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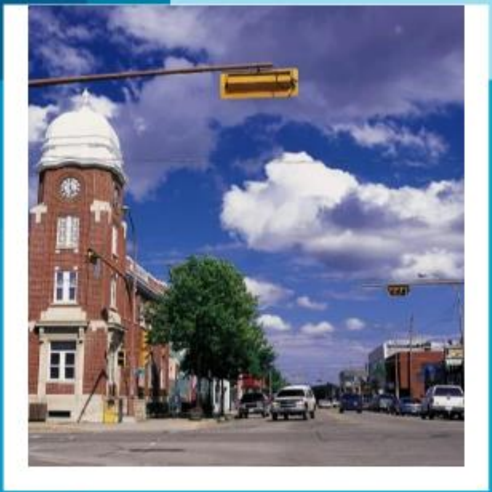
City of Lloydminster

Transportation Master Plan



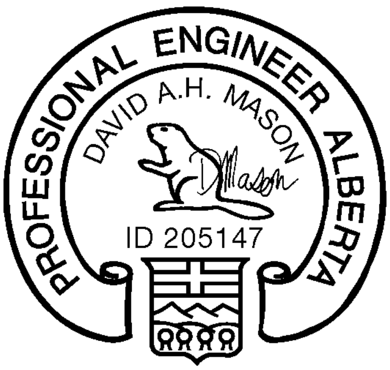
October 2025
Final Report

ISL Engineering and Land Services Ltd. is an award-winning full-service consulting firm dedicated to working with all levels of government and the private sector to deliver planning and design solutions for transportation, water, and land projects.

At ISL, your identity is part of our identity. Diversity, Equity, and Inclusion (DEI) speaks to our core values and provides space for our teams to bring their authentic selves to work. ISL believes DEI creates the best outcomes for our clients while sustaining a happy and thriving work environment that allows for career development opportunities for all staff. ISL is committed to a focused effort on continuous improvement and development of a respectful and safe workplace.

Corporate Authorization

This document entitled “Transportation Master Plan” has been prepared by ISL Engineering and Land Services Ltd. (ISL) for the use of City of Lloydminster. The information and data provided herein represent ISL’s professional judgment at the time of preparation. ISL denies any liability whatsoever to any other parties who may obtain this report and use it, or any of its contents, without prior written consent from ISL.



2025-10-28

David Mason, M.Eng., P.Eng.
Transportation Engineer

Permit to Practice
ISL Engineering and Land Services Ltd.

RM Signature:

RM APEGA ID: 63067

Date: 2025-10-29

Permit Number P4741
The Association of Professional Engineers and Geoscientists of Alberta

Territory Acknowledgement

City of Lloydminster

The City of Lloydminster acknowledges that we are located on Treaty 6 Territory, the traditional lands of the Cree, Dene Suliné, Saulteaux, Nakota Sioux, and Métis Peoples. We respect and honour the histories, languages, and cultures of all First Nations, Métis, and Inuit Peoples, whose presence continues to enrich our vibrant community. We are all treaty people.

ISL Engineering and Land Services Ltd.

ISL Engineering and Land Services Ltd. acknowledges that ISL's Edmonton office and work, and our connection to one another, takes place on the traditional, ancestral, and present-day territories of many, including nêhiyaw/Cree, Dené, Nakota Isga/Nakota Sioux, Anishinaabe/Saulteaux, Niitsitapi/Blackfoot, and Inuit peoples, as well as being part of Métis Nation of Alberta Region 4. We recognize these peoples have called these lands their home since time immemorial.

We acknowledge that many ISLers are settlers living and working in this Territory. We are grateful for the opportunity to live and work here. We are committed to continued learning and working toward reconciliation in ways that minimize our impact on the earth, groundwater, and habitats, so we build sustainable communities for today and for future generations to come.

Table of Contents

TABLES

FIGURES

1.0 Introduction

1.1 Authorization

The City of Lloydminster (the City) retained ISL Engineering and Land Services Ltd. (ISL) to conduct a comprehensive review of its transportation system and assess its capacity to support both existing and future travel demands. A PTV Visum travel demand model was developed to forecast future travel demands, incorporating existing travel patterns, projected land use growth, and anticipated expansions to the transportation network.

Detailed intersection assessments were completed using Synchro traffic operations analysis software. The study also examined collision data, alternative network scenarios (including the proposed north-south couplet and a Highway 16X bypass), potential locations for rail grade separations, and the designation of truck and dangerous goods routes, including those within annexation areas. The above encompassed the development of a 3-, 5-, 10- and 20-year staging plan.

1.2 Background

The previous Transportation Master Plan (TMP) was completed by ISL in 2015. Since then, the City limits have been expanded via the 2022 Annexation Lands along with various transportation network upgrades completed. The anticipated increase in travel demand due to ongoing growth and development within Lloydminster necessitates this TMP update.

The updated TMP will help the City understand the transportation requirements for servicing existing demands and forecast demand from new developments to ensure effective infrastructure implementation.

1.3 Purpose of Study

The objectives of the updated TMP are as follows:

- Assess the existing transportation system based on existing travel demands.
- Engage the public to gather their feedback on the existing transportation system.
- Develop a travel demand model up to the 20-year horizon in PTV Visum based on existing travel patterns, demands, and future growth to the land use and transportation network.
- Assess the future transportation system using PTV Visum (corridor capacity) and Synchro (intersection capacity).
- Review collisions as an input to the review.
- Review several other areas including the north/south couplet, Highway 16X bypass, potential locations for rail grade separation, trucks and dangerous goods movements, and potential future network beyond the 20-year horizon.
- Develop transportation system plans to accommodate existing and projected travel demands across 3-, 5-, 10-, and 20-year planning horizons.

2.0 Background Information

2.1 Location

The City of Lloydminster (City) straddles the Alberta/Saskatchewan border and is located approximately 250 km southeast of the City of Edmonton. Lloydminster is bordered by the County of Vermilion River No. 24 on the Alberta side and both the Rural Municipality (RM) of Britannia No. 502 and the Rural Municipality (RM) of Wilton No. 472 on the Saskatchewan side. The Yellowhead Highway (Highway 16), an interprovincial corridor connecting Manitoba to British Columbia, passes through Lloydminster and is designated as 44 Street (Ray Nelson Drive) within City limits. Highway 17 runs north/south through Lloydminster along the Alberta/Saskatchewan border and is known as 50 Avenue within City limits. The study area is shown in Figure 2.1.

The study area encompasses 24 neighbourhoods, as well as approximately 23.5 quarter sections of recently annexed land as shown in Figure 2.2. The study area encompasses a total area of approximately 5,870 ha. Not all existing neighbourhoods are fully developed; therefore, future growth is anticipated both within these neighbourhoods, as well as within the recently annexed land.

Figure 2.3 highlights the regional road network that connects Lloydminster to its broader economic and geographic context. As a unique bi-provincial municipality, Lloydminster serves as a key service and logistics hub for both eastern Alberta and western Saskatchewan. The surrounding counties and rural municipalities—such as the County of Vermilion River, the RMs of Britannia and Wilton, and others—rely on this network for access to urban amenities, employment, and trade. The regional road system supports the movement of agricultural products, energy sector goods, and interprovincial freight, reinforcing Lloydminster's role as a strategic connector within the prairie region.

2.2 Development Type

The nature of future developments significantly influences travel patterns and traffic intensity. As such, obtaining accurate zoning classifications was essential to ensure a representative model of the road transportation network. When determining development classifications for existing areas within Lloydminster, a land use district shapefile was used as provided by the City.

A land use district map for existing development is illustrated in Figure 2.4, while Table 2.1 summarizes all land use district codes and their corresponding descriptions. The land use categorizations for the TMP were based on the existing land uses assessments completed for the water and utility-related master plans and adapted to develop a transportation demand model. In addition, vehicular travel within Lloydminster is influenced not only by internal land uses but also by those in adjacent rural areas. Land uses for areas immediately outside of Lloydminster City limits were also assessed for purposes of estimating travel behaviour to and from these rural areas.

As part of the utilities master plans, the land uses were compared to aerial maps and Google Street View to confirm that parcels were properly categorized. For the purposes of this report, land use determines the intensity of travel to/from a specific parcel of land and the type of trips may vary based on this land use. In Travel Demand Modeling, road users are split into travel demand strata (or segments) (see Section 3.0 for further details). To match the various travel strata (such as home-based-work trips), land parcels contain either residential properties, employment opportunities or a combination within mixed-development lots.

Table 2.1 shows specific land uses were used to estimate total number of dwelling units (single-family or multi-family), or number of jobs (retail, non-retail, industrial or institutional).

Table 2.1: Land Use District Descriptions

<table>
<tr><th>Basis of Trips</th><th colspan="2">District Description</th></tr>
<tr><td rowspan="2">Single Family Dwelling Units</td><td colspan="2">Residential (County Rural)</td></tr>
<tr><td colspan="2">Residential (Single Family Buildings)</td></tr>
<tr><td>Multi-Family Dwelling Units</td><td colspan="2">Residential (Multi Family Buildings)</td></tr>
<tr><td>Mix of Dwellings and Employment</td><td colspan="2">Mixed Residential / Commercial</td></tr>
<tr><td rowspan="5">Employment</td><td colspan="2">Commercial Retail</td></tr>
<tr><td colspan="2">Commercial Non-Retail</td></tr>
<tr><td colspan="2">Business Industrial</td></tr>
<tr><td colspan="2">Other Industrial</td></tr>
<tr><td colspan="2">Institutional</td></tr>
<tr><td rowspan="4">None</td><td>Urban Transition</td><td>Urban Growth</td></tr>
<tr><td colspan="2">Zoned Industrial or Commercial not yet Developed</td></tr>
<tr><td colspan="2">Agricultural</td></tr>
<tr><td colspan="2">Open Space, Public Utility</td></tr>
</table>

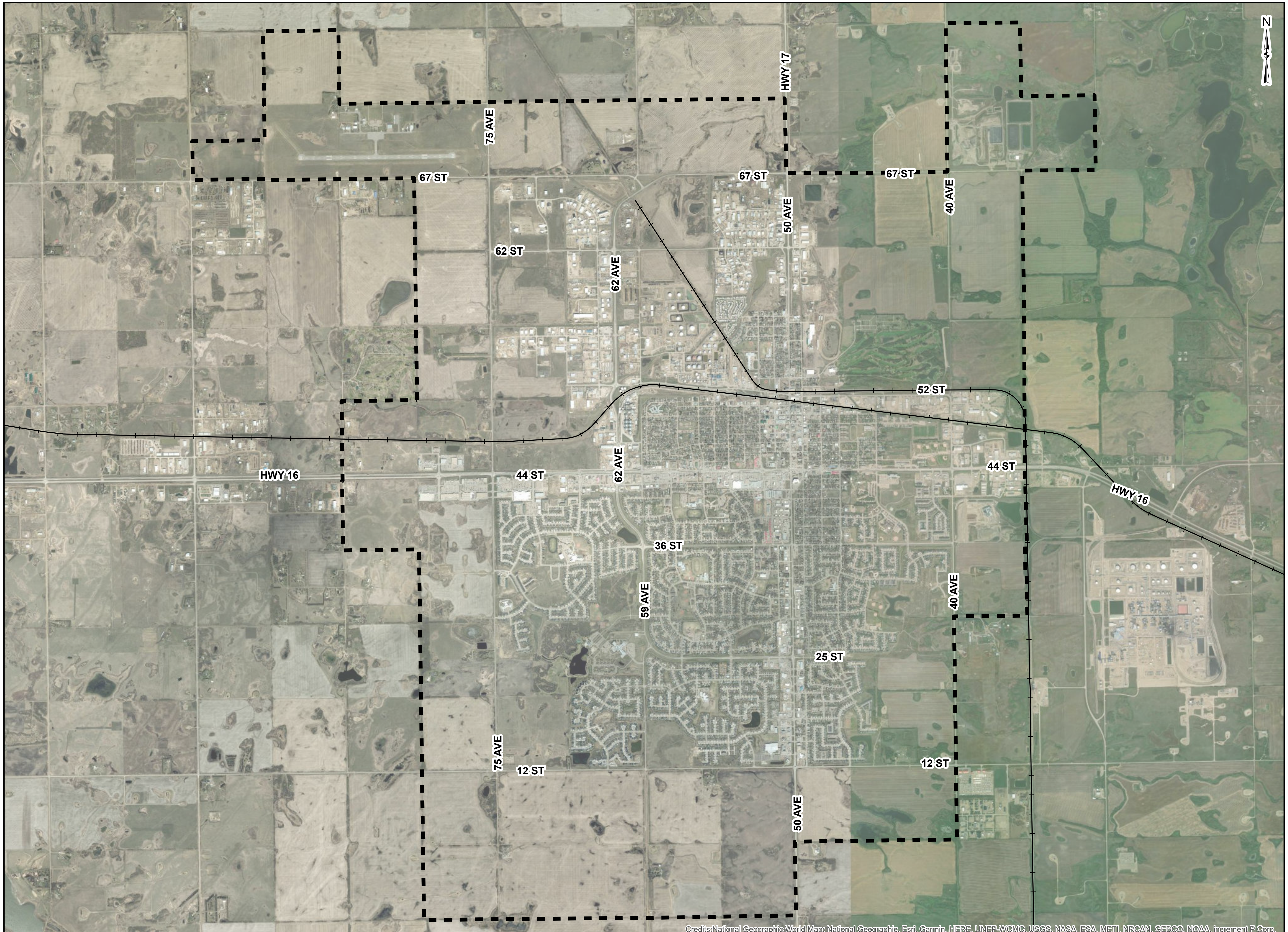


FIGURE 2.1
STUDY AREA
LLOYDMINSTER TRANSPORTATION
MASTER PLAN

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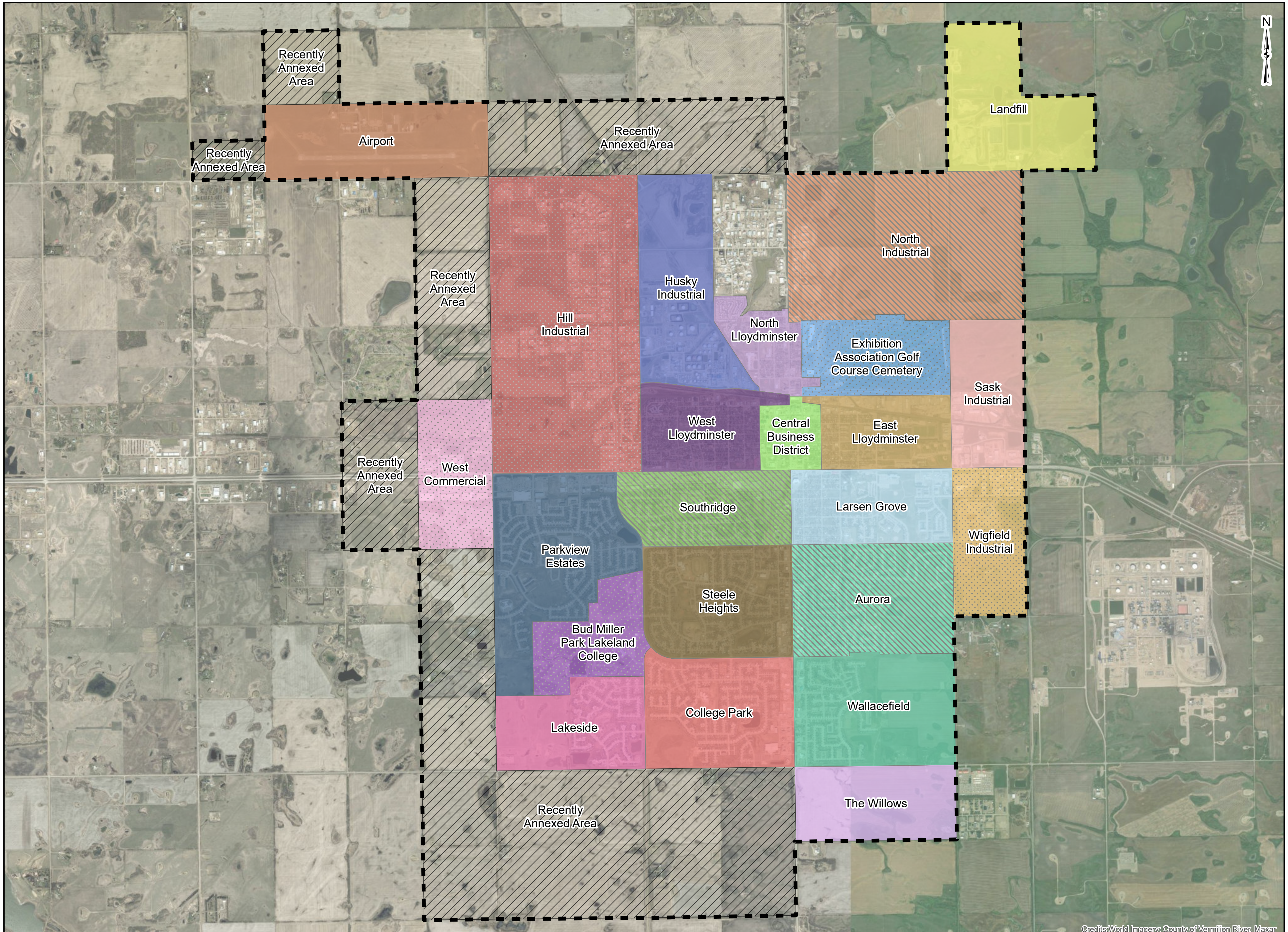

Legend

Study Area

Neighbourhood

- Airport
- Aurora
- Bud Miller Park Lakeland College
- Central Business District
- College Park
- East Lloydminster
- Exhibition Association Golf Course Cemetery
- Glen E. Neilson Industrial Park
- Hill Industrial
- Husky Industrial
- Lakeside
- Landfill
- Larsen Grove
- North Industrial
- North Lloydminster
- Parkview Estates
- Sask Industrial
- Southridge
- Steele Heights
- The Willows
- Wallacefield
- West Commercial
- West Lloydminster
- Wigfield Industrial
- Recently Annexed Area

0 500 1,000 2,000 Meters

1:40,000 NAD 1983 UTM Zone 12N

FIGURE 2.2
EXISTING NEIGHBOURHOODS
LLOYDMINSTER TRANSPORTATION MASTER PLAN

ISL LLOYDMINSTER

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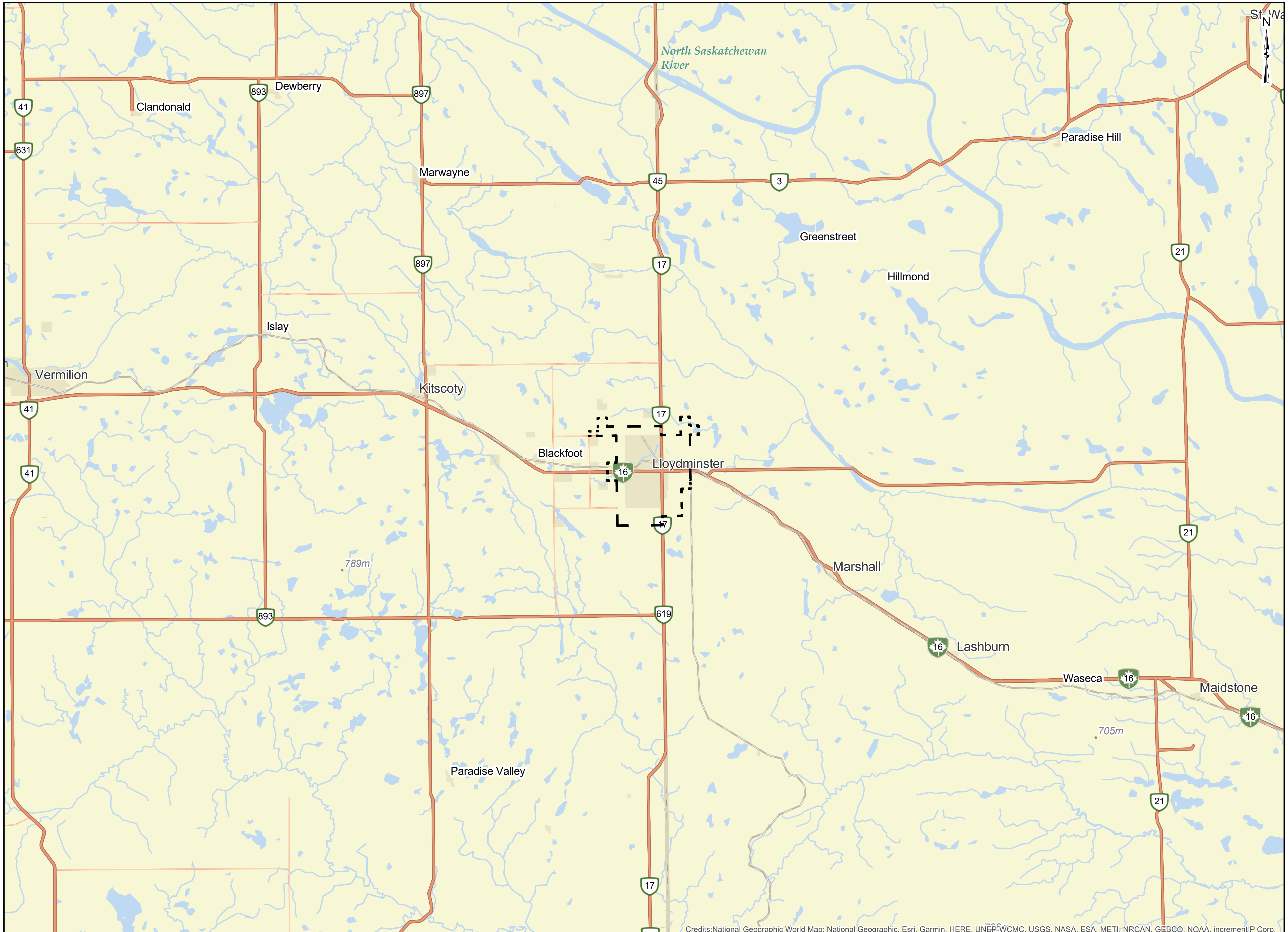

Legend

City Limits

Regional Highway Network

0 4,150 8,300 16,600 Meters

1:330,000 NAD 1983 UTM Zone 12N

FIGURE 2.3
REGIONAL ROAD NETWORK
LLOYDMINSTER TRANSPORTATION MASTER PLAN

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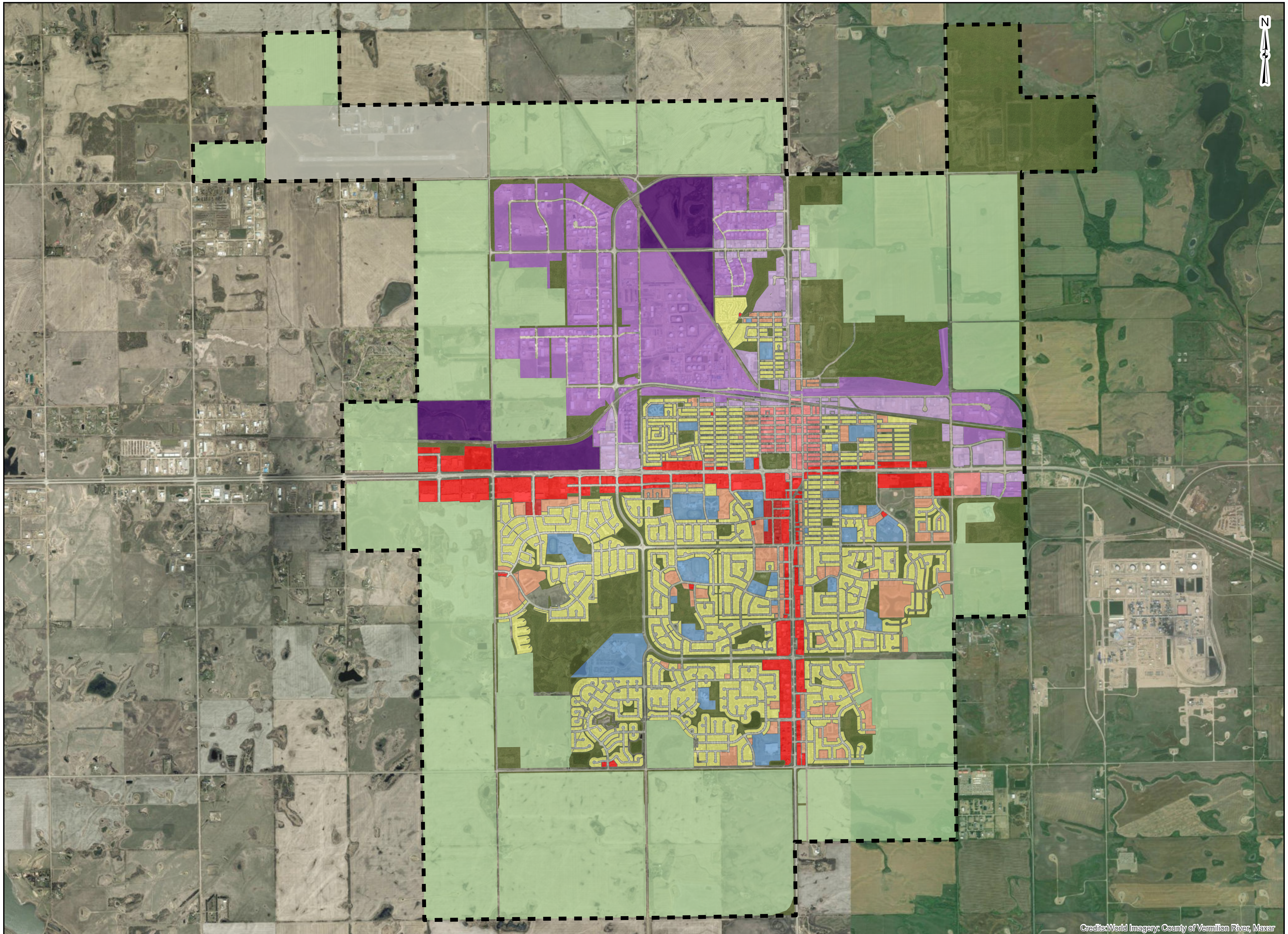

Legend

City Limits

Land Use

- Residential (Single)
- Residential (Multi)
- Mixed Residential/ Commercial Retail
- Commercial Retail
- Commercial Non-Retail
- Business Industrial
- Industrial
- Institutional
- Urban Transition
- Zoned Industrial or Commercial Not Yet Developed
- Airport
- Environmental Areas, Open Spaces, Public Utilities, Rights-of-Way

0 500 1,000 2,000 Meters

1:40,000 NAD 1983 UTM Zone 12N

FIGURE 2.4
EXISTING LAND USE
LLOYDMINSTER TRANSPORTATION MASTER PLAN

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2.3 Growth Projections

One existing development horizon and four future development horizons were considered in this TMP, including the 3-year, 5-year, 10-year, and 20-year timeframes. Residential and employment development areas under each growth horizon were determined based on the approved local Area Structure Plans (ASPs), the 2013 *Comprehensive Growth Strategy*, the 2019 *Joint Regional Growth Study*, the *County of Vermilion River and City of Lloydminster Intermunicipal Development Plan* (2008), and the 2020 Annexation Application. Population and employment projections were modified from those generated for the Water Master Plan (ISL, 2024) and repeated below in Table 2.1.

Table 2.1: Population Horizon Assessment Scenarios

Scenario[1]	Year	Cumulative Population		
		Alberta	Saskatchewan	Total
Existing Conditions[2]	2021	19,739	11,843	31,582
3-Year Growth	2025	22,081	12,570	34,651
5-Year Growth	2027	22,475	13,658	36,132
10-Year Growth	2032	23,564	17,584	41,148
20-Year Growth	2042	37,085	20,185	57,271
Full Buildout	**2051**	**46,461**	**20,688**	**67,149**

[1] The growth year scenario is based on the year at the start of the project, which is 2022.
[2] The population for the existing conditions scenario is based on the 2021 Census (Statistics Canada, 2022).

Population growth projections were initially based on an annual growth rate of 2.2%, consistent with the rate used in the design of the City's Wastewater Treatment Plant (WWTP). This was based on the City of Lloydminster and County of Vermilion River Joint Regional Growth Study (Applications Management, et.al, 2019). Additionally, the target population allocation of 70% to the Alberta side of Lloydminster and 30% to the Saskatchewan side of Lloydminster was used to scale the populations for the future development areas.

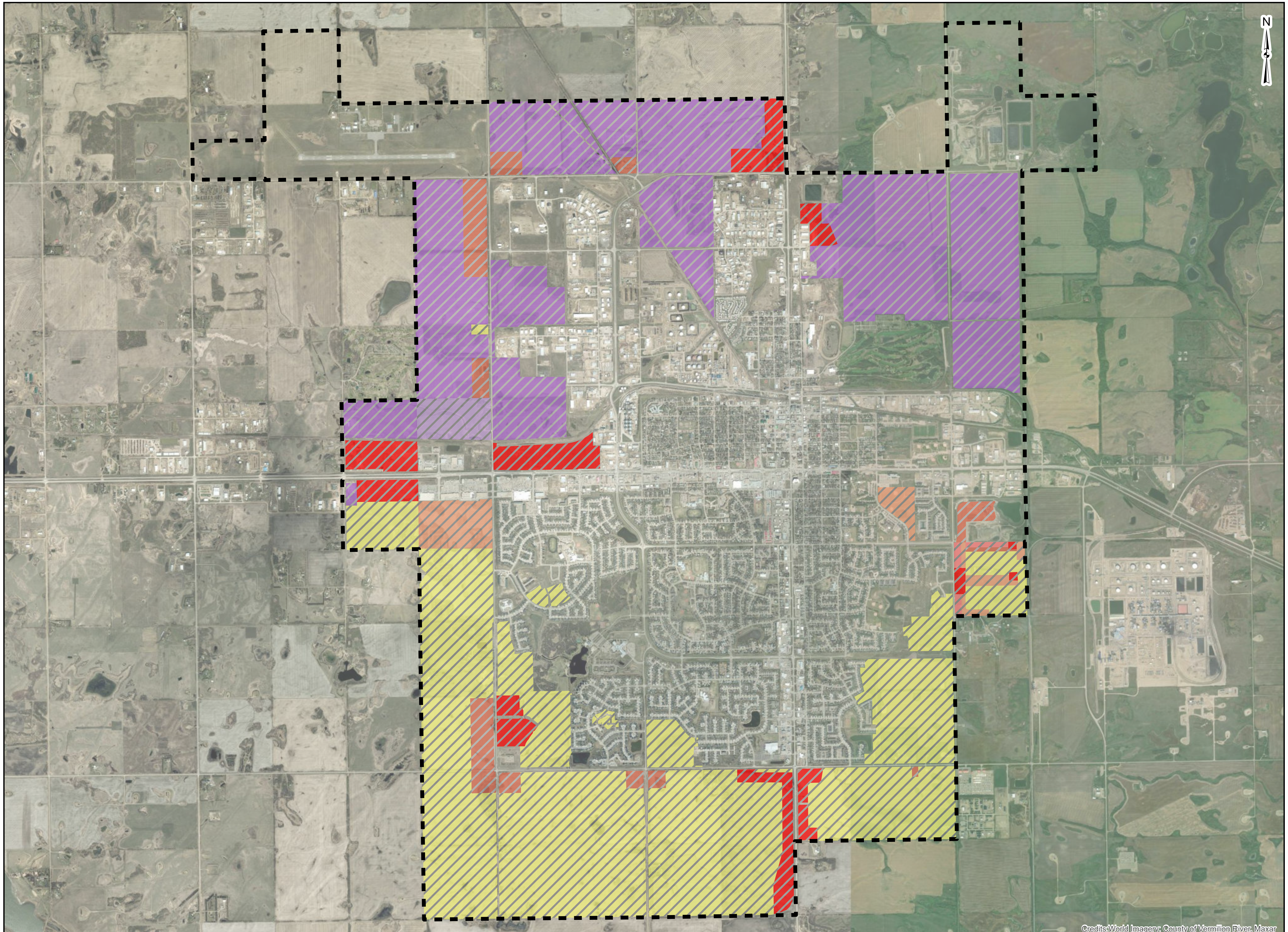
Staging of growth areas was then refined by the City to align with the anticipated growth horizon for each future development area. This results in a non-linear growth rate that deviates from the annual growth rate of 2.2% that was initially applied across Lloydminster.

Although full buildout population figures were not used in travel demand modeling, the TMP emphasizes the importance of long-term planning to ensure that the Lloydminster's transportation network remains adaptable and resilient. Areas identified as not expected to develop within the 20-year timeframe have been designated as long-term growth areas, anticipated to accommodate future development beyond the current planning horizon. To support this, the TMP has identified key long-range transportation corridors and connectivity requirements that will be critical to serving these future areas. This proactive approach ensures that right-of-way protection, network continuity, and future infrastructure integration are considered today, even in the absence of detailed land use projections. See Section 6.2 for discussion of these topics.

The future development areas by land use district under each incremental time horizon are summarized in Table 2.2 and are illustrated in Figure 2.5. The staging horizon for each future development parcel within City limits are shown in Figure 2.6.

Table 2.2: Future Development Areas by Land Use District Under Different Time Horizons

District Code	District Description	3-Year Horizon	5-Year Horizon	10-Year Horizon	20-Year Horizon
		ha	ha	ha	ha
RES-SF	Single-Family Residential	52.29	40.80	156.26	434.48
RES-MF	Multi-Family Residential	1.45	2.12	13.69	53.29
CBD	Commercial Business District	25.38	44.52	53.95	69.63
IND	Industrial	137.17	45.25	148.40	247.05
PS	Public Services	7.74	21.90	2.65	0.00
Total		**224.03**	**154.59**	**374.95**	**804.45**



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City Limits

Land Use

Residential (Single)

Residential (Multi)

Mixed Residential/ Commercial Retail

Commercial Retail

Commercial Non-Retail

Business Industrial

Industrial

0 500 1,000 2,000 Meters

1:40,000 NAD 1983 UTM Zone 12N

FIGURE 2.5
FUTURE DEVELOPMENT AREAS AND LAND USE
LLOYDMINSTER TRANSPORTATION MASTER PLAN

ISL

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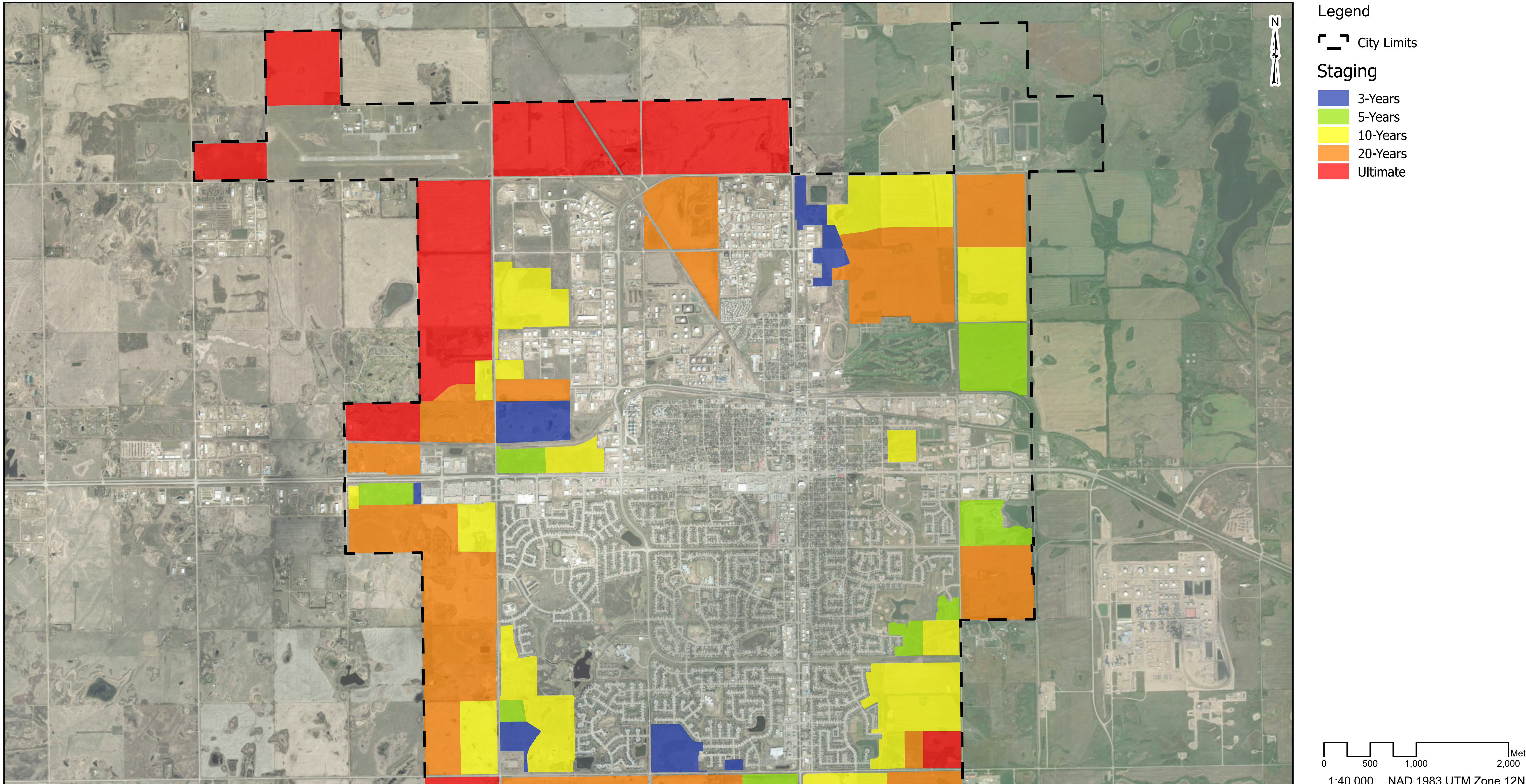

FIGURE 2.6
FUTURE DEVELOPMENT AREAS STAGING
LLOYDMINSTER TRANSPORTATION MASTER PLAN

ISL

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2.4 Public Engagement

Public engagement activities included an online survey posted from June 10 to July 2, 2024, and an in-person event held on June 4, 2024. Paper copies of the survey were printed and made available at City Hall, Servus Sports Centre, Bioclean Aquatic Centre, Lloydminster Museum + Archives, and the City's Operations Centre during the survey period. The online survey received 245 responses, and 3 paper responses. 60 people attended the in-person event. A series of traditional and digital advertising methods were used to educate residents on consultation opportunities, including social media, printed news, radio, posters and billboards. Responses are summarized as follows:

- **Driving:** Respondents expressed a strong desire for improved traffic calming measures, enhanced road maintenance (particularly addressing potholes and faded markings), and additional turning and driving lanes along Highways 16 and 17. There's strong support for more multi-lane roads and a bypass route for semi-trucks. Concerns were also raised about short turning lanes, particularly on Highway 17, and rush hour congestion, especially east-west travel. Many support a rail overpass or underpass to ease traffic flow. Recent downtown changes received negative feedback due to increased congestion, reduced parking, and difficult navigation.
- **Walking/Rolling and Biking:** Many respondents noted the need for sidewalk repairs and maintenance. Some raised safety concerns when using trails due to crime, poor lighting, and lack of barriers near roads. Many noted sidewalks are not wheelchair accessible due to missing ramps and curbs. Others want better-connected walking and biking trails, dedicated bike lanes on main roads, and more trails near highways and on the Saskatchewan side. Respondents also want more walking paths to key destinations like Bud Miller All Seasons Park, shopping areas, and seniors' homes. Many also asked for better trail connections, trails on both sides of Highways 16 and 17, and paving of existing trails.
- **Traffic Signals/Intersections:** Respondents gave suggestions on intersections where the City should consider installing traffic signals, turning lanes, and Rectangular Rapid Flashing Beacons (RRFB's). Responses varied and were reviewed by the Project Team for the inclusion in the TMP update.
- **Speed Limits:** 42% of respondents were somewhat satisfied and 30% completely satisfied with speed limits. 26% were dissatisfied to some degree. 58% of respondents indicated that they think 50 km/hr is fast/slow enough for residential neighbourhoods. 32% of respondents indicated that they think the speed limit should change. Some want lower limits in residential and school zones, while a few suggested raising the limit to 60 km/h on 62 Street and parts of Highway 16. Others preferred better enforcement and street design over changing speed limits.
- **Traffic Calming:** About 38% valued traffic calming for slowing traffic, 31% for safer crossings, and 27% for reducing shortcutting. Some opposed traffic calming, disliked speed bumps, or preferred overall traffic reduction. The biggest concern was loss of on-street parking (40%), followed by traffic diversion (29%) and route changes (26%). While 45% saw benefits, 29% opposed traffic calming and 26% had no opinion. The neighborhoods most identified to benefit were College Park, Bud Miller All Seasons Park/Lakeland College, and Lakeside, with 14% seeing no benefit city-wide.
- **Rail Crossings:** 69% of respondents were dissatisfied with the railway crossing locations, while 20% were satisfied, and 11% had no opinion. Many noted the crossings cause congestion and limit emergency access. Most favored an overpass or alternative crossing, with some suggesting train schedule changes to ease peak traffic. A few felt improvements were unlikely or too costly. Regarding locations, 68% preferred 62 Avenue (south of 52 Street) for an overpass/underpass, while 64% ranked 40 Avenue (south of 52 Street) as least favorable.

The detailed What We Heard Report is available in Appendix A.

3.0 Existing Transportation Network

Lloydminster's existing transportation network includes a variety of facilities designed to accommodate both mode-separated and mixed-mode travel. Mode-separated facilities provide dedicated infrastructure for specific travel modes (e.g., sidewalks for pedestrians), while mixed-mode facilities allow multiple user types to share the same space[1]. Roads and highways are primarily designed for motorized vehicles—including passenger cars, trucks, motorcycles, delivery vans, and tractor-trailers—but may also be used legally by cyclists, although many cyclists find busy roads to be uncomfortable. Road corridors may also be bordered by sidewalks and/or walking trails. Lloydminster's transportation network also includes off-street trails and pathways that are primarily designed for active modes of travel. These off-street facilities are not within the scope of this study and have been planned for in the Trails and Sidewalks Master Plan (ISL, 2022).

Furthermore, the heavy rail network (operated by CN and CPKC) within and around Lloydminster is critical for local and regional goods movement and crosses the transportation network at several locations within north Lloydminster. While this TMP does not address rail network expansion, it does examine how the transportation network interacts with existing rail crossings and the impacts of the rail network on the broader transportation network within Lloydminster. Sections 6.1 and 6.2 examine the current rail network and rail crossings within Lloydminster while assessing the potential for a grade-separated crossing.

Table 3.1 below shows the breakdown of the over 500 km of roadways that are within City limits, categorized by functional classification. A road's functional classification describes the type of service and purpose of the roadway within the larger road network that is used to guide roadway design, traffic management strategies and expected service quality.

Most of the roads within Lloydminster (206km, 40%) are local roads that provide direct access to adjacent homes, workplaces, and municipal services. Arterials (116km, 23%) and collectors (91km, 18%) carry larger volumes of traffic and connect the different neighbourhoods of Lloydminster to each other. Urban Highways (59km, 12%) include Highway 16 (44 Street) and Highway 17 (50 Avenue) that not only provide travel within Lloydminster but also provide regional connections. Rural roads and service roads are also present but in much smaller quantities. Figure 3.1 includes a map of Lloydminster, depicting the road classifications used.

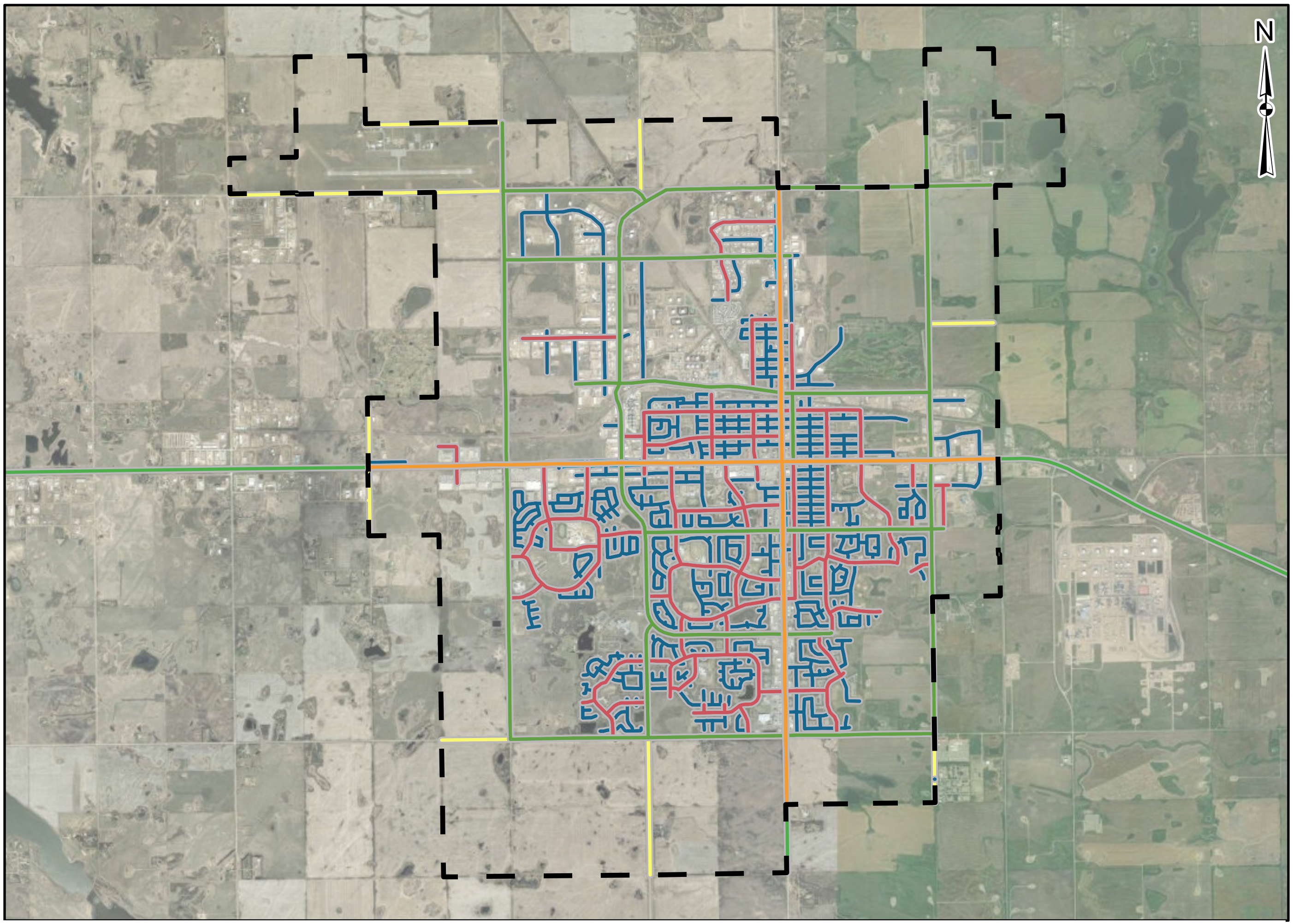
[1] Separated meaning providing individual treatments for specific needs of individual modes of travel. Mixed mode meaning for multiple different road users on the same facility. For example, a roadway with a sidewalk can be considered as mode separated, providing specific spaces for motorized versus non-motorized travel, or can be considered as mixed mode, where cyclists are permitted to use the same space as motor vehicles. Sidewalks, for example, may function as mixed-mode facilities, accommodating pedestrians, wheelchair users, mobility devices, and other low-speed travel modes.

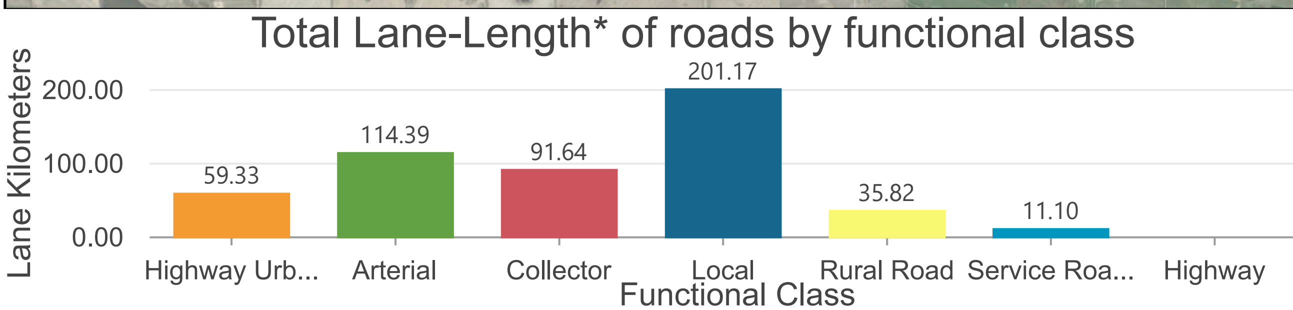
Classification definitions are summarized as follows:

- **Local Roads:** Local roads provide direct access to homes, businesses, and other properties. They support lower traffic volumes and are not intended for through traffic.
- **Collector Roads:** Collector roads link local roads to arterials, balancing mobility and property access.
- **Arterial Roads:** Arterials connect between regional roadways (such as highways) and collectors and serve medium- to long-distance travel within urban areas. They allow limited access to properties and often have signalized intersections.
- **Urban Highways**: Function like arterials within Lloydminster but transition to higher speed roadways outside the City limits, for long-distance and regional travel.
- **Rural Road:** Grid roadways within Lloydminster. These are generally paved or gravel and have ditch drainage systems, typically upgraded as development occurs.
- **Service Roads**: Typically, parallel urban highways or arterials with access provided to adjacent properties from the service road.

Table 3.1: Existing Road Network and Functional Classification Summary

FunctionalClass	Number of Lanes (Per Direction)	Total Lane-Length	Percentage of Total
	#	km	%
Local	1	200.93	39.1
	2	0.24	<0.1
Collector	1	85.71	16.7
	2	5.93	1.2
Arterial	1	75.49	14.7
	2	38.90	7.6
Urban Highway	1	15.82	3.1
	2	27.51	5.4
	3	16.00	3.1
Rural Road	1	35.82	7.0
Service Road	1	11.10	2.2
Total		**513.45**	**100**





* Lane-length for a road segment is length times number of lanes.

LEGEND

City Limits

Rural Road

Classification

- Highway Urban
- Highway
- Arterial
- Collector
- Local
- Service Road

TITLE
2024 ROAD NETWORK

PROJECT
LLOYDMINSTER TRANSPORTATION MASTER PLAN

CLIENT
CITY OF LLOYDMINSTER

PROJECTION
NAD 1983 UTM Zone 12N

0 1,000
Meters

1:82,435

DATA SOURCES
- Topographic Map:County of Vermilion River, Earthstar Geographics

FIGURE	3.1
DATE	7/29/2025
PROJECT NO.	16680
AUTHOR	dmason

3.2 Trails and Sidewalks

In 2022, the City completed the Trails and Sidewalk Masterplan which outlines a comprehensive strategy for enhancing the pedestrian and trail infrastructure throughout Lloydminster. The report included a baseline review of the current conditions, mapped the existing infrastructure, identified gaps in the network, and conducted pedestrian crossing assessments.

The report provided recommendations to improve network connectivity, including the development of crosswalks along collector roads, intersection safety enhancements, lighting and accessibility audits, wayfinding improvements, and better integration with future developments and regional trail systems.

The 2022 Trails and Sidewalk Master Plan (ISL 2022) also established a clear implementation framework, including short-, medium-, and long-term priorities, cost estimates, and potential funding sources. It emphasized the importance of creating a safe, accessible, and connected active transportation network that supports both recreational and utilitarian travel. The plan was developed through extensive public engagement and technical analysis, ensuring that its recommendations reflect community needs and align with broader municipal goals.

Given the depth and recency of that work, this TMP does not duplicate or re-evaluate the detailed planning already completed for trails and sidewalks. Instead, it defers to the 2022 *Trails and Sidewalk Master Plan* (ISL, 2022) as the guiding document for the development and enhancement of these facilities. This TMP focuses on integrating the active transportation network with broader mobility strategies, ensuring that future transportation investments support and complement the vision established in the *Trails and Sidewalk Master Plan* (ISL, 2022).

3.3 Truck and Dangerous Goods Routes

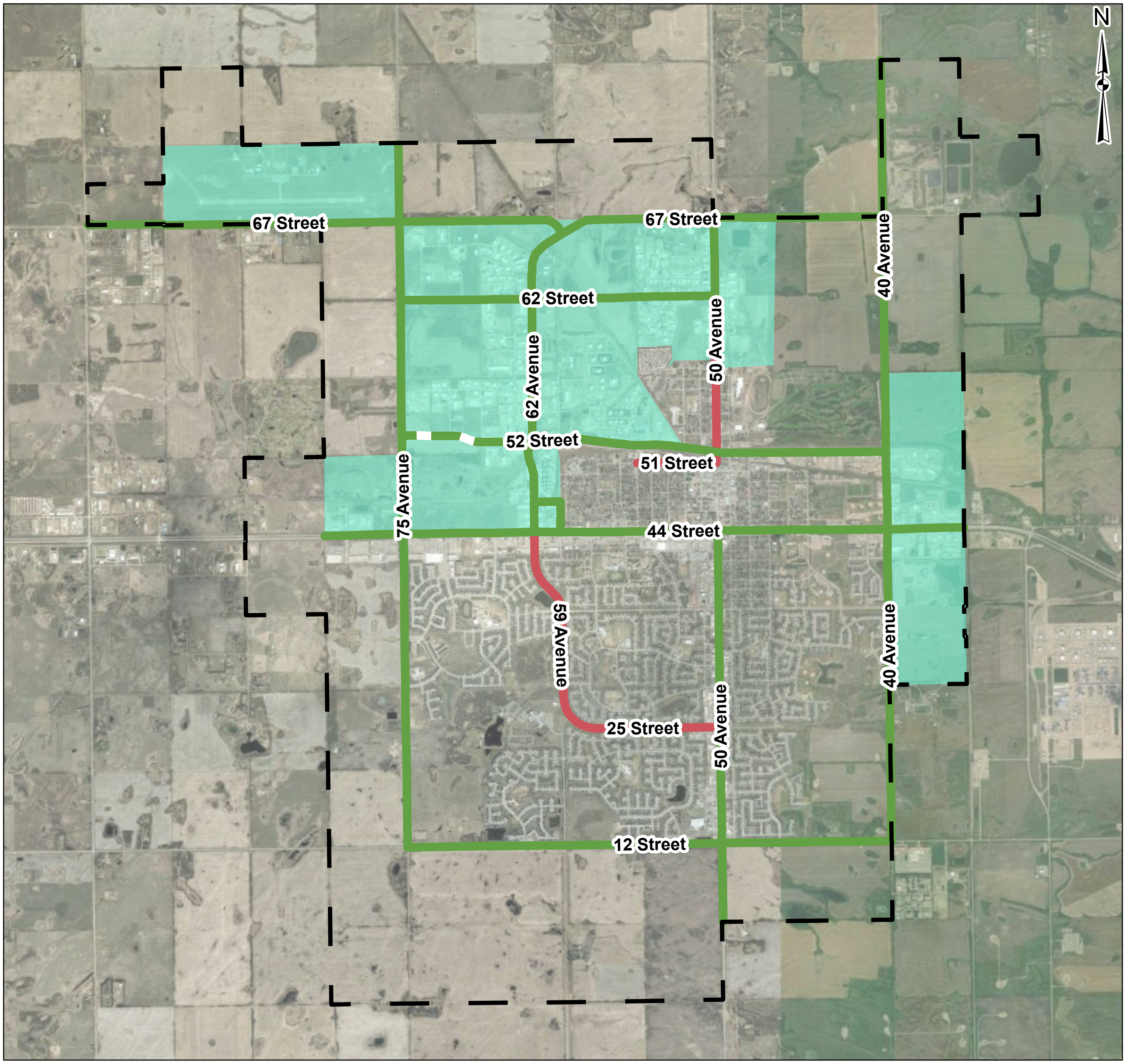
In 2020, the City completed the *Dangerous Goods Route* (DGR) and *Truck Routes Establishment Report* (ISL, 2020), which sets guidelines and identifies suitable roadways for the transport of goods and dangerous goods within Lloydminster. The report provides an evaluation framework assessing route purpose, network connectivity, reduction in trip length, and reduction in off-route trips as criteria. Designated truck routes and dangerous goods routes serve related but different purposes; truck routes are designed to accommodate heavy and large vehicles of all kinds while the dangerous goods route includes some more stringent requirements for the transport of hazards materials, such as fuel, chemicals, and reactive materials.

The report categorizes truck routes into three types to balance freight efficiency with community safety:

- **24-hour truck routes** are major arterial roads open to truck traffic at all times of day, designed for continuous goods movement along appropriately sized infrastructure.
- **Truck route areas** are entire industrial zones where all roads are automatically considered truck routes, simplifying access and reducing the need for individual signage.
- **Restricted truck routes** are specific roads—mainly in mixed-use or downtown areas—where truck access is only allowed between 6:00 AM and 10:00 PM to minimize noise and safety concerns during off-peak hours.

The report identified corridors with higher truck volume demand, particularly in northwest Lloydminster, and along 44 Street and 50 Avenue. Recommendations include the designation of arterial roads within industrial areas to be designated as truck routes, with restricted routes along 50 Avenue at specific times of day, given the proximity to residential areas. Furthermore, it was recommended that 50 Avenue, within the downtown core between 44 Street and 52 Street, be removed from both the truck route and the dangerous goods route.

The truck route and dangerous goods routes have been re-assessed for additional roadways that have been identified in Section 6.2 of this report. Figures 3.2 and 3.3 include maps of the truck routes and dangerous goods routes as they exist in 2025.



LEGEND

City Limits

Existing

Truck Route Areas

24 Hour Truck Route

Restricted Truck Route

Future

24 Hour Truck Route

TITLE

2024 TRUCK ROUTES

PROJECT

LLOYDMINSTER TRANSPORTATION MASTER PLAN

CLIENT

CITY OF LLOYDMINSTER

PROJECTION

NAD 1983 UTM Zone 12N

0 1,000

Meters

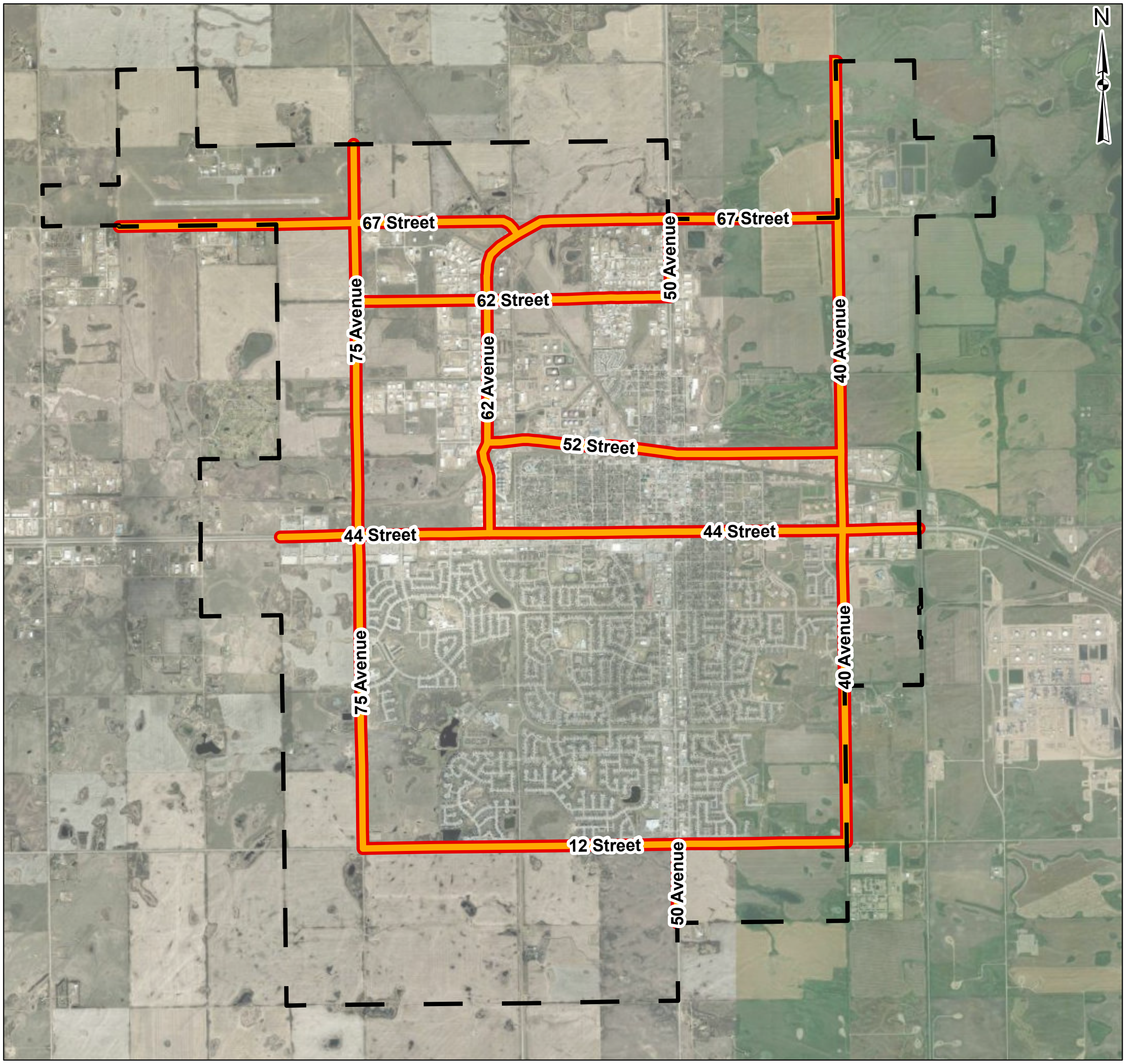
1:62,944

DATA SOURCES

- Topographic Map:County of Vermilion River, Earthstar Geographics

FIGURE	3.2
DATE	7/29/2025
PROJECT NO.	16680
AUTHOR	dmason

Document: Z:\Shared\GIS\Projects\16680_Lloydminster_TMP\16680_Lloyd_Transportation_Master_Plan.aprx - Figure 3.2_2024 Truck Route



LEGEND

City Limits

Existing

2024 Dangerous Goods Route

TITLE
2024 DANGEROUS GOODS ROUTE

PROJECT
LLOYDMINSTER TRANSPORTATION MASTER PLAN

CLIENT
CITY OF LLOYDMINSTER

PROJECTION
NAD 1983 UTM Zone 12N

0 1,000
Meters
1:62,957

DATA SOURCES
- Topographic Map:County of Vermilion River, Maxar

FIGURE	3.3
DATE	7/29/2025
PROJECT NO.	16680
AUTHOR	dmason

Document: Z:\Shared\GIS\Projects\16680_Lloydminster_TMP\16680_Lloyd_Transportation_Master_Plan.aprx - Figure 3.3_2024 Dangerous Goods Route_portrait

3.4 Existing Traffic Conditions

This section outlines the current performance of the transportation network within Lloydminster as of 2024. This assessment used the traffic counts provided by the City which were collected in 2018 and 2024 to estimate typical "peak PM hour" traffic volumes.

Industry best practice for evaluating roadway performance is the Level of Service (LOS) metric, which assigns a grade from A to F based on average vehicle delay. The LOS is based on the extent of delay experienced by the average driver. LOS can be calculated for each leg (or approach) of an intersection (Figure 3.4 Right) or aggregated for the overall intersection (Figure 3.4 Left), weighted by the total number of vehicles for each direction of travel. All types of intersections within Lloydminster, including those which are signalized, four-way stop, and two-way stop, were assessed and are summarized in this section of the report, unless otherwise noted.[2]

An LOS of A means that drivers are experiencing very little delay while an LOS of F means that drivers are waiting long periods of time at intersections. Many jurisdictions have a target LOS of D or greater, as it indicates that the transportation network infrastructure is being well utilized. In some cases, if all intersections operate at LOS A, it may indicate that the transportation network is overbuilt, providing more capacity than necessary.

3.4.1 Intersection Operations

Figure 3.4 indicates that the transportation network within Lloydminster is working well, overall. All intersections analyzed experience an overall LOS grade of C or better with the large majority (>92%) receiving an LOS grade of B or higher.

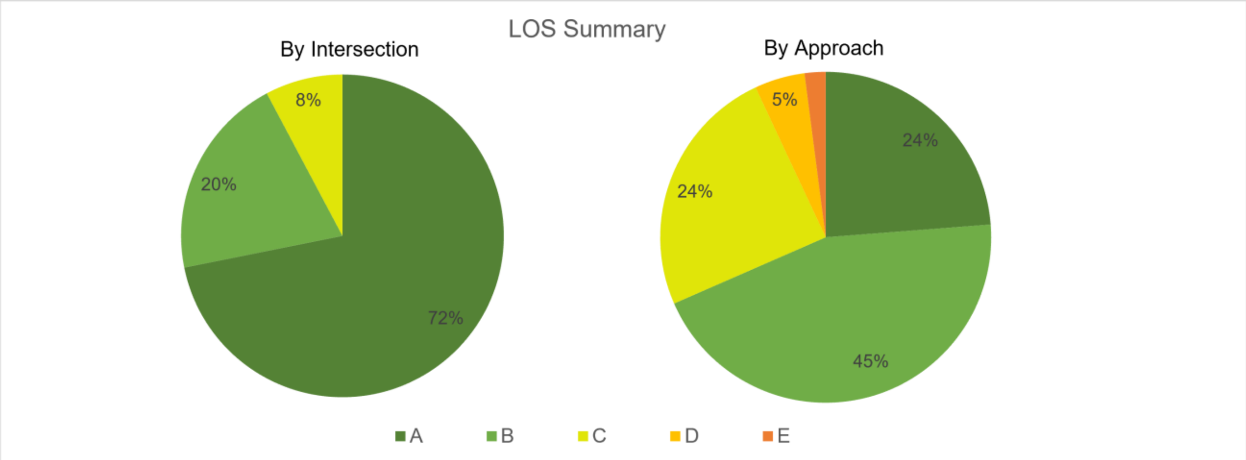


Figure 3.4: Level of Service (LOS) Summary

At a more granular level, LOS grades for individual approaches are slightly lower: most legs (>98%) experience a LOS of D or better. At the top end, roughly two-thirds (69%) of approaches receive an LOS of B or greater.

[2] For signalized intersections, timing plans were optimized based on observed traffic volumes and may not reflect actual field operations. For these sites, results should be considered as indicating the best possible conditions, given the information available.

Note that LOS grades of A and B indicate low amounts of delay, but do not necessarily indicate how well utilized a roadway is3.

Tables 3.2 and 3.3 show the list of intersections and approaches that operate under Levels of Service of D, E or F.

Table 3.2: Intersections with an Overall LOS of E or F

LOS	Intersection
E	None
F	None

Table 3.3: Approaches with an LOS of D, E or F

Control	Intersection	Approach	LOS	Volume (veh/hr)	Approach Delay (s)	95th Percentile Queue (m)
Signal	49 Avenue & 50 Street	EB	D	82	41.7	35
		WB	D	90	43.6	39
	50 Avenue & 36 Street	SB	D	703	40.6	152
	62 Avenue & 44 Street	SB	D	793	37.1	112
Two-Way Stop	12 Street & 61 Avenue	SB	D	142	25.9	15
	44 Street & 48 Avenue	NB	D	11	30.3	1
	47 Avenue & 44 Street	NB	E	62	40.4	11
		SB	D	58	27.0	7
	49 Avenue & 36 Street	SB	D	209	29.5	25
	50 Avenue & 21 Street	EB	D	40	30.5	6
	52 Avenue & 43 Street	EB	D	141	25.5	14
	59 Avenue & 44 Street	SB	D	104	26.9	12
	59 Avenue & 29 Street	EB	E	89	41.4	15
	62 Avenue & 43 Street	EB	E	123	42.0	21
		WB	E	81	39.4	14

The waiting delay for an average vehicle at each intersection is shown in Figures 3.5 and 3.6. These figures show the typical spread of delay across Lloydminster and permit the comparing of individual intersections against each other.

For example, these figures show that traffic volumes are highest at intersections with traffic signals, and that only a few of the studied stop-controlled intersections within Lloydminster approach the same total volume as a signalized intersection.

[3] Consider a roadway that is overbuilt with an excess number of lanes, or an approach that provides excessive green time to one direction of travel. Both of these situations will have low delay and a high LOS grade.

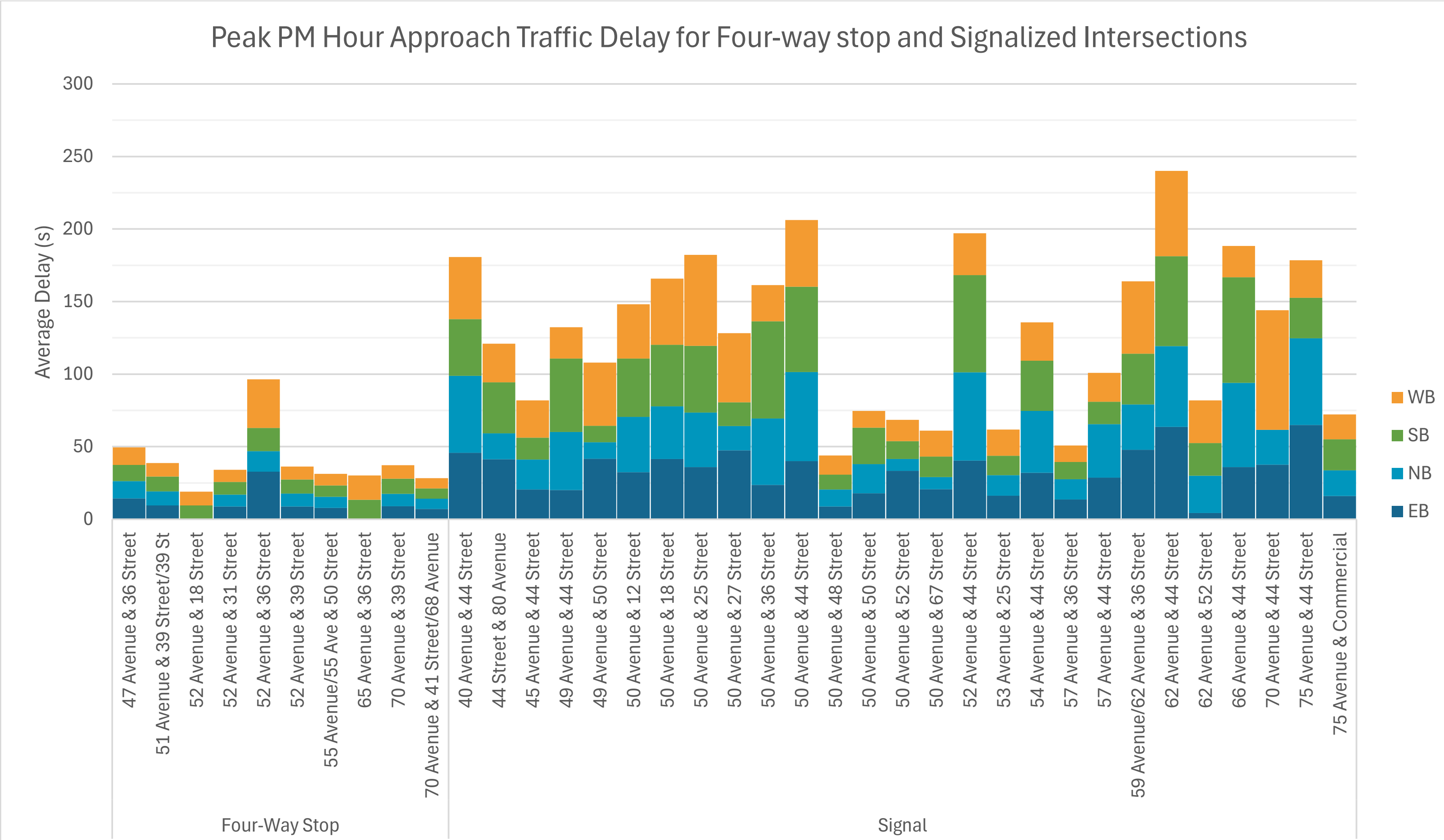


Figure 3.5: Average vehicle delay during the peak PM hour for Four-way stop and Signalized Intersections

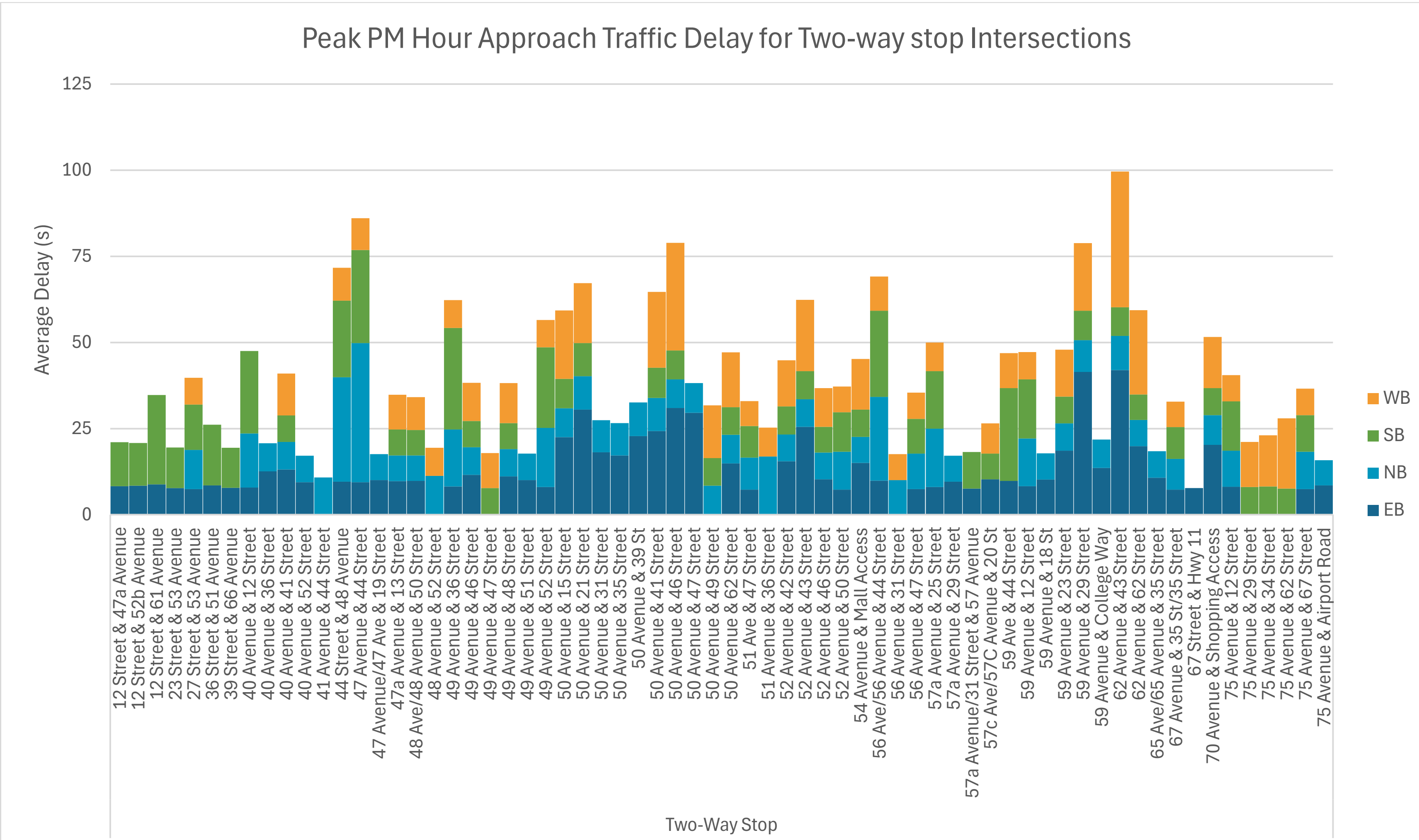


Figure 3.6: Average vehicle delay during the peak PM hour for Two-way stop Intersections

3.4.2 Signalized Intersection Capacity

In addition to delay-based LOS scores, another means to assess the performance of an intersection is to compare the volume of traffic against the overall capacity of the intersection. For signalized intersections, the Intersection Capacity Utilization (ICU) metric represents the percentage of capacity that is used by vehicles. The results for all studied intersections are shown below in Figure 3.7.

To compare performance scores at stop-controlled intersections with signalized intersections, ICU is paired up against LOS letter grades, as shown below:

• Greater than 100%:	F	Over capacity.
• Between 90% and 100%:	E	Over capacity and likely congested, minor fluctuations in traffic flow may increase congestion.
• Between 80% and 90%:	D	Nearly congested, minor fluctuations in traffic flow may increase congestion.
• Between 70% and 80%:	C	Normally no congestion, well operating and can accommodate up to 10% more traffic.
• Between 60% and 70%:	B	No major congestion, well operating and can accommodate up to 20% more traffic
• Less than 60%:	A	Very little congestion, well operating and can accommodate up to 30% more traffic.

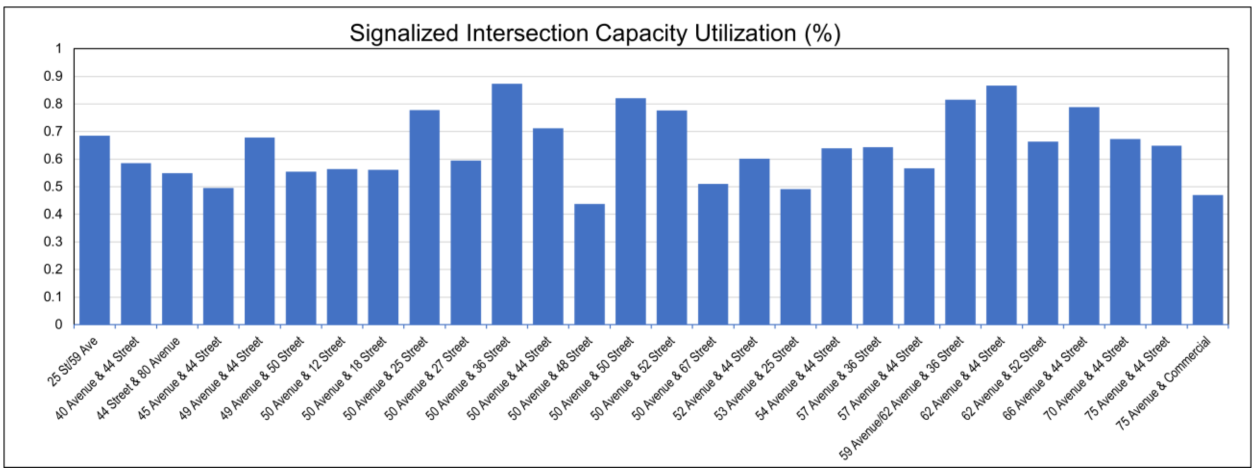


Figure 3.7: Intersection Capacity Utilization (ICU) for signalized intersections.

Overall, most signalized intersections are well utilized in capacity. Half (50%) of the intersections surveyed receive an ICU LOS grade of A or B (see Figure 3.8) while only one in ten (10%) of intersections receive a grade of E. There are no intersections that are over-capacity (LOS F).

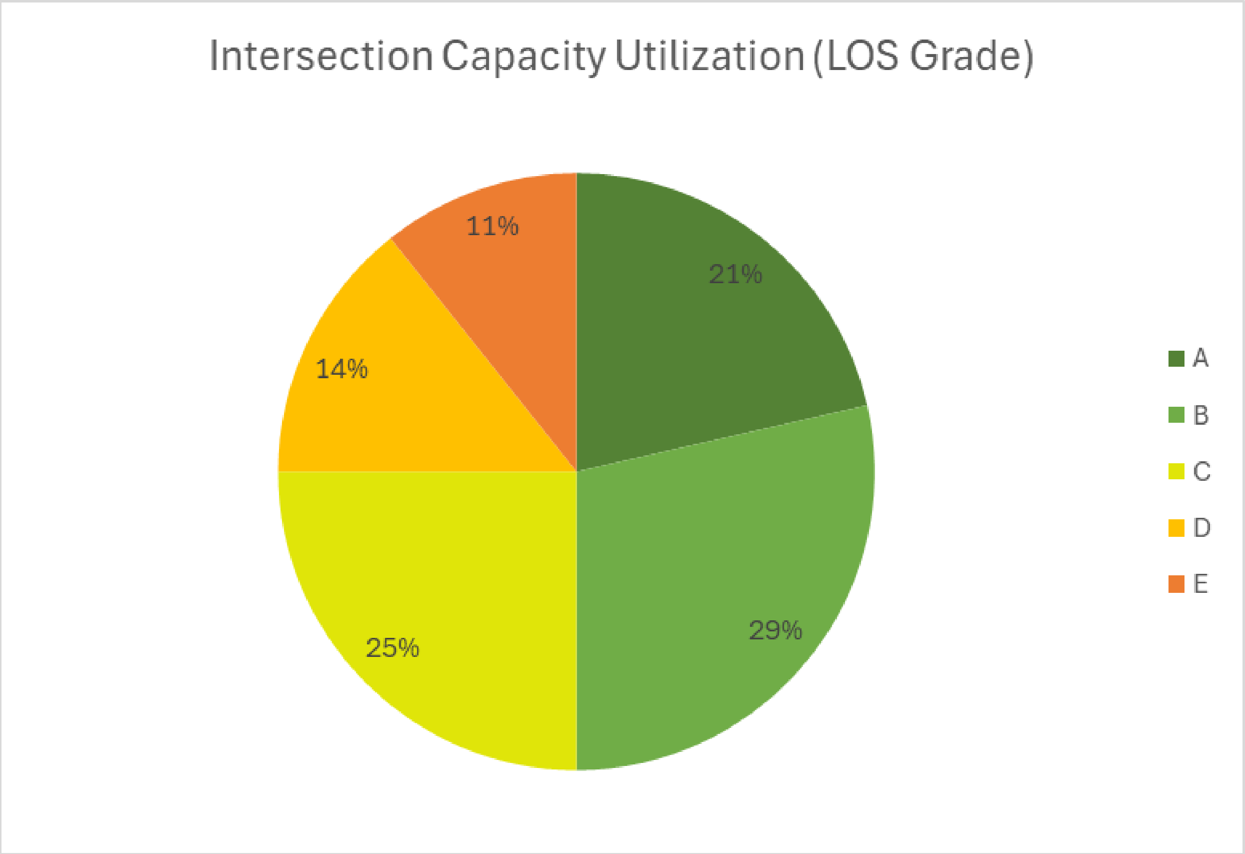


Figure 3.8: Percentage of Intersections at each ICU Grade

3.4.3 Lane Capacity

For individual lanes and approaches, a volume-to-capacity (v/c) measure can be used to further assess performance. This measure compares the volume of vehicles within a specific lane or travel direction against the hourly capacity for that specific case. A volume-to-capacity (v/c) ratio close to and above 1.0 indicates an overly congested situation while a lower v/c indicates the capacity for more traffic to be routed and serviced at the particular intersection.

Figure 3.9 shows the breakdown of v/c for each lane or travel direction at the selected study sites within Lloydminster. The chart shows that only a very small percentage of lanes are experiencing a high v/c ratio.

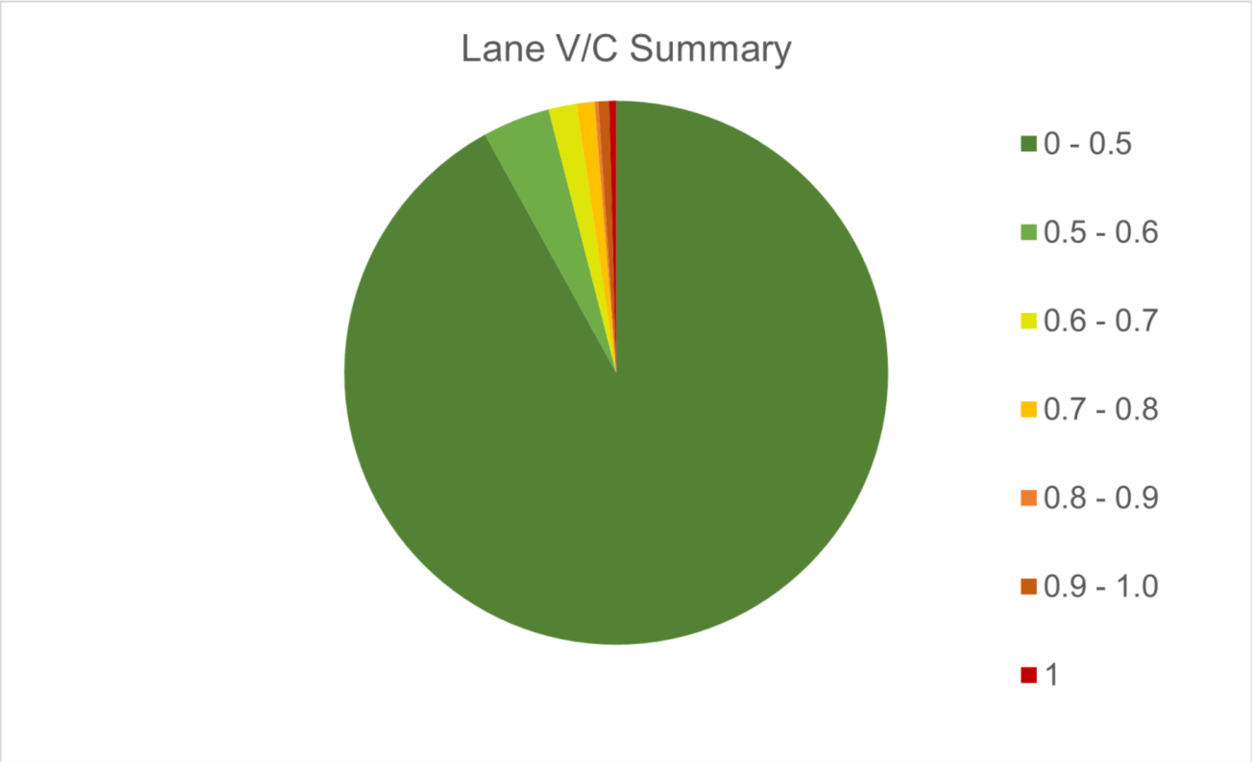


Figure 3.9: Volume-to-Capacity (v/c) for lanes at select sites within Lloydminster

3.4.4 Intersection Storage Length

One important consideration for assessing intersection performance is whether vehicle queues are excessive and/or impede other traffic. Consider a signalized intersection with a storage lane for left turning vehicles. It is possible, under certain circumstances, that more vehicles are waiting to complete a left turn than can safely wait within the storage lane. This situation is called "queue spillback" and results in a safety hazard for rear-end collisions and reduced capacity for vehicles traveling directly through the intersection.

Using aerial imagery, the storage length for each of the study intersections was estimated and compared against the assessed "95th Percentile Queue" (meaning, 95% of the time the queue is shorter than this length). Figure 3.10 shows that none of the assessed intersections would experience queue spillback, using the available data. However, this contrasts with in-person observations for other sites with known queue spillback for which data was not collected. These sites include a) eastbound right turns at 50 Avenue and 25 Street, b) eastbound and westbound travel on 50 Avenue and 36 Street, c) northbound left turns at 62 Avenue and 52 Street, d) eastbound and northbound left turns at 44 Street and 62 Avenue, and e) westbound left turns at 44 Street and 70 Avenue.

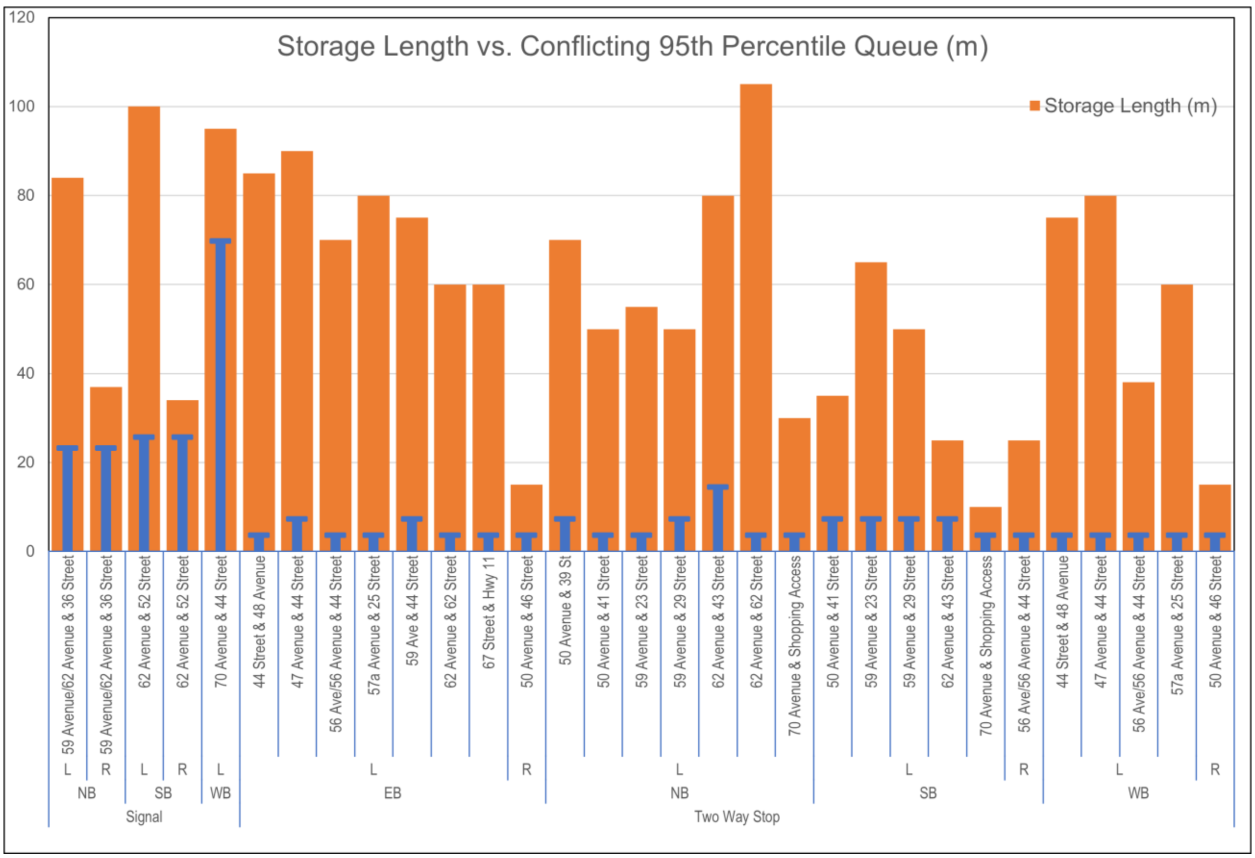


Figure 3.10: Storage Length vs Conflicting 95th Percentile Queue

3.5 Collision Data Analysis

The City provided datasets related to collision reports that have occurred within City limits. Two datasets were provided, where each was sourced from the respective provincial authorities for Alberta and Saskatchewan. The collision details between these two datasets are slightly different, with each dataset providing a different set of attributes related to collisions. A summary of the two datasets is provided in Table 3.4 below.

Table 3.4: Collision Datasets provided by the City of Lloydminster

	Number of Reported Collisions	Date Range	Number of Vehicles
Alberta	2,618	Jan 2019 – Dec 2023	5,803
Saskatchewan	1,223	Jan 2018 – Dec 2022	2,374
Total	**3,841**	**Jan 2018 – Dec 2023**	**8,177**

3.5.2 Collision Trends

Given the differences between the datasets, only a few collision attributes are common, allowing for aggregation into trends for all of Lloydminster. One of the primary methods for analyzing traffic collisions is by date. Figure 3.11 illustrates how total collisions have changed over the 6 years of data provided. Note that while both datasets cover 5 years, there is only a 4 year overlap between them.

Similar to many other Canadian and prairie jurisdictions[4], traffic collisions in Lloydminster dropped in 2020 and 2021 before rising again in 2022 and 2023. This trend is often attributed to public health isolation measures related to the COVID-19 pandemic. However, a more comprehensive traffic trend analysis is recommended, such as calculating collision rates that account for changes in total traffic volumes.

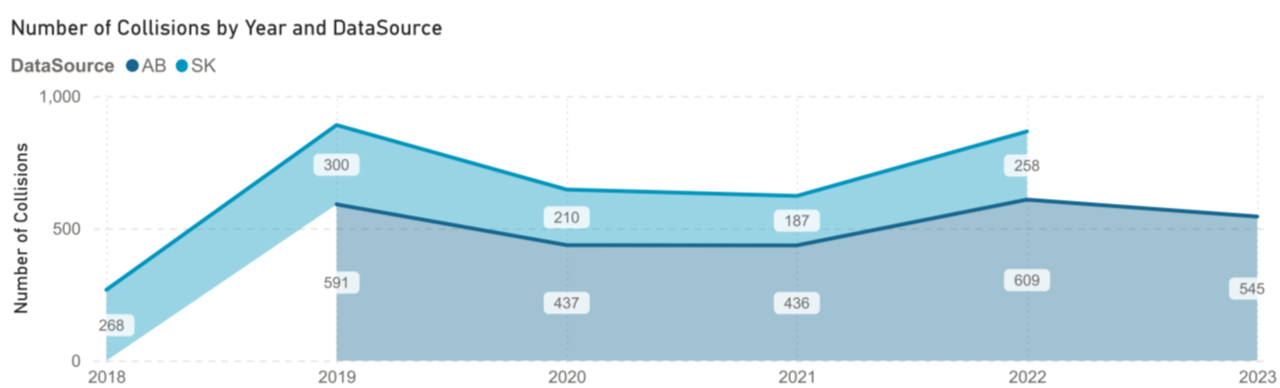
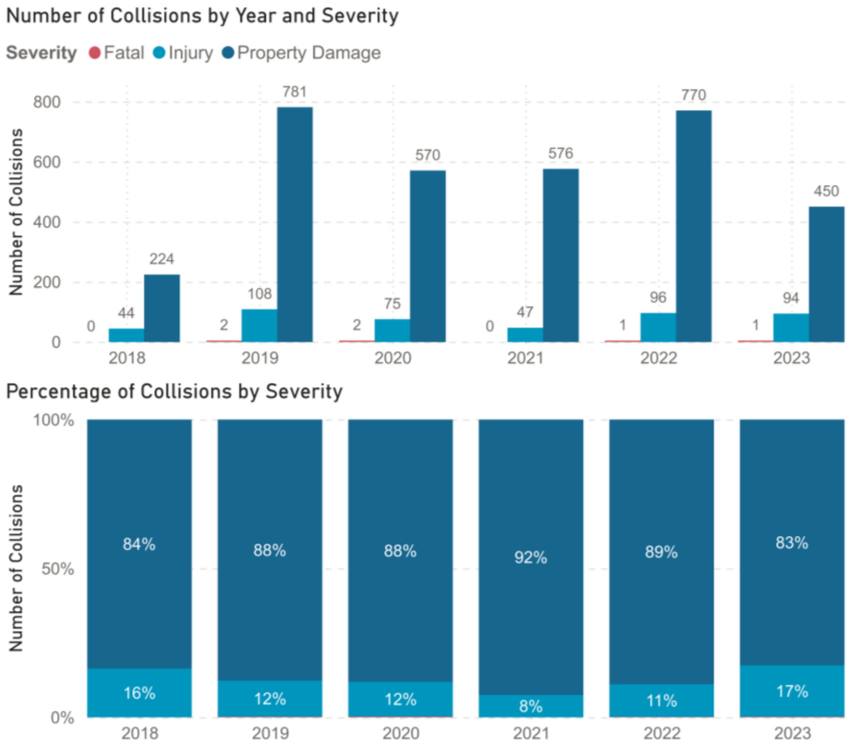


Figure 3.11: Number of collisions per year and from respective provincial agencies

Collision severity is an attribute common to both datasets, and the trend of how collision severity changes over time is shown in Figure 3.12. Fatal collisions are rare, accounting for less than 1% of all reported incidents. Injury collisions are somewhat steady in the mid-to-high 80% range with 2021 having the highest proportion of injuries at 92%, despite the reduction in total collisions in that same year.

[4] Traffic Injury Research Foundation – December 2021

Recall that 2018 data is only from the Saskatchewan dataset while 2023 data is only from the Alberta dataset.



Year	Fatal	Injury	Property Damage	Total
2018	0	44	224	**268**
2019	2	108	781	**891**
2020	2	75	570	**647**
2021	0	47	576	**623**
2022	1	96	770	**867**
2023	1	94	450	**545**
Total	**6**	**464**	**3371**	**3841**

Figure 3.12: Number of collisions per year and by severity

The collision trend within each year is shown in Figure 3.13, showing the month of collision across all six years of data. The data shows a sharp drop in total collisions during the summer months, dropping by 53% from a high of 450 collisions in December down to a low of 210 collisions in April. This trend contrasts with the steady rate observed across Canada.[5]

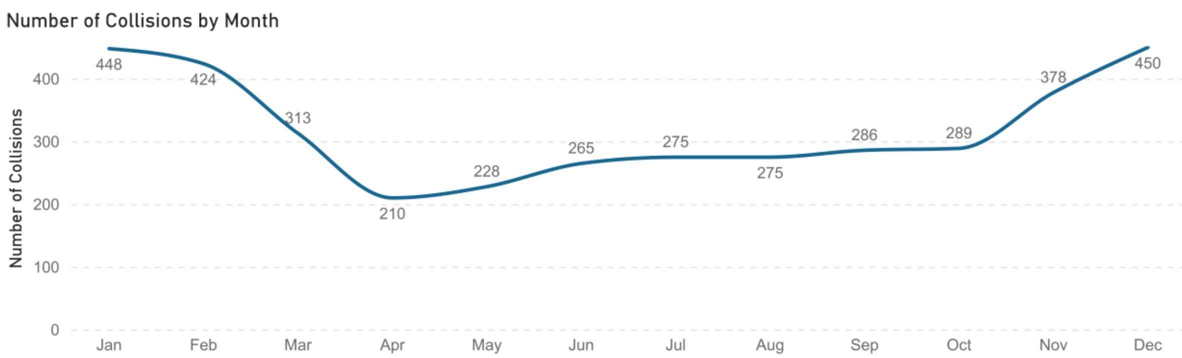
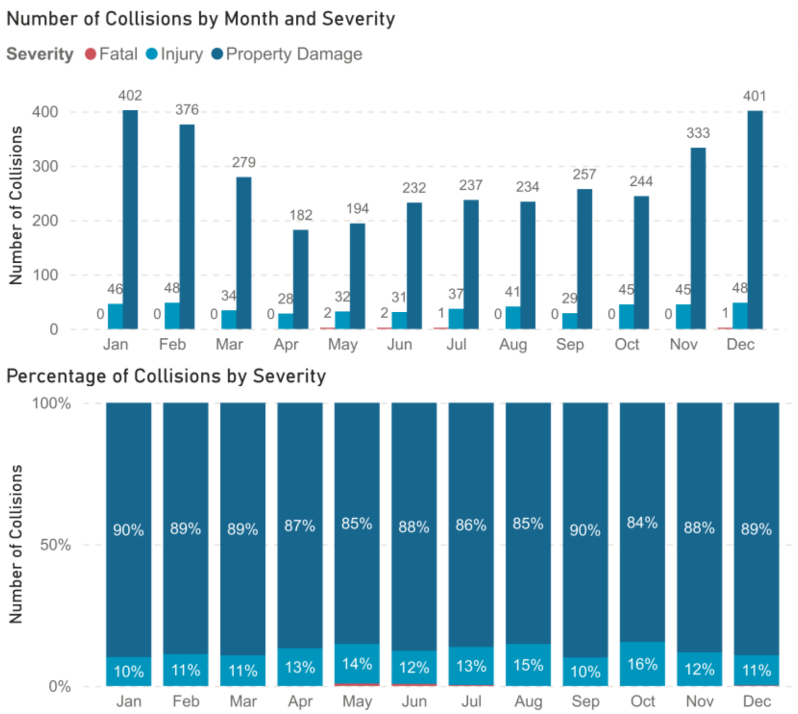


Figure 3.13: Number of collisions by month

[5] Transport Canada – National Collision Database, https://tc.canada.ca/en/road-transportation/statistics-data/motor-vehicle-casualties-dashboard

Figure 3.14 illustrates how collision severity changes throughout the year. The top facet of the figure shows how injury collisions range between a low of 28 in April to a high of 48 in February and December (increase of 170%). However, this is somewhat related to the higher number of collisions that occur in winter months; the proportion of injury collisions varies between 10% to 16% of collisions in a given month. While winter months see a higher number of collisions, the increase is primarily due to a rise in property-damage incidents, with injury collisions remaining relatively stable. Fatality collisions are infrequent, and trends are hard to assess, yet 5 of the 6 fatal collisions occurred between May and July.



Month	Fatal	Injury	Property Damage	**Total**
Jan	0	46	402	**448**
Feb	0	48	376	**424**
Mar	0	34	279	**313**
Apr	0	28	182	**210**
May	2	32	194	**228**
Jun	2	31	232	**265**
Jul	1	37	237	**275**
Aug	0	41	234	**275**
Sep	0	29	257	**286**
Oct	0	45	244	**289**
Nov	0	45	333	**378**
Dec	1	48	401	**450**
Total	**6**	**464**	**3371**	**3841**

Figure 3.14: Number of collisions per month and by severity

The collision trend within the days of the week is shown in Figure 3.15, showing the weekday of each collision over the 6 years of data. Most collisions occur midweek, with an average of 615.8 collisions on weekdays across the 6 years of data. Weekends have a lower propensity for collisions, dropping by 40% to 381 on average between Saturdays and Sundays.

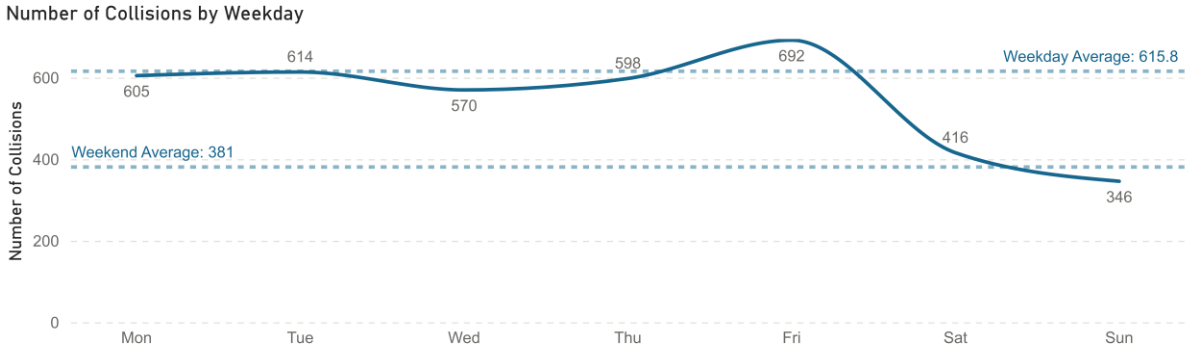
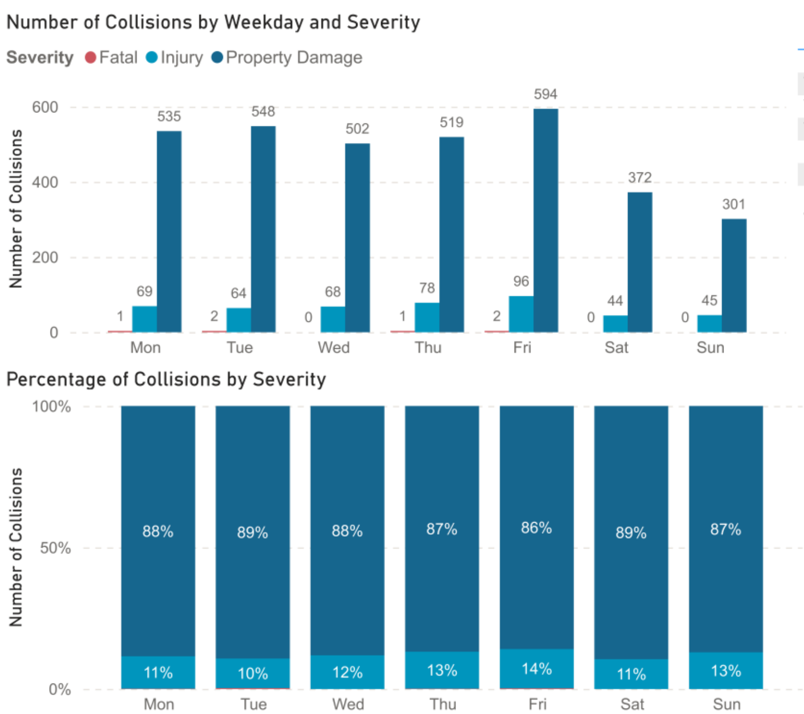


Figure 3.15: Number of collisions by weekday

Figure 3.16 illustrates how collision severity changes throughout the week. Severity remains somewhat steady between 10% and 14% of collisions involving injuries and vary between 44 and 96. Fridays exhibit both the highest total number of collisions and the highest proportion involving injuries.



Day	Fatal	Injury	Property Damage	Total
Mon	1	69	535	**605**
Tue	2	64	548	**614**
Wed	0	68	502	**570**
Thu	1	78	519	**598**
Fri	2	96	594	**692**
Sat	0	44	372	**416**
Sun	0	45	301	**346**
Total	**6**	**464**	**3371**	**3841**

Figure 3.16: Number of collisions by weekday and severity

3.5.3 Collision Locations

The City provided two datasets related to collision reports within City limits, sourced from Alberta and Saskatchewan. These datasets contained different attributes, some common between them. Both included location data, but not always as coordinates. The Alberta dataset provided latitude and longitude information along with addresses and street names, while the Saskatchewan dataset only provided street names and/or addresses. ISL processed the text fields using the Google Maps API to generate latitude and longitude data for Saskatchewan collisions.

To ensure accuracy, a sample from both datasets was reviewed. The plotted coordinates were compared against the address and street name fields. Locations were deemed accurate if within 50 meters of the reported address. The table below shows the accuracy levels for each sub-sample of collision data.

Table 3.5: Quality Assessment of GPS Data and Address Fields.

Province	Sample Size	Percent Accurate
Alberta	65 (2.5%)	74%
Saskatchewan	66 (5%)	76%

Upon examining the location mismatches, some locations were repeatedly observed with the exact same coordinates (within 7 digits in decimal degrees and less than 400mm of precision), indicating a systematic error from the source data. For example, many geo-referencing services return a default location, such as the center of a city, when a supplied street address cannot be found. To filter out these coordinates, the 5 locations (out of 2,373 unique locations) with identical coordinates were excluded from further analysis.

Both datasets demonstrate an accuracy rate of about 75%, where the latitude-longitude information closely matched the street address information. Given the random nature of collision locations and the filtering of systematic coordinate errors, this provides a reasonable basis for assessing collision patterns throughout Lloydminster.

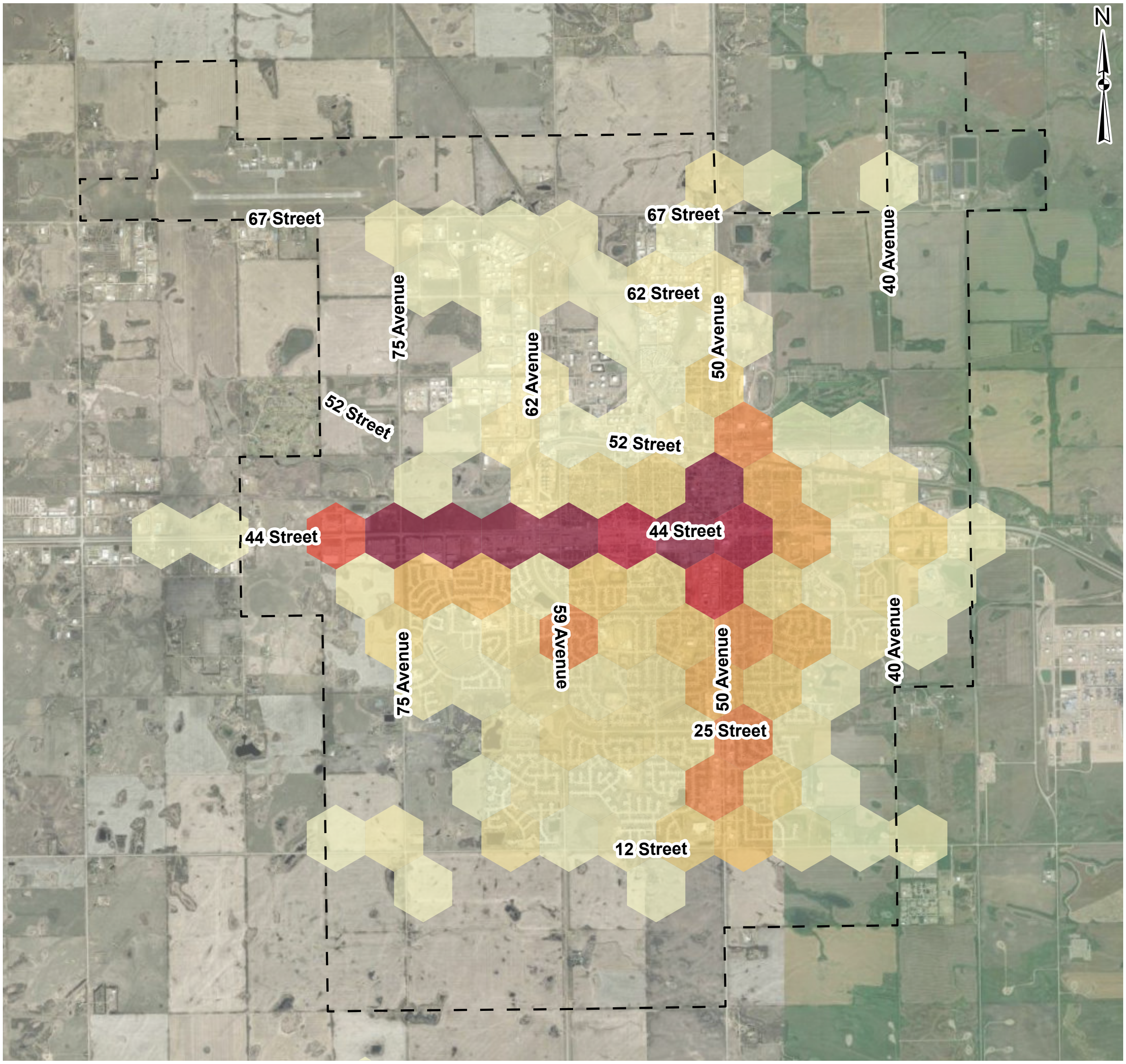
Figures 3.17 and 3.18 show how collision locations are distributed across Lloydminster. Collision locations are clustered into a hexagonal grid, with each grid segment aggregating all collisions within it and colored based on the total. Figure 3.17 shows that the Highway 16 (44 Street) corridor has a high number of collisions, the Highway 17 (50 Avenue) corridor has a moderate to high number, and other areas of Lloydminster range from low to medium in collision numbers. The area around the intersection of 59 Avenue and 36 Street also shows a moderate collision hotspot.

Figure 3.18 displays smaller clusters, with each circle indicating the count of collisions within its immediate area. The size and color of the circles vary based on the collision count, continuing to show the same trends as Figure 3.17.

These collision maps are provided to help identify areas and roads that are more prone to collisions compared to other locations. To gain deeper insights and further enhance road safety, the City is encouraged to explore a more comprehensive road safety analysis program. This may include normalizing collision data by traffic volumes, screening network segments for elevated collision rates, and monitoring high-risk locations on an annual or rolling basis. These efforts can enable more accurate risk assessments and targeted interventions.

Building on this analysis, the City should consider using the collision heatmaps and supporting data in this report as a foundation for an ongoing network screening process—identifying individual locations where collision trends suggest the need for further safety evaluation. From this broader screening, a limited number of high-priority sites (e.g., one to two annually) could be selected for in-depth investigation and potential improvement. This phased approach balances actionable progress with resource realities.

While the implementation of a comprehensive traffic safety management program—encompassing network screening, site selection, diagnosis, remediation projects, and ongoing monitoring—offers strategic and analytical benefits, it is important to acknowledge that such programs can require significant technical and financial commitment. Following this framework can support a transparent and data-driven approach to prioritizing road safety investments, which can lead to more efficient outcomes over the long term. However, tailoring the scope of such initiatives to align with the City's available capacity and funding levels will be key to ensuring that they are both practical and sustainable.



LEGEND

City Limits

Collision Hot Spots

Low

High

TITLE
COLLISION HOT SPOTS

PROJECT
LLOYDMINSTER TRANSPORTATION MASTER PLAN

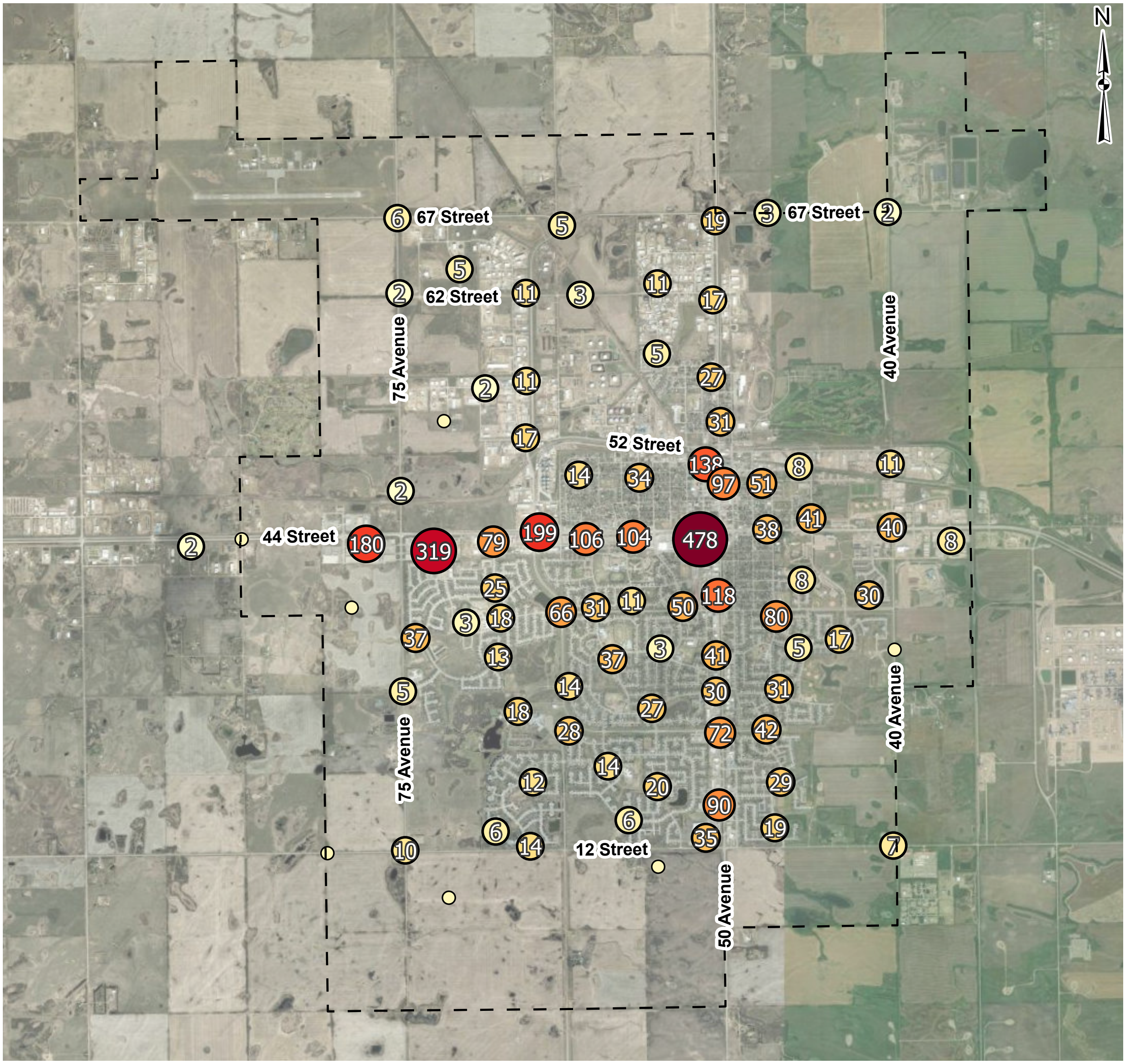
CLIENT
CITY OF LLOYDMINSTER

PROJECTION
NAD 1983 CSRS 3TM 111

DATA SOURCES
- Topographic Map:County of Vermilion River, Maxar

0 1,000
Meters
1:62,103

FIGURE	3.17
DATE	7/29/2025
PROJECT NO.	16680
AUTHOR	dmason



LEGEND

City Limits

Number of Collisions between 2019 and 2023

Low

High

TITLE

CLUSTERING OF COLLISION LOCATIONS

PROJECT

LLOYDMINSTER TRANSPORTATION MASTER PLAN

CLIENT

CITY OF LLOYDMINSTER

PROJECTION

NAD 1983 CSRS 3TM 111

0 1,000

Meters

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DATA SOURCES

- Topographic Map:County of Vermilion River, Earthstar Geographics

FIGURE	3.18
DATE	7/29/2025
PROJECT NO.	16680
AUTHOR	dmason

Document: Z:\Shared\GIS\Projects\16680_Lloydminster_TMP\16680_Lloyd_Transportation_Master_Plan.aprx - Figure 3.18_Collision Clusters

4.0 Traffic Forecasting

A Transportation Demand Model (TDM) is a digital and mathematical tool used to simulate travel demand across a road network. Using demographic data, land use data, a digital road network and travel preference information, the model estimates the demand for people, goods, and vehicles to travel from one place to another. The demand for trips within and around the Lloydminster is then evaluated against the capacity of the road network, to determine where congestion can be anticipated.

Estimating travel demand is a complex, iterative process, as travel behavior is highly sensitive to congestion, more specifically to how long it might take one to travel to their destination. Land development is also highly sensitive to the structure of the road network, as creating additional road capacity will encourage additional land development (and subsequently additional demand for travel) in the neighbouring land.

This section of the report outlines the process and techniques used to assess both the current travel demand needs of Lloydminster but also anticipate potential travel needs in the future.

4.1 Computer Model Introduction

The TDM was developed using PTV Visum, a software platform selected for its advanced capabilities in travel demand forecasting. PTV Visum uses a suite of digital objects such as Traffic Analysis Zones (TAZ), 1D road segments, traffic control devices, origin-destination tables and travel demand segments that all interact through a sequential calculation process to produce traffic volume estimates on each road segment of the within Lloydminster.

The initial road network was based on data from the 2015 TMP and supplemented with GIS files from OpenStreetMap. The project team diligently assessed all road segments to ensure that functional classification, free-flow capacity, speed limits, number of lanes, and delay functions best matched with their real-world counterparts. For future scenarios, new roadways were identified through reviewing appropriate area structure plans (ASPs), intermunicipal development plans (IDPs), the City's Municipal Development Plan (MDP), as well as the other utility master plans completed in 2024.

4.2 Base Model Framework

To create the TDM, ISL followed a structured and iterative process that ensured the model was both accurate and reflective of local conditions. The key steps included:

- **Data Collection and Integration:** ISL compiled and harmonized data from multiple sources, including city collected traffic counts, municipal land use reports, third-party data suppliers and GIS layers. This data was used to define the base year conditions and calibrate the model inputs.
- **Traffic Analysis Zone (TAZ) Development:** The city was divided into TAZs based on land use homogeneity, population density, and natural boundaries. Each TAZ was assigned demographic and employment data to represent trip origins and destinations. For the most part, TAZ boundaries were maintained from the 2015 TMP and modified for new growth areas as needed.
- **Network Coding and Validation:** The road network was coded into PTV Visum, including attributes such as road type, number of lanes, speed limits, and intersection controls. The network was validated using observed traffic counts, regional travel pattern data and travel time data.

- **Model Calibration and Validation:** The base year model was calibrated to ensure that simulated traffic volumes closely matched observed counts. This involved adjusting trip generation rates, distribution parameters, and assignment settings.
- **Scenario Development:** Future land use and network scenarios were developed in consultation with the City and based on planned developments and infrastructure investments.

The development of the TDM was structured around a comprehensive, multi-source framework, as illustrated in Figure 4.1. The model integrates data and projections from both historical and current planning efforts to ensure consistency and accuracy across all planning horizons.

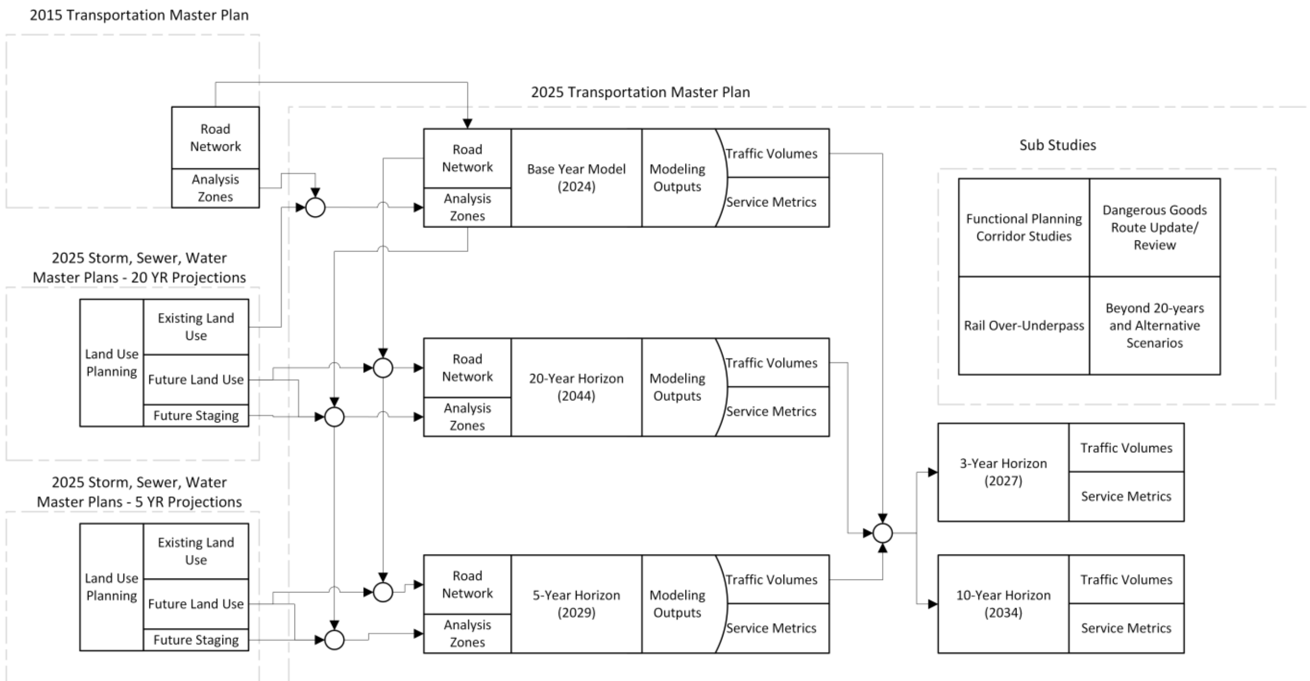


Figure 4.1: Model Formulation Flowchart

The foundation of the model was built upon the 2015 TMP, which provided the initial road network and traffic analysis zones. These were updated and refined using land use and servicing data from the Water Master Plan (ISL, 2024), which offered detailed 5-year and 20-year projections. This Master Plan (ISL, 2024) contributed critical inputs such as existing and future land use patterns, as well as development staging information, and were outlined in Section 2.3.

The 2025 TMP then synthesized these inputs to develop a base year model (2024), along with forecast scenarios for the 5-year (2029) and 20-year (2044) horizons. Each scenario produced outputs including projected traffic volumes and key service metrics.

To support long-term planning and scenario testing, additional sub-studies were conducted. These included functional planning corridor studies, a review of the Dangerous Goods Route, and assessments of potential rail over/underpasses. The model also explored alternative scenarios extending beyond the 20-year horizon.

Intermediate forecasts for the 3-year (2027) and 10-year (2034) horizons were interpolated to enhance temporal resolution, ensuring that the model could support both near-term decision-making and long-range strategic planning.

The current industry practice for developing Travel Demand Models typically follows a four-step process:

- **Trip Generation:** Estimates the number of trips originating from and destined to each zone in the city, based on existing or planned land use and socio-economic characteristics.
- **Trip Distribution:** Connects trip origins to destinations using models that favor shorter travel distances for specific trip purposes (e.g., work, school, shopping), ensuring that all trip productions and attractions are balanced.
- **Travel Mode Choice:** Determines the share of trips made by different travel modes (e.g., auto, transit, walking, cycling), based on local travel behavior and infrastructure availability. Due to data limitations and the absence of transit service in Lloydminster, the model focused solely on auto travel. Active modes were considered only at the infrastructure planning level.
- **Trip Assignment:** Assigns trips to specific routes on the road network, based on travel time, congestion levels, and route choice behavior.

4.2.2 Model Set-Up and Calibration

The base year model was constructed using a combination of GIS-based road network data, traffic control attributes, and socio-economic inputs. The model was calibrated using observed traffic counts from permanent and temporary count stations, supplemented by third-party mobility data. Calibration efforts focused on aligning model outputs with observed screenline volumes and turning movement counts at key intersections. Adjustments were made to trip generation rates and route choice parameters to ensure alignment with observed conditions.

These adjustments and calibration steps are assumed to also be applicable to future scenarios, thereby providing as accurate as possible an assessment of future travel patterns within and around Lloydminster.

4.3 Traffic Forecasts

Traffic forecasts were developed for 5-year and 20-year planning horizons, with intermediate 3-year and 10-year forecasts interpolated from these primary scenarios. For each horizon, a “do-nothing” scenario (hereafter called the “Business as Usual” (BAU) scenario was modeled to assess how the network would perform if no major infrastructure improvements were made.

It is important to note that the baseline scenario is not truly a “do nothing” scenario, wherein no new infrastructure is assumed. As new areas of Lloydminster develop, new roads are required to access those areas. Hence, the name of “Business as Usual” (BAU) better represents the incremental expansion of Lloydminster, without assuming major upgrades or intensive financial investments being present. This baseline scenario helps identify future congestion hotspots and prioritize network improvements.

4.3.1 Growth Forecasting and Allocation

Population and employment forecasts have been described previously in section 2.3. Within the TDM, the total area for each type of land use, as well as the staging horizon for development, were aggregated for each Traffic Analysis Zone to generate total population, total employment, and total commercial activity in each area. Using the calibration completed for the base year model, the same assumptions for trip generation and trip distances were used to forecast growth in traffic volumes.

4.3.2 Model Outputs and Applications

The TDM outputs include link-level traffic volumes, volume-to-capacity ratios, and travel time estimates. These outputs were used to:

- Identify future congestion hotspots
- Evaluate the effectiveness of proposed road improvements
- Support corridor studies and functional planning
- Inform capital budgeting and phasing

The proposed future transportation network at each of the 3-year, 5-year, 10-year and 20-year horizons is provided in Section 5.0.

5.0 Future Transportation Network Analysis

As previously discussed, Lloydminster has developed a comprehensive Traffic Demand Model (TDM). This model serves as a critical tool for assessing the current performance of the road network and predicting future congestion levels under various growth scenarios. Understanding projected congestion patterns is critical for developing effective transportation strategies.

This section presents a series of proposed projects aimed at mitigating anticipated traffic congestion. These projects include corridor and intersection improvements, which are designed to enhance traffic flow and reduce bottlenecks. Each project is assessed for its potential impact on the overall road network, offering a strategic overview of its effectiveness.

Additionally, this section will delve into the methodology used for the analysis, offering insights into how the TDM operates and the criteria for selecting improvement projects.

5.1 Proposed Future Road Network

5.1.1 Methodology for Assessing Future Infrastructure Needs

To determine the necessity for future infrastructure projects, the analysis began with a 20-year horizon. This approach involved identifying areas of congestion and proposing projects to address the observed issues. ISL conducted simulations using three distinct analysis scenarios, with a "Business as Usual" (BAU) scenario serving as the baseline for comparison.

The BAU scenario is based on the road network as it exists in 2024 and incorporates projected travel demand and land use development for the 20-year horizon. This scenario represents the case where the City of Lloydminster does not undertake any major roadway improvements for 20 years.

Additionally, some roadways were included as expected neighbourhood roadways needed to connect newly developed areas, ensuring access to the road network where it currently does not exist. These neighbourhood connection roads are listed in the full list of recommended projects presented further below but construction costs are not funded by the City. Upon reviewing the levels of congestion for the BAU scenario, improvement projects are identified to address these bottlenecks.

To evaluate the need for traffic signals, ISL considered intersections with capacity and level of service (LOS) scores of E or lower at each planning horizon as candidates for upgrades. Potential improvements may include installing signals, adding turning lanes, adjusting signal timing, converting to roundabouts, or other solutions to be determined later. Additionally, Traffic Signal Warrant analyses were completed for all four-way stop-controlled intersections in the City and are provided in Appendix E.

Below, we outline how ISL categorized the various potential road improvements across the three analysis scenarios. For descriptions of the projects coded with “Red” and “Green”, see Section 5.2.

Table 5.1: List of Analysis Scenarios

Scenario Code	Description	Assessment Method
BAU	"Business as Usual" (No Intervention/Scheme) Neighbourhood internal roads needed for local access into new developments (as outlined in Neighbourhood Structure Plans and Area Structure Plans)	N/A
BAU + Blue	"Business as Usual" road network with the inclusion of roadway improvements which are anticipated to be needed for the 20-year horizon, but uncertain about timing of development.	Compare overall network v/c and travel time metrics to BAU
BAU + Blue + Red	Visioning Test #1 - North-South Couplet	Compare project-level improvements to travel time and congestion along 50 Avenue
BAU + Blue + Green	Visioning Test #2 - Highway 16 Bypass	Compare project-level improvements to travel time and congestion along 44 Street

Evaluating and Finalizing the Recommended Network

After simulating the three scenarios, the project team evaluated the performance of each major improvement to determine their inclusion in the final "Recommended Network" scenario. This Recommended Network was simulated one final time to achieve the ultimate forecasted traffic volumes for the 20-year horizon. These forecasts were crucial for evaluating intersection improvements and served as design volumes for the 12 Street and 75 Avenue Functional Plans, respectively.

Cost Estimation

Capital costs for this planning-level level of accuracy were assumed to be $5,000 per metre for two-lanes (either a new two-lane arterial or expanding an arterial from two- to four-lanes) and $500,000 for a new signalized intersection. For other intersection capacity improvements (additional turning lanes), a cost of $2,500 per metre was used. These estimates are rough order-of-magnitude figures in 2025 dollars and should not be interpreted as detailed or final. They exclude contingency allowances and other cost elements typically included in detailed engineering estimates.

Notwithstanding the above, the cost estimates for improvements along 50 Avenue are anticipated to be slightly higher than typical, due to the constrained spacing, changes to signalized infrastructure, and required changes to road centreline alignment. A unit cost of $7,500 per meter per two-lanes was used for this project.

The cost estimates for projects along the 75 Avenue and 12 Street corridor have been summarized from the appropriate functional plans for each of these corridors. Costs for intersection upgrades to be completed at the same time as expanding the total roadway have been bundled into a single estimate.

Lastly, collector and local roads are typically outside of City capital asset funding as they are developed on an as and when needed basis to service greenfield developments. As such, the costs associated with developing these roads within these lands have been listed as being funded by other sources.

The other funding sources include the developers of the lands in question where the collector and local roads will be providing the service.

Mid-Horizon and Short-Term Planning

A mid-horizon model was generated using land use projections for the 5-year horizon. This process mirrored the approach used for the 20-year horizon. A 5-year BAU scenario was created, and projects identified for the 20-year horizon were assessed to determine if they should be implemented by the 5-year mark.

Once the 20-year and 5-year models were generated, traffic volumes across the road network were interpolated to produce 3-year and 10-year traffic volume forecasts. Projects were subsequently allocated to the 3-year or 10-year horizon based on analysis using Synchro traffic modeling software, ensuring a phased and strategic approach to infrastructure development.

5.1.2 3-Year Horizon

This section outlines the projects identified that should be considered for implementation within the next three years. Most projects listed here were identified as road network connections to support short-term development, and not as a result of congestion. Tables 5.2 and 5.3 show the corridor and intersection improvements[6] identified to service these developments. Figure 5.1 illustrates the locations of these projects.

[6] Only upgrades to existing intersections are listed individually. New intersections that arise as part of new corridor construction are assumed to be included within the scope of the corresponding corridor project and are not itemized separately.

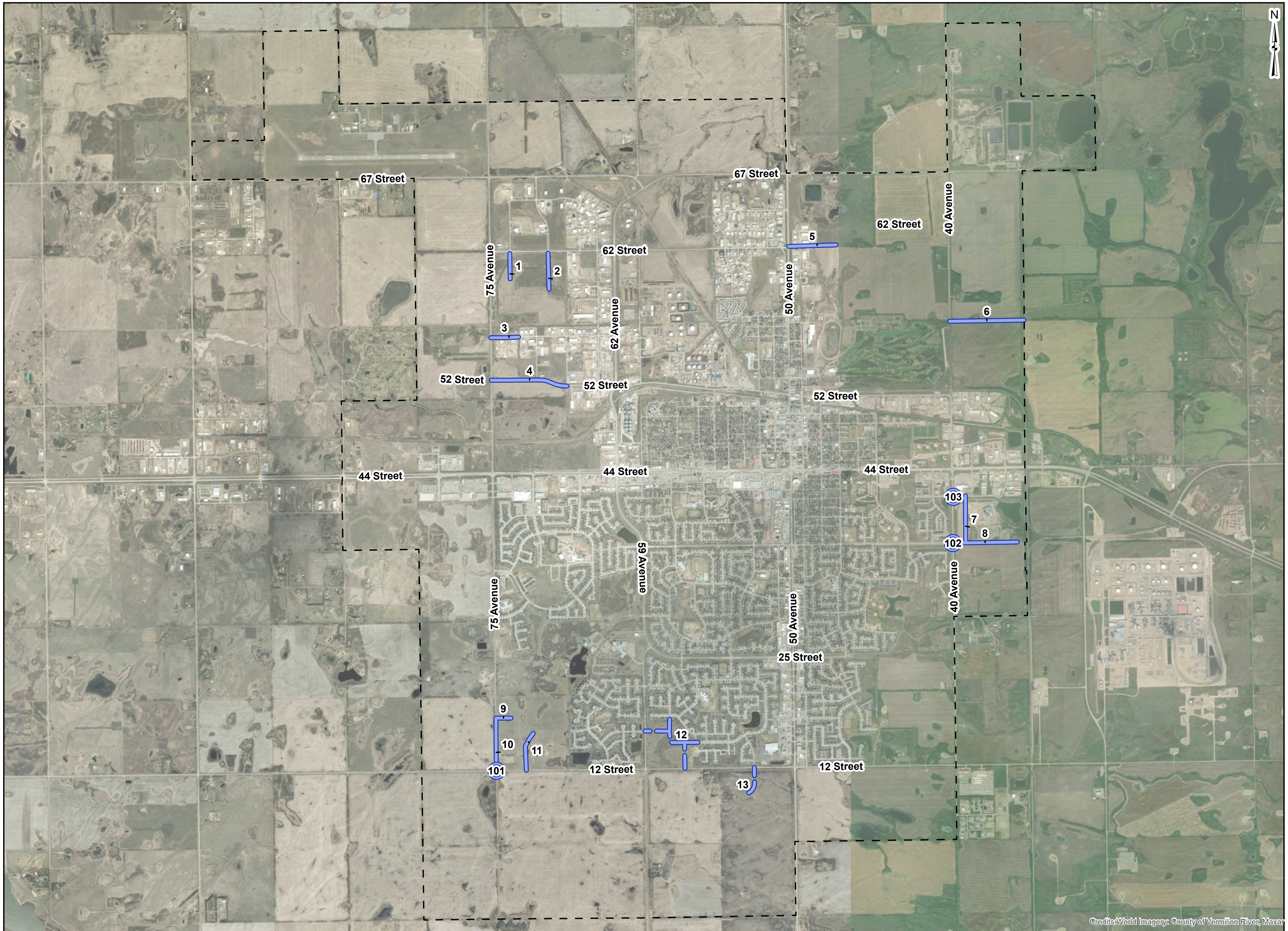
Table 5.2: Corridor Projects within 3 years

#	Road Name	Scope of Improvement	Development Horizon (Years)	Cost Estimate
1	73 Avenue	New two-lane local (Hill Industrial)	3	$1.4M[B]
2	70 Avenue	New two-lane local (Hill Industrial)	3	$2.0M[B]
3	56 Street	New two-lane collector (Robinson Industrial)	3	$1.5M[B]
4	52 Street	New two-lane arterial (Robinson Industrial)	3	$4.2M[A]
5	62 Street	New two-lane arterial (Meridian Industrial)	3	$2.6M[A]
6	57 Street	Upgrade to paved rural arterial (North East Industrial)	3	$4.1M[A]
7	39 Avenue	New two-lane collector (Wigfield)	3	$2.6M[B]
8	36 Street	New two-lane collector (Wigfield)	3	$3.5M[B]
9	19 Street	New two-lane collector (Lakeside)	3	$0.8M[B]
10	75 Avenue	Road Widening from 12 Street to 19 Street	3	$2.3M[A]
11	72 Avenue	New two-lane collector (Lakeside)	3	$2.1M[B]
12	College Park Connections	New two-lane collectors	3	$5.5M[B]
13	52B Avenue	New two-lane collector, south of 12 Street	3	$1.5M[B]

Table 5.3: Intersection Upgrade Projects[C] within 3 years

#	Intersection Name	Scope of Improvement	Development Horizon (Years)	Cost Estimate
101	75 Avenue and 12 Street	Signalized	3	$0.5M[A]
102	40 Avenue and 36 Street	Signalized and Additional Turning Lanes	3	$0.8M[A]
103	40 Avenue and 41 Street	Signalized	3	$0.5M[A]

[A] City-funded capital asset. The City assumes both construction costs and future maintenance liabilities.
[B] Developer-funded. The City assumes no construction cost but accepts future maintenance liabilities.
[C] Intersection upgrades located at the junctions of corridor projects are considered part of the overall corridor scope and cost.



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City Limits

Intersection Projects

Year 3

Corridor Projects

Year 3

Known Alignments

Conceptual Alignments

Note: Future road alignments shown on this map are conceptual and are based on preliminary assumptions. Segments labeled as conceptual alignments are subject to future planning and development processes.

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FIGURE 5.1
FUTURE ROAD PROJECTS
YEAR 3
LLOYDMINSTER TRANSPORTATION
MASTER PLAN

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5.1.3 5-Year Horizon

A mid-horizon travel demand model was generated to align with the land use developments expected to be completed within the next 5 years. Figure 5.2 illustrates the anticipated levels of congestion if no major road improvements are undertaken. The primary areas of congestion are projected to be along 50 Avenue, south of 44 Street.

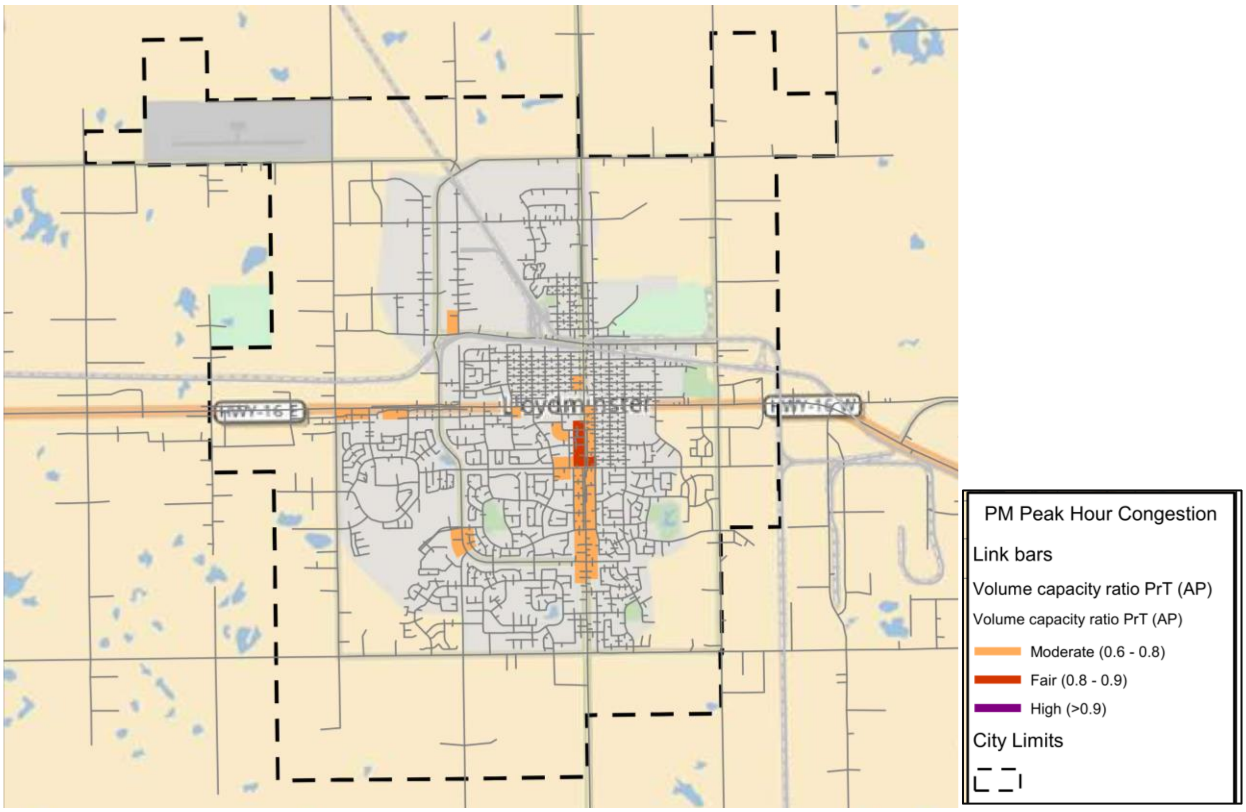


Figure 5.2: Levels of Congestion in 5 years with no improvements

Similar to the 3-year horizon analysis, the table below lists the road network improvements anticipated to be necessary within the next 5 years. Tables 5.4 and 5.5 show the corridor and intersection improvements[7] identified to reduce the levels of congestion. Figure 5.3 illustrates the locations of these projects.

[7] Only upgrades to existing intersections are listed individually. New intersections that arise as part of new corridor construction are assumed to be included within the scope of the corresponding corridor project and are not itemized separately.

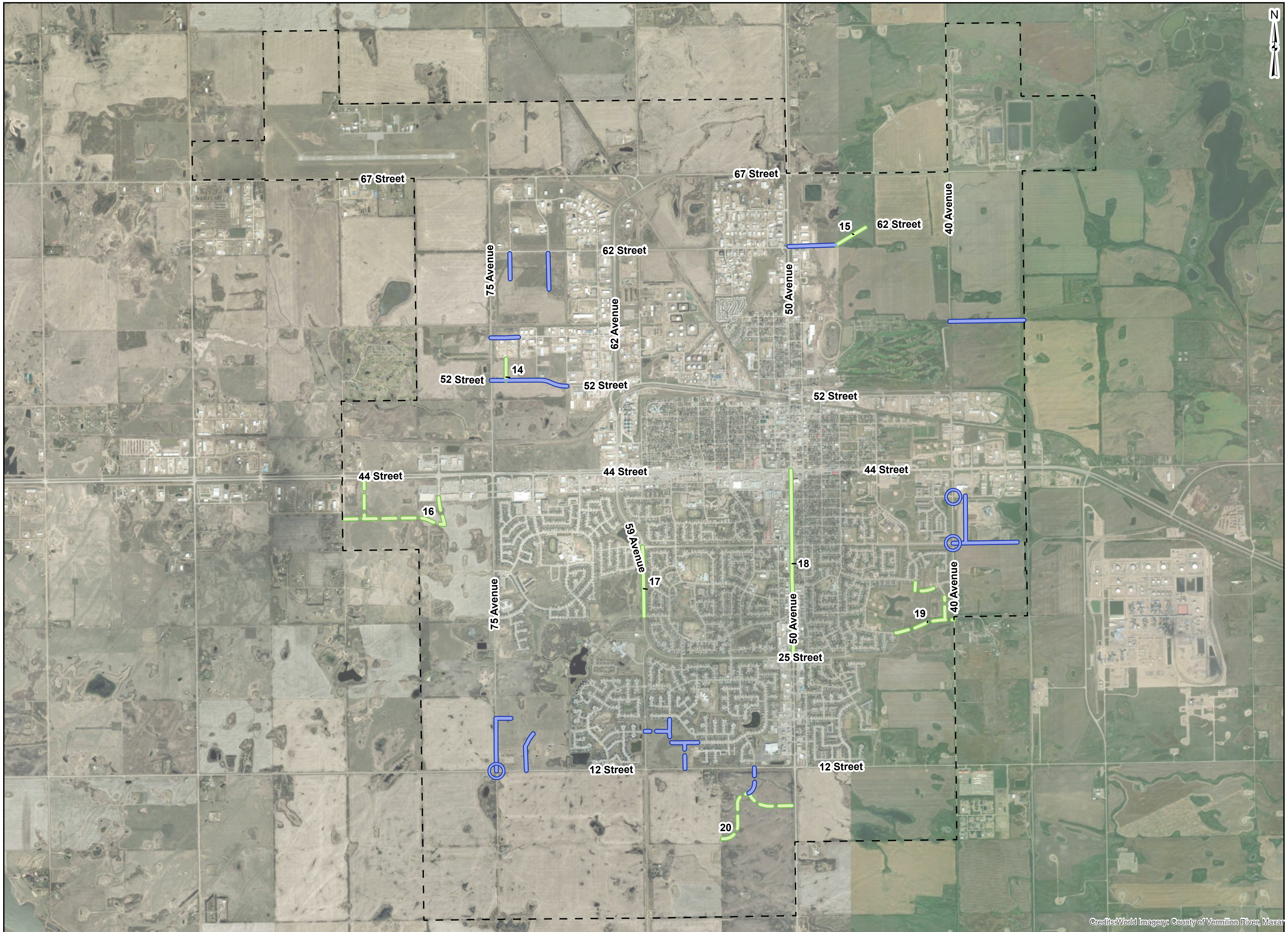
Table 5.4: Corridor Projects within 5 years

#	Road Name	Scope of Improvement	Development Horizon (Years)	Cost Estimate
14	73 Avenue	New two-lane local (Robinson Industrial)	5	$1.2M[B]
15	62 Street	New two-lane arterial (Meridian Industrial)	5	$1.9M[A]
16	West Commercial Connections	New two-lane collectors (West Commercial)	5	$9.6M[B]
17	59 Avenue	Four-lanes between 29 Street and 36 Street	5	$3.8M[A]
18	50 Avenue	Four-lanes between 25 Street and 44 Street	5	$15.3M[A]
19	Aurora Connections	New two-lane collectors	5	$6.0M[B]
20	Annexed Land Connections	New two-lane collectors	5	$6.2M[B]

Table 5.5: Intersection Projects[C] within 5 years

#	Intersection Name	Scope of Improvement	Development Horizon (Years)	Cost Estimate
	None			

[A] City-funded capital asset. The City assumes both construction costs and future maintenance liabilities.
[B] Developer-funded. The City assumes no construction cost but accepts future maintenance liabilities.
[C] Intersection upgrades located at the junctions of corridor projects are considered part of the overall corridor scope and cost.



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City Limits

Intersection Projects

Year 3

Corridor Projects

Year 3

Known Alignments

Conceptual Alignments

Year 5

Known Alignments

Conceptual Alignments

Note: Future road alignments shown on this map are conceptual and are based on preliminary assumptions. Segments labeled as conceptual alignments are subject to future planning and development processes.

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FIGURE 5.3
FUTURE ROAD PROJECTS
YEAR 5
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After identifying projects 15 and 16 as essential for reducing congestion, the TDM was re-run with these upgrades included. This allowed us to assess the improvements in traffic conditions with the proposed road upgrades in place. Figure 5.4 shows the levels of congestion with the same land use developments but with the road upgrades implemented.

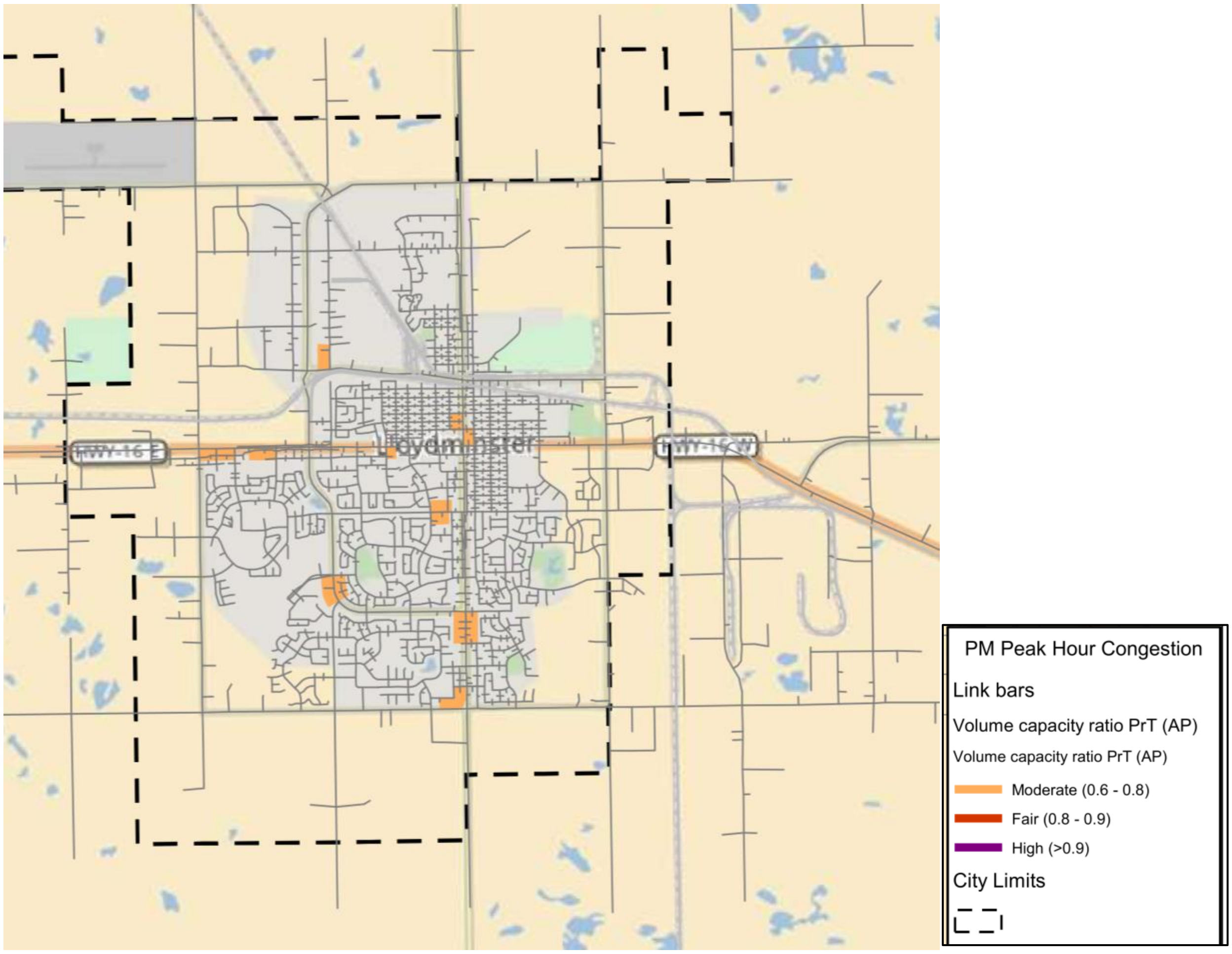


Figure 5.4: Levels of Congestion in 5 years with proposed projects built

5.1.4 10-Year Horizon

The 10-year projects were identified using a similar approach to that of the 3-year projects. Traffic volumes for each roadway were interpolated based on the 5-year and 20-year forecasted volumes. These interpolated volumes were then analyzed using the Synchro traffic analysis software to identify intersections and corridors with poor levels of service, significant delays, and high congestion.

Tables 5.6 and 5.7 show the corridor and intersection improvements[8] identified to reduce the levels of congestion. Figure 5.5 illustrates the locations of these projects. Note that the extension of 25 Street to connect with 40 Avenue is anticipated to be needed within this development horizon, to better disperse travel demand away from 50 Avenue and to support the adjacent neighbourhood developments.

Projects identified for addressing congestion include projects 17, 19 and each of the intersection improvement projects. Intersection improvements are identified as either a) maintain traffic control type and increase specific lanes or b) upgrade the traffic control type to a higher capacity method. This report does not distinguish between the performance benefits, cost differences, or space constraints between a signalized control or a roundabout. Both solutions represent an increase in capacity and performance above the existing situation.

Collectors with Traffic Calming in Parkview and Lakeside

Projects 24 and 25 involve the construction of new collector roads to support upcoming land developments in the Parkview Estates and Lakeside neighborhoods, respectively. During the travel demand modeling process, the project team observed that these roads are likely to attract a high volume of through-traffic—drivers using them as shortcuts to avoid the main arterial roads, rather than accessing local destinations.

To address this issue, ISL recommends incorporating traffic calming or traffic management strategies into the design of these collector roads. The specific measures will be determined in future design phases.

Potential options include, but are not limited to:

- Speed bumps or speed tables
- Curved (curvilinear) road alignments[9]
- Lower speed limits
- Access restrictions
- Other traffic calming measures as outlined by multiple industry publications (ITE, TAC)

The goal of these measures is to enhance safety and preserve the livability of the community by reducing the risk posed by high volumes of fast-moving traffic.

[8] Only upgrades to existing intersections are listed individually. New intersections that arise as part of new corridor construction are assumed to be included within the scope of the corresponding corridor project and are not itemized separately.

[9] Curvilinear road layouts may help deter shortcutting by discouraging direct-through travel but do not directly address speeding. In fact, drivers who choose to speed along curves can create new safety concerns within neighbourhoods streets. Speed management and road design elements should also be implemented to manage excessive speeding.

Table 5.6: Corridor Projects within 10 years

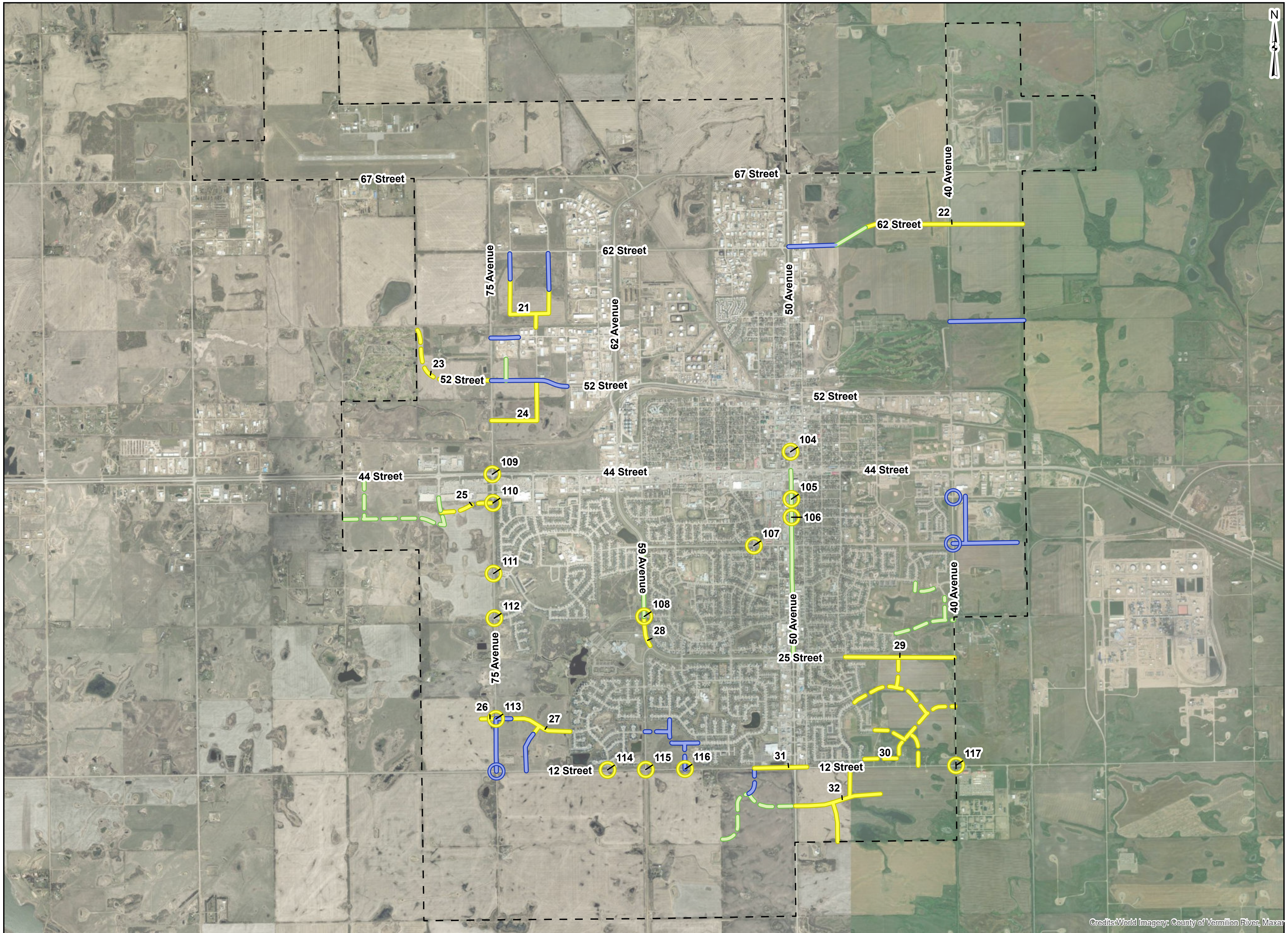
#	Road Name	Scope of Improvement	Development Horizon (Years)	Cost Estimate
21	Hill Industrial Connections	New two-lane local	10	$6.1M[B]
22	62 Street	New two-lane arterial (Meridian Industrial)	10	$8.6M[A]
23	West Commercial Connections	New two-lane arterial	10	$6.1M[A]
24	Hill Industrial Connections	New two-lane local	10	$5.8M[B]
25	West Commercial Connections	New two-lane collector (West of Parkview Estates)	10	$2.9M[B]
26	19 Street	New two-lane collector, west of 75 Avenue in newly annexed lands.	10	$0.8M[B]
27	19 Street	New two-lane collector with traffic calming in Lakeside	10	$4.0M[B]
28	59 Avenue	Four-lanes between 25 Street and 29 Street	10	$1.6M[A]
29	25 Street	New two-lane arterial	10	$6.0M[A]
30	Wallacefield Connections	New two-lane collectors	10	$16.7M[B]
31	12 Street	Four-lanes between 49 Avenue and 52B Avenue plus other intersection improvements	10	$25.7M[A]
32	The Willows Connections	New two-lane collectors	10	$8.5M[B]

[A] City-funded capital asset. The City assumes both construction costs and future maintenance liabilities.
[B] Developer-funded. The City assumes no construction cost but accepts future maintenance liabilities.

Table 5.7: Intersection Projects[C] within 10 years

#	Intersection Name	Scope of Improvement	Development Horizon (Years)	Cost Estimate
104	50 Avenue and 46 Street	Signalize or Restrict left turns onto 50 Avenue and through movements crossing 50 Avenue	10	$0.5M
105	50 Avenue and 42 Street	Signalized or Roundabout	10	$0.5M-$1.5M
106	50 Avenue and 39 Street	Signalized or Roundabout	10	$0.5M-$1.5M
107	52 Avenue and 36 Street	Signalized or Roundabout	10	$0.5M-$1.5M
108	59 Avenue and 29 Street	Signalized or Roundabout	10	$0.5M-$1.5M
109	75 Avenue and 44 Street	Major Intersection Improvements specified in Functional Plans for 75 Avenue	10	$5.0M
110	75 Avenue and 39 Street	Major Intersection Improvements specified in Functional Plans for 75 Avenue	10	$0.5M
111	75 Avenue and 34 Street	Major Intersection Improvements specified in Functional Plans for 75 Avenue	10	$0.5M
112	75 Avenue and 29 Street	Major Intersection Improvements specified in Functional Plans for 75 Avenue	10	$0.5M
113	75 Avenue and 19 Street	Major Intersection Improvements specified in Functional Plans for 75 Avenue	10	$0.3M
114	61 Avenue and 12 Street	Major Intersection Improvements specified in Functional Plans for 12 Street	10	$0.7M
115	59 Avenue and 12 Street	Major Intersection Improvements specified in Functional Plans for 12 Street	10	$0.3M
116	57 Avenue and 12 Street	Major Intersection Improvements specified in Functional Plans for 12 Street	10	$0.9M
117	40 Avenue and 12 Street	Major Intersection Improvements specified in Functional Plans for 12 Street	10	$0.6M

[A] City-funded capital asset. The City assumes both construction costs and future maintenance liabilities.
[B] Developer-funded. The City assumes no construction cost but accepts future maintenance liabilities.
[C] Intersection upgrades located at the junctions of corridor projects are considered part of the overall corridor scope and cost.



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City Limits

Intersection Projects

Year 3

Year 10

Corridor Projects

Year 3

Known Alignments

Conceptual Alignments

Year 5

Known Alignments

Conceptual Alignments

Year 10

Known Alignments

Conceptual Alignments

Note: Future road alignments shown on this map are conceptual and are based on preliminary assumptions. Segments labeled as conceptual alignments are subject to future planning and development processes.

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FIGURE 5.5
FUTURE ROAD PROJECTS
YEAR 10
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5.1.5 20-Year Horizon

The 20-year horizon travel demand model was the first scenario to be simulated, incorporating the land use developments expected to be completed within twenty years. Figure 5.6 illustrates the anticipated levels of congestion if no major road improvements are undertaken, including those identified in the mid-horizon scenarios. Significant congestion is projected across the road network, particularly along 12 Street, 44 Street, 40 Avenue, 50 Avenue, 59 Avenue, and 75 Avenue.

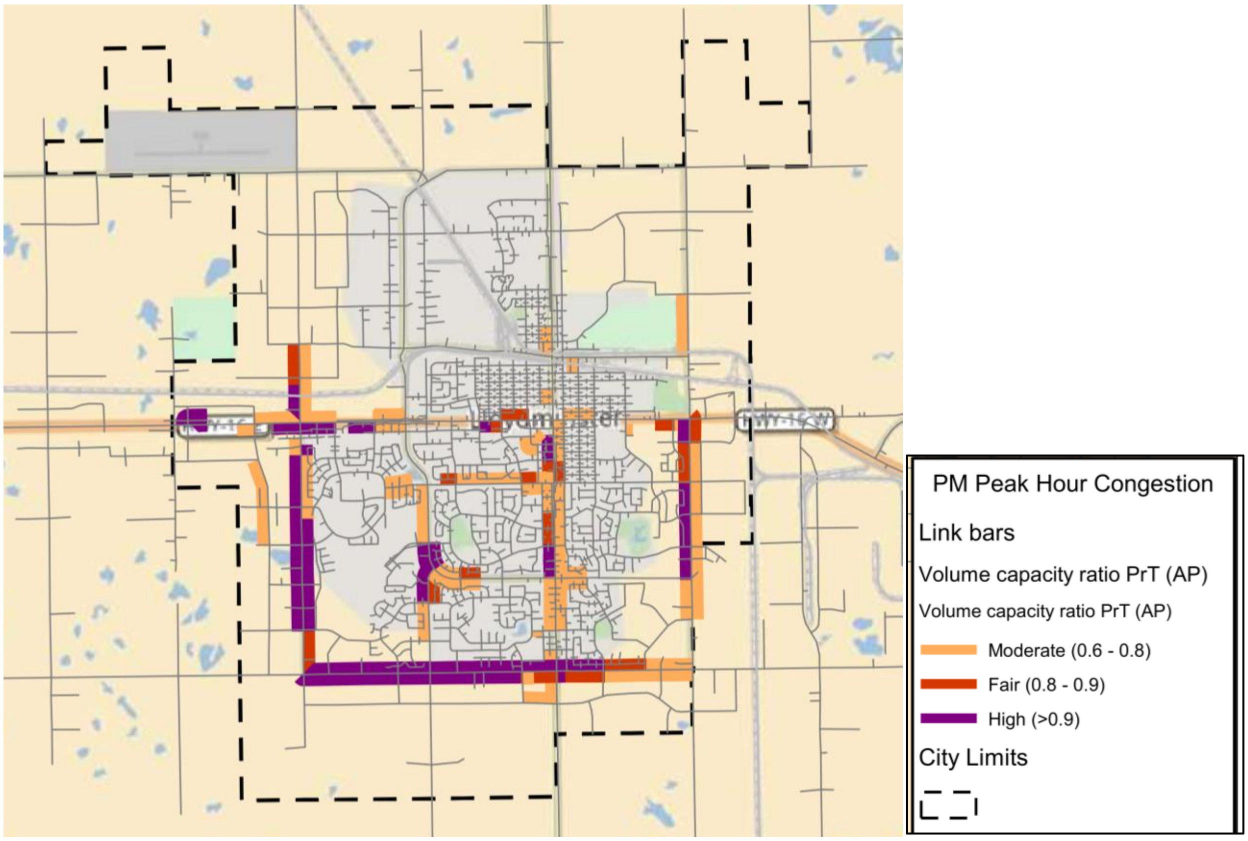


Figure 5.6: Levels of Congestion in 20 years with no improvements

As before, Tables 5.8 and 5.9 list the road network improvements anticipated to be necessary between the 10- and 20 -year horizons. While many of these improvements involve the construction of new access roads to support land development, projects 35, 36, and 38 through 43 are road upgrades identified to address congestion.

Similar to the 3-year horizon analysis, Tables 5.8 and 5.9 identify the road network improvements[10] anticipated to be necessary within the next 20 years. Figure 5.7 illustrates the locations of these projects.

[10] Only upgrades to existing intersections are listed individually. New intersections that arise as part of new corridor construction are assumed to be included within the scope of the corresponding corridor project and are not itemized separately.

Shortcutting

Much of the lands acquired by the City in 2022 do not yet have applicable developmental reports or designs for the road network. For these areas, a simple collector roadway network was assumed to provide direct land access. These simplified layouts promoted high levels of shortcutting within the neighbourhood collector roads (future 78 Avenue, 10 Street, and 19 Street). ISL recommends that either a) traffic calming measures or b) curvilinear road layouts be explored for these corridors to limit the degree of shortcutting that could occur. Such projects are not listed below but should remain in consideration as Lloydminster expands.

Table 5.8: Corridor Projects within 20 years

#	Road Name	Scope of Improvement	Development Horizon (Years)	Cost Estimate
33	Northwest Annexed Area	New two-lane collectors (West of Hill Industrial)	20	$6.9M[B]
34	Northwest Annexed Area	New two-lane collectors (West of Hill Industrial)	20	$8.1M[B]
35	75 Avenue	Four-lanes between 44 Street and 62 Street	20	$12.1M[A]
36	North Industrial Connections	New two-lane collectors (Meridian Industrial)	20	$11.0M[B]
37	West Commercial Connections	New two-lane collector (West of Hill Industrial)	20	$6.6M[B]
38	West Annexed Area	New two-lane collector (West of West Commercial	20	$5.2M[B]
39	75 Avenue	Four-lanes between 10 Street and 44 Street plus intersection improvements	20	$18.2M[A]
40	34 Street	New two-lane collector (West of Parkview Estates)	20	$5.2M[B]
41	29 Street	New two-lane collector (West of Parkview Estates)	20	$7.3M[B]
42	Southwest Annexed Area	New four-lane arterial (West of Parkview Estates)	20	$5.2M[A]
43	19 Street	New two-lane collector (West of Lakeside)	20	$3.8M[B]
44	Southwest Annexed Area	New two-lane collector (West of Lakeside, North from 12 Street)	20	$9.6M[B]
45	South Annexed Area	New two-lane collectors	20	$17.0M[B]
46	59 Avenue	Four-lanes between 12 Street and 25 Street	20	$6.9M[A]
47	25 Street	Four-lanes between 53 Avenue and 59 Avenue	20	$4.6M[A]

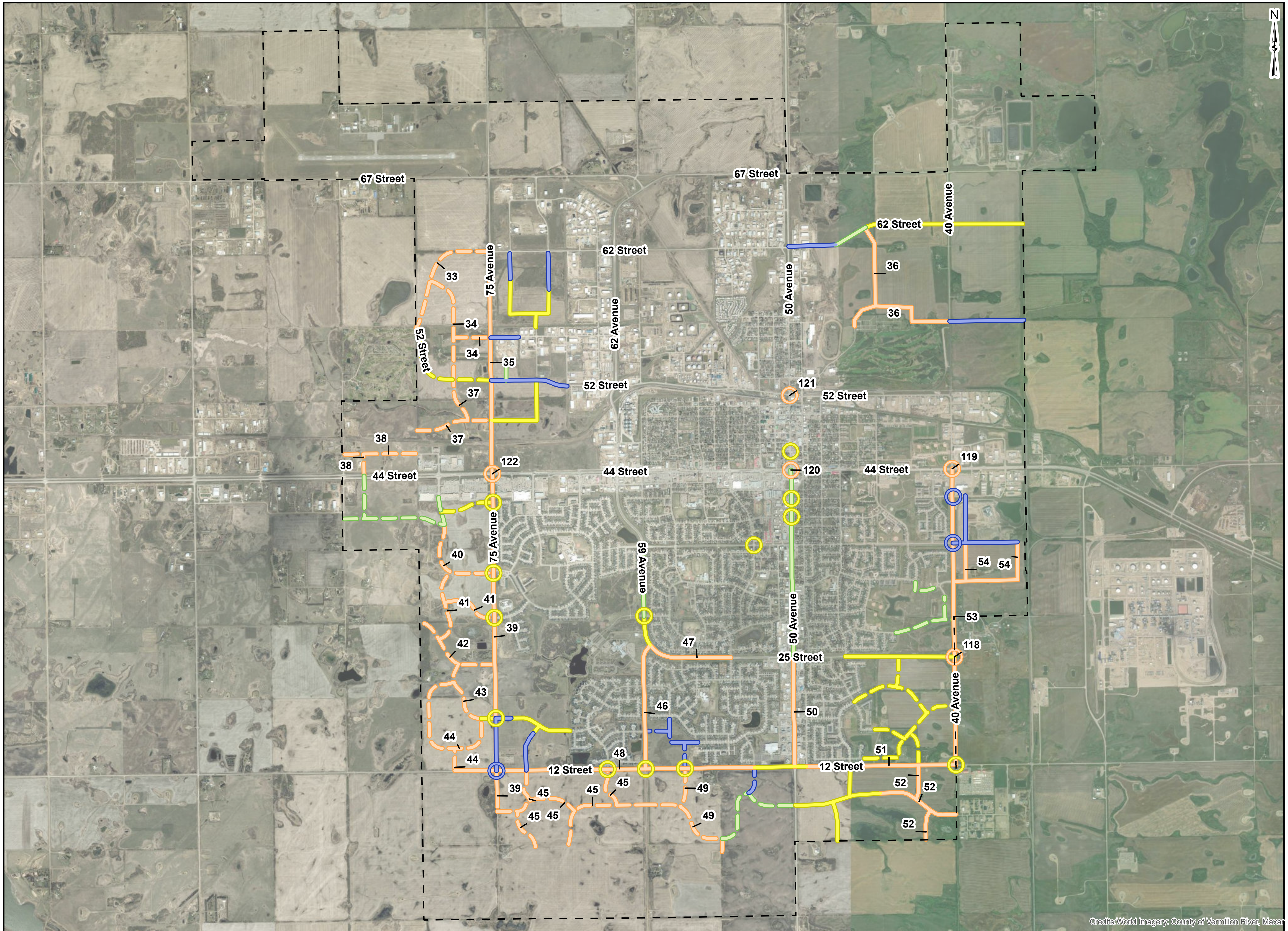
#	Road Name	Scope of Improvement	Development Horizon (Years)	Cost Estimate
48	12 Street	Four-lanes between 52B Avenue and 78 Avenue plus intersection improvements	20	$75.3M[A]
49	South Annexed Area	New two-lane collectors	20	$7.9M[B]
50	50 Avenue	Four-lanes between 12 Street and 25 Street	20	$9.0M[A]
51	12 Street	Four-lanes between 40 Avenue and 49 Avenue plus intersection improvements	20	$33.4M[A]
52	The Willows Connections	New two-lane collectors	20	$8.0M[B]
53	40 Avenue	Four-lanes between 12 Street and 44 Street	20	$16.1M[A]
54	Wigfield Connections	New two-lane collectors	20	$7.7M[B]

[A] City-funded capital asset. The City assumes both construction costs and future maintenance liabilities.
[B] Developer-funded. The City assumes no construction cost but accepts future maintenance liabilities.

Table 5.9: Intersection Projects within 20 years

#	Intersection Name	Scope of Improvement	Development Horizon (Years)	Cost Estimate
118	40 Avenue and 25 Street	Signalized	20	$0.5M
119	40 Avenue and 44 Street	Increase intersection capacity (signal timing, additional lanes and/or roundabout conversion)	20	$0.5M-$1.5M
120	50 Avenue and 44 Street	Increase intersection capacity (signal timing, additional lanes and/or roundabout conversion)	20	$0.5M-$2.5M
121	50 Avenue and 52 Street	Increase intersection capacity (signal timing, additional lanes and/or roundabout conversion)	20	$0.5M-$1.5M
122	75 Avenue and 44 Street	Major Intersection Improvements specified in Functional Plans for 75 Avenue	20	$0.7M

[A] City-funded capital asset. The City assumes both construction costs and future maintenance liabilities.
[B] Developer-funded. The City assumes no construction cost but accepts future maintenance liabilities.
[C] Intersection upgrades located at the junctions of corridor projects are considered part of the overall corridor scope and cost.



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City Limits

Intersection Projects

Year 3
Year 10
Year 20

Corridor Projects

Year 3

Known Alignments
Conceptual Alignments

Year 5

Known Alignments
Conceptual Alignments

Year 10

Known Alignments
Conceptual Alignments

Year 20

Known Alignments
Conceptual Alilgnments

Note: Future road alignments shown on this map are conceptual and are based on preliminary assumptions. Segments labeled as conceptual alignments are subject to future planning and development processes.

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FIGURE 5.7
FUTURE ROAD PROJECTS
YEAR 20
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MASTER PLAN

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Figure 5.8 shows levels of congestion should the above list of projects be implemented. Not all areas see congestion levels fully relieved: 44 Street at 75 Avenue and sections of 12 Street continue to see fair and high levels of congestion.

ISL recommends that these areas remain closely monitored over the intervening years to determine if additional upgrades are necessary. Other societal or non-infrastructure changes within twenty (20) years may change how people and goods travel within Lloydminster (such as shifting to public transit, or increased density) that have not been captured within the scope of this travel demand model.

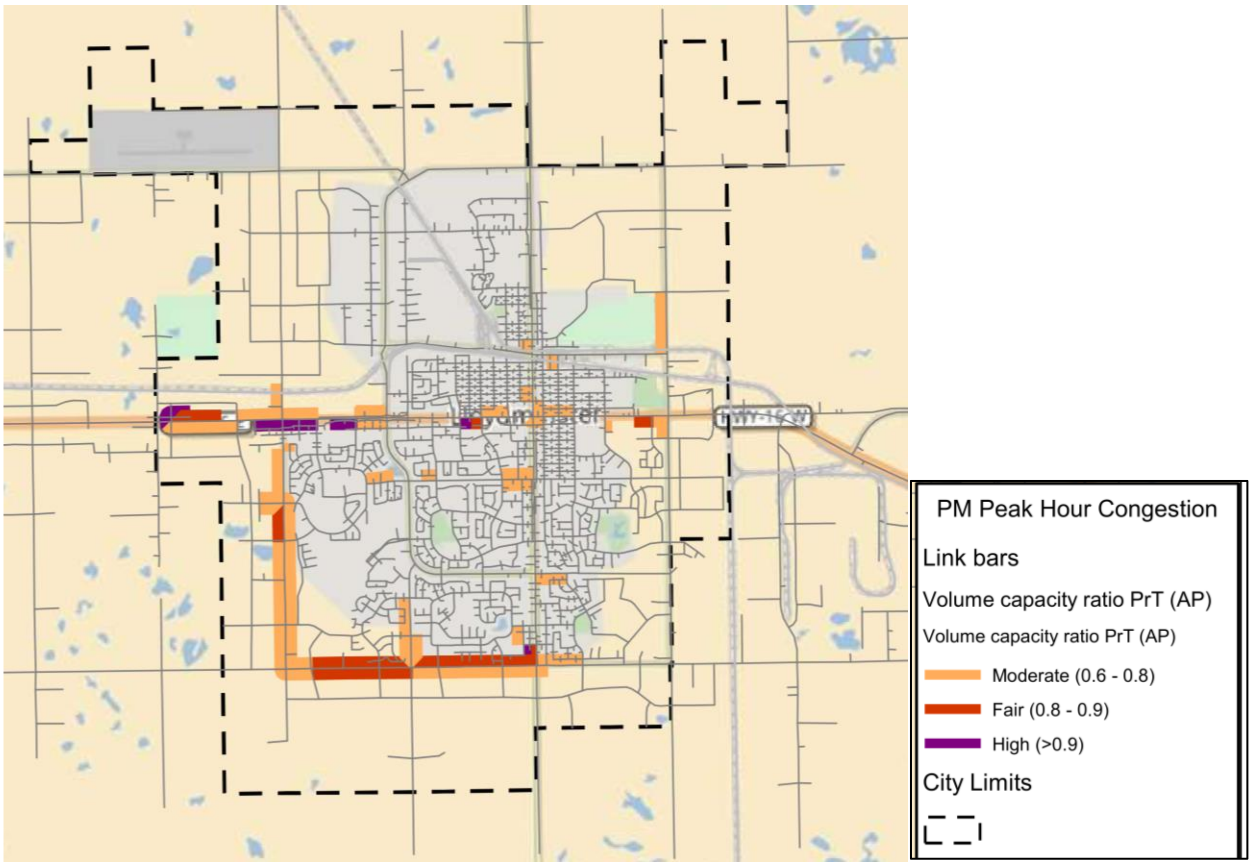


Figure 5.8: Levels of Congestion in 20 years with proposed projects

5.2 Alternative Scenarios

As part of the evaluation process of potential future roadway infrastructure, ISL also examined the potential for predetermined major projects to provide travel benefits to Lloydminster and regional travellers. Travel demand modelling was completed for the following major projects:

- A couplet design for 50 Avenue (Highway 17) through the downtown core[11]
- A bypass alignment for Highway 16 (designated 16X) located to the south of the current City limits

Outside of travel demand modelling, ISL examined the potential alignments and suitability of the following project:

- A ring road encircling the current City limits

[11] A couplet design is a road network with alternating one-way streets.

5.2.1 Highway 17 North-South Couplet

For more than 30 years, the City has explored the potential for a North-South Couplet design along 50 Avenue (Highway 17), resulting in a preliminary design report in August 2011. In 2016, the City procured a detailed design for a North-South Couplet system that would convert 50 Avenue into a one-way southbound corridor and 49 Avenue into a one-way northbound corridor between 44 Street and 56B Street. Transitional segments would connect the North-South Couplet to the broader two-way network at 35 Street (south) and 62 Street (north).

The North-South Couplet was originally conceived during a period when traffic operations—particularly congestion relief and vehicle throughput—were the primary planning objectives. However, contemporary transportation planning increasingly recognizes the importance of place-making, multi-modal accessibility, and community livability, especially in downtown cores. While the couplet may offer operational benefits, its broader impacts must be considered. The general layout for the North-South Couplet is shown in Figure 5.9.

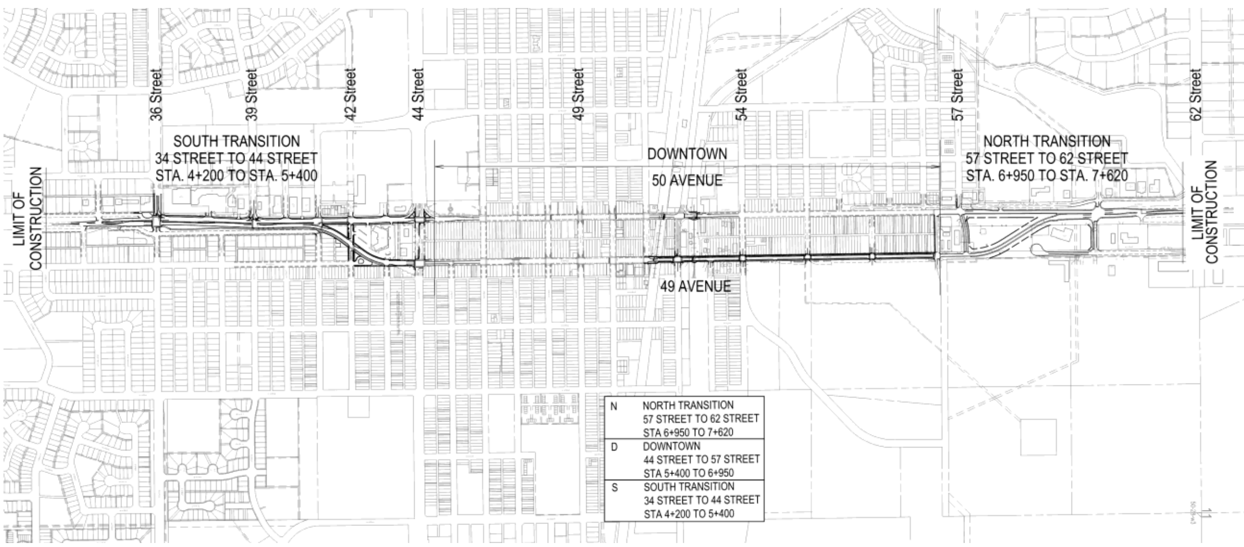


Figure 5.9: General Layout for the North-South Couplet design

Travel Demand Modeling Results

As part of the 2025 TMP, a future scenario was modeled using this project's Transportation Demand Model (TDM) in PTV Visum. This scenario included all planned projects (outlined in section 6.1) plus the couplet design at the 20-year horizon. When comparing the 20-year horizon with and without the couplet (in the peak PM period), the model results showed:

- A significant increase in northbound volumes along 49 Avenue (from ~150 veh/hr to ~550 veh/hr)
- A moderate increase in southbound volumes along 50 Avenue (from ~650 veh/hr to ~920 veh/hr)
- A net decrease in northbound volumes between both corridors (from ~650 veh/hr to ~550 veh/hr)[12]
- A moderate increase in southbound volumes between both corridors (from ~830 veh/hr to ~920 veh/hr)
- Minimal change in overall congestion levels.
- Minimal improvements in travel times along the corridor

[12] The decrease in northbound travel on 49 Avenue was primarily due to vehicles destined for the residential areas west of downtown using 52 Avenue instead.

This variation raise concerns about the model's ability to fully capture the operational realities of the downtown core. Factors such as signal timing, pedestrian activity, and local access patterns may not be adequately represented. Nonetheless, within the capacity of the model to anticipate future conditions, it is reasonable to expect between minimal and moderate improvements to traffic conditions within the downtown core.

The following table summarizes the potential advantages and disadvantages of implementing a North-South Couplet along 50 Avenue (Highway 17) and 49 Avenue:

Table 5.10: Advantages and Disadvantages of the North-South Couplet

Advantages	Disadvantages
Improved traffic flow through directional separation	**Wayfinding challenges** for visitors and non-local drivers
Simplified intersections with fewer conflict points	**Reduced business access** from one direction
Potential for signal coordination and smoother flow	**Higher intensity of traffic** along residential sections of 49 Avenue
Pedestrian safety improvements with one-way crossings	**Risk of higher vehicle speeds** without calming measures
Freed-up space for wider sidewalks, bike lanes, or landscaping	**Emergency response complexity** due to routing changes
Supports downtown revitalization if paired with urban design	**Implementation costs** for signage, signals, and outreach
Aligns with truck route changes that removed heavy vehicles from 50 Avenue	**Modeling limitations** may obscure true impacts

Recommendation

While the North-South Couplet concept offers some merit from a traffic operations perspective, the modeling results do not demonstrate a compelling benefit in terms of congestion relief or travel time savings. Additionally, the context of downtown Lloydminster has evolved: 50 Avenue (Highway 17) is no longer a designated truck route, while the corridor is increasingly recognized for its importance to local access, pedestrian activity, and community character.

Given these considerations—and acknowledging the limitations of the current Transportation Demand Model in capturing the nuanced dynamics of the downtown core—it is recommended that the North-South Couplet concept be removed from the City's long-term asset planning, pending the completion of a functional study for the section of 50 Avenue south of 44 Street. This recommendation is made with caution and does not preclude future reconsideration should conditions change or should a more detailed operational model be developed.

It is also recognized that some form of infrastructure investment to support north-south regional travel along Highway 17 (50 Avenue (Highway 17) will likely be necessary in the coming decades. Whether through a reimagined North-South Couplet or improvements to alternative corridors that reroute Highway 17 away from the downtown core, strategic planning for long-term mobility remains essential.

In the interim, the City is encouraged to explore alternative downtown mobility strategies that prioritize walkability, safety, and economic vitality—while maintaining efficient traffic flow through the core.

5.2.2 Highway 16X Bypass

As part of the long-range planning process, the 2025 TMP also evaluated an alternative scenario incorporating the proposed Highway 16X bypass south of Lloydminster. This scenario was modeled using the same 20-year horizon and included all other projects listed in Section 5.1. The Highway 16X concept, currently under study by Alberta Transportation, envisions a new alignment beginning near the hamlet of Blackfoot and reconnecting with Highway 17 approximately 4.8 km south of the existing Highway 16/17 intersection. Originally conceived to improve regional mobility and reduce downtown congestion, the bypass offers a strategic alternative to the North-South Couplet by diverting through-traffic—particularly heavy vehicles—away from the urban core, thereby supporting long-term goals for downtown livability and safety.

Figure 5.10 shows the current best understanding of the alignment for a Highway 16X bypass. This concept would be a limited access, 4 lane highway, with a speed limit of 110 km/hr. Access to this highway is provided only at Highway 16 5.5 km west of Lloydminster, Township Road 494 (12 Street), Highway 17 (50 Avenue), Range Road 3280, and Highway 16 6.7 km east of Lloydminster. It is also possible that this bypass could be staged as a limited-access, high-speed, 2 lane highway with signalized intersections as a first stage before twinning and constructing interchanges in subsequent stages.

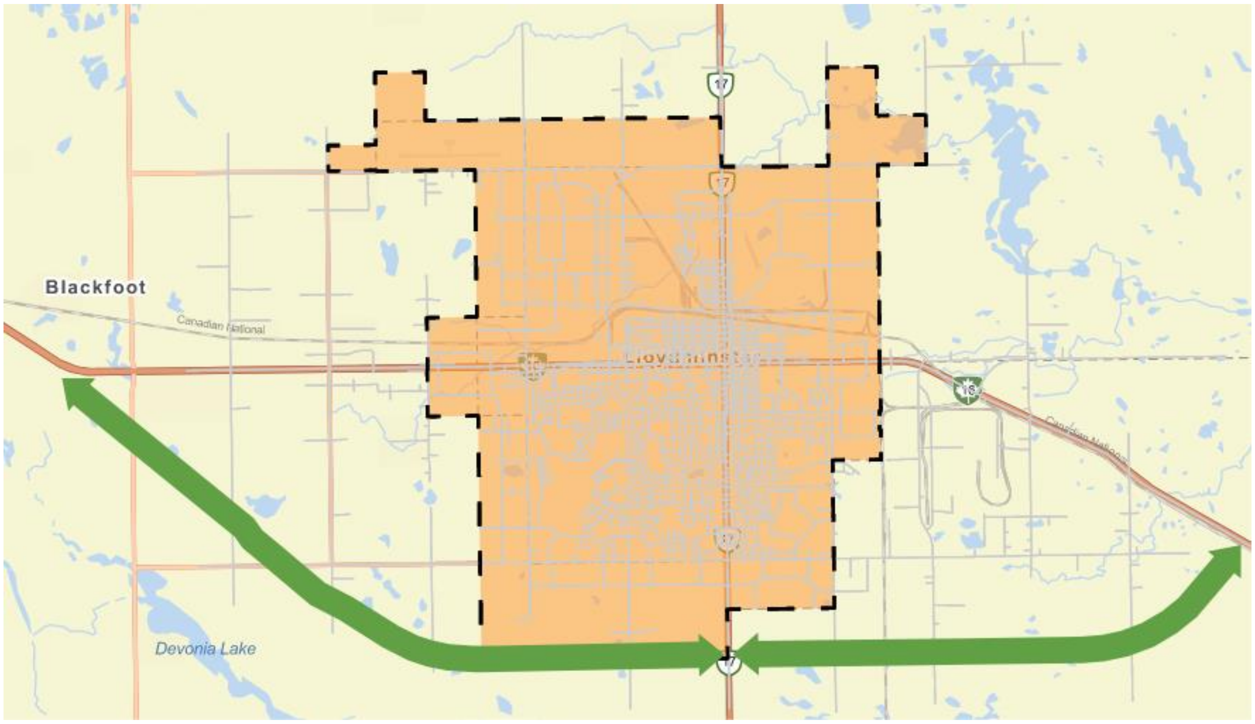


Figure 5.10: Highway 16X conceptual alignment

Travel Demand Modeling Results

As part of the 2025 TMP, a future scenario was modeled using this project's Transportation Demand Model (TDM) in PTV Visum. This scenario included all planned projects (outlined in section 5.1) plus the Highway 16X design at the 20-year horizon. When comparing the 20-year horizon with and without the couplet (in the peak PM period), the model results showed[13]:

- A moderate usage along Highway 16X (~360 veh/hr per direction)
- A moderate reduction in volume along 44 Street (~130-210 veh/hr reduction per direction)
- A significant increase along Highway 17, south of 12 Street (~600-700 veh/hr per direction)
  - Regional trips starting and ending on the south side of Lloydminster tended to re-route onto Highway 16X, rather than through 44 Street.
- A moderate reduction along 12 Street, 75 Avenue, and Range Road 14 (~90-150 veh/hr reduction per direction)

The following table summarizes the potential advantages and disadvantages of implementing a Highway 16X bypass:

Table 5.11: Advantages and Disadvantages of a Highway 16X Bypass

Advantages	Disadvantages
Reduces downtown congestion by diverting through-traffic, especially heavy trucks	**High capital cost** for land acquisition, construction, and interchanges
Improves safety and livability in the downtown core by removing regional traffic	**Potential environmental impacts** on undeveloped or agricultural land
Supports long-term regional mobility and economic development	**May reduce traffic exposure** for downtown businesses reliant on pass-through traffic
Preserves downtown for local access, pedestrians, and community uses	**Requires interprovincial coordination** between Alberta and Saskatchewan
Enhances freight efficiency by providing a more direct, high-speed route for long-haul trucks	**May shift traffic impacts** to other residential or rural areas
Reduces wear and tear on urban infrastructure	

Recommendation

This TMP supports the continued planning and development of the proposed Highway 16X bypass south of Lloydminster. This project represents a long-term, strategic investment in regional mobility, safety, and economic resilience. By diverting through-traffic—particularly heavy trucks—away from the downtown core, the bypass would help preserve 50 Avenue and surrounding areas for local access, pedestrian activity, and community-focused development.

While the bypass offers clear benefits, its implementation is not without challenges. The project will require extensive coordination between the provinces of Alberta and Saskatchewan, as well as engagement with national-level transportation and infrastructure bodies. These jurisdictional complexities may affect timelines, funding mechanisms, and design approvals.

Despite these hurdles, the Highway 16X bypass aligns with the City's broader goals of enhancing downtown livability, supporting long-haul freight efficiency, and preparing for future growth.

[13] Note that this Travel Demand Model focused on travel within City Limits; projections for growth in regional highway travel were roughly estimated and may differ significantly from a Highway-focused travel demand estimation process.

6.0 Future Network Planning

6.1 Rail Crossings (Grade Separation Evaluation)

Lloydminster is located on Canadian National's (CN) transcontinental main line, which runs east–west through the City. Another line, operated by Canadian Pacific Kansas City (CPKC), passes north/south through Lloydminster, albeit with less connectivity compared to the CN main line. The CN main line is shown in blue, and the north/south CPKC line is shown in red in Figure 6.1, with the at-grade crossings shown with a yellow circle containing a black 'X'.

In total, 15 active at-grade crossings are noted within Lloydminster,[14] with 8 at-grade crossings along the CN transcontinental main line and 7 at-grade crossings along the CPKC line. There are 2 closed at-grade crossings (CN line/55 Avenue and CPKC line/ and 67 street) that remain on record as potential crossings. In addition, a CN/CPKC grade separation at the crossing of the two rail lines on the east City limit along with a grade separation of the CPKC line with the Yellowhead Highway 16.

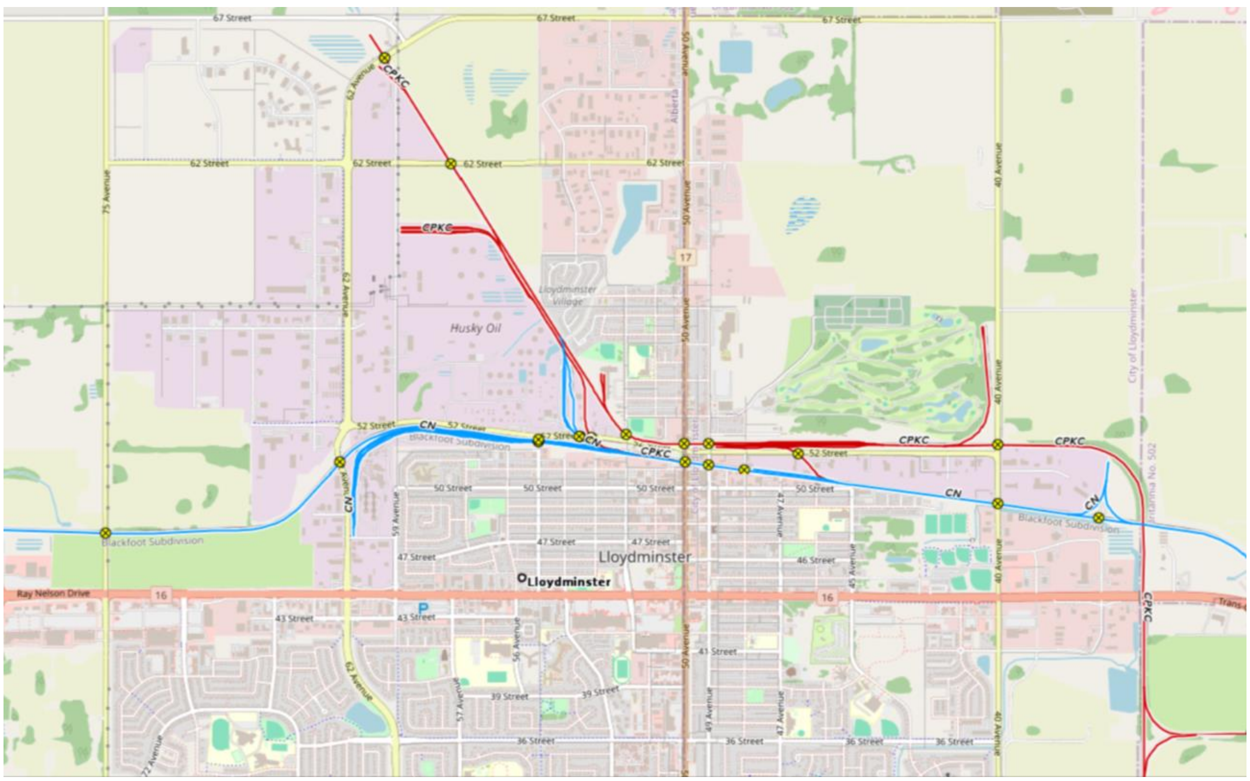


Figure 6.1: CN and CPKC Rail Lines (Source: The Railway Atlas, The Railway Association of Canada)

[14] The CPKC crossing of 62 Avenue is listed in Figure 6.1 from the Railway Association of Canada's website despite the track having been removed. It is ISL's understanding that the ROW corridor remains registered should a crossing be desirable due to future developments to the north. Additionally, Figure 6.1 includes a rail crossing near mile post 83 along the CN line. It is ISL's understanding that this is a privately maintained and operated crossing location outside the jurisdiction of the City of Lloydminster.

The CN transcontinental main line operates with 3 trains per day crossing at several arterial roadways, including 75 Avenue, 62 Avenue, 50 Avenue, 49 Avenue, and 40 Avenue. The north/south line operates with 2 trains per day, also crossing 40 Avenue and 50 Avenue but also 62 Street and 67 Street in the northwest. Detailed data on all 17 rail crossing locations is provided in Appendix B.

Grade Crossing Review

To support the decision-making process of when a grade-separated rail crossing may be warranted, ISL reviewed available data against established criteria from Transport Canada for grade separation. A full warrant analysis could not be completed due to lack of data on three of the criteria: vehicle delay, percentage of time below minimum Level of Service, and queuing length. For the criteria in which data was available, none of the study locations met the warrant thresholds under the current or 20-year forecast conditions.

Recognizing these limitations, the following evaluation focuses on the contextual factors for determining which location most merits a grade separated crossing, should one be built within Lloydminster.

There are 4 key rail crossings along the arterial roads of 75 Avenue, 62 Avenue, 50 Avenue/49 Avenue, and 40 Avenue are subject to significant delays and are a cause for public frustration. As such, the purpose of this section of the TMP is to review the existing crossings based on the number of trains and compare them using existing and future traffic volumes to determine the most advantageous location for a grade separated crossing based on benefits and feasibility.

Following identification of the best location, an additional assessment is provided, discussing the potential footprint, constraints and costs. Existing rail crossing locations and their attributes are outlined in Table 6.1 with changes to laning and anticipated traffic volume are captured in Table 6.2. Volumes reported in both tables are bi-directional[15].

Table 6.1: Rail Crossing Attributes (Grade Crossing Inventory Data-Transport Canada)

Railway Company	Mile	Location	# of Reported Accidents	Total Trains Daily	Vehicles Daily	Train Max Speed (mph)	Road Speed (km/h)	# of Lanes	Tracks
CN	86.54	75 Avenue	0	3	3,006	25	60	2	1
CN	85.65	62 Avenue	0	3	8,730	25	60	4	2
CN	84.40	50 Avenue	0	3	10,300	25	50	2	1
CN	83.29	40 Avenue	0	3	3,360	25	50	4	1
CPKC	104.31	50 Ave	0	2	10,700	10	50	4	1
CPKC	103.21	40 Ave	0	2	700	10	80	2	1
Transport Canada Threshold				150	100,000	110	90	N/A	N/A

Note – Vehicles daily are sourced from Transportation Canada and may slightly vary from those published elsewhere in this report.

[15] Counting both directions of travel for motor vehicles.

Table 6.2: Rail Crossing (Existing and Future Lanes and Traffic Volumes)

Location	Roadway	Lanes		Volumes (24hr)	
		Existing	Future	Existing+	Future (20 Year)
1	75 Avenue (CN)	2	4	3,006	16,600
2	62 Avenue (CN)	4	4	8,730	10,600
3A	50 Avenue South (CN)	2	2	10,300	11,100 or 8,200*
3B	50 Avenue North (CPKC)	2	2	10,700	11,200 or 7,400*
4A	49 Avenue South (CN)	2	2	3,650	3,200 or 4,800*
4B	49 Avenue North (CPKC)	2	2	3,710	2,400 or 5,400*
5A	40 Avenue South (CN)	4	4	3,360	14,500
5B	40 Avenue North (CPKC)	2	4	700	11,500
***Transport Canada* Threshold for grade separation**					**100,000**

** - with North-South couplet design*

+ - existing traffic volumes from Transport Canada Grade Crossing Inventory (Grade Crossings Inventory)

Grade Separation Considerations

In reviewing grade crossing locations for potential grade separation, jurisdictions must consider a variety of factors. Many of the criteria that should be considered in assessing grade crossings for potential grade separation are noted in the Transport Canada *Grade Separation Assessment Guidelines* (included in Appendix C).

These include but are not limited to:

- Traffic volume and vehicle speeds
- Types of roadway traffic (pedestrians, cyclists, buses, dangerous goods)
- Emergency Service and Emergency Access
- Train volume and train speeds
- Type of railway traffic (passenger, goods, dangerous goods)
- Vehicle / train cross product
- Queuing and accesses within proximity to a rail crossing
- Delay caused by blockage and level-of-service
- Collision history and risk
- Blocked crossing issues
- Number of lanes and Numbers of tracks
- Roadway functional classification
- Environmental impacts, noise issues, air quality and emissions
- Community and social impacts (quality of life, community cohesion, aesthetics, business loss)
- Feasibility and constructability (access, land needs, drainage, utilities)
- Secondary impacts (to networks, accesses, land use, property)
- Costing and funding

In considering which criteria would provide the best assessment of location for Lloydminster, many of the above noted criteria were excluded as they are either equal, or very similar, for all of the crossings being evaluated (i.e. train speed, road speed, road type). In these cases, the criteria would have been assessed equally and would not have provided any differentiation between the crossing locations.

As such, criteria were selected for evaluation that captured areas of importance for the crossings in Lloydminster, provided variation between the locations, and enabled a comparison of the crossings against each other to assess which location(s) would make good candidates for grade separation consideration.

A high-level evaluation of the 8 crossings was conducted using 12 key criteria in assessing and ranking the locations. This assessment is shown on Tables 6.3 and 6.4. For this assessment, the crossings of 50 Avenue, 49 Avenue, and 40 Avenue have been assessed individually, as well as collectively.

To help with this assessment and the evaluation of impacts, 2 key assumptions were made:

- All crossings were evaluated as overpass crossings. While it may be feasible to develop a crossing as an underpass, that determination could only be made following geotechnical evaluation of the sub surface conditions and an assessment of storm water management. This assumption helped focus the evaluation on Location of crossing instead of Type of Crossing.
- Road Grade for rail overpasses is assumed to be 10m above track grade to account to the rail clearance requirement (7.16m / 23.5 feet), girder depth and bridge deck thickness. Connections are further assumed to be 250 m up and downstream of a grade separation based on a 4% grade and a 4m/100m rise/run relationship.

Table 6.3: Rail Crossings Considerations – Part 1

Crossing	Avenue	Future Cross Product#		Impact to Existing Traffic	Impact on Access / Cross Streets	Driving Distance / time to Hospital	Direct Route from Fire Stn. 1 or 2	Direct Route from WPD Ambulance
1	75 – CN	49,800		Low	Low	5.1 km / 11 min	Least Direct	Least Direct
2	62 – CN	31,800		High	Med	4.1 km / 8 min	Direct	Less Direct
3 A&B	50 – CN & CPKC	56,000	41,000[1]	High	High	2.2 km / 5 min	Less Direct	Direct
4 A&B	49 – CN & CPKC	16,000	27,000[1]	Low	High	2.1 km / 4 min	Less Direct	Direct
5A	40 – CN	43,500		Low	High	1.9 km / 3 min	Direct	Less Direct
5B	40 – CPKC	23,000		Low	High	2.2 km / 3 min	Direct	Less Direct
5 A&B	40 – CN & CPKC	66,500		Low	High	1.9 km / 3 min	Direct	Less Direct
Transport Canada Threshold		1,000,000		N/A	N/A	N/A	N/A	N/A

Table 6.4: Rail Crossing Considerations – Part 2

Crossing	Avenue	Truck Route		Dangerous Goods Route	Sidewalks / Active Modes		Community / Land Impacts	Ease of Implementation	Relative Cost
1	75 – CN	Yes		Yes	No		Low	High	$$
2	62 – CN	Yes		Yes	Yes		Low	High	$$$
3 A&B	50 – CN & CPKC	Yes		No	Yes		High	Low	$$$$$
4 A&B	49 – CN & CPKC	No	Yes[1]	No	No		High	Low	$$$$$
5A	40 – CN	Yes		Yes	No	Yes[2]	Med	Med	$$$
5B	40 – CPKC	Yes		Yes	No		Low	Med	$$$
5 A&B	40 – CN & CPKC	Yes		Yes	No	Yes[2]	Med	Med	$$$$$

- assumes future trains remain similar to today (CN – 3, CPKC – 2); all cross products are well below the Transport Canada Threshold of 1 million
[1] – second value with couplet of 50 Avenue / 49 Avenue
[2] – with planned sidewalk as per Trails and Sidewalk Master Plan

Factors that either favour/do not favour a location for grade separation

Factors that favour location	Neutral factors	Factors that do not favour location

Note – Due to the proximity of the CN and CPKC lines to each other of 100m and 118m along 50 Avenue and 49 Avenue respectively, for the purposes of this review it has been assumed that should a grade separation occur along one of these two roadways, that grade separation of both railways simultaneously would be required discussion of the above. As such these two locations have been assessed as combined crossings.

To further review the assessment above in Tables 6.3 and 6.4 a weighting of 5 points was applied to green criteria, a weighting of 3 points was applied to yellow criteria, and a weighting of 1 point was applied to red criteria.

Table 6.5: Rail Crossing Evaluation Summary

Crossing	Avenue	Green (5 pts ea.) # (total pts.)	Yellow (3 pts ea.) # (total pts.)	Red (1 pt ea.) # (total pts.)	Total Points
1	75 – **CN**	7 (35)	0 (0)	5 (5)	40
2	62 – **CN**	**7 (35)**	**5 (15)**	**0 (0)**	**50**
3 A&B	50 – **CN** & **CPKC**	6 (30)	1 (3)	5 (5)	38
4 A&B	49 – **CN** & **CPKC**	2 (10)	1 (3)	9 (9)	22
5A	40 – **CN**	4 (20)	5 (15)	3 (3)	38
5B	40 – **CPKC**	5 (25)	3 (9)	4 (4)	38
5 A&B	40 – **CN** & **CPKC**	5 (25)	3 (9)	4 (4)	38

- assumes future trains remain similar to today (CN – 3, CPKC – 2); all cross products are well below the Transport Canada Threshold of 1 million

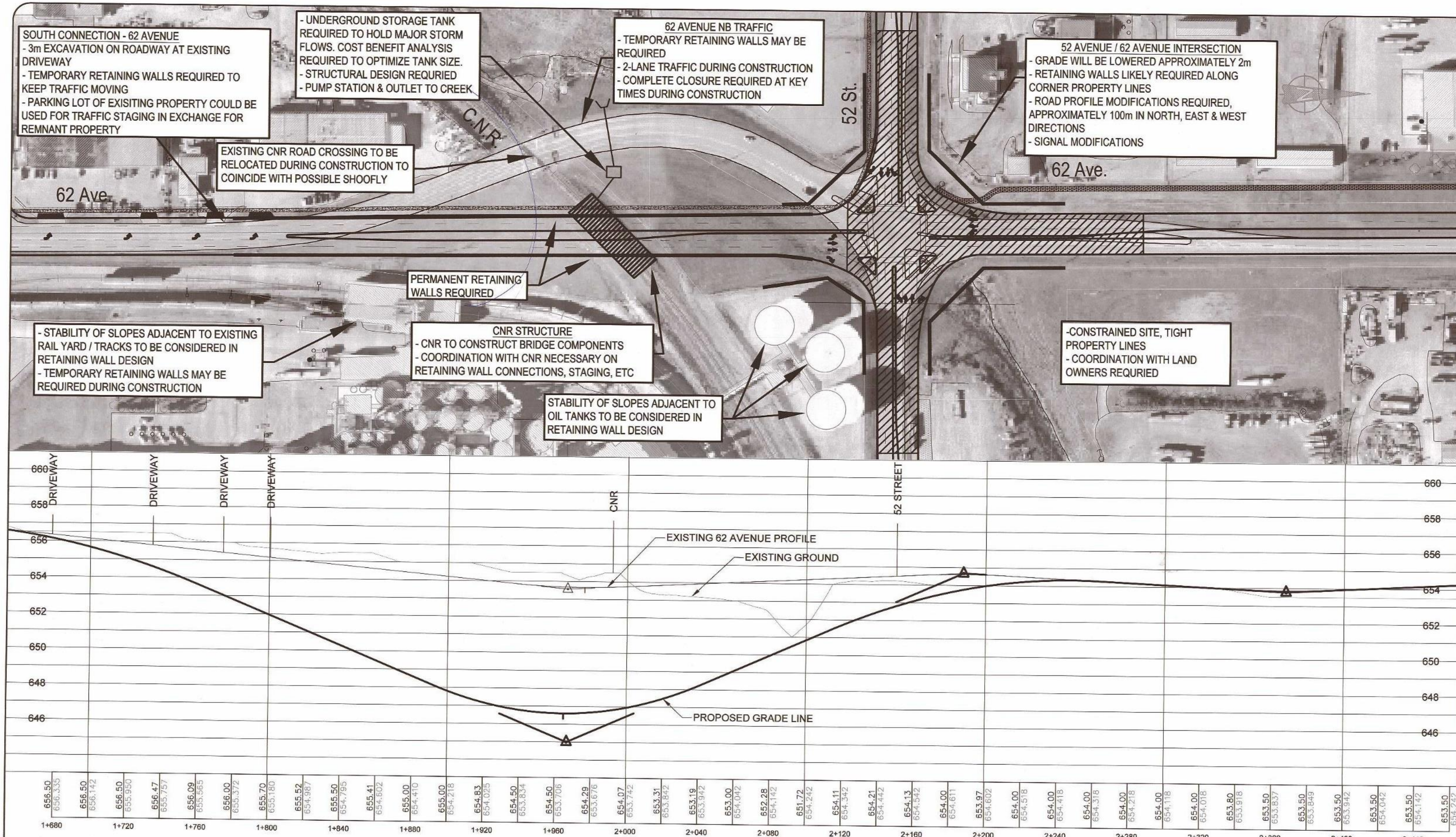
Based on the assessment, the 62 Avenue crossing received the highest score and is recommended as the preferred location for a rail grade separation. It is noted that this crossing location was the only location to receive no red scores within the criteria.

6.1.2 Recommended Rail Crossing Location (62 Avenue)

Based on the current layout of the road/rail at-grade crossing, it may be feasible to construct a rail grade separation as either a rail overpass (road over rail) or a rail underpass (road under rail). Previous work by ISL for the 62 Avenue Functional Planning Study reviewed the merits of a rail underpass along 62 Avenue. A copy of the previous plan is included as Figure 6.2 – 62 Avenue Rail Underpass Challenges (2006). For comparison purposes a conceptual sketch of a rail overpass was prepared in order to compare both crossing types. The overpass concept is included as Figure 6.3 – 62 Avenue Rail Crossing Feasibility Diagram. This concept was prepared to consider the potential footprint for an overpass, help with the identification of constraints, and assist with the order of magnitude cost assessment and the identification of next steps.

Railway crossing data and overpass assumptions:

CN right-of-way	100 ft or 30.5 m
Rail skew	45^0
Rail Overpass	30 m wide (assumed)
Skewed Overpass	~35m in nominal length/65m in total length
Overpass deck elevation	10 m above track grade
Profile of 62 Ave	4% max grade (250m long)
Slide Slopes	4:1 with earth fill
Retaining Walls	Bridge abutments, adjacent to rail ROW, adjacent to ADM Agri Industries
Land	Land was assumed to be available except for ADM Agri Industries



ISL Engineering and Land Services

62 AVENUE CN RAIL UNDERPASS PROJECT CHALLENGES

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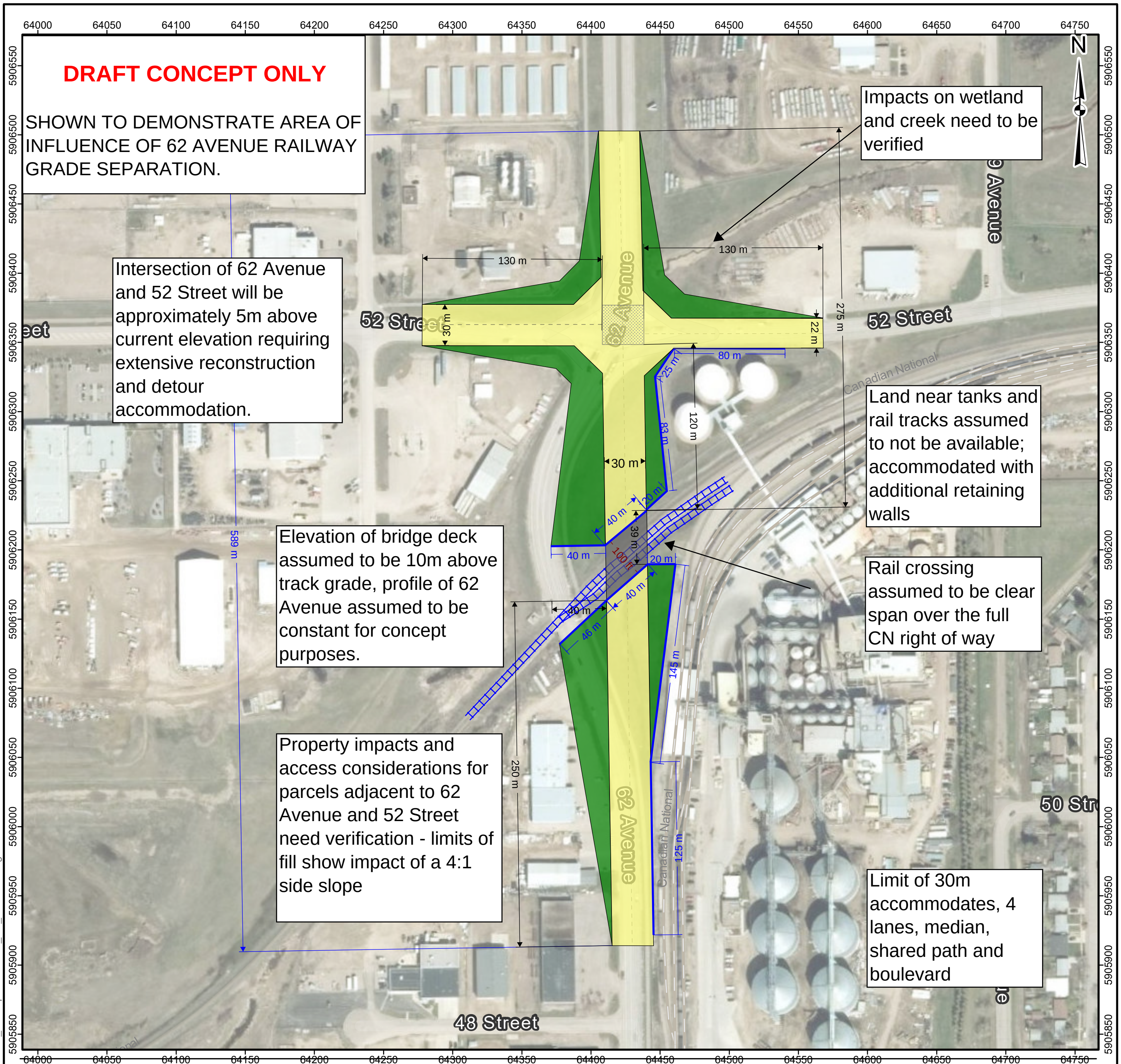
HORZ 0 2 4 6 8 1:200

TC 06/FEB/21 J:\11500\11558_Lloyd_Hwy16_62 Ave.\02-drafting\02a-project\11558-LDD\dwg\11558PP.dwg



LEGEND

- Potential Railway Overpass
- Potential Roadway Reconstruction Area
- Potential Earth Fill Area
- Potential Retaining Wall
- Railway

TITLE
62 AVENUE RAIL CROSSING FEASIBILITY DIAGRAM

PROJECT
LLOYDMINSTER TRANSPORTATION MASTER PLAN

CLIENT
CITY OF LLOYDMINSTER

PROJECTION
NAD 1983 CSRS 3TM 111

0 100
1:4,226 Meters

DATA SOURCES
- Topographic Map:County of Vermilion River, Esri Canada

FIGURE	6.3
DATE	2025-05-01
PROJECT NO.	16680
AUTHOR	dmason

To complete the feasibility assessment a high-level order of magnitude cost estimation was completed for the overpass based on the key items and quantities for the bridge, retaining walls and abutments, earth fill, and roadway costs. As a full functional plan was not completed, a more accurate estimate could not be completed. As such, these major quantities were assumed to capture most of the hard costs of the overpass while the additional costs, and unknowns, are assumed to be captured with the 50% contingency.

Table 6.6: 62 Avenue Railway Overpass Order of Magnitude Cost Assessment

Overpass Element	Rate	Quantity	Cost
Bridge	$9,000/sq. m	1,170	$ 10,530,000
Wall / Abutment	$2,500/sq. m	3,243	$ 8,107,500
Fill	$35/cu m	168,000	$ 5,880,000
Roadway	$3 million / km	0.85	$ 2,550,000
Construction Subtotal			$ 27,067,500
Contingency	50%	1	$ 13,533,750
Engineering	15%	1	$ 4,060,125
Total			$ 44,661,375 **

** Cost estimate does not include land costs

Based on the above table the cost of a railway overpass at 62 Avenue at the CN crossing, could be in the order of **$45 million, plus land costs**.

The 2006 underpass evaluation noted a cost of approximately $16.2 million in 2005 dollars. However, the unit rates from 2005 were between one half (1/2) and one quarter (1/4) of those being used in 2025. In addition, the pump station cost assumed in 2006 was only $900,000 however a recent comparison notes this could be in excess of $5 million depending on storage capacity requirements. Considering inflation, construction price and materials increases, this could be more in the range of $50 million – $80 million today.

To fully determine the benefits and constraints of either option, a functional planning study should be initiated. This study would enable the City to compare the benefits and constraints of over vs. under, optimize the alignment, grades profile and geometry and obtain a more accurate assessment of implementation costs, once functional criteria for the crossing have been evaluated and decision made.

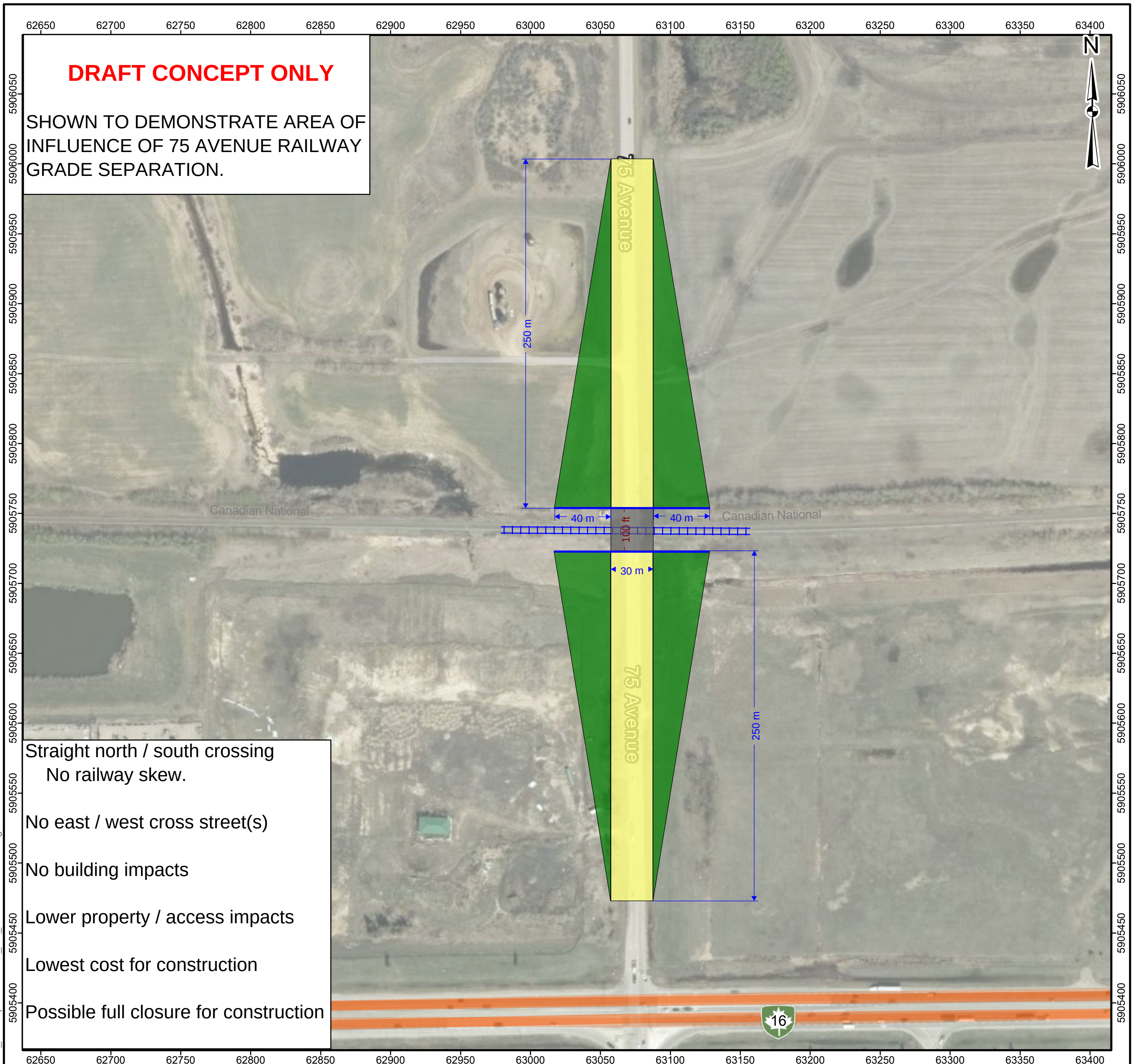
6.1.3 Alternative Rail Crossing Locations (40, 50 and 75 Avenues)

For comparison purposes, a simple feasibility exercise was completed to further assess the 75 Avenue and 50 Avenue crossings and compare them to the 62 Avenue crossing. These overpass concepts are included as Figure 6.4 – 75 Avenue Rail Crossing Feasibility Diagram and Figure 6.5 – 50 Avenue Rail Crossing Feasibility Diagram. A concept drawing was not generated for 40 Avenue due to the increased uncertainty and number of different configurations at this site, for example, whether the grade separation would span a) the CN line only, b) the CPKC line only or c) both lines. Instead, only a write-up is provided for 40 Avenue.

These rail crossing concepts for 50 Avenue and 75 Avenue have been prepared to show the differences in complexity between these two locations and the recommended crossing at 62 Avenue and to validate the assumptions used in the Rail Crossings Considerations table. In addition, these two crossings were selected for secondary evaluation as the 75 Avenue crossing was ranked second highest in the crossing assessment and the 50 Avenue crossing was ranked third highest when comparing the highest rankings in the green categories.

DRAFT CONCEPT ONLY

SHOWN TO DEMONSTRATE AREA OF INFLUENCE OF 75 AVENUE RAILWAY GRADE SEPARATION.



Straight north / south crossing
No railway skew.

No east / west cross street(s)

No building impacts

Lower property / access impacts

Lowest cost for construction

Possible full closure for construction

LEGEND

- Potential Railway Overpass
- Potential Roadway Reconstruction Area
- Potential Earth Fill Area
- Potential Retaining Wall
- Railway

TITLE
75 AVENUE RAIL CROSSING FEASIBILITY DIAGRAM

PROJECT
LLOYDMINSTER TRANSPORTATION MASTER PLAN

CLIENT
CITY OF LLOYDMINSTER

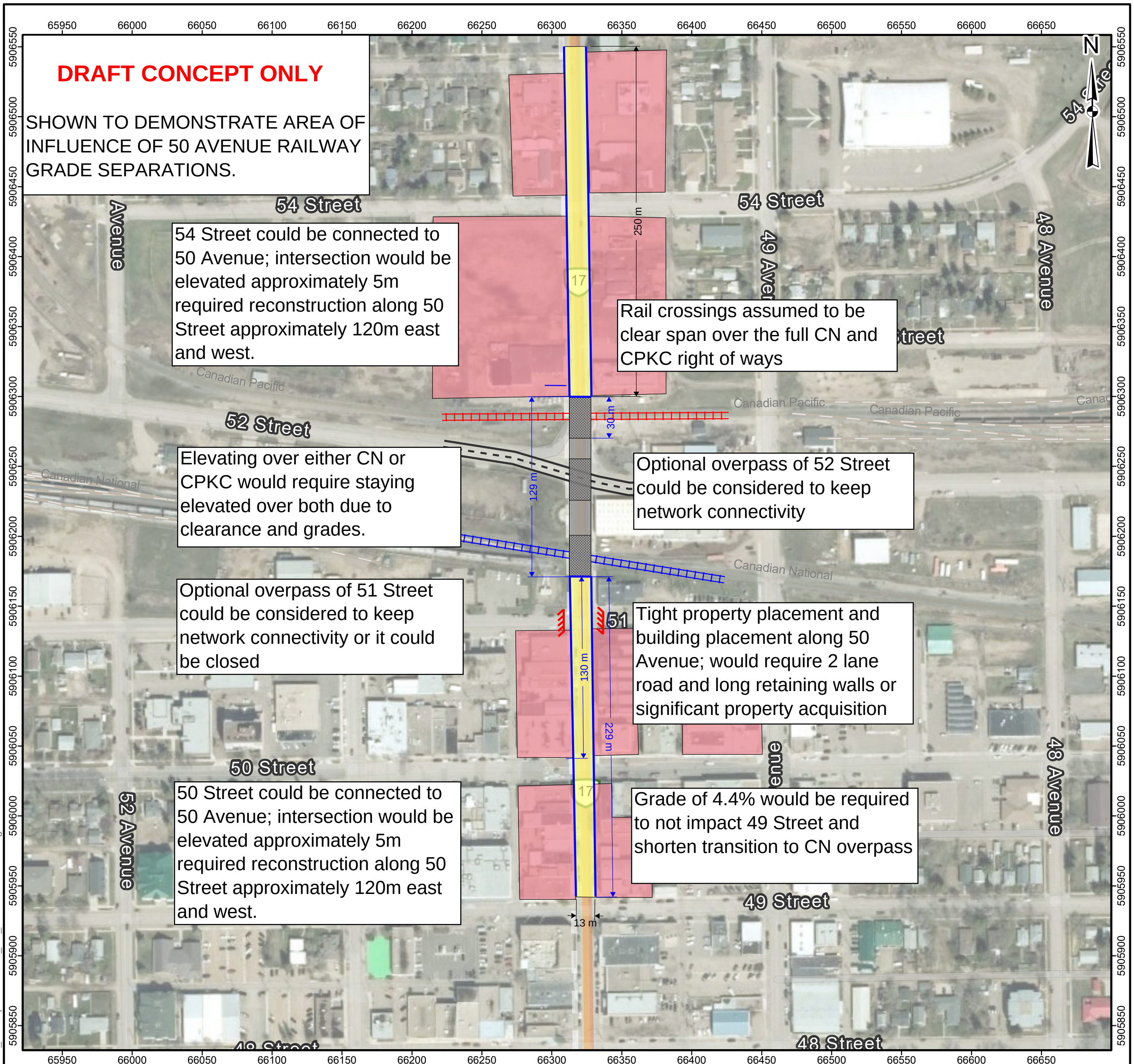
PROJECTION
NAD 1983 CSRS 3TM 111

0 100
Meters
1:4,226

DATA SOURCES
- Topographic Map:County of Vermilion River, Esri Canada

ISL

FIGURE	6.4
DATE	2025-05-15
PROJECT NO.	16680
AUTHOR	dmason



LEGEND

- Potential Railway Overpass
- Potential Roadway Reconstruction Area
- Potentially Impacted Properties
- Potential Retaining Wall
- Railway

TITLE
50 AVENUE RAIL CROSSING FEASIBILITY DIAGRAM

PROJECT
LLOYDMINSTER TRANSPORTATION MASTER PLAN

CLIENT
CITY OF LLOYDMINSTER

PROJECTION
NAD 1983 CSRS 3TM 111

DATA SOURCES
- Topographic Map:County of Vermilion River, Esri Canada

0 100 Meters
1:4,226

FIGURE	6.5
DATE	2025-05-15
PROJECT NO.	16680
AUTHOR	dmason

75 Avenue

As can be seen in Figure 6.4, the crossing at 75 Avenue is less impacted by development as it is outside of the current built up area of the City. At this location, the CN railway is also generally perpendicular to 75 Avenue and not on a skew as it is at 62 Avenue. Both factors simplify the concept at this location which considered the same basic assumptions as the 62 Avenue Concept:

Railway crossing data and overpass assumptions:

CN right-of-way	100 ft or 30.5 m
Rail skew	0^0
Rail Overpass	30 m wide (assumed)
Overpass deck elevation	10m above track grade
Profile of 62 Ave	4% max grade (250m long)
Slide Slopes	4:1 with earth fill
Retaining Walls	Bridge abutments and adjacent to rail ROW only
Land	Land was assumed to be available in all 4 quadrants

To complete the feasibility assessment of 75 Avenue a high- level order of magnitude cost estimation was completed for the overpass based on same the key items as 62 Avenue. As this location was seen as simpler for design, construction and implementation than 62 Avenue, the additional costs, and unknowns, are assumed to be captured with a slightly lower 40% contingency.

Table 6.7: 75 Avenue Railway Overpass Order of Magnitude Cost Assessment

Overpass Element	Rate	Quantity	Cost
Bridge cost	$9,000/sq. m	900	$ 8,100,000
Wall / Abutment costs	$2,500/sq. m	1,440	$ 3,600,000
Fill cost	$35/cu m	141,667	$ 4,958,333
Roadway Cost	$3 million / km	0.6	$ 1,800,000
Subtotal 1			$ 18,458,330
Contingency	40%	1	$ 7,383,333
Engineering	15%	1	$ 2,768,750
Total			$ 28,610,417 **

** Cost estimate does not include land costs

Based on the above table the cost of a railway overpass at 75 Avenue at the CN crossing, could be in the order of **$28.5 million, plus land costs**. While this is approximately 60% lower cost than the 62 Avenue location, 75 Avenue is 1,300m west of 62 Avenue, resulting in longer travel times and distances.

50 Avenue

As a third comparison, the crossing at 50 Avenue can be seen in Figure 6.5. At this location the following issues are noted:

- Both the CN and CPKC railways would need to be crossed resulting in 2 separate bridges being required
- 52 Street is located between the 2 railway lines, presenting additional connectivity challenges with a grade crossing. Maintaining connectivity for this truck route would need additional infrastructure changes to allow vehicles to route between 52 Street and 50 Avenue, for example routing vehicles onto 49 Avenue or 52 Avenue to transition between the elevated and the ground-level roadways.
- Bridge costs could be 4 times higher for 50 Avenue than 75 Avenue.
- 51 Street would need to be closed as it is too close to the CN Rail line to maintain connectivity
- Both 50 Street and 54 Street could either remain connected, or be closed, at 50 Avenue
- If either remains open, the intersection would be elevated approximately 5m above current grade and the regrading would extend approximately 125m east and west of 50 Avenue
- Both 49 Street and 54a Street could remain connected to 50 Avenue as is, if a steeper grade were implemented.
- Significant property impacts will be realized, either through acquisition or changes in access and/or accessibility

To complete the feasibility assessment of 50 Avenue a high- level order of magnitude cost estimation was considered for the overpass based on the same key items as 62 Avenue. However, given the complexity of the location and the uncertainty of the decisions it was decided that a range estimate was appropriate.

Table 6.8: 50 Avenue Railway Overpass Order of Magnitude Cost Assessment

Overpass Element	Rate	Quantities	Cost
Bridge cost	$9,000/sq. m	2 @ 13x30 to 1@ 20x130	$ 7,000,000 to $23,400,000
Wall / Abutment costs	$2,500/sq. m	4,000 to 9,000	$ 10,000,000 to $22,500,000
Fill cost	$35/cu m	70,000 to 200,000	$ 2,500,000 to $7,000,000
Roadway Cost	$3 million / km	0.7 to 1.3	$ 2,100,000 to $3,900,000
Subtotal 1			$ 21,600,000 to $ 56,800,000
Contingency	50%	1	$ 10,800,000 to $ 28,400,000
Engineering	15%	1	$ 3,240,000 to $ 8,500,000
Total			$ 35,640,000 to $95,400,000**

** Cost estimate does not include land costs

Based on the above table the cost of a railway overpass at 50 Avenue at both the CN and CPKC crossings, could be in the order of **$35.6 million to $95.4 million plus land costs**. Given the level of existing development near the 50 Avenue right of way, it is assumed that land costs at this location would be high.

While it is noted that the hard costs for an overpass at 50 Avenue could be less than at 62 Avenue, this assumes that all cross streets, including 52 Street, are closed and do not connect to, or across, 50 Avenue and that retaining walls are minimized while earth fill is maximized, requiring a similar impact and footprint to 75 Avenue. As this would require the acquisition of many parcels and would impact countless more, this lower cost option would not be recommended due to these secondary costs and impacts. In addition, given the high level of complexity, impacts on adjacent parcels, and probable costs, implementing a rail crossing at 50 Avenue would likely prove very challenging and costly.

40 Avenue

As mentioned previously, there are multiple rail crossing configurations for 40 Avenue, given the larger spacing between the two rail corridors in comparison to the other sites. At this location, the following issues are noted:

- Road elevation, road grade and side slopes are assumed to be similar to those for 75 Avenue.
- The spacing between the rail crossings (from ROW boundaries) is roughly 300m, and between the CN line and 52 Street (west leg) is roughly 250m. As with the other concept drawings, this would be sufficient spacing for making grade along 40 Avenue for a crossing of the CN line only.
    - Under this layout, the east leg of 52 Street would need to be raised by roughly 4m to meet the new road elevation. 52 Street would return to ground level approximately 100-120m to the east of the newly raised intersection at 40 Avenue. This would heavily impact access to adjacent property.
- A grade separation of the CPKC line only or both lines simultaneously generates significant changes to property accesses, needs for retaining walls and/or land acquisitions to maintain the road network connectivity with 52 Street.
- For all configurations, accesses to industrial buildings along 40 Avenue on the south side of the CN line would be impacted by the change of grade. These businesses would need to be relocated for earthen berms to be used or retaining walls with reconfigured accesses would need to be constructed to maintain those properties.

Due to the uncertainty involved, the cost of a grade separation at 40 Avenue is estimated to fall between the costs projected for 62 Avenue (Table 6.6) and for 50 Avenue (Table 6.8), also excluding land costs.

Implementation Roadmap for Grade-Separated Rail Crossing

To advance the development of a new grade-separated rail crossing, the City should initiate the phased actions listed below. Given the scale and complexity of a grade-separated crossing, it is important that the City begin these initial planning steps as early as possible (ideally within the next five years) to ensure timely delivery and alignment with long-term transportation goals.

- Conduct targeted traffic studies at each candidate crossing location to address gaps in the current assessment. These studies should quantify vehicle delay, queuing lengths, and total time spent at reduced service levels. *(Estimated timeline: 1–5 years)*
- Confirm or revise the preferred crossing location, currently proposed as 62 Avenue. This decision should be informed by the outcomes of the traffic studies and used to establish appropriate construction timelines. Note: Traffic volume forecasts in this TMP do not yet meet the threshold for immediate implementation. (*Est. timeline: 1-5 years)*
- Update relevant functional plans for the selected corridor to reflect the proposed grade separation and its integration into the broader transportation network. (*Est. timeline: 2-4 years)*
- Coordinate project timing to avoid overlapping with other major north-south roadway closures in Lloydminster, ensuring minimal disruption to traffic flow. (*Est. timeline: concurrent with previous steps)*
- Engage stakeholders and the public to validate the proposed location and timeline, and to incorporate feedback into final design and phasing. (*Est. timeline: 2-5 years)*
- Secure funding and initiate preliminary design once the location and timing are confirmed, aligning with the City's capital planning cycles. (*Est. timeline: 3-6 years)*

6.2 Truck and Dangerous Goods Routes Review

The review of truck and dangerous goods routes within this TMP focuses on evaluating the suitability of the current network to support future growth and identifying whether any expansions or modifications are necessary.

In 2020, the City adopted the Dangerous Goods Route (DGR) and Truck Routes Establishment report, which provided a comprehensive framework for designating truck and dangerous goods routes. This framework was developed through a detailed review of background conditions, jurisdictional comparisons, and extensive stakeholder and public engagement. It introduced a two-step evaluation process for both truck and dangerous goods routes, assessing network functionality and route performance or safety. The report emphasized the importance of consistent, objective criteria to ensure that all routes are evaluated fairly and effectively.

This TMP builds on that foundation by reviewing the proposed future road network against the established criteria to determine whether the existing routes remain appropriate or require adjustment. A worksheet for the evaluation framework from the 2020 report is provided in Appendix D.

6.2.1 Truck Route Assessment

The truck route assessment framework is based on two benchmarks each with additional sub-criteria:

- **Network Functionality Assessment**
  - **Route Purpose:** Serves goods movement within or through Lloydminster.
  - **Network Connectivity:** Connects to existing truck routes or regional networks.
  - **Reduces Trip Length:** Offers more direct or efficient routing.
  - **Reduces Off-Route Trips:** Minimizes the need for trucks to deviate from designated routes.
- **Route Performance Assessment**
  - **Roadway Classification:** Preference for highways and arterials.
  - **Roadway Geometrics:** Adequate lane width, turning radii, and shoulders.
  - **Surface Conditions/Structural Capacity:** Pavement strength and condition.
  - **At-Grade Rail Crossings:** Fewer crossings preferred.
  - **Land Use Compatibility:** Industrial/commercial areas preferred.
  - **Supports Future Development:** Aligns with planned growth areas.

For this TMP, the proposed conceptual alignments of new arterial and collector roadways were evaluated for potential inclusion in the truck route network and DGR network, contingent on their future construction. There are 2 sub-criteria—Roadway Geometrics and Surface Conditions—which could not be assessed, as they depend on the physical characteristics of the built roadway, which do not yet exist.

It is important to note that this review does not represent a final decision regarding the inclusion or exclusion of these routes in the truck or dangerous goods networks. Final alignments and community feedback—both essential components of the evaluation process—were not available at the time of writing.

Table 6.9 shows the results of the evaluation and Figure 6.6 shows a map of the proposed future truck routes. As part of the initial 2020 report, the future extension of 52 Avenue between 67 Avenue and 75 Avenue was identified as a future truck route; this report re-affirms its suitability and has been labeled separately from the other proposed routes.

Truck Routes into the County of Vermilion River

In addition to the assessment above, the inclusion of future West Hill Industrial arterials (52 Street and 62 Street) as designated truck routes is based on the assumption of a newly constructed arterial road extending beyond city limits. This road would pass through County of Vermilion River lands and connect with the corridor designated for a future Range Road 13, as outlined in the 2006 Intermunicipal Development Plan.

Since these areas are identified for development beyond a 10-year horizon, both the City and County of Vermilion River have the opportunity to further refine these conceptual layouts. This report has identified and assumes the route could become a key regional truck corridor.

Truck Routes into the RM of Britannia

Similarly, the proposed eastward extension of 62 Street to the City limits is included as a potential truck route, contingent on the development of a regional road network in the City's northeast, within the RM of Britannia. Currently, no such connection to regional roads exists to the northeast.

Although there is currently no formal Intermunicipal Development Plan with the RM of Britannia, this route reflects anticipated demand for truck access toward and around Neale Lake. It may eventually connect with Highway 303 and/or Highway 774 to support agricultural operations and oil infrastructure in the RM of Britannia northeast of Lloydminster. In the absence of this regional connectivity, 62 Street from the East City Limit to 40 Avenue would likely be covered as truck route as part of the larger Truck Route Area in the northeast industrial area.

Truck Routes into the RM of Wilton

The existing truck routes extending to the RM of Wilton include the eastern endpoints of 12 Street (which continues as Township Road 494) and 25 Street, the latter operating as a time-of-day restricted route. Both streets connect to 40 Avenue, which functions as a key north-south corridor within the broader truck route network.

At present, there are no proposed new arterial roadways extending eastward from the City into the RM of Wilton. Similar to the RM of Britannia, there is currently no formal Intermunicipal Development Plan in place with the RM of Wilton. As a result, future opportunities for regional connectivity and potential truck route extensions remain undefined and would require further intermunicipal coordination and long-term planning.

Table 6.9: Truck Route Assessment Results

	Roadway	From	To	Roadway Geometrics	Surface Conditions	At-Grade Rail Crossings	Land Use Compatibility	Supports Future Development	Assessment of Candidacy as a Truck Route
Arterial Grid	12 Street	75 Avenue	West City Limits	N/A	N/A	Very Good	Fair	Good	Fair
	44 Street	West Commercial	West City Limits	N/A	N/A	Very Good	Good	Good	Strong
	75 Avenue	12 Street	South City Limits	N/A	N/A	Very Good	Poor	Good	Poor
Arterials	52 Street	67 Avenue	75 Avenue	N/A	N/A	Very Good	Very Good	Very Good	Strong
	52 Street	75 Avenue	West City Limits	N/A	N/A	Very Good	Very Good	Very Good	Strong
	62 Street	40 Avenue	50 Avenue	N/A	N/A	Very Good	Very Good	Very Good	Strong
	62 Street	East City Limits	40 Avenue	N/A	N/A	Very Good	Very Good	Very Good	Strong
	62 Street	75 Avenue	West City Limits	N/A	N/A	Very Good	Very Good	Very Good	Strong
	25 Street	75 Avenue	West City Limits	N/A	N/A	Very Good	Poor	Very Good	Poor
	25 Street	40 Avenue	50 Avenue	N/A	N/A	Very Good	Poor	Good	Poor
Collectors	56 Street	70 Avenue	75 Avenue	N/A	N/A	Very Good	Very Good	Good	Strong
	56 Street	75 Avenue	West City Limits	N/A	N/A	Very Good	Very Good	Very Good	Strong
	73 Avenue	19 Street	29 Street	N/A	N/A	Very Good	Poor	Poor	Poor
	72 Avenue	12 Street	19 Street	N/A	N/A	Very Good	Poor	Fair	Poor
	36 Street	East City Limit	40 Avenue	N/A	N/A	Very Good	Fair	Good	Poor
	25 Street	40 Avenue	47 Avenue	N/A	N/A	Very Good	Fair	Good	Poor
	19 Street	72 Avenue	75 Avenue	N/A	N/A	Very Good	Fair	Good	Poor
	Wallacefield Connections			N/A	N/A	Very Good	Poor	Fair	Poor
	The Willows Connections			N/A	N/A	Very Good	Poor	Fair	Poor
	South Annexed Land Connections			N/A	N/A	Very Good	Poor	Fair	Poor
	West Annexed Commercial Connections			N/A	N/A	Very Good	Very Good	Very Good	Poor
Areas	West Hill Industrial			N/A	N/A	N/A	Very Good	Very Good	Strong
	West Highway Commercial			N/A	N/A	N/A	Very Good	Very Good	Strong
	North Industrial			N/A	N/A	N/A	Very Good	Very Good	Strong

* Network connectivity dependent on inclusion of surrounding truck routes
** Support Future Development and would be considered very good once widened to four lanes. As a two lane roadway it is currently considered good

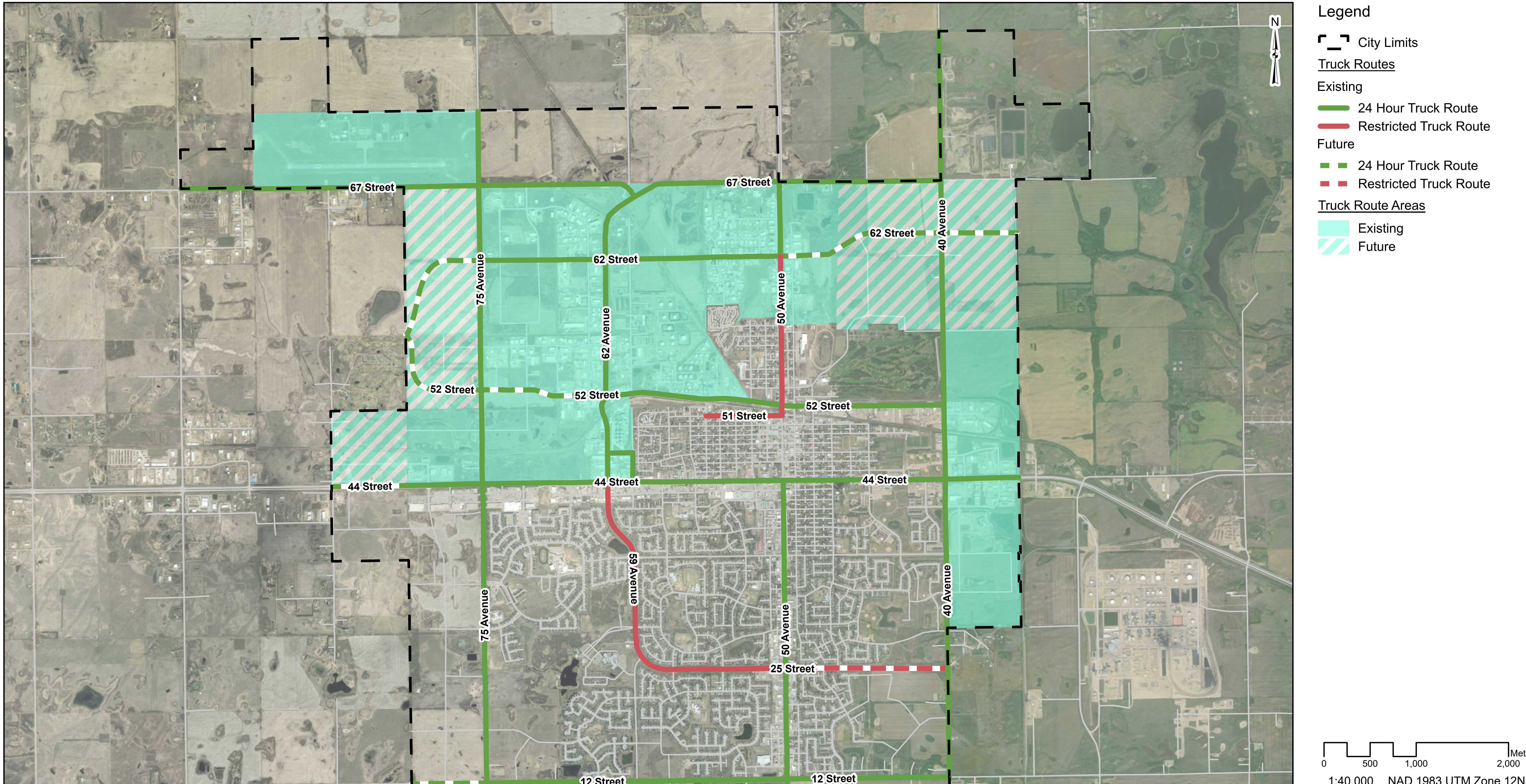


FIGURE 6.6
PROPOSED 20-YEAR TRUCK ROUTES
LLOYDMINSTER TRANSPORTATION
MASTER PLAN

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LLOYDMINSTER

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Date: 10/17/2025 Document: Z:\Shared\GIS\Projects\16680_Lloydminster_TMP\16680_Lloyd_Transportation_Master_Plan.aprx

6.2.2 Dangerous Goods Route Assessment

The DGR assessment framework includes the benchmark of Network Functionality, but adds a second benchmark of a safety assessment, which is further divided by assessing the probability and significance of a safety incident along the route.

Safety Assessment

- A. Probability of Incident
  - **Roadway Geometrics:** Adequate lane width, shoulders, turning radii.
  - **At-Grade Rail Crossings:** Fewer crossings preferred.
  - **Access Control:** Signalized or controlled intersections reduce risk.
  - **Traffic Efficiency:** Fewer delays reduce exposure time.
  - **Collision History:** Routes with fewer past incidents are preferred.
- B. Significance of Incident
  - **Environmental Impact:** Proximity to sensitive areas (e.g., water bodies, farmland).
  - **Population Exposure / Land Use:** Fewer people and sensitive land uses nearby.
  - **Population Responsiveness / Evacuation Potential:** Ability to evacuate quickly.
  - **Emergency Response:** Proximity to fire stations and response times.

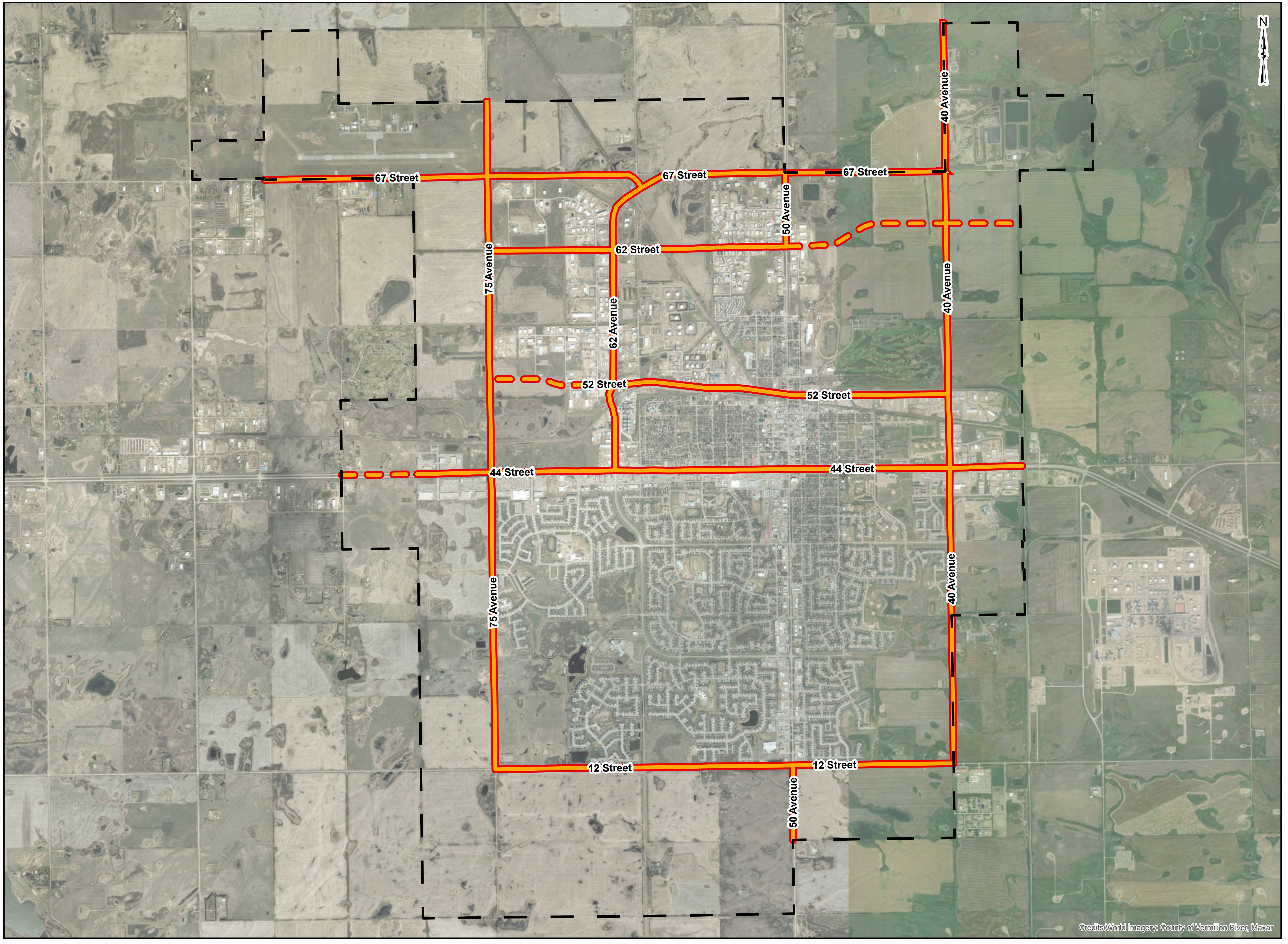
Similarly to the truck toute assessment, certain elements within the DGR framework could not be assessed. The Probability of Incident metric could not be fully evaluated; only the At-Grade Rail Crossings criterion was applicable at this stage. Environmental Impacts were assessed based on anticipated land uses (rather than current land uses) as well as proximity to nearby waterbodies; this assessment does not constitute a full environmental impact assessment.

Table 6.10 shows the results of the DGR evaluation and Figure 6.7 shows a map of the proposed future Dangerous Goods Routes.

Table 6.10: Dangerous Goods Route Assessment Results

	Segment			Probability					Significance				
	Road Name	From	To	Roadway Geometrics	At-grade Rail Crossings	Intersection Control	Traffic Efficiency	Collisions	Environmental Impact	Population Exposure / Land Use	Population Responsiveness / Evacuation Potential	Emergency Response	Assessment – Based on Safety Assessment
Arterial Grid	12 Street	75 Avenue	West City Limits	N/A	Very good	N/A	N/A	N/A	Good	Poor	Good	Very Good	Poor
	44 Street	West Commercial	West City Limits	N/A	Very good	N/A	N/A	N/A	Very Good	Good	Good	Very Good	Strong
	75 Avenue	12 Street	South City Limits	N/A	Very good	N/A	N/A	N/A	Fair	Poor	Good	Very Good	Poor
Arterials	52 Street	67 Avenue	75 Avenue	N/A	Very good	N/A	N/A	N/A	Fair	Very Good	Very Good	Very Good	Strong
	52 Street	75 Avenue	West City Limits	N/A	Very good	N/A	N/A	N/A	Fair	Very Good	Good	Fair	Poor [1]
	62 Street	40 Avenue	50 Avenue	N/A	Very good	N/A	N/A	N/A	Fair	Very Good	Very Good	Very Good	Good
	62 Street	East City Limits	40 Avenue	N/A	Very good	N/A	N/A	N/A	Good	Very Good	Very Good	Very Good	Good
	62 Street	75 Avenue	West City Limits	N/A	Very good	N/A	N/A	N/A	Poor	Very Good	Good	Fair	Poor [1]
	25 Street	75 Avenue	West City Limits	N/A	Very good	N/A	N/A	N/A	Good	Poor	Good	Good	Poor
	25 Street	40 Avenue	50 Avenue	N/A	Very good	N/A	N/A	N/A	Good	Poor	Good	Very Good	Poor

1 - Related to proximity with nearby waterbodies and potential environmental impacts; Score may be revised with proper mitigation measures



Legend

City Limits

Future Dangerous Goods Route

Existing

Existing DGR

Proposed Additions

Future DGR

0 500 1,000 2,000 Meters

1:40,000 NAD 1983 UTM Zone 12N

FIGURE 6.7
PROPOSED 20-YEAR DANGEROUS GOODS ROUTES
LLOYDMINSTER TRANSPORTATION MASTER PLAN

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6.3 Beyond 20-years, Ring Road Concepts and Bypass Discussion

As Lloydminster and the larger regional economies continue to grow, the developmental pressures along Highway 16 and Highway 17, which run through the core of the Lloydminster, intensify and generate public and political interest in diverting traffic away from the city core. This section outlines some guidance to aid discussions and decision makers on whether to build a ring-road and/or a highway bypass.

Importantly, a highway bypass can take one of two general forms:

- **Freeway-Style New Alignment**: This approach involves constructing a new, limited-access corridor outside the existing urban footprint, designed specifically to carry regional traffic around the city. These alignments typically offer high-speed with minimal interruptions and are intended to serve long-distance and/or freight movements. While this approach requires significant capital investment, land acquisition and long-term planning, such a corridor can provide the greatest for long-term traffic diversion and regional connectivity.
- **Designated Urban Bypass:** In contrast, some highway bypasses may utilize existing arterial roads within urban limits. These roads are not physically altered to freeway standards but may be designated as part of the highway network through signage and wayfinding. This approach leverages the existing road infrastructure to guide traffic around urban cores and potentially congested areas. This approach may be a cost-effective solution for low-demand highway connections where a freeway-style alignment is not feasible.

Both approaches have implications for land use, infrastructure investment, and traffic operations. The choice between them depends on the volume and nature of through-traffic, the availability of suitable corridors, and the City's long-term growth strategy.

Highway 17 Bypass Concept

Within the 2006 Intermunicipal Development Plan (IDP) with the County of Vermillion River, the overall road network concept map included a corridor for an interim and long-term future alignment for re-routing Highway 17. This conceptual layout describes the potential for using 75 Avenue as a short-term Highway 17 bypass following the designated urban bypass approach described above. The IDP also describes a longer-term alignment located along the current alignment of Range Road 14. While no further design details were provided, a freeway-style corridor would be a reasonable assumption for this concept.

Highway 16 Bypass Concept

A highway 16 bypass functional study was prepared by Alberta Transportation in 2002 and is also discussed within the IDP with the County of Vermillion River. Such a bypass would connect with existing Highway 16 roughly 6.5 km West of City limits, extend to the south and run along the current south city limits before joining Highway 16 on the Saskatchewan to the south and east of the Cenovus Energy Upgrader. The alignment for this highway was explored as an alternative scenario, described in Section 5.2.2.

Ring Road Concept

Having considered a Highway 17 bypass on the west side of the City and a Highway 16 bypass on the south side of the City, the concept of a ring road would complete a circle from the Saskatchewan side of Highway 16 through the north-east and connect with Highway 17 to the north. As of publication of this report, ISL is not aware of any formal plans or studies that have contemplated such an alignment.

Discussion

The City's vision, as outlined in the Municipal Development Plan and Downtown Area Redevelopment Plan, emphasizes the transformation of the downtown into a vibrant, pedestrian-oriented, mixed-use district. This vision is in tension with maintaining 50 Avenue (Highway 17) as a primary regional travel corridor. A similar challenge exists along 44 Street (Highway 16), which functions as a critical east-west regional connector but is increasingly influenced by adjacent commercial growth, evolving land uses, and the City's broader goals for walkability, placemaking, and urban intensification.

As development pressures mount along these corridors, their dual role as both regional highways as well as urban main streets becomes more difficult to reconcile. The MDP acknowledges this complexity, identifying 44 Street (Highway 16) as a key transportation spine while also calling for more integrated, human-scaled development. These competing demands underscore the need for a long-term strategy that evaluates alternative alignments for regional traffic and supports the City's aspirations for livability, economic resilience, and cohesive urban design.

HIGHWAY 17 RECOMMENDATION

Based on current and 20-year travel demand data, there is insufficient North-South through traffic to warrant a dedicated Highway 17 freeway-style bypass corridor, separate from the arterial road network. Origin-Destination data indicates that less than 1% of daily traffic entering the city along Highway 17 exits at the opposite end, and less than 1% of Highway 17 traffic connects with Highway 16. This pattern is consistent in both current and 20-year forecast scenarios, with most Highway 17 traffic terminating within City limits and utilizing internal arterial routes.

Based on the available data, there is no strategic case for a high-capacity, freeway-style Highway 17 bypass within the immediate future. Such an infrastructure project would require substantial investment and land acquisition and is unlikely to deliver meaningful travel benefits given current and forecasted traffic patterns. Within the next 20 years, it is instead recommended that the City explore re-designating internal arterial routes (eg. 75 Avenue or 40 Avenue) as Highway 17, supported by appropriate signage and wayfinding updates. In conjunction, very long-term planning should continue regarding the potential freeway-style alignments through regional and intermunicipal coordination.

HIGHWAY 16 RECOMMENDATION

Based on current and 20-year forecasted travel demand, there is a strategic case for continuing to explore a Highway 16 bypass. Origin-Destination data indicates that approximately 10% of Highway 16 traffic travels through the city without terminating within City limits, suggesting a meaningful volume of regional through-traffic. This supports the long-term planning of a bypass corridor to improve freight mobility and reduce congestion within the urban core.

It is recommended that the City maintain coordination with Alberta Transportation and Economic Corridors, the Saskatchewan Ministry of Highways, the County of Vermillion River and the RM of Wilton to preserve and refine the previously studied Highway 16 bypass alignment. While not an immediate priority, this corridor should remain part of the City's long-range transportation and land use planning framework.

RING ROAD RECOMMENDATION

Given the above recommendations of bypasses for both Highway 16 and Highway 17, the potential for a full ring road is not strategically recommended for completion within the next 20 years. Travel demand between the various quadrants of the city is relatively low and can be effectively accommodated by existing and planned corridors, thereby reducing the strategic case for a full encirclement of the City via limited-access highways. These strategically valuable corridors include 40 Avenue, 12 Street, and 67 Street for trips that bypass Lloydminster entirely, as well as 25 Street, 52 Street, and the future 62 Street for trips with destinations within the city. These routes already provide (or are planned to provide) viable alternatives to traveling through the city core, reducing the need for a continuous loop around Lloydminster.

While this TMP is focused on internal traffic patterns, it recognizes the importance of regional connectivity as a key economic driver for Lloydminster. Continued dialogue with regional stakeholders will be essential in identifying and designating long-distance travel corridors that align with both local and regional transportation goals.

6.4 Ultimate Road Network

6.4.1 Long-Term Vision Beyond the 20-Year Horizon

The 20-year transportation plan provides a structured and phased approach to addressing Lloydminster's short- and medium-term mobility needs. In contrast, the Ultimate Road Network looks beyond to envision a long-term, conceptual framework for how the City's arterial and collector road system could evolve over the coming decades to support full buildout and regional connectivity.

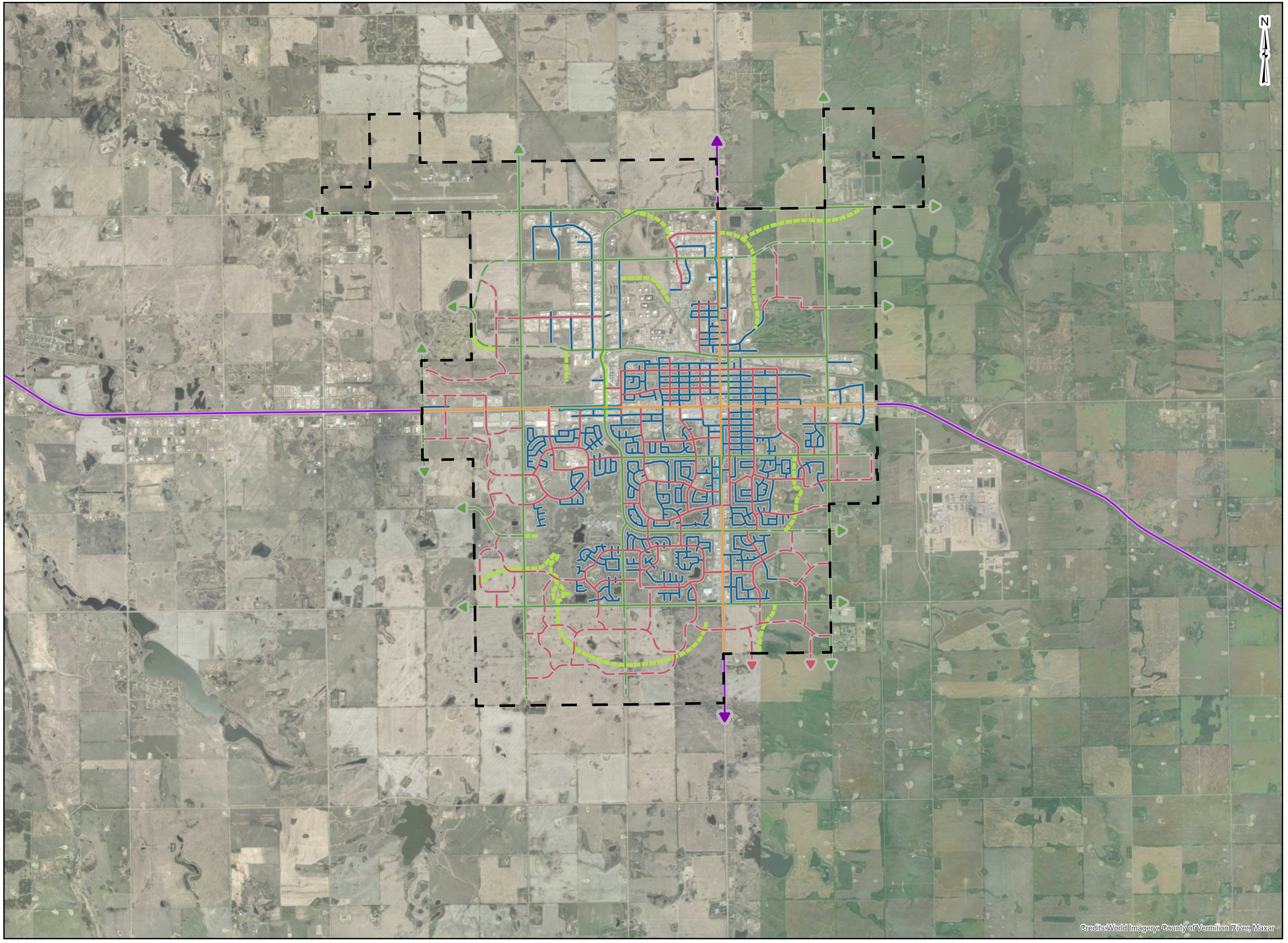
This Ultimate Road Network is not tied to a specific year or population threshold. Instead, it serves as a visionary planning tool—a flexible guide that anticipates full buildout of the city and its surrounding region. It is intended to inform future Area Structure Plans (ASPs), intermunicipal coordination, and long-range infrastructure strategies, ensuring that today's decisions do not preclude tomorrow's opportunities.

6.4.2 Vision and Purpose

The purpose of the Ultimate Road Network is to provide a high-level conceptual layout of future arterial and collector roads that will guide long-term planning and inform future ASPs. This network is not intended to prescribe exact alignments or right-of-way requirements, but rather to identify potential corridors and connectivity needs that should be considered as development progresses.

Figure 6.8 illustrates the conceptual Ultimate Road Network. It includes:

- Functional classifications for new arterial and collector roads
- Conceptual alignments for future arterials, including connections to regional roadways
- Anticipated collector road layouts to support neighbourhood-level circulation
- Integration with existing and proposed infrastructure, including Highway 16X and Highway 17 bypass concepts
- Local roads are not included in this conceptual layout, as their design will be determined through future ASPs and subdivision planning.



Legend

City Limits

Existing Roads

Classification

Highway

Highway Urban

Arterial

Collector

Local

Service Road

Ultimate Road Concept Plan

Classification

Arterial

Collector

Off-Street Trails

Highway 16X Bypass

Highway 16X Conceptual Alignment

Note: Future road alignments shown on this map are conceptual and are based on preliminary assumptions. Segments labeled as conceptual alignments are subject to future planning and development processes.

0 750 1,500 3,000 Meters

1:60,000 NAD 1983 UTM Zone 12N

FIGURE 6.8
PROPOSED ULTIMATE ROAD NETWORK CONCEPT
LLOYDMINSTER TRANSPORTATION MASTER PLAN

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6.4.3 Key Assumptions and Strategic Connections

The Ultimate Road Network assumes the eventual construction of two major regional bypasses:

- **Highway 16X Bypass:** A limited-access, high-speed corridor south of the city, as discussed in Section 6.3. This bypass is assumed to be part of the ultimate network, notwithstanding future decisions on alignment, staging, and interchange design.
- **Highway 17 Bypass:** A north-south corridor west of the city, generally aligned with Range Road 14, as identified in the 2006 Intermunicipal Development Plan (IDP) with the County of Vermilion River. This bypass is envisioned as a regional wayfinding route to divert through-traffic from the downtown core, rather than a high-speed freeway.

A full ring road encircling the city is not included in the Ultimate Road Network. As discussed in Section 6.3, current travel patterns and land use projections do not support the need for a continuous ring road. Instead, strategic bypasses and internal arterial upgrades are expected to meet long-term mobility needs.

6.4.4 Planning and Policy Considerations

To support the evolution of the Ultimate Road Network, the following planning and policy steps are recommended:

- **Use the conceptual network to inform ASPs:** While not prescriptive, the Ultimate Road Network should be referenced during the preparation of new ASPs to ensure long-term connectivity and corridor protection.
- **Identify potential rights-of-way:** The City should begin identifying and safeguarding potential corridors for future arterials and collectors, particularly in areas expected to develop beyond the 20-year horizon. Functional planning studies should be completed to identify the right-of-way needed as an input to future neighbourhood plans and subdivisions.
- **Coordinate with regional partners:** Continued collaboration with the County of Vermilion River is essential. The City is currently engaged in updating the Intermunicipal Development Plan (IDP), and this process is ongoing as of this report’s publication date. Given that the existing IDP is over 15 years old, this update is timely and necessary to reflect evolving growth patterns and transportation needs. No formal agreements currently exist with the RM of Britannia or the RM of Wilton; establishing dialogue with these municipalities will be important for regional road network integration.
- **Integrate with land use planning:** The City’s Integrated Land Use Planning initiatives should incorporate the Ultimate Road Network to ensure that future development supports efficient and resilient transportation infrastructure.
- **Monitor and adapt:** As development occurs and travel patterns evolve, the Ultimate Road Network should be revisited and refined. This includes updating assumptions about growth, land use, and regional travel demand.

6.5 Transportation Systems Bylaw Review

The City of Lloydminster's Transportation System Bylaw (Bylaw No. 04-2021) provides the legal framework for defining the municipal road network, including functional classifications, truck and dangerous goods routes, and the official transportation system map. As the City continues to grow and evolve, it is essential that this bylaw remains aligned with current infrastructure, development patterns, and long-range planning objectives.

This TMP recommends a focused review and update of the bylaw to ensure consistency with the updated transportation network and future planning directions.

6.5.1 Key Observations

- **Schedule B** (Transportation System Map) is generally accurate as of 2025 but omits several recent developments:
  - The extension of 36 Street around the new arena (Cenovus Energy Hub) and surrounding entertainment district.
  - New roadways and connections in and around 73 Avenue.
  - Updates to reflect the 2022 annexation and revised city boundaries.
- **Schedule C** (Physical Description of the Transportation System) should be updated to include:
  - 59 Avenue from 12 Street to 25 Street as an arterial roadway.
  - 59 Avenue from 12 Street to the south city limits as a future arterial roadway.
  - 25 Street from 75 Avenue to the west city limits as a future arterial roadway.
  - 52 Street from 75 Avenue to the west city limits as a future arterial truck route.
  - 62 Street from 75 Avenue to 52 Street as a future arterial truck route.
- Rather than listing all future arterials and collectors in this TMP, it is recommended that the city assemble and maintain this list as new statutory plans (e.g., Area Structure Plans) are adopted.

6.5.2 Recommendations

- Initiate a formal update to the Transportation System Bylaw following adoption of this TMP and Establish a process for ongoing updates to the bylaw as new ASPs and development plans are approved.
- Update Schedule B to reflect current infrastructure and annexed areas.
- Revise Schedule C to include new arterial and truck route segments as noted above.

The following arterial roadways should be added to the City's transportation system bylaw. These are primarily those located in the newly annexed areas.

7.0 Conclusions and Recommendations

7.1 Purpose and Use of the TMP

This TMP is intended to serve as a living document, as a strategic reference that evolves alongside the City of Lloydminster's growth, development, and transportation needs. It is not a static blueprint, but a flexible framework that should be revisited and refined over time.

The TMP provides a comprehensive assessment of the current transportation system, forecasts future travel demand, and identifies infrastructure improvements across multiple time horizons. It is designed to support:

- Planning decisions related to land use, development staging, and network connectivity
- Capital investment planning, including budgeting and prioritization of transportation projects
- Policy development and intermunicipal coordination
- Public engagement and transparency, helping residents understand how their city may change over time

This document is intended to serve as a foundational tool for guiding transportation-related decisions across the city. It supports budgeting, infrastructure planning, and the development of future studies by providing a clear understanding of current conditions, future needs, and strategic priorities. As conditions evolve, the TMP should be revisited and updated to ensure it continues to reflect the City's long-term vision and operational realities.

7.2 Summary of Key Transportation Improvements

The TMP outlines a phased approach to transportation improvements, aligned with projected growth and development patterns. While detailed project lists are provided in earlier sections, the following summarizes the overarching focus for each planning horizon:

- **3-Year Horizon:** Focus on enabling short-term development through new collector and arterial connections. Most projects are driven by access needs rather than congestion.
- **5-Year Horizon:** Begin addressing emerging congestion points, particularly along 50 Avenue and 59 Avenue. Includes both new corridors and upgrades to existing infrastructure.
- **10-Year Horizon:** Expand the network to support mid-term growth, with emphasis on traffic calming in residential areas, intersection upgrades, and strategic east-west connectivity.
- **20-Year Horizon:** Implement major arterial upgrades and regional connections, and initiate the development processes for the assumed Highway 16X and Highway 17 bypasses (within the Ultimate long term horizon). Address long-term congestion and support full buildout of recently annexed lands.

These recommendations are intended to be phased and adaptive, with flexibility to adjust based on development timing, funding availability, and community needs.

North South Couplet

The North-South Couplet has been a longstanding component of Lloydminster's transportation planning, with prior investments made in anticipation of its implementation. This TMP recommends removing the couplet from long-term infrastructure planning—not because it would be detrimental, but because the modeling results indicate only marginal operational benefits.

trafThe analysis does not present a compelling case that the couplet would meaningfully improve traffic conditions, particularly in light of evolving downtown priorities such as walkability, accessibility, and local business access.

However, given the historical significance of the project and the infrastructure already in place, the city is encouraged to undertake a focused internal review to determine whether the couplet should be formally retired or retained as a future option.

Rail Crossing Evaluation

While current and projected conditions do not meet the quantitative thresholds for grade separation (such as traffic volume, speed, and risk exposure) the City may still consider constructing a rail crossing based on broader planning and safety objectives. To support future decision-making, it is suggested that the City undertake the following:

- **Conduct an Operational Assessment of Rail Crossing Performance:** Undertake a focused operational study to measure queuing lengths, average total vehicle delay per day, and Level of Service (LOS) scores throughout the day at key rail crossings. Although current and projected conditions do not meet traditional thresholds for grade separation - such as traffic volume, speed, and exposure risk - these additional metrics may offer a more direct and context-sensitive basis for justifying future investment. Completing this study within 1-3 years will provide the technical justification for continuing with the 62 Avenue site as the preferred option and better inform the future timelines.
- **Initiate a Functional Planning Study for 62 Avenue Rail Crossing:** Begin a detailed functional planning study to evaluate design options, feasibility, and cost estimates for a grade-separated rail crossing at 62 Avenue. This study can proceed either in anticipation of future warrant criteria being met or as a proactive step to support long-term infrastructure planning. Assuming the technical case continues to be justified, completing this study within 3-6 years is required to keep the planning and approval process aligned with capital budgeting cycles and to ensure readiness for potential funding or partnership opportunities.

7.3 Policy and Governance Recommendations

To support the successful implementation of the TMP, the following policy and governance actions are recommended:

- **Update the Transportation Systems Bylaw** to reflect new arterials, functional classifications, and long-term network concepts.
- **Review and update the Intermunicipal Development Plan (IDP)** with the County of Vermilion River within the next 10 years to ensure alignment with updated growth and transportation priorities.
- **Continue intermunicipal dialogue** with the RM of Britannia and RM of Wilton to explore opportunities for future coordination on regional road connections and land use planning.
- **Establish a TMP monitoring and update cycle**, with a review every 2-3 years and a full update every 10 years, to ensure the plan remains current and responsive to changing conditions.
- **Develop a corridor protection policy** to identify and preserve potential rights-of-way for future arterials and collectors, particularly those shown in the Ultimate Road Network (Figure 6.9).
- **Integrate TMP findings into Area Structure Plans (ASPs)** and other statutory planning documents to ensure consistency between land use and transportation planning.
- **Initiate an ongoing safety management process** for roadway safety that would regularly screen the road network for problematic locations, diagnose and propose remedies for these locations, prioritize continuous improvement projects based on cost-to-benefit assessments.

7.4 Implementation Guidance

The TMP is not a prescriptive construction schedule, but a strategic guide to inform decision-making. The infrastructure recommendations are subject to change depending on the progress of future growth and development within Lloydminster. To support effective implementation, the following principles are recommended:

- Prioritize projects based on need and impact, using criteria such as safety, congestion relief, development support, and cost-effectiveness.
- Align infrastructure investments with development staging, ensuring that roads are built when and where they are needed.
- Leverage diverse funding sources, including development levies, provincial/federal grants, and public-private partnerships.
- Coordinate across departments and agencies, ensuring that transportation planning is integrated with utilities, land use, and economic development.
- Engage the public and stakeholders throughout the planning and implementation process to build support and ensure transparency.

7.5 Final Remarks

The City of Lloydminster is at a pivotal point in its growth. This Transportation Master Plan provides a clear and adaptable roadmap for building a safe, efficient, and resilient transportation network that supports the city’s long-term vision.

By using this document as a reference, decision-makers can ensure that infrastructure investments are strategic, coordinated, and future-ready. Continued collaboration between City Council, administration, regional partners, and the public will be essential to realizing the full potential of this plan.

8.0 References

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APPENDIX
What We Heard Report

A

LLOYDMINSTER

What We Heard Report
2024 Transportation Master Plan

August 01, 2024

Communications + Engineering

Report Contents

Project Outline

The City of Lloydminster (City) has Initiated a project to update the Transportation Master Plan (TMP). The City's most recent TMP was compiled almost a decade ago in 2015. A TMP sets the direction for how the City will build, maintain and operate the different transportation options, including roads, sidewalks, trails and pathways. Since the last TMP, several upgrades to the transportation infrastructure system have been made, including:

- Annexation of approximately 23.5 quarter sections of land on the Alberta side of Lloydminster
- Construction of various intersection and roadway improvements
- Construction of various sidewalk trail connections through various capital projects
- Approval of a Trails and Sidewalk Master Plan in 2022
- Establishment of both a Dangerous Goods and Truck Route
- Various areas of community growth and area development

Upgrading the TMP will help ensure system improvements are identified, the models and assumptions for current and future users are updated, and ways to improve the overall network level of service are identified while keeping in mind the growth of Lloydminster.

Advertising Methods

The Communications Department used a series of traditional and digital advertising methods to educate residents on consultation opportunities. These methods include:

- Social Media
    - Facebook, Instagram, LinkedIn
    - Sponsored posts for both Facebook and Instagram
- Newspaper
    - Weekly Bean
    - Meridian Source
    - Morning News
- Radio
    - Vista Radio
    - Stingray
- Posters
- Billboards
    - Big Sky Billboard

Engagement Tactics

Online and Paper Survey

A Transportation Master Plan survey was available online from June 10 to July 02, 2024. Paper copies were printed and made available at City Hall, Servus Sports Centre, Bioclean Aquatic Centre, Lloydminster Museum + Archives and the Operations Centre during the survey period. Completed paper surveys were dropped off at the Library, City Hall, or the Operations Centre. The online survey received 245 responses and 3 paper copies were returned.

In-Person Consultation

- Community Information Night
  - Bud Miller Park PSM Park Centre on June 04, 2024
  - Approximately 60 people engaged during the event

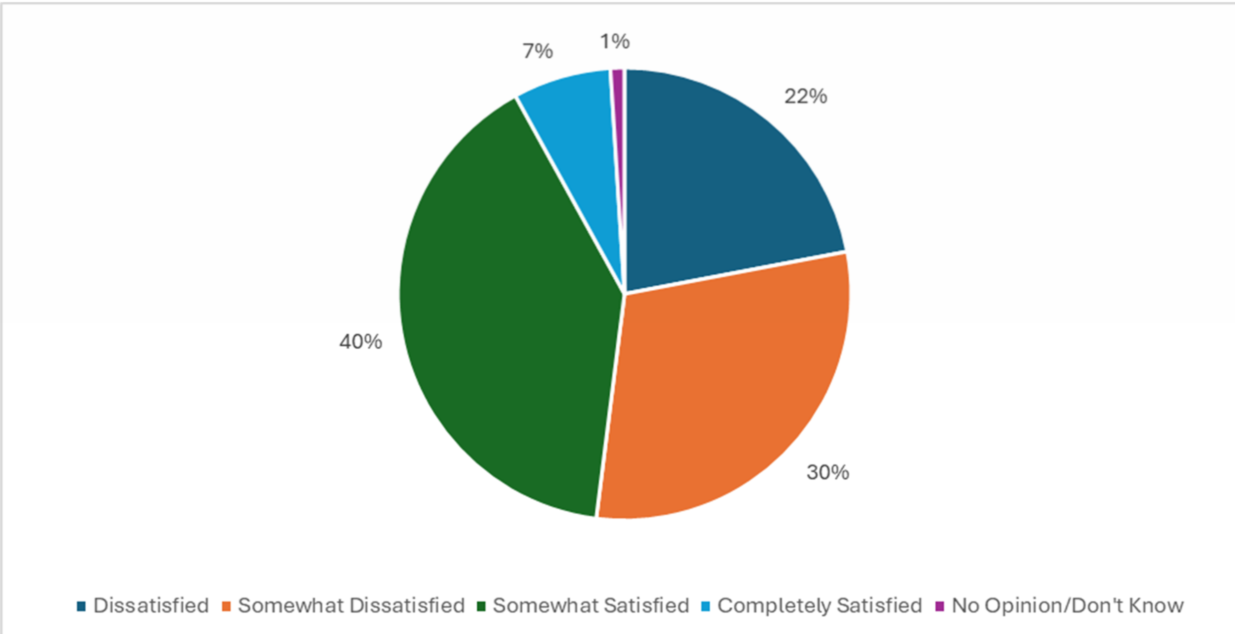
This event involved several City initiatives. People who stopped at the Transportation Master Plan were asked to leave sticky notes with their comments on information boards corresponding with the survey questions.

What We Heard

This survey and information boards were divided into sections that highlighted key points of the Transportation Master Plan: driving, walking, rolling and biking, missing links/roadways/trails/sidewalks and intersections. Respondents also gave feedback on speed limits, traffic calming measures and railway crossings. Some of these topics are too specific for inclusion in a Transportation Master Plan but will instead be considered by the City for future small-scale projects. On the next page is a summary of the responses received over the engagement period.

Survey Results

1. On a scale of 1 (Dissatisfied) to 4 (Completely satisfied), how satisfied are you with DRIVING in Lloydminster?



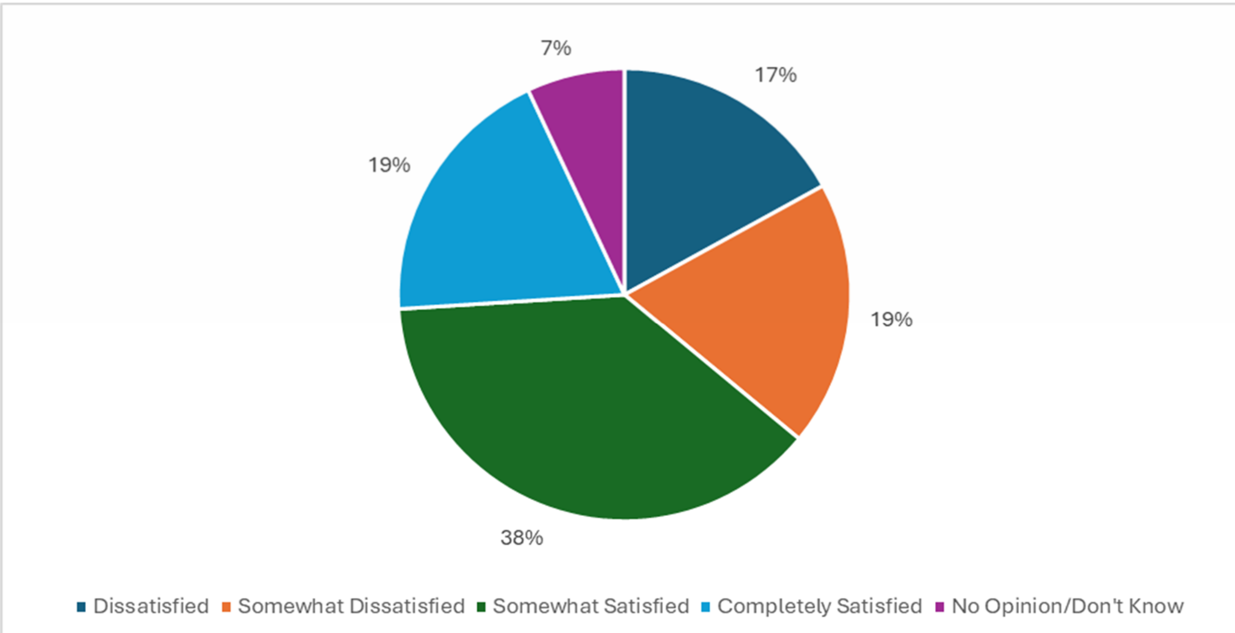
40% of the respondents indicated that they were somewhat satisfied and 7% indicated that they were completely satisfied with driving in Lloydminster. 22% of respondents indicated that they were dissatisfied, and 30% of respondents indicated that they were somewhat dissatisfied. The remaining 1% of respondents indicated that they had no opinion or did not know.

2. Driving: Please provide suggestions for opportunities and improvements.

- Many respondents indicated that they would like to see more traffic calming measures around Lloydminster. Respondents identified areas where they have noted potential speeding. These locations have been passed along to the Project Team.
- A number of respondents said that they would like to see road maintenance. The biggest concerns were fixing potholes and upgrading road markings (e.g. repainting lanes and pedestrian crossings).
- Many respondents indicated that they would like more turning lanes and more driving lanes on Highways 16 and 17. People are concerned about the amount of traffic on the two highways and would like to see it reduced.
- A lot of respondents said that they would like more multi-lane roads around the city and a bypass route for semi-trucks that goes around the city.
- Several respondents indicated that they would like to see more turning lanes on busy streets, the ring road, and main roads around the city. They also said that the existing turning lanes are too short, specifically on Highway 17.
- Many respondents indicated that an overpass or underpass for the train should be added somewhere in Lloydminster to help increase traffic flow.

- A few respondents indicated that rush hour traffic is bad, specifically when travelling East to West of the city and when there are a lot of semi-trucks on the road.
- Many respondents indicated that they are not happy with the recent changes made downtown. They said that traffic has gotten worse, there is reduced parking and it is hard to make turns, all of which has discouraged some respondents from going downtown.

3. On a scale of 1 (Dissatisfied) to 4 (Completely satisfied), how satisfied are you with WALKING in Lloydminster?

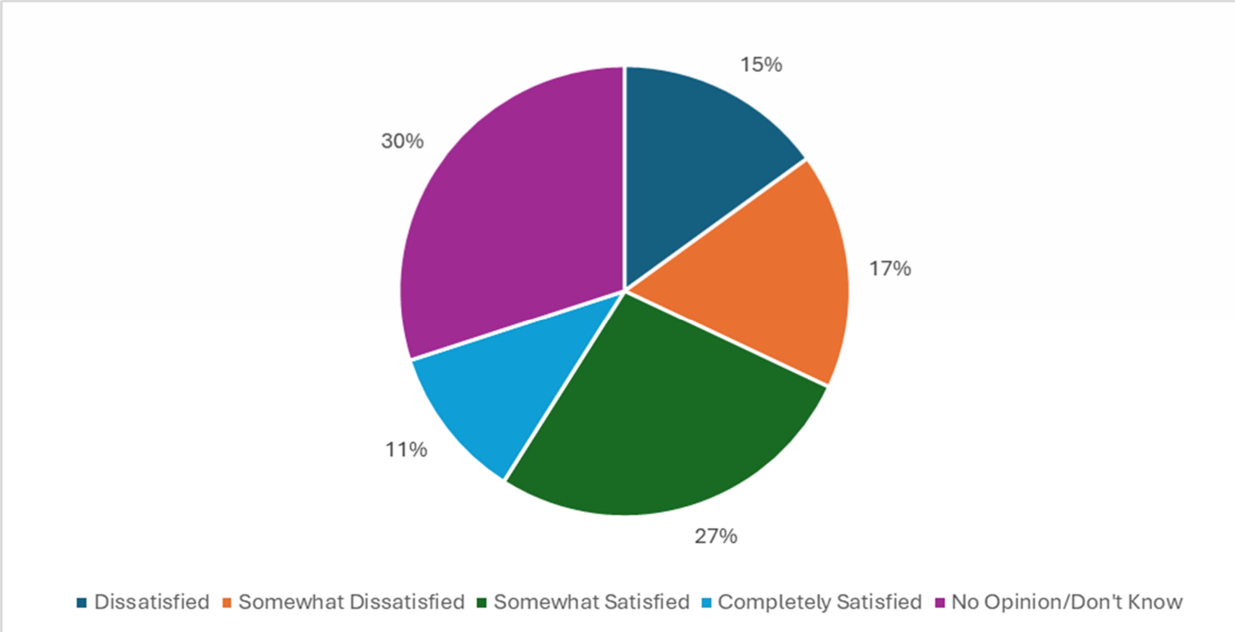


38% of respondents indicated that they were somewhat satisfied and 19% of respondents indicated that they were completely satisfied with walking in Lloydminster. 17% of respondents indicated that they were dissatisfied and 19% indicated that they were somewhat dissatisfied. The remaining 7% of respondents indicated that they had no opinion or did not know.

4. Walking: Please provide suggestions for opportunities and improvements

- Many respondents indicated that general maintenance is required on sidewalks around the city to address uneven and broken sidewalks.
- Some respondents said that they do not feel safe walking on paths and trails because of crime, a lack of lighting, and no barriers between walking paths and busy roads.
- Some respondents indicated that they would like sidewalks added to all main streets and that there are roads without sidewalks on both sides. Respondents identified areas in the city where there are missing sidewalks. Those locations have been passed on to the project team.
- Several respondents said that there are trails throughout the city that do not connect to other existing trails. Respondents said they would like to see more trail connections to all areas of the city and big destinations (e.g. new event center, BMASP, downtown).
- Many respondents indicated that they would like to see more walking paths added around the city, specifically connecting one side of the city to the other.

5. On a scale of 1 (Dissatisfied) to 4 (Completely satisfied), how satisfied are you with ROLLING (such as using a wheelchair, pushing a stroller, using other mobility aids or scooters) and BIKING in Lloydminster?



Respondents were roughly evenly divided on how satisfied they were with rolling and biking in Lloydminster. 15% indicated that they were dissatisfied, 17% indicated that they were somewhat dissatisfied, 27% indicated that they were somewhat satisfied, 11% indicated that they were completely satisfied, and 30% indicated that they had no opinion/did not know.

6. Rolling and Biking: Please provide suggestions for opportunities and improvements

- Many respondents indicated that most sidewalks in Lloydminster are not accessible for wheels and that there is a lack of ramps and accessible curbs.
- Several respondents said that they would like to see the existing walking and biking paths joined together to create more direct routes around the city.
- Some respondents indicated that they would like to see separate biking facilities added to Lloydminster's main roads.
- Many respondents said that they would like to see more walking trails by the main roads, highways and on the Saskatchewan side of Lloydminster.

7. Other Roads: Are there any missing links or new roadways the City should consider adding to improve DRIVING in Lloydminster?

- Several respondents indicated specific roads and areas where they would like to see some streets extended to connect with avenues. Those locations have been passed on to the project team.
- Many respondents said they would like the city to add a bypass route around Lloydminster for heavy trucks and semi-trucks to help divert traffic off the highways that pass through the city.

- Many respondents indicated that an overpass or underpass for the train should be added somewhere in Lloydminster to help increase traffic flow.
- A lot of respondents said that they would like more multi-lane roads around the city and a bypass route for semi-trucks that goes around the city.

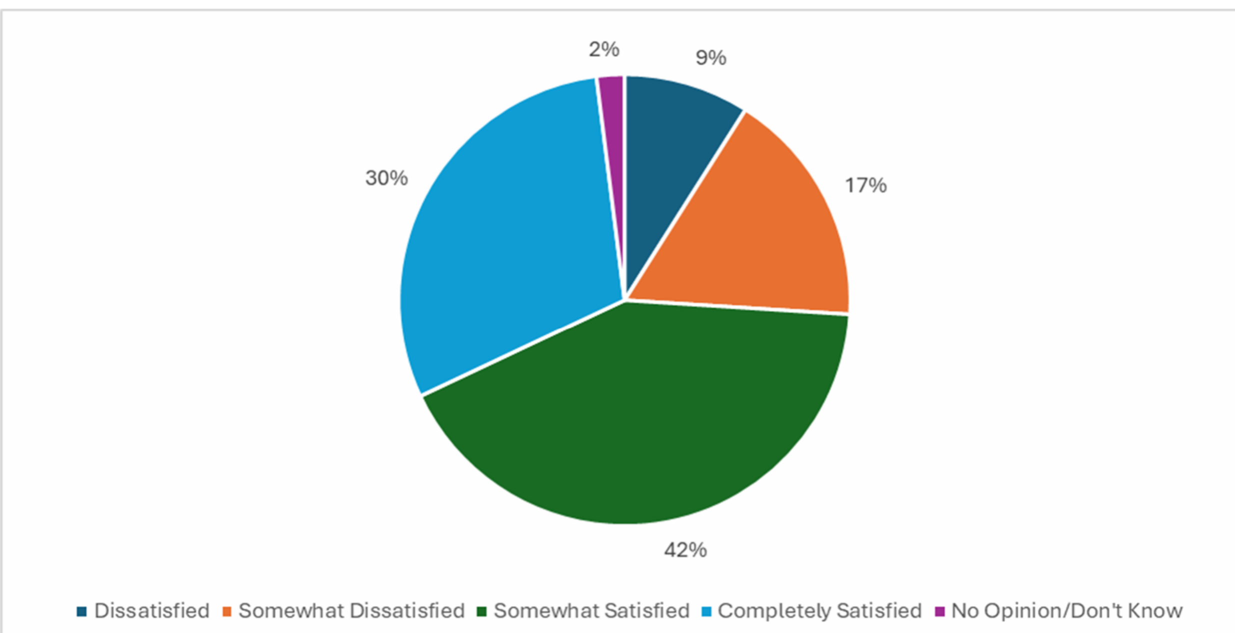
8. Intersections: Traffic signals, turning lanes, and Rectangular Rapid Flashing Beacons (RRFB's)

Respondents gave suggestions on intersections where the City should consider installing traffic signals, turning lanes and Rectangular Rapid Flashing Beacons (RRFB's). Responses varied and have been passed along to the Project Team to consider for the Transportation Master Plan.

9. Active Travel (Walking, Rolling, Cycling): Are there any missing trails or sidewalks the City should consider adding to improve active travels (walking, rolling, cycling) in Lloydminster?

- Some respondents indicated that they would like more walking paths that lead to commonly used destinations in the city (ex. Multiplex, shopping centres, Bud Miller Park) and more walking paths near seniors' homes that lead to shopping areas.
- Many respondents said that they would like the existing trails in the city to connect to other trails and eliminate some of the dead ends.
- Several respondents indicated that they would like paths added to both sides of Highways 16 and 17.
- A few respondents said that they would like more paths to Bud Miller Park and have the existing paths paved.
- Some areas were identified by respondents that are missing sidewalks. These locations have been passed along to the project team.

10. How satisfied are you with SPEED LIMITS in Lloydminster?

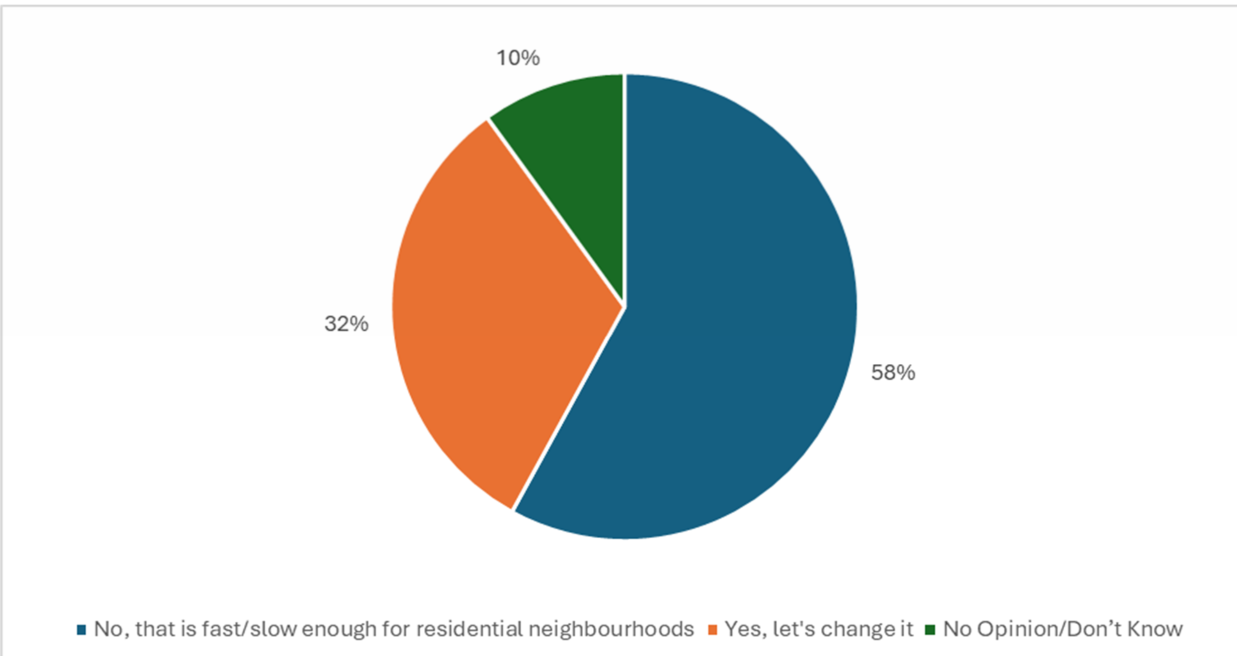


42% of respondents indicated that they were somewhat satisfied and 30% indicated that they were completely satisfied with the speed limits in Lloydminster. 17% of people indicated that they were somewhat dissatisfied and 9% indicated that they were dissatisfied. 2% indicated that they had no opinion or did not know.

11. Speed Limits: Please provide suggestions for opportunities and improvements

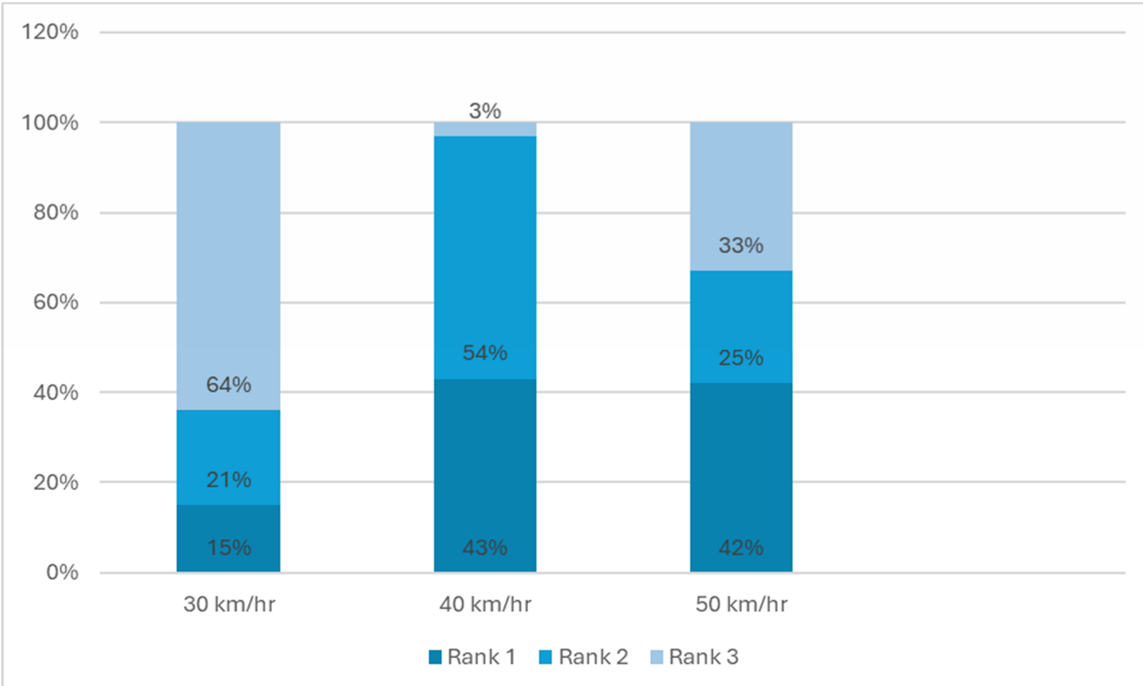
- Some people wanted to change the speed limit. This change includes lowering speed limits in residential areas and school zones.
- A few respondents flagged 62 Street from 75 Avenue to 63 Avenue and Highway 16 as being too slow and noted that the speed could be increased in this area, with most suggesting that the speed limit increases to 60km/hour.
- Of the respondents who did not think speed limits changes were necessary, better enforcement and better street design and network planning were suggested instead.

12. Speed Limits: In regards to speed limits, do you think it should be changed from 50 km/hr to something else?



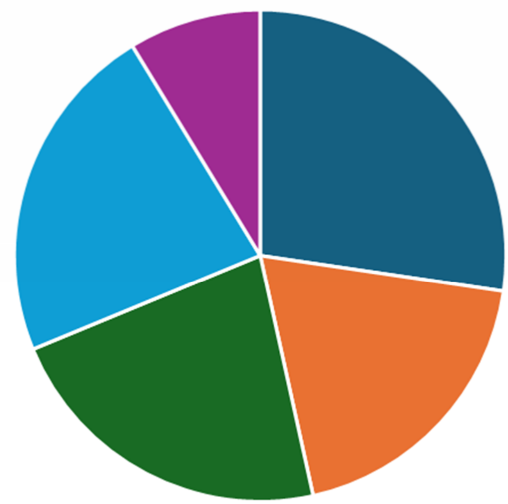
58% of respondents indicated that they think 50 km/hr is fast/slow enough for residential neighbourhoods. 32% of respondents indicated that they think the speed limit should change. 10% of respondents indicated that they had no opinion or did not know.

13. Speed Limits: Within residential neighbourhoods, please rank the following speed limits from most in favour to least in favour:



Roughly the same number of people indicated that they favour having residential neighbourhoods remain at 50km/hr (42% of respondents) or lowered to 40km/hr (43% of respondents). 54% of respondents ranked 40km/hr as being the second most favourable option, with 30km/hr considered the least favourable by most people.

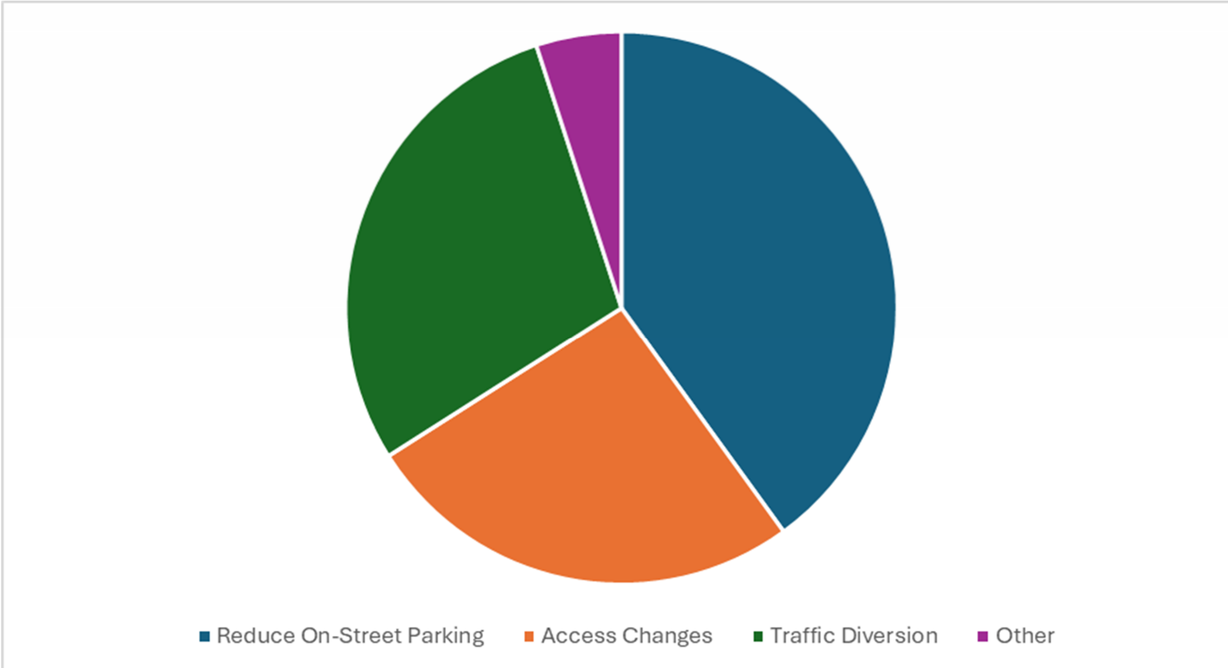
14.Traffic Calming: What benefits are important to you?



Respondents were instructed to select all benefits of traffic calming that were important to them. Roughly 38% of the respondents thought that an important benefit of traffic calming measures is that they slow traffic in the immediate vicinity. 31% of people see the benefit of shortening crossing distances for people who walk or roll and improving visibility of people crossing the street. 27% of people think it is important to use a combination of measures to encourage slower traffic on an area-wide basis and discourage shortcutting.

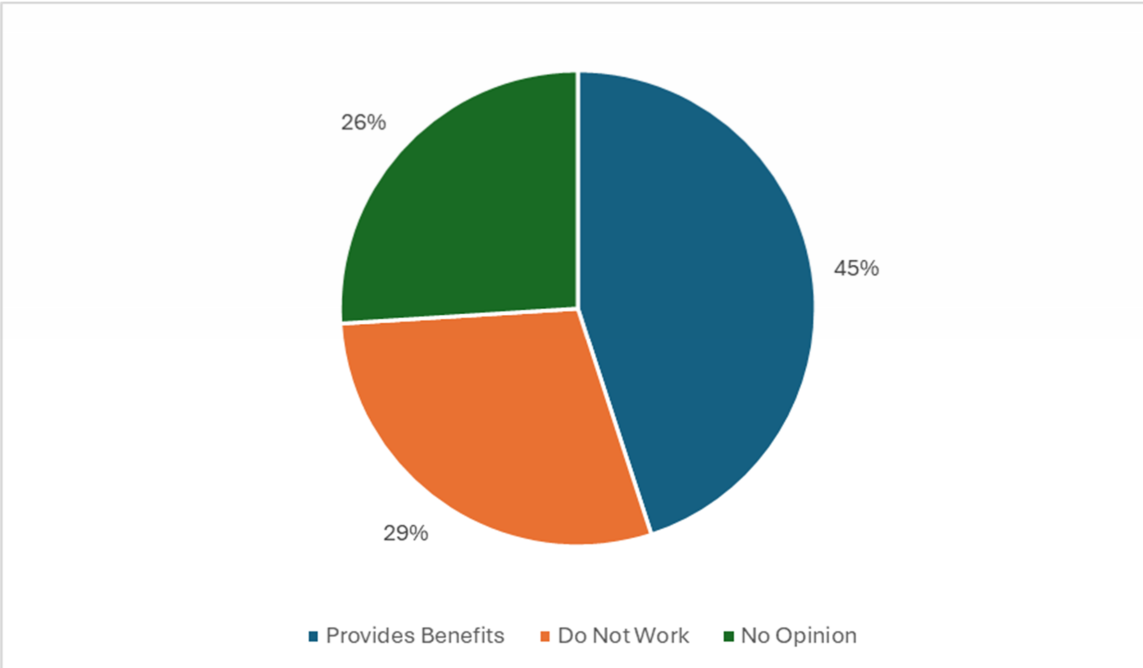
- Of those who selected the “other” option, a few respondents did not feel traffic calming measures had benefits.
- Other respondents did not like the use of speed bumps to calm traffic.
- A few also noted that methods for reducing traffic overall would also contribute to calming traffic.

15.Traffic Calming: What trade-offs are you most concerned about?



Respondents were instructed to select all trade-offs of traffic calming that they were most concerned about. The top concern for implementing traffic calming measures is the impact it may have on on-street parking (40% of respondents). 29% of respondents indicated that they were concerned about diverting traffic to other roads. Of the three options listed, the fewest number of respondents (26%) indicated that they were concerned about access changes that may require drivers to alter their routes within the neighbourhood.

16. Traffic Calming: Overall

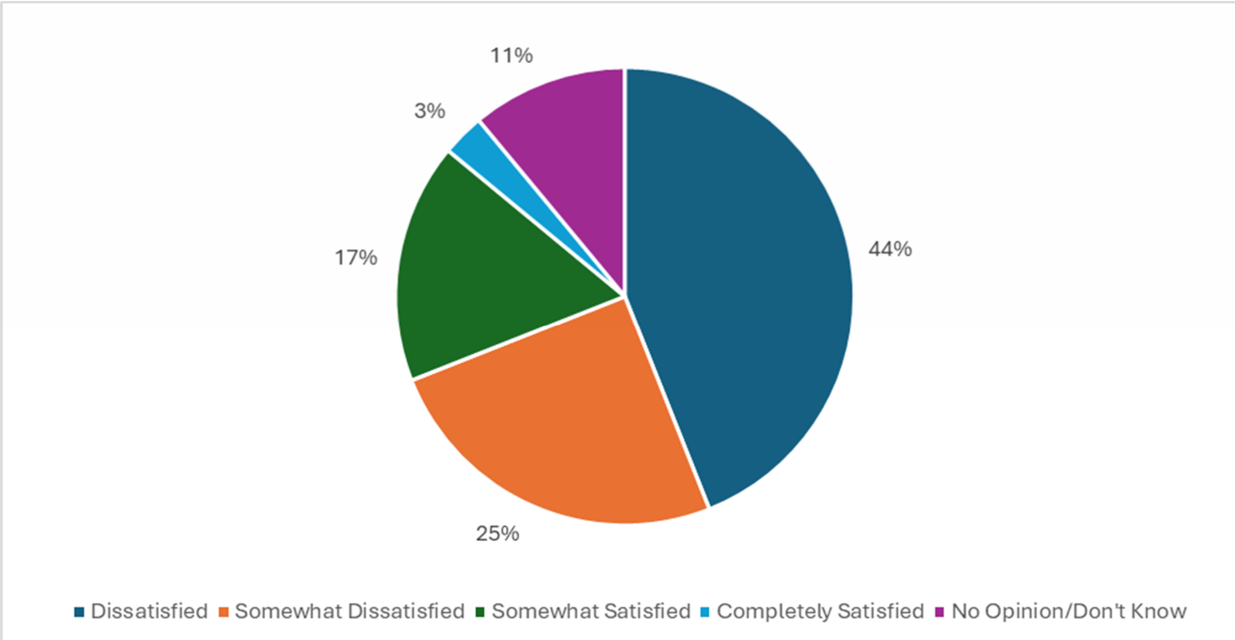


Most respondents believed that traffic calming measures provided benefit (45%), but just as many people did not have an opinion about traffic calming. 29% of people think that traffic calming measures do not work and should not be introduced to the city, and 26% of people had no opinion. A few others noted that measures would negatively impact their driving or contribute to more vehicle collisions.

17. Traffic Calming: What neighbourhoods do you think would benefit from the implementation of traffic calming

- The top neighbourhoods respondents though would benefit from the implementation of traffic calming were College Park, Bud Miller Park / Lakeland College, and Lakeside.
- Every neighbourhood was selected at least once by respondents.
- 14% of people do not see any benefits of implementing traffic calming measures.

18. Railway Crossings: What is your experience with existing RAILWAY CROSSING LOCATIONS in Lloydminster?

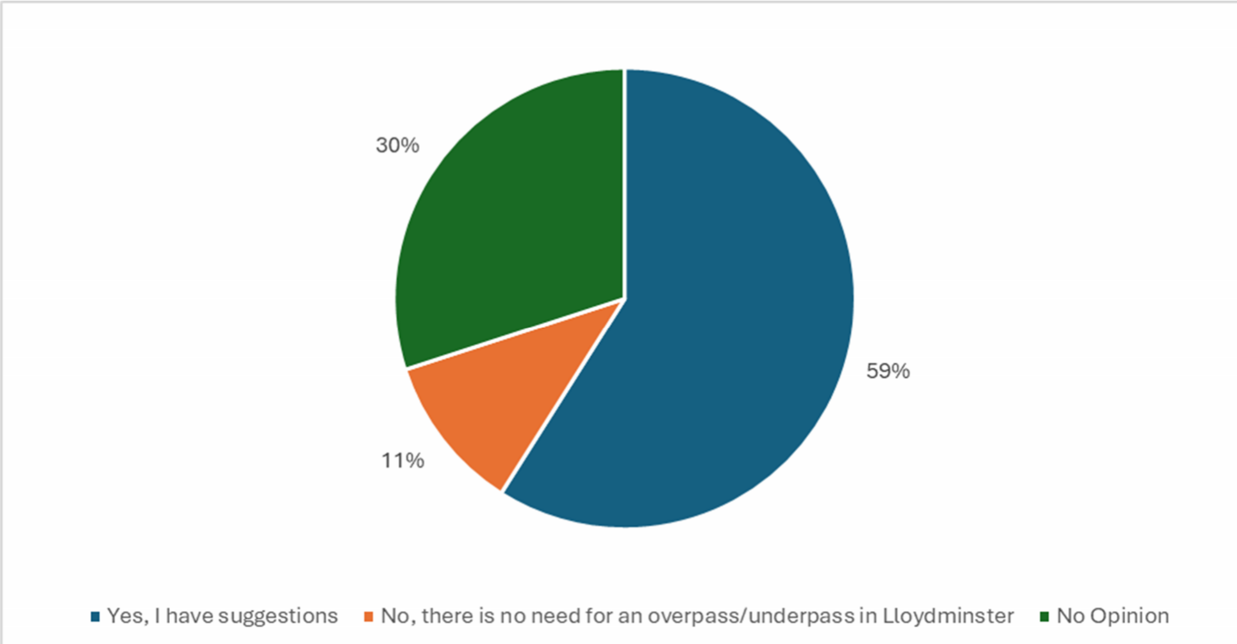


69% of people were either dissatisfied or somewhat dissatisfied with the existing railway crossing locations in Lloydminster. 20% of people were somewhat or completely satisfied and 11% of people had no opinion or did not know.

19. Railway Crossings: Please provide suggestions for opportunities and improvements

- The majority of respondents who provided suggestions and opportunities said that the rail crossing creates congestion and traffic. There were also some concern with the rail crossing limiting access to emergency vehicles and preventing ease of access north of the tracks.
- Most respondents were in favour of an overpass, with many others in favour of either an overpass, underpass, or some alternative form of crossing.
- Some respondents also noted that train schedules should be adjusted to not block traffic during peak rush hours. Additionally, a few people did not think any opportunities or improvements exist. Out of this group, some thought building an overpass or underpass would be too costly whereas others thought that nothing can be done to improve traffic and congestion.

20. Railway Crossings: Do you have any suggestions for potential overpass/underpass locations?



21. Railway Crossings: Please rank the potential overpass/underpass locations from most in favour to least in favour:

- **40 Avenue (south of 52 Street)**
- **62 Avenue (south of 52 Street)**
- **75 Avenue (south of 44 Street)**
- **No overpass/underpass needed**

68% of those respondents ranked 62 Avenue (south of 52 Street) to be the most favorable location for a potential overpass/underpass and 64% ranked 40 Avenue (south of 52 Street) to be the least favourable location.

Next Steps

The City of Lloydminster would like to thank everyone who engaged through in-person or the survey throughout the first phase of the Transportation Master Plan. The results from this consultation will be considered by the Project Team and will be posted on the City's website as well as on YourVoiceLloyd.ca/TMP.

Any questions about this consultation should be directed to the Community Engagement Coordinator at yourvoice@lloydminster.ca or 780-875-6184 Ext. 2322.

APPENDIX
Rail Crossing Data

B

Transcontinentaly Rail Crossing Database

Source: https://open.canada.ca/data/en/dataset/d0f54727-6c0b-4e5a-aa04-ea1463cf9f4c/resource/a53fda5b-134f-449d-a639-9b896065fc2

	Railway Company	Region	Province	Access	Mile	Subdivision	Spur Mile Point	Spur Name	Location	Latitude	Longitude	Road Authority	Protection	Accidents	Fatality	Injury	Trains Daily	Vehicles Daily	Train Max Speed (mph)	Road Speed (km/h)	Lanes	Tracks	IsUrban
Transcontinental (East/West)	**Canadian National Railway**	PNR	SK	Public	83.29	Blackfoot	-	-	40 Avenue	53.2826	-109.979	Lloydminster (Part	Active - FLB	1	0	1	3	3360	25	50	4	1	N
	Canadian National Railway	PNR	SK	Public	84.31	Blackfoot	-	-	49 Avenue	53.2846	-110.0035	Lloydminster (Part	Active - FLBG	0	0	0	3	3650	25	50	4	1	Y
	Canadian National Railway	PNR	SK	Public	84.4	Blackfoot	-	-	50 Avenue	53.2848	-110.0055	Lloydminster (Part	Active - FLBG	0	0	0	3	10300	25	50	2	1	Y
	Canadian National Railway	PNR	AB	Public	85.65	Blackfoot	-	-	62 Avenue	53.28477	-110.0347	Lloydminster (Part	Active - FLB	0	0	0	3	8730	25	60	4	1	N
	Canadian National Railway	PNR	AB	Public	86.54	Blackfoot	-	-	75 Avenue	53.28119	-110.0543	Lloydminster (Part	Active - FLBG	0	0	0	2	3006	25	60	2	1	Y
North/South CP	**Canadian Pacific Railway**	PNR	SK	Public	103.21	Lloydminster	-	-	40 Ave (52	53.28557	-109.9791	Lloydminster (Part	Active - FLB	0	0	0	2	700	25	80	2	1	N
	Canadian Pacific Railway	PNR	AB	Public	104.53	Lloydminster	-	-	52 Ave (N.	53.28617	-110.0105	Lloydminster (Part	Active - FLB	0	0	0	2	2730	25	50	2	1	N
	Canadian Pacific Railway	PNR	SK	Public	104.31	Lloydminster	-	-	50 Ave (N.	53.28569	-110.0055	Lloydminster (Part	Active - FLBG	0	0	0	2	10700	25	50	4	1	Y
	Canadian Pacific Railway	PNR	SK	Public	104.07	Lloydminster	0.07	Interchang	52 St (E. O	53.2852	-109.996	Lloydminster (Part	Passive	0	0	0	2	2730	25	50	2	1	N
	Canadian Pacific Railway	PNR	SK	Public	104.23	Lloydminster	-	-	49 Ave (N.	53.28568	-110.0034	Lloydminster (Part	Active - FLBG	0	0	0	2	3710	25	50	2	1	Y
	Canadian Pacific Railway	PNR	AB	Public	105.65	Lloydminster	-	-	62 St (E. O	53.29979	-110.0252	Lloydminster (Part	Passive	1	0	0	2	25	25	60	2	1	Y

Date: **03-Apr-25**

APPENDIX
Grade Separation Assessment Guidelines

C

GRADE SEPARATION ASSESSMENT GUIDELINES

These guidelines help railway companies and road authorities assess when to consider grade crossings for grade separation, or otherwise eliminate them, thereby removing a road/rail conflict zone.

About these guidelines

These guidelines respond to the 2015 Transportation Safety Board (TSB) Recommendation R15-04, made after the fatal collision between an OC Transpo bus and a VIA Rail passenger train at an at-grade railway crossing in Ottawa, Ontario, on September 18, 2013. This recommendation specifies that "The Department of Transport provide specific guidance as to when grade separation should be considered."

In February 2018, Transport Canada funded a literature review on grade separation approaches, done at the University of Manitoba. To obtain a copy of the final report of this study, "Review of Research and Practice on the Implementation of Grade Separation," please contact the Rail Safety Directorate at railsafety@tc.gc.ca

What to consider in assessing grade crossings for grade separation

Where possible, you should not assess a crossing in isolation. Rather, consider it in the context of the rail corridor in which it and adjacent crossings are located.

As well, these guidelines do not preclude further evaluation of a location. A site-specific study and feasibility analysis are essential to establish whether or not a grade separation is possible.

The table below lists:

- criteria with thresholds
- additional criteria with no established thresholds, which you may consider as part of a more detailed analysis
    - These criteria do not have thresholds because the range, or manner in which they are treated or quantified, may vary significantly from one location to another

Table 1.0: Criteria to consider in assessing grade crossings for grade separation

Criteria		***Value or threshold for grade separation candidates***
Criteria (with threshold)	***Traffic and Safety-related criteria***	
	Traffic volume	AADT* exceeds 100,000
	Train volume	Average of 150 or more trains per day*

	Vehicle speed	Posted/Unposted highway speed equals or exceeds 90 km/h.
	Cross product	Cross product exceeds 1 million*
	Queuing	Existing crossings where there are known queuing issues and an entranceway or intersection is within 30m of the nearest rail of the crossing. **Note**: New grade crossings are not permitted where the train speed is more than 25km/h, and there is an entranceway or intersection within 30m of the nearest rail of the proposed crossing.
	Maximum train speed	Train speed exceeds 177 km/h (110 mph).
	Vehicle delay	Exceeds 40 vehicle hours per day.
	Level of service	If the highway/roadway facility is performing at a level of service below its intended minimum design level 10 percent or more of the time.
Other criteria for consideration in identifying locations for further assessment		
Criteria (without threshold)	• **Collision history or predicted collisions** • **Blocked crossing issues** • **Number of highway/roadway lanes** • **Number of railway tracks** • **Type of railway traffic (i.e. passenger, dangerous goods)** • **Highway functional classification** • **Road surface type** • **Environmental impacts** • **Air quality / emissions** • **Noise disruptions in community**	• **Type of roadway traffic (pedestrians and cyclists, vulnerable road users, emergency services, school buses, dangerous goods)** • **Various adaptations of 'cross product' (i.e. consideration of the number of occupants such as passenger rail, bus or transit)** • **Development, community and social impacts (quality of life, community cohesion, aesthetics, business disruption)** • **Feasibility and constructability** • **Other (secondary) network impacts** • **General physical conditions** • **Land use**

**For further information on measuring these values, please consult the Institute of Transportation Engineers (ITE), Transportation Association of Canada (TAC) and other relevant manuals or guidance material relevant within your jurisdiction.*

Note: It may be appropriate to consider a combination of criteria when assessing a crossing for grade separation.

Terms to know

Annual average daily traffic (AADT): The average daily vehicular traffic volume for a given year at a site.

Cross product: A product of the average number of trains per day multiplied by the AADT at a grade crossing.

Highway functional classification: The category of highway that defines the role it plays in serving traffic flow through a road network.

Level of service (LOS): A qualitative measure used to relate the quality of vehicular traffic service. Used to analyze roadways and intersections by categorizing traffic flow and assigning quality levels of traffic based on performance measures like vehicle speed, density and congestion. Defined in terms of volume-capacity (V/C) to quantify the average operational condition of the grade crossing during the peak hour.

Queuing: The study of traffic behavior in a segment of a roadway, where demand exceeds available capacity. In the context of grade crossings, where nearby entrances or intersections are close to the crossing, vehicular traffic on the road approach may extend across a railway crossing or into the track area.

Vehicle delay: The time lost by a vehicle due to traffic-related causes beyond the control of the driver.

Vulnerable road users: According to the *Ontario Highway Traffic Act*, vulnerable road users include:

- pedestrians
- people on a bicycle or a motor-assisted bicycle
- people in a wheelchair or other mobility device
- roadway workers
- emergency responders outside their motor vehicle

They are vulnerable due to lack of protection they have from traffic.

APPENDIX
Truck and Dangerous Goods Route Evaluation Framework

D

Project:	**15520 - Lloydminster Truck Routes / Dangerous Goods Routes**
Stage:	**Option Development**
Subject:	**Evaluation Framework for Truck Routes**
Edit Date:	**11/6/2019**

Network Functionality Assessment

Criteria	Description	Yes	No
Route Purpose	Truck routes must either provide direct access to/from destinations within the City that produce or receive goods via trucks or provide for efficient movement of goods through the City	Route provides a direct connection of a location in the City that produces or receives goods or route provides for the safe and efficient movement of goods through the City	Route does not provide a connection to a location in the City that produces or receives goods or route does not facilitate the safe and efficient movement of goods through the City
Network Connectivity	Truck routes must provide a connection to the existing truck routes within the City or provide a connection to the regional networks	Route connects without creating "dead end" segments and connects to the network in a manner that allows efficient transportation of goods into and through the City	Route does not connect to the network and may create "dead end" segments. Route does not allow for efficient transportations of goods into and through the City
Reduces Trip Length	Truck routes add efficiencies to the network by reducing the trip length to destinations within the City and does not add unnecessary trip length for goods moving through the City	Route reduces trip length to destinations within the City and provides efficient movement of goods through the City	Route does not reduce trip length to destinations within the City and to goods moving through the City
Reduces Off Route Trips	Truck routes are connected in a manner that reduces the number of off route trips required for goods to reach their destination within the City as well as pass through the City	Route provides direct access to destinations with frequent use or route allows for efficient travel through the City	Route does not provide direct access to destinations and is not used frequently or route does not allow for safe and efficient movement of goods through the City

Route Performance Assessment

Criteria	Description	Good / Very Good	Fair / Poor
Roadway Classification	Roadway classification as defined by the City's Municipal Development Standards document and includes Locals, Collectors, and Arterials as roadway types. Primary Highways are defined as those roadways that connect to the Provincial Highway networks (i.e. Hwy 16 and Hwy 17)	Highways and Arterials	Collectors and Locals
Roadway Geometrics	Roadway and intersection geometric factors such as lane width, available shoulders, and turning radii are appropriate for the safe use by trucks	Roadway geometrics are sufficient to accommodate frequent truck usage and allow for safe movements along the roadway and through intersections	Roadways and intersections do not easily accommodate truck traffic due to narrow lane widths, little to no existing shoulder, small turning radii
Surface Conditions / Structural Capacity	Existing roadway surface conditions are capable of supporting frequent truck use	Roadway structure has a high enough structural capacity to facilitate frequent truck use	Roadway structure does not have enough structural capacity to facilitate frequent truck use
At-Grade Rail Crossings	Truck Routes have few at-grade rail crossings to ensure safe and efficient transportation of goods around and through the City and reduce delays caused by trains	Route has one or no at-grade rail crossings	Route has two or more at-grade rail crossings
Land Use Compatibility	Current surrounding land use is appropriate for frequent trucks and often producing or receiving the goods which needs to be transported	Commercial and Industrial	Residential and Institutional (i.e. schools, public facilities, hospitals)
Supports Future Development	Truck routes are located in a manner that supports future development as the City grows and changes	Route provides support for future development	Route does not provide support for future development

Note: Off route trips are defined as a trip or portion of a trip taken by a truck that is used to reach a delivery destination and/or pickup goods from a location this is not located on an existing or designated truck route. For example, the portion of a trip that deviates from a designated truck route for medical deliveries to a hospital is defined as an off route trip.

Project:	15520 - Lloydminster Truck Routes / Dangerous Goods Routes
Stage:	Option Development
Subject:	Evaluation Framework for Dangerous Goods Routes
Edit Date:	11/13/2019

Dangerous Goods Route Functionality Assessment

Criteria	Description	Yes	No
Route Purpose	Dangerous goods routes must either provide direct access to/from destinations within the City that produce or receive goods via trucks or provides for efficient movement of goods through the City	Route provides a direct connection of a location in the City that produces or receives goods or route provides for the safe and efficient movement of dangerous goods through the City	Route does not provide a connection to a location in the City that produces or receives goods or route does not facilitate the safe and efficient movement of dangerous goods through the City
Network Connectivity	Dangerous goods routes must provide a connection to the existing dangerous goods routes within the City or provide a connection to the regional networks	Route connects without creating "dead end" segments and connects to the network in a manner that allows efficient transportation of dangerous goods into and through the City	Route does not connect to the network and may create "dead end" segments. Route does not allow for efficient transportations of dangerous goods into and through the City
Route Compatibility	This criteria ensure that any and all proposed dangerous goods routes are apart of the existing truck routes network	Route is a part of the existing truck route network	Route is not currently designated as a truck route
Reduces Trip Length	Dangerous goods routes add efficiencies to the network by reducing the trip length to destinations within the City and does not add unnecessary trip length for dangerous goods moving through the City	Route reduces trip length to destinations within the City and provides efficient movement of dangerous goods through the City	Route does not reduce trip length to destinations within the City and to dangerous goods moving through the City
Reduces Off Route Trips	Dangerous goods routes are connected in a manner that reduces the number of off route trips required for dangerous goods to reach their destination within the City as well as pass through the City or reduces the number of off route permits required	Route provides direct access to destinations with frequent use or route allows for efficient travel through the City	Route does not provide direct access to destinations and is not used frequently or route does not allow for safe and efficient movement of goods through the City

Probability Assessment

Criteria	Description	Good / Very Good	Fair / Poor
Roadway Geometrics	Roadway and intersection geometric factors such as lane width, available shoulders, and turning radii are appropriate for the safe use by trucks	Roadway geometrics are sufficient to accommodate frequent truck usage and allow for safe movements along the roadway and through intersections	Roadways and intersections do not accommodate truck traffic due to narrow lane widths, little to no existing shoulder, small turning radii
At-grade Rail Crossings	Dangerous goods routes have few at-grade rail crossings to ensure safe and efficient transportation of goods around and through the City and reduce risks associated with rail/truck collisions	Route has one or no at-grade rail crossings	Route has two or more at-grade rail crossings
Access Control	Accesses along the route have higher levels of control, such as signals, to minimize risk of collision	Higher level of access control at all or most of the accesses	All or most accesses have lower levels to no access control
Traffic Efficiency	Route allows for efficient transportation of goods around and through the City due to few delays associated with congestion	Delays due to congestion are not likely or never to be experienced along the route	Delays due to congestion are likely or very likely to be experienced along the route
Collisions	Based on judgement from the City, does the dangerous goods route have potential for frequent or severe collisions	Route is likely to have a low frequency and severity of collisions	Route is likely to have a high frequency or severity of collisions

Consequence Assessment

Criteria	Description	Good / Very Good	Fair / Poor
Environmental Impact	There are no sensitive or natural areas along the route (i.e. storm water ponds, water bodies, water courses, farmer's fields, existing landscaping and natural vegetation, and water treatment plants, etc.)	Few to no sensitive or natural areas are located along the route	Many sensitive or natural areas are located along the route
Population Exposure / Land Use	Land use surrounding the dangerous goods route is appropriate and reduces the number of people exposed in the event of an emergency	Industrial and Commercial land uses where fewer people are located	Residential and institutional land uses where large amounts of people may be located together (i.e. hospitals, high-density residential, etc.)
Population Responsiveness / Evacuation Potential	In the event of an emergency people have the ability to evacuate the area quickly and safely	There are no high-density land uses in the surrounding area (i.e. hospitals, nursing homes, high-density residential, etc.) and there are alternate roadways available for evacuation	Route is in close proximity to high-density land uses (i.e. hospitals, nursing homes, high-density residential, etc.) and does not have alternate roadways available for evacuation
Emergency Response	In the event of an emergency the dangerous goods route is located where the fire department can respond quickly	Route is located within the 4 to 6 minutes range from either fire hall	Route is located 8 or more minutes away from either fire hall

APPENDIX E
Traffic Signal Warrants

20-Year Traffic Signal Warrants

For current 4-way stop intersections

Intersection	Horizon	Scenario	Warrant Result	Intersection Average Hourly Volume
31St_52Ave	20YR	Total	NOT Warranted	162
36St_43Ave	20YR	Total	NOT Warranted	559
36St_47Ave	20YR	Total	NOT Warranted	655
36St_49Ave	20YR	Total	Not Warranted - Vs<75	767
36St_52Ave	20YR	Total	Warranted	1180
39St_51Ave	20YR	Total	NOT Warranted	368
39St_52Ave	20YR	Total	NOT Warranted	401
39St_70Ave	20YR	Total	NOT Warranted	718
52St_49Ave	20YR	Total	NOT Warranted	754

City of Lloydminster - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	**31 Street**	**Direction (EW or NS)**	**EW**	**Road Authority:**	**City of Lloydminster**
Side Street (name)	**52 Avenue**	**Direction (EW or NS)**	**NS**	**City:**	**City of Lloydminster**
Quadrant / Int #		**Comments**	**20 Year Peak PM Midday Hours and Secondary Peak Hours estimated from Typical Daily Percentages**	**Analysis Date:**	**2025 Aug 01, Fri**
	CHECK SHEET			**Count Date:**	**20 Year Projections**
				Date Entry Format:	(yyyy-mm-dd)

for Warrant Calculation Results, please hit 'Page Down'

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
31 Street	WB				1					1			
31 Street	EB				1					1			
52 Avenue	NB				1					1			
52 Avenue	SB				1					1			

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

Are the 52 Avenue NB right turns significantly impeded by through movements? (y/n)	n
Are the 52 Avenue SB right turns significantly impeded by through movements? (y/n)	n
Are the 31 Street WB right turns significantly impeded by through movements? (y/n)	n
Are the 31 Street EB right turns significantly impeded by through movements? (y/n)	n

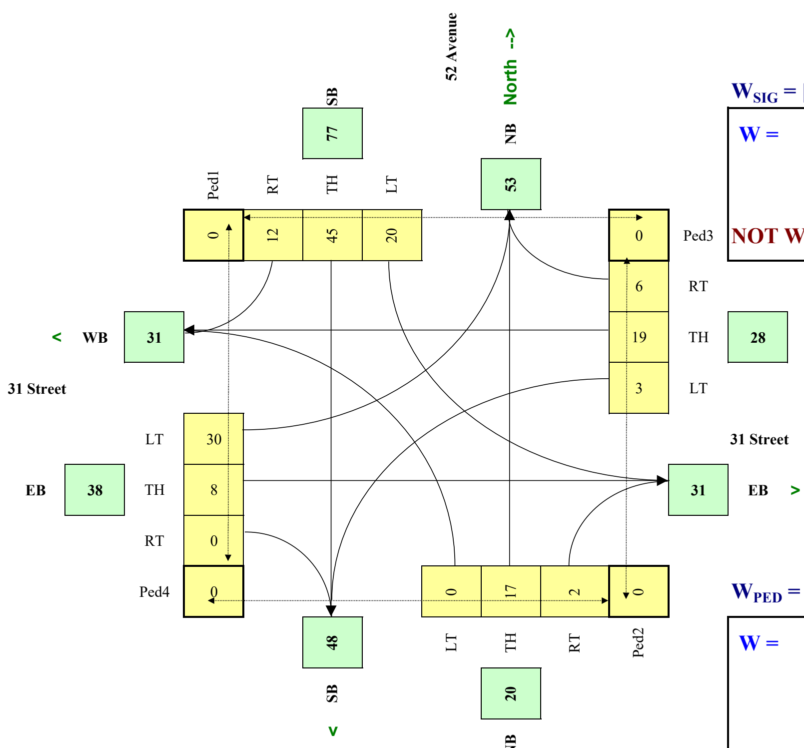
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	2,400
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
31 Street	EW	50	5.0%	n	0.0
52 Avenue	NS	50	5.0%	n	0.0

Set Peak Hours

Traffic Input	**NB**			**SB**			**WB**			**EB**			**Ped1 NS**	**Ped2 NS**	**Ped3 EW**	**Ped4 EW**	
	LT	**Th**	**RT**	**LT**	**Th**	**RT**	**LT**	**Th**	**RT**	**LT**	**Th**	**RT**	**W Side**	**E Side**	**N Side**	**S Side**	**% of Daily**
7:00 - 8:00	0	13	2	15	33	9	2	14	4	22	6	0					5.1
8:00 - 9:00	0	15	2	17	37	9	2	15	5	29	8	0					6.5
11:00 - 12:00	0	15	2	17	39	10	2	17	5	26	7	0					6
12:00 - 13:00	0	16	2	19	43	11	3	18	5	29	8	0					6.5
4:00 - 5:00	0	22	3	26	60	16	4	27	7	35	10	0					8.1
5:00 - 6:00	0	22	3	26	58	15	4	25	7	39	11	0	0	0	0	0	8.9
Total (6-hour peak)	**0**	**103**	**14**	**120**	**270**	**70**	**17**	**116**	**33**	**180**	**50**	**0**	**0**	**0**	**0**	**0**	
Average (6-hour peak)	**0**	**17**	**2**	**20**	**45**	**12**	**3**	**19**	**6**	**30**	**8**	**0**	**0**	**0**	**0**	**0**	
Actual Pedestrian Crossing Distance (m)																	

Average 6-hour Peak Turning Movements



$$W_{SIG} = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\ (X_{v\text{-}p})\ L) / K_2] \times C_i$$

W = **4** **4** **0**

Veh ***Ped***

NOT Warranted

RESET SHEET

$$W_{PED} = [F\ ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$$

W = **0**

Warranted - Complex Intersection

City of Lloydminster - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	36 Street	Direction (EW or NS)	EW	Road Authority:	City of Lloydminster
Side Street (name)	43 Avenue	Direction (EW or NS)	NS	City:	City of Lloydminster
Quadrant / Int #		Comments	20 Year Peak PM Midday Hours and Secondary Peak Hours estimated from Typical Daily Percentages	Analysis Date:	2025 Aug 01, Fri
	CHECK SHEET			Count Date:	20 Year Projections
for Warrant Calculation Results, please hit 'Page Down'				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
36 Street	WB				1					1			
36 Street	EB				1					1			
43 Avenue	NB				1					1			
43 Avenue	SB				1					1			

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

Are the 43 Avenue NB right turns significantly impeded by through movements? (y/n)	n
Are the 43 Avenue SB right turns significantly impeded by through movements? (y/n)	n
Are the 36 Street WB right turns significantly impeded by through movements? (y/n)	n
Are the 36 Street EB right turns significantly impeded by through movements? (y/n)	n

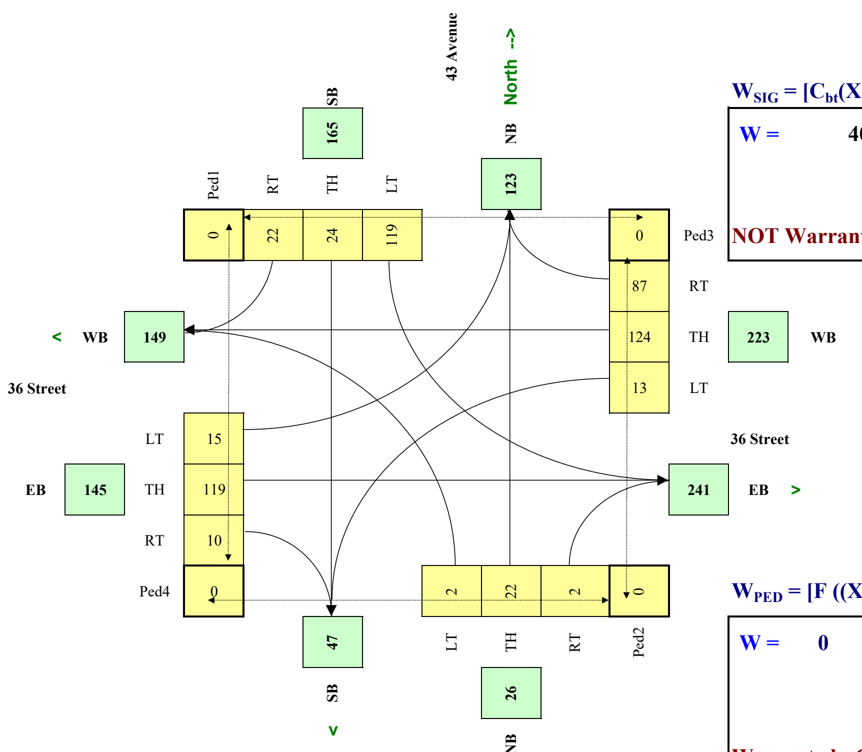
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	2,400
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
36 Street	EW	50	5.0%	n	0.0
43 Avenue	NS	50	5.0%	n	0.0

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW	
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side	% of Daily
7:00 - 8:00	2	16	2	88	17	16	9	92	65	11	89	8					5.1
8:00 - 9:00	2	21	2	91	18	11	8	98	99	21	117	9					6.5
11:00 - 12:00	2	19	2	103	21	19	11	108	76	13	105	9					6
12:00 - 13:00	2	21	2	112	22	21	12	117	83	15	113	10					6.5
4:00 - 5:00	3	25	3	166	33	38	20	170	83	10	137	13					8.1
5:00 - 6:00	3	28	3	153	30	28	16	160	113	20	155	13	0	0	0	0	8.9
Total (6-hour peak)	14	130	14	713	141	133	76	745	519	90	716	62	0	0	0	0	
Average (6-hour peak)	2	22	2	119	24	22	13	124	87	15	119	10	0	0	0	0	
Actual Pedestrian Crossing Distance (m)																	

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$

W =	40	40	0
		Veh	*Ped*

NOT Warranted

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 0

Warranted - Complex Intersection

City of Lloydminster - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	**36 Street**		**Direction (EW or NS)**	**EW**		**Road Authority:**	**City of Lloydminster**
Side Street (name)	**47 Avenue**		**Direction (EW or NS)**	**NS**		**City:**	**City of Lloydminster**
Quadrant / Int #		**Comments**	**20 Year Peak PM Midday Hours and Secondary Peak Hours estimated from Typical Daily Percentages**			**Analysis Date:**	**2025 Aug 01, Fri**
	CHECK SHEET					**Count Date:**	**20 Year Projections**
						Date Entry Format:	(yyyy-mm-dd)

for Warrant Calculation Results, please hit 'Page Down'

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
36 Street	WB				1					1			
36 Street	EB				1					1			
47 Avenue	NB				1					1			
47 Avenue	SB				1					1			

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

Are the 47 Avenue NB right turns significantly impeded by through movements? (y/n)	n
Are the 47 Avenue SB right turns significantly impeded by through movements? (y/n)	n
Are the 36 Street WB right turns significantly impeded by through movements? (y/n)	n
Are the 36 Street EB right turns significantly impeded by through movements? (y/n)	n

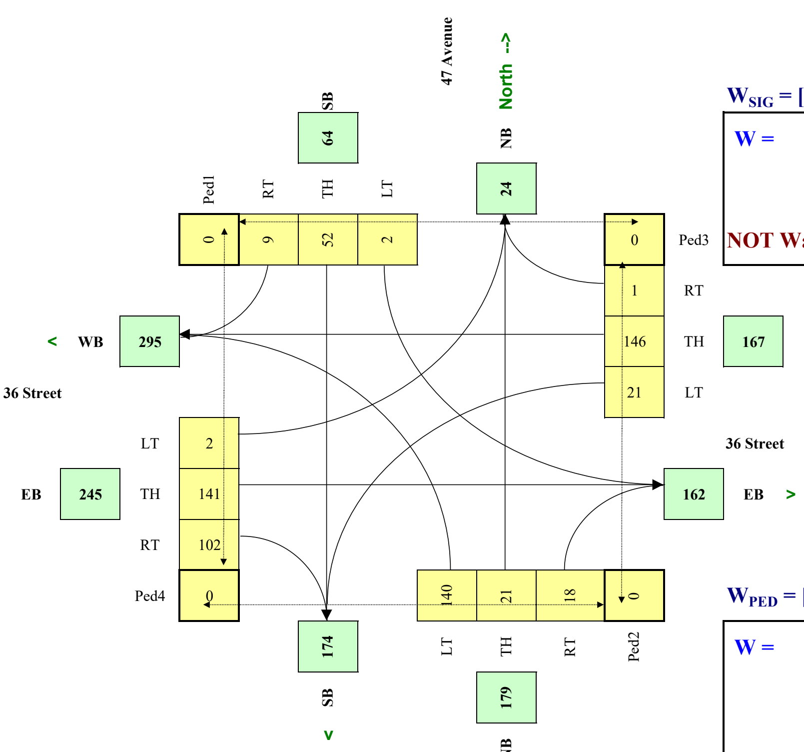
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	2,400
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
36 Street	EW	50	5.0%	n	0.0
47 Avenue	NS	50	5.0%	n	0.0

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW	
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side	% of Daily
7:00 - 8:00	104	16	14	2	38	7	15	108	1	1	105	76					5.1
8:00 - 9:00	137	22	21	2	38	8	12	116	1	2	138	86					6.5
11:00 - 12:00	123	18	16	2	45	8	18	127	1	2	124	89					6
12:00 - 13:00	133	20	17	2	49	9	19	137	1	2	134	96					6.5
4:00 - 5:00	161	22	17	3	74	12	33	197	2	2	162	133					8.1
5:00 - 6:00	182	27	24	3	67	12	26	188	2	2	183	132	0	0	0	0	8.9
Total (6-hour peak)	**840**	**125**	**109**	**14**	**311**	**56**	**123**	**873**	**8**	**11**	**846**	**612**	**0**	**0**	**0**	**0**	
Average (6-hour peak)	**140**	**21**	**18**	**2**	**52**	**9**	**21**	**146**	**1**	**2**	**141**	**102**	**0**	**0**	**0**	**0**	
Actual Pedestrian Crossing Distance (m)																	

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$

W =	62	62	0
		Veh	*Ped*

NOT Warranted

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 0

Warranted - Complex Intersection

City of Lloydminster - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	36 Street		Direction (EW or NS)	EW	Road Authority:	City of Lloydminster
Side Street (name)	49 Avenue		Direction (EW or NS)	NS	City:	City of Lloydminster
Quadrant / Int #		Comments	20 Year Peak PM Midday Hours and Secondary Peak Hours estimated from Typical Daily Percentages		Analysis Date:	2025 Aug 01, Fri
	CHECK SHEET				Count Date:	20 Year Projections
					Date Entry Format:	(yyyy-mm-dd)

for Warrant Calculation Results, please hit 'Page Down'

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
36 Street	WB				1					1			
36 Street	EB				1					1			
49 Avenue	NB				1					1			
49 Avenue	SB				1					1			

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

Are the 49 Avenue NB right turns significantly impeded by through movements? (y/n)	n
Are the 49 Avenue SB right turns significantly impeded by through movements? (y/n)	n
Are the 36 Street WB right turns significantly impeded by through movements? (y/n)	n
Are the 36 Street EB right turns significantly impeded by through movements? (y/n)	n

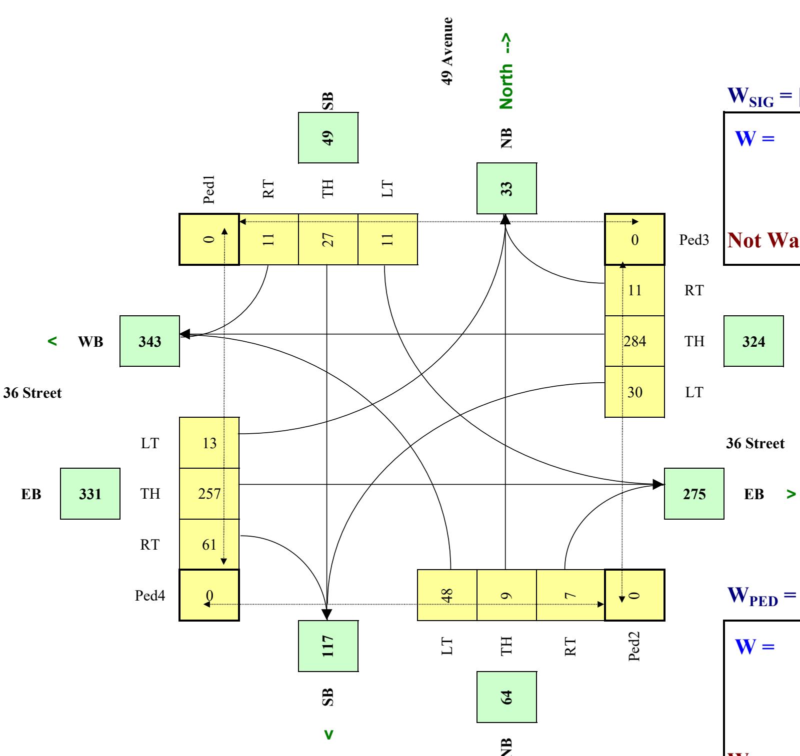
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	2,400
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
36 Street	EW	50	5.0%	n	0.0
49 Avenue	NS	50	5.0%	n	0.0

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW	
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side	% of Daily
7:00 - 8:00	36	7	5	8	19	8	22	211	8	10	192	45					5.1
8:00 - 9:00	46	8	7	8	14	8	27	257	10	12	242	54					6.5
11:00 - 12:00	42	8	6	10	23	10	26	248	9	11	225	53					6
12:00 - 13:00	45	8	7	10	25	10	28	269	10	12	244	57					6.5
4:00 - 5:00	56	11	8	16	44	16	36	350	13	16	307	76					8.1
5:00 - 6:00	62	12	9	14	34	14	38	368	14	17	334	79	0	0	0	0	8.9
Total (6-hour peak)	287	54	42	66	159	66	177	1,703	64	78	1,544	364	0	0	0	0	
Average (6-hour peak)	48	9	7	11	27	11	30	284	11	13	257	61	0	0	0	0	
Actual Pedestrian Crossing Distance (m)																	

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$

W =	52	52	0
		Veh	*Ped*

Not Warranted - Vs<75

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 0

Warranted - Complex Intersection

City of Lloydminster - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	**36 Street**	**Direction (EW or NS)**	**EW**	**Road Authority:**	**City of Lloydminster**
Side Street (name)	**52 Avenue**	**Direction (EW or NS)**	**NS**	**City:**	**City of Lloydminster**
Quadrant / Int #		**Comments**	**20 Year Peak PM Midday Hours and Secondary Peak Hours estimated from Typical Daily Percentages**	**Analysis Date:**	**2025 Aug 01, Fri**
	CHECK SHEET			**Count Date:**	**20 Year Projections**
				Date Entry Format:	(yyyy-mm-dd)

for Warrant Calculation Results, please hit 'Page Down'

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
36 Street	WB				1					1			
36 Street	EB				1					1			
52 Avenue	NB				1					1			
52 Avenue	SB				1					1			

Saturation Flow Rates (if not default) (vphpl)		**Default Saturation Flow Rates (vphpl)**
Left Turn		1,650
Through		1,800
Right Turn		1,500

Are the 52 Avenue NB right turns significantly impeded by through movements? (y/n)	n
Are the 52 Avenue SB right turns significantly impeded by through movements? (y/n)	n
Are the 36 Street WB right turns significantly impeded by through movements? (y/n)	n
Are the 36 Street EB right turns significantly impeded by through movements? (y/n)	n

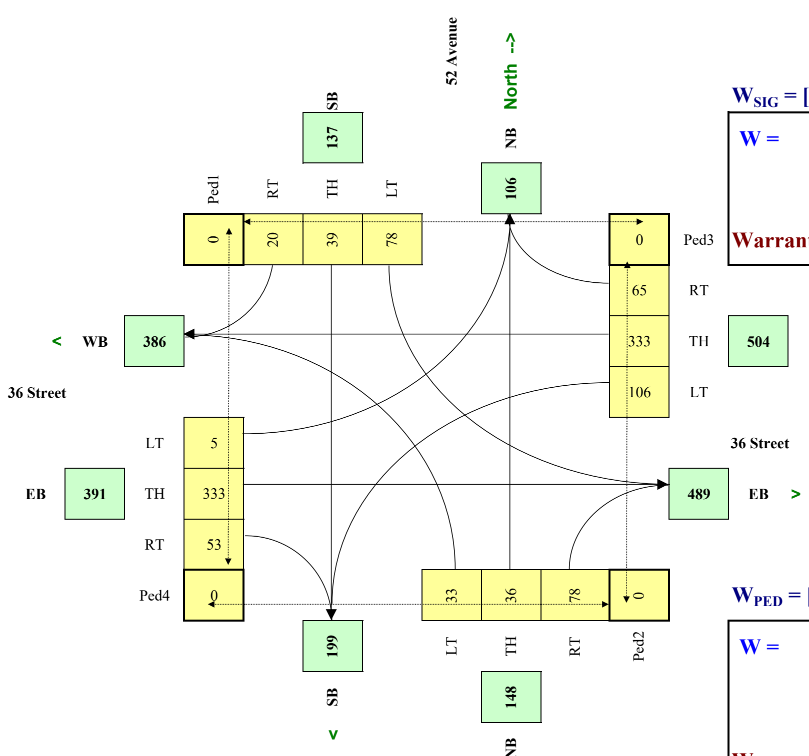
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	2,400
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
36 Street	EW	50	5.0%	n	0.0
52 Avenue	NS	50	5.0%	n	0.0

Set Peak Hours

Traffic Input	**NB**			**SB**			**WB**			**EB**			**Ped1**	**Ped2**	**Ped3**	**Ped4**	
													NS	**NS**	**EW**	**EW**	
	LT	**Th**	**RT**	**LT**	**Th**	**RT**	**LT**	**Th**	**RT**	**LT**	**Th**	**RT**	**W Side**	**E Side**	**N Side**	**S Side**	**% of Daily**
7:00 - 8:00	25	27	58	58	29	15	79	248	48	4	248	39					5.1
8:00 - 9:00	36	29	78	68	31	18	79	312	61	6	323	46					6.5
11:00 - 12:00	29	32	69	68	34	17	92	291	57	4	292	46					6
12:00 - 13:00	32	34	74	74	37	19	100	316	62	5	316	50					6.5
4:00 - 5:00	34	49	88	100	54	24	151	398	78	4	386	68					8.1
5:00 - 6:00	43	47	102	101	51	26	137	432	85	6	433	69	0	0	0	0	8.9
Total (6-hour peak)	**199**	**218**	**469**	**469**	**236**	**119**	**638**	**1,997**	**391**	**29**	**1,998**	**318**	**0**	**0**	**0**	**0**	
Average (6-hour peak)	**33**	**36**	**78**	**78**	**39**	**20**	**106**	**333**	**65**	**5**	**333**	**53**	**0**	**0**	**0**	**0**	
Actual Pedestrian Crossing Distance (m)																	

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$

W =	**154**	**154**	**0**
		Veh	***Ped***

Warranted

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 0

Warranted - Complex Intersection

City of Lloydminster - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	52 Street	Direction (EW or NS)	EW	Road Authority:	City of Lloydminster
Side Street (name)	49 Avenue	Direction (EW or NS)	NS	City:	City of Lloydminster
Quadrant / Int #		Comments	20 Year Total Note: Total 6 Hr estimates based on factor of 6 hr existing count and AM+PM peak hours	Analysis Date:	2025 Aug 01, Fri
	CHECK SHEET			Count Date:	20 Year Projections
				Date Entry Format:	(yyyy-mm-dd)

for Warrant Calculation Results, please hit 'Page Down'

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
52 Street	WB				1					1			
52 Street	EB				1					1			
49 Avenue	NB				1					1			
49 Avenue	SB				1					1			

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

Are the 49 Avenue NB right turns significantly impeded by through movements? (y/n)	n
Are the 49 Avenue SB right turns significantly impeded by through movements? (y/n)	n
Are the 52 Street WB right turns significantly impeded by through movements? (y/n)	n
Are the 52 Street EB right turns significantly impeded by through movements? (y/n)	n

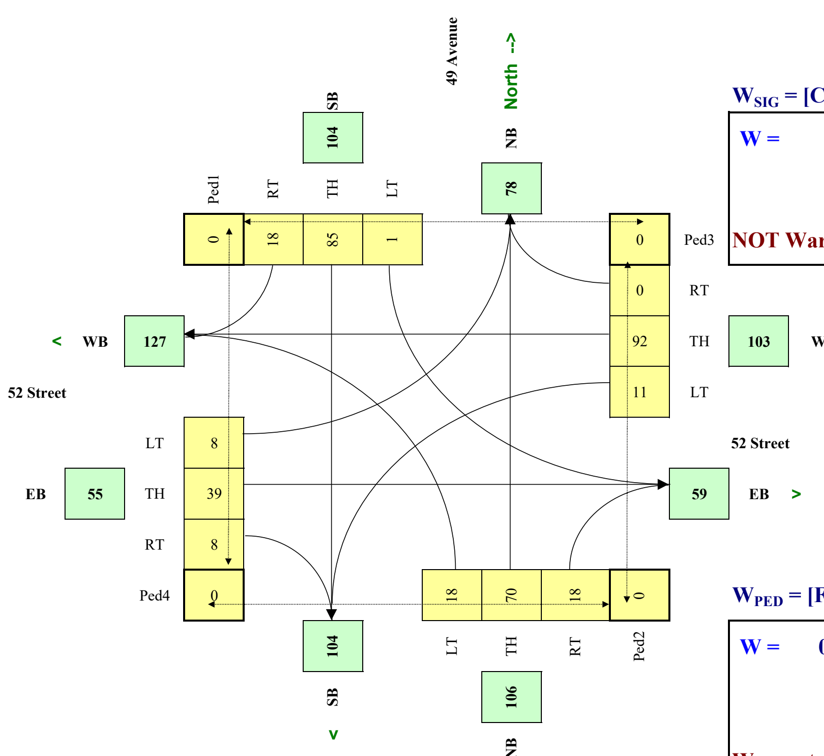
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	2,400
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
52 Street	EW	50	5.0%	n	0.0
49 Avenue	NS	50	5.0%	n	0.0

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW	
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side	% of Daily
7:00 - 8:00	13	52	14	1	63	13	8	67	0	6	29	6					5.1
8:00 - 9:00	18	66	17	1	75	15	10	61	0	8	35	8					6.5
11:00 - 12:00	16	61	16	1	74	15	10	79	0	7	34	7					6
12:00 - 13:00	17	66	17	1	80	17	11	86	0	8	37	7					6.5
4:00 - 5:00	20	83	22	1	107	23	14	138	1	9	49	8					8.1
5:00 - 6:00	23	91	24	1	110	23	15	118	1	10	51	10	0	0	0	0	8.9
Total (6-hour peak)	107	419	110	6	509	106	68	549	2	48	235	46	0	0	0	0	
Average (6-hour peak)	18	70	18	1	85	18	11	92	0	8	39	8	0	0	0	0	
Actual Pedestrian Crossing Distance (m)																	

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$

W =	22	22	0
		Veh	*Ped*

NOT Warranted

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 0

Warranted - Complex Intersection

City of Lloydminster - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	39 Street		Direction (EW or NS)	EW	Road Authority:	City of Lloydminster
Side Street (name)	52 Avenue		Direction (EW or NS)	NS	City:	City of Lloydminster
Quadrant / Int #		Comments	20 Year Peak PM Midday Hours and Secondary Peak Hours estimated from Typical Daily Percentages		Analysis Date:	2025 Aug 01, Fri
	CHECK SHEET				Count Date:	20 Year Projections
for Warrant Calculation Results, please hit 'Page Down'					Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
39 Street	WB				1					1			
39 Street	EB				1					1			
52 Avenue	NB				1					1			
52 Avenue	SB				1					1			

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

Are the 52 Avenue NB right turns significantly impeded by through movements? (y/n)	n
Are the 52 Avenue SB right turns significantly impeded by through movements? (y/n)	n
Are the 39 Street WB right turns significantly impeded by through movements? (y/n)	n
Are the 39 Street EB right turns significantly impeded by through movements? (y/n)	n

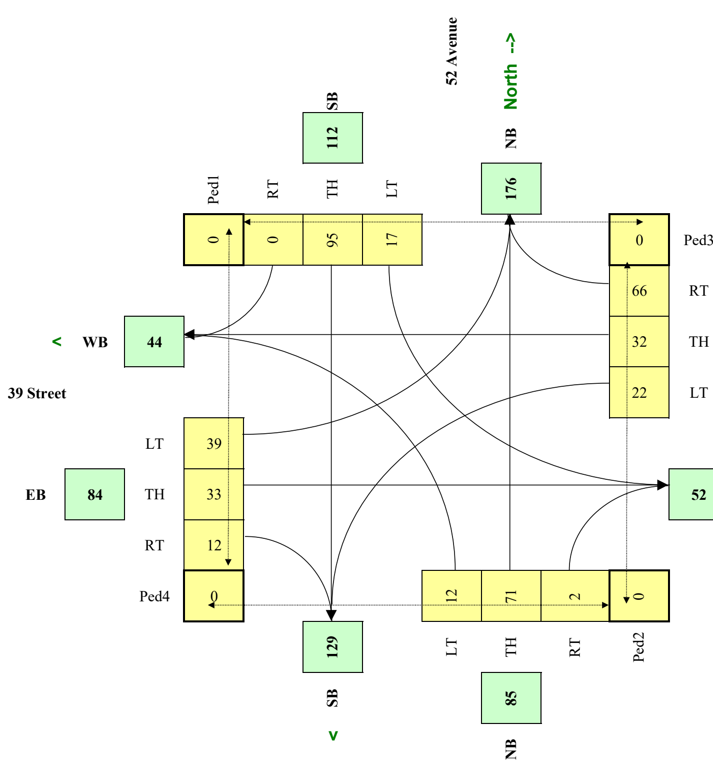
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	2,400
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
39 Street	EW	50	5.0%	n	0.0
52 Avenue	NS	50	5.0%	n	0.0

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW	
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side	% of Daily
7:00 - 8:00	9	53	2	12	71	0	17	24	48	29	25	9					5.1
8:00 - 9:00	11	64	2	15	79	0	18	24	43	32	29	10					6.5
11:00 - 12:00	10	62	2	15	83	0	19	28	57	34	29	10					6
12:00 - 13:00	11	67	2	16	90	0	21	30	62	37	31	11					6.5
4:00 - 5:00	14	88	3	21	126	0	30	46	100	52	42	15					8.1
5:00 - 6:00	15	92	3	22	123	0	29	42	84	50	43	15	0	0	0	0	8.9
Total (6-hour peak)	70	426	14	101	572	0	134	194	394	234	199	70	0	0	0	0	
Average (6-hour peak)	12	71	2	17	95	0	22	32	66	39	33	12	0	0	0	0	
Actual Pedestrian Crossing Distance (m)																	

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$

W =	27	27	0
		Veh	*Ped*

NOT Warranted

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 0

Warranted - Complex Intersection

City of Lloydminster - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	**39 Street**	**Direction (EW or NS)**	**EW**		**Road Authority:**	**City of Lloydminster**
Side Street (name)	**70 Avenue**	**Direction (EW or NS)**	**NS**		**City:**	**City of Lloydminster**
Quadrant / Int #		**Comments**	**20 Year Peak PM Midday Hours and Secondary Peak Hours estimated from Typical Daily Percentages**		**Analysis Date:**	**2025 Aug 01, Fri**
	CHECK SHEET				**Count Date:**	**20 Year Projections**
					Date Entry Format:	(yyyy-mm-dd)

for Warrant Calculation Results, please hit 'Page Down'

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
39 Street	WB				1					1			
39 Street	EB				1					1			
70 Avenue	NB				1					1			
70 Avenue	SB				1					1			

Saturation Flow Rates (if not default) (vphpl)		**Default Saturation Flow Rates (vphpl)**
Left Turn		1,650
Through		1,800
Right Turn		1,500

Are the 70 Avenue NB right turns significantly impeded by through movements? (y/n)	n
Are the 70 Avenue SB right turns significantly impeded by through movements? (y/n)	n
Are the 39 Street WB right turns significantly impeded by through movements? (y/n)	n
Are the 39 Street EB right turns significantly impeded by through movements? (y/n)	n

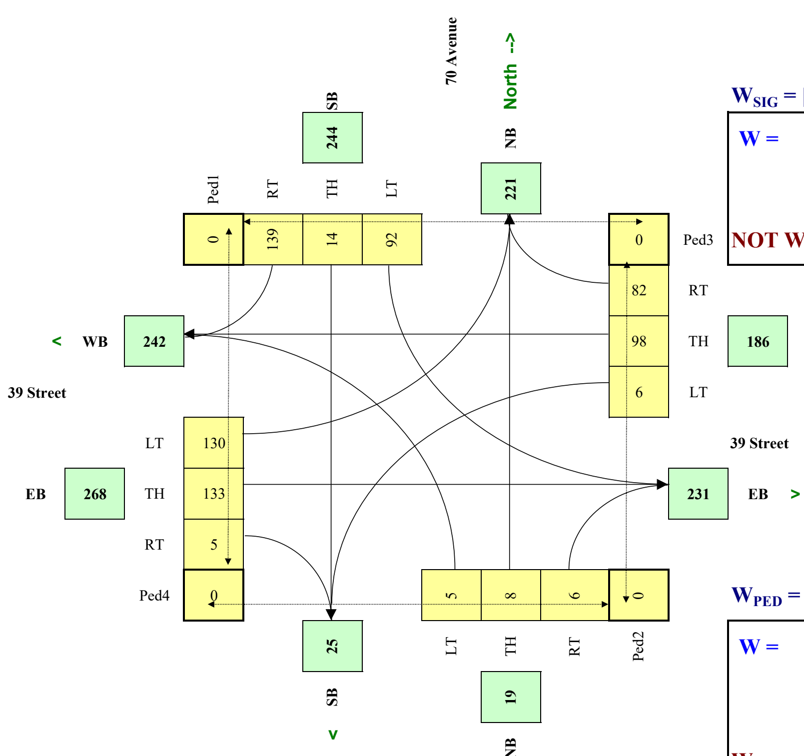
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	2,400
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
39 Street	EW	50	5.0%	n	0.0
70 Avenue	NS	50	5.0%	n	0.0

Set Peak Hours

Traffic Input	**NB**			**SB**			**WB**			**EB**			**Ped1** NS	**Ped2** NS	**Ped3** EW	**Ped4** EW	
	LT	**Th**	**RT**	**LT**	**Th**	**RT**	**LT**	**Th**	**RT**	**LT**	**Th**	**RT**	**W Side**	**E Side**	**N Side**	**S Side**	**% of Daily**
7:00 - 8:00	4	6	5	68	10	103	4	72	61	97	99	4					5.1
8:00 - 9:00	5	8	6	81	11	129	5	79	70	121	124	5					6.5
11:00 - 12:00	4	7	5	80	12	122	5	85	72	114	116	5					6
12:00 - 13:00	5	8	6	87	13	132	6	92	78	123	126	5					6.5
4:00 - 5:00	5	10	7	115	18	168	8	131	106	156	160	6					8.1
5:00 - 6:00	6	11	8	119	17	181	8	126	106	169	173	7	0	0	0	0	8.9
Total (6-hour peak)	**29**	**50**	**37**	**550**	**81**	**835**	**36**	**585**	**493**	**780**	**798**	**32**	**0**	**0**	**0**	**0**	
Average (6-hour peak)	**5**	**8**	**6**	**92**	**14**	**139**	**6**	**98**	**82**	**130**	**133**	**5**	**0**	**0**	**0**	**0**	
Actual Pedestrian Crossing Distance (m)																	

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$

W =	53	53	0
		Veh	*Ped*

NOT Warranted

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 0

Warranted - Complex Intersection

City of Lloydminster - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	**52 Street**	**Direction (EW or NS)**	**EW**	**Road Authority:**	**City of Lloydminster**
Side Street (name)	**49 Avenue**	**Direction (EW or NS)**	**NS**	**City:**	**City of Lloydminster**
Quadrant / Int #		**Comments**	**20 Year Peak PM Midday Hours and Secondary Peak Hours estimated from Typical Daily Percentages**	**Analysis Date:**	**2025 Aug 01, Fri**
	CHECK SHEET			**Count Date:**	**20 Year Projections**
				Date Entry Format:	(yyyy-mm-dd)

for Warrant Calculation Results, please hit 'Page Down'

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
52 Street	WB				1					1			
52 Street	EB				1					1			
49 Avenue	NB				1					1			
49 Avenue	SB				1					1			

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

Are the 49 Avenue NB right turns significantly impeded by through movements? (y/n)	n
Are the 49 Avenue SB right turns significantly impeded by through movements? (y/n)	n
Are the 52 Street WB right turns significantly impeded by through movements? (y/n)	n
Are the 52 Street EB right turns significantly impeded by through movements? (y/n)	n

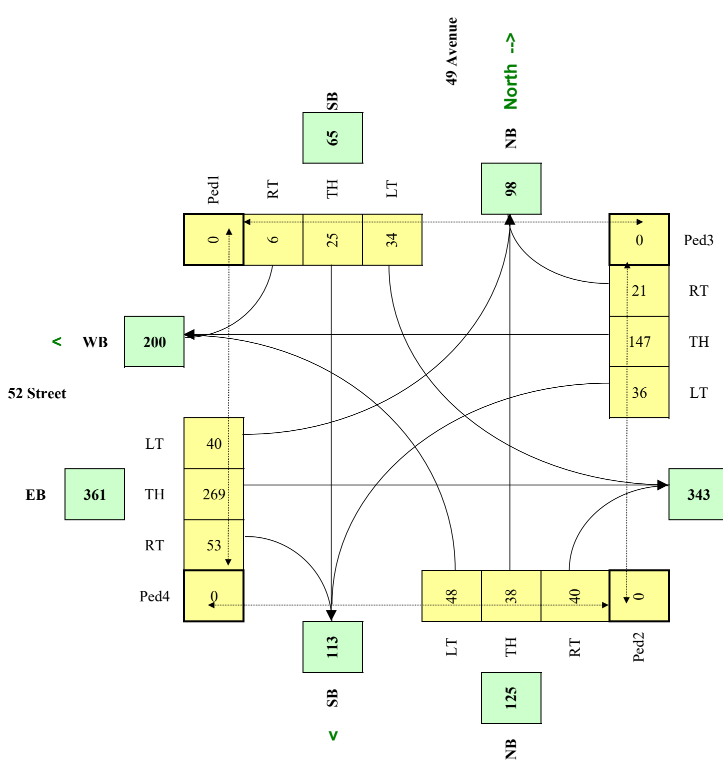
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	2,400
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
52 Street	EW	50	5.0%	n	0.0
49 Avenue	NS	50	5.0%	n	0.0

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW	
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side	% of Daily
7:00 - 8:00	35	28	30	25	18	4	26	109	15	30	199	39					5.1
8:00 - 9:00	43	39	37	26	14	2	25	131	20	42	230	36					6.5
11:00 - 12:00	42	33	35	29	22	5	31	128	18	35	235	46					6
12:00 - 13:00	45	36	38	32	23	5	33	139	20	38	254	49					6.5
4:00 - 5:00	59	41	48	47	41	11	52	183	24	42	347	78					8.1
5:00 - 6:00	62	49	52	44	32	7	46	190	27	52	348	67	0	0	0	0	8.9
Total (6-hour peak)	**286**	**226**	**240**	**203**	**150**	**34**	**213**	**880**	**124**	**239**	**1,613**	**315**	**0**	**0**	**0**	**0**	
Average (6-hour peak)	**48**	**38**	**40**	**34**	**25**	**6**	**36**	**147**	**21**	**40**	**269**	**53**	**0**	**0**	**0**	**0**	
Actual Pedestrian Crossing Distance (m)																	

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$

W =	**70**	**70**	**0**
		Veh	***Ped***

NOT Warranted

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 0

Warranted - Complex Intersection