchronizing

9.1.3 INTERNAL AND EXTERNAL STAKEHOLDER WORKSHOPS

An internal stakeholder workshop was held online in January 2023 with 22 participants from internal City departments.

From the conversations had at the event, the following themes arose:

- **Regional transportation network connections:** Desire to see integration with broader, regional transportation and pathway networks, such as the airport and rail systems.
- **Seniors:** Desire to see senior centers prioritized alongside schools.
- **Public spaces:** Interest in how the TMP can suggest innovative and flexible urban public spaces, for example with reducing parking spaces for additional public space.
- **Alleyways:** Concerns with back alleys and lanes being upgraded (e.g. paved).

Two external stakeholder workshops were held online in January 2023.

A meeting with the Reconciliation Lethbridge Advisory Committee (RLAC) occurred in a hybrid format, with 12 participants. The following themes followed from the conversations at the event:

- **Reconciliation:** A desire to see active reconciliation and decolonizing efforts in the TMP, such as acknowledging the Traditional Blackfoot Territory in the naming of transportation related infrastructure.
- **Pedestrian infrastructure:** Concern with missing sidewalk links in industrial area of the city, leading to unsafe crossings.
- **Equity:** Desire to see a focus on equitable transportation options for those with low income.

A meeting with the Youth Advisory Committee (YAC) occurred in a hybrid format, with 7 participants. The following themes followed from the conversations at the event:

- **Transit:** Suggestion to consider priority bus lanes to address congestion.
- **Accessibility:** Suggestion to prioritize all accessibility recommendations.
- **Cycling:** Interest in seeing cycling improvements, such as improving the infrastructure transitions between cycling and non-cycling infrastructure, having protected bike lanes, and having access to secure bike parking.

From all internal and external workshops, participants were also asked to prioritize actions, from short-term to longer-term, under five policy areas considered in the TMP.

The following list of actions under each of the following policies represents the joint data from all internal and external stakeholder workshops. They are listed in order of priority from short term to long term. To see the detailed prioritization information from each group please see Appendix D.

Objective #1: Accessibility

1. Working with Lethbridge Transit, to ensure there are pedestrian connections to all transit stops.
2. Upgrade intersections to ensure accessible curb ramp angle, slope, and design, including Tactile Walking Surface Indicators (TWSIs).
3. Revise and invest more in the winter maintenance programs to provide high-priority snow and ice control for public sidewalks near intersections, transit stops, schools, and pathways.
4. Identify strategic transit access corridors to prioritize with pedestrian, streetscape, crossing, and lighting investments to improve accessibility to transit.

Objective #2 – Safety

1. Invest in the strategies and actions of the five focus areas identified in the 2020 Transportation Safety Plan: Distraction, Speed & Aggressive Driving, Intersections, Vulnerable Road Users, and Safe Vehicles.
2. Develop an education and encouragement program for residents and businesses to support a shift in mode choice, safe routes, and 'sharing the road'.
3. Implement a Traffic Calming Policy that ensures a consistent issue intake and prioritization process to implement traffic calming measures.

Objective #3 – People Walking and Rolling

1. Construct missing sidewalk segments in the pedestrian network, with priority given to transit access, schools, employment centers, senior centers and activity centres.
2. Implement intersection and crossing improvements, prioritizing locations of high traffic stress, near transit, schools, employment centers, senior centers and other activity centres.
3. Implement wider pedestrian sidewalks and streetscape elements (e.g., street furniture, trees) on existing and new transit corridors and high-activity corridors to accommodate and attract pedestrians.

Objective #4 – People Cycling

1. Implement the planned cycling network with priority given to key corridors that will connect more users to the destinations they need to reach.
2. Finalize and adopt a Complete Streets Policy and revise the City's street design guidelines so that bicycle infrastructure can be implemented on new streets.
3. Identify roadway segments scheduled for maintenance or re-striping to lower the capital cost and accelerate the implementation of the on-street bicycle network.
4. Implement a new active-modes river crossing to create a river valley multi-use pathway and directly connect communities in southwest and southeast Lethbridge.
5. Expand shared mobility opportunities including electric-scooter and electric bike share.

Objective #5 – People Driving

1. Implement a Traffic Management Centre to manage traffic signals, transit operations, detours, and incidents in real time.
2. Implement Mobility as a Service (MaaS) digital platform to integrate transportation systems and options for visitors and residents.
3. Engage with, and identify the needs of, the delivery and freight industry.

9.1.4 SUMMARY

In summary, the top themes noted by all participants regarding the Implementation Plan phase were:

- **Overall:** For some the policy areas, there was a consensus from participants that all the actions listed would improve the quality of life and transportation network.
- **Active transportation modes:** A desire for more bike infrastructure, with an emphasis on separated bike lanes, and pedestrian oriented infrastructure with a focus on accessibility and safety measures.
- **Transit:** A desire for a broader bus schedule (more times and increased frequency and increased stops), and increased accessibility to bussing (through routes, timing and stops) for people with mobility issues, elderly people, and children.
- **Reconciliation:** A desire to see active reconciliation and decolonizing efforts in the TMP, such as acknowledging the Traditional Blackfoot Territory in the naming of transportation related infrastructure.
- **Pedestrian infrastructure:** Concern with missing sidewalk links in the industrial area of the city, leading to unsafe crossings.
- **Winter City:** A desire to see improved efforts to make Lethbridge more accessible during the winter, including more clearing and de-icing of roads, sidewalks pedestrian ramps, and accesses to bus stops.

9.2 Transportation Network Improvements

9.2.1 ROADWAY IMPROVEMENTS

Short-term roadway improvements are those road upgrades or new road construction required by 2029. **Table 9-7** shows those improvements included within a current Capital Improvement Program, and those recommended, but unfunded.

Table 9-7: Short-Term (10 year) Roadway Improvements

Road Name	Road Segment	Improvement	Current CIP
26 Avenue N	Scenic Drive N to 23 Street N	Upgrade to 4-lane arterial	CO-7
Métis Trail W	Coalbrook Gate W to Great Bear Boulevard W	New construction: interim arterial	CO-6
Scenic Drive N	Stafford Drive N to Uplands Boulevard N	Upgrade to 4-lane arterial	CO-1
Scenic Drive S / Whoop Up Drive Interchange	EB to NB and SB to WB ramps	Upgrade to 2-lane ramps	C-15
Scenic Drive S	3 Avenue S to 5 Avenue S	Upgrade to 6-lane arterial	C-15
University Drive W	Walsh Drive W to WLEC Commercial Access	Upgrade to 4-lane arterial	CO-4, CO-5
Walsh Drive W	Argyll Road W to Métis Trail W	Upgrade to 4-lane arterial	CO-3

Medium-term improvements **(Table 9-8**) are those road upgrades or new road construction required between the next 10-20 years (by 2039). Table 9-8Table 9-8 shows those improvements included within a current Capital Improvement Program, and those recommended, but unfunded.

Table 9-8: Medium-Term (10-20 year) Roadway Improvements

Road Name	Road Segment	Improvement	Current CIP
28 Street N	5 Avenue N to 9 Avenue N	Upgrade to 4-lane arterial	unfunded
28 Street N	Kodiak Gate N to Blackwolf Boulevard N	Upgrade to 4-lane arterial	CO-8
43 Street N	9 Avenue N to 26 Avenue N	Upgrade to 4-lane arterial	unfunded
Garry Drive W	Métis Trail W to Garry Station Port W	Upgrade to 4-lane arterial	unfunded
Métis Trail W	Whoop Up Drive to Caledonia Boulevard W	Upgrade to 4-lane arterial	unfunded
Scenic Drive N	Uplands Boulevard N to Grace Dainty Road N	Upgrade to 4-lane arterial	CO-2
Scenic Drive N	Grace Dainty Road N to 44 Avenue N	Upgrade to 4-lane arterial	CO-2

Road Name	Road Segment	Improvement	Current CIP
University Drive W	Sunridge Boulevard W to Canyons Parkway W	Upgrade to 4-lane arterial	unfunded
University Drive W	WLEC Commercial Access to Highway 3 Interchange	Upgrade to 4-lane arterial	unfunded
Walsh Drive W	Métis Trail W to 400m west of Métis Trail W	Upgrade to 4-lane arterial	unfunded
Whoop Up Drive W	University Drive W and Scenic Drive S	Interchange Improvements	unfunded

Long-term improvements **(Table 9-9)** are those road upgrades or new road construction required beyond the next 20 years (beyond 2039).

Table 9-9 shows those improvements included within a current Capital Improvement Program, and those recommended, but unfunded.

Table 9-9: Long-Term (20+ year) Roadway Improvements

Road Name	Road Segment	Improvement	Current CIP
26 Avenue N	28 Street N to 43 Street N	Upgrade to 4-lane arterial	unfunded
28 Street N	9 Avenue N to 18 Avenue N	Upgrade to 4-lane arterial	unfunded
28 Street N	Blackwolf Boulevard N to 44 Avenue N	Upgrade to 4-lane arterial	unfunded
28 Street N	44 Avenue N to 50 Avenue N	Upgrade to 4-lane arterial	unfunded
28 Street N	50 Avenue N to 62 Avenue N	Upgrade to 4-lane arterial	unfunded
43 Street N	26 Avenue N to 44 Avenue N	Upgrade to 4-lane arterial	unfunded
43 Street N	44 Avenue N to 62 Avenue N	Upgrade to 4-lane arterial	unfunded
58 Street S	10 Avenue S to 60 Avenue S	New construction: 2-lane collector	unfunded
62 Avenue N	Cemetery Entrance to 800m east of Scenic Drive N	New construction: 4-lane arterial	unfunded
62 Avenue N	800m east of Scenic Drive N to 28 Street N	Upgrade to 4-lane arterial	unfunded
62 Avenue N	28 Street N to 43 Street N	Upgrade to 4-lane arterial	unfunded
Chinook Trail W	University Drive W to Métis Trail W	New construction: interim arterial	unfunded
Chinook Trail W	Métis Trail W to Great Bear Boulevard W	New construction: interim arterial	unfunded
Chinook Trail W	Great Bear Boulevard W to Whoop Up Drive W	New construction: interim arterial	unfunded
Chinook Trail W	Whoop Up Drive W to Garry Drive W	New construction: interim arterial	unfunded
Chinook Trail W	Garry Drive W to Walsh Drive W	New construction: interim arterial	unfunded

Road Name	Road Segment	Improvement	Current CIP
Chinook Trail	University Drive W to Scenic Drive S	New construction: 6-lane arterial	unfunded
Garry Drive W	Homestead Boulevard W to Chinook Trail W	New construction: interim arterial	unfunded
Métis Trail W	Caledonia Boulevard W to Garry Drive W	Upgrade to 4-lane arterial	unfunded
Métis Trail W	Garry Drive W to Walsh Drive W	Upgrade to 4-lane arterial	unfunded
Métis Trail W	Great Bear Boulevard W to Chinook Trail W	New construction: interim arterial	unfunded
Métis Trail W	Walsh Drive W to Westside Drive W	New construction: interim arterial	unfunded
Métis Trail W	5 Avenue W to Westside Drive W	New construction: interim arterial	unfunded
Scenic Drive N	5 Avenue N to Stafford Drive N	Upgrade to 4-lane arterial	unfunded
Scenic Drive N	400m past 44 Avenue N to Cemetery	Upgrade to 4-lane arterial	unfunded
Scenic Drive N	44 Avenue N to 400m past 44 Avenue N	Upgrade to 4-lane arterial	unfunded
Walsh Drive W	400m W of Métis Trail W to Chinook Trail W	Upgrade to 4-lane arterial	unfunded
Westside Drive W	2 Avenue W to Highway 3 Interchange	Remove road segment	unfunded
Whoop Up Drive W	Mauritania Boulevard W to Chinook Trail W	Upgrade to 4-lane arterial	unfunded
Whoop Up Drive W	University Drive W and Scenic Drive S	Bridge and Interchange Improvements	unfunded

The short-term (2029), medium-term (2039), and long-term (2069) roadway improvements (both widening and new construction) are shown in Error! Reference source not found..

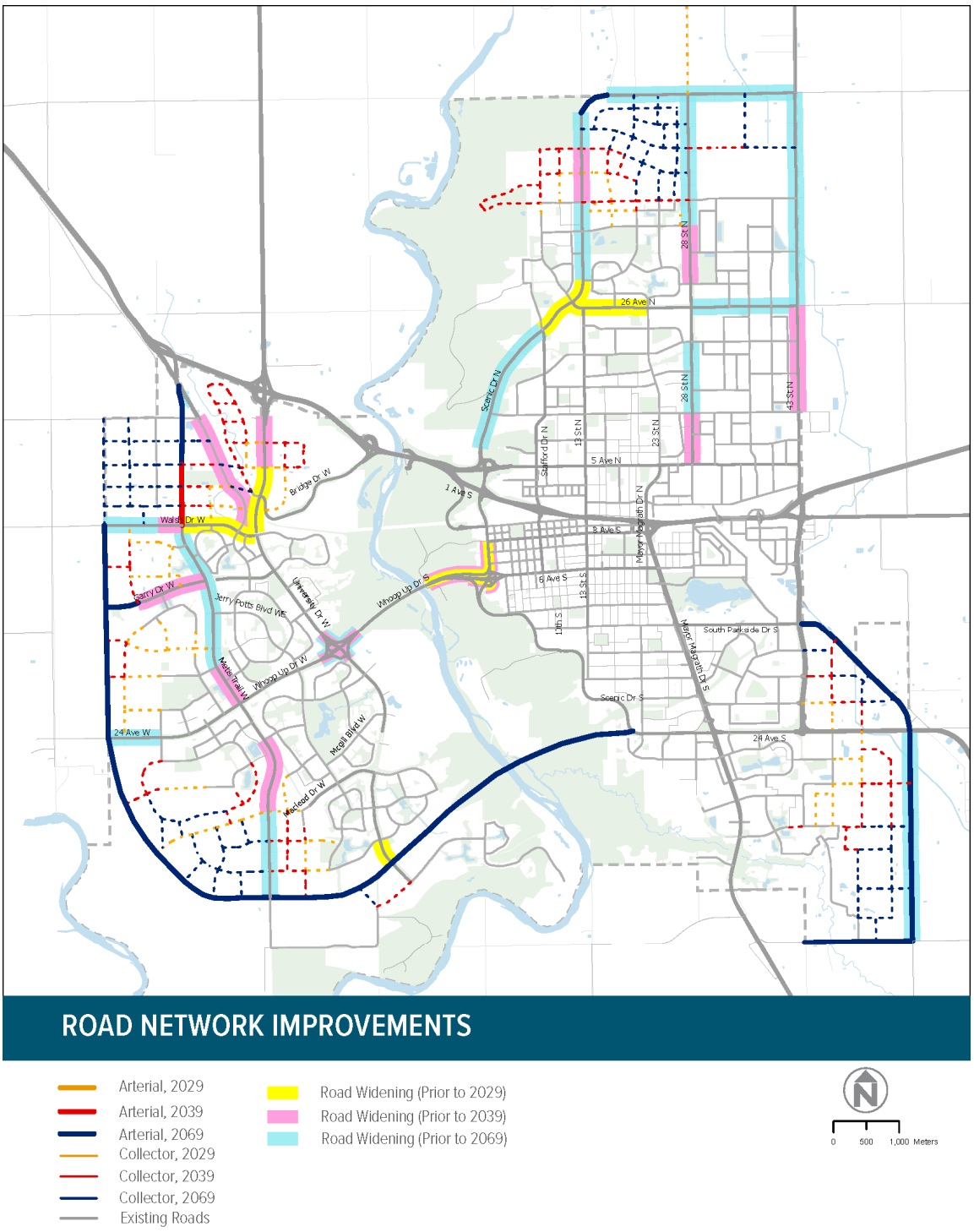


Figure 9-1: Future Road Network Improvements

Source: Stantec

9.2.2 PEDESTRIAN & BIKEWAY IMPROVEMENTS

There are three on-street bicycle facility types proposed for Lethbridge: Bicycle Lanes (usually located on moderate volume roads), Protected Bicycle Lanes (located on higher volume roads), and Bicycle Boulevards (reserved for low volume, low speed roads. These facilities are described and illustrated below.

Bike Lanes are painted on-street bike lanes with no buffer. An illustration of these improvements is shown in **Figure 9-2.**

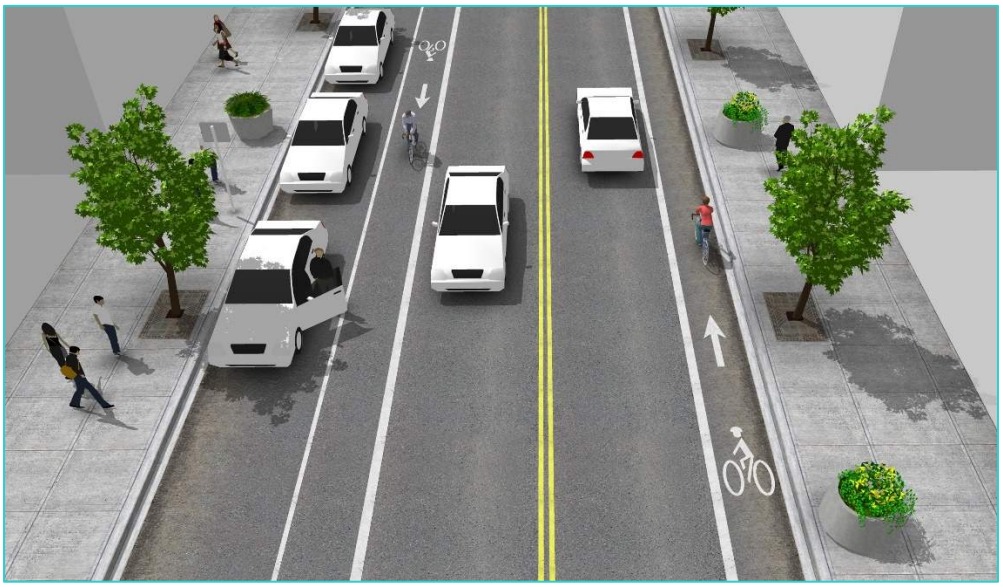


Figure 9-2: Bicycle Lane Illustration

Source: https://nacto.org/publication/urban-bikeway-design-guide/bike-lanes/conventional-bike-lanes/

Protected Bike Lanes – painted on-street bike lanes with a delineated buffer. An illustration of these improvements is shown in **Figure 9-3.**

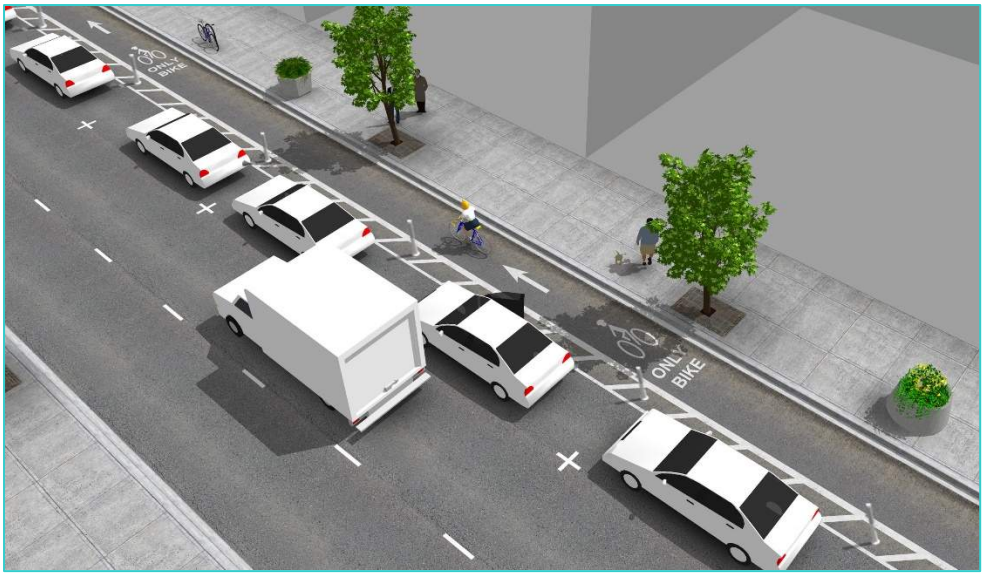


Figure 9-3: Protected Bicycle Lane Illustration
Source: https://nacto.org/publication/urban-bikeway-design-guide/bike-lanes/buffered-bike-lanes/

Bicycle Boulevards are corridors with painted on-street sharrow symbols with a lowered speed and traffic calming intersection treatments. An illustration of these improvements is shown in **Figure 9-4.**

Figure 9-4: Bicycle Boulevard Illustration
Source: https://nacto.org/publication/urban-bikeway-design-guide/icycle-boulevards/speed-management/

Existing and future sidewalks, local connectors, multi-use pathways, and on-street bikeway improvements are shown in **Figure 9-5.** On-street specific future cycling infrastructure, both

proposed city-projects along existing roads, and new community projects to be determined at outline plan stage, are shown in **Figure 9-6**.

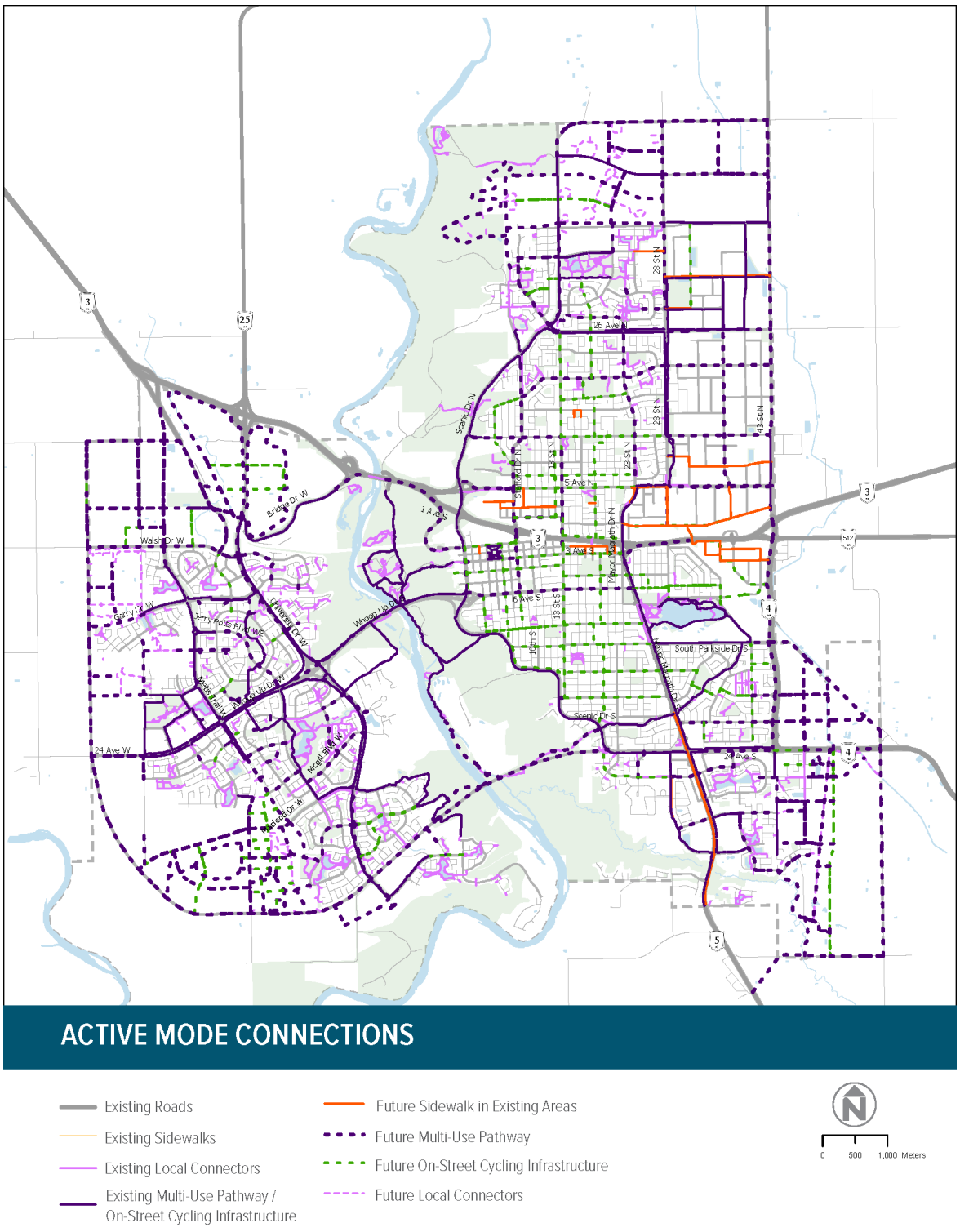


Figure 9-5: Existing & Future Pedestrian & Bikeway Network
Source: Stantec

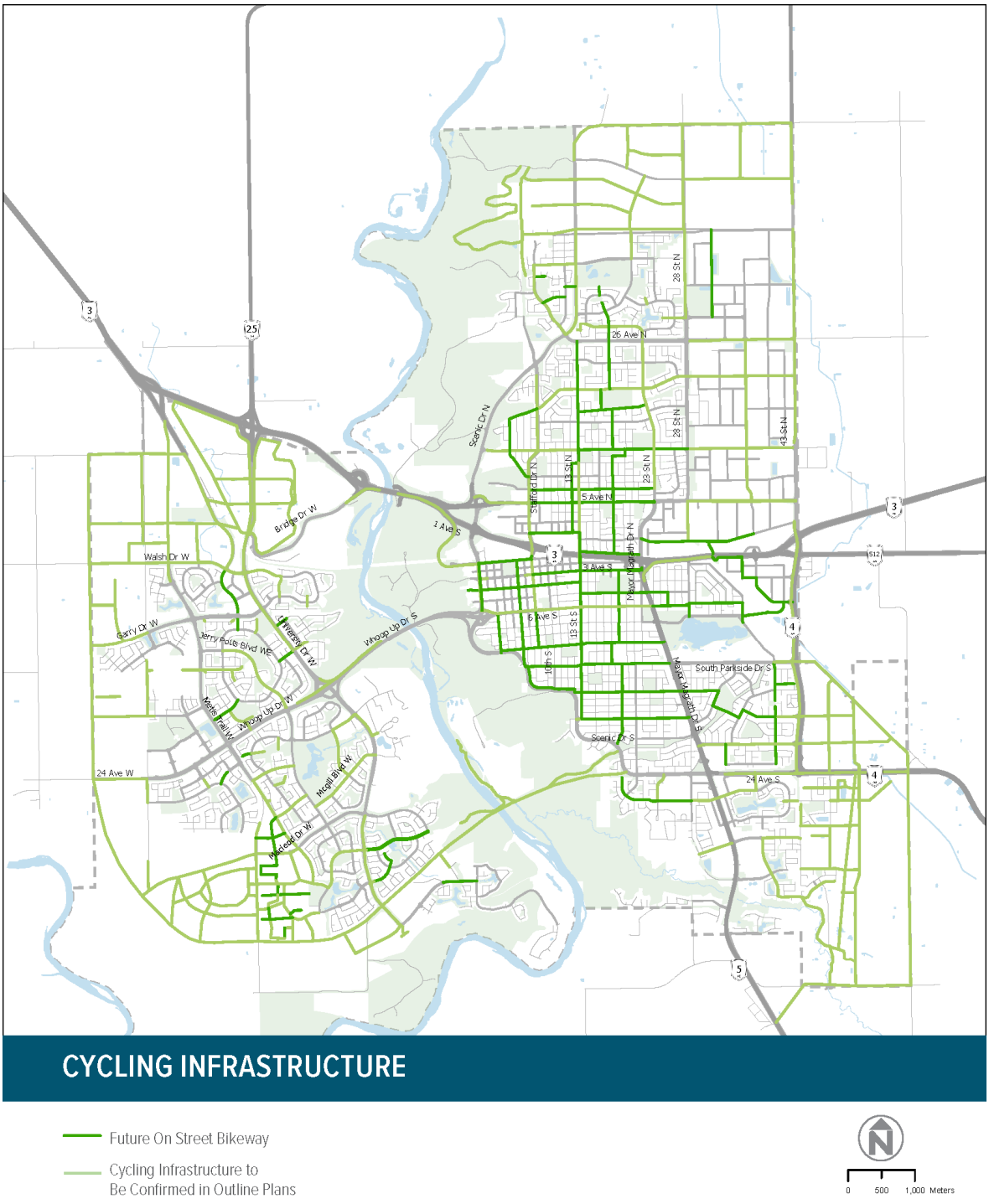


Figure 9-6: Future Bikeway Network

Source: Stantec

9.2.3 INTERSECTION IMPROVEMENTS

Using the analysis undertaken in Section 7.4 (Multi-Modal Needs Analysis) and Section 7.5 (Future Accessibility Needs), two categories of intersection improvements were identified:

Cycling Crossing Improvements –existing signalized intersections along identified on-street cycling routes, will require cycling improvements. An illustration of potential improvements (bicycle symbols, green conflict zones, bike lane lines) is shown in **Figure 9-7.**

Figure 9-7: Cycling Crossing Improvements Illustration

Source: https://nacto.org/publication/urban-bikeway-design-guide/intersection-treatments/intersection-crossing-markings/

Pedestrian Crossing Improvements – several existing unsignalized, t-intersection, or minor intersection (residential/collector) requiring pedestrian or accessibility improvements have been identified. An illustration of these improvements (enhanced crosswalk markings, signage, tactile surface treatment) is shown in **Figure 9-8.**

Figure 9-8: Pedestrian Crossing Improvements Illustration

Source: https://nacto.org/publication/urban-bikeway-design-guide/bicycle-boulevards/offset-intersections/

These improvement locations are shown in **Figure 9-9.**

Note that intersection improvements targeting specifically at pedestrians and cyclists generally make the intersection safer for all users (including drivers) as operating speeds are lower, cyclists are given their own designated space, and existing pedestrian crossings are improved such that pedestrian visibility is greater, and exposure time is reduced.

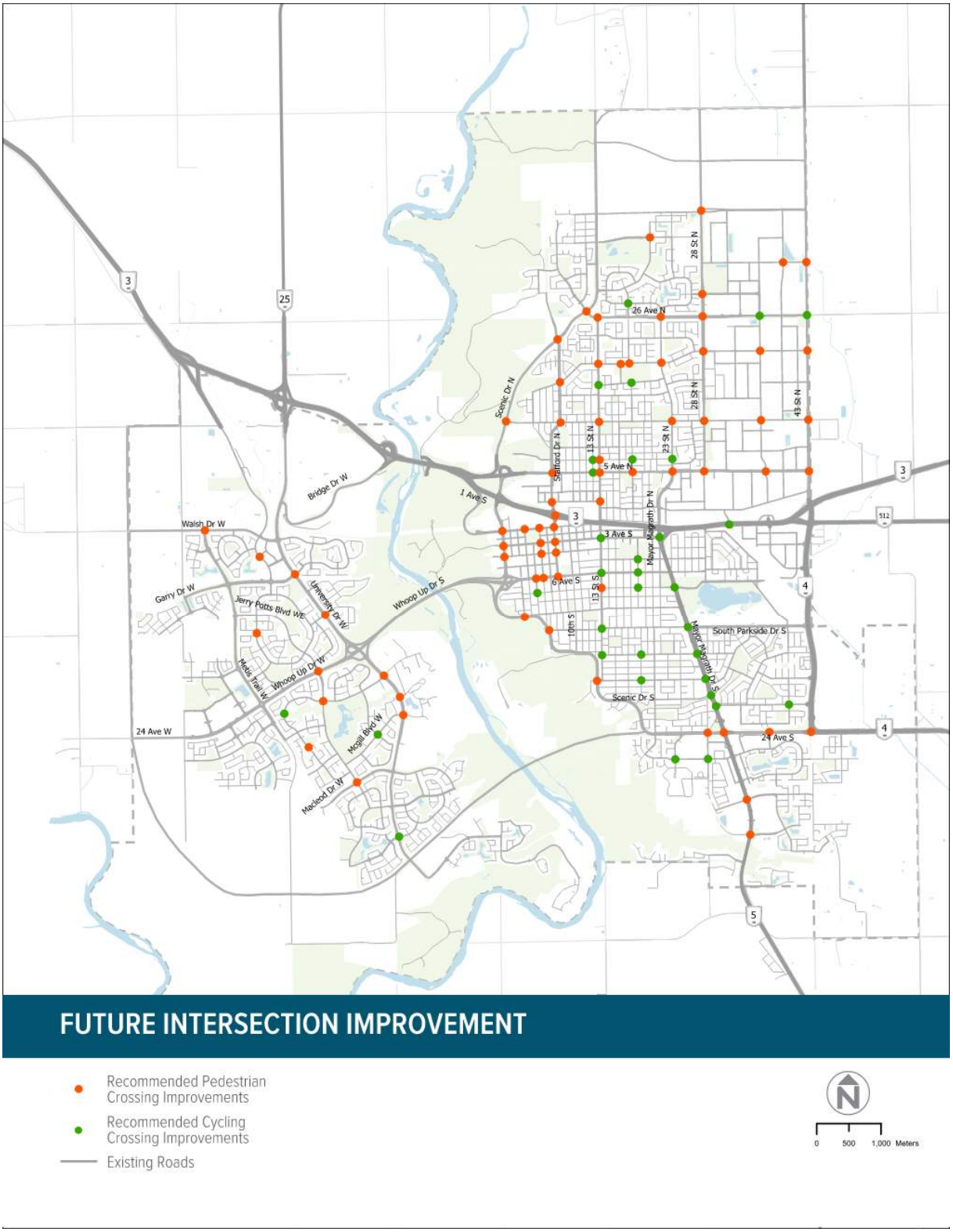


Figure 9-9: Future Intersection Improvement Locations

Source: Stantec

9.2.4 TRANSIT/ACCESSIBILITY IMPROVEMENTS

Pedestrian access improvements to transit stops, including those with mobility issues, have already been identified in Figure 9-2 and 9-3. Improving the integration of on-street bike routes with transit routes, however, requires the implementation of floating transit stops where the bicycle facility is realigned behind the transit stop. This removes the conflict between the slowing or stopped bus, and cyclists using the same space. This design does create a new conflict between cyclists and transit users that must cross this new bicycle facility. This conflict is mitigated by implementing pedestrian crossing treatments (pavement markings, tactile strips) just as would be done for crossing regular traffic lanes. This is shown in isometric view in **Figure 9-10** and an installed example in **Figure 9-11.** Locations have been identified in **Figure 9-12** and number nearly 70. Most floating bus stops would be installed when the cycling infrastructure is constructed, reducing costs.

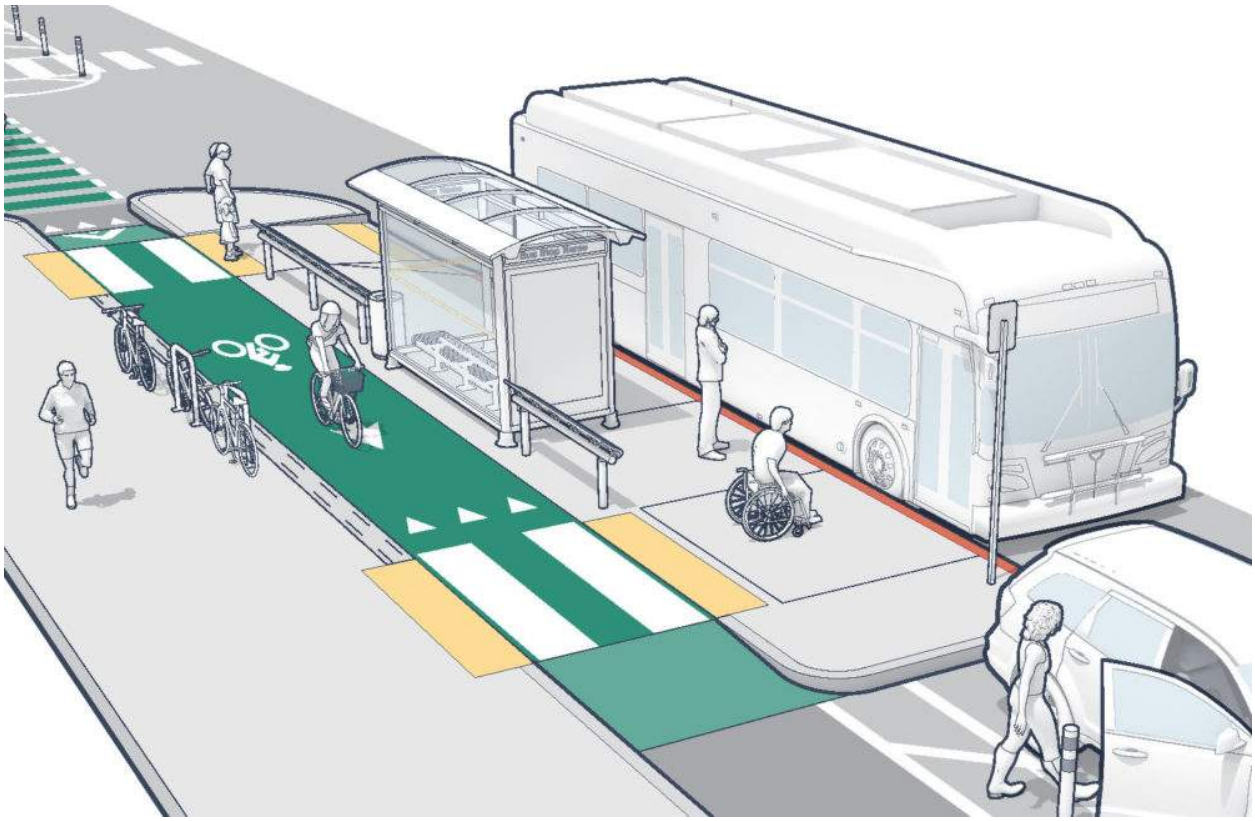


Figure 9-10: Midblock Floating Transit Stop (Isometric View)
Source: AC Transit Multimodal Corridor Design Guidelines, Toole Design

Figure 9-11: Example Floating Transit Stop (Burrard Street Vancouver, BC)
Source: Page H-12, BC Active Transportation Design Guide

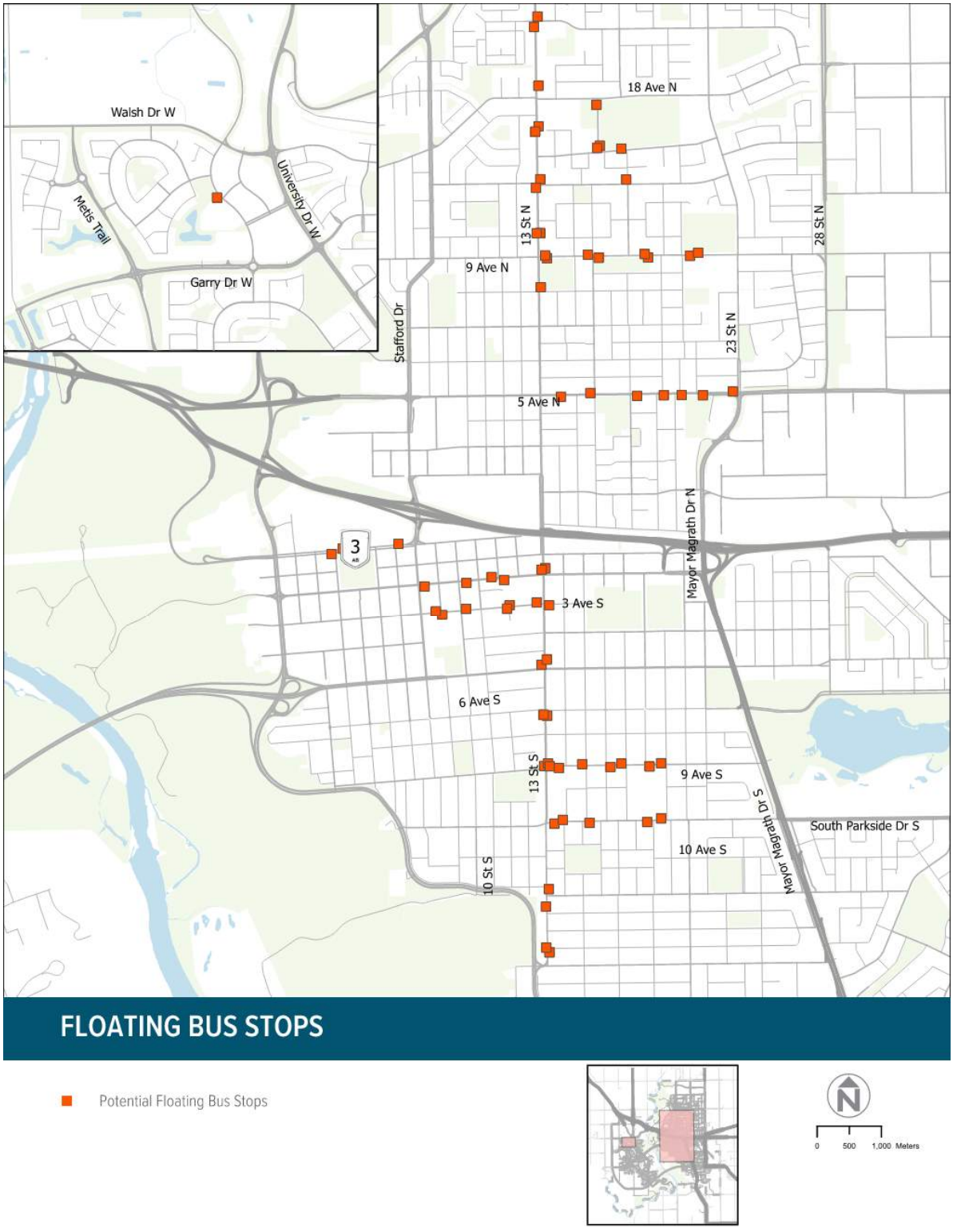


Figure 9-12: Locations of Potential Floating Bus Stop Improvements

Source: Nelson Nygaard (Modified by Stantec)

9.2.5 TECHNOLOGICAL IMPROVEMENTS

Improve data collection: The City can take a strategic approach to data collection which support investment to influence travel needs and demands. This can be achieved through a balancing of data sources including regular use of Location based data, screen lines or regular counts. Critical to this is the need to collect all mode data in a strategic way, then present that data transparently through publicly available open data or similar approach for public planning and innovation purposes.

Roadway efficiency improvements: There are tools readily available to improve the efficiency of the roadway for freight, transit, and personal vehicles. The importance and function of limited access highways in accessing the city, including for internal traffic, suggests a value to implementation of traffic management such as advanced signal coordination on arterials and ramp metering at interchanges to increase the efficiency of these facilities. Operational efficiency improvements should be studied when there is reported recurring congestion and verified through traffic speed monitoring. Appropriate strategies should be developed on a case-by-case basis and monitored for effectiveness once implemented.

Implement Mobility as a Service (MaaS) Citywide: The City has a population that is younger than most Canadian mid-sized cities which means there is a more digitally savvy population overall. There is an opportunity to ensure that a range of transportation services are available to visitors and residents through the implementation of a digital platform which combines all mobility options in one location. The implementation of this approach does not have to be solely City run but can be through either a partnership or even just by providing data in transparent platforms for others to create those options. By delivering MaaS, Lethbridge residents will be able to get dynamic and multi-modal journeys planned for them that open the options outside of car trips and deliver clear information about the full spectrum of trips at their disposal.

9.3 Implementation Plan & Costs

9.3.1 TIMING OF IMPROVEMENTS

The timing for the recommended network improvements falls under two categories: Roadway Improvements, and Transit, Cycling, Pedestrian, and Technological Improvements. The timeframes for each are different. The roadway improvements are over a longer 50-year timeframe while the other improvements are over a shorter 20-year timeframe. This is summarized in **Table 9-10**.

Table 9-10: Infrastructure Improvement Timeframes

Term	Roadway Improvements	Transit, Cycling, Pedestrian, Technological Improvements
Short	<10 years (2023-2029)	<5 years (2023-2027)
Medium	10-20 years (2029-2039)	5-10 years (2027-2032)
Long	20+ years (2039-2069)	10+ years (2032-2042)
Inputs	VISUM Model, CIP, Engagement	2017 Cycle Master Plan, Transportation Safety Plan, Multi-modal Analysis & Prioritization, Accessible Destinations, Readiness Report, Engagement

9.3.2 PRIORITIZATION METHODOLOGY

Infrastructure was identified and prioritized as short, medium, or long-term improvements based on several tools and inputs. These are summarized in **Table 9-11.**

Table 9-11: Prioritization Tools & Inputs

Infrastructure Type	Prioritization Tools / Inputs
Roads & Bridges	Lethbridge 2022-2031 CIP, ASPs, OPs, VISSUM Model
Bikeway Improvements	2017 Cycle Master Plan, 2019 Cycling Corridor Functional Planning Study, Multi-Modal Analysis (high-stress intersections)
Pedestrian Improvements	Multi-Modal Analysis (missing sidewalk links)
Intersection Improvements	Multi-Modal Analysis (roadway crossing barriers, crossings near transit), Accessibility Analysis
Accessibility Improvements	Accessibility Analysis
Floating Bus Stops	Bicycle/Transit corridor tension analysis
Technology	Smart(ER) Mobility Readiness Report

9.3.3 COSTING METHODOLOGY

- Roads & Bridges were estimated based on a general per-kilometre cost per upgrade type. This cost includes removals, earthworks, roadway surfacing, deep utilities, shallow utilities, landscaping, erosion control, pavement markings, survey, traffic accommodation, materials testing and engineering. These costs do not include contingency.
- Pathways/On-Street Bicycle costs were estimated based on a general per-metre cost per upgrade type. These costs generally include pathway construction, pavement markings, signage, concrete curb, concrete fill, delineators, survey and traffic accommodation. These costs do not include engineering or contingency.
- Floating Bus Stops were estimated based on a general per-location cost. These costs generally include concrete curb, concrete fill, asphalt concrete pavement, pavement markings, tactile warning plates, signage, removals, survey and traffic accommodation. These costs to not include engineering or contingency.
- Sidewalk/Transit Connections were estimated based on a general per-metre cost per upgrade type. This cost includes earthworks, concrete, asphalt concrete pavement, traffic accommodation, survey, removals and engineering. There costs do not include contingency.
- Intersection costs were estimated based on a general per-location cost. These costs generally include concrete curb, concrete fill, pavement markings, signage, survey, and traffic accommodation. There costs do not include engineering or contingency.
- Technology is included in these costs. The costs of upgrading traffic signals, addition of signals, and RRFBs are included in the cost estimates.

9.3.4 CAPITAL IMPROVEMENT COSTS

Road Infrastructure

The road infrastructure costs, summarized in **Table 9-12**,

Table 9-12includes road widening, new arterial roads, and new bridges. It does not include developer-funded collector roads.

Table 9-12: Road Infrastructure Cost Estimates (2023)

Corridor	< 10 years	10-20 years	20+ years	Total
26 Avenue N	$10.0 M	$0 M	$4.7 M	$14.7 M
28 Street N	$4.5M	$13.5 M	$16.1 M	$34.1 M
43 Street N	$0 M	$6.2 M	$12.7 M	$18.9 M
62 Avenue N	$0 M	$0 M	$23.1 M	$23.1 M
Garry Drive W	$0 M	$2.7 M	$3.3 M	$6.0 M
Métis Trail	$6.6 M	$2.6 M	$28.7 M	$37.9 M
Scenic Drive N	$7.3 M	$12.3 M	$19.5 M	$39.1 M
Scenic Drive S	$12.3 M	$0 M	$0 M	$12.3 M
University Drive	$9.5 M	$12.6 M	$0 M	$22.1 M
Walsh Drive	$17.3 M	$4.0 M	$4.1 M	$25.4 M
Westside Drive W	$0 M	$0 M	$0.4 M	$0.4 M
Whoop Up Drive	$10 M	$45 M	$42.9 M	$97.9 M
Chinook Trail				
- Scenic Drive S to University Drive W (including bridge: 4km)	$0 M	$0 M	$130.0 M	$130.0 M
- University Drive W to Métis Trail W (2km)	$0 M	$0 M	$19.8 M	$19.8 M
- Métis Trail W to Whoop Up Drive W (3.5km)	$0 M	$0 M	$38.5 M	$38.5 M
- Whoop Up Drive W to Walsh Drive W (3.2km)	$0 M	$0 M	$31.9 M	$31.9 M
TOTAL	**$77.5 M**	**$98.9 M**	**$375.7 M**	**$552.1 M**

Bicycle Infrastructure

Bikeway specific infrastructure projects, facility type, and costs are provided in **Table 9-13**. It includes bike boulevards (BB), painted bicycle lanes (BL), and protected bicycle lanes (PBL). The unit costs for each of these facilities is $393/linear metre, $285/l.m. and $715/l.m. respectively. Note these costs include intersection measures. It is important to note at the outset of planning and design, the cycling corridors should be reviewed to confirm that no other alignments are more desirable given the current conditions. Changes in understanding of infrastructure suitability or changes in cycling usage are examples of reasons this review is necessary.

Table 9-13: Bicycle Infrastructure Cost Estimates (2023)

Corridors	Limits	Facility Type	Timeframe	Project Cost
13 Street N*	8 Avenue N to 26 Avenue N	PBL	Short	$10.1 M
13 Street S* 16 Avenue S	2 Avenue S to 16 Avenue S 13 Street S to Scenic Drive S	PBL	Short	$6.0 M
13 Street N* 2A Avenue N*	2A Avenue N to 2 Avenue S Stafford Drive N to 13 Street N	PBL	Short	$3.7 M
1 Avenue S* 7 Street S*	Scenic Drive S to Stafford Drive S 1 Avenue S to 10 Avenue S	PBL	Short	$3.7 M
Scenic Drive S	1 Avenue S to 6 Avenue S	PBL	Short	$0.5 M
4 Avenue S* 5 Avenue S	Scenic Drive S to 13 Street S 13 Street S to Mayor Magrath Drive S	PBL	Short	$4.9 M
12C Street N	8 Avenue N to 2A Avenue N	BB	Short	$1.3 M
1 Avenue N 6 Avenue N 18 Street N	13 Street N to Mayor Magrath Drive N Stafford Drive to 23 Street N 1 Avenue N to 9 Avenue N	BB	Med	$1.8 M
10 Avenue S 16 Avenue S 17 Street S 18 Street S	Scenic Drive S to Mayor Magrath Drive S 13 Street S to Mayor Magrath Drive S 9 Avenue S to 10 Avenue S 10 Avenue S to Scenic Drive S	PBL BL BB BB	Med	$2.6 M
12 Avenue S Scenic Drive S	Scenic Drive S to Henderson Lake Boulevard S 10 Avenue S to 12 Avenue S	BL	Med	$1.0 M
Grand River Boulevard W Princeton Crescent W Riverglen Link W	University Drive W to Riverstone Boulevard W Métis Trail W to Columbia Boulevard W University Drive W to Riverdale Terrace W	BL	Med	$0.5 M
2 Avenue N	Mayor Magrath Drive N to 30 Street N	PBL	Med	$2.3 M
3 Avenue S 9 Avenue S 18 Street S	Stafford Drive S to Mayor Magrath Drive S 13 Street S to Mayor Magrath Drive S 3 Avenue S to 9 Avenue S	PBL BL BB	Med	$2.6 M
Stafford Drive S	6 Avenue S to 9 Avenue S	BB	Med	$2.0 M
Coalbanks Link W 30 Street	Firelight Way W to Coalbanks Boulevard W Whoop Up Drive W to Coalbanks Blvd W	PBL PBL	Med	$0.4 M
32 Street S Forestry Avenue S / Lakemount Boulevard S Henderson Lake Boulevard S / Lakeridge Boulevard S	20 Avenue S to 24 Avenue S 43 Street S to Lakeridge Boulevard S 12 Street S to Forestry Avenue S	BL	Med	$0.5 M
4 Street S 9 Avenue S	7 Avenue S to Scenic Drive S 4 Street S to 13 Street S	BL BL	Med	$0.5 M
40 Avenue N Grace Dainty Road N Haru Moriyama Road N Lettice Perry Road N Mildred Dobbs/Edith Emma Coe	Mildred Dobbs Boulevard N to 13 Street N Lettice Perry Road N to 13 Street N Mildred Dobbs Boulevard N to Lettice Perry Road N Mildred Dobbs Boulevard N to 40 Avenue N Lettice Perry Road N to 40 Avenue N	PBL PBL BL BL BL	Med	$1.2 M

Corridors	Limits	Facility Type	Timeframe	Project Cost
5 Avenue N* 9 Avenue N	Strafford Drive N to 23 Street N 13 Street N to 28 Street N	PBL PBL	Med	$6.0 M
Parkside Drive S / 7Avenue S WT Hill Boulevard S	34 Street S to WT Hill Boulevard S 4 Avenue S to 43 Street S	BL BL	Med	$1.5 M
6 Street N / Stafford Avenue N	9 Avenue N to Stafford Bay N	BL	Med	$0.4 M
Blackfoot Blvd Country Meadows Boulevard W Grassland Boulevard W Highlands Boulevard W	Métis Trail W to Red Crow Boulevard W 30 Street W to Métis Trail W County Meadows Boulevard W to Garry Drive W Walsh Drive W to Red Crow Boulevard W	BB BB BB BB	Med	$1.0 M
Edgewood Boulevard W Mic Mac Boulevard W	University Drive W to Sherwood Boulevard W Red Crow Boulevard W to University Drive W	PBL PBL	Long	$1.2 M
5 Avenue S 6 Avenue S 28 Street S 34 Street S	Mayor Magrath Drive S to 25 Street S Mayor Magrath Drive S to 34 Street S 6 Avenue S to Parkside Drive S Leaside Avenue S to Parkside Drive S	PBL PBL PBL PBL	Long	$0.4 M
Great Lakes Road S Nipigon Road S	South Parkside Drive S to Cul-de-Sac Great Lakes Road N to 43 Street S	BB BB	Long	$0.7 M
36 Street N 2 Avenue N	2 Ave N to 26 Ave N 30 St N to 36 St N	BL BL	Long	$1.0 M
15 Avenue N 18 Street N	13 Street N to 23 Street N 9 Avenue N to 26 Avenue N	BL BB	Long	$1.2 M
Tudor Boulevard S / 28 Avenue S	Scenic Drive S to 28 Street S	BB	Long	$0.5 M
TOTAL				**$59.5 M**

* Costs include road improvements.

Pathways & Sidewalks

Table 9-14 summarizes the short, medium, and long-term length and associated costs for new sidewalks and pathways. The unit cost for sidewalks is $260/l.m. and for pathways is $238/l.m.

Table 9-14: Pathway & Sidewalk Cost Estimates (2023)

Infrastructure Type	Short-Term	Medium-Term	Long-Term	Total
Lengths				
Sidewalks	3.8 km	11.8 km	15.2 km	30.8 km
Multi-Use Pathways	11.8 km	37.6 km	29.2 km	78.6 km
Costs				
Sidewalks	$1.0 M	$3.1 M	$3.9 M	$8.0 M
Multi-Use Pathways	$2.8 M	$9.0 M	$6.6 M	$18.4 M
TOTAL	**$3.8 M**	**$12.1 M**	**$10.5 M**	**$26.4 M**

Intersection Crossing Improvements

Table 9-15 summarizes the short, medium, and long-term number of pedestrian crossing improvements and their associated costs. The unit cost for pedestrian-related improvements is $270,000. Bicycle related crossing improvement costs have already been factored into the unit cost for bicycle infrastructure.

Table 9-15: Intersection Pedestrian Improvement Cost Estimates (2023)

Intersection Improvement	Short-Term	Medium-Term	Long-Term	Total
Quantity	11	55	16	82
TOTAL	**$3.0 M**	**$14.9 M**	**$4.3 M**	**$22.2 M**

Floating Transit Stops

The cost estimates for the floating transit stops is summarized in **Table 9-16**. There are a total of 69 locations identified. The unit cost for each is $111,000. The timing corresponds to the timing of the bicycle corridor.

Table 9-16: Floating Transit Stop Cost Estimates (2023)

	Medium-Term	Long-Term	Total
Quantity	39	30	69
TOTAL	**$4.3 M**	**$3.3 M**	**$7.7 M**

9.3.5 INTEGRATION WITH CAPTIAL IMPROVEMENT PROGRAM

The City of Lethbridge has a 10-year 2022-2031 Capital Improvement Program (CIP) for funding municipal infrastructure projects. The funding areas related to the City's Transportation Network are summarized in **Table 9-17**.

Table 9-17: Transportation Network Related Capital Investment Programs

Program ID	Program Description
Maintain Safety	
C-5	Intersection Improvements (non-growth areas)
C-6	Bikeways/Pathways/Sidewalks along Roadways
C-7	Accessibility Improvements
Preserve Existing Infrastructure	
C-8	Annual Overlay Program
C-9	Bridge Rehabilitation Program
C-10	Railway Rehabilitation Program
C-11	Traffic Signals Replacement
C-12	Community Lighting - Rehabilitation
C-13	Major Sidewalk Rehabilitation Program
C-14	Paved Lane Rehabilitation Program
Upgrade Existing System	
C-19	In-Service Safety Review of Intersections
Urban Revitalization	

D-20	Urban Core Public Realm Enhancement Program

The programs most related to the infrastructure recommendations of the TMP are C-5, C-6, C-7 and C-19.

9.3.6 INTEGRATION WITH OPERATING PROGRAM

As the City proceeds with the implementation of multi-modal transportation projects, operational funding will be needed to reflect that. The costing, on the operational side, will vary depending on the recommendation, such as road widening, construction of new roads, new sidewalks as missing links, new multi-use pathways, and new on-street bicycle infrastructure. These new operational needs have been summarized with anticipated areas of focus:

1. **Transportation & Land Use Planning Integration**

   Operational considerations in this area are limited, with consideration for administration staff time in reviewing new developments and supporting City policy development. As these action items are developed or delivered, additional public space and amenities, such as green space, will have a direct impact on city operations and maintenance, which can be evaluated with the associated developer.

2. **Multi-modal Integration**

   The development new sidewalks, new pathways, new on-street bicycle infrastructure (painted and protected bike lanes), and new roads will need to consider both lifecycle maintenance and seasonal maintenance in their priority. Snow clearing on pathways should be considered and expanded to support this network. This will similarly be the case for new roads, bridges or signals which will expand the City's operating needs.

3. **Transit Integration**

   Public transit carries considerable operational costs, with increased operating hours and distances traveled increasing the cost of drivers and maintenance on the vehicles. Access to Transit during the winter months is dependent on seasonal maintenance (including responsive snow clearing during the winter months) at and connecting to the transit stops.

4. **Transportation Demand Management**

   Most Transportation Demand Management solutions come tied with a separate business case model, such as car share or ride share. The use of information sharing supporting Transportation Demand Management is achieved through either online or separate applications, each with their own operational and maintenance implications.

5. **Transportation Supply Management**

   Management of traffic supply is dependent on the collection of accurate data, whether continuous real-time or sampled data. The better this data, the more informed traffic management decisions will be. Each technology will carry its own operational costs and requirements.

6. **Monitoring and Reporting**

Successful implementation of the TMP will require dedicated staff and other resources to initiate and deliver actions, monitor TMP progress, and report back to Administration and Council.

7. **Winter Maintenance**

   New pathways, sidewalks, on-street bikeways, and universal access at intersections and transit stops will require additional budget for snow and ice control including snow clearing, salting/sanding, and spring clean up.

It is important that operational and maintenance funding needs are accounted for when seeking the approval of capital funding for new roads, sidewalks, pathways, and cycling infrastructure.

9.3.7 OTHER FUNDING SOURCES

Government Funds & Programs

Based on the nature of the recommended improvement projects, the follow sources of funding have been identified for consideration.

Infrastructure Canada – Canada Community Building Fund

Previously named the Gas Tax Fund, it provides a permanent source of funding to provinces and territories, who in turn flow this funding to their municipalities to support local infrastructure priorities - investments across 19 different project categories, including local roads, public transit, bridges, highways, local and regional airports, recreation and fire stations.

Project Eligibility
- Road widening
- Intersection improvements
- Sidewalk construction
- Multi-use pathways
- Bridges

Federation of Canadian Municipalities - Green Municipal Fund

There are economic, environmental and health benefits to capital projects that reduce pollution by improving transportation network efficiency and providing commuting options (encouraging people to switch to less polluting transportation). Examples include:

- On-demand transportation solutions.
- First- and last-mile solutions.
- Connecting commuters to park-and-ride facilities.
- Active transportation infrastructure (e.g., bike lanes).
- Walking and cycling networks that promote accessibility and safety.

Project Eligibility
- Sidewalk construction
- Multi-use pathways

Alberta Funding Programs – Strategic Transportation Infrastructure Program

Two funding streams in this program are relevant to the TMP recommendations:

Project Eligibility
- Road widening
- Intersection improvements
- Sidewalk construction
- Multi-use pathways

- Resource Road Program - Building or improving road infrastructure that supports industrial and economic growth.
- Local Municipal Initiatives - Local transportation infrastructure projects.

The program's goals are to improve accessibility and the movement of goods and people; to increase the capacity of municipal transportation infrastructure to support economic growth; enhance safety and efficiency; and extend the service life of key transportation infrastructure.

Offsite Levy Program

The Offsite Levy is a mechanism that the City uses to fund major infrastructure (water, sanitary, and storm sewer trunks and arterial roads) that are required to serve new developments in multiple neighbourhoods. It helps land developers cooperate on major projects and divide costs up between them. While the Offsite Levy is initially paid by developers, the cost is passed down to the lot purchaser, as it is included in the lot price, along with the cost of local infrastructure. All property owners share in the initial costs of water, sewer and road infrastructure they use.

The current (2023) Offsite Levy rate is $290,000/ha and that works out to approximately $24,300 for a single residential lot. The City has used these funds to build major infrastructure projects like Métis Trail, Garry Water Reservoir, Bridge Drive Sanitary Sewer and the recent twinning of Whoop-up Drive. Projects that will be built using the Offsite Levy are identified in the City's Capital Improvement Program.

The current Offsite Levy Bylaw includes rates that apply to the end of 2026. This means that new rates need to be set for 2027 and beyond. Under the Municipal Government Act, setting new rates requires a review and consultation with stakeholders (i.e., development/building industry).

9.4 Pilot Project Opportunities

9.4.1 MAYOR MAGRATH DRIVE ROAD DIET (INTERIM DESIGN)

Collision data and engagement both highlighted Mayor Magrath Drive as a corridor to examine to improve the environment for pedestrians and cyclists crossing. Its wide intersection crossings (6 or more lanes) wide travel lanes, and high arterial speeds create an uncomfortable environment for pedestrians and cyclists. Scenario testing with the updated travel demand model suggests that a narrowing of this corridor from 6 to 4 travel lanes will not greatly impact the surrounding road network. Before committing the capital funding for relocating existing curb and stormwater infrastructure, an interim road diet with the use of delineator posts, signage and pavement markings could be done for much less cost, and its operations monitored. If after a year of monitoring, corridor operations are not working well, it would be simple to revert to the current design. If, on the other hand, operations are working well, the City could then pursue detailed design and procurement for the ultimate narrowing.

9.4.2 PERMANENT PATHWAY COUNTERS

Real time transportation data is helpful for monitoring current, hourly, and seasonal activity and helping inform decisions impacting the transportation network. Calgary currently has over 70 permanent bicycle/pedestrian counters spread throughout the city. As Lethbridge expands its current regional pathway and bikeway network, permanent counter installations at key locations (e.g., Whoop Up Drive multi-use pathway bridge) would provide the City with data on daily and seasonal use, and provide necessary information to measure increases in the TMP's modal targets.

9.5 Integration of Sustainability

Environmental sustainability is embedded in **TMP Goal #7: Design transportation infrastructure that contributes to a healthy environment and ecosystem function.**

This section demonstrates how sustainability has been built into the development of this Plan, and sustainable strategies around the detailed design of the infrastructure, the transportation fleet, and land use further this goal.

Modal Shift

The Transportation Master Plan has sustainability embedded within it by setting modal targets and focusing on investment in transit, and active transportation infrastructure to help support these targets. By prioritizing safe active transportation and transit infrastructure, the City of Lethbridge can potentially reduce its proportion of vehicle trips by 10%. With this reduction in vehicle trips, is a corresponding reduction in green house gas emissions. Shown in **Figure 9-13**, this reduction is estimated to be a 35,000-ton/year savings in GHG emissions.

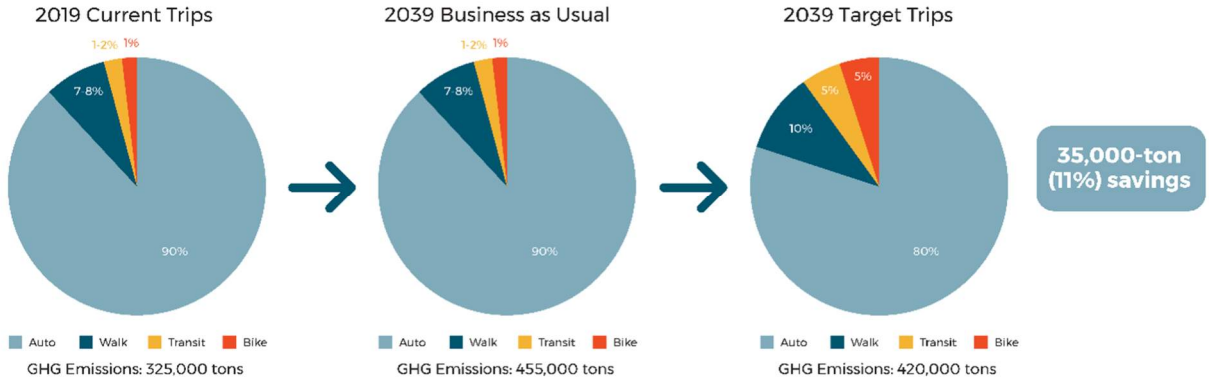


Figure 9-13: Modal Targets & GHG Emission Savings
Source: Stantec

Street Trees

Street trees improve air quality by absorbing pollutants, reducing greenhouse gas emissions by absorbing carbon dioxide, and provide shade which can help reduce the urban heat island effect. Street trees can

also provide important habitats for wildlife and help preserve biodiversity in urban areas. Finally, from a sustainability perspective, street trees can help reduce runoff and improve water quality by absorbing rainwater and reducing the amount of water that flows into the stormwater system. Average monthly evapotranspiration in the region ranges from about 100mm to 220mm per month and about 1000mm per year, so trees can have a significant reduction of water flows to the storm water system, especially if it can be stored for use (ie. a mature tree can use 20m3 of water per year). If soil cells with porous paving within the 'furnishing zone' (1.2-1.5m wide zone between the sidewalk and curb) are incorporated, a significant portion of spring, summer, and fall rainwater that flows from lots and sidewalk areas can be captured, stored and utilized.

Boulevard Landscaping

Hardscaping and mowing grass boulevards are not very sustainable approaches to road design. Lethbridge should consider implementing wild, native grasses and vegetation into the road right-of-way. Not only do these treatments require less moisture to maintain, but they provide habitat for pollinators like bees. These, coupled with rain gardens, and permeable pavements, also help with water retention during storm events. These features are more commonly known as Low Impact Development (LID). Rain gardens, bioretention, permeable pavements, and other LID features can work well in clay soils. Designs can be modified to work with any subsoil conditions.

Sustainable Road Building

Some sustainable road building practices the City of Lethbridge should consider in new construction include:

- Minimizing impacts on the environment: minimizing impacts on natural resources and wildlife habitats, such as wetlands, undisturbed grasslands and the river valley.
- Integrating with the surrounding landscape: designing roads that blend in with the natural surroundings and complement the local environment, using, for example, vegetation and permeable pavements.
- Promoting energy efficiency: use of high-efficiency lighting, permeable pavements, and materials that reflect sunlight.

Alternative Fuels

The City of Lethbridge should consider the following alternative fuels for their fleet to reduce environmental impacts:

- **Electric**
  Electric vehicles powered by battery or hydrogen fuel cells are a clean and efficient alternative to gasoline-powered vehicles and are increasing in popularity each year.
- **Biofuels**
  Biofuels such as ethanol, biodiesel and biomethane are made from organic matter and are a renewable alternative to fossil fuels. They have lower greenhouse gas emissions.
- **Natural Gas**
  Natural gas vehicles run on compressed or liquified natural gas and emit less greenhouse gasses than traditional gasoline vehicles.
- **Hydrogen**
  Hydrogen is a clean-burning fuel that produces only water when used in fuel cell vehicles.

Land Use

As has been identified in this document and the City's current Municipal Development Plan, there are fewer opportunities for employment, shopping and recreation in the west sector of the City. This is due to a number of factors and means that traffic going to and from West Lethbridge to seek out these opportunities is uneven. While this disparity between land uses across the entire city will likely remain, measures can be undertaken to attract citizens from other parts of the city to West Lethbridge for employment, shopping and recreation and also to encourage these necessary land uses to be closer to residents of West Lethbridge. The TMP supports balancing such activity nodes where possible in the city, as described in the current Municipal Development Plan, to aid with reducing traffic congestion and to delay/avoid building costly new transportation infrastructure necessary where possible.

By supporting more mixed-use development with good access to public transit and pedestrian friendly streets, vehicle trips and vehicle trip length are both reduced. This has a corresponding reduction in greenhouse gas emissions.

9.6 Integration of Health

Alberta Health Services (AHS) is a strong supporter of healthy transportation networks. The following is a summary of material provided by AHS (Nov 28, 2022, Letter to City of Lethbridge re: 2022 TMP health and well-being considerations) highlighting the benefits of active transportation networks, transit, and compact, walkable communities:

The built environment is an essential part of life which directly impacts physical and mental health. Local community planning, including transportation networks, shape the health and well-being of all citizens. Municipalities are a key to this process, and thus have a unique opportunity and responsibility for creating healthier places for citizens where they live, learn, work, and play.

Promoting **active transportation networks** can benefit the entire community, not only those utilizing those networks. Evidence has shown that improvements to active transportation networks can help reduce traffic congestion through a shift in travel methods and help achieve equity objectives by providing physically, economically, and socially disadvantaged people with basic mobility methods.[6]

At a large scale, promoting **active travel and public transport** has both health and environmental benefits due to increased physical activity, reduced air and noise pollution, and decreased greenhouse gas emission.[7]

---

[6] Litman, T. (2013). Whose Roads? Evaluating bicyclists' and pedestrians' right to use public roadways. Victoria Policy Institute; Victoria, BC. Retrieved from https://www. vtpi.org/whosrd.pdf

[7] Perez, KI, Olabarria, M., Rojas-Rueda, D., Santamarina-Rubio, E., Borell, C. & Nieuwenhuijsen, M. (2017). The health and economic benefits of active transport policies in Barcelona. Journal of Transport and Health 4: 316-324. Retrieved from https://doi.org/10.1016/j.th.2017.01.001.

Economic benefits:

Bike lanes, recreational trails, and a wide network of bus routes and stops, and other infrastructure promoting active transportation within communities can increase property values due to better walking and cycling conditions, and contribute to large tax revenues.[6]

Physical Health Benefits:

Active transportation networks, such as walking and biking paths, can help increase physical activity and reduce sedentary behaviour in the population. Even moderate increases in physical activity can substantially reduce incidence and prevalent rates of major chronic conditions and premature mortality. [8] Sustainable modes of travel, including walking, cycling, public transit and carpooling enable people to travel more efficiently and improve health by promoting both physical activity and more environment-friendly travel that reduces greenhouse gas emissions and other air pollutants.[9]

Social and Safety Benefits:

Communities where people are active and socialize have higher levels of social capital and are associated with greater prosperity, lower crime, greater overall community cohesion, and better engagement with local government. Connected communities are also safer. Safety is linked with a higher residential density and mixed land use. Such places can be vibrant with social activity in the daytime and the evenings.[10]

Reduce/Prevent Injuries and Fatalities:

Providing safe (physically separated, and safe intersection crossings) bicycle and pedestrian infrastructure is critical to limit road trauma.

9.7 TMP Policy and Action List

Policies and Actions have been developed using information from several sources: recommendations in Section 6, 7, and 8 (informed by engagement and analysis), the 2012 TMP and the MDP. These Policies and their supporting actions, are grouped into one of these five themes:

1. Transportation & Land Use Planning Integration
2. Multi-modal Integration
3. Managing Transportation Demand
4. Transportation Supply
5. Parking

[8] Bounajm, F., Dihn, T. & Theriault, L. (2014). Moving Ahead: The economic impact of reducing physical inactivity and sedentary behavior. The Conference Board of Canada: Ottawa, On.

[9] City of Calgary (2020). Calgary Transportation Plan. Retrieved from https://www.calgary.ca/transportation/tp/planning/calgary-transportation-plan-ctp.html

[10] Plan H. (n.d.) Healthy Neighborhood Design. Retrieved from https://planh.ca/takeaction/healthy-environments/builtenvironments/page/healthy-neighbourhood design.

Public Transit is not included as a policy/action theme as Lethbridge Transit is a department separate from Transportation and has its own policies and actions.

As transportation and urban form share a close relationship, the City's Municipal Development Plan (MDP) and TMP have traditionally complemented and reinforced one another. One of the intents of the City's recently approved MDP was to set the framework for the TMP. The MDP vision statement is:

"We are a City that works together with our community and partners to ensure that Lethbridge is a leader in environmental stewardship, innovation, and active leadership. We are recognised as being safe, healthy, vibrant, prosperous, economically viable and a place where all people can fully participate in community life. "

Key elements of that vision statement that work in concert with the TMP highlight the integration of the community at the core of the City, the delivery of a healthy and safe network is directly reflected in the TMP's vision for sustainability, similarly the relationship between the TMP's adaptability to the future reflects the MDP's emphasis on innovation, leadership and economic viability. Delivery of both these plans requires an approach through which both vision statements encourage the delivery on one another. The MDP affords a connection between transportation and land use and provides guidance in the TMP's ability to deliver a city-wide, multi-modal transportation system that is adaptable to change and fiscally responsible. Recommended policies and supporting actions for each of these policy areas are summarized in the sections that follow.

The sections below provide the policies and supporting actions for each theme. These are provided with a relative priority, forecasted implementation timeline and relative cost. Priority is provided as High, Medium and Low, which differentiates the necessity of each supporting action in delivering on the TMP vision statement. The timeline is provided based on the timeline to deliver on something once it is resourced and underway. It is provided in three time horizons: <5years, <10 years and >10years, with a separate grouping for 'ongoing' where the supporting action is a policy decision/direction that only requires a decision to start delivering as current capacity and capability on the part of the City will allow. Cost is provided as a scale of $, $$, $$$ which could correspond to both operating and capital costs, where $ is a small scale project (e.g. a supporting action is less than $100,000), $$ is a medium scale project (e.g. a supporting action between $100,00 and $500,000, and $$$ is a larger scale project which exceeds the medium scale threshold of $500,000.

9.7.1 TRANSPORTATION & LAND USE PLANNING INTEGRATION

The policies and supporting actions under this theme focus on connecting the transportation network to where residents live, work, and do other activities. Making the most efficient use of the transportation network requires convenient access to transportation options and more intensive and mixed land-uses where public transit is available.

Table 9-18: Transportation & Land Use Planning Integration Policies & Actions

#	Policy	Supporting Actions	Priority	Timeline	Cost
1-1	Develop new lands with the intention of accommodating all modes (and encouraging active modes and transit).	A. Ensure high quality pedestrian and cycling connections exist to major activity centers and transit stops.	High	Ongoing	$$
		B. Promote transit routes to serve activity centers and residential developments.	High	Ongoing	$$
		C. Support continuous high quality active transportation infrastructure network throughout new developments.	High	Ongoing	$$
		D. Develop the road network to maintain high quality transit service with walkable stop locations.	High	< 10 years	$$$
		E. Work with the development industry to encourage the provision of secure and high-quality parking for regular bicycles, e-bicycles and cargo/over-sized bicycles.	High	< 5 years	$
		F. Update City of Lethbridge Traffic Impact Study guidelines to improve considerations of all modes of transportation.	High	< 5 years	$
		G. Work with Lethbridge County and Alberta Transportation to plan for the future arterial road connection from the southeast boundaries of the city to Highway 5.	High	< 5 years	$
		H. Continue the logical expansion and maintenance of the City's industrial rail network.	High	Ongoing	$$$
		I. Through the Municipal Development Plan and other related planning documents, endeavor to balance the development of activity nodes throughout the City as best as possible to assist in the distribution of traffic on the road network.	High	Ongoing	$
1-2	Support development in targeted nodes and corridors serviced by transit and intensify uses and activities in these areas.	A. Promote a mixture of land uses at current and future transit hubs and stops which can support one another for and range of user groups and mobility solutions. This needs to be achieved in parallel to ensure both transit is available at occupancy.	Med	Ongoing	$
		B. Support airport passengers and employees with reliable and frequent travel options which are tied to forecasted journeys.	Med	<5 years	$$

#	Policy	Supporting Actions	Priority	Timeline	Cost
1-3 	Support opportunities for mixed-use developments in areas with existing infrastructure.	A. Support a network that connects and promotes basic services (e.g., convenience retail, health food options, schools, social services and parks) at a local level.	Med	Ongoing	$$
		B. Ensure that contextually sensitive infill and redevelopment in existing built-up areas informs multi-modal transportation infrastructure investments.	Med	Ongoing	$$
		C. Pursue opportunities to make auto dependent existing neighbourhoods more accessible near bus stops, along arterial roads and at intersections.	Med	< 5 years	$$
		D. Explore funding options to pave commercial roadways and rear lanes.	Low	< 5 years	$
1-4 	Improve communication to be inclusive, accessible, and equitable.	A. Provide the opportunity for Indigenous Relations Advisors/Specialists to be engaged during the planning, design, and implementation phases of future transportation and planning projects.	High	< 5 years	$
		B. Transportation staff to complete development reviews with equity, diversity and inclusion lenses specifically considered.	High	Ongoing	$
		C. Ensure that all public transportation communication materials and planning events are accessible and available by providing different formats for users with diverse abilities.	High	< 5 years	$

9.7.2 MULTI-MODAL INTEGRATION

The policies and supporting actions under this theme focus on ensuring that streets are designed for multiple modes, are safe for everyone, and that the public is made aware of the opportunities and benefits.

Table 9-19: Multi-Modal Integration Policies & Actions

#	Policy	Supporting Actions	Priority	Timeline	Cost
2-1 	Design streets to create pedestrian, cycling, and transit supportive environments.	A. Facilitate flexibility in design standards by completing the Complete Streets Guidelines/Policy and providing a greater range of roadway cross sections to include a range of appropriate active transportation and transit infrastructure.	High	< 5 years	$$
		B. Update design standard to include the principles of Universal Design.	High	< 5 years	$
		C. Ensure the missing links in the pathway system are completed to accommodate pedestrians and cyclists.	Med	< 10 years	$$$

#	Policy	Supporting Actions	Priority	Timeline	Cost
		D. Commit to a new active-modes river crossing to create a river valley multi-use pathway loop and directly connect southwest and southeast Lethbridge communities.	Med	> 10 years	$$$
		E. Support expanded shared mobility opportunities including electric scooter and electric bike share.	Med	< 5 years	$$
		F. Consider opportunities to integrate cultural heritage (i.e. indigenous public art) into transportation infrastructure (e.g., concrete treatment for underpasses, art piece for roundabouts).	Med	< 10 years	$$
		G. Consider opportunities to integrate shade, wind buffering and nature-based solutions to create supportive environments for all users.	Med	< 10 years	$$$
2-2	Build awareness and promote the benefits of walking and cycling.	A. Develop an education program to provide information (to decision makers, and the public) on the environmental, economic/financial (both City and individual), and health benefits of walking and cycling by way of advertising and promotional activities.	High	< 5 years	$
		B. Secure capital, grant, or alternative funding streams to earmark for cycling network implementation.	Med	< 5 years	$
2-3	Ensure the transportation network serves everyone, including people of all ages, incomes, and abilities.	A. Commit to the winter maintenance of pathways, cycle lanes and sidewalks to promote alternative modes throughout the year.	Med	< 5 years	$$$
		B. Accelerate the retrofit programs for the construction of accessible infrastructure to ensure accessible wheelchair ramp angle and design, and addition of tactile walking strips.	High	< 5 years	$$
		C. Ensure intersection and crossing improvement implementation, prioritizing locations of high traffic stress, near transit, schools, and other activity centres.	High	< 5 years	$$
		D. Create new standards and/or adopt existing standards from other municipalities to improve legibility of street name signs and pedestrian information/wayfinding signs.	Med	< 10 years	$$
		E. Update Indigenous Street names to culturally acceptable spellings.	Med	< 5 years	$
		F. Update temporary traffic control standards to include accessibility requirements.	Med	< 10 years	$$$
		G. Support regional transportation initiatives.	Low	Ongoing	$
		H. Develop a wayfinding strategy that incorporates the principles of universal design.	Med	< 5 years	$

#	Policy	Supporting Actions	Priority	Timeline	Cost
2-4	Ensure that new developments adhere to design standards and incorporate multi-modal infrastructure.	A. Work with the development industry (Building Industry & Land Development Association – BILD) and/or other similar organizations to develop planning guides for planning cycling networks for new communities.	High	Ongoing	$
		B. Ensure all new developments provide safe and convenient pedestrian environments through provision of infrastructure such as sidewalks, crosswalks, lighting etc.	High	< 5 years	$
2-5	Ensure Lethbridge streets are safe for all people.	A. Commit funding towards and implement the actions of the 5 focus areas identified in the 2020 Transportation Safety Plan: Distraction, Speed & Aggressive Driving, Intersections, Vulnerable Road Users, and Safe Vehicles.	High	> 10 years	$$$
		B. Develop an education and encouragement program for residents and businesses to support a shift in mode choice, safe routes, and 'sharing the road'.	High	< 5 years	$$
		C. Provide communications programs for safety relating to natural risks to driver and user safety (e.g. threats from wildlife collisions, seasonal weather, etc.)	Low	< 5 years	$$

9.7.3 MANAGE TRANSPORTATION DEMAND

The policies and supporting actions under this theme focus on managing or reducing traffic demand, particularly during peak hours when the transportation system is under the most stress.

Table 9-20: Transportation Demand Policies & Actions

#	Policy	Supporting Actions	Priority	Timeline	Cost
3-1	Design streets to create pedestrian, cycling and transit-supportive environments.	A. Create and fill the position of Transportation Demand Management Coordinator within the City staffing structure, to be responsible for leading and managing the City's implementation of Transportation Demand Management strategies.	Med	< 5 years	$$
		B. Develop a comprehensive Transportation Demand Management implementation plan that will confirm key objectives, set priorities for short-term actions, and identify required resources.	Med	< 5 years	$

#	Policy	Supporting Actions	Priority	Timeline	Cost
		C. Promote sustainable transportation choices through communication and outreach methods including partnering with other agencies, web sites, integrated transit, cycling, and pathways maps, cycling and transit skills training, media relations, and special events that raise the profile of sustainable transportation choices.	Med	< 5 years	$
3-2 	Consider traffic calming as an effective means of reducing the negative impacts of traffic on the quality of life for Lethbridge residents in existing and future neighbourhoods and built-up areas.	A. Require the development of neighbourhood traffic management plans as part of future outline plans and area redevelopment plans.	Med	Ongoing	$
		B. Develop a Traffic Calming Policy to guide the prioritization and implementation of traffic calming measures.	Med	< 5 years	$$
		C. Develop (or adopt existing) traffic calming design standards.	Med	< 5 years	$$

9.7.4 MANAGE TRANSPORTATION SUPPLY

The policies and supporting actions under this theme focus on maximizing the capacity or efficiency of the transportation network through technology, data collection and monitoring, and wayfinding.

Table 9-21: Transportation Supply Policies & Actions

#	Policy	Supporting Actions	Priority	Timeline	Cost
4-1 	Maximize the multimodal capacity of current infrastructure (e.g., transit priority, access management).	A. Develop and require incorporation of key criteria and factors that impact or define level of service for each major mode – walking, cycling, goods, transit and vehicles in all planning and design projects.	Med	< 10 years	$$$
4-2	Keep Lethbridge moving by developing and maintaining a well-connected street network to address traffic flows.	F. Install permanent traffic counters and promote the use of Location Based Data for monitoring traffic growth and for improved open data sharing.	High	< 5 years	$$
		G. Begin the planning process for implementing a Traffic Management Centre to manage traffic signals, transit operations, detours, and incidents in real-time.	Med	< 10 years	$$$

#	Policy	Supporting Actions	Priority	Timeline	Cost
		H. Continue expanding the Transit Signal Priority program and investigate the use of dynamic signals in areas of high congestion.	Med	< 10 years	$$$
		I. Promote Mobility as a Service digital platform to integrate transportation systems and options for visitors and residents.	Med	Ongoing	$
		J. Undertake a review of the current signage and ease of wayfinding for Trucks and Dangerous Goods, and implement improvements where required.	Med	< 5 years	$
4-3	Consider the life cycle benefits and costs when planning, maintaining, and operating the transportation system.	E. Ensure that direct investments in roadway projects will enhance mobility, safety, and the Level of Service on the City's arterial road network.	Med	Ongoing	$
		F. Ensure roadway segments scheduled for maintenance or restriping are compared against planned on-street bicycle routes to lower the capital cost and accelerate the implementation of the bicycle network.	High	Ongoing	$
		G. Limit the impact to natural lands when designing and implementing new infrastructure to protect and, in some instances, recognize adjacent historical Indigenous sites.	High	Ongoing	$
		H. Ensure designs for transportation corridors, notably arterials, provide sufficient spacing and easements suitable for compatible utilities such as high-pressure gas lines and electrical transmission.	High	Ongoing	$$

9.7.5 PARKING MANAGEMENT

The policies and supporting actions under this theme focus on strategies to provide adequate, but not oversupply, parking which is an inefficient use of land, creates additional municipal costs, and does not encourage the use of alternative modes of travel.

Table 9-22: Parking Policies & Actions

#	Policy	Supporting Actions	Priority	Timeline	Cost
5-1	Attempt to balance the need to supply sufficient parking to	F. Ensure that parking standards in the Land-Use Bylaw accurately represent needs by specific land use and do not result in excess parking supply,	Med	< 5 years	$

#	Policy	Supporting Actions	Priority	Timeline	Cost
	support residents and businesses while avoiding excess parking supply that can discourage alternative modes.	G. Support reducing the amount of required parking along major transit routes by creating parking maximums or reducing parking minimums.	Med	Ongoing	$
		H. Explore eliminating or reducing parking minimums in the Land Use Bylaw.	Med	< 10 years	$
		I. Reduce the reliance on public curbside parking and allow repurposing of this space for street furniture, patios, bicycle and micro-mobility parking.	Med	< 10 years	$
		J. Create cycling and micro-mobility parking minimums.	Med	< 5 years	$
5-2 	Improve on-street parking operations	B. Require periodic parking needs surveys in the downtown to determine utilization and potential for pricing.	Med	< 5 years	$$

9.8 Policy & Lens Alignment

The policies and actions identified in Section 9.7, align with the policies/actions of these approved City of Lethbridge governing documents/Plans:

- Municipal Development Plan
- Intermunicipal Development Plan
- Mobility & Accessibility Master Plan
- Transportation Safety Plan

These plans should be consulted for more specific policies, actions and strategies focused on land use planning, transportation outside of the City Limits, mobility & accessibility, and safety.

To communicate alignment between the TMP lenses and the recommendations/policies within this report, the related lens icons are displayed with headers for specific sections throughout the report. In addition, associated lenses for each policy are provided in Section 9.7.

10 MONITORING IMPLEMENTATION PROGRESS

Monitoring the progress or success of the Transportation Master Plan requires key performance indicators, metrics (and a means to collect those metrics), baseline data and targets. Eleven key indicators for mobility have been identified for the TMP. These cover progress on the infrastructure for pedestrians, cyclists/micro-mobility users and those with accessibility requirements, all of which directly impacts the transportation mode split. For the vehicular mode, there are two key indicators: progress on EV station growth and maintaining an average speed threshold for the street network. Data sources to monitor metrics include the 5-year federal census survey, city GIS inventory and mapping, and the regional transportation model. **Table 10-1** summarizes the eleven key indicators, their metrics, baseline years and values, and target values for both 2029 and 2039.

Table 10-1: Key Indicators for Mobility (TMP)

#	Key Indicator	Metric	Baseline Year	Baseline	2029	2039
1	Transportation Mode Split*	Walking Mode Split (all-purpose trips, 24 hrs, city-wide)	2019	4.7%	7%	10%
		Cycling Mode Split (all-purpose trips, 24 hrs, city-wide)	2019	1.3%	3%	5%
		Transit Mode Split (all-purpose trips, 24 hrs, city-wide)	2019	1.4%	3%	5%
		Auto Mode Split (all-purpose trips, 24 hrs, city-wide)	2019	89.0%	87%	80%
2	Bikeway Network (On-Street)	% Phase 1 (Cycle Master Plan) complete	2019	10%	30%	100%
3	Pathways	% Pathway network complete	2021	73%	85%	100%
4	Sidewalks	% Sidewalk network complete	2021	86%	90%	100%
5	Accessible Ramps	% of Intersections with pedestrian ramps	2023	77%	85%	100%
6	Tactile Walking Surface Indicators	% of downtown, major collector and arterial intersections with tactile walking surface indicators at ramps	2023	4%	50%	100%
7	Audible Traffic Signals	% of signalized intersections with audible pedestrian signals	2023	77%	88%	100%
8	E-Scooter/e-Bike Services	# of Annual Trips	2022	167,000	50% increase	100% increase
9	EV Stations	# EV Charging Stations (publicly owned)	2022	6	400% increase	800% increase

#	Key Indicator	Metric	Baseline Year	Baseline	2029	2039
10	Average Street Network Speed	Average speed for all daily trips (based on the VISSUM model)	2019	39km/hr	>35 km/hr	>35 km/hr
11	Safety	Pedestrian & Cycling Severe Injuries & Fatalities	2019	20 per year (5-year average)	50% reduction	100% reduction (to zero)

*3.6% trips were recorded as “other” for baseline data

It is recommended that progress on the action items and key indicators should be reported back to Council every 2 to 3 years and that the TMP be updated in 10 years.